Globalisation, the financial crisis and stabilisation policies

EXPERT REPORT NO. 36 TO SWEDEN'S GLOBALISATION COUNCIL
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Torben M. Andersen
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Preface

The recent wave of globalisation - and the effects of the global financial crisis - raises new questions on the role of stabilisation policy. The mainstream consensus view is that stabilisation policy should be left to monetary policy pursuing credible policy rules with a focus on inflation. On the other hand, most macroeconomists would argue that fiscal policy should rely on the automatic stabilisers, restraining discretionary fiscal policy to very special circumstances with a clearly identified need for policy intervention. Are those commonly held wisdoms still true in today's globalised world?

The report aims to shed light on the following issues. First, how does the current global financial crisis influence the need and scope for monetary and fiscal policy? Second, is globalisation the cause of the present turmoil or are there other explanations that should be invoked? Finally, to what extent can the lack of regulations and supervision of global financial markets be held accountable for the recent downturn, and which remedies can be implemented to avoid a similar situation to emerge in the future?

In the first chapter Torben M. Andersen focuses on the implications of the crisis for fiscal policy. He emphasises the role of automatic stabilisers in normal situations, but advocates a more active fiscal policy strategy when the economy is exposed to severe and idiosyncratic shocks. The degrees of freedom in pursuing such strategy is discussed, as is the preferable instruments - based on their multiplier effects - to be used. Torben Anderson also conclude that leakages across countries associated with fiscal policies calls for more of coordination to avoid free passenger problems and to make sure that the taken measures are effective. He strongly favours labour market policies to prevent unemployed to get marginalised and lose contact with the labour market. The conceivable tension between short and long-run objectives is also discussed. Thus, the present situation makes a case for active fiscal policy in order to boost aggregate demand, simultaneously as the crisis necessitates structural adjustments. That has to be taken into account in order to avoid that policy measures impede a basically sound restructuring of the economy.

Peter Englund focuses on the mechanisms of modern financial markets that made it possible for losses, initially related to U.S. housing finance, to give rise to a world-wide crisis. In addition,

a number of reforms to circumvent future financial crises are suggested. He identifies plenty of shortcomings in the current regulatory system and argues for a more global approach to address financial market regulation. These are critically important for the functioning of any economy, and they are interconnected through a global web of financial institutions and agents. Hence, shocks are easily transmitted across these financial networks. In a world of international capital markets and cross-border banking, it is not possible for any nation to protect its banking system simply by a national system of regulation.

In the final chapter Stefan Gerlach tries to find answers to the crucial issue on what factors led to the crisis. In particular, how did globalisation impact the crises? A second question concerns what policy responses are warranted to prevent future financial crises. Gerlach analyses the low inflation policies in recent decades and explores the hypothesis that monetary policy set the stage for the crisis by depressing long real yields and triggering the search for yield. He also discusses the crisis from a financial stability perspective. He argues that the main cause of the crisis was a global imbalance in the rate of savings, i.e. he finds support for the "saving glut" hypothesis, combined with poor incentives and ineffectual regulation and supervision. However, according to Stefan Gerlach, that should not be interpreted as if there is no important role for monetary policy to play. Rather the contrary, the independence of central banks and the design of monetary policies, is the main cause of decreasing inflation while globalisation may have had an indirect but limited effect on inflation. Still, the challenges ahead are substantial. In the short term those relate to the deflation threats that have emerged in several countries, while in the longer term the enormous liquidation of the markets should constitute a risk of higher inflation expectations.

The authors are all well-renowned professors in economics: Torben M. Andersen, School of Economics and Management, Aarhus University, Peter Englund, Department of finance, Stockholm School of Economics, and Stefan Gerlach, Institute for Monetary and Financial Stability, University of Frankfurt. The authors take full responsibility for the results and the analyses presented in this report.

Stockholm, May 2009
Pontus Braunerhjelm
Principal Secretary, The Globalisation Council

Globalisation Council members

The Swedish Government has established a Globalisation Council to promote a deeper knowledge of globalisation issues, draw up economic policy strategies and broaden public dialogue about what needs to be done to ensure that Sweden can compete successfully in a world marked by continued rapid globalisation. The Council's work is expected to lead to proposed measures whose purpose, broadly defined, will be to boost Sweden's competitiveness and attractiveness on the international scene.

In addition to regular Council meetings, background reports will be written by independent researchers and other experts. These will be quality assessed by reference groups composed of representatives from academia and the Government Offices and by leading economists on the Council's Advisory Board. The work of the Council, which must be completed well before the 2010 general election, will be documented in a final report along with economic policy recommendations. Plans are also being drawn up for a number of external activities, such as conferences and seminars.

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Fiscal policy and the global financial crisis

February 2009

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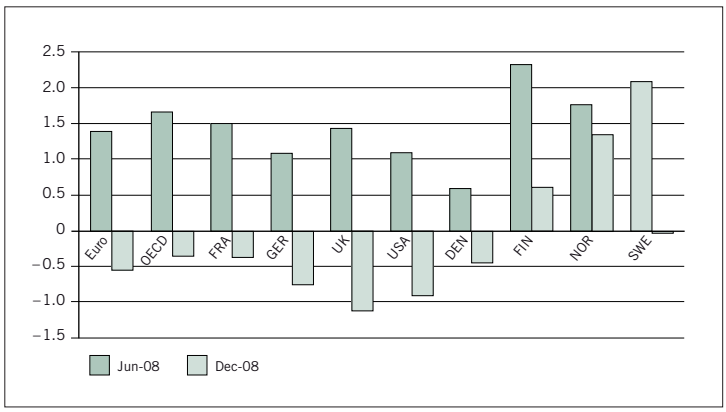
1. Introduction

The global financial crisis is now turning into a worldwide economic crisis. Business cycle forecasts are continuously being revised downwards[1] and negative growth rates are expected in many OECD countries for 2009, cf. figure 1. Growth rates are expected to recover only sluggishly, and consequently unemployment rates are soaring in all OECD countries.

Figure 1: Forecast adjustments:
OECD growth forecasts for 2009: June and December 2008



Note: Forecast for real GDP growth in the OECD's Economic Outlook 83 (June 2008) and Economic Outlook 84 (November 2008). **Source:** http://stats.oecd.org

Against this background, political interest in fiscal policy as a possible remedy is increasing. For some years fiscal policy has been downplayed, but it now faces a renaissance with high expectations

[1] In January, IMF (2009) revised the projected world growth rate for 2009 downwards to 0.5 per cent, In November 2008 it was forecast to be 2 .25 per cent, and in July 2008 3.9 per cent. The EU Commission (2009) has adjusted the projected growth rate for 2009 down by 2 percentage points to -0.2 per cent between autumn 2008 and January 2009.

as to what fiscal policy can accomplish. In many countries, there is a lively debate on the need for a fiscal stimulus, its magnitude, and its composition, and some countries have undertaken fiscal stimulus packages. Leaders at the G20 summit, the EU Commission and many others have called for a coordinated fiscal stimulus.

The revival of fiscal policy raises two questions: what role can fiscal policy play in the current situation and what does past experience teach us about fiscal policy? The views on fiscal policy prevailing before the onset of the crisis were heavily influenced by events triggered by the 'oil crisis', when there were widespread attempts to manage the crisis with demand management policies. Policies during that period were not particularly successful. This can largely be attributed to the misperception that the crisis was temporary and to a neglect of structural aspects.[2] Another important lesson is the trade-off between short- and long-run objectives. High levels of debt accumulated during the 1970s and 1980s have turned out to be a significant burden and constraint on policy options for a number of countries for prolonged periods of time. For some countries, these problems had not been fully solved before the onset of this crisis. At the same time, the approaching demographic shifts are challenging public finances still further.

The mainstream consensus view on macroeconomic policy can be summarised as follows.[3] Stabilisation policy should be left to a monetary policy pursuing credible policy rules with a focus on inflation. Fiscal policy should rely on the automatic stabilisers (the rule-based part of fiscal policy), leaving discretionary fiscal policy only to special circumstances where there is a clear need for policy intervention (escape clause). Hence, well-known lag-problems should not lead to fiscal fine-tuning, but 'coarse-tuning' is called for in special situations. The conditions for the latter clearly seem to be fulfilled in the current situation.

With the recent wave of globalisation, the current situation raises new questions. The cause of the crisis, and in particular its propagation, have a very strong global element driven by closer financial and trade links. At the same time, this also significantly influences the effects of fiscal policy since increased demand

[2] See e.g. Andersen (1990) for an account and discussion of policy strategies in the Nordic countries.

[3] This is clear in the 'Maastricht assignment' for the European Monetary Union, which leaves centralised monetary policy to stabilise inflation, and decentralised fiscal authorities to stabilise national output by relying primarily on the automatic stabilisers.

leakages via trade and specialisation of production may make fiscal instruments less effective. If either of these factors is important, it may, however, point to larger gains from policy coordination than in the past. However, it is not clear that the political barriers and obstacles to beginning coordinating stabilisation efforts have been reduced. This may cause a 'stabilisation deficit' tending to worsen the depth and duration of the crisis.

The aim of this paper is to discuss the need and scope for fiscal policy in light of the global financial crisis. It is not the aim here to give a general account of fiscal policy, but rather to focus on issues particularly relevant in the current situation. First, a few general remarks on the nature of the crisis and the role of fiscal policy are highlighted in section 2. Next, the role of automatic stabilisers and their strength are discussed in section 3. Some crucial aspects of the effectiveness of fiscal policy are discussed in section 4, while section 5 considers specific aspects of fiscal policy design in the current situation. The possible tension between short- and long-run objectives is discussed in section 6, and section 7 considers coordination issues. Finally, section 8 offers some concluding remarks.

2. Economic implications of the crisis and fiscal policy

The need and scope for a discretionary fiscal policy depend on the nature of the shock and on the value added it may contribute to monetary policy responses and automatic budget reactions. In the following paragraphs, these issues are briefly considered.

While the origin of the crisis is attributed to the financial sectors, there are also some counterparts in the real economy. Most notably, the housing markets in a number of countries have been overheated and this overheating has been reflected both in excessive house price increases[4] and a booming activity level in the sector. The specific problems in the financial sector (liquidity and solvency issues) will not be discussed here, but the financial sector itself has also been overheated. Moreover, the implied effects for credit policy (eventually a credit crunch) are important since they make borrowing constraints more binding. This, in turn, has implications for both investment and consumption.

Maintaining the status quo is thus neither a feasible nor a desirable policy option. Some structural adjustments are inevitable, and it is important that policy discussions take this into account. If not, policy will be based on unattainable objectives and lead to large waste as it attempts to counteract the inevitable structural adjustments.

However, the downturn is more than mere structural readjustments after 'bubble' phenomena in the housing market and financial sectors. These effects are exacerbated by sharp declines in aggregate demand. This applies to all three main components of private demand: private consumption, investment and net exports. Several factors cause private consumption growth to decline. Wealth losses induce a higher savings rate. Lack of confidence in the future and more dismal expectations as well as an increased perception

4 IMF (2008) shows that price increases in a number of countries significantly exceed what can be explained by market fundamentals, leaving house price gaps in the order of 10-30 per cent.

of risk further strengthen incentives to save. In addition, tighter credit policies make liquidity constraints more binding for some households. Likewise, private investments are depressed by tighter credit policies (credit rationing, interest rates) as well as declining expectations and increased risk perceptions. Finally, net exports are falling due to the similar contractionary effects taking place in many countries. This may be called a global multiplier effect, which owes its existence to the global nature of the crisis, and it has been strengthened as a result of the globalisation of financial and goods markets. The changes in net exports may differ across countries depending on exchange rate regimes, as seen from the appreciation of effective exchange rates in some countries and their depreciation in others (e.g. Norway and Sweden).[5]

In response to the financial crisis, monetary policy has been radically eased, including provisions of liquidity and significant interest rate reductions. Interest rates have been reduced to rather low levels, implying that the room for further interest rate reductions is small (related to the general discussion about the liquidity trap). Moreover, it is possible that monetary policy may have asymmetric effects or degrees of effectiveness in the sense that monetary policy is more effective in contracting a boom than in inducing a boom (you can pull a string, but not push it). Accordingly, it is a widespread perception that monetary policy cannot deliver sufficient stabilisation in the current situation.

Attention is therefore turning to fiscal policy, and the first question is whether the conditions for the use of a discretionary fiscal policy have been fulfilled. There is no general rule as to when a discretionary policy is called for, but output gaps below 1-2 per cent seem to indicate severe problems justifying discretionary measures.[6] Clearly the need and scope for policy intervention should be seen relative to other indicators, including the unemployment rate. In determining the scope for fiscal policy intervention, it is important to take medium- to long-run effects into account. Expansionary fiscal policy in combination with budget deteriorations implied

[5] E.g. Denmark has experienced tightened monetary conditions. The currency is pegged to the euro, but the interest rate spread has increased due to turmoil in international financial markets.

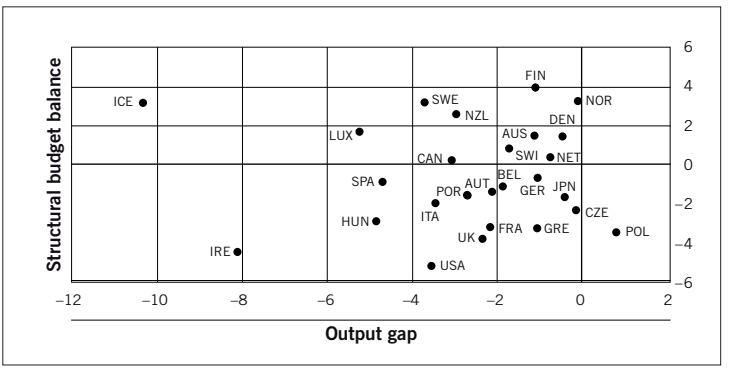
[6] There is no conventionally agreed cut-off point. In the STEMU report, an output gap of – 2 per cent was proposed as a critical level (SOU(2002)).

by automatic budget reactions will drive up public debt, which, in turn, may create future adjustment problems (see also section 6). The more expansionary the fiscal policy, the less fiscal sustainability has been addressed in the past.

Figure 2 sheds some light on the need and scope for fiscal policy action. It shows both the output gap and the structural budget balance for OECD countries for 2009. For the sake of argument, take an output gap below -1 per cent as an indicator of a need for an expansionary policy, and a positive structural budget balance as an indicator of the presence of short-run room for manoeuvre without jeopardising long-run objectives. This leaves four different possibilities in the need/no need and room/no room for an expansionary fiscal policy, and the heterogeneity across countries stands out as an important factor. Where Sweden is in the 'need and room' category, we have in the 'need but no room' category a large number of countries including e.g. the United States, France, and Italy. Clearly, the position of public finances may not constrain policy actions, but it points to the long-run consequences of such actions.

In summary, fiscal policy is called upon to provide additional stabilisation. The conditions triggering the escape clause have been fulfilled; the crisis is severe, and monetary policy combined with automatic stabilisers cannot provide sufficient stabilisation.

Figure 2: Need and scope for fiscal policy
Output gaps and structural budget balance, OECD countries



Note: Output gap for 2009 and structural budget balance relative to GDP for 2008.
Source: Data from the OECD's Economic Outlook 84, December 2008.

3. Automatic stabilisers

Automatic stabilisers are widely appreciated, and as noted, the consensus view is that fiscal policy in 'normal times' should be left to the automatic stabilisers. They have the advantage of not suffering from the usual information, decision, and implementation lags, and empirical evidence has shown that they contribute to stabilisation (see e.g. van der Noord (2000) and Debrun et al. (2008)). However, one key issue is whether automatic stabilisers are strong enough. The design of automatic stabilisers is more by chance than design in the sense that it captures the net effect of policy decisions in a number of policy areas.[7] Aiming at a specific level for the automatic stabiliser is usually not a policy target.

3.1 What has happened to automatic stabilisers?

One particular concern is whether automatic stabilisers have been weakened in recent years due to structural reforms' focus on the incentive effects of both tax and labour market policy (see e.g. Knieser and Ziliak (2003)). Figure 3 shows estimates of the size of automatic stabilisers reported by the OECD in 2000 and 2005. On average, automatic stabilisers have not tended to weaken (the average in 2000 was 0.49 and in 2005, 0.46). Yet there seems to be a systematic pattern since those countries with initial weak automatic stabilisers have tended to get stronger automatic stabilisers, whereas they have been muted for countries with initial strong automatic stabilisers.

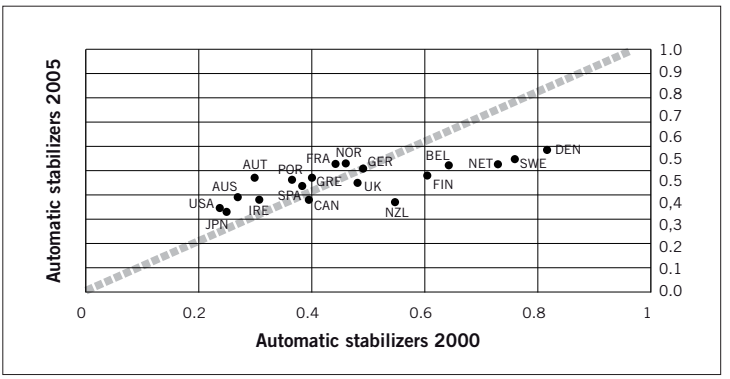
[7] It is empirically well established that economies with large public sectors tend to have large automatic stabilisers and vice versa.

According to these estimates, there has been a levelling of the strength of automatic stabilisers. Note that it cannot be concluded that this is due to reforms since different estimation methods and data have been applied. Moreover, active labour market policies are not included in the 2005 measure, and this is important for such countries as Denmark and Sweden. Including active labour market policies implies that automatic stabilisers have not been weakened in those countries.

It is thus generally not possible to conclude that automatic stabilisers have been weakened. However, for the countries where they have been weakened, the question is whether that has been a conscious policy choice or an unintended side effect of reforms in other policy areas.

The overall fiscal response is the sum of the effects of automatic stabilisers and discretionary changes, and hence one might expect large discretionary changes in countries with weak automatic stabilisers. Historically the Nordic countries stand out with both large automatic stabilisers and more active use of discretionary fiscal policy (Ahrend et al. (2007)). Revealed preferences indicate that the political value of stabilisation is considerable.

Figure 3: Automatic stabilisers: 2000 vs 2005



Note: Automatic stabilisers are measured by the semi-elasticity of the budget balance in relation to GDP; that is, the change in the budget balance relative to GDP induced by a 1 per cent change in GDP. Norway refers to mainland Norway only.
Source: van der Noord (2000) and Girouard and André (2005).

3.2 Can automatic stabilisers be strengthened?

The crisis has raised concerns that automatic stabilisers are too weak and proposals have been made to strengthen them. Most explicit is a recent position paper from the IMF (see Spilimbergo (2008)), which proposes strengthening automatic stabilisers by changing e.g. unemployment insurance schemes (benefit levels, duration and eligibility conditions).[8]

Conditioning unemployment insurance schemes more explicitly on the business cycle situation is a possible way to strengthen automatic stabilisers. This will provide more insurance when it is needed most (when unemployment is high) and less when it is not much needed (when unemployment is low). The idea of introducing business cycle conditions explicitly into the unemployment insurance scheme is known in both Canada (benefit level, duration and eligibility conditions)[9] and in the United States (extending benefit periods), see e.g. Andersen and Svarer (2009) for details. Sweden is also known for using labour market policy as a semi-automatic stabiliser by varying active labour market policies with the state of the labour market.

Making one or several dimensions of unemployment insurance more (less) generous in bad (good) times clearly strengthens the insurance and automatic stabilisers. But such contingencies may have detrimental structural effects. One is that it may make wage setting less responsive to the labour market situation since the effects of changes in unemployment are countered by changes in benefits. Another important issue is the effect on job search incentives. It turns out that it is not at all obvious that labour market structures are impaired. This depends on how the distortionary (incentive) effects of unemployment insurance are affected by the business cycle situation. If benefit generosity is more distortionary in good than in bad times, it follows that such a contingency will reduce benefits when they are most distortionary and increase them when they are

[8] Similarly, it is argued in the European Economic Recovery Plan (see European Commission (2008)) that unemployment benefits or their duration may be increased.

[9] As an example, benefits in Canada depend in a step-wise fashion on the regional unemployment rate, and the potential benefit level is about 50 per cent higher if regional unemployment is high (above 13 per cent) than if it is low (below 6 per cent).

least distortionary; that is, the average distortionary effects can thus be lowered. This is interesting since it shows that it is possible to strengthen insurance and automatic stabilisers without necessarily increasing the structural unemployment rate. The strength of this mechanism can be debated, but it shows that the structural costs of the improved insurance coverage and strengthened automatic stabilisers need not be large (and they may be negative). However, a supply side consequence is that this contributes to making unemployment display more variability over the business cycle (see Andersen and Svarer (2009)).

Changing elements of the unemployment insurance scheme with the business cycle entails a political risk since it may be easier to agree on a more generous scheme in bad times than to make the opposite adjustment in good times. The latter is an example of a general problem in relation to discretionary fiscal policy and whether it has a pro-cyclical bias. However, if changes to unemployment benefit schemes in the current situation are made explicitly business cycle dependent, this is a way to introduce a rules-based policy, and therefore increase the political costs of opportunism.

4. Effectiveness of discretionary fiscal policy

The current debate on fiscal policy raises a number of questions concerning the effectiveness of fiscal policy. This section considers some principal arguments, while the subsequent section turns to more specific issues about how to compose a fiscal policy package.

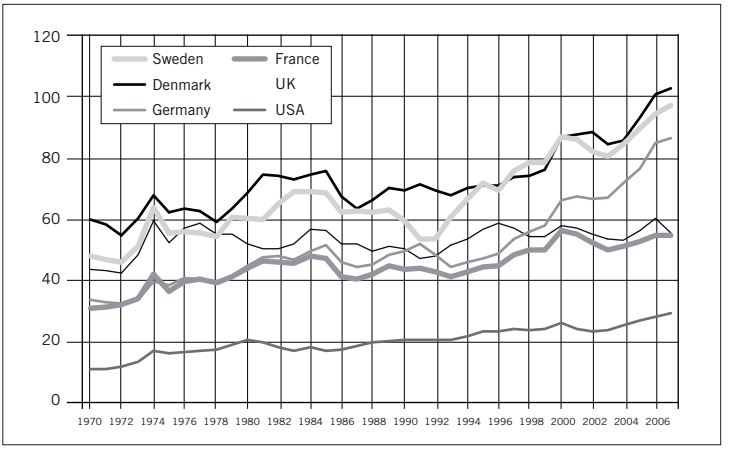
4.1 Demand leakages

Trade shares have been on an upward trend for some years, cf. figure 4. This is a visible consequence of the tighter economic integration associated with the globalisation process. It is a standard textbook result that the larger the import leakage, the smaller the fiscal multipliers.[10] The reason is that a larger share of domestic demand turns to foreign production. Hence, via stronger trade links globalisation tends to reduce the effectiveness of fiscal policy (see the later discussion on fiscal policy coordination).

This point should be qualified by the fact that there may be a significant difference between private and public demand with respect to the demand leakage. The reason is that the import content in private consumption is larger than in public consumption. Hence, the leakage problem relates in particular to measures aimed at increasing private demand and less at public demand. By changing the composition of the fiscal policy package, it is possible to minimise the leakage effect (see section 7).

[10] Barell et al. (2009) show that the size of country-specific fiscal multipliers is inversely related to the openness of the country.

Figure 4: Openness measures – selected countries



Note: Openness measured by the sum of exports and imports relative to GDP.
Source: www.sourceoecd.com.

4.2 Structural aspects

Traditional macro analyses take an aggregate approach to the labour market, essentially assuming homogenous labour which easily/costlessly can be reallocated across sectors. It is implied that only the aggregate level of demand matters, and a reduction in one component (say net exports) can be compensated by an increase in another component (say public demand) so as to leave aggregate activity and employment unchanged. In other words, different components of aggregate demand are perfect substitutes as concerns employment.

One particular reason why this homogeneity assumption may be called into question is globalisation. An important consequence of globalisation is that it leads to more specialisation. In models of inter-industrial trade and outsourcing, globalisation tends to strengthen skill bias in labour demand; that is, it increases demand for skilled labour and decreases demand for unskilled.[11] Exploitation of

[11] There has been a heated controversy whether skill bias is primarily due to technological shifts or globalisation. For the policy discussions considered here, it is, however, of no consequence what the underlying cause is. See OECD (2007) for a recent discussion of how globalisation affects labour markets.

comparative advantages is a key driver and further integration leads to expansions of sectors/types of production with high comparative advantages and vice versa. Since comparative advantages are closely related to specialisation, and hence sector specific knowledge (human capital), it follows that the structural composition of the economy matters.

If labour for these and other reasons is increasingly non-homogeneous across types of production, it follows that the composition of aggregate demand matters. When labour embodies sector specific knowledge, it is not plausible that labour can be reallocated across uses/sectors at no cost. The costs arise due to training costs (explicit or via on-the-job training) and to the sluggishness by which workers may adapt their reservation demands to changes in labour market prospects (in particular if it is associated with a different type of job, lower wage, etc.). The speed and willingness involved depend on wage formation and the social safety net, and the options it offers for 'postponing adjustment'.

Such adjustment effects have several important implications for fiscal policy.[12] First, even if falling private demand is counteracted by a fiscal stimulus, there will be a transitional phase with excessive unemployment due to falling demand in contracting sectors and the sluggish process by which labour is reallocated (increasing mismatch problems). It is far from self-evident that a general expansion will 'lift all boats' in the labour market. Those becoming unemployed may possess other skills than those in demand as a consequence of a more expansionary fiscal policy. This implies that shocks may have more persistent effects (including more wage/unemployment dispersion), and that fiscal policy may have a weaker short-run impact due to these supply factors.

Second, it is of utmost importance whether the changes are transitory or permanent. In the case of transitory changes, reallocation of labour may entail inefficiently large adjustment costs due to excessive labour turnover. In the case of permanent changes, the issue is more complicated. On the one hand, it is important

[12] The effects and design of fiscal policy in the presence of sectoral adjustment costs have not been much researched. One exception is Steigum and Thøgersen (2003). In a full employment model, they allow for the costs of transferring labour from the non-tradable sector to the tradable sector. One implication of negative private wealth shocks is that fiscal policy redistributes from future to current generations by running deficits (consumers are non-Ricardian) and that demand for non-tradables is supported in the transition.

that policy does not constrain the necessary structural adjustment process. On the other hand, if idle resources are only sluggishly absorbed in other sectors, there may be an argument for some temporary support even to declining sectors. Dealing with this issue is not an easy task since it requires an identification of the sectors facing particular problems and policies targeted to the problems of these sectors. General measures like tax cuts may be too imprecisely targeted and sector specific measures may amount to sector subsidies that raise questions regarding EU rule and moral hazard problems if sectors are bailed out.

4.3 Expectations

Expectations may play a critical role in fiscal policy's effectiveness. Arguments are often made that fiscal policy could be very influential because it may induce more optimistic expectations, fuelling domestic demand. Likewise, arguments are often made that expectations can make fiscal policy ineffective if expansionary policies lead to unsustainable debt levels. Let us consider these two arguments in some detail.

In a recessionary period, it is often suggested that a fiscal stimulus can be used to jump- or kick-start the economy. The idea is that a fiscal stimulus can induce a shift in expectations in a more optimistic direction, which, in turn, via private demand and investment, can give momentum to an upturn. This is essentially an argument that a properly timed fiscal stimulus package may have a larger multiplier effect if it can trigger an expectation effect.[13] This idea has not been much studied, but discussions of some policy episodes may shed some light on the idea. One example often highlighted as a 'kick-start' is a fiscal stimulus package in Denmark in 1993/94, which led to a significant change in the business cycle situation, with

[13] Yellen (2009) argues that a fiscal expansion is essential in the current situation since it is expected by the private sector. Disappointing these expectations will worsen the crisis.

strong growth in domestic demand. It is, however, difficult to assess whether this was driven by an expectations effect or other factors.[14] There is, however, a prominent case pointing to the possibility that expectation shifts may have muted fiscal multipliers. During the crisis in Japan in the 1990s, economic insecurity fuelled more pessimistic expectations, causing tax reductions to go into more (precautionary) saving rather than consumption, and thereby lowering the effects of fiscal stimulus packages.15

Another expectations argument stresses entirely different factors. The idea is that a fiscal expansion may trigger expectations of a tightening of fiscal policy if the expansionary policy is not sustainable. The point is that expectations of future fiscal policy may depend critically on the present fiscal stance, e.g. the current expenditure level or the current debt level. This is so since these levels may signal something about future fiscal policy, and thereby influence expectations formation. This may cause non-linearities or state dependencies in the effects of fiscal policy; that is, the effects of fiscal policy intervention may depend critically on the initial policy situation. A fiscal expansion causing increasing deficits may thus induce expectations of a policy change in the opposite direction in the future if the policy change brings fiscal sustainability into question.[16] In this situation, the private sector response to the announcement of a fiscal expansion may be a contraction in demand. This tends to counteract the expansionary effects of the fiscal stimulus package. If a moderate policy change makes a large future policy adjustment likely, it is even possible that a fiscal expansion might be contractionary.[17, 18]

[14] Prior to the policy change, there was a prolonged recession, and the increase in demand seems in part to reflect a 'ketchup' effect in the demand for durables.

[15] Doi (2004) finds that employment risk had a significant effect on precautionary savings in Japan. However, the extent to which fiscal policy was expansionary in the period is disputed. An alternative explanation is that the savings increase reflects a Ricardian response to increasing levels of public debt.

[16] Consider the effects of a tax reduction causing a budget deficit and rising debt. If the initial debt level is low, the deficit would have only a small effect on expected future taxes, and therefore private consumption would increase. However, at a high debt level a further deficit would be an argument for consolidation and thus future tax increases Therefore private consumption may fall. Both the size and direction of taxes' effect on private consumption are thus dependent on the level of debt.

[17] This holds both with Ricardian Equivalence (see Bertola and Drazen (1993)) and with non-Ricardian Equivalence (see Sutherland (1997)).

[18] There has been an extensive debate on the possibility of encountering expansionary fiscal contractions, various case studies have been undertaken, and econometric studies of the issue have been performed (see e.g. Giudice et al. (2003)).

To sum up, expectations effects may cause fiscal policy multipliers to increase or decrease (or even change signs), and hence it is not possible to make unambiguous conclusions on how expectation formation influences fiscal policy. One lesson is that expectations matter and credibility problems make it is easier to have them working against you rather than for you.

5. Designing fiscal policy packages

Appropriate fiscal interventions depend on the nature of shocks, the capability of monetary policy and the strength of automatic stabilisers. Requirements for a discretionary fiscal policy are that it should be *well timed* in relation to the business cycle situation, it should be adapted to the nature of the shocks, it should be *temporary*, the specific instruments applied should be *effective* in light of the policy goals, and medium- to *long-term constraints* should be taken into account.

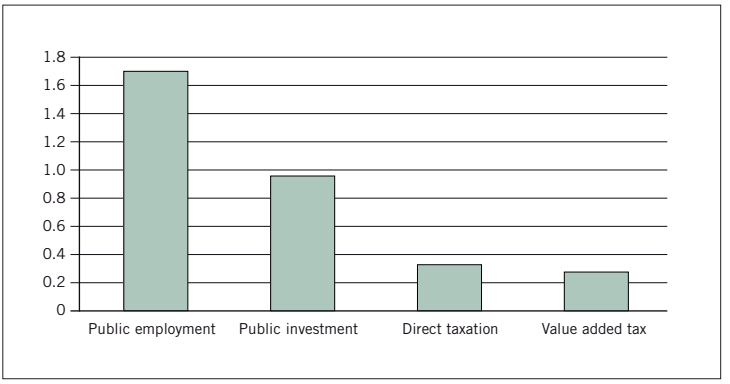
A business cycle event (its impulse response) can be characterised by its impact effect and its persistence. Most policy discussions are focused on muting the impact effect of the crisis based on the perception that this will lower both the immediate cost and the duration of the crisis (cf. the discussion above on kick-starts). However, the issue of how policy can affect persistence is equally important. Whereas addressing the impact effect mainly involves aggregate demand management, the issue of persistence mainly involves structural issues, not least labour market policies.

5.1 Targeting public or private demand?

To mute or mitigate the effects of the financial crisis, the primary focus is on the extent to which falling private aggregate demand, and thus employment, can be countered by an expansionary fiscal policy.

One important choice is whether to target private or public demand. Targeting private demand mainly involves tax instruments to increase disposable income (e.g. temporary reductions in direct taxes) or to induce inter-temporal substitution in demand (e.g. a temporary VAT reduction). Public demand involves all expenditure items composing public consumption and public investment.

Figure 4: Fiscal employment multipliers – change in employment for a 1 percentage point change in the budget balance relative to GDP



Note: Gives the percentage increase in total employment from a change in the instrument causing a 1 per cent change in the budget balance relative to GDP. The effect is the first year effect, and the policy change is assumed to be permanent. This may in particular lower the effect of a permanent VAT change compared to a credible temporary change.
Source: Calculated on the basis of multipliers reported in Grinderslev and Smith (2007).

There is a large empirical literature supporting the argument that expenditure instruments have larger short-run multipliers[19] than tax instruments. As an illustration, figure 5 shows employment multipliers for four main types of fiscal instruments.. In a survey of a number of applied policy models, Hemming et al. (2002) conclude that although the range of short-run multipliers is wide, the expenditure multipliers tend to be in the range 0.6 to 1.4 (an increase of one per cent in government consumption will increase GDP by 0.6 to 1.4 per cent), while tax multipliers are in the range 0.3 to 0.8. As expected, long-run multipliers are significantly smaller than short-run multipliers. Similar findings are reported in e.g. Spilimbergo et al. (2008).

Effectiveness in terms of achieving the largest employment effect for a given change in public finances argues for the use of expenditure

[19] Stabilisation policy is a matter of temporary policy changes, and hence short-run multipliers are relevant. Many theoretical discussions have focused on the long-run multipliers, and the extent to which these may be negative due to various crowding-out mechanisms. However, short-run multipliers are generally conventionally signed even though the long-run multipliers are smaller or even oppositely signed, see e.g. Andersen (2005).

instruments. However, the ease by which the instruments can be changed tends to be inversely related to the size of the multipliers. A change in the VAT or the income tax system can be implemented relatively quickly, and although there are administrative aspects, it is mainly a question of changing parameters in given systems. Public investments in general have very long planning lags, and only if a stock of already approved projects exists (shovel ready), is it possible to have an effect with a reasonably short lag. If so, public investments fulfil the criteria of being both temporary and effective on short notice. It exploits existing capacity in e.g. the building and construction sector, and thus public activities should be used at a time when their opportunity costs are lowest. Public consumption and employment are somewhat trickier. Core basic public sector activities (administration, legal system, etc.) and welfare services (social services, health care, and education) are not ideally suited to temporary variations. One question is whether there is the capacity to absorb more staff in the short run (existence of workplaces, etc.), and it may moreover be politically difficult to implement a temporary hike without creating anticipations of new higher service levels. A particular problem may arise if municipalities or regions operate under balanced budget requirements since this may enforce pro-cyclical policies. If so, this situation needs reconsideration.

The effect of various fiscal policy instruments is generally shock dependent. Therefore one cannot critically rely on historical assessments of fiscal policy, and there is reason to ask whether the present situation makes fiscal policy more or less effective.[20] At a general level, it may be argued that the severity of the crisis makes the usual crowding-out mechanisms weak. In the short term, an expansionary fiscal policy is not likely to induce interest rate increases via an increase in inflation. Actually, if deflation is a risk, an expansionary fiscal policy may prevent monetary policy from effectively becoming contractionary. The effect on wage formation is not to induce higher wage growth, but rather to counteract wage (growth) moderation due to higher unemployment. Since wage formation is downward rigid, this effect may be small. Hence, basing discussions of fiscal policies on 'normal' measures of fiscal multipliers may lead to an underestimation of their effects in the current business cycle situation.

[20] However, large policy changes call into question whether available empirical evidence (econometric and model based) is a reliable guide since the maintained assumption for such analyses is that the policy changes are small.

There are specific arguments why tax instruments may be either more or less effective in the current situation.[21] The transmission mechanism of a tax reduction runs via disposable income to private consumption. If households are very pessimistic and perceive increasing risk in future economic possibilities, they may want to expand their savings. Tax increases therefore end up supporting savings rather than consumption. However, the policy is not in vain since it implies that households reach their savings target sooner[22] and therefore it aids in supporting demand at a later date (but it is still an imprecise instrument). Also it may be argued that it is a question of targeting the tax decrease. By targeting towards liquidity constrained consumers (and the crisis may have increased the fraction of liquidity constrained households), the expansionary effect is larger since these groups have a marginal propensity to consume of one. It has been argued that such targeting can be achieved by increasing unemployment benefits since they mainly go to liquidity constrained households. However, this demand effect has to be weighed against the possible supply side effect arising via a change in the incentive structure (see section 3).

A reduction of consumption taxes (e.g. a temporary reduction of VAT) does not suffer to the same extent from an uncertain transmission mechanism since it is targeted at consumption. However, the problem with this instrument is that it needs to be well timed relative to the duration of the crisis. This instrument works by inducing consumers to shift demand forward in time. The flip-side of this is that consumption will fall when the tax is reset at its pre-crisis level. When the duration of the crisis is uncertain, it is difficult to time this instrument and it may destabilise the situation. Moreover, the possibility of inducing intertemporal substitution relates only to non-liquidity constrained households. Since the percentage of liquidity constrained households has increased due to the crisis, this works to make this instrument less effective.

Also included in tax instruments are social security reductions to boost labour demand. The design of such schemes raises a

[21] In the United States, there has been much debate about the effects of the 2001 tax reduction . Macro evidence does not point to an effect (see e.g. Taylor (2009) but micro evidence does (see e.g. Johnson et al. (2006)).

[22] This may be interpreted as 'buffer stock' saving behaviour, cf. Carroll (2001) in the sense that agents will target a given level of 'cash-on-hand' (relative to permanent income) determined by financial wealth and current income. If cash-on-hand is below target, agents will try to rebuild the stock, and if it is above target, it can be depleted.

standard problem of targeting to minimise the deadweight losses. Such targeting is difficult since it is hard to tie subsidies to new job-creation or to jobs at a marginal risk of destruction.[23] While this instrument may be effective if it can be targeted to a specific sector, this is in practice difficult or may violate free trade arrangements.

For the reasons noted above, measures directed towards both private and public demand suffer from problems related to timing and effect lags. Pragmatically it may thus be argued that a fiscal stimulus package should include a portfolio of instruments. This is also the case for most of the fiscal stimulus packages undertaken in response to the financial crisis. Table 1 gives a brief overview of fiscal stimulus packages for some key countries.

5.2 Labour market policies

Discussions of stabilisation policy tend to focus on aggregate demand management, but there is reason also to consider labour market policies in general and active labour market policies in particular. Downturns tend to produce persistent reductions in employment rates. Figure 6 illustrates this by considering the path for the overall employment rates[24] during crisis years in the 1980s for the four large Nordic countries. It is seen that the recovery of the employment rate has been very sluggish. Time spans of 10 years or more elapsed before the employment rate returned to its previous peak level.[25] Since public finances are very sensitive to the employment rate (see e.g. Finanspolitiska Rådet (2008)), the pattern depicted is a key reason for significant and persistent public deficit problems.[26] Hence,

[23] The empirical evidence in general supports the position that wage subsidies boost employment in the affected groups, (see e.g. Kluve (2006)). Only a few studies consider the substitution effects, but a recent analysis of Finnish data shows that firms that hire subsidised labour experience a real increase in total employment and firms in the same industry do not seem to be disadvantaged (Kangasharju (2007)).

[24] Note that this measure is better than unemployment since the latter may be affected by schemes allowing the unemployed to opt out of the labour force.

[25] If marginalisation problems are not solved, the effects become persistent due to the overlapping generations mechanism that arises since these cohorts will have to reach normal retirement age and new cohorts will have to enter the labour market for the average employment rate to resume its 'normal' level.

[26] Van den Noord et al. (2006) argue that countries with more generous social safety nets tend to display more persistent responses to adverse shocks.

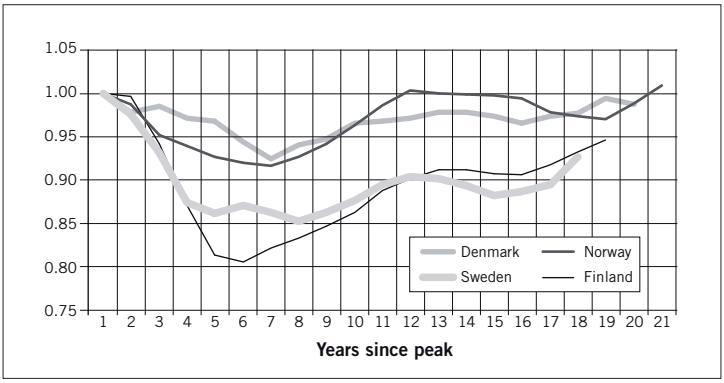
Table 1: Fiscal stimulus packages for 2009-10

	Budget Effect (% of GDP)	Measures	Share of package	Remarks
United States	5.5 %	Tax relief State and local relief Health care, energy and education	40 %: public consumption 40 %: taxes, transfers 15 %: infrastructure	
United Kingdom	1.1 %	Temporary lower VAT reduction from 17.5 % to 15 % Public investment project brought forward in time	30 %: public investments 70 %: taxes	Some transfers and basic allowances have also been changed The temporary nature of the measures is stressed: future tax and social security increases have been announced
Germany	3.2 %	Tax and social security contribution reductions Labour market policy (job rotation, training) Infrastructure	Taxes: 60 % Expenditures: 20% Infrastructure: 20 %	Proposes limits for public borrowing to safeguard long-run fiscal sustainability
France	1.3 %	Public expenditures/infrastructure Tax cuts for firms Support to sectors particularly affected by the crisis Employment measures and support to small firms	45 %: public expenditures/ investments 40 %: tax rebates 8 %: sector support Other: 8 %	
Sweden	2.4 %	Income tax and social security contribution reductions Subsidies for house repairs/rebuilding Strengthening active labour market policies	60 %: taxes 40 %: public consumption	Expansionary policy was planned in budget before financial crisis was fully perceived, additional measures (mostly labour market policies) some of which have supply-side effects

Note: The table includes measures planned/approved before February 2009. For Sweden, the numbers include both already planned expansionary measures in the budget for 2009 and specific additional discretionary measures taken subsequently.

Source: United States: American Recovery and Reinvestment Act; United Kingdom: Pre-Budget report 2008; Germany: Bundesregierung: Emerging from the crisis ready for the next upswing, 13/1-09; France: Mission Plan de Relance de l'économie, December 2008; Sweden: Regeringens proposition, Åtgärder för job och omställning, 2008/09:97.

Figure 5: Previous crises in Nordic countries – persistent reductions in employment rates



Note: The figure shows the employment rate in subsequent years relative to its peak level in the 1980s. The peak year is 1988 for Denmark, 1990 for Sweden, 1987 for Norway and 1989 for Finland. The employment rate is for the age group 15-64.
Source: Computations based on data from www.source.oecd.org.

persistence is important both for the social consequences and for their fiscal implications.[27]

Labour market policies are intertwined in fiscal policy. This is obvious for measures aimed at job creation such as lower social security contributions or public employment programmes. But equally important are other elements of active labour market policies since they are of importance in maintaining a high employment rate to ensure the financial viability of a large public sector. Increasing unemployment leads to increasing expenditures on active labour market policies at the same time as there is a risk that these policies will become less effective.

Recessions are generally associated with increasing inflows into unemployment as well as decreasing outflows from unemployment, i.e. longer unemployment spells (long-term unemployment), see

[27] Ljungqvist and Sargent (1995) argue that a system relying on active labour market policies may display multiple equilibria: a low unemployment equilibrium with an effective active labour market policy and small expenditures on the policy, and a high unemployment equilibrium where policy becomes less effective but more expensive. The Nordic experience seems to indicate that there is very strong persistence, but that policies have been adapted to prevent high and persistent non-employment.

e.g. Elsby et al. (2008). This causes inflows into labour market programmes to increase, but the composition of the unemployed also changes since more core workers experience unemployment. The latter seems particularly relevant in the current crisis since unemployment is rising for groups with long work experience and labour market relevant qualifications. In recent years, labour market policies in Denmark and Sweden have to an increasing degree focused on the long-term unemployed and marginalised. While this is both important and natural in a situation where unemployment has been falling, the present situation calls for a reconsideration of active labour market policies.

The issue is how to adapt active labour market policies to these changes. Intensive and costly programmes early in unemployment spells may have large deadweight losses since most of the newly unemployed have a strong work record and thus labour market relevant qualifications. However, it is important to prevent an inflow into long-term unemployment. This calls for measures to allow the unemployed to maintain contact with the labour market, including incentives for temporary jobs and job rotation as well as short-term activation programmes intended to keep the participants in close contact with the labour market. To prevent inflow into long-term unemployment, there is a need to focus on significant programme activities after some duration of an unemployment spell (say 9-12 months).

Education and retraining programmes are often highlighted as a remedy during a downturn. The basic argument is that the opportunity costs of programme participation are lower and that the potential detrimental effects on job search (the locking-in effect) are smaller in a downturn. However, such programmes also have their pitfalls. They are generally rather costly and they may be difficult to target. The targeting problem is two-sided since it requires programmes targeted to individuals with specific qualification barriers to employment and content/type directed towards areas where there will be a demand for labour in the future. Evaluation studies of retraining programmes are not very positive, underscoring the problems of designing effective retraining programmes (see e.g. Kluve (2007)). For Sweden, this issue is particularly important. The empirical findings indicate that education programmes were more effective in the 1980s with low unemployment than in the 1990s with high unemployment (Calmfors et al. (2004)). More recent studies for 2002-04 with low unemployment find more positive effects (see

de Luna et al. (2008)). This may be explained by better empirical identification of the effects and better targeting of policy. Moreover, this may suggest that these policies have been less effective during high unemployment periods, perhaps because they have had a mainly passive orientation. One lesson from this is that it is important to maintain an active focus on job prospects and job search in labour market policies.

One important lesson from earlier crises is that measures making it easier for the unemployed to opt out of the labour force (e.g. earlier retirement) are very costly since they cause a persistent decline in employment. Moreover, even though high unemployment rates tend to create pessimism with respect to job creation, experience has repeatedly proven this pessimism wrong (see figure 6).

6. Conflict between short-term and medium-term objectives – fiscal sustainability

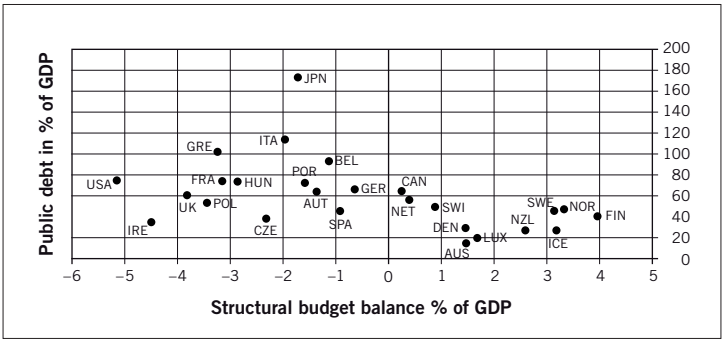
Another important lesson from the past is that short-run policies can have large long-run costs. After the prolonged downturn in the 1970s and 1980s, many countries faced public debt problems and consolidation has since been pursued, although with varying success. In addition, approaching demographic changes will strain public finances, and therefore the issue of fiscal sustainability is at the fore in fiscal policy discussions.

The focus on fiscal sustainability is explicitly reflected in the establishment of fiscal policy frameworks in a number of countries. While the specific formulation and institutional design of such frameworks differ, the main motivation has been to ensure that short-run policy decisions are made without jeopardising medium- to long-run objectives. The current crisis challenges these developments both because it is likely to produce systematic budget deficits, thus accumulating debt, and because it raises questions about how to reformulate targets in fiscal policy frameworks to put public finances back on track.

6.1 Public debt – a constraint on fiscal stabilisation policy?

It is worth noting that medium-/long-run aspects are much more in focus in fiscal policy discussions now than in the past. To take two prominent examples, both the G20 statement in November 2008 and the EU statement on a *European Economic Recovery Plan* stress that fiscal stimulus packages should be designed taking into account the current situation of public finances and the fiscal sustainability aspects.

Figure 8: Budget balance and debt level for OECD countries

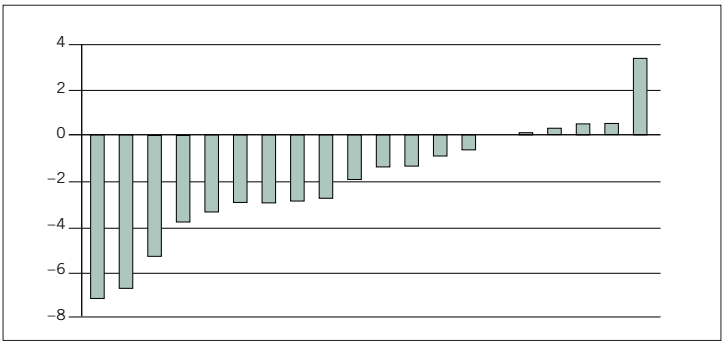


Note: Gross financial liabilities and structural budget balances as a share of GDP.
Source: OECD.

The importance of the public finance constraint for an active stabilisation policy depends both on the initial situation and on the impact of the crisis on public finances. The first issue can be assessed from figure 8 showing the current structural budget balance[28] and debt position for OECD countries. It is seen that already at the outset, a significant number of countries have a structural public finance problem; that is, structural budget deficits and high debt levels. A deep and long recession will cause budget deteriorations, adding to the debt problems, and together with debt servicing this will increase debt levels. The budget effects of the crisis can be read from figure 9 showing the projected budget balance for 2009 for some selected countries according to OECD forecasts. For the whole OECD area, the average budget deficit in 2009 is projected to be -3.8 per cent of GDP, and for the euro area -2.2 per cent of GDP. It is seen from the figure that some countries face severe public finance problems, including Ireland, the United States, the United Kingdom, France, and Japan. Hence the crisis causes most countries to be on north-west trajectories in figure 8. This leaves one clear implication, namely that the current crisis will bring the problem of high public debt levels back to the policy scene. Only a few countries have pursued a sufficiently strong consolidation policy to be in the low

[28] Revisions of structural budget balances are to be expected both because some extraordinary income streams in the past may have been taken to be permanent and because structural unemployment rates are likely to be revised upwards.

Figure 9: Projected budget balance for 2009, selected countries



Source: OECD Economic Outlook 84.

risk zone. Interestingly, both Denmark and Sweden are among them. Ireland is an example of failure to ensure sufficient consolidation. It has recently resorted to reductions in public spending despite a very deep crisis.

One particular problem making it difficult to assess public debt levels in the current situation concerns the liabilities implied by various arrangements to provide loans and capital to private companies (primarily in the financial sector).

Public debt problems may contribute to higher interest rates. While government bonds currently are perceived as being low risk assets and therefore highly priced relative to private sector bonds, this situation may change alongside normalisation in financial markets and increasing debt levels. Some indication of this is already visible when considering interest rates on government bonds. There is wide dispersion in government bond rates and for some countries (e.g. Greece, Spain and Italy), mounting public finance problems are already reflected in large interest rate premiums.

6.2 Adapting fiscal policy frameworks

Fiscal policy frameworks aim at ensuring that short-run policy decisions are consistent with medium- to long-run objectives. While the specific form differs, the core elements are intermediary targets (structural budget balance, debt levels, etc.) set in accordance with long-term objectives, and providing some room for variation in the short run to cope with business cycle fluctuations. The latter is often formulated in the sense that there is some requirement to balance the budget 'on average over the business cycle'.[29] This reflects first and foremost the cyclically sensitive nature of budget balances , and variations due to the cycle are therefore to be expected, but they pose no problem if the 'average criterion' is met. Implicitly, this view assumes that business cycle fluctuations are relatively short-lived and symmetric. However, the latter assumption may be called into question for the financial crisis. The crisis is likely to be deep and prolonged. It is difficult to maintain that it is probable that an opposite strong and prolonged upturn can be expected in the near future such that the 'average' criterion can be met.

Implemented fiscal policy frameworks are not designed to cope with large shocks. One problem is that they usually have not formulated escape clauses indicating when a situation is to be considered special and therefore justifies discretionary fiscal policy initiatives (see the discussion in the Swedish Fiscal Policy Council (2008)). Another problem is that large persistent shocks make it impossible to meet intermediary targets in the framework and therefore necessitate resetting the targets. There is thus an eminent risk that some or all of the credibility gained by implementing fiscal policy frameworks is lost.

[29] This has been the explicit formulation in e.g. the Swedish Fiscal Policy Framework.

The tension between the current situation and the fiscal policy frameworks is exemplified by the United Kingdom, which has explicitly announced that the crisis implies that the fiscal framework has been temporarily dispensed with. In the words of the Chancellor of the Exchequer:

> *…to apply these rules rigidly in today's changed conditions would be perverse (Darling (2008), p 1).*

However, at the same time it is stipulated that dispensing with the rules has a future consequence for getting back on track:

> *…the government is setting a temporary operating rule: to set policies to improve the cyclically-adjusted current budget each year, once the economy emerges from the downturn, so it reaches balance and debt is falling as a proportion of GDP once the global shocks have worked their way through the economy in full (UK 2008 pre-budget report, p 13).*

This statement recognises the costs of violating budget rules irrespective of the fact that a strict adherence would imply pro-cyclical policies, which are hardly recommendable. At the same time, it is clear that the plan to bring the framework back on track is quite loosely formulated and open for interpretation and manipulation. The same may be said in relation the Stability and Growth Pact where it has been stressed that despite the crisis:

> *The Stability and Growth Pact will therefore be applied judiciously ensuring credible medium-term fiscal policy strategies (EU Commission (2008, p 10)).*

Significant deteriorations of public finances in Member States, some of whom already had difficulties with the fiscal norms at the outset of the crisis, make it unclear precisely how and whether the Pact will be adhered to.

The UK case underlines the fragility of fiscal policy frameworks if they have not been properly specified or adhered to. The UK fiscal framework has been based on an upper target for public net debt (should not exceed 40 per cent of GDP). However, the actual debt levels have been very close to this upper bound. Hence, already prior to the crisis it was obvious that even a relatively

modest change in the business cycle situation could lead to a violation of the target.

Such ad hoc definitions or introductions of escape clauses to the fiscal policy framework may be seen as a deficiency of the framework in the sense of not creating enough room for counter-cyclical fiscal policy. However, more pragmatically it may be argued that it is impossible to make a complete blueprint of all possible contingencies relevant for fiscal policy, and therefore some ad hoc approach is inevitable.

Even for Sweden, the issue of adjusting the fiscal policy framework may arise. At the outset, the fiscal position is well within the targets set in the fiscal policy framework. However, a sequence of bad years can easily bring the seven-year moving average indicator below the 1 per cent target, and the estimates of the structural budget balance may also be significantly revised, both in light of an increase in unemployment as well as a reassessment of certain revenue sources.

Reformulating new intermediary targets is difficult as long as the depth and duration of the crisis are unknown. New targets will have to take into account the significant deterioration in public finances during the crisis. Since the crisis was unanticipated, both tax smoothing and intergenerational risk sharing arguments can be given for smoothing the consequences across time and thus generations. One clear implication is that the need for reforms to ensure fiscal sustainability will be even more urgent in most countries.

7. Policy coordination

Designing fiscal policy raises coordination issues in relation to both the interaction between fiscal and monetary policy, and the international coordination of policy initiatives.

7.1 Monetary and fiscal policy

The mainstream view of stabilisation policy stresses that monetary policy has a leading role, leaving fiscal policy to passively follow automatic stabilisers in normal times. In this way, coordination problems between monetary and fiscal policy are minimised. A prompt discretionary fiscal policy change to respond to the crisis raises the question of whether there are coordination problems with monetary policy and whether an inadequate policy mix may arise.

However, these problems seem small in the initial phase of the crisis. The policy objective is reasonably clear and does not seem to involve traditional dilemmas between inflation and output. The crisis creates a need for policies to boost activity and inflation is not a likely problem in the foreseeable future. As noted above, the interest rate spillover from fiscal policy is weak in the current situation and this reduces coordination problems.

One particular issue within the euro area is the tensions or problems that may arise since the common monetary policy may not be equally well aligned to the business cycle situation in individual euro countries. However, in the current situation the need for a monetary policy ease is shared by all, and this tension is not present. However, the euro countries may recover at different paces and face different structural problems (including public finance positions). Tensions may therefore develop within the euro area in the future.

7.2 International coordination

Since the crisis is global and since its effects are spread globally, it is natural to call for coordinated policy actions. This is even more relevant now because increasing openness has weakened the effectiveness of national fiscal policies directed at aggregate demand since the demand leakage is larger. Furthermore, structural reallocations may have an impact on the effectiveness of national fiscal policies (see the discussion above). Calls for coordinated fiscal policy initiatives are numerous, including statements from the G20 in November 2008 and the EU recovery plan:

> *…..the influence of intelligent coordination adds up to a potent force to arrest the trend towards a deeper recession. A Europe ready to take swift, bold, ambitious and well-targeted action will be a Europe able to put the brakes on the downturn and begin to turn the tide. We sink or swim together (preface by J. Barroso to European Economic Recovery Plan, European Commission 2008).*

The calls for coordinated initiatives reflect both the global nature of the crisis and a concern that national planning of fiscal stabilisation policy will create an undersupply of initiatives because non-cooperative national policy making will not take into account the effects on trading partners. Demand leakages may curtail the incentive to pursue expansionary policies since the beneficial effect in terms of improved export possibilities for trading partners is not valued in the political decision making process.[30]

However, one cannot necessarily conclude from this that there is a stabilisation 'deficit'. Governments acting non-cooperatively may change the composition of fiscal policy packages to achieve the largest impact effect on domestic demand and production (see the discussion in sections 4 and 5). There are various ways of accomplishing this. At one end of the spectrum are preferential treatments of domestic firms, support that is conditional on the use of domestic firms/products etc., which has been discussed recently

[30] Barell et al. (2009) show that fiscal policy is significantly more effective in the coordinated than in the non-coordinated case.

in some countries, and which effectively is protectionism, violating free trade. At the other end is a change in the composition of fiscal packages targeting public demand rather private demand. Public demand does to a larger extent target non-tradable sectors (therefore the demand leakage is lower) and thus this policy has a twist effect between domestic and foreign activities. It is a well-established and robust result[31] that this twist mechanism causes governments to overestimate the potential gains from such policies in the non-cooperative case since they perceive one of the benefits of this policy to be an improvement of the terms of trade. Consequently, there may be an upward bias in non-cooperative policies. In the present situation, the implication is that non-cooperative policy making twists fiscal policy too much towards public rather than private demand.

The scope for a coordinated effort is complicated by large cross-country variations both in the need (see figure 1) and the room for an expansionary fiscal policy that does not jeopardise medium-term objectives (see figure 8). Hence, the heterogeneity in the position on the need and scope for fiscal stimulus makes a larger coordinated fiscal stimulus unlikely. The recovery plan from the EU is also an example of the tension involved since it stresses the need for coordinated actions and recognises the difference in the initial position of the member countries, and it stresses the rules of the Stability and Growth Pact. Fiscal policy initiatives will remain driven by national priorities, and despite the strong theoretical arguments that can be made in the current situation, the possibility of enacting a large coordinated fiscal stimulus remains very weak.

[31] It holds under various market forms, with or without full employment, and in models with both an exogenous and endogenous trade structure, see e.g. Andersen and Sørensen (2008) for references and analysis of this mechanism.

8. Concluding remarks

The economic consequences of the financial crisis include a sharp fall in aggregate demand. It is therefore natural to discuss the scope for an aggregate demand management policy. Since monetary policy cannot be expected to provide sufficient stimulus, attention has turned towards fiscal policy instruments. Globalisation has been a factor in both the cause and spread of the crisis, but it is also a factor which may make fiscal policy less effective. Most important is the weakening of fiscal multipliers due to the demand leakages created by trade, and the specialisation of production and labour which makes structural (re)adjustments more difficult and costly.

Fiscal policy instruments will be effective towards aggregate demand in current circumstances both because traditional crowding-out mechanisms will be weak owing to the large excess capacity created by the sharp decrease in demand and because problems in the financial market create liquidity constraints. However, important timing problems remain. This applies both in terms of the effects that policy may have on expectations formation, and more generally in adapting policies to the nature of the shocks. The crisis makes structural adjustments necessary, and fiscal policy has to take this into account.

A primary policy aim is to prevent long-term unemployment by ensuring that the unemployed do not get marginalised and lose contact with the labour market. The specific measures needed to ensure this may include: i) targeted job market training and education programmes, ii) measures promoting job rotation and work sharing since empirical evidence shows that private job/job training is the most effective, and iii) stronger incentives to accept short-term positions, for example, by shortening the employment criterion to regain entitlement to unemployment benefits after an unemployment spell.

The crisis puts public finances under strain and comes on top of unsolved problems with fiscal sustainability in most countries. Steeply increasing public debt levels will arise in a number of

countries. A huge question is how to reset fiscal policy targets after the crisis to ensure that fiscal policy becomes sustainable.

There is substantial heterogeneity across countries with respect to both the initial position (business cycle, public finances) and the effect of the crisis (shocks, duration). Therefore, there are huge differences in both the need and scope for fiscal policy activism. Hence, even though globalisation may point to larger gains from policy coordination, it is unlikely that the conditions needed for a coordinated effort are in place. It is unrealistic to expect anything but 'speeches'. The driver remains national interests and the positions of various countries simply differ too much to make an agreement on a reasonable common policy approach likely.

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Systemic risks in the financial system
Lessons from the current crisis

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1. Introduction

There is already an enormous literature on the current financial crisis, ranging from in-depth analyses of the determinants of liquidity in markets for asset-backed securities to wide-ranging proposals for a new financial architecture. In a short report, it is not meaningful to try to give a balanced perspective of all aspects of the crisis. I will focus on two issues: one is the mechanisms of modern financial markets that made it possible for relatively moderate losses related to US housing finance to give rise to a worldwide crisis. The second issue is what can be done about it: what reforms to financial regulation are needed in order to minimise the chances of similar crises in the future?

The financial crisis of 2008-09 is far from the first one, not even in recent history. Laeven and Valencia (2008), limiting themselves to the post Bretton-Woods period, count up to 124 systemic banking crises in 101 different countries during the period 1970-2007. The current crisis stands out by its worldwide scope and by its almost instantaneous spread from the United States to the rest of the world in autumn 2008. Viewed as a US crisis, the general background is quite similar to that of other crises. Previous research has found that crises are well predicted by run-ups in the prices of houses and other assets and by deficits in the public budget and the current account. As shown by Reinhart and Rogoff (2008), the evolution of these indicators in the United States prior to 2007 is remarkably similar to that of a typical crisis country. The parallels to the Nordic crisis in the early 1990s are obvious.[1] One could also add that most crises have been preceded by sudden institutional changes: financial innovation with asset-backed securities in the United States and deregulation of standard bank lending in the Nordic countries in the 1980s.

The story we are going to tell focuses on the United States. It bears emphasising, however, that many of the same elements were present

[1] See Englund and Vihriälä (2009).

in a number of other countries – including the United Kingdom, Spain, Ireland, Iceland, etc. On the other hand, many countries such as Sweden shared few of the same background factors, but are still in the midst of a financial crisis as severe as our homemade crisis in the early 1990s. Hence, even accounting for the fact that impulses came from several sources, it seems reasonable to focus on its background in the US economy.

2. The background – innovations in US housing finance and transformation of the financial system

In analysing financial crises, it is useful to distinguish between factors triggering the crisis and the propagating mechanism that contributed to the depth of the crisis. In the current case, we have already noted that US monetary and fiscal policy played an important role leading up to the crisis. Another key impulse came from innovations and structural changes in US housing finance.[2] These changes in the housing finance system were important triggers in their own right, but they also changed the way macroeconomic shocks were transmitted into the financial system. In fact, they were an integral part of a broader transformation of the banking and financial system worldwide.

2.1 Financing real estate investments

It is no coincidence that real estate finance has played a central role in most banking crises. In the Swedish crisis of the early 1990s, most of the problems were concentrated to commercial properties. In the current crisis, it is residential housing that has occupied centre stage, not only in the United States, but also in some European countries such as the United Kingdom and Spain. Providing credit for real estate is a main task for any financial system. Real estate makes up over half of the capital stock in modern economies and the value of owner-occupied homes is two thirds of household wealth. Buildings

[2] See Green and Wachter (2005) on the evolution of US housing finance.

are more long lived than other assets and generate income in cash or kind to their owners often over a period of a century or more. Hence, home buyers and other cash constrained investors will have a natural demand for credit. Seen from the supply side, lending to real estate tends to be attractive as most properties are tradable in a relatively liquid market and are well suited as collateral to secure the loan. A well-functioning market for real estate finance, allowing high loan-to-value ratios, is a key indicator of a well-functioning financial system – provided this is achieved without jeopardising financial stability.

Any housing finance system has to handle a couple of basic stability problems. The first problem relates to the maturity mismatch between borrowers, with typically a long horizon, and investors, in many cases with a shorter time horizon, desiring to maintain a high liquidity of their savings. A housing finance system that relies on bank lending funded by deposits is particularly vulnerable to this problem. Maturity mismatch was, for example, a key factor leading to the US savings banks crisis in the 1980s. To a surprising degree, the US commercial banks and investment banks of today turned out to be – largely indirectly via mortgage-backed securities – exposed to a similar maturity mismatch, which explains much of the current crisis.

The second problem faced by a housing finance system is that the reliance on secured lending creates an interaction with property prices, reflected in cyclical property markets and stability problems in the financial sector. Most households tend to favour owning over renting as a mode of consuming housing services[3] and want to enter into owner-occupancy early in life. Short of current assets, they will borrow as much as the bank will allow them to. Depending on their current income and employment and future prospects, they face a constraint on the ratio of loan to value (LTV) of collateral, which effectively determines their housing consumption. In periods of rising house prices, such constraints will be eased over time, allowing current home owners to move up the housing ladder, demanding larger and more expensive housing. This extra demand will stimulate

[3] A basic reason is that owning gives control rights and allows internalising the consequences of maintenance and operation decisions; see Henderson and Ioannides (1983) for the seminal statement of this insight. Owning is also favoured by the tax system in many countries, and rental markets may offer little flexibility due to regulations.

further increases in house prices and collateral values, thereby increasing the availability of bank credit. If, on the other hand, prices were to start falling, then this process would be thwarted and turned into a downward price spiral.[4] With falling prices, problems would spread to the lenders in the form of increased credit risk as loan values may come to exceed collateral values. The consequences may be defaults and foreclosed sales, which would tend to depress housing prices even further. Defaults are more likely if lenders do not have recourse to other borrower assets or income, as is the case in many US states. In such cases, the mortgage contract effectively contains a put option, allowing the borrower to 'sell' the house to the bank at a price equal to the value of the loan.

The interaction between real estate markets and the financial sector thus implies that any shocks to fundamentals – e.g. due to a tightened monetary policy – will be amplified through their effects on credit constraints. But it also implies that any changes in credit availability will trigger house price movements. The innovations to US housing finance in recent years as well as the deregulation of the Swedish credit market in the mid-1980s are two striking examples of changes that led to an immediate boom in property markets, but also carried the seeds for the disasters a few years later.

2.2 Innovations in US housing finance – subprime loans

A key task for banks is to assess the credit risks involved in different types of loans and to adapt loan conditions accordingly. Innovative loan contracts may allow banks to extend credit to groups otherwise excluded from borrowing. Subprime loans can be defined as loans given to borrowers that are not fully creditworthy according to standard criteria. As of 2007, some 80 per cent of all outstanding US mortgages were prime, while 20 per cent were subprime.[5] These

[4] See Stein (1995) for an early analysis of this mechanism and Ortalo-Magné and Rady (2006) for a fully articulated model.

[5] This includes both subprime loans (to borrowers with low credit scores or uncertain income prospects) and 'Alt-A loans' (to borrowers not able to fully document their income or to provide traditional down payments). See DiMartino and Duca (2007).

numbers are the result of an explosive growth in subprime mortgages. As a fraction of all newly originated securitised mortgages, subprime and near-prime loans shot up from 9 per cent in 2001 to 40 per cent in 2006. The very large credit losses primarily derive from loans originated in 2005 and 2006 at the peak of the housing prices boom.[6]

In most countries, housing loans tend to be quite standardised. Lenders decide on the maximum amount of lending in relation to collateral, depending on an evaluation of the borrower's ability to repay. Interest rates and amortisation schedules differ little across borrowers, and from the borrower's point of view, lending is seen as rationed. It is not possible to get a larger loan simply by offering to pay a higher interest rate. In this sense, the price mechanism does not work for loans in the same way as for other goods and services. The main reason for this is that charging a higher interest rate would increase the risk of default and hence reduce the expected returns to the lender.[7] Subprime loans as they developed in the United States can be seen as an innovative response to this situation, in effect making owner-occupation available to larger groups in society.[8]

A loan to a household with a low current income and no other assets to plead as collateral would have to meet two conflicting objectives. On the one hand, in order for the loan to be affordable to the borrower, the payments profile would have to be tilted, with relatively low payments in the first years and higher payments later on. On the other hand, the lender would need to limit his or her credit risk. Subprime loans with 'teaser rates' offered a partial resolution to this conflict. The interest rate was kept low and fixed during the first two or three years, after which it was reset to a much higher, normally adjustable rate.[9] In fact, the jump in interest was typically so sharp as to force the borrower into either defaulting or trying to renegotiate the terms of the loan. If the credit risk of the

[6] See Gerardi et al. (2009).

[7] See Stiglitz and Weiss (1981) for the original theoretical analysis clarifying this.

[8] Increasing the number of homeowners, especially among minority groups, has been an important political aim in the United States. The Community Reinvestment Act originally enacted in 1977 requires banks to meet the credit needs of their 'entire community'. It has been claimed that modifications to this law and its application contributed to the boom in subprime lending. There does not seem to be any clear support for this statement. An informative piece in Wikipedia gives details and further references.

[9] Teaser rates were not in general lower than rates on prime loans. As an example, the average teaser rate on a 2/28 subprime loan originated in 2006 was 8.5 per cent with a reset rate 6.1 per cent over LIBOR. At the time, Libor was between 5 and 6 per cent, implying a 3 per cent increase in interest after two years.

borrower had gone down – because of higher house prices (increased collateral value) or improved income prospects – then the lender would willingly offer a new loan at standard conditions. Otherwise, he might prefer to cut his losses short and force the borrower into default. In effect, a subprime loan with a teaser rate would give the lender an option to extend a new loan at the reset date.[10]

Subprime loans, often with loan-to-value ratios close to or above 100 per cent, were obviously very sensitive to the development of house prices. As long as US house prices continued to increase through 2005 and into 2006, few problems surfaced. But with house prices stagnating and starting to fall from late 2006, defaults and subprime credit losses were exploding. The fraction of subprime loans in foreclosure increased from 3 per cent in the second quarter of 2005 to 9 per cent in the third quarter of 2007.[11] In itself, this may not have been so serious, but the stability problems were aggravated by another financial innovation, new forms of mortgage-backed securities.

2.3 Innovations in US housing finance – mortgage-backed securities

The growth in subprime lending coincided with a change in the structure of the US mortgage industry. The originators of subprime loans were to an increasing degree small, independent firms specialising in mortgage lending. Typically thinly capitalised and not in a financial position to retain the mortgages on their own books, they had to rely on a market where they could sell the loans. In this way they relieved themselves of the risks associated with mortgage lending: credit risk and interest rate risk as well as liquidity risk. This 'originate-and-distribute' model had obvious advantages by allowing specialisation and transferring risks to other actors more able to carry them. But an equally obvious drawback, which seems to have played

[10] This perspective on subprime loans is developed by Gorton (2008).

[11] Jaffee (2008), figure 5. It is worth noting, however, that an equally rapid increase in foreclosures had occurred between 1998 and 2000, but in that period housing prices continued to increase, leaving the lenders with limited losses in the end (the total amount of subprime loans was also much smaller at that time).

a crucial role leading up to the crisis, was that it weakened originator incentives to do a proper screening of borrowers. It created a classic situation of moral hazard, allowing the borrowers an informational advantage over lenders and allowing the lenders to pass this on to the mortgage investors. This asymmetry made these loans particularly attractive for high risk or even dishonest borrowers. The pool of subprime borrowers also became an adverse selection relative to the overall population of low-income high-risk borrowers. Cases of outright fraud turned out to be quite common.

In principle, these disadvantages in terms of moral hazard and adverse selection may have been worth taking, as long as they were clearly recognised. Judged by the pricing of these loans as they were sold to investors, it is obvious – at least with the benefit of hindsight – that the risks were not fully appreciated. Furthermore, as we will discuss below, the potential advantages in terms of redistributing risks were not realised. In the end, much of subprime loan risk ended up with the banks themselves and other actors relying heavily on short-term funding.

Subprime loans were to a large degree sold to issuers of mortgage-backed securities (MBS). Far from being a recent innovation, mortgage-backed securities have a long history in US real estate finance going back at least to 1968 when the Government National Mortgage Association (Ginnie Mae) issued the first pass-through MBS. The basic idea is for a loan originator to sell mortgages to a financial institution, which packages the mortgages into a pool and issues securities backed by the coupons and all principal-related payments in the pool (amortisation, prepayments and receipts from foreclosure sales). These securities can be simple pass-throughs, where a MBS holder receives a predetermined fraction of the total payments in the pool. More commonly today, a single pool is used to back up several securities (called tranches). The tranches are structured in a senior-to-junior hierarchy such that credit losses would hit the most junior tranche first, and then sequentially move up the scale to more senior tranches. Compared to covered bonds of the type common in European housing finance, junior and mezzanine MBS tranches are much riskier since there is a non-negligible probability that the entire tranche will be wiped out. Senior tranches, on the other hand, may be essentially free of default risk.[12]

[12] Senior tranches do, however, face considerable interest risk as they typically mature first if the underlying mortgages are prepaid.

Most of the early MBSs in the 1970s and 1980s were issued by the public agencies Fannie Mae and Freddie Mac, which had the task of making mortgage loans more affordable for homeowners. These institutions bought mortgages from savings banks and other originating institutions. Since they were limited to buying prime loans guaranteed by the government, MBSs issued by Freddie and Fannie were in practice free from credit risk. These securities were typically purchased by investors with a long-term horizon, but also to some extent by the originating institutions themselves. This gave them some exposure to well-diversified housing risk, while at the same time avoiding the specific risk of the mortgages they had originated.

An important development in the MBS market took place in the early 1990s with the issuance of securities backed by commercial (rather than residential) real estate loans, often with considerable credit risk and no government guarantee.[13] This was accompanied by a proliferation of a variety of MBSs with a rich structure of tranches. The market for commercial mortgage-backed securities apparently has worked quite well despite sustained periods of credit losses in the order of 10-20 per cent of the underlying stock of mortgages.

The securitisation of subprime residential mortgages started in the mid-1990s but it was not until after 2002 that the majority of subprime loans were securitised. In 2001, 45 per cent of all subprime loans were securitised compared with 98 per cent of all prime FHA insured loans. In 2007 the corresponding numbers were 96 per cent of all subprime and 95 per cent of all prime loans. Most of this expansion consisted of 'private label' issues done by major commercial banks and investment banks such as Wells Fargo, Bear Stearns and Lehman Brothers as well as major lenders specialising in subprime lending, such as Indymac and Countrywide. The share of private label issues out of all issuance of mortgage-backed and asset-backed securities increased from 24 per cent in 2003 to 57 per cent in 2006.[14] An important recent development has been the repackaging of MBSs into other instruments, in particular Collateralised Debt Obligations (CDOs) based on pools of MBSs with similar credit risk.

[13] This development was stimulated by the sale of large amounts of real estate loans of dubious quality by the government-owned Resolution Trust Company following the Savings and Loans crisis in the late 1980s.

[14] Dodd (2007).

This contributed to make the risk properties of the final instrument more difficult to judge and made the market more dependent on the ratings.

The rating of the different tranches played a key role in this process. Market participants priced the instruments based on the grades given by the rating agencies rather than from an independent analysis of the risks involved. In contrast to other instances of rating, the rating agencies were often directly involved in the construction of the different tranches; in practice they seemed to have answered questions such as "what is the maximum fraction of the underlying pool that can be allowed to get into the senior tranches in order to warrant, e.g., an AAA rating?".

The various types of mortgage-backed securities were typically traded by banks and other dealers over-the-counter (OTC) rather than on organised and transparent stock exchanges. For this reason it is not easy to get an overview of prices and quantities in the market and how the risks were distributed. This lack of transparency is, indeed, a key aspect of the crisis that was to follow. In contrast to exchange traded assets, there is no surveillance of the market and the exposure of individual actors is not known. Furthermore, no actor has a long-term responsibility to act as market maker and there is no assurance of liquidity in the market. This makes these markets particularly vulnerable to sudden disturbances. Major shocks may make trading impossible and lock investors into unwanted positions.

In an ideal world, one would expect the investors in mortgage-backed securities and the various instruments derived from them to be actors with a long horizon or a good ability to carry risks. Some investors such as pension funds – often limited by their statutes to investment grade instruments – fit this description well. The crisis has made it clear, however, that the mortgage-backed securities largely ended up with institutions that were highly levered and involved in large-scale maturity transformation. This includes institutions such as hedge funds and special investment vehicles (SIVs), institutions that operated on over-the-counter markets with little transparency and were not subject to much regulation – hence the name the 'shadow banking market'. Hedge funds tended to focus on the junior tranches at the high-risk end of the spectrum. According to Dodd (2007), the typical ratio of capital-to-equity for hedge funds on this type of investment was around five. SIVs, on the other hand, specialised in high-grade mortgage- and asset-backed securities with funding mainly from the short-term commercial paper market.

While the SIVs may not have been exposed to much credit risk, they did face considerable funding risk. These risks, however, were typically mitigated by explicit or implicit guarantees by commercial banks. In this way the banks were still exposed to considerable risk although the mortgages did not show up on their balance sheets and were not subject to capital requirements. The consequences of the growth of the shadow banking system, operating in the background but still with links to the 'daylight' banks, became abundantly clear as the crisis unfolded.

3. A vulnerable system

US housing prices had seen a sustained increase from the mid-1990s until 2005. In earlier years, there had been episodes of falling prices, but the nationwide index (inflation adjusted) had never fallen by more than 10 per cent from peak to trough and nominal decreases had been insignificant. The historical averages, however, had concealed large regional variations, with major slumps in New England, Texas and California uncorrelated with price movements in other parts of the country. Also during the recent boom – with aggregate house prices (Case-Shiller 10 cities index) increasing almost three-fold between 1997 and 2005 – there was a wide variation between areas like California with extreme price increases and many places in the mid-west with relatively stable prices. While it was clear to commentators that the boom could not go on forever, there was an active debate among economists as late as 2005 about whether there was a bubble in housing prices, with Case and Shiller (2003) on the side of overvaluation and Himmelberg et al. (2005) being more sceptical.

Be that as it may, it should have been obvious that the subprime MBS market was very sensitive to changes in the trend of housing prices. When housing prices stagnated in 2005 and started to fall in 2006, a combination of factors contributed to spreading the problems beyond the MBS market and across the financial system. It is still too early to sort out exactly which of these factors were most important and commentators vary in the weight they attach to different factors. The following is a list of the key factors:

By selling the mortgages, the originator's incentives to screen and monitor the borrowers were diluted. This 'originate-to-distribute' model of mortgage lending created moral hazard problems in loan origination, including cases of outright fraud. The IMF (2008) talks about "fraud, speculation, over extension of borrowers and... weak underwriting standards". This view is also in line with econometric studies by Demyanyuk and van Hemert (2008) and Ben-David (2009). These moral hazard problems would have been alleviated if

the originators had kept the most junior tranches of the MBS, but in most cases they did not. One may ask, like Jaffee (2008) and others, why the MBS investors did not understand the moral hazard involved and let that knowledge affect the price they were willing to pay. If deemed serious enough, it would not have been possible to establish the market at all, in line with the insights on lemon markets going back to Akerlof (1970). When losses started to mount, however, these various moral hazard issues were exposed and triggered an immediate reassessment and repricing of the risks involved.

The rating of the different tranches played an important role. It was key to creating a market for these securities among investors whose regulations restricted them to instruments with a certain minimum rating. As it turned out, the credit risk analysis of the rating agencies was clearly flawed. Influenced by recent US experience, the models underestimated the probability of a housing market slump, in particular the degree of correlation across regions and market segments.

The repackaging into other assets, in particular collateralised debt obligations was based on pools of MBSs with similar credit risk. This contributed to make the risk properties of the final instrument more difficult to judge and made the market even more dependent on the ratings. Again, it is fair to ask why the lack of transparency did not make investors more cautious; see Gorton (2008) for a detailed analysis of the information losses created by adding extra layers of securitisation.

In fact, a large fraction of all housing risk ended up in banks, even though such long-term risks are better suited to pension funds and life insurance providers. Hellwig (2008) ascribes this to "blindness to risk in the competition for Turf". The MBS market was seen as being of growing importance for the future and many banks saw it as strategically important to invest in a presence in this market. In the short run, it also seemed possible to gain market shares while at the same time making money from fees. High current fees[15] received with certainty apparently were more attractive than the prospect of containing risks that would only materialise in the distant future. Many would ascribe such behaviour to short-sighted bonus systems, but it may also reflect differences in observability between current

[15] According to Hellwig (2008), the fee income received by UBS for securitising mezzanine mortgage-backed securities was as high as 120 basis points.

profits and future risks. Similar competition for market shares has been important in other episodes where institutional changes in banking due to deregulation or financial innovation have ended up in a major banking crisis. The Swedish deregulation in the mid-1980s is a case in point, where those banks that expanded the fastest also suffered the largest credit losses.

All of this is sufficient to explain major disasters in the US banking industry. It has been estimated that total credit losses to the investors in subprime MBS are on the order of USD 500 billion. This is certainly a big number, but no bigger than the losses incurred by the US savings and loans industry a couple of decades ago that have been estimated at between USD 600 and 800 billion. Why did it develop into a worldwide crisis this time?

4. The unfolding of the crisis

The crisis evolved in three phases, with the first phase starting in the winter of 2007, when an increase in subprime mortgage defaults was first noted in February. This immediately resulted in an increase in the market price of mortgage default risk, as indicated by ABX spreads. As an example, the cost of insuring BBB rated assets increased from 3 per cent in January to 10 per cent in March. As a consequence, some hedge funds were forced out of business and the rating agencies started to review various subprime securities for downgrade. Widespread downgrades were announced in June and July. This led to an increase in the cost of insuring AA and AAA securities, which had so far remained negligible. This increase had a dramatic effect on the market for asset-backed commercial paper, the main market for funding the shadow banking system. The outstanding amount of asset-backed commercial paper fell by fifty per cent during autumn 2007. At this stage, hedge funds and other actors in the shadow banking system started trying to get out of their positions. But now, markets became illiquid just when they were most needed. With falling asset prices, these highly levered actors were more or less locked into their positions, while at the same time facing margin calls from banks and other financiers. As a result, hedge funds stopped trading in CDOs and credit derivatives and these markets essentially ceased to exist.

With no investors in mortgage-backed securities, originators were unable to sell loans that they had already made. These were typically unregulated finance companies with very little equity. Not being able to raise new capital, many of them were forced out of business. As a result, borrowers found it increasingly difficult to get subprime loans as well as to refinance old loans as teaser rates expired. This in turn reduced housing demand, reinforced the downward spiral in house prices and aggravated lender problems.

In a second stage, starting in the late summer of 2007, the crisis spread to the banks. Given their close links with the shadow banks, this was only natural. In the first week of August, the interbank

market was hit by a liquidity crisis that resulted in the central banks stepping in to offer credit. This episode led banks to reassess the riskiness in this market. Typically the risk premium when banks borrow from each other is negligible; the difference in interest between interbank loans (as measured by the Libor rate) and the corresponding t-bill rate is usually small. It had been around 50 basis points during the first half of 2007, but after the liquidity crisis it jumped to around 200 basis points in August, a level that was more or less maintained for the next year.

During this period, it also became clear that the crisis was spreading to Europe. In some cases, the link from the US market was very direct. Two German banks – IKB and Sachsen Landesbank – had to be bailed out after losses related to asset-backed securities and the French bank BNP Paribas stopped payments from some of its funds because they were "unable to calculate a reliable net asset value for the funds".[16] In other cases, the links were more indirect. The British bank Northern Rock had funded a spectacular growth after 2000 almost entirely by issuing mortgage-backed securities. When this market dried up, Northern Rock was unable to switch to alternative funding and was ultimately taken over by the government.[17]

During the spring of 2008, the crisis hit new financial institutions – the monoline insurers in January, Bear Stearns in March, and Fannie Mae and Freddie Mac in July. Still these were seen as isolated events and indicators like interbank market spreads or credit default swap spreads were only affected temporarily. Two events in early September changed the picture completely: the bankruptcy filing of Lehman Brothers on September 15 and the government rescue of the insurance company AIG on September 16. As a result, credit default swap spreads skyrocketed and the interbank market more or less ceased to exist. Central bank and governments intervened massively. It was now clear that this was a worldwide crisis.

[16] From the BNP Paribas press release quoted from The Road to the London Summit (2009).
[17] See Shin (2009) for an account of Northern Rock's demise.

5. Systemic externalities

The challenge is to understand how credit losses in US housing finance – that were after all rather limited in magnitude – could spread so rapidly, in a first phase throughout the US financial system and with some delay across the world, even to banking systems like the Swedish one with very little direct exposure to subprime loans or mortgage-backed securities. In other words what are the externalities that one bank in trouble impinges on other banks? Why does banking seem to be different from other industries in the sense that learning that a competing bank is in trouble often is bad news? In other industries, such as the car industry, learning that a competitor is in trouble would typically be seen as good news. There are a number of mechanisms that create such negative externalities.

5.1 Informational externalities

One set of externalities derive from the fact that financial intermediaries handle contracts where information is asymmetric. Actors in financial markets constantly interpret noisy information signals in making pricing and investment decisions. Banks make a living by acquiring private information that they use to screen and monitor their clients. This enables banks to grant credit to households and the great majority of firms that are too small to have access to securities markets. Long-term relationships between banks and their clients thrive as a result of informational and reputational capital, often accumulated over many years.

Since the raison d'être of banks is their ability to handle and process private information, they are inherently difficult to analyse and evaluate. Their private information about clients is by definition difficult to communicate to outside analysts. This makes banks sensitive to information and rumours. There may be *informational*

contagion from one bank to the rest of the system. In particular, various off-balance sheet items including those central to the current crisis may be particularly difficult to observe and evaluate. As a consequence, learning that one bank is in trouble – e.g. due to write downs related to a particular type of derivative instrument or losses in lending to a particular industry – naturally leads to the inference that other banks are facing similar problems. In the current crisis, the near-failure of Bear Stearns and the subsequent failure of Lehman Brothers contaminated all other investment banks and the failure of Glitnir contaminated other Icelandic banks. Informational contagion was also an important factor leading to the sudden illiquidity of the interbank market.

Another informational externality spills over into the private sector. As a result of long-term relationships, banks possess unique and private information about their customers. If a bank were to fail, such specific information would get lost. This would increase the cost of funds even for those bank clients that are in good financial health.

5.2 Asset price externalities

Another type of externality between banks derives from the links that operate over asset markets. As an example, consider a bank that has incurred losses and had its capital base eroded, e.g. due to credit losses or falling asset values. In order to meet capital requirements and retain its solvency, the bank has two main options: to sell risky assets or to reduce its stock of loans. As a short-run solution, asset sales would appear to be the more likely reaction. However, market prices of those assets will tend to be driven down by such sales. This may not be much of a problem if the bank is small and would in any case not cause further repercussions if the cause of the original losses was specific to the bank in question. On the other hand, if the origin was a macro shock – say a general decrease in housing prices that affected a whole class of mortgage-backed securities – then the attempt of one large bank to solve its problems by selling assets would have feedback effects on all banks in the system. By trying to solve its own problem, the bank will export part of it to other banks,

thereby amplifying the overall problem. With accounting rules requiring banks to report assets valued on a mark-to-market basis, any fall in asset values will show up immediately in the books.

If banks instead adjusted by cutting down on lending, there would be no direct impact on tradable asset prices. Such an action is, however, likely to cause problems for some borrowers, thereby possibly increasing the amount of credit risk in the system. Whichever adjustment method is chosen, there will be external effects, even though they may be more direct and stronger as a result of asset sales.

There is a third possible road to increase solvency, namely by increasing the amount of equity. This would be the socially desirable response in order to restore the stability of the banking system. It is likely to be particularly unattractive to the individual bank, however, in a situation in which bank liabilities are subject to increased default risk. By injecting more capital, the equity owners would increase the value of bank debt, the debt overhang problem first highlighted by Myers (1977). For this reason, it is unlikely to be a viable road in a crisis. Creating a system that would facilitate obtaining more equity in a crisis would be a key to avoiding some of the negative externalities discussed above.

5.3 Liquidity externalities

Effects of balance-sheet adjustments are not limited to prices and interest rates. Liquidity is also affected. The current crisis has provided abundant evidence that the ability to trade and the cost of trading is highly sensitive. When markets are needed the most, it is often difficult and expensive to use them. This is particularly critical not only since modern banks rely for their day-to-day cash management on access to the interbank market, but also since they have positions vis-à-vis each other in various derivative instruments and guarantees.

The traditional simplified textbook model portrays bank liabilities as consisting entirely of deposits. The amount of lending becomes a reflection of the availability of deposits. This picture was always a simplification but it is becoming more and more obsolete, even as

a stylised picture of modern banks. Today, banks acquire loans and fund these loans by borrowing from other banks and the public on the money market. To take an example, Northern Rock (which in fact also was subject to a bank run from depositors) had only 23 per cent of its liabilities in the form of deposits. The rest was short-term funding from the money market. Similar fractions, although not quite as extreme, hold for most banks.

When a levered financial institution purchases an asset, it would typically fund the purchase by short-term borrowing using the asset as collateral. Such funding is only partial, with the remaining margin (sometimes called the haircut) covered from other sources such as deposits for a bank or equity for a hedge fund. Under normal circumstances, short-term funding can be routinely rolled over, subject only to a risk of variations in interest rates. But there is also the extra risk of variations in the margin. Added to these two forms of risk – roll-over risk and margin risk – is the risk related to the availability of other sources of funding, be it deposits for banks or equity for hedge funds. All these forms of risk would be manageable as long as any desired balance-sheet adjustment could be effected by selling assets.

We discussed in the previous section how asset sales may have negative effects on asset prices and how this induces a feedback effect on the entire balance sheet, thereby forcing further asset sales. Added to this is the feedback effect operating over margins and haircuts. It is an empirical regularity that margins tend to increase in periods of falling asset prices (see Adrian and Shin (2009)). This may seem counterintuitive. Indeed, if asset price declines were temporary, e.g. due to fire sales, one would expect margins to decrease in expectance of a price rebound. There are at least three reasons why the reverse pattern is observed: (i) falling prices tend to coincide with increased risk; (ii) even if the fundamental risk has not increased, the techniques for calculating risk measures are typically based on historical data and (iii) problems about asymmetric information may be more severe in a situation of falling prices.

As we have experienced recently, required margins may become very high in a systemic crisis, effectively approaching one, i.e. a situation where funding disappears altogether. This is similar to a classic bank run, although those who run from the bank are not depositors but investors unwilling to roll over commercial paper or other funding. The mechanisms behind such runs may not be completely understood. But it is clear that a key element is the

interaction between the pure asset price spiral discussed in the previous section and the margin spiral discussed in this section (see Brunnermeier and Pedersen (2009) for a formal model).

6. Towards new rules of the game[18]

It is easy to be overwhelmed by the number of things that went wrong and that contributed to the current crisis. Indeed, one may even be sceptical about the viability of a sophisticated decentralised financial system. For a sceptic, one 'solution' would be to impose draconian new regulations that would outlaw many of the symptoms of the current crisis and force the banking system back to, say, something like the Swedish system pre-1985. Like it or not, it is doubtful whether such a step backward would be at all possible, at least not without doing much more harm in the transition process than the current crisis has already caused. Leaving that option aside, the relevant question is instead what can be done to fix the current system while maintaining the basic institutions of a decentralised financial system.

Broadly speaking, one may identify three kinds of sources of the crisis: mistakes in decision making regarding macroeconomic policy, mistakes in decision making by financial institutions, and unsuitable regulatory frameworks. It is undoubtedly important to identify the mistakes both in the public and the private sector. Whether institutional reforms could improve policy making and whether new corporate governance structures could improve private decision making are also important issues. But even though we can conceive of such reforms and also hope that decision makers in various positions will learn from their past mistakes, they will undoubtedly make new mistakes in the future. For this reason, it is natural to focus on the regulations and institutions that are intended to ensure the stability of the system, even in the face of mistakes in decision making, and discuss how the regulatory framework can be reformed so as to be more conducive to stability in the future. We need regulations that dampen rather than amplify the effect of disturbances from the political sector and from financial markets.

[18] For a discussion of the fundamentals of financial regulation along with a set of reform proposals, see Brunnermeier et al. (2009). The importance of a macro-prudential perspective on regulation is not a new insight; see, e.g., Knight (2006).

6.1 Current regulations

Banks and other financial institutions are regulated primarily because the banking system provides payments and liquidity services that are essential to the functioning of a modern market economy. The collapse of a major financial institution would give rise to systemic spillovers as discussed above. The social costs of the failure of a (sufficiently large and systemically important) financial institution far exceed the private costs. Banks acting in their own private interest would tend to take on too much risk relative to what is socially desirable.

Banks are risky, almost by definition, since they fund loans and other illiquid assets by liquid and short-term funding, i.e., they engage in maturity transformation. This makes them vulnerable to disturbances in funding resulting from the sudden withdrawal of deposits (bank runs) or by difficulties in obtaining money market funding. Further, their ratio of assets to equity (their leverage) is higher than for firms in most other industries. This amplifies the maturity-mismatch risk and makes banks vulnerable to changes in the value of their assets coming from credit losses or from market prices of traded assets. The key purpose of banking regulations is to prevent banks from taking on too much risk. The crisis illustrates that current regulations did not succeed in doing this.

The system of regulation ('the Basle rules') combines three elements ('pillars'). Most importantly, according to the first pillar, each bank is required to hold capital in excess of a minimum in relation to its assets. This required minimum can be calculated in either of two ways. The default method is to apply a set of fixed weights to the different types of assets, thereby arriving at a risk-weighted total asset value. Alternatively, and subject to approval from the supervisor, banks may use their own internal models to calculate the aggregate risk in the asset and credit portfolio. In principle, such calculations of value-at-risk should account not only for assets and loans on the balance sheet of banks but also for guarantees and other off-balance sheet items. In practice, the coverage of such instruments has been incomplete.

The Basle rules also rest on two other pillars. The second pillar relates to the prudential supervision of banks. Supervisors should ensure that banks have an internal process for assessing their overall capital adequacy, including proper risk models, and that banks

operate above the required minima. Supervisors should intervene at an early stage to prevent capital from falling below the required minimum. The third pillar relates to transparency and the conditions for market discipline. It requires banks to publish regular reports on risk exposure, loan losses and other information relevant to judge the risk management system of the bank. It is probably fair to say that supervisors have had a hard time living up to the expectations stated in the second pillar and that the transparency required under the third pillar has been insufficient to enable the market to make a good risk assessment.

6.2 Shortcomings revealed

The crisis has revealed a number of shortcomings of the current system of banking regulation:

- *Institutions included*. Currently, only banks and some other credit institutions are regulated. The crisis has revealed that other types of institutions (the shadow banking system) – although not directly producing payments services – have such strong external effects on the banking system as to make them systemically important. This includes, e.g., hedge funds. The issue is not that the hedge fund investors may lose money if a fund fails, but that the disinvestments of the funds when adjusting in the face of losses and equity withdrawal may affect asset prices with severe spillover effects onto the banking system. Hedge funds have played important roles in the asset-price-liquidity spirals discussed in sections 5.2 and 5.3 above.

- *Same rules for all.* Current regulations make a sharp distinction between those institutions that are regulated and those that are not, but then go on to apply in principle the same rules to all regulated institutions. The rules do not take into account differences in systemic importance, e.g. the external effects that result when a financial institution adjusts its asset holdings. In general, the degree of systemic importance increases more than proportionately with the size of the institution. This is currently

not reflected in the capital requirements. Further, a hedge fund heavily invested in credit derivatives may have larger external effects than a low-risk bank with regular loans and a portfolio of government securities.

- *Assets and obligations included*. The crisis has revealed that banks issue many guarantees and obligations that do not impact on the capital required. As an example, the major investment banks were involved in setting up SIVs that invested in asset-backed securities and played such an important role in the crisis. Explicitly or implicitly, the banks took on extra risk by guaranteeing the obligations of these funds, but this had no impact on their required capital.

- *Pro-cyclicality*. Currently, capital requirements vary with the riskiness of the assets held by the bank. This is eminently sensible as a basis for differentiating capital requirements across banks. It implies, however, that banks are required to hold more capital in bad times. The problem is that regulation does not give any incentives for banks to accumulate extra reserves in good times that would provide a cushion for bad times. It follows that banks will be forced to sell assets in bad times, which will amplify credit cycles as discussed in section 5.2 above. This is a fundamental problem of the current system.

- *No consideration of funding and liquidity risks.* Current regulations are exclusively focused on the asset side of bank balance sheets, although the overall risk depends crucially on the way bank assets are funded. Many banks finance illiquid long-term assets with short-term borrowing in the money market. As we have seen, this imbalance was a key element of the current crisis, just as it was in many previous crises. Yet capital requirements do not take any account of the degree of maturity mismatch.

- *The reliance on internal models*. In principle, sophisticated models aimed at assessing the probability of insolvency (value-at-risk) ought to provide a better measuring-stick for capital requirements than standardised risk weights. This presumes, however, that supervisors have full insight and understanding of these models. In practice, this is a daunting task. In any case, these models – no matter how sophisticated they are - are limited by the available

data. As an example, much of the pricing of mortgage-backed securities seems to have been based on US experience during a period of generally rising house prices, only interrupted by local and uncorrelated episodes of falling prices. A coordinated decrease in prices had never happened before, in the memory of available data, and consequently the price development after 2006 was assigned a very low probability. It may be that standardised rules would provide a more robust and transparent basis for calculating required capital.

- *The reliance on the rating institutes*. Standardised risk weights as well as internal risk models both use credit ratings as central building blocks. In this way, the role of the rating agencies has been transformed from providing services to the market place into directly influencing the capital requirements imposed on banks.

- *Mark to market*. Current accounting rules require banks to base their valuation of tradable assets on market prices. While this is a sound principle in general, it means that liquidity related variations in the value of bank assets will have a very direct impact on bank capital, thereby forcing banks to make adjustments that will tend to deepen a crisis. In contrast, banks have considerable freedom in writing down the book value of loans even in a situation of growing credit risk.

- *Market transparency*. The instruments at the core of the crisis are typically traded in over-the-counter markets with very little transparency. This makes it more difficult for supervisors to assess the overall risk. It also adds liquidity and counterparty risk to the system. The lack of transparency contributed to the sudden illiquidity of key markets in 2008. Earlier, when credit risks in the system were seen to be negligible, the lack of transparency was not much of a problem. But with growing credit risk and the market price of such risk changing by the minute, it became crucial.

- *Financial innovation*. It may seem like a puzzle that many banks – even mid-size European banks – got so heavily involved in high-risk non-transparent markets for asset-backed securities and credit derivatives. One explanation is that these new and, at the time, rapidly growing markets were seen as strategic for the future. In the

competition for turf, banks were apparently willing – consciously or not – to take on considerable risks. This observation suggests that regulators should be particularly observant during periods of rapid financial innovation.

- *Shortage of equity*. An individual bank in trouble may solve its problems by selling assets and shrinking the balance sheet, thereby improving its capital ratio. But several banks cannot do the same thing simultaneously without exporting their problems to the rest of the banking system. In such a situation, the entire banking system needs new equity capital. This will be particularly difficult to attract, however, for highly leveraged banks in trouble. There are at least two reasons. First, there is the debt overhang problem discussed in section 5.2; new equity would partly benefit debt holders. Second, in a situation with poor information, asking the shareholders for new equity may signal hidden problems and be counterproductive in that sense.

6.2 Some basics of regulatory reform

Given all the shortcomings of the current regulatory system, it seems like a daunting task to come up with a comprehensive reform proposal. A new system would also need to be decided and implemented internationally. In a world of international capital markets and cross-border banking, it is not possible for any nation to protect its banking system simply by a national system of regulation. In fact stricter regulations are likely to be counterproductive as they would give incentives for banks to locate abroad.[19] A small country can contribute to the international reform process, but it will only be one voice among many. In concluding this brief report, I will state some general points that should guide financial regulation in the future.

[19] That being said, the implementation of the current Basle rules – which took two decades to negotiate – has differed across countries, with the United States lagging behind the EU countries. There are also examples of individual countries adding elements of regulation. The Spanish rules making the capital requirements dependent on the rate of lending expansion is a good example of this.

- The list of *systemically important institutions* subject to regulation needs to be extended and continuously updated. The key criterion should be the external effects that the failure of one institution imposes on the rest of the system, in particular on those institutions that play a key role in the payments system. In this sense, large hedge funds with leveraged positions in the money market are systemically important even though they do not provide payments services. It is not possible, however, to make a once-and-for-all definition of what constitutes systemic importance.

- Regulations currently treat financial institutions in isolation, trying to ascertain that each institution is robust to exogenous shocks. Such micro-prudential regulation needs to be a central element of regulations also in the future. Like today's Basle II rules, they could be based on some form of risk-adjusted capital requirements. But in contrast to today's rules, account has to be taken of the *systemic external effects* of each institution. Such external effects will not be easy to measure, but may perhaps be based on a set of indicators. An institution's contribution to systemic risk may be captured by indicators such as leverage, maturity mismatch and asset growth. The current Spanish system, where capital requirements increase with the rate of lending growth, is a simple example of this approach.

- Systemic importance also depends on *size*. Current practice acknowledges this by treating certain banks as "too big to fail". As we have seen throughout the world, governments stand ready to support the biggest actors, while occasionally allowing smaller banks to go bankrupt. In this sense the current practice even contains an incentive for banks to grow and become systemically important. This could be counteracted by making capital requirements more directly dependent on size.

- Capital requirements need to be *time-varying*, requiring banks to accumulate excess capital in good times that could serve as a cushion in bad times. The capital requirement could, for example, vary over time as a function of the deviation of asset prices from fundamental values. Again, the implementation of this is not straightforward. One could envisage the regulator adjusting the required capital ratio from year to year in attempting to 'lean against

the wind'. It is also reasonable to increase capital requirements in periods of rapid financial innovation and institutional change.

- Much of the depth of the current crisis is due to *liquidity* problems. Regulation should provide incentives for banks to choose long-term funding in order to avoid excessive maturity mismatch. This could be achieved by relating the capital requirements to the fraction of short-term debt among the liabilities.

- A key problem in the current crisis is the difficulty in recapitalising banks. *Recapitalisation* is likely to involve redistribution of wealth between shareholders, debt holders and taxpayers. Currently these measures tend to be improvised once a crisis has occurred, and many of the rescue measures we have seen recently are at the expense of taxpayers. To avoid this, it would be desirable to have a system that steps in at an early stage, when the amount of redistribution is likely to be smaller. One can think of different measures, including forced conversion of debt into equity or direct government ownership. The exact scheme may be less important than the fact that there is a transparent and reasonably automatic system in place.

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Globalisation, Monetary Policy and the Financial Crisis

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1. Introduction

With a growing number of countries reporting a rapid deceleration of real GDP and consumer prices, if not an outright fall, the global financial crisis is showing no signs of abating. At the present time, the primary concern of policy makers is naturally how to rekindle growth by making the financial system function properly. This involves many important questions, including how to reduce credit risk perceptions in the interbank market and how to get credit to flow to firms and households, and thus stimulate aggregate demand for goods and services.

Over time, however, far more important questions will need to be addressed. One crucial issue is what led to the crisis. For instance, what was the importance of globalisation? Did global imbalances or lax monetary policy trigger the crisis by depressing real interest rates, leading investors to search for yield? Or did globalisation depress inflation temporarily, leading central banks to believe that monetary policy had to be relaxed in order to prevent inflation from falling too low or even becoming negative, and in doing so, did they trigger an asset price bubble? Or was the crisis primarily caused by incentive problems in financial markets, combined with poorly designed regulation and lax supervision?

A second question is what policy responses are warranted to prevent future financial crises of this type. It is clear that much emphasis will be put on regulation and supervision. The G20, at its summit in November 2008, argued that measures were needed in five areas: (i) financial market transparency and disclosure by firms must be strengthened; (ii) regulation needs to be enhanced to ensure that all financial markets, products and participants are regulated or subject to oversight, as appropriate; (iii) financial markets' integrity should be improved by bolstering investor and consumer protection, by avoiding conflicts of interest, and by promoting information sharing; (iv) international cooperation among regulators must be enhanced; and (v) international financial institutions must be reformed to better reflect changing economic weights in the world

economy in order to increase the legitimacy and effectiveness of these institutions.

Other observers have suggested that central banks, in particular the Federal Reserve, contributed to the crisis by reducing interest rates too aggressively in 2001 and 2002 and by maintaining them at too low levels for too long. This depressed real yields and triggered the search for yield that played such a central role in the run-up to the crisis. To prevent similar episodes, the argument continues, central banks should 'lean against' increases in asset prices and credit by tightening monetary policy over and beyond what is needed to control inflation.

In this paper we look at the second set of questions that concern the implications for monetary policy. It is structured as follows. In Section 2 we discuss globalisation, starting with the link between global imbalances and the level of real interest rates. The thrust of the argument is that shifts in global savings-investment patterns are likely to have depressed real interest rates and led to the search for yield that played such an important role in the run-up to the crisis. We also review whether globalisation might have played a role in depressing inflation rates, but we reject that hypothesis.

In Section 3 we turn to monetary policy. We argue that the disinflation experienced in recent decades largely reflects a downward shift in central banks' inflation targets, that shocks to inflation have become less persistent and that inflation is less sensitive to the output gap and import prices, a development that we also attribute to changes in central banks' conduct of monetary policy rather than globalisation. We also argue that there is no evidence that global output gaps are important determinants of inflation in individual countries. Finally, we explore the hypothesis that monetary policy set the stage for the crisis by depressing long real yields and triggering the search for yield. We argue that on both theoretical and empirical grounds, this seems unlikely.

Section 4 discusses the crisis from a financial stability perspective. We argue that the main cause of the crisis was a combination of poor incentives and ineffectual regulation and supervision that only became apparent when the interest rates fell and the search for yield led market participants to take increasingly risky positions. In turn, this implies that there are relatively few lessons from the crisis for central banks in their role of monetary policy makers.

These lessons will be considered in Section 5. The thrust of the argument is that while in principle an inflation targeting framework

is suitable for dealing with and guarding against asset prices bubbles, in practice the models and macroeconomic framework used tend to downplay or disregard the importance of asset prices and financial sector developments. Thus, more work is needed on integrating these factors in the conceptual framework underpinning monetary policy.

Finally, Section 6 concludes our discussion.

2. Globalisation

It is useful to start by considering the state of globalisation, that is, the extent to which national economies are globally integrated. Globalisation has increased at a rapid rate for a number of years.[1] As an illustration, the left-hand panel of figure 1 shows the median (and the interquartile range) of total exports and imports relative to GDP for a sample of advanced economies as a measure of trade integration.[2] The right-hand panel shows the sum of foreign assets and liabilities, relative to GDP, for the same countries. Figure 2 shows the analog graphs for a sample of emerging market countries.[3] Beyond establishing that globalisation has increased, the figures suggest that much of the action in the last decade or two has been in the area of financial integration, in particular, integration of the advanced economies. However, without any formal metric of what high and low integration is and with cross-country comparisons being problematic, these results should not be overinterpreted.[4]

But what role has globalisation played in the financial crisis? This is the issue we turn to next. We first discuss the potential role of global imbalances in depressing real interest rates, and then consider how globalisation shaped the resulting search for yield. Finally, we review the potential role of global factors in explaining the successful disinflation many countries have experienced in recent decades.

[1] IMF (2006, figure 3.4, p. 101) shows how trade and financial openness has evolved between industrialised and emerging economies since 1970.

[2] We use data for Australia, Canada, France, Germany, Italy, Japan, Switzerland, the United Kingdom, and the United States. For more discussion, see Gerlach et al. (2009, Box 3).

[3] The countries are Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Malaysia, the Philippines, Singapore, South Africa and Thailand.

[4] For instance, one problem with comparing the two groups of countries is that the openness of economies naturally varies with their size. One reason the emerging market economies may appear most closed to trade may thus simply be the fact that many of them are large.

Figure 1: International integration in industrialized countries

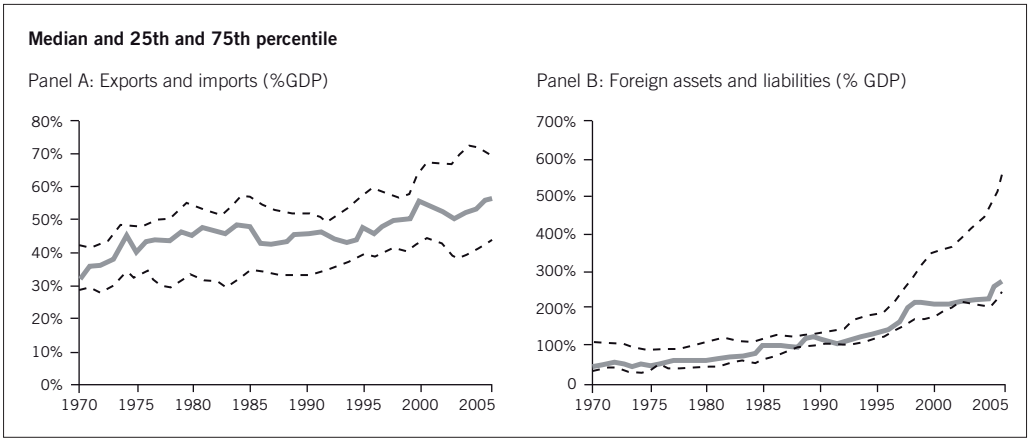
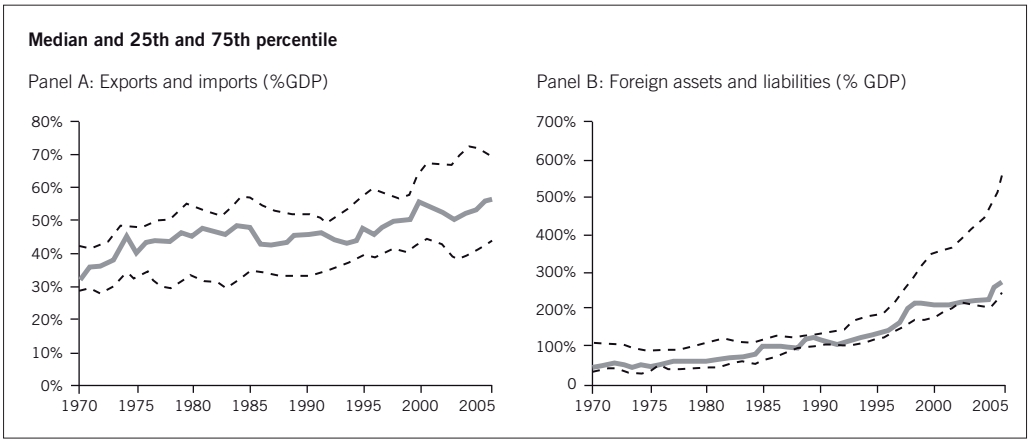


Figure 2: International integration in emergin markets



2.1 Global imbalances and real interest rates

Many observers have argued that global imbalances played an important causal role in the current global financial crisis.[5] The argument follows the savings glut hypothesis for the US current account deficit, initially proposed by Bernanke (2005). This argument starts by noting that following the Asian financial crisis, increases in global saving and reductions in investment tended to reduce the demand for goods.[6] Much attention has focused on developments in three regions.

First and most importantly, the investment-to-GDP ratio fell sharply in Asia after the onset of the Asian financial crisis in 1997. While it exceeded the savings-to-GDP ratio by about 3 per cent during the boom period before the crisis, the investment ratio subsequently fell to 3-4 per cent below the savings ratio, reflecting both an adjustment to the excessive build up of capital stock during the boom and a desire by the authorities in many Asian economies to reduce their vulnerability to external shocks by accumulating foreign exchange reserves. In turn, this required them to run large current account surpluses. In some cases, notably China, a competitive exchange rate was at least for a while seen as an effective way to promote domestic economic growth and raise living standards also in rural areas.

Second, oil producing economies increased savings very substantially between 1998 and 2005 in response to the rise in global oil prices. By contrast, investment as a fraction of GDP remained unchanged.

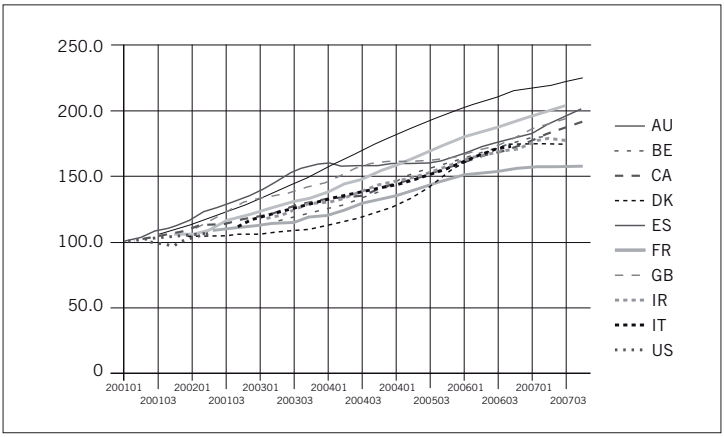
Third, savings in the United States fell by about 4 per cent of GDP in the same period while investment remained roughly constant at around 20 per cent of GDP.

These changes in regional saving-investment balances are interrelated, with the link between them being provided by the real interest rate. Thus, the increase in saving in some countries and the decline in investment spending in others led to a tendency for an excess supply of goods to develop. In turn, this slowed output growth and reduced inflation, requiring a fall in equilibrium real interest

[5] See, for instance, Gerlach et al. (2009), Lane (2009) and Portes (2009).

[6] See the discussion in IMF (2005) and in Moëc and Frey (2006), which is the source of the data on investment and saving that I quote.

Figure 3: Nominal house prices, 2001Q1=100



Source: Data from Assenmacher-Wesche and Gerlach (2009)

rates in order to induce spending to rise sufficiently to restore global goods market equilibrium. While these movements in output growth and inflation would presumably also lead central banks to adjust monetary policy, we postpone the discussion of monetary policy issues to a later section.

Unfortunately, studying the behaviour of real yields is not straightforward since these are not directly observed. While some countries have issued inflation-indexed government bonds, the stock of such debt is in many cases small and observed yields are therefore subject to liquidity effects. Furthermore, clientele effects, arising for instance from regulatory constraints that make this type of debt attractive for particular investors that buy and hold it to maturity, may be important. Inflation-index yields are therefore best seen as a proxy for the unobserved real interest rate.

With that caveat in mind, figure 3 shows 10-year indexed spot yields in the United Kingdom as an indicator of global real yields.[7] The figure tells an interesting story. Real interest rates in the United Kingdom fluctuated between 3 and 4 per cent in the first part of the

[7] The data are estimates of the 10-year indexed spot yield and come from the Bank of England's website. The UK market is relatively liquid and data are available for an extended time period. While the levels of indexed real yields differ across countries, their changes are typically quite strongly correlated.

sample starting in 1985 and stood at 3.7 per cent in May 1997 before the onset of the Asian financial crisis. Subsequently they declined gradually, reaching a low of 1.3 per cent in January 2006. Since the onset of the financial crisis, the yields have fluctuated substantially, at times falling below 1 per cent as a consequence of the flight to quality.

In turn, this decline in real interest rates raised asset prices across the world, particularly in real estate, triggering a global boom in housing construction.[8] Figure 3 shows that nominal house prices rose by between 50 per cent and 125 per cent in ten countries between 2001 and 2007/8.[9] Furthermore, in the United States, where mortgage equity withdrawal was possible, the rise in housing prices led to a period of strong consumption and a collapse in the household saving rate.

One view is that the housing price boom and the low US household saving rate were independent causal factors that led to the financial crisis. By contrast, the view put forth above is that they reflected the decline in real yields triggered by global imbalances. Had these booms not occurred, real interest rates would have had to fall further until some other component of spending somewhere else rose. Under this interpretation, the housing and consumption boom should be thought of as symptoms that something was wrong with the global economy and not as causes of the crisis.

2.2 The global search for yield

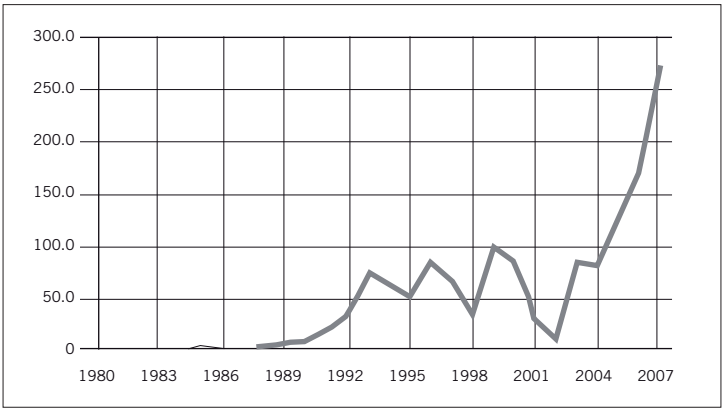
More generally, the decline in real interest rates, together with the disinflation in the 1980s and 1990s that amplified the fall in nominal interest rates, had a powerful impact on the financial system.[10] Lower yields provided incentives for pension funds and insurance companies that had sold products with promised returns, and for market participants whose remuneration depended on returns,

[8] See IMF (2008).

[9] The data are for Australia, Belgium, Canada, Denmark, France, Great Britain, Ireland, Italy, Spain and the United States and stem from Assenmacher-Wesche and Gerlach (2009).

[10] See the discussion in Rajan (2005).

Figure 4: Private portfolio investment in emerging market economies, in billion US dollar



Source: IMF Balance of Payments Statistics.

to seek to raise them. This could be done in different ways. Most obviously, investors could increase leverage by borrowing against their current portfolios, using the proceeds to increase their asset holdings. Alternatively, they could purchase riskier, higher-yielding assets and assume 'tail risk'.[11]

The resulting demand for such assets generated an opportunity for broker-dealers and banks to develop a range of new products with the desired risk-return profiles using financial engineering techniques. The most discussed case was the creation of Collateralized Debt Obligations whose collateral consisted of packages of subprime mortgages, that is, mortgage loans made to borrowers that were perceived as too risky to obtain a traditional mortgage.[12] Given the opacity and complexity of these products, this was a highly profitable activity for the financial institutions that created them. In turn, these instruments played a key role in the financial crisis, as discussed in greater detail below.

While global imbalances depressed real interest rates and triggered a search for yield, financial globalisation influenced the resulting

[11] Such risk materialises rarely but when it does, it has particularly severe consequences. One way to assume tail risk is to write options. See Rajan (2005, 2006) for a discussion.
[12] See the discussion in Hellwig (2008).

developments in at least two ways. First and most obviously, it led to a growing demand for emerging market assets.[13] As shown in figure 4, private portfolio investment flows to emerging market countries fell from almost USD 100 billion in the late 1990s to less than USD 10 billion in 2001, but then rose sharply to about USD 275 billion in 2007.

Second, it generated a global market for the new financial products discussed above. This is evidenced by, for instance, the large number of non-USsvestors that experienced losses on mortgage-backed securities linked to the US subprime market when the crisis struck. This broadening of the group of potential investors reduced transaction costs and promoted the growth of these markets. Liquidity is a desirable characteristic of any financial instrument. However, given the severe incentive problems and the lack of proper credit risk analysis throughout the issuance chain in the case of these highly complicated products, the benefits are doubtful. Rather, it appears that distance amplified the opacity of the products and attracted a new pool of poorly informed investors who did not understand the risks inherent in them. These investors relied excessively on the views of rating agencies, rather than on undertaking their own risk analysis, and did not realise that the ratings pertained to credit risk, not to liquidity and market risk.

In sum, globalisation played an important role in shaping the search for yield by channelling large flows of capital towards emerging market economies and by providing a global market for structured finance products.

2.3 Globalisation and inflation

A second important development in which globalisation is frequently believed to have played a role is the disinflation experienced in the last ten or fifteen years. Typically this argument focuses on China, India, Brazil and other major emerging market countries as low-cost

[13] The evolution of capital flows to emerging market countries and the policy issues they raise are discussed in CGFS (2009).

manufacturing centres that have put downward pressure on import prices, and therefore on inflation, across the world. However, theory suggests that such import price reductions are best thought of as shocks to the price *level* that have no permanent effects on the *rate* of inflation.

This conjecture is supported by many studies, which generally find that such terms-of-trade shocks have had small and transient effects on inflation. For instance, estimates indicate that in most OECD countries, CPI inflation has declined by between 0 and 0.25 per cent per annum since 2000 due to this effect.[14] Moreover, the effects are estimated to be short-lived and last at most two years.[15] Overall, the impact of improved terms-of-trade on US inflation appears to have been small. [16]

Furthermore, it should not be forgotten that while globalisation at times may have depressed inflation, at other times it has raised it temporarily. This was evident in 2007 and 2008 as rapid economic growth in emerging economies increased the global demand for commodities and led their prices to rise abruptly, triggering a sharp run-up of inflation across the world.[17] Overall, there seems to be little reason to assume that globalisation has reduced inflation by depressing import prices.

But could it have reduced inflation in other ways? For instance, could the entrance of foreign firms and the resulting increase in competition have played a role in reducing inflation? Or could changes in the bargaining power of wage setters, arising for instance from immigration flows or from the threat of offshoring that have reduced workers' ability to push for higher wages, have done so?

These types of shocks have two effects. First, they directly influence the level of prices and wages. However, this effect is temporary: once these have reached a new level, which may take some time, the influence of the shock dissipates. In order for inflation to fall, a large number of such shocks, all putting downward pressure on the level of prices, must have occurred. While that is possible, it seems unlikely. Thus, the direct effect of globalisation on inflation has most likely been negligible.

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[14] See the discussion in Pain et al. (2006). IMF (2006) suggests that falling import prices could have reduced inflation by as much as 0.5% in 1998 and 1999.

[15] See IMF (2006).

[16] See Bernanke (2007), Kohn (2006) and Yellen (2006).

[17] See IMF (2007).

Second, such shocks may potentially affect the functioning of the economy and therefore the effectiveness of monetary policy. This raises the possibility that the conduct of monetary policy may have changed as a consequence of globalisation. If so, globalisation may have impacted on the rate of inflation.

To understand why, note that the average rate of inflation over an extended time period must depend on the central bank's target for inflation, since positive and negative price level shocks over time average to zero. For globalisation to impact on inflation permanently, it must thus influence the central bank's choice of inflation target. Standard Barro-Gordon analysis suggests that average inflation rates are determined by a trade-off between the output gains and inflation costs associated with an unexpected relaxation of monetary policy.[18] The more impact the monetary policy has on expanding output, which depends on the degree of price-stickiness, the more tempted the central bank may be to lower interest rates to promote economic growth. Of course, the public understands this incentive, so expected and therefore actual inflation rise. Furthermore, the costlier the central bank perceives inflation to be, the less inclined it will be to relax monetary policy unexpectedly to raise output, reducing inflation expectations and lowering the steady-state rate of inflation.

Greater openness resulting from increasing globalisation may have reduced the output effects of expansionary monetary policy by raising the degree of price flexibility (since the exchange rate and therefore import prices respond immediately to a monetary stimulus). Central banks therefore have less incentive to inflate in an open economy, reducing the average inflation rate.[19] An alternative way to invoke this mechanism is to argue that the interplay between globalisation and deregulation has raised the level of competition and therefore the degree of price flexibility in goods markets.[20]

While the economic logic of these explanations is correct (although it remains to be demonstrated that price flexibility has increased), they appear unable to account for the timing of inflation movements. In particular, while globalisation could account for the decline in inflation since the mid-1980s, it is difficult to reconcile it

[18] See Barro-Gordon (1983a,b).
[19] See the discussion in Romer (1993).
[20] See Rogoff (2003 and 2006).

with the increase in inflation in the 1970s. Perhaps this is because financial integration, which started much more recently, exerts a disciplinary effect on countries with bad economic policies, providing strong incentives for central banks to reduce inflation. For instance, financial globalisation enables domestic residents to invest abroad instead of holding domestic government debt. Furthermore, globalisation gives governments access to the deep world financial market, thereby reducing the need to rely on the inflation tax.

Another problem with explaining the disinflation by arguing that globalisation led central banks to adopt lower objectives for inflation is that these are typically set by law, in many cases in the early 1990s, and have generally not been revised. But more fundamentally, there are many other, more plausible reasons why central banks started to aim for low and stable inflation. To consider these issues in greater detail, we therefore next turn to a discussion of monetary policy.

3. Monetary policy

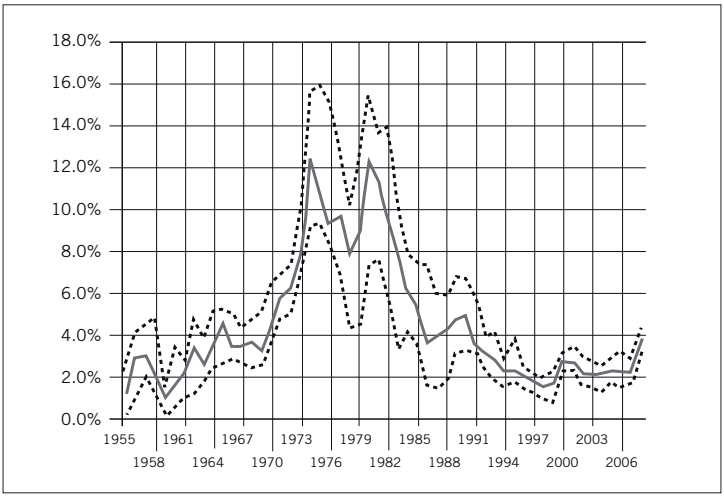
The thrust of the preceding analysis is that while global imbalances may have reduced long real interest rates and played a role in setting the stage for the crisis, globalisation had at most a temporary effect on inflation. In this section we explore three related questions. First, we ask how and why central banks' inflation targets have evolved in recent decades. Second, we consider whether globalisation has made inflation less sensitive to the output gap (that is, whether it has flattened the Phillips curve) and whether global output gaps might have become important determinants of domestic inflation. Third, we review how central banks might have responded to the fall in equilibrium real interest rates triggered by global imbalances.

3.1 Central banks' inflation targets

While it seems clear that the achievement of low and stable inflation reflects changes in central banks' targets for inflation, these changes were most likely not caused by globalisation. The disinflation took place in two phases, the first of which followed the period of high and volatile inflation in the 1970s and ended in the late 1980s (see figure 5).[21] This decline arguably reflects greater public understanding of the costs of inflation and the resulting demand for policies aimed at achieving price stability, together with increased efforts by central banks to stabilise inflation. The second phase started around 1990 and led to the achievement of inflation of around two per cent in many industrialised countries by the turn of the millennium.

[21] All data are annual. The inflation data are from the International Monetary Fund (except for 2008 where we use forecasts from the Economist's Intelligence Unit) and cover 24 industrialised economies (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States).

Figure 5: Inflation in Industrialised Countries



Source: Gerlach et al. (2009).

This latter phase was marked by several developments. Of particular importance was the introduction of inflation targeting in New Zealand in 1990 when the Minister of Finance and the Governor of the Reserve Bank of New Zealand signed an agreement that specified a numerical target for CPI inflation of 0 to 2 per cent, to be achieved by the end of 1992. This was soon followed by the adoption of a similar target in Canada. Inflation targeting constitutes a new approach to monetary policy in which interest rates are set directly on the basis of the central bank's outlook for inflation without any intermediate exchange rate or money growth target.

A further development that was important for the disinflation process was the episode of severe pressures on a range of fixed exchange rate regimes in Europe in 1992 and 1993. As a consequence of this crisis, a number of central banks abandoned fixed exchange rates and thus needed a new monetary policy framework. Finland, Spain, Sweden and the United Kingdom all adopted inflation targeting in order to prevent the large depreciation they had experienced from triggering a sharp adjustment of prices. The growing number of central banks operating with this strategy, coupled with their success in stabilising inflation, meant that gearing monetary policy to ensuring low and stable inflation increasingly became seen as

'best practice' in monetary policy, even by central banks that did not adopt inflation targeting.[22] Overall, by the end of the 1990s a range of central banks pursued monetary policy with the objective of maintaining inflation within a range of 0 to 3 per cent.

A related development was the introduction of operational independence for central banks that was seen as a key component in an inflation targeting strategy and was a part of the Maastricht Treaty, which was signed in 1992 and underpins European Monetary Union. With many central banks operating with an explicit objective for monetary policy and being free to set whatever level of interest rates necessary to achieve it, inflation rates were soon stabilised at a low level across the world. While globalisation may have helped by depressing inflation by suggesting that relatively ambitious inflation targets could be adopted, it most likely played a secondary role.

3.2 The slope of the Phillips curve and global output gaps

A number of empirical studies have considered whether and how the inflation process might have changed as a consequence of globalisation.[23] While the results are somewhat sensitive to the countries included and the sample period studied, the empirical evidence indicates that over time the Phillips curve has become flatter and that the pass-through of exchange rate shocks has fallen. Could globalisation explain these facts?

Globalisation increases the degree of foreign competition that domestic firms face at home, which reduces their pricing power, that is, their ability to pass on increases in production costs to consumers. However, economic theory suggests that a once-and-for-all increase in competition should reduce firms' markups over costs, leading to a similar once-and-for-all decline in prices, thus having at most a transitory effect on inflation.

[22] Thus, the ECB's monetary policy framework adopted in 1998 and the Swiss National Bank's new framework that became operational in 2000 both called for monetary policy to ensure price stability, defined as inflation of 0-2 per cent.

[23] See Melick and Galati (2006), IMF (2006) and Pain et al. (2006).

Furthermore, globalisation can be associated with potentially sizable immigration flows that might alter the dynamics in the labour market. Suppose, for instance, that the labour supply of immigrants is more sensitive to the wage rate than that of locals. An increase in aggregate demand can then be met by firms with only a limited increase in marginal costs, requiring only a moderate increase in prices. In turn, this could make inflation appear less sensitive than before to the level of aggregate demand as captured by the output gap. It has been argued that the sizable immigration experienced by Spain in recent years played a substantial role in the observed flattening of the Phillips curve.[24]

Offshoring provides another channel through which increased competition in international labour markets may affect wage determination. Splitting, or the threat of splitting, the production process in parts and offshoring some to countries with lower labour costs may serve to moderate domestic wages and could potentially reduce the impact of changes in the output gap on wage demands and therefore on inflation.

Two caveats regarding the relevance of the mechanism are in order. First, Spain absorbed immigration flows that were substantially larger than those of other countries.[25] Second, and more important in our view, the effect could be temporary. Once immigrants become more integrated into the local economy, their labour supply decisions may become similar to that of the local population, suggesting that the Phillips curve may revert to its original steeper slope.

Other authors have argued that while inflation has become less sensitive to domestic output gaps as a consequence of globalisation, it has become more sensitive to global output gaps.[26] This raises the possibility that central banks that focus on global demand conditions may underestimate the amount of inflation pressure coming from global forces and potentially set interest rates at the wrong level. For instance, if global factors put downward pressure on inflation, central banks may incorrectly infer that the domestic output gap is turning increasingly negative and cut interest rates in order to support economic activity. There is therefore a risk that monetary policy may become too stimulatory.

[24] See Bentolila et al. (2008).
[25] See the discussion in Nickell (2007).
[26] See Borio and Filardo (2007).

While globalisation effects that depress import prices could reduce inflation temporarily, empirically estimated Phillips curve models typically control for this effect. Global macroeconomic developments could impact on the demand for domestic exports, but this effect would presumably be captured by the domestic output that does enter the Phillips curve. In sum, it is difficult to see how global output gaps might impact on domestic inflation except through the variables included in Phillips curve models. That argument is supported by the fact that, despite its plausibility, it is now generally recognised that the formal evidence provides no support at all for the notion that global output gaps have become important determinants of domestic inflation.[27]

But globalisation is neither the only, nor the most plausible, reason why the Phillips curve may have become flatter. Changes in monetary policy are also very likely to alter the parameters in reduced-form inflation equations. Thus, improvements in monetary policy associated with the adoption of inflation targeting and a closely related policy framework have led to the achievement of lower and much more stable inflation rates in a number of countries. With inflationary conditions becoming more predictable, wage and price setters can afford to reassess economic conditions less frequently, leading to an increased degree of wage and price inertia.[28] In other words, the Phillips curve is likely to become flatter if the economy enters a low inflation regime.

Furthermore, lower inflation and the firmer anchoring of inflation expectations may have reduced the impact of changes in the output gap on inflation. Modern macroeconomic theory holds that firms set prices in a forward-looking manner. When inflation rates are above the range of one to three per cent typically associated with price stability, firms run the risk that a shock to the output gap and inflation will persist for an extended time period and inflation expectations will therefore rise. With increases in both the output gap and expected inflation, firms are likely to increase prices relatively strongly. By contrast, if firms expect the central bank to do whatever is necessary to maintain inflation close to the inflation target, inflation expectations will remain unchanged so that only

[27] See Ihrig et al. (2007). See also Bernanke (2007), Kohn (2006), White (2008) and Yellen (2006).
[28] See Ball, Mankiw and Romer (1988).

a direct output channel remains operative. Consequently, a change in the output gap has a smaller effect on inflation when monetary policy is credible.[29]

To understand these issues better, we provide some simple empirical evidence on changes in the Phillips curve, using data from a sample of 19 countries for the period 1985 to 2008.[30] We fit a standard, backward-looking Phillips curve that ties inflation to the lagged output gap, lagged inflation, and changes in import and oil prices.[31] We focus on five main questions. First, have shocks to inflation in the Phillips curve become less persistent over time? Second, has the impact of import prices on inflation declined? Third, has the effect of oil price inflation on inflation changed? Fourth, has the impact of the output gap on inflation declined? Fifth, have measures of global output gaps become increasingly important determinants of domestic inflation, and if so, how can this be interpreted?

The results for various specifications are presented in Table 1, where we split the sample between 1985Q1 – 1992Q4 and 1993Q1 – 2008Q1. We observe a sharp fall in the persistence of inflation, with the sum of the autoregressive lags of inflation dropping from 0.62 to 0.33 (columns 1 and 2). Similarly, the impact of import prices falls from 0.01 to -0.01. Furthermore, while they were highly significant in the first sample, they are insignificant in the second sample. The impact of oil price changes is highly significant and has declined as well over time, from 0.07 to 0.02, and the parameter on the output gap fell from 0.31 to 0.17, and is highly significant in both samples.

Turning to our final question, we assess the role of the global output gap, using alternative measures. The estimates in columns 3 and 4 are analogous to those in columns 1 and 2, except that they also include the GDP-weighted global output gap. We find that the global gap is insignificant, even in the most recent period. This result is robust to alternative measures of the output gap, such as the median output gap in the various countries (columns 5 and 6) or the first principal component of these output gaps (columns 7 and 8). Domestic output gaps by contrast remain highly significant.

[29] See Roberts (2006).

[30] The countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

[31] We compute the output gap as the difference between actual output and the Hodrick-Prescott filtered trend. While oil prices are part of import prices, we use both variables to capture the effect of price movements in other imported goods.

Table 1: Panel estimates of Phillips curve

Model	1	2	3	4	5	6	7	8	9	10
Sample	1985Q1-1992Q4	1993Q1-2008Q4	1985Q1-1992Q4	1993Q1-2008Q4	1985Q1-1992Q4	1993Q1-2008Q4	1985Q1-1992Q4	1993Q1-2008Q4	1985Q1-1992Q4	1993Q1-2008Q4
Countries	19	19	19	19	19	19	19	19	19	19
Constant	2.12*** (0.28)	1.21*** (0.11)	1.27*** (0.24)	1.21*** (0.10)	1.44*** (0.25)	1,22*** (0.10)	1.27*** (0.24)	1.22*** (0.10)	1.31*** (0.23)	1.18*** (0.10)
Inflation (sum of lags)	0.62*** (0.05)	0.33*** (0.05)	0.64*** (0.05)	0.41*** (0.05)	0.64*** (0.05)	0.39*** (0.05)	0.65*** (0.05)	0.38*** (0.05)	0.63*** (0.05)	0.42*** (0.05)
Import prices (sum of lags)	0.01 (0.02)	-0.01 (0.01)	0.05*** (0.02)	0.01 (0.01)	0.05*** (0.01)	0.01 (0.01)	0.05*** (0.01)	0.01 (0.01)	0.04*** (0.02)	0.00 (0.01)
Oil prices (sum of lags)	0.07*** (0.02)	0.02*** (0.01)	-0.01** (0.00)	0.00 (0.00)	-0.01* (0.00)	0.00* (0.00)	-0.01** (0.00)	0.00** (0.00)	-0.01** (0.00)	0.00 (0.00)
Output gap, lagged	0.31*** (0.06)	0.17*** (0.04)	0.25*** (0.06)	0.11** (0.04)	0.31*** (0.06)	0.16*** (0.05)	0.24*** (0.06)	0.20*** (0.05)	0.25*** (0.06)	0.11*** (0.04)
Global gap (GDP weighted), lagged	—	—	0.26 (0.16)	0.13 (0.10)	—	—	—	—	—	—
Global gap (median), lagged	—	—	—	—	-0.15 (0.15)	-0.07 (0.08)	—	—	—	—
Global gap (PC), lagged	—	—	—	—	—	—	0.04 (0.03)	-0.04** (0.02)	—	—
US gap, lagged	—	—	—	—	—	—	—	—	0.30*** (0.09)	0.18*** (0.06)
Adjusted R-squared	0.66	0.47	0.56	0.29	0.64	0.29	0.62	0.29	0.64	0.30
Country and/or time dummies	Country, time	Country, time	Country	Country	Country	Country	Country	Country	Country	Country

Note: */**/*** denotes significance at the 10%/5%/1% level.

This casts doubt on the notion that global output gaps have become important determinants of domestic inflation.

To explore this issue a bit further, we remove the United States from the countries included in the panel and instead include the US output gap as an extra regressor in the inflation equations. Interestingly, it is significant (columns 9 and 10). This does not necessarily mean that the US gap plays a structural role in the inflation equations for the other countries. Indeed (unreported) Granger causality tests show that the US output gap contains information useful for predicting

the output gaps in the other economies, suggesting that the US gap is a leading indicator of the world business cycle.[32]

In sum, we draw four main conclusions from this exercise. First, shocks to inflation have become less persistent over time, indicating that central banks are better able to control inflation. Second, the impact of the output gap on inflation has become much smaller, that is, the Phillips curve has indeed become flatter. Third, the effects of import price shocks and oil price inflation on inflation have declined. Fourth, global output gaps do not appear to be important determinants of domestic inflation. However, the US output gap does appear to matter because it helps forecast domestic output gaps that theory suggests do matter for inflation.

3.3 Monetary policy and long real interest rates

But while globalisation does not seem to have had a major impact on inflation and the Phillips curve, global imbalances did depress real interest rates and played a role in the search for yield. However, the run-up to the financial crisis also saw very low policy-controlled interest rates. This raises the question of the relationship between low real interest rates and the stance of monetary policy.

Indeed, some have argued that lax monetary policy played a major role in setting the stage for the crisis.[33] However, while the impact of monetary policy on short-term real interest rates since inflation is sticky, it is difficult to believe, as a proposition in economic theory, that changes in the short-term nominal interest rates controlled by central banks would have much impact on long-term real yields. Indeed, the adoption of inflation as the overriding goal for monetary policy is based on the belief that the real and nominal sides of the economy are approximately independent in the long run, so that the central bank's choice of inflation target has no effect on real economic outcomes (except potentially by reducing uncertainty).

[32] See Giannone and Reichlin (2006) for formal evidence on how the US output gap leads that in the euro area.

[33] See for instance the discussion in Taylor (2009).

To better see why it is difficult to believe that expansionary monetary policy depressed the real interest rate, suppose that real interest rates are at their equilibrium level, which we take as given, and that the central bank relaxes monetary policy. Short-term real rates are now below the equilibrium level, over time, raising inflation and forcing the central bank to tighten policy to avoid overshooting its inflation target. In sum, if monetary policy is too expansionary, one would expect rising inflation to force the central bank to recalibrate policy.

Suppose instead that the equilibrium real yield falls as a consequence of global imbalances and that the central bank maintains monetary policy unchanged. Since inflation tends to be sticky, real interest rates are now above their equilibrium level, gradually reducing inflation and slowing the economy. From the central bank's perspective, the slowing of inflation appears inexplicable and requires it to cut interest rates to prevent inflation from falling too low.[34] Thus, a fall in the equilibrium real interest rate will over time lead the central bank to cut nominal short-term interest rates so as to maintain inflation at target.

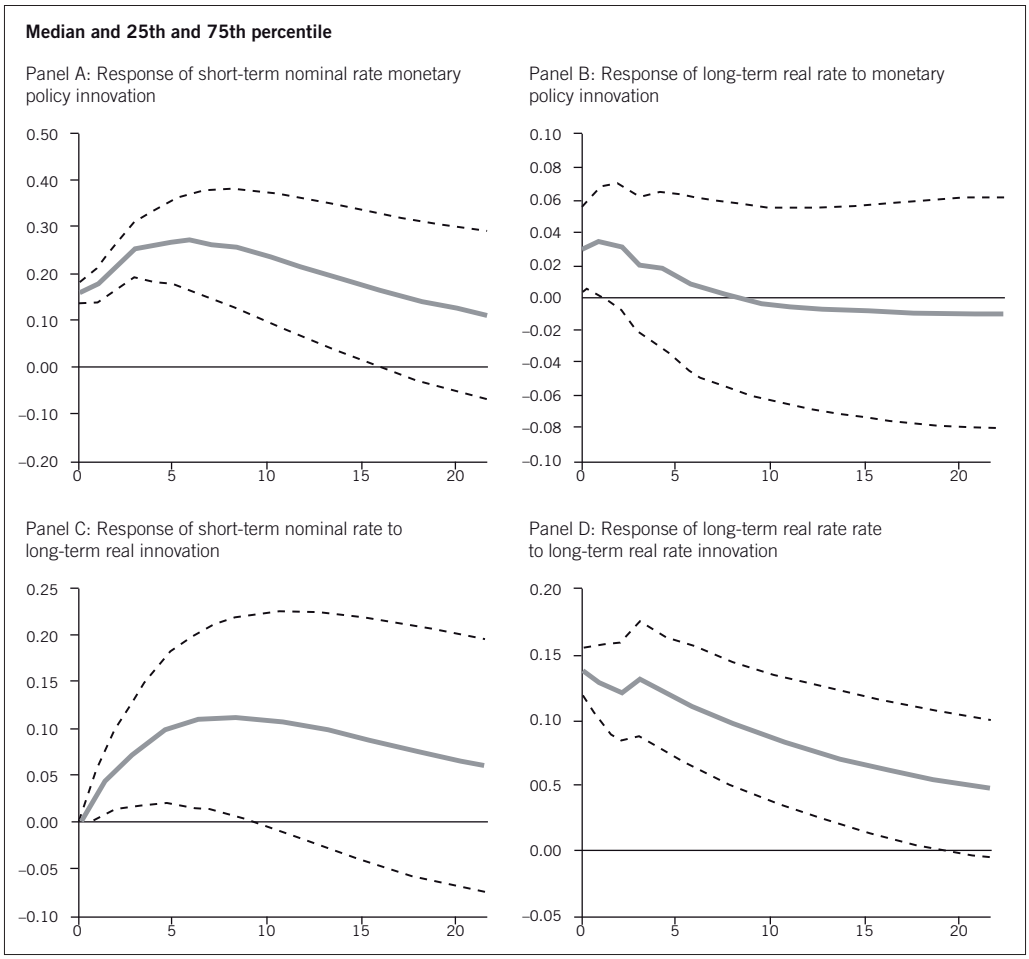
These arguments suggest that changes in nominal interest rates have no impact on long real yields but that changes in long real yields over time induce changes in short-term nominal interest rates. Next we explore these hypotheses by studying the behaviour of the one-month nominal interbank rate, which we view as capturing the stance of monetary policy, and the yield on ten-year indexed bonds in the United Kingdom for which data on real yields are available for an extended period. We focus on the period from January 1993 onwards, that is, after the adoption of inflation targeting.[35]

The upper-left panel of figure 6 shows that a typical contractionary monetary policy shock raises the one-month rate by about 15 basis points. Over time the short interest rate reverts back to the initial level. However, as hypothesised above, the shock has little impact on the long real yield (bottom-left panel), which increases temporarily by about 3 basis points.

[34] This was very much the situation the Federal Reserve found itself in from 2001-2002, see Bernanke (2002, 2003).

[35] The results stem from a VAR. We identify monetary policy shocks using the restriction that the contemporaneous correlation between short nominal and long real rates is due to reactions by the latter to the former. The results are not sensitive to the inclusion of inflation and a measure of the state of the economy.

Figure 6: Impulse responses for interest rates



Note: Response to Choleski one standard-deviation innovations; two standard-errors bands.

Turning to shocks to the long real interest rate, long real rates rise by about 15 basis points (lower-right panel), with the effect being highly persistent. Thus, after two years, long real yields are about 10 basis points above the initial level. More importantly, this shock leads to an increase in the short nominal interest rate over time. After two years, the nominal interest rate has risen by about 9 basis

points above its initial level, that is, to the same level as long real yields.

Overall, these results suggest that changes in monetary policy had negligible effects on long-term real interest rates, as theory suggests.[36] By contrast, movements in long real yields are soon reflected in short-term nominal rates. In turn, this suggests that the relaxation of monetary policy across the world before the crisis at least partially reflected the decline in long real yields related to global imbalances. Of course, it still remains possible that central banks cut rates too far and maintained them at too low a level for too long.[37]

[36] The variance decomposition suggests that at a time horizon of two months, the fraction of the forecast error variance of the ten-year real yield explained by the nominal one-month rate is less than 6 per cent; after two years, it is less than 3 per cent.

[37] While short rates respond on a one-to-one basis to shocks to long rates in the long run, shocks to long rates explain only about 16 per cent of the forecast error variance of one-month rates at a two-year horizon.

4. Financial stability and the crisis

So far we have argued that globalisation played a secondary role in the achievement of low inflation and in the flattening of the Phillips curve, both of which we viewed as more likely to reflect a firmer commitment to price stability by central banks. But global imbalances did play a role in depressing real interest rates and central banks reacted by relaxing monetary policy. Together with greater macroeconomic stability and lower volatility in financial markets, this triggered a search for yield which was global in several dimensions. First, emerging market economies experienced massive inflows as investors sought to diversify their portfolios and reap higher returns. Second, the market for structured financial products was global and led in particular to the exposure of investors outside the United States to the US subprime sector. Third, globalisation in the sense of the international interconnectedness of financial institutions played a major role in transmitting the crisis. Overall, while globalisation did not have a causal role in the crisis, it had a global dimension.

Moreover, globalisation in the form of rapid growth in emerging market economies contributed to the sharp rise in commodity prices, particularly energy and food prices, in the second half of 2007. This led to a rapid increase in headline inflation across world, which suggested that interest rates should be raised or be kept high. Since the financial market tensions that started in the summer of 2007 called for lower interest rates, the increase in commodity prices complicated the management of monetary policy at a critical moment.

But if globalisation did not play a central role in the financial crisis, what factors did contribute to the crisis? While a consensus view has yet to emerge, below we discuss some key elements emphasised by many observers.

4.1 Incentives and financial stability

It is now commonly argued that the crisis resulted from weaknesses in the financial sector arising from a combination of poor incentives and ineffectual regulation and supervision. While these weaknesses may have been present for a long time, they were accentuated by the search for yield that resulted from the decline in equilibrium real interest rates and the expansionary stance of monetary policy.[38] Several such weaknesses have been identified above.

Most importantly, the originate-to-distribute banking model, which had become increasingly important, provided very poor incentives for credit risk analysis.[39] In the traditional originate-to-hold model, banks that initiate mortgages and other loans hold them on their books and consequently have good reasons to ensure that the loans will be serviced. In the originate-to-distribute model, by contrast, brokers and lenders are rewarded through fees that depend on the number of loans that are originated. In the case of subprime mortgages, this provided incentives to originate as many loans as possible, provided that they satisfy the criteria to be resold, with insufficient regard to credit risk since it was assumed by the purchaser of the loans.[40]

This might not have been a problem if the ultimate holders of these loans had conducted their own credit analysis. However, once the loans were securitised and used as collateral for structured products, this was difficult, if not impossible. First, information about the underlying loans, if ever collected, was not passed on through the securitisation chain, generating an information gap between originators and investors.[41] Second, the structured financial products that used the underlying loans and collateral were highly complex and opaque. It was therefore difficult for investors, except the very largest, to assess their riskiness.

One consequence of the difficulty investors had doing their due diligence was an over-reliance on ratings. This was problematic for several reasons. In particular, rating agencies were subject to

[38] See Bean (2008).
[39] The following discussion draws on Mizen (2008).
[40] It should be emphasised that while rising defaults in the subprime mortgage market provided the spark that triggered the financial crisis, it is best seen as being due to deeper problems in the financial sector.
[41] See Giovannini and Spaventa (2008).

a conflict of interest since they were paid by issuers to rate their products. Furthermore, they generated additional fee income by selling advice on how issuers could enhance the rating of their products, further accentuating the conflict of interest. Indeed, rating agencies earned a disproportionate part of their revenues from rating structured products.[42] A related problem was that the ratings were misunderstood by many investors as applying also to market and liquidity risk.

A related problem was that in assessing risks and in rating and pricing products, too much reliance was put on statistical models. While these were estimated or calibrated on the basis of recent data, the decade before the onset of the crisis was unusually tranquil and characterised by steady growth, low and stable inflation, and few episodes of financial volatility.[43] Thus, the data used to validate the models were unrepresentative and vastly underestimated the extent of the risk.[44] Alternatively put, risk was underpriced.

A further factor that played a central role in the crisis was the excessive reliance on wholesale funding and the assumption that liquidity would always be available. Banks and, increasingly, other financial institutions borrow short and lend long. While one may think of this as maturity transformation, one can equally well consider it liquidity transformation, in which liquid liabilities are converted into illiquid assets. As evidenced by the growing use of the originate-to-distribute model, one prominent trend in financial markets in the years before the crisis was the growing use of financial engineering techniques to make "illiquid [assets] liquid and the non-tradable tradable".[45]

While this permitted risk trading, which is in principle a good thing, it also created a sense that risk was limited since investors came to believe that they could always close their positions if market conditions turned difficult. While this is true for an individual investor, this is not possible for the market as a whole. Thus, a sufficiently widespread shock would lead a large number of investors to attempt to close positions in a range of markets, causing them to become one-sided and prices to collapse. This is precisely what happened: when US housing prices started to fall and it became

[42] See Portes (2008).
[43] See Panetta et al. (2006).
[44] See Haldane (2009).
[45] See Buiter (2008, p. 522).

clear that subprime loans constituted collateral for a broad range of structured products, it triggered fire sales of these products, sharp price falls and massive credit losses. With the size and location of these losses being unknown, but perceived to be large and widespread, a swath of institutions found their credit standing in doubt, leading to a generalised fall in asset prices and to cascading losses. Thus, the financial tensions in the small US subprime mortgage market quickly grew into a global financial crisis affecting a previously almost unimaginable number of institutions and markets.

A closely related problem was that investors relied excessively on wholesale markets to fund positions in structured and other products. Paradoxically, in many cases these investors were SIVs and conduits that were established by the structuring banks as off-balance sheet entities to avoid capital charges. When increasing default rates among subprime borrowers led investors to withdraw from the markets for structured products and their prices collapsed, the sharp increase in credit risk perceptions made it impossible for the SIVs and conduits to roll over their funding. These entities therefore migrated back to the balance sheets of their sponsors, who suddenly had to fund them. Not knowing their own borrowing needs, banks operating in the interbank market therefore withdrew funds from interbank markets, while others saw their borrowing needs rise sharply as a consequence of the need to fund positions in structured products. As a consequence, interbank markets started to dry up, particularly for longer maturities, creating funding problems for other investors.

The incentives inherent in many financial sector compensation schemes also played a role in the crisis. Remuneration policies were asymmetric in that risk taking that was profitable resulted in potentially large bonuses for investment managers, while losses were absorbed by employers. Furthermore and arguably more importantly, remuneration depended on short-term, rather than on long-term, profitability. This provided an incentive to assume tail risk, that is, risk that rarely materialises but that has very adverse consequences when it does. To raise returns, investment managers could, for instance, write far out-of-the-money put options. Given the very calm environment before the crisis, these were seen as extremely unlikely to be exercised but generated fee income that boosted investment returns.

Foreign exchange carry trades are another example of such tail risk. In these the investor borrows in low-yielding currency and uses the

proceeds to invest in a high-yielding currency, leaving the exchange risk unhedged. In many cases this involved borrowing in countries with large current account surpluses such as Japan or Switzerland and investing in countries with large current account deficits such as Australia or New Zealand. The yield differential is thus at least partially a premium for the risk that the exchange rate would adjust abruptly if the economic environment turned turbulent. Thus, most days the investor makes a small profit at the risk of suffering a large loss if the exchange rate moves sharply in the 'wrong' direction.[46]

Finally, weaknesses in regulation and in supervision also played a central role in setting the stage for the crisis.[47] Some of these are readily apparent: the lack of effective rules concerning the liability of originators and securitisers; an absence of regulation of key players such as hedge funds, SIVs and conduits; the conflict of interests in the case of rating agencies; and the fragmentation of regulation and supervision in the United States. More fundamentally, prudential regulation focused on protecting small and unsophisticated investors and on ensuring the stability of individual institutions, rather than on the stability of the financial system.

However, there is an obvious tension between micro- and macro-prudential regulation. For instance, micro-prudential regulations may require an institution finding itself overextended to reduce leverage and cut its exposure. For the financial system as a whole, this is not possible: any generalised attempt to withdraw from a market merely leads prices to fall. Indeed, measures that may be desirable for an individual institution in the current situation of severe financial tension – such as withdrawing from the interbank market because of credit risk or contracting mortgage lending because of declining property prices – will aggravate the crisis and are thus undesirable from a systemic perspective.[48] Increasingly the resilience of the financial system thus requires regulation and supervision to have a macro-prudential focus.

A final problem with the regulatory approach to date is that it has done little to reduce the pro-cyclicality that is inherent in the financial system. Going forward, regulation of the financial system must increasingly constrain risk taking in periods of boom and reduce the likelihood of a retrenchment in periods of macroeconomic weakness.

[46] This presupposes that the distribution of exchange rate changes is not normal.
[47] For a discussion of regulation, see Hellwig (2008) and Brunnermeier et al. (2009).
[48] See the discussion in King (2009).

5. Monetary policy after the global financial crisis

While the financial crisis was predominantly due to poor incentives in the financial sector, coupled with weak regulation and supervision, central banks are asking what lessons they should draw for monetary policy from the turmoil. Some observers have argued that monetary policy before the crisis focused too much on ensuring low and stable headline inflation, leading central banks to disregard important developments in the financial system. In particular, with real interest rates and inflation at historically low levels, central banks adopted an excessively expansionary policy stance. While this may have been appropriate from the perspective of inflation control, it triggered a search for yield, large increases in leverage in the financial system and sharp run-ups in asset prices, particularly property prices.

Overall, although monetary policy may have been appropriate from a short-term macroeconomic perspective, central banks attached insufficient emphasis to the impact of their interest rate decisions on risk taking in the financial sector. While the management of financial institutions bears primary responsibility for the financial viability of their institutions, ex post it is clear that tighter monetary policy would have been desirable.

Not surprisingly, the proponents of this view argue that monetary policy makers must attach more weight to financial developments and should lean against the wind by tightening monetary policy over and beyond what is necessary to control inflation in the next year or two whenever asset market developments appear unsustainable. One commonly cited rationale for doing so is that episodes of large asset price increases, if left unchecked for a number of years, frequently end with sharp price falls. As demonstrated by recent experience, these can trigger financial instability and macroeconomic weakness and lead inflation to undershoot the central bank's target. This activist view of monetary policy is therefore sometimes motivated on the grounds that taking asset prices into consideration helps control inflation beyond the standard two- to three-year policy horizon that many central banks adhere to.

But conventional inflation-targeting strategies would seem to be compatible with responding to financial developments. Under such strategies, interest rates are set on the basis of an inflation forecast. If that forecast points to too high inflation, policy will be tightened; if the forecast points to too low inflation, policy will be relaxed.[49] Thus any asset market development that has implications for inflation will influence interest rate setting under such a strategy.

There are several further reasons to be hesitant about conducting policy by leaning against the wind.[50] For instance, it presupposes that central banks can determine in real time when financial market developments are unsustainable. That seems unlikely to be the case in practice. It also requires central banks at times to set interest rates above (and at other times presumably below) the level necessary to reach the inflation objective. This may exacerbate business cycles and increase the amplitude of movements in inflation. Whether this would worsen macroeconomic performance and, if so, by how much would depend on the interest rate sensitivity of asset prices and credit growth relative to the interest rate sensitivity of real economic activity and inflation. While more research on this question is needed, preliminary evidence suggests that the impact of higher interest rates on asset prices is small relative to their impact on real economic activity, suggesting that gearing monetary policy to asset prices can result in much worse macroeconomic outcomes.[51] However, these issues remain unsettled and more research is warranted.

However, inflation targeting is fully compatible with incorporating financial sector developments into the policy process since the central bank will respond to any variable that impacts on its forecast of inflation. For instance, if a house price bubble leads to a rise in housing investment, a pick-up in mortgage lending and expansion of economic activity that signals future inflation pressures, the central bank should raise interest rates even if inflation currently is subdued. This suggests that focusing monetary policy on headline inflation is not incompatible with reacting to asset prices.

But is the critique of inflation targeting entirely off the point? While in theory, an inflation-targeting central bank reacts to all

[49] In practice inflation-targeting central banks also attach some weight to economic growth and the state of labour markets.

[50] See Kohn (2006 and 2008) for a critique of this approach to monetary policy.

[51] See Assenmacher-Wesche and Gerlach (2009).

variables that impact on the inflation forecasts, in practice the models used to forecast future inflation and output disregard many important variables, including property prices, measures of leverage in the financial system, risk spreads and the state of market liquidity. Indeed, these models typically disregard financial variables, even money stocks and credit aggregates. As a consequence, while inflation targeting in theory allows for asset market developments and bubbles to influence policy, in practice financial variables rarely play a role for the simple reason that they do not enter the models used to forecast future inflation and output. This is not because these variables are unimportant, but rather because central banks have not yet developed ways to include them in the models.

Of course, no central bank relies entirely on forecasts in setting interest rates and there is ample room for judgement to influence interest rate decisions. But in practice, it is easy to imagine that concerns about asset prices and financial sector developments will tend to be downplayed in an inflation targeting strategy.

6. Conclusions

We end the paper by summarising the main conclusions in bullet point form.

Global imbalances played an important role in setting the stage for the financial crisis by restricting demand and putting downward pressure on real interest rates. In turn, this played an important role in triggering the relaxation of monetary policy that many central banks engaged in. The declines in real and nominal interest rates led to a global search for yield as investors sought to raise returns.

Globalisation helped shape the search for yield in two ways. First, it took the form of very large flows to emerging market economies. Second, financial integration provided a large international market for broker-dealers and banks to market structured financial products, and thus supported the growth of these markets.

The direct impact of globalisation on the disinflation process of recent decades was negligible. Declines in import prices should be thought of as price-level shocks that have at most a temporary effect on inflation. Similarly, immigration and increases in competition because of the entry of foreign firms are also best thought of as price-level shocks.

The indirect effect of globalisation on inflation may have been larger. If globalisation increased price flexibility (which has not been established), it may have reduced the ability of monetary policy to stimulate economic activity, and therefore provided central banks with an incentive to aim for lower inflation.

The main reason for the decline in inflation was changes in the conduct of monetary policy, in particular the greater weight attached to price stability as the dominant objective for monetary policy and increased central bank independence, which made it possible for central banks to set interest rates freely in pursuit of price stability.

The financial crisis was caused mainly by incentive problems in financial markets, and weaknesses in the regulatory and supervisory regime. These were only revealed once yields fell and the resulting search for yield 'stretched' the financial system.

Greater emphasis needs to be placed on protecting the financial system as opposed to individual financial institutions. Moreover, there is a need to reduce the pro-cyclicality of financial regulation.

While monetary policy may have been appropriate from a macroeconomic perspective in the years before the crisis, central banks arguably paid insufficient attention to financial sector developments. One reason may have been that the economic models used to forecast inflation typically downplay or disregard financial variables, leaving them with little room to influence interest rate setting.

Under inflation targeting (and similar monetary policy strategies), the central bank will automatically lean against asset price movements that impact on the forecast for inflation. The centrality of the latter implies that the possibility of financial imbalances needs to be incorporated into the inflation analysis.

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The financial crisis, initially limited to the US housing market, has turned into a world-wide economic crisis. Business cycle forecasts have continuously being revised downwards. Negative growth rates and soaring unemployment rates are expected for almost all OECD countries. As a response to the crisis, monetary policy has been radically eased, including both provisions of liquidity and significant interest rate reductions. Fiscal policy measures have also been implemented, albeit the extent and design have differed between countries. The global downturn has initiated a discussion concerning the need to redesign and globally coordinate stabilisation policies. But what role can stabilisation policy - fiscal and monetary policy - play in the current situation? And to what extent is globalisation the cause of the current global turmoil?

In *Globalisation, the financial crisis and stabilisation policies. Challenges for the future* three professors of economics discuss the current financial crisis and the need and scope for monetary and fiscal policy. The report also analyses what mechanisms gave rise to the world-wide crisis and what reforms to financial regulation are needed in order to minimize the chances of similar crises in the future.

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