Transparency and financial stability[1]

Prasanna Gai, Australian National University and Hyun Song Shin, London School of Economics

Improved information about macroeconomic fundamentals, the balance sheets of firms and financial institutions, and the conduct of policy has been central to recent efforts to improve financial stability. Strides have been made in recent years to improve the quantity and quality of data provision under the IMF's *Special Data Dissemination Standard* (SDDS). Pillar III of the proposed Basel II Accord relies on disclosures by banks to exert market discipline through the price mechanism. Codes and standards on monetary, fiscal and financial policy seek to establish best-practice guidelines to clarify the objectives, role and process of policy. And countries have sought to publicise the extent of their disclosures through *Reports on Observance of Standards and Codes* (ROSCs) in an attempt to make a virtue of their 'transparency about transparency'.

THE NOTION OF TRANSPARENCY is broad-ranging. It encompasses notions of accountability and political legitimacy of decision makers, as well as the legal and accounting infrastructure in which economic decisions are made. But from the operational perspective of a central bank, transparency can be regarded more narrowly in terms of the disclosure of information to a wider audience. Intuitively, the release of a greater volume of more precise information in a more timely manner seems beneficial because it reduces asymmetric information and uncertainty in financial markets. Information about the financial stability framework and public evaluation of national balance sheets against yardsticks on international codes and standards offers investors an opportunity to assess risk better and arrive at more informed decisions. Moreover, greater clarity about financial stability policy potentially simplifies the task of monetary and fiscal policy by establishing clear lines of responsibility and objectives. In an environment of greater trust, communication by the central bank allows for greater flexibility to act.[2]

In this paper we explore some of the consequences of greater transparency for financial stability. We highlight issues of incentives, co-ordination, and the interaction between the two, which play out in different ways depending on the nature of the disclosure. In particular, the ramifications of transparency for financial stability hinge on answers to the following questions:

- *Who* is disclosing? Is it the central bank or other public authorities, or is it a private sector player or regulated entity?
- *When* is the disclosure? Is the disclosure one of general intent and/or in pursuit of the setting up of general channels of communication, or is the disclosure made after learning some specific features of the world, and hence discretionary?
- What is the *format* of the disclosure? Is the disclosure public in the sense of becoming common knowledge among all interested parties, or is it less than public, perhaps in the form of confidential bilateral communications between a private sector firm and the central bank?

Ex-ante central bank communication

We first consider the creation of general channels of communication by central banks, government agencies and other public bodies that take place before any specific information on distress or problems with the financial system are known. To the extent that the channels of communication are established before any specific features of the world

1: Paper prepared for the December 2003 issue of the *Financial Stability Review*. We are grateful to Andy Haldane, Stephen Millard, Roger Clews, Nigel Jenkinson and Alex Bowen for their comments on earlier drafts.

2: Svensson (2002) offers a similar argument.

are known, we regard such actions as being *ex-ante* communication. The task is to set up a framework for disclosure that is embodied in particular institutions.

Concrete examples of such *ex-ante* communication include the Bank of England's Monetary Policy Committee minutes, *Inflation Report* and *Financial Stability Review*, all published regularly, testimony in front of the Treasury Select Committee of the House of Commons and public speeches by Bank officials. Such communications establish a conspicuous platform from which the central bank's assessments of the economic and financial outlook can be conveyed in reasonable detail to transmit key messages to the public and the financial markets. The very open nature of these communications serves two critical purposes. First, they make the actions of the central bank very sensitive to reputation, thereby fostering credibility in the policy framework. And second, they provide a coherent institutional structure for ensuring common knowledge of the central bank's analysis and intentions.

The academic literature on monetary policy considers both issues in detail. The fact that there is always some information relevant for policymaking that, as Vickers (1998) notes, is simply incapable of being put in the public domain means that outside observers can never be completely certain what a central bank's actions will be, given public information and the central bank's avowed objective. Effective policy-making always requires some degree of discretionary behaviour. In principle, that means that, if a central bank's true objective were to differ for some reason from its avowed intentions, it could exploit the scope for discretionary behaviour to pursue its private goal without being caught out straight away. But any immediate benefits of doing so must be set against the future reputational costs of compromising the remit. In practice, it is not clear why a central bank would have any objective other than its avowed one, but observers might nevertheless not be convinced of that. Improvements to *ex-ante* channels of communication allow the public to gauge the intentions and goals of the central bank better and, in so doing, increase the reputational costs to the policy-maker of pursuing an objective that differs from the stated one[3]. In the UK, publication of inflation 'fan charts' together with details of the discussions of MPC members within the Inflation Report and MPC minutes, serves as a benchmark against which the intentions of the central bank can be openly scrutinised.

Policymakers' behaviour in promoting financial stability is the focus of this article. Viewed from a financial stability perspective, *ex-ante* transparency may play an even more critical role as a check on the actions of the central bank. The temptation for policy-makers in this instance is to deny a willingness to provide a financial safety net *ex ante*, but to intervene to bail out financial institutions *ex post*. Greater transparency about the goals and intentions of financial stability makes the potential loss of reputational capital very large, however. Unlike monetary policy, where policy-maker reputations are built and lost slowly, financial crises are low probability extreme events where the costs – both real and reputational – are upfront, large and immediate. Furthermore, since the central bank is often unsure about the systemic risks of a bank failure or a sharp fall in asset prices, it risks damaging its reputation by acting when intervention is unjustified, or by failing to act in what turns out to be a systemic crisis.

The format of the central bank's communication is critical to its ability to convey its intentions. Publications such as the *Financial Stability Review*, the *Inflation Report* and the MPC minutes seek to provide a clear informational platform from which the contents can be projected as a coherent whole to its audience. The aim is to achieve common knowledge of its main propositions. Not only does each individual in the audience understand the contents, but each individual can be reasonably confident that the audience as a whole has grasped the main propositions. This communication strategy contrasts with an alternative communication strategy that relies more heavily on speeches and testimonies of policy-makers made at different times. Although a collection of speeches taken together may convey a coherent message, the fragmented nature of the communication leaves open the possibility that some market observers fail to capture the intended picture with its emphases and qualifications. More importantly, even those market participants who have understood the full picture may be uncertain whether everyone has grasped it.

3: Faust and Svensson (2001) exemplify models that take this view. See Chortereas et al. (2001) for a concise review of the literature on monetary policy transparency. Geraats (2002) also surveys models of transparency in the Barro-Gordon Class.

An analogy from the everyday use of email is useful to illustrate the difference between the two strategies. Compare two instances. In the first, an email message is sent to a group of recipients in which the list of recipients is suppressed. In the second, the same message is sent to the same group of recipients, but the list of recipients is clearly displayed on the message. In both instances, all the recipients will be aware of the contents in the body of the email. However, common knowledge is achieved only in the second scenario.

A fragmented communication strategy is akin to an email message in which the list of recipients is partially obscured. The recipient of such a message cannot be sure whether everyone has received the same message. Even if the proportion of market participants who miss the full picture is small, the overall consequences can be much larger, since even those market participants who have understood the full picture may harbour doubts as to the extent of slippage in addressing the full audience. Overall, there is the possibility that the market outcome may be driven by the lowest common denominator – ie the less than fully informed parties – and not by fully informed agents. This is because market participants typically find it diffcult to co-ordinate their actions, and the reactions of less than fully informed agents may affect the actions of better-informed agents.[4]

Ex-post discretionary disclosure

A central bank can sometimes have an informational advantage over other market participants. Its role as the lender of last resort, and the trust that private sector players place in the motives of the central bank, often mean that the central bank is in receipt of sensitive information about financial entities that is not widely shared in the market. The central bank is thus in a powerful position. By having a policy of disclosing information[5] about the financial conditions of an individual entity, it can discourage financial institutions from engaging in excessively risky activities. To what extent should the central bank play the role of a whistle-blower willing to disclose the true state of financial balance sheets?

The existence of a distressed party influences the market dynamics in important ways, and the presumption that more information is better does not always hold. Common knowledge of financial distress can generate opportunities for speculative gains by exploiting and further aggravating the balance sheet of the distressed party. This is because of the greater scope for co-ordination that arises from the common knowledge of distress, and from the predictability of the actions of the distressed party. To a large extent, a successful speculative attack is the resolution of a co-ordination problem between a group of interested parties whose actions tend to be mutually reinforcing.

The Thai financial crisis of July 1997 is a concrete example where the central bank was, itself, the distressed party. In the period leading to the abandonment of the baht's peg to the dollar on 2 July, the Thai authorities' figures for foreign reserve holdings were exaggerated by the inclusion of dollar holdings needed to settle forward and swap positions in dollars put in place to shore up the peg. However, once IMF assistance was requested late in July, one of the conditions that the IMF imposed on Thailand for the IMF package was that the Thai authorities should clarify the true extent of the foreign reserve losses. The Thai package was announced on 20 August, and the announcement was accompanied by the revelation that some US$23 billion of the Thai dollar reserves were already tied up with the forthcoming settlement of swap and forward contracts. The Thai baht duly crashed, exacerbating the financial distress. Many commentators, as well as the IMF itself (IMF (1999)), have identified this episode as an avoidable mistake.

The issue in Thailand was whether it was wise to issue a highly public announcement on the deteriorating fundamentals of a distressed party in the market. Public announcements, by their nature, serve a co-ordination role among disparate market participants. To the extent that a currency attack is the resolution of a co-ordination problem among disparate speculators and domestic hedgers, any opportunity to enhance this co-ordination would be detrimental – at least to the Thai authorities.

4: Morris and Shin (2002), Amato et al (2002) and Allen et al (2003) study the role played by common knowledge of the central bank's intentions in financial market behaviour. The literature on herding and informational cascades (eg Bannerjee, 1992; Bikchandani et al, 1992) offers related insights. Woodford (2002) discusses how the breakdown of common knowledge gives rise to nominal rigidities that allow monetary policy to have real effects.

5: Any disclosures by the central bank would be subject to legal constraints on the disclosure of information or duties of confidentiality arising through contract when the information was received, or duties implied by general principles of law (principles of banking secrecy). These contracts, principles and laws will clearly influence the central bank's public disclosure policy.

A thought experiment helps push this point further. Think back to September 1998 when the hedge fund Long-Term Capital Management (LTCM) was close to bankruptcy, and the US authorities were considering the various options on how to resolve the crisis. What if the authorities (the New York Fed, in this instance) had taken the same course of action that the IMF had taken with Thailand in 1997? In other words, suppose that the New York Fed had required LTCM to announce its trading positions publicly as a precondition for facilitating the co-ordination of its creditors. There seems little doubt that LTCM's distress, as well as the distress of its creditor banks and counterparties, would have been greatly exacerbated. Common knowledge of the trading positions of LTCM would have identified more clearly than ever the greatest vulnerabilities and served as an effective co-ordinating signal to exploit the weakened position of the distressed parties. In such circumstances an orderly resolution of the crisis would have been more diffcult to achieve.

The obvious retort to the claim that public disclosures are detrimental is that if such disclosure requirements had been in place from the beginning, then LTCM would not have overreached itself to the extent that it did, and the Thai authorities would not have attempted to hold the dollar peg by committing reserves in the swap market for so long. Hence, when the public disclosure requirement is in place from the outset, practices that only thrive on asymmetric information will be discouraged, and prevent potential vulnerabilities from appearing in the first place.

Although the argument that disclosure can mitigate the temptation of banks and other financial entities to engage in excessively risky behaviour is a powerful one, it runs the risk of limiting the policy-maker's ability to react flexibly to events. Vickers (1998) argues that optimal monetary policy cannot be absolutely transparent – a degree of discretion in monetary policy is necessary to ensure sensible decision-making in a rapidly changing macroeconomic environment.[6] And George (1994) emphasises that withholding information about the timing, nature and terms of intervention in financial crises provides the central bank with vital room for manoeuvre:

"...we usually try to keep the fact that we are providing systemic support secret at the time... If people know we are so concerned about systemic fragility that we have judged it necessary to provide support, that could lead to a wider loss of confidence... and we would rapidly find ourselves in the position where we were in practice underwriting all the liabilities of the banking system."

Thus, the benefits of discretionary disclosure in mitigating the inefficiencies of moral hazard need to be balanced against its efficacy in managing crises. Given the high reputational costs at stake in managing financial crises, a central bank may need to be selective in its *ex-post* discretionary disclosures and engage in policies of 'constructive ambiguity'. While this places a higher degree of discretion in the hands of a crisis manager, problems of time inconsistency and 'policy-maker moral hazard' are likely to be tempered if clear *ex-ante* channels of central bank communication are in place.

Disclosures by private sector players and the informational role of prices

Closely related to the idea that disclosures by the central bank help mitigate excessive risk in the financial system is the notion that market prices have their maximum impact when the public information on which prices are based is as accurate as possible. Pillar III of Basel II advocates reliance on market discipline through market prices, in turn informed by disclosures by banks and other financial institutions. Mitigating information asymmetries by policies that require greater disclosure by market participants may thus be a means of limiting moral hazard in financial markets.

The argument for the preventative effects of greater disclosures by regulated entities is a strong one.[7] But it is important to keep in mind the mechanism that is envisaged in this argument. When informed parties are required to disclose some of their private information, there is less scope for the informed party to pursue their own socially detrimental goals by hiding behind the cloak of secrecy. Thus transparency is most effective in reducing economic inefficiencies when the information required is directly relevant to the underlying principal-agent problem. The same

6: Jensen (2002) discusses how transparency in monetary policy may constrain flexibility in pursuing stabilisation policy by encouraging the central bank to focus more on reducing undesirable variability in inflation.

7: There is a burgeoning empirical literature that backs up the force of the argument. Baumann and Nier (2003), for example, find that banks in those jurisdictions that require a greater degree of disclosure tend to take on less risky projects.

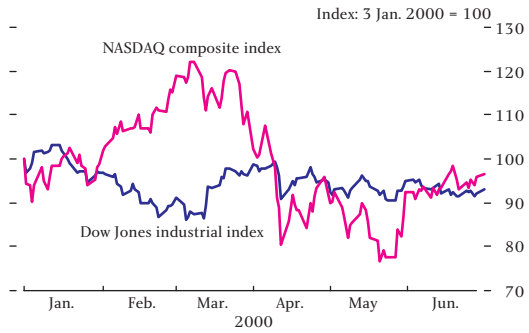
goes for the information conveyed by prices. The information conveyed by prices is most useful in those cases where the market prices reveal information that the informed party would like to withhold from the rest of the market. Market discipline through prices serves to level the playing field between informed and uninformed parties.

In many contexts, prices serve to aggregate the divergent opinions of a large number of uninformed agents. One might argue that it is nevertheless useful to use the price information that is derived from the interactions of such agents in regulating other, more secretive, agents who want to benefit from their private information. Relying on such price signals is most effective whenever the traders who determine prices have decision horizons that are a close match with the decision horizons of the regulated entities. For instance, suppose that a firm has issued corporate bonds, and that such bonds are held mainly by investors who normally hold those bonds to maturity, but enough bonds are traded in the market to give continuous prices. In such a case, the market price of the bond will reflect the probability of default and the loss, given default. If the firm were to venture into riskier ventures or increase its leverage further, then the disclosures by this firm will be digested by the market and the bond will be priced accordingly. Anticipating this, the firm will think twice before engaging in any risky venture that may weaken its position in the market.

In some other cases, however, the decision horizon of the regulated entity may not coincide with the decision horizon of the dominant market participants whose activities determine prices. For example, short-term movements in equity prices may reflect incentive and agency problems among the major market participants themselves operating in the market, as well as shifts in the fundamentals of the companies being traded. Fund managers whose mandates are written in terms of relative performance measures may feel pressured to deviate from their judgements on fundamental values, given the nature of their compensation contract. The prospect of losing a valued client would further reinforce the tendency to deviate from fundamentals. Indeed, the agency problems go deeper. The trustees who employ fund managers are, themselves, subject to an agency problem *vis-à-vis* the beneficiaries who have appointed them. Trustees may profess the importance of long-term investment goals, but may feel pressured to dismiss a low-performing fund manager and replace him with an alternative fund manager chasing the latest fashion in the market. Equity markets often experience sharp 'sector reversals', in which once-fashionable sectors of the equity market fall out of favour and are replaced by newly fashionable sectors.

The first few months of 2000 illustrate sector reversals dramatically. In the period running up to the peak of the Nasdaq index on 10 March, stocks in the technology, media and telecoms (TMT) sector rose very rapidly even as the Dow Jones index (composed mainly of conventional, 'old economy' stocks) fell. But the roles were reversed following the peak. The Nasdaq index fell sharply thereafter, often experiencing wild swings, while the previously unfashionable old economy stocks rallied strongly (Chart 1).

Chart 1:
Dow Jones industrial and Nasdaq composite index



Source: Bloomberg.

When market prices are driven by players whose actions are motivated mainly by short-term considerations arising from agency problems that bear little fundamental relationship to the long-run value of the assets that they trade, then prices will lose much of their informational role. There is a 'horizon mismatch' between those (short-term) traders who influence prices and the regulated entities whose long-term decisions on risk one is most interested in. Failing to recognise this horizon mismatch can lead to suboptimal decisions and economic costs.

Take the example of the Merton-style 'structural' models of credit risk used by firms such as KMV (now part of Moody's) in which the volatility of the share price is used to calculate the volatility of the firm's assets as a whole, and thereby calculate the probability of default by setting the probabilistic path

of the firm's assets against the notional value of its liabilities. Such models have been used extensively, and have proved to be successful.

However, on those occasions when the share price is buffeted by short-horizon trading decisions that bear little relationship to the long-run fundamental value of the assets, calculations of default risk that neglect such effects may give misleading results. Many telecom firms issued large amounts of debt in order to finance their extensive investment projects at the peak of the stock market's strength in the late 1990s. Analyses of credit risk that relied on inference from share prices often came up with conclusions on default risk that were more optimistic than assessments implied by the credit ratings of these firms. Moreover, the probability of default intimated by debt prices sometimes deviated from those intimated by equity prices. When market prices give conflicting signals of the underlying fundamentals, the reasons for the discrepancy are worth exploring further.

There is another notable instance of the economic costs arising from the failure of the market to reflect the fundamental values of underlying assets. Many European countries started to auction off licences for the third generation (3G) mobile phones in 2000, beginning with the UK in February/March of 2000. The 3G auction in the UK led to a fiercely contested bidding contest, netting the UK Treasury a *per capita* revenue of 650 euros. Subsequent auctions in other European countries yielded less, sometimes dramatically less (Table 1).

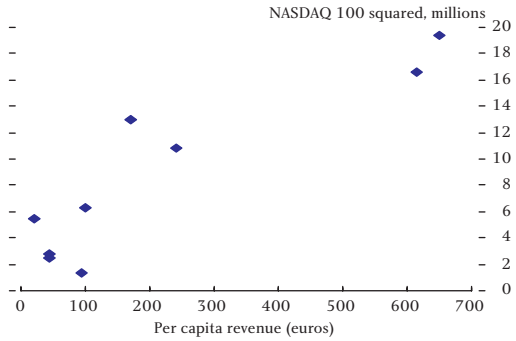
Table 1:
***Per capita* revenue (euro), and concluding month of auction**

Country	*Per capita* revenue	Clearing month of auction
UK	650	March 2000
Netherlands	170	July 2000
Germany	615	August 2000
Italy	240	October 2000
Austria	100	November 2000
Switzerland	20	December 2000
Belgium	45	March 2001
Greece	45	July 2001
Denmark	95	September 2001

Source: Klemperer (2002).

Authors such as Klemperer (2002) have emphasised the importance of the auction design in explaining the differences in revenues raised. To some extent, however, the variation in the revenues also reflected the prevailing euphoria and perceived spending power as reflected in the equity index for high-tech stocks at the time of the respective auctions. Consider the following scatter plot between the *per capita* revenue raised and the squared value of the Nasdaq 100 index at the close of the month in which the auction took place (Chart 2). The squared value of the index is intended as a proxy for the non-linear nature of any euphoria, or the perceived ability to pay, that rely on excess value above some basic threshold. The correlation coefficient has value over 90%.

Chart 2:
Relationship between revenue per capita for 3G mobile phone licences and the square of the Nasdaq 100



Sources: Klemperer (2001) and Bloomberg.

The reasons underlying this relationship are worth exploring further. For a telecoms firm contemplating a bidding strategy in a forthcoming auction, the first question to ask would be how much the licences were worth, and how much funding can be raised to finance the bidding strategy, at what cost. Net present value calculations can be made based on projections of revenue growth and the choice of a suitable discount rate. However, the margin of error in such calculations would be large for projects that pay off such a long time in the future. They are typical 'long duration' projects that are extremely sensitive to the discount rate and growth rate of revenue. However, by embracing the principle that market prices reveal relevant information, clues for the appropriate numerical values for such variables could be obtained from market prices themselves. What better way, then, to infer the value of such licences than by looking at the market price as expressed in the share prices of the high-tech sector itself? Provided that prices were faithful reflections of the underlying values, the logic of the reasoning cannot be faulted. But the key premise that

the price reflected the underlying value may be the weak link in this chain of reasoning.

The direction of causation between optimistic projections of revenue from a project and the high market valuation of the project is almost certainly more complex than in the simple account suggested above. Strong projections of revenue may influence market value, as well as the market value itself influencing methods for calculating future revenues. The popularity of course options on valuation in business school finance programmes in the late-1990s reflects the latter.

Additional insights on the consequences of signals generated by market prices for real economic decisions such as investment can be gained by examining an estimate for the cost of equity. At its simplest, the cost of equity can be regarded as the internal rate of return for an equity-funded project – that is, the discount rate that would set the present value of the dividend stream equal to the market price of equity. Following this definition, the cost of equity can be written as

$$\text{cost of equity} = g + \frac{d}{p}(1 + g)$$

where g is the real growth rate of dividends, d is current dividends and p is the share price.[8] The following chart plots the cost of equity for the UK assuming a real growth rate of dividends of 2.5% – roughly the long-run growth rate of the UK.

Chart 3:
Cost of equity

Sources: Thomson Financial Datastream, Bloomberg and Bank calculations.

The cost of equity fluctuated between 5% and 8% in the last two decades, but dipped below 5% in the late 1990s and 2000. Present value calculations of long-duration investment projects are sensitive to small changes in the discount rate. The information conveyed by market prices affects the cost of equity, and hence real economic decisions.

The central bank's whistle-blowing role need not be confined to cases where it has received privileged information concerning a distressed party. There may be cases where the dynamics of asset prices may be distorted by short-term incentives or other impediments to the workings of an effcient market, and where private sector agents' incentives do not allow them to correct the misalignments by means of the workings of the market mechanism. Should the central bank blow the whistle in this instance? Finding the right time to blow the whistle can be almost impossible. Blow it too soon, and the central bank is accused of venturing into judgement too quickly when the uncertainties are too large to allow such presumptions. Blow it too late, and the central bank is accused of failing in its duties, and allowing imbalances to develop. However, when market prices give conflicting signals of the underlying fundamentals, such discrepancies may be highlighted by the central bank for consideration and digestion by the market. The design of the central bank's communication strategy is, thus, of critical importance given its authoritative role in marshalling debate.

In the context of banking regulation, Crockett (2001) argues that there are four prerequisites for market discipline to be effective. The market must have sufficient information; the ability to process it; the right incentives to process it; and the mechanism to exercise effective discipline. In the wider context that we have in mind, one could add to this list the condition that the market information must derive from actors whose motivation is closely tied to the underlying problem at hand.

Some concluding remarks

Calls for transparency in economic life are increasingly commonplace. In this paper we have attempted to highlight how greater disclosure influences financial stability through its effects on the incentives of market participants and their ability to co-ordinate their actions in the financial system. Although transparency is a powerful tool for limiting the moral hazard of investors and governments alike,

8: The market price p is construed to be the present value of the dividend stream, so that $p = d\,(1 + g)/(r + g)$, where r is the cost of equity.

it can be a two-edged sword. The efficacy of communication depends on the institutional framework, the decision horizon and expectations of key players, and the constraints that these can place on policy-maker flexibility. From the viewpoint of the central bank, it suggests that while the platform for the dissemination of information must be coherent and open, disclosures themselves may need to be selective. The benefits of reducing moral hazard *ex ante* need to be weighed against the risks of generating real hazards *ex post*. Our analysis suggests three broad implications for central bank communication related to its financial stability remit:

- First, *ex-ante* communication about the general intention of policy is a powerful tool, which allows the public to scrutinise the actions of the central bank. But this discipline is sensitive to the format of the disclosures. In general, it is not possible to express policy intentions fully and fragmented communication can exacerbate co-ordination problems in financial markets, resulting in over-reaction to public information.

- Second, the release of specific information (for example, about firms and financial entities), can mitigate moral hazard and promote market discipline. Such discretionary disclosures, however, also risk exacerbating co-ordination failures in asset markets and can have damaging consequences for the real economy. The sensitivity of market expectations suggests that policy-makers may need to be selective about disclosures of this kind.

- Third, disclosure policies aimed at the private sector that rely on the price mechanism to mitigate socially inefficient activities are sensitive to the decision horizons of market participants. In circumstances where the dynamics of asset prices impede the workings of an efficient market, a role for central bank communication in correcting 'horizon mismatches' cannot be ruled out.

References

ALLEN, F., MORRIS, S., and SHIN, H., 2003. *Beauty contests, bubbles and iterated expectation in asset markets*, mimeo. London School of Economics.

AMATO, J., MORRIS, S., and SHIN, H., 2002. Communication and monetary policy. *Oxford Review of Economic Policy*, 18, pages 495–503.

BANNERJEE, A., 1992. A simple model of herd behaviour, *Quarterly Journal of Economics*, 107, pages 797–818.

BAUMANN, U., and NIER, E., 2003. Market discipline, disclosure, and moral hazard in banking, *Bank of England Working Paper* (forthcoming).

BIKCHANDANI, S., HIRSHLEIFER, D., and WELCH, I., 1992. A theory of fads, fashion, custom and cultural change as informational cascades, *Journal of Political Economy*, 100, pages 992–1026.

CHORTEREAS, G., STASAVAGE, D., and STERNE, G., 2001. Does it pay to be transparent? International evidence from central bank forecasts, *Bank of England Working Paper* 143.

CROCKETT, A., 2001. Market discipline and financial stability, *Financial Stability Review*, 10, June.

FAUST, J., and SVENSSON, L., 2001. Transparency and credibility: monetary policy with unobservable goals, *International Economic Review*, 42, pages 369–397.

GEORGE, E., 1994. The pursuit of financial stability, *Bank of England Quarterly Bulletin*, February, pages 6–66.

GERAATS, P., 2002. Central bank transparency, *Economic Journal*, 112, pages F532–565.

INTERNATIONAL MONETARY FUND, 1999. IMF-supported programs in Indonesia, Korea and Thailand: a preliminary assessment, *IMF Occasional Paper*. Washington DC.

JENSEN, H., 2002. Optimal degrees of transparency in monetary policymaking, *Scandinavian Journal of Economics*, 104, pages 399–422.

KLEMPERER, P., 2002. How (not) to run auctions: the European 3G telecom auctions, *European Economic Review*, 46, pages 829–845.

MORRIS, S., and SHIN, H., 2002. Social value of public information, *American Economic Review*, 52, pages 1521–1534.

SVENSSON, L., 2002. Monetary policy and real stabilization. *Rethinking stabilization policy, a symposium sponsored by the Federal Reserve Bank of Kansas City*. Jackson Hole.

VICKERS, J., 1998. Inflation targeting in practice: the UK experience, *Bank of England Quarterly Bulletin*, 38, pages 368–375.

WOODFORD, M., 2002. Imperfect common knowledge and the effects of monetary policy, Aghion, P., et al, eds., 2002. *Knowledge, information, and expectations in modern macroeconomics: in honor of Edmund S. Phelps*, Princeton N.J. Princeton University Press.