

ARTICLES

BANK MARKET DISCIPLINE

This article reviews the conceptual issues surrounding market discipline for banks and describes to what extent market discipline could complement supervisory activities. The potential of market discipline has been explicitly recognised in the New Basel Accord. In addition to capital requirements (Pillar I) and supervisory review (Pillar II), the Accord provides for a greater role of financial markets in complementing traditional supervisory activities by asking banks for increased transparency with regard to their operations (Pillar III). This article puts Pillar III in the broader context of direct and indirect market discipline. It is argued that both direct and indirect market discipline should be enhanced by the transparency requirements of the New Capital Accord, but that other conditions may also need to be met in order for market discipline to become more effective. Nevertheless, the article also shows that aggregated market prices can play a useful role in monitoring banking sector stability.

I INTRODUCTION

In June 2004, the revised framework for capital measurement and capital standards, commonly known as Basel II, was published by the Basel Committee on Banking Supervision (BCBS).¹ The new regulatory framework comprises three components or “pillars”, namely minimum capital requirements (Pillar I), the supervisory review process (Pillar II) and market discipline (Pillar III). By providing a comprehensive and risk-sensitive approach, Basel II is intended to alleviate the shortcomings of the current framework for capital requirements, which dates back to the 1988 Accord. In the new regulatory framework, Pillar III aims to complement minimum capital requirements and the supervisory review process. In particular, it would support the development of market discipline by introducing high-quality disclosure standards, enabling market participants to better assess banks’ risk profiles, risk management and capital strength.

The requirements of Pillar III of Basel II have to be viewed against the backdrop of the substantial changes under way in the financial system. Banks’ operations have increasingly become more complex and sophisticated.² Today banks have considerable exposure to financial markets and are increasingly active in markets for sophisticated financial products such as derivatives. These products are used to hedge existing risks on banks’ balance sheets or to take on new risks. For instance, the growth of credit derivatives and the increasing use of

securitisation have had a profound impact on the structure of banks’ risk profiles. In addition, large banks tend to operate internationally, in some cases with a majority of their operations taking place outside their home country. In the context of the euro area, the introduction of the common currency has provided additional momentum for the development of cross-border banking groups. Finally, consolidation in the banking sector has also had a sizeable impact on the structure and risk dynamics of the banking system as a whole. All of these changes have resulted in greater interest among bank supervisors and central banks in the availability and quality of market signals on banks’ current and prospective financial conditions and risks.

The way in which balance sheets and profit and loss totals of large and complex banking organisations are currently disclosed may provide an incomplete and insufficiently detailed picture for market participants to be able to fully evaluate the quality of a particular bank. Additional data may be needed on the composition of banks’ credit exposures and capital; off-balance sheet activities and the associated risks; and exposures to liquidity,

1 “International Convergence of Capital Measurement and Capital Standards: A Revised Framework”, Basel Committee on Banking Supervision, 2004. For a more detailed discussion of the Basel II framework, see the article entitled “The new Basel Capital Accord: main features and implications” in the January 2005 issue of the ECB’s Monthly Bulletin.

2 For more details see “Financial Stability Review”, ECB, December 2004, and “Report on EU banking structure”, ECB, November 2004.

operational and market risk. This has been acknowledged in Pillar III of the New Basel Accord, which provides for such information to be made available to the market (Box 1).

The ECB takes an active interest in the stability of the financial system and, hence, in the potential contribution of market discipline in this regard. The ECB, together with the ESCB's Banking Supervision Committee

(BSC), regularly monitors risks to financial stability on an area-wide basis in order to identify potential threats to financial stability and to assess the financial system's ability to absorb adverse shocks. The monitoring combines other, more traditional data sources with market information on the stability of the financial system, in order to provide a comprehensive picture of the EU financial system. For instance, the ECB's recent

Box 1

BASEL II AND MARKET DISCIPLINE

Under Pillar III of Basel II, banks will be required to publish detailed information for the top consolidated level of the banking group. Both qualitative and quantitative information will have to be disclosed. In the BCBS's view, disclosure should be consistent with how a bank's management analyses, assesses and administers the bank's risks internally. At present, the implementation of the more advanced methods of the Basel II framework is planned for the end of 2007.

The information to be released focuses on describing the key parameters of a bank's business profile, its risk exposure and risk management. Hence it is planned to make available information on the structure and adequacy of capital, such as details on Tier I capital. In relation to capital adequacy, it is envisaged that credit, market and operational risk will be addressed separately. For the disclosure of credit risk, it is planned to publish data on the portfolio structure, the major types of credit exposure, their geographical and sectoral distribution and details on impaired loans. In addition, information on credit risk mitigation techniques and asset securitisation will be provided to market participants and other analysts. Banks will be required to outline some details on their use of Internal Ratings Based (IRB) approaches, which represent a major component of the new framework. For market risk, banks will be required to summarise the key details of their internal models and to describe the use of stress testing and back testing. Finally, the framework requires banks to disclose details on their approach to operational risk (Basic Indicator, Standardised or Advanced Measurement Approach) and that data on the interest rate risk in the banking book also be published.

The new capital framework will be introduced into EU legislation via the amendment of two existing Directives: the Codified Banking Directive (2000/12/EC) and the Capital Adequacy Directive (93/6/EEC). Pillar III rules at the EU level are in general consistent with the Basel II framework. However, there are some differences, concerning terminology, a few definitions and the frequency of disclosure. For example, the Basel document foresees information disclosure on a *semi-annual* basis, although there will be some exemptions, such as the *annual* disclosure of risk management objectives and policies. Furthermore, information on Tier 1 and total capital adequacy, as well as rapid changes of risk exposures, should be disclosed on a *quarterly* basis. In contrast, according to the draft EU Directive, there will be an *annual* disclosure requirement for all items. However, credit institutions themselves would be free to publish some or all of the required items at a higher frequency.

Financial Stability Review³ uses aggregated market prices of large banks to analyse the stability of the banking system as a whole, complementing other information on banking sector and financial stability.

The interest in market information and market discipline is based on the inherent ability of markets to process information and aggregate this information very rapidly into market prices. It is important to distinguish between two related variants of market discipline.⁴ First, the increased cost of raising new debt or equity in the primary capital markets could exert *direct* market discipline on banks. Depositors, debt and equity holders may impose constraints on a bank's ability to grow without first reducing their exposure to risks or improving their risk management. This could occur through higher financing costs, quantity constraints on the availability of new finance, covenants on bond contracts, or through direct influence on the bank's operations (e.g. in the context of shareholder meetings). Second, the prices of banks' outstanding securities could provide an indication of banks' financial conditions to supervisors, rating agencies and central banks. The monitoring and potential corrective actions in response to adverse signals, especially by supervisors, are referred to as *indirect* market discipline. In particular, supervisors may use signals from secondary markets as screening devices or inputs into early warning models geared towards identifying those banks which need to be more closely examined. In addition, central banks can use market signals to complement their monitoring of the financial system as a whole.

2 DIRECT MARKET DISCIPLINE

Direct market discipline refers to the influence by depositors, debt or equity holders on banks' behaviour. *Equity holders*, as the owners of a bank, can exercise market discipline in an immediate way, as they have the right to replace management. Hence, in theory, if equity holders disagree with the decisions of

the current management concerning a bank's risk profile, they have the right to replace the management. Nevertheless, equity holders have not been considered particularly strong candidates for providing market discipline in banking, because in many circumstances and in particular when the value of their stake in the bank is low, they have an interest in the bank taking on more risk rather than less.⁵ Hence, precisely when – in the view of supervisors – a bank is most in need of market discipline equity holders have strong incentives not to provide it.

Depositors, if they are covered by deposit insurance, have no incentive to monitor banks because their funds are not at risk. Even if they are uninsured, it is frequently argued that they may not be able or have the incentive to exercise discipline effectively. Depositors are thought to consist of individuals (small savers, rather than institutions) who may have neither the expertise nor the time to regularly evaluate a bank's performance. Furthermore, if there are many depositors, each with relatively small deposits, the so-called "free-rider" problem may arise. The "free-rider" problem suggests that, as the monitoring of a bank is a "public" good in the sense that all depositors benefit, each individual depositor may rely on others to do so, resulting in no or too little monitoring of a bank.

Subordinated debt holders, given their subordinated status relative to other bank creditors, such as senior debt holders and depositors, should have particularly strong incentives to monitor a bank's risk-taking. Given that they do not benefit from upside

3 "Financial Stability Review", ECB, December 2004.

4 This terminology was first proposed by the Board of Governors of the Federal Reserve System in "Using subordinated debt as an instrument of market discipline", Staff Study 172, December 1999.

5 Equity holders are entitled to the residual claim on the bank, i.e. after all other claimants, such as depositors, senior debt holders and subordinated debt holders have been satisfied. Once the value of equity in a bank approaches zero, equity holders benefit from higher risk-taking by the bank, because they only receive the upside gain but do not have to bear the downside.

gains in an unlimited way, subordinated debt holders can be expected to naturally be concerned about limiting risk-taking. However, it has also been recognised that the actual power of subordinated debt holders over a bank's management may, in practice, be limited. Hence, some observers have suggested that banks be required to issue short-term subordinated debt frequently (more than four times a year). They have also proposed specific features to strengthen the effectiveness of the discipline arising from subordinated debt holders. These include put options, where subordinated debt holders have the right to demand early repayment of their claims, and the convertibility of subordinated debt into equity. Most recently, caps on the spread over government bonds on primary issues have been proposed in order to impose funding constraints on banks that are perceived to be highly risky.⁶ A serious concern with these proposals is not that market discipline does not work, but that it may work disruptively. If investors are unable to fully distinguish between "good" and "bad" banks, herding behaviour may result in an excessive and non-discriminatory reaction by markets to bad news. Even banks which are initially sound

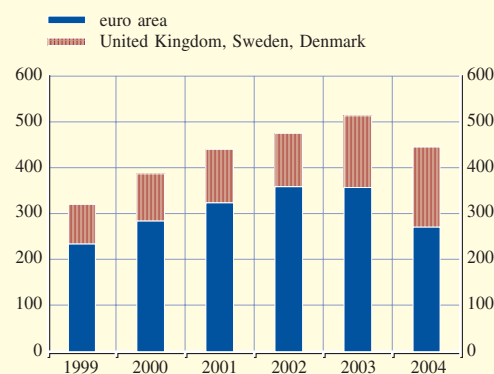
could then be subjected to high interest rates on their liabilities or even be excluded from the market.

Currently, none of the major industrialised countries has a subordinated debt requirement in place. Nevertheless, subordinated debt issues are widespread in the EU and have been increasing over time (Charts 1 and 2). The number and volume of issues increased substantially from 320 issues valued at €56 billion in 1999 to more than 500 issues valued at €70 billion in 2003. Data for the period from January to October suggest that these trends have continued in 2004. Charts 1 and 2 also show that issues in the euro area tend to be somewhat smaller than those in non-euro area EU countries (especially the United Kingdom). Subordinated debt is generally issued by very large banks. Hence, despite their relatively low number, banks issuing subordinated debt tend to represent more than 50% of the total assets in the banking system in all EU countries.

⁶ Mandatory subordinated debt requirements were advocated, inter alia, by the European Shadow Financial Regulatory Committee (Statement No. 7, February 2000, and, more recently, Statement No. 19, October 2004, p. 3).

Chart 1 Number of subordinated debt issues in the EU

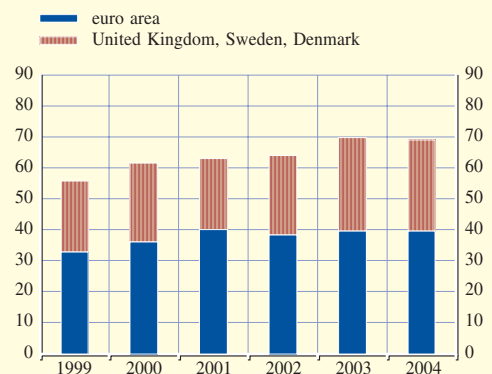
(1999-2004)



Sources: Bondware and ECB calculations.
Notes: Includes large public and private placements only. May not include some very small private placements in some countries. Placements by banking and financial services as classified by Bondware. For 2004, data refer to the period up to October.

Chart 2 Value of subordinated debt issues in the EU

(EUR billions; 1999-2004)



Sources: Bondware and ECB calculations.
Notes: Includes large public and private placements only. May not include some very small private placements in some countries. Placements by banking and financial services as classified by Bondware. For 2004, data refer to the period up to October.

The increase in the number of issues has resulted in a corresponding increase in the amount of subordinated debt outstanding. The total amount outstanding in the EU countries examined in a recent Basel Committee Working Paper⁷ increased by 70% between 1997 and 2001 (the latest figures available). This suggests that subordinated debt markets have most probably become deeper and more active. It also suggests that exposure to potential direct market discipline of banks may have increased. Data for the largest banks suggest that the share of subordinated debt in total assets is now above 2% on average; subordinated debt has become an important source of funding for these banks.

A precondition for direct market discipline to be operational is that market participants in fact monitor the riskiness of banks. This can be examined by analysing whether market prices reflect contemporaneous risk-taking by banks. The evidence in the case of subordinated debt spreads is mixed. While there tends to be a relatively tight relationship between ratings agency assessments of banks and their subordinated debt spreads, there is little relationship between publicly available accounting data and spreads.⁸ The correlation of spreads and ratings may have strengthened over time in the EU, possibly in part due to the increase in the size of the market following the introduction of the common currency, which has resulted in more liquid and deeper markets for subordinated debt, especially in smaller euro area countries.

All available empirical evidence suggests that equity prices react to changes in issuer ratings of leading international ratings agencies.⁹ However, the reason for the ratings change matters. Ratings downgrades, which were caused by an increase in risk (i.e. a perceived change in the standard deviation of expected earnings), have led to an increase in stock prices, while downgrades due to a deterioration of earnings potential (i.e. a change in the average expectation of earnings) have resulted in a decline in stock prices.

It is very difficult to verify empirically whether banks actually change their behaviour in response to adverse signals or pressure from the market. For example, when banks react immediately to a deterioration in spreads, then spreads recover quickly and their movements cannot be identified in the data available. However, the fact that market indicators do seem to be able to predict bank fragility to some extent (see the next section) implies that banks tend to react only imperfectly to a deterioration in market prices.

3 INDIRECT MARKET DISCIPLINE

At first glance, it seems that indirect market discipline is less ambitious than direct market discipline. As already discussed above, indirect market discipline refers to the idea of supervisors (or other players, such as rating agencies) using market prices to complement accounting and other information to identify weak banks or weaknesses in the banking system as a whole. However, as in the case of direct market discipline, proper incentives to monitor banks' risk-taking by market participants are necessary. For this to be the case, investors' money must be at stake. Secondary markets for the securities from which the information is to be obtained, i.e. for bank subordinated debt or equity, must also be liquid and deep. Furthermore, some comparability of market prices across banks is needed, which suggests that banks should issue sufficiently standardised securities, as for example in the context of benchmark issuance programmes.

Even if these conditions are satisfied, further challenges arise in relation to the supervisory

7 The data are from "Markets for Bank Subordinated Debt and Equity in Basel Committee Member Countries", Basel Committee on Banking Supervision, Working Paper No. 12, August 2003. The paper includes Belgium, France, Germany, the Netherlands, Spain, Sweden and the United Kingdom.

8 For a summary of the evidence in the EU, the United States and other countries, see C. Borio et al., eds., "Market Discipline across Countries and Industries", MIT Press, 2004.

9 "Market Discipline across Countries and Industries", op. cit.

use of market prices. First, even if market prices do indeed accurately reflect the probability that a bank will default, they will only reflect the anticipated, private (to the investor) costs of default, and not the social cost, which, *inter alia*, would include the costs arising from disruptions to the financial system. Market participants lack incentives to adopt a systemic view of the risk that a bank may default and may therefore be willing to accept more risk-taking than a supervisor. Second, in an ideal, frictionless world the probabilities of default extracted from bond and equity prices for the same issuer would be identical. However, default probabilities extracted from bond and equity prices are often far from perfectly correlated, even the probabilities of default implied by prices of bonds issued by the same bank may be different. Third, several factors other than default probabilities affect bond market spreads, including taxes, liquidity premia and varying investor appetite for risk-taking.¹⁰

Although in the case of equity prices the link between fundamentals and returns tends to be more stable, it has already been pointed out that equity holders' incentives are only poorly aligned with the interests of supervisors, because in many circumstances equity holders prefer more volatile rather than less volatile assets. However, this drawback in terms of equity prices can be improved by adjusting raw equity returns for changes in leverage and asset volatility. The best known examples of such measures, which have been used frequently in financial stability monitoring, are the expected default frequency and the distance to default.¹¹ The distance to default, for example, measures the number of standard deviations away from the default point, where the latter is the point at which assets are just equal to liabilities (i.e. equity is zero).

Functioning indirect market discipline would require the public issuance of subordinated debt (rather than private placement). In 1999 there were 296 public placements of subordinated debt in the EU, valued at just

under €50 billion. This increased to 441 issues, valued at €69 billion, in 2003. In the first ten months of 2004 alone, there were 419 issues, valued at €69 billion. The latest data on the frequency of issues for the largest banks is only available for 2001 and show that, on average, large EU banks issue subordinated debt about twice a year. In contrast to the frequency of subordinated debt issues, equity issuance is neither a common nor a regular occurrence for major banking organisations in Europe or elsewhere.¹² However, there seems to be considerable potential for equity markets to provide indirect market discipline in the sense that these markets are deep and liquid. And even though the number of banks listed at major stock exchanges is small in Europe, these banks tend to be very large. The share of listed banks for which equity signals would be available represent around 50% of the total assets of the banking system in most EU countries.

If market prices of a bank's liabilities were to predict its fragility and, in particular, if they added information to traditional supervisory data, such as accounting data, these prices may be of use to supervisors, for example in terms of identifying banks requiring closer attention. The predictive properties of two indicators have been examined: subordinated debt spreads and the distance to default.

Empirically, the predictive ability of both subordinated debt spreads and the distance to default is quite poor and tends to be inferior to the predictive ability of simple models using accounting information. The disadvantage of subordinated debt spreads is that a measurable reaction to a bank's deteriorating conditions is only detectable very close to the default point, rather than well in advance, as would be desirable from a supervisory perspective. The

¹⁰ For a discussion of the determinants of corporate bond spreads, see, for example, J. Amato and E. Remolona, "The credit spread puzzle", BIS Quarterly Review, December 2003, pp. 51-63.

¹¹ See, for example, "Financial Stability Review", ECB, December 2004.

¹² "Markets for Bank Subordinated Debt and Equity in Basel Committee Member Countries"; *op.cit.*

distance to default is more useful in this regard, as it tends to suggest a weakness well in advance of any serious problems. Unfortunately, the distance to default is relatively volatile for each individual bank, which implies that only when signals persist over some period of time does it have predictive value. However, when using market indicators to predict fragility in individual banks, there is some improvement at the margin: in a model which combines market indicators with accounting information, fewer sound banks are misclassified as weak.¹³

For the ECB, the most promising use of market indicators may not be so much the monitoring of individual bank fragility as the monitoring of banking system fragility. The ECB takes a macroprudential approach to financial stability and is therefore concerned with the stability of the financial system as a whole. Taking a macroprudential view has two important implications. First, it suggests that by judging the impact of distress in an individual institution, systemic implications are the primary concern. And second, the correlations

in risk exposures across institutions assume critical importance. If many banks are exposed to the same sector or risk, they may encounter difficulties at the same time, with potential adverse consequences for the system as a whole.

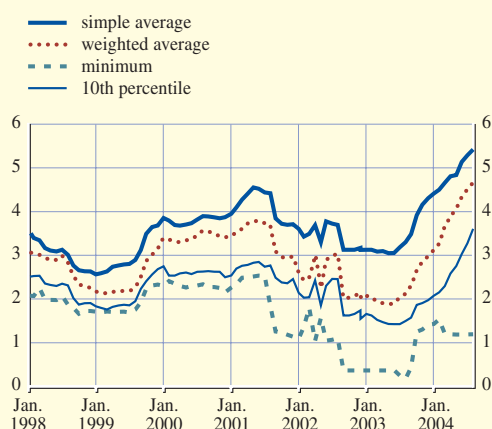
In the context of financial stability monitoring at the ECB, it was found that aggregate measures of the distance to default may be particularly useful.¹⁴ Given the previous discussion, for market indicators to be useful as indicators of financial fragility they should satisfy at least three properties. First, they should reflect the main sources of risk appropriately, namely they should indicate higher risk if the bank's asset value declines, if the bank's asset volatility increases and if the bank's leverage increases. Second, the indicator should yield easily interpretable

¹³ See "Market Discipline across Countries and Industries", op. cit.

¹⁴ For conceptual details and further information concerning its calculation, see "Modelling Risk", KVM Corporation, San Francisco, 2003. See also Financial Stability Review, ECB, December 2004, for an application.

Chart 3 Distance-to-default indicators for 37 large euro area banks

(Jan. 1998 - Sep. 2004)

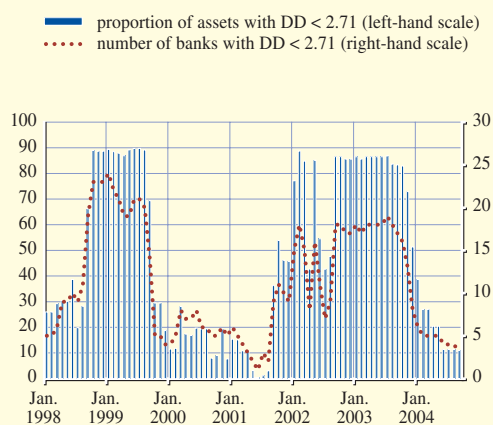


Sources: Thomson Financial Datastream, Bankscope and ECB calculations.

Note: An increase in the distance to default reflects an improving assessment.

Chart 4 Threshold indicators based on distance to default (DD) for 37 large euro area banks

(Jan. 1998 - Sep. 2004)



Sources: Thomson Financial Datastream, Bankscope and ECB calculations.

Notes: The threshold used of $DD < 2.71$ corresponds to the threshold between investment-grade and speculative-grade credit quality used by rating agencies (i.e. an implied probability of default in a year of higher than 0.65).

signals with a high signal-to-noise ratio.¹⁵ Third, given that the objective is to measure systemic risk, the indicator should largely reflect the risk of the system as a whole, rather than that of an individual bank. While subordinated debt spreads satisfy the first condition, their signal-to-noise ratio tends to be low, especially further away from default. Also, when checking the performance of spreads against well-identified historical episodes of financial instability (the Asian crisis in 1997/98 or Russia's default on its obligations in 1998), spreads tend to provide a lagging signal, rather than indicate higher risk in advance.

The distance to default satisfies all three conditions. More specifically, while the signal-to-noise ratio can also be fairly low for an individual bank, aggregated distances to default, when assessed against historical episodes of financial instability, tend to give easily identifiable signals well in advance. Charts 3 and 4 show two different ways to aggregate the distances to default of individual banks into banking system stability indicators. In Chart 3, simple and asset-weighted averages of the distance to default for the 37 largest banks in the EU are reported. The Chart shows a decline between early 2001 and the summer of 2003, which corresponds to deteriorating financial stability. Since then the distance to default has increased, implying a substantial improvement in the stability of the banking system. By September 2004, the average values of this indicator had risen to levels not seen since early 1998. In addition, the distance to default of the weakest bank and the average for the weakest 10% of banks had also improved from the low points reached in early 2003. The asset-weighted distance to default can be a more useful indicator than the simple average, as the former places a greater weight on larger banks, which are potentially more important from a systemic stability perspective. Comparing the simple with the weighted average distance to default, it appears that the stability of large banks, while continuing to be assessed as somewhat weaker than average, has

particularly improved as the gap between the two measures has narrowed.

Even more informative from a macroprudential monitoring perspective may be the threshold indicator reported in Chart 4. The threshold indicator reports the proportion of banks (in numbers or in terms of their share of assets) that are below investment grade at a given point in time, suggesting that the market has at least some reservations about their quality. After fairly high levels of this indicator in 1999 and again in 2002/2003, it has recently fallen substantially, both in terms of assets and in terms of the number of banks. All in all, the development of these market indicators of banking system risk suggest that after a period of some strain in 1999 and 2003, the EU banking system has returned to a situation of relatively low risk of systemic fragility.

4 CONCLUSIONS

This article has outlined some of the theoretical arguments in favour and against the likely effectiveness of market discipline and has referred to the evidence available about its current effectiveness. The resulting conclusions suggest that direct market discipline may be far from operational. At present, market participants most likely neither have the tools nor the incentive to limit risk-taking by banks to a socially optimal level. Even indirect market discipline may – at present – be limited to the largest institutions. At the same time, given these institutions' complexity, the extent of their off-balance sheet operations and their international orientation, it is precisely in these banks that the traditional tools used by supervisors may be most effectively complemented by market discipline. In addition, aggregated market prices can play a useful role as a tool for the macroprudential monitoring of the banking

¹⁵ Any indicator will be measured with some imprecision or error. The more precise the indicator, the higher its signal-to-noise ratio.

system as a whole, rather than individual banks.

One of the crucial preconditions for market discipline to become more operational is that market participants need to have sufficient information about banks. This has been recognised in the New Basel Accord, where disclosure requirements (Pillar III) have been placed alongside minimum capital requirements (Pillar I) and supervisory review (Pillar II). The faithful implementation of the stringent disclosure requirements of Pillar III will be of great use for market participants to improve their ability to monitor increasingly complex financial institutions and potentially deliver useful market signals to supervisors.

All in all, the institutional structure, especially with regard to the rules governing the procedures for dealing with bank fragility, must be conducive to market discipline. Deposit insurance should be limited to small depositors and some creditors of the bank (uninsured depositors, subordinated debt holders) must be credibly left out of the safety net and expect to lose their money in case the bank fails. If market participants widely expect to be bailed out with government funds should a bank run into serious difficulties, their incentive to monitor the behaviour of the bank will be severely impaired. It is possible that in the case of the creditors of very large, systemically important banks, such a commitment by the authorities not to bail out may not be fully credible in the eyes of at least some market participants, resulting in a reduction in the quality of the indicators.

This article suggests that there may be some value in supervisors incorporating market prices into early warning models. In particular, the combination of equity-based measures, such as the distance to default, with subordinated debt spreads and accounting data, seems to have some potential. Market indicators have three important advantages over accounting data: they represent the views of a large number of market participants

condensed into one convenient price; they are inherently forward-looking; and they are available at a relatively high frequency. Bearing these advantages in mind, this article has provided a long list of arguments as to why the risk of obtaining an inaccurate signal cannot be discounted. This underlines the need to rely on multiple indicators and sources of information when attempting to come to a sensible assessment of the stability of financial institutions.

The usefulness of aggregating market indicators into measures of systemic risk in the banking sector has been recognised in the ECB, and these indicators have become part of the ECB's tool kit for financial stability monitoring.¹⁶ They tend to provide an insightful perspective which is complementary to other indicators and serve to further cross-check the ECB's view on financial stability.

¹⁶ "Financial Stability Review", ECB, December 2004.