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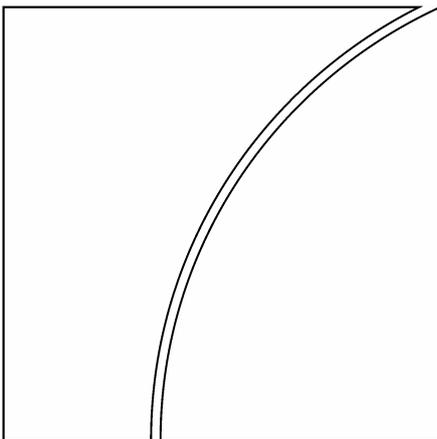
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Accounting, prudential regulation and financial stability: elements of a synthesis

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Abstract

What information about the financial condition of firms is conducive to efficient and stable operation of the financial system and of the economy more broadly? In this essay, we outline the contours of an ideal set of such information, identify existing gaps and propose a way forward to fill them. We argue that an ideal set should comprise two dimensions. As regards financial characteristics, it should cover three different types, viz: estimates of the current financial condition (“first-moment information”); estimates of risk profiles (“risk information”); and measures of the uncertainty surrounding both kinds of estimate (“measurement error information”). As regards the object of the analysis, it should cover information about both the individual firm (“micro information”) and, suitably aggregated, the “system” as a whole (“macro information”). So far, efforts have mainly focused on micro information and, within it, on estimates of the current financial condition; by contrast, risk information has drawn attention only more recently and measurement error information has been largely neglected. We also note that, as regards micro information, significant differences in perspective between accounting standard setters and prudential supervisors have come to light. We examine the reasons for these differences and propose ways in which they could be reconciled. We propose a strategy based on two principles: first, in the long term, the “decoupling” of the objective of accurate financial reporting about the firm from that of instilling the desired degree of prudence in its behaviour; and second, a “parallel” process towards that objective so that at all points the prudential authorities can neutralise any undesirable implications for financial stability of changes in financial reporting standards. We stress that close cooperation between accounting standard setters and supervisory authorities is called for both in developing the final set of information and in implementing it.

Keywords: financial reporting, accounting, disclosure, risk management, prudential regulation, financial stability, information

JEL Classification Numbers: D80, G00, G28, G38, M41

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“Reported earnings follow the rules and principles of accounting. The results do not always create measures consistent with underlying economics. However, corporate management’s performance is generally measured by accounting income, not underlying economics. Risk management strategies are therefore directed at accounting rather than economic performance.”

Enron’s internal risk management manual

Introduction¹

In recent years, both market participants and policymakers have paid increasing attention to the production and dissemination of information, seen as a key factor allowing the financial system to guide resources to the most productive uses and to allocate and manage risk. The rapid growth of the financial sector, its greater sophistication and its global character have fuelled this interest. Moreover, a number of financial crises and, more recently, episodes of corporate malfeasance have highlighted some dysfunctional aspects of information provision and processing. As a result, several initiatives have been put in place to meet the corresponding demand for more and better information. In addition to efforts to improve macroeconomic information, an important strategy has been to strengthen the information available about individual firms. One salient initiative in this area comprises the efforts to develop harmonised International Financial Reporting Standards (IFRS) led by the accounting profession (Tweedie (2002) and (2004a) and Volcker (2004)). Another relates to similar steps to upgrade disclosure standards about the risk profile of regulated financial institutions spearheaded by prudential authorities, notably by the Basel Committee, such as in the context of the new capital adequacy framework (Basel II) (BCBS (1999), (2000) and (2004a)).

This process has brought to the fore significant differences in perspective between accountants and prudential supervisors concerning the information to be sought, not least as the potential implications for financial stability of accounting standards have become apparent.² One such illustration is the debate surrounding the merits of some of the fair value accounting elements in the IFRS — a debate that, to be sure, has also revealed significant differences of view among the various providers and users of the corresponding information (eg JWG (2000), BCBS (2001a) and G30 (2003)).

In this essay, we examine the reasons for these differences of view and propose ways in which they could be reconciled. We do so within a broader framework aimed at identifying the type of information conducive to the proper functioning of the financial system in general and the pursuit of financial stability in particular. Our starting point is information at the micro level, taking the *individual firm* as the unit of analysis. But we also build on it to provide more encompassing information sets. We ask three questions. What are the existing information gaps? Why do they exist and to what extent do they reflect differences in standard setters’ perspectives? How can they best be filled and these differences reconciled? We reach four broad conclusions.

First, information about any firm — be it a financial or non-financial firm³ — should concern three characteristics, namely: estimates of its current financial condition and profitability; estimates of its risk profile; and a measure of the uncertainty surrounding those two types of estimate. This “micro” information should be complemented with equivalent “macro” information, where the object of the analysis is not the firm itself but the economy as a whole, and the financial system in particular. We conjecture that micro information, suitably aggregated, can help to provide such a macro picture.

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² For a discussion of the structural changes in the financial environment bringing accounting and prudential standard setters into closer contact, see Borio (2005).

³ Clearly, financial risk information, in particular, is quantitatively more important for financial firms. While our analysis is quite general, as regards implementation we would expect materiality thresholds to apply throughout.

Second, the information currently available is quite uneven. It is considerably greater for the micro type than for its macro counterpart. And within each of these two types, it is most advanced for the current financial condition and profitability aspects, less developed for risk profiles and least developed for measures of the uncertainty that surrounds estimates of the these two sets of attributes. Conceptual and practical work is needed to fill the corresponding gaps.

Third, accountants and prudential regulators give different weight to the different kinds of information. Accountants have traditionally focused on information about the financial condition and performance of firms while prudential regulators have naturally paid more attention to their risk profile. Oddly, both appear to have paid far less attention to the uncertainty that surrounds those estimates. Moreover, to the extent that prudential regulators see themselves as responsible for financial stability — together with the central banks that share similar responsibilities — they should also have a strong interest in “macro-type” information. However, the prudential authorities’ traditional focus on the safety and soundness of individual institutions (“microprudential” perspective) has until recently provided little impetus to the development of macro information. Over the last few years, the increasing attention being paid to a system-wide (“macroprudential”) perspective in pursuing financial stability has been removing an important obstacle to the development of that information. This shift should be encouraged.

Finally, since the various types of information are complementary, it should be possible to overcome differences in perspective while at the same time not compromising the achievement of the objectives that each standard-setting authority is pursuing. This is an especially important issue in the case of micro information. To accomplish the reconciliation of different perspectives in this area, we suggest a broad strategy, based on two principles, concerning the ultimate goal and the transition towards it, respectively. As regards the ultimate, **long-term goal**, it would seem appropriate to “**decouple**” the objective of providing public information about the characteristics of the firm from that of instilling the desired degree of prudence in its behaviour. In other words, rather than creating prudential cushions for regulated financial institutions through deliberately conservative measures of assets and liabilities through primary financial statements, a better strategy would be to instil the required degree of prudence through the calibration of prudential instruments based on unbiased valuations. As regards the **transition** to this long-term goal, it is essential that progress be made in parallel. A “**parallel transition**” means that *at all points in time* the prudential authorities should be in a position to offset any undesirable implications for financial stability of changes in financial reporting standards. This broad strategy calls for close cooperation between prudential authorities and financial reporting standard setters, both in the achievement of the final goal and during the transition towards it.

The structure of the essay is the following. In Section I, we provide a taxonomy of the information conducive to the proper performance of the financial system in general and to financial stability in particular. In Section II, we use that taxonomy to identify existing information gaps and speculate about the reasons for their existence. In the same section, we also explore the reasons for the differences in perspective between accounting and prudential authorities, outlining the debate about the desirability of “conservative” and “prudent” accounting — a debate that, to be sure, has been just as prominent within the accounting profession itself. In Section III, we explore ways in which the gaps can be filled and, in the process, the different perspectives of accounting and prudential authorities reconciled. In the conclusion, we highlight a few key points and areas that require further conceptual work.

I. The ideal information set: a taxonomy

Our initial question is deceptively straightforward: what type of financial reporting information about individual firms is most conducive to the efficient functioning of the financial system? Whether we think of the financial system as allocating resources or risks, we would argue that the key information set can be classified in two dimensions. The first dimension describes the **financial characteristic** of interest; the second the **object of the analysis** or the degree of aggregation of that information.

As regards financial characteristics, we distinguish three types: measures of financial condition and profitability; measures of risk profiles; and measures of the uncertainty or margin of error attaching to

Table 1
The ideal information set matrix

Financial characteristic	Object of the analysis	
	Micro (firm-level)	Macro (sectoral/economy-wide level)
First-moment	Profitability, balance sheet valuations and cash flows	
	eg: - income statement - balance sheet statement - cash flow statement	eg: - sectoral profit and loss accounts and balance sheets - flow of funds statistics - monetary and credit aggregates
Risk	Measures of statistical variation in first-moment information	
	eg: - firm-level earnings-at-risk and value-at-risk - firm-level portfolio stress tests	eg: - sectoral earnings-at-risk and value-at-risk - macro stress tests
Measurement error	Measures of the uncertainty surrounding first-moment and risk information	
	eg: - sensitivity analysis of firm level reports to parameter values - comparison of outcomes with previous estimates at firm level	eg: - sectoral sensitivity analysis - sectoral-level comparisons of outcomes with previous estimates

the estimates of the first two characteristics.⁴ Henceforth, for reasons that will become clearer later, we refer to these three types as information about first moments, about risks and about measurement error, respectively. As regards the object of the analysis, the key distinction is between the individual firm itself and the economy as a whole. We refer to these two categories as “micro” and “macro” information, respectively. All in all, this yields a three-by-two matrix (Table 1). To clarify and make these concepts more concrete, it is simplest to consider the micro information first, as it is the most familiar (see also Annex I). This will then allow us to identify its macro counterpart more easily.

Financial reporting: micro information

Micro **first-moment information** is by far the type of information with the longest tradition in accounting; it is, in fact, the type with which accounting has often been identified. It relates to the income statement, the balance sheet (financial position) and cash flows. Much of this information is of a backward-looking or contemporaneous nature, to the extent that it is supposed to reflect the result of “past transactions and events”. However, whenever the estimate of certain items is based on expectations about the future, it can easily include forward-looking elements too. For instance, this is true whenever the value of an item is based on some estimate of future cash flows, and the earnings figure is seen as the period-to-period change in those estimates. Certain varieties of forward-looking loan provisioning immediately spring to mind as an example. More generally, this forward-looking element is intrinsic to fair value accounting. It is implicit to the extent that market values embody such expectations: in this case, the objective result of a past transaction (the market price) “telescopes” into the present views about the future. It is explicit whenever “models” are used to derive fair values.

Micro **risk information** is fundamentally forward-looking. Future profits, cash flows and valuations are intrinsically uncertain. Risk information is designed to capture the prospective range of outcomes or statistical dispersion for the variables of interest. More specifically, to the extent that the behaviour of these variables can be represented by probability distributions, ideally risk information would provide

⁴ See Crockett (2002a) for a first articulation of this tripartite classification. The main difference is that we distinguish two quite different sources of measurement error, viz model error and reporting bias. Our classification is also similar to, but not quite the same as, that suggested by Barth (2004). She distinguishes between inherent volatility (included in our risk information), estimation error (akin to our measurement error information, except that she focuses only on the error attached to first-moment information) and artificial volatility (discussed in the last section of this paper).

the best estimate of the corresponding (unconditional) probability distributions. Obvious examples of this type of information include value-at-risk or cash-flow-at-risk statistics. But one may also wish to include in this category information that is not so easily captured by probability measures, such as the outcome of stress tests.

Micro **measurement error information** is a form of meta-information. It designates the margin of error or uncertainty that surrounds the measurement of the variables of interest. This arises whenever these variables have to be estimated. It would, for instance, be zero for first-moment information concerning items that were valued at observable market prices and for which a liquid market existed. But it would be positive if, say, such items were marked to model and illiquid, since a number of assumptions would need to be made to arrive at such estimates.

The margin of error, in turn, can derive from two sources. There may be intrinsic uncertainty about the measure, arising from imperfect “modelling” of the variable – what one may call “**model error**”. Or whoever is the source of the information may intentionally misreport it, giving rise to what one may call “**reporting bias error**”. Returning to the previous examples, instances of the former include the margin of error associated with predictions about future cash flows used to calculate the current value of a loan (first-moment information) or the parameters used in calculating VaRs (risk information; eg Jorion (1996) and Christoffersen and Gonçalves (2005)). Instances of the latter include the uncertainty surrounding the reporting of a profit or VaR figure over which the reporting entity has some discretion and stands to gain from not revealing what it regards as the truth. For instance, profit figures could be purposefully inflated if the compensation of the manager is tied to short-term share performance, as painfully revealed in the aftermath of the recent equity market bust.⁵ Similarly, the management of a bank might be tempted to underestimate its VaR measure if by so doing it could reduce its regulatory capital.

There are several ways in which measurement error can be made explicit. Ideally, *model error* could be portrayed by having the reporting entity supply a confidence interval around the point estimates together with ex post information about how previous such estimates compared with subsequent realisations. This information could allow verification of the validity of the point estimates given the corresponding range. An obvious example is ex post information on the number of outliers in VaR estimates.⁶ Falling short of an ex ante range, information about the sensitivity of the estimates to a variety of alternative assumptions would also be helpful (eg the choice of model parameters). By its very nature, *reporting bias error* is harder to make explicit. To varying degrees, the types of ex ante and ex post information applicable to model error could help, although they would not necessarily be able to distinguish between the two sources of measurement error. More indirectly, supplying information that could aid to better understand the incentive to misreport might be useful. Disclosures concerning conflicts of interest are a case in point (eg Crockett et al (2004)). Otherwise, the risk of misreporting can be limited through the stringency of the standards of verifiability, which can be tightened whenever the risk is seen as “too high” and ex post verifiability as “too low” (see below).

It is straightforward to see how the various types of micro information identified can help to promote the efficient operation of the financial system. First-moment information provides a useful input for assessing the current and **expected returns** from channelling resources into an enterprise. Risk information provides essential complementary elements to assess the enterprise’s riskiness, necessary to form a view about **risk-adjusted returns**. Think, for instance, of Sharpe ratios, commonly used to assess the performance of mutual funds (Sharpe (1966)). And measurement error information is a key additional input to assess the **uncertainty surrounding the judgment** reached about risk-adjusted performance. It could precisely help to dispel the misleading “aura of precision” (FASB (1978), page 12) that surrounds the other information provided.⁷ Moreover, since risk premia necessarily affect measures of current value, risk and measurement error information can be an

⁵ For an excellent discussion of the perverse incentives associated with equity market overvaluation, see Jensen (2004) and Jensen et al (2004).

⁶ Another example might be the so-called “subsequent cash flow test” envisaged by the UK accounting standards and applicable to the evaluation of impairment of goodwill.

⁷ The importance of this type of information has recently been stressed also by Bies (2005).

important input into the determinants of first-moment information too. All of these elements are critical for informed decisions.

Financial reporting: macro information

Micro information can be mapped one to one into equivalent macro information once we shift the focus of the analysis from the individual firm to the economy as a whole or subsectors thereof. Of particular interest to us here is the financial system, given our concern with financial stability. However, in order to consider the impact on the financial system, equivalent information about the non-financial sector is also important.

Macro **first-moment information** represents the bottom-up aggregation of first-moment information from the individual reporting units. It captures, for instance, the profitability, overall balance sheet and cash flow information for the corresponding sector, eg the banking or non-financial enterprise sector. Statistics of this sort are quite familiar. They are also the basis for specific subaggregates, such as those in monetary and credit statistics. Provided the underlying data are comparable, the only substantive issue of interpretation relates to the appropriate degree of aggregation and of consolidation.

Macro **risk information** describes the risk profile of whole sets of reporting units. An example might be a VaR for the corporate sector as a whole or for the banking sector. Constructing this information presents at least two challenges. First, typically it cannot simply be derived from the aggregation of its counterpart at the level of the firm (eg a combination of VaRs or probability distributions). The reason is that it requires information about correlations or statistical dependence between the original measures that would not come along with the individual firm measures.⁸ In other words, just as at the level of the firm what matters for its risk profile is the correlation between its various assets and liabilities, so at the level of a specific sector what matters is the correlation between the net asset values of the constituent firms. Shared exposures are of the essence. The raw material should include, at a minimum, the response of the variables of interest (values, cash flows or earnings) to specific risk factors, and hence requires knowledge of the underlying exposures. The aggregation of stress tests would be information of this type (eg CGFS (2000)). Second, mechanical aggregation is simply a first step. The reason is that, as the object of the analysis becomes more encompassing, the assumption that risk remains exogenous becomes less tenable. Ideally, the analysis would have to provide some estimate of the corresponding second-round or feedback effects associated with behavioural responses to the perceived risks.⁹ For instance, as the financial system becomes subject to strain following some unexpected change in asset prices and the real economy, retrenchment would in turn have a material effect on those variables and hence on risk.

Macro **measurement error information** would capture the measure of uncertainty surrounding the point estimates of the macro first-moment and risk information. Conceptually, the correlation of errors across individual firms is again important, regardless of whether the source is model error or reporting bias error. For instance, the use of similar models or similar incentives to misreport, related both to structural factors (eg shared corporate governance arrangements) and to economic conditions (eg a booming stock market) should naturally be expected to result in positively correlated errors. Just as at the micro level, both sensitivity analysis and comparisons of outcomes with original estimates can provide some guide to the size of the potential measurement error and hence to the reliability of the point estimates.

The value added of macro information is immediately apparent. Quite apart from the traditional first-moment information, risk information and measurement error information highlight the importance of embedded correlations across individual firms that would not emerge from individual firm disclosures or reports. Better knowledge of these shared exposures and correlations should help individual investors and markets form better judgments about the distinction between systematic and idiosyncratic risk in portfolios, and hence about their effective diversification. Moreover, it is precisely

⁸ See, for example, Artzner et al (1999) for a discussion on the additive properties of different risk measures.

⁹ Danielsson et al (2004) explore in a formal model the endogenous magnification of risk through the behaviour of market participants.

Table 2
The macro- and microprudential perspectives compared

	Macroprudential	Microprudential
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid output (GDP) costs	consumer (investor/depositor) protection
Model of risk	(in part) endogenous	exogenous
Correlations and common exposures across institutions	important	irrelevant
Calibration of prudential controls	in terms of system-wide distress; top-down	in terms of risks of individual institutions; bottom-up

Source: Borio (2003a).

the correlation of exposures between firms that ultimately determines the riskiness of the system as a whole.¹⁰

As defined, the micro/macro distinction is entirely analogous to the stylised difference between the microprudential and macroprudential perspectives in the pursuit of financial stability (Table 2), examined in some depth in previous work (Borio (2003a) and Tsatsaronis (2002)).¹¹ The microprudential dimension focuses on limiting financial distress at individual institutions, calibrates prudential instruments with respect to their individual risk profiles and hence ignores correlations in exposures across them. In addition, it treats risk as fundamentally exogenous. By contrast, its macroprudential counterpart focuses on limiting the risk of system-wide distress with potentially serious consequences for the real economy, calibrates prudential controls with respect to the risk profile of the system as a whole and hence pays close attention to correlations in exposures across individual financial institutions. Moreover, naturally, it treats risk as endogenous with respect to the collective behaviour of institutions. The microprudential perspective can best be rationalised in terms of depositor or investor protection, its macroprudential counterpart in terms of limiting systemic risk.

II. Existing gaps and different perspectives

Having identified the relevant information set, the obvious next two questions are: Are there gaps in the information currently available? And, if so, why do they exist? The available information is in fact quite uneven across categories. And the reasons for this involve a mixture of supply side and demand side factors. The factors include limitations of the existing measurement technology, inadequate market incentives to produce the information, and genuine disagreements over the information to be sought, largely arising from differences in perspective. In part, these disagreements are linked to the debate about the desirability of “conservatism” or “prudence” in accounting. We next explore the existing gaps and the reasons for them in turn.

Gaps in the information available

The information available follows a natural pattern in the two dimensions (Table 3). In terms of financial characteristics, first-moment information is the most developed type of information, risk information is comparatively less accessible and systematic, and information about measurement error

¹⁰ It might be tempting to argue that this information is unnecessary, because it can be gleaned from the correlation of market prices (eg equity returns). However, this begs the question of the raw-material information on which those prices are based in the first place. Poor financial reporting will undermine the usefulness of the information impounded in market prices.

¹¹ See Crockett (2001) for the first articulation of this distinction in these terms.

Table 3
Availability of information

Financial characteristic	Object of the analysis	
	Micro	Macro
First-moment	very high	high
Risk	medium	very low
Measurement error	low	almost non-existent

is the least well articulated. In terms of the object of analysis, micro information is far more plentiful than its macro counterpart.

By now, we have a full set of **micro first-moment information**, comprehensively articulated and codified through accounting standards. At a minimum, these standards define the various variables of interest and link them within a unified framework. The three basic statements (income, cash flow and balance sheet) make up its common core. This system has gradually grown since the birth of the accounting profession. To be sure, significant differences still exist across countries, reflecting variations in philosophical approaches, broader background institutional conditions, not least legal frameworks, and the inevitable path-dependence of historical evolution. We will return to this point below. But the question nowadays is not whether this information is useful, but rather how best to harmonise it across jurisdictions, strongly encouraged by the process of financial globalisation. This is the objective of the efforts under way to develop a set of internationally accepted financial reporting standards (Crockett (2002b), Volcker (2002) and Tweedie (2002) and (2004a)).

Micro risk information is of more recent vintage and has not developed as much. Admittedly, it has always been recognised that financial reporting should supply information that facilitates the assessment of the risks surrounding returns (eg FASB (1978)). Even so, it is only since the late 1980s-early 1990s that firms have started to disclose specific quantitative risk information about aspects of their financial activities. This development has largely been limited to financial firms, for which these risks may be more important, given the higher degree of leverage with which they operate. And the information generally relates only to subsets of their financial activities rather than to the firms as a whole, except in the case of very homogeneous businesses, such as some investment banks. Examples include value-at-risk measures for the trading portfolios of banks or securities firms (eg BCBS (1999) and (2003a)). When covering the exposure of the whole firm, the information typically applies to an individual risk category (eg interest rate risk) and is sometimes limited to the result of a specific exercise (eg the impact on the balance sheet of a given change in interest rates, as commonly done by insurance companies). There is, as of now, no encompassing coherent framework to calculate and present the information. Financial reporting standards devote comparatively little space to it (eg IAS 32, in IASB (2002)). The corresponding disclosures have been strongly encouraged by prudential authorities, which have taken the lead in this area.¹² They remain largely voluntary, being presented as standards of best practice (eg BCBS (2000)). Sometimes, however, they may be required in fulfilment of minimum qualifying criteria tied to complementary prudential requirements. This is the case, for instance, with certain credit risk exposures in the context of Basel II (BCBS (2003b)). Partly in the wake of these efforts, accounting standard setters have been paying more attention to risk disclosures too (IASB (2003a)).

Micro measurement error information is even less developed. Estimates of first-moment and risk information are generally provided by firms as if they had no uncertainty attached to them. The main exception to this common practice is that sometimes firms supply additional information about the assumptions that underlie the estimates, possibly accompanied by sensitivity analysis (eg for the calculation of pension liabilities or options used in compensation). Equally unsystematic is the presentation of a comparison of forecast outcomes with actual outturns. To our knowledge, this has largely been limited, and in a very uneven way, to VaR information, again with the encouragement of

¹² Several Basel Committee documents describe these efforts and the state of the art of disclosure in the banking sector, including BCBS (1999), (2000), (2001b) and (2003a).

supervisory authorities and central banks (CGFS (1994) and (2001b); BCBS (1999) and (2003a)). All in all, this is an odd state of affairs, given the importance of measurement error information.

Macro first-moment information abounds. Just like its micro counterpart, it has a long history, in this case closely tied to the development of the concept and practice of macroeconomics. Sectoral and aggregate income statements and balance sheets are commonplace, and cash flows (sources and uses of funds) are also sometimes available, as in flow of funds statistics. Admittedly, the information varies considerably across countries and sectors. It is generally less encompassing for emerging market economies. And it is more limited for the financial sector, mirroring to some extent a certain lack of transparency at the individual firm level too. For instance, information concerning loan loss provisions or the quality of the loan portfolio may not be available at all, or, if available, may span only a very short period or remain confidential. But the gaps have generally been clearly identified and have already become the object of national and international policy initiatives, such as in the context of the IMF's Special Data Dissemination Standard (SDDS) or its push for the construction of so-called macroprudential statistics (eg IMF (2002)).

In contrast, there is hardly any **macro risk or measurement error information** available. Efforts to develop it have so far been limited largely to public institutions in charge of assessing and promoting financial stability, not least central banks, and have taken place only over the last few years (Sorge (2004) and BIS (2005a)).¹³ Sometimes, the analysis is limited to prototype attempts to measure the mechanical knock-on effects within particular sectors resulting from interlinkages in exposures (eg Humphrey (1987), Angelini et al (1996) and Furfine (2003), for payment system exposures, and Upper and Worms (2004), for interbank exposures more generally). Sectoral VARs are in their infancy (eg Elsinger et al (2002)).¹⁴ Probably the most systematic effort has been made with respect to macro stress testing. While still at a rudimentary stage, macro stress tests are now routinely included in the Financial Sector Assessment Programs (FSAPs) carried out jointly by the IMF and the World Bank in cooperation with national authorities (eg Blaschke et al (2001) and Jones et al (2004)). FSAPs seek to develop a comprehensive view of the financial sector of individual countries and of its interaction with overall economic performance. None of these efforts, however, pays explicit attention to measurement error, except perhaps through robustness analysis.

The reasons for existing gaps

Why do these information gaps exist? We consider, in turn, limitations in know-how (or "information technology" broadly defined), limitations in the incentives to demand and supply the information, and differences of view concerning what the appropriate information should be, largely originating from differences in perspective.

Information technology limitations

The limitations in information technology that lie at the origin of the existing gaps have constrained both the elaboration of the corresponding concepts and their practical implementation. The elaboration of the concepts naturally reflects the speed at which our understanding of fundamental valuation and risk measurement proceeds. Moreover, because valuations in turn depend on risk assessments, ultimately risk measurement is fundamental. Their implementation is more closely associated with the actual cost of elaborating the information, as determined by the cost of computational capacity and of putting in place the necessary organisational processes.

Risk measurement technology has made enormous strides over the last 30 years or so. The ability to price options represented a major breakthrough (Black and Scholes (1973)), bringing within reach the possibility of pricing a seemingly boundless set of financial instruments. Starting with market risk, the technology of risk measurement was then extended to cover credit risk, liquidity risk and, most recently, operational risk too (eg CRMPG (1999)). The art of stress testing has made considerable

¹³ Sorge (2004), in particular, surveys theoretical and empirical developments in the measurement of system-wide financial vulnerabilities; BIS (2005a) provides a snapshot of current approaches in the central banking community.

¹⁴ Among private sector efforts, see, in particular, Gray et al (2003).

progress (eg CGFS (2000) and (2001a)). Hence the various tools already mentioned above, which provide the raw material for disclosures.

At the same time, the technology has not developed sufficiently to provide a coherent set of disclosures that could match the one already available for first-moment information. In particular, quite apart from the lack of consensus on the most appropriate methodologies, which hinders the feasibility of harmonised disclosures, there are still significant advances to be made in the aggregation of risks across apparently disparate categories, such as credit and liquidity risk. In some cases, traditional differences in the horizons over which risks are managed further complicate the picture. For example, at bottom, value-at-risk measures for trading portfolios are conceptually equivalent to asset-liability management measures of risk; they differ only in terms of the instruments included (a portfolio of tradable instruments versus a more encompassing combination of assets and liabilities), of the riskless benchmark assumed (cash versus the exogenously given risk profile of liabilities) and of the horizon employed (one day to a week versus longer). Moreover, by comparison with micro information, advances in the measurement of macro information are in their infancy (eg CGFS (2000), Sorge (2004) and BIS (2005a)).¹⁵ How best to address the interlinkages between firms, the nexus between the real economy and the financial system and, above all, the endogeneity of risk that reflects behavioural responses remains a serious analytical challenge.

Probably just as challenging is the application of conceptual breakthroughs to the day-to-day risk management of firms. First, the capital investments in the IT systems required to measure risk, and the associated human capital, can be costly. Second, the availability of the necessary data may be limited. In the case of credit risk, for example, it is surprising that banks have started to systematically collect information about default history only in recent years, not least under supervisory prodding as part of the revisions in capital adequacy requirements. Finally, adopting uniform risk management practices can be a daunting task in complex organisations straddling traditionally distinct business lines, such as banking and securities businesses or, even more so, insurance (Joint Forum (2001) and (2003)).

Incentives to demand and supply information

Limitations in incentive structures that can constrain the amount and quality of the information available operate through both the demand and the supply side. Of the two, those on the supply side are probably the most significant and hardest to address. The bottom line is that since information has a number of “public good” features, it will tend to be undersupplied in equilibrium.

One potential obstacle on the ***demand side*** is the ***absence of a natural constituency*** capable of eliciting the corresponding information. There is an element of catch-22 here. On the one hand, public disclosure of information is especially important for the functioning of open capital markets, where transactions are at arm’s length rather than being based on long-term relationships designed to keep information closely held between the providers and users of funds (Allen and Gale (2000)).¹⁶ On the other hand, well functioning capital markets tend to be atomistic, with highly dispersed investors, and hence to exacerbate the free-rider problems associated with coordinated action by economic agents; pressure comes mainly through the impact of individual actions on market prices (Box).¹⁷ This means

¹⁵ See also Goodhart (2004), who stresses the limitations of current frameworks for analysing system-wide financial stability in a rigorous way, and Goodhart et al (2004) for their attempt to overcome these limitations.

¹⁶ Allen and Gale (2000) discuss at length the complementary capacity of markets and intermediaries to deal with information. Institutions offer expertise and economies of scale in generating private information, which they can exploit for the benefit of their stakeholders. They are a superior arrangement when there is agreement over the information to be generated or when they can repackage the associated risks in forms that are attractive to their investors. Markets are more suitable when the benefits from giving expression to a diverse set of participants’ views override the possible dampening effect of free-rider problems on the quantity and quality of information supplied. Note that all this also implies that the optimum amount of publicly available information is by no means invariant to financial and corporate governance arrangements.

¹⁷ The revelation of any firm-specific information gathered by individual agents through the price mechanism can make it hard to profit from this information, in turn reducing the incentive to gather it in the first place. This argument is taken to its extreme logical conclusion by Grossman and Stiglitz (1980), who note the impossibility of informationally efficient markets when these can perfectly aggregate (and reveal) private information. For overviews of this literature, see Dye (2001) and Verrecchia (2001).

Disclosure, verifiability and truthful revelation

Under what conditions will economic agents be willing to reveal fully and truthfully the private information they have to outsiders? How can outsiders induce them to do so? This box explores these questions heuristically, so as to complement the briefer analysis in the main text. The idea is not to consider fully fledged models, but to provide a framework for thinking about these issues and hence to highlight the kind of factors that are relevant to providing answers.

Assume first that the information is fully verifiable ex post at no cost; then it will either be revealed or withheld, but obviously never misreported. Misreports would be immediately recognised. In this case, there is no credibility issue. The agents will reveal their private information as long as they stand to benefit, net, from doing so.

In this setting, under some restrictive conditions voluntary disclosure can be complete. For example, assume that (a) disclosure is costless; (b) outsiders cannot distinguish between agents with “good” and those with “bad” information (eg earnings results, projects); but (c) on balance, outsiders know the underlying distribution of the information available to insiders (eg how many agents have good/bad news to report and its value); (d) all this is common knowledge; and (e) insiders seek to obtain the best “price” for their information (eg have outsiders reward the company with the highest equity price/lowest cost of capital for a project). In this setting, the only thing outsiders do not know is who has good news and who has bad news to report. Then, information will be fully revealed. The reason is that outsiders will necessarily be pricing the information uniformly, so that those insiders with better than average news will be penalised. They will then have an incentive to reveal the information to obtain better pricing. Within the remaining set, price will again be uniform, so that the losers will in turn have an incentive to disclose. The logic ultimately implies that everyone will reveal the information. In other words, in equilibrium the asymmetric information will “unravel” (Grossman (1981) and Milgrom (1981)). Note also that the same thought process can be applied to a single agent that has different pieces of information to reveal. In this case, as long as outsiders charge an “uncertainty” premium for their limited information, the agent will have an incentive to reveal all the information, good and bad.

If any of the above assumptions is relaxed, then information revelation will be less than complete (Verrecchia (2001) and Dye (2001)). In particular, if disclosure has some private cost, agents will have an incentive to withhold at least part of it. Similarly, if outsiders are uncertain about whether costs of information disclosure do exist, are uncertain about the distribution or are unable to process it correctly, there may not be sufficient benefits to full disclosure. As a result, whenever the social net benefits exceed the private net benefits, there would be a case for mandatory disclosure. What opens the door for mandatory disclosure is that full disclosure would allow a better pricing of projects and hence channel resources towards more productive uses, while the costs of producing the corresponding information would remain, to a considerable extent, private.¹

When the information is not verifiable, or can be verified only at a cost, then the agents with private information will have an additional option, namely to provide biased information. As before, in general an incentive to do so will exist whenever they perceive the benefits to exceed the costs. Specifically, they will do so to the point where the marginal benefit equals the marginal cost. An incentive will exist whenever their interests are not fully aligned with those of the outsiders who use the information. Clearly, management has a natural incentive to claim that the performance of the firm is rosier than it is as long as their payoff is, directly or indirectly, linked to that performance. But the benefits and costs of doing so will depend very much on specific circumstances and the structure of their compensation.²

If outsiders knew for certain the benefit and cost schedules of insiders, if they had an influence on either, and if the benefits of enforcing truthful revelation to them exceeded the costs, then they could ensure truthful revelation.³ But, in general, this will not be possible. Verification is generally costly and outsiders only have a general idea about the insiders’ costs and benefits and about how they depend on circumstances.

What does this imply for the choice of the degree of verifiability of the information to be reported? First, *ceteris paribus*, whenever the incentives to misreport are greater, either the verifiability bar should be set higher or the efforts to verify the information should be greater. For example, once regulatory capital becomes tied to specific risk measures, the incentive to misreport would increase, in order to save on the private costs imposed by regulation. This means that, other things equal, the verifiability of the corresponding risk measure becomes more important. Second, if two measures were equally relevant, in the sense of being equally representative of the relevant piece of information (eg current profits), the most verifiable measure should be chosen for

1 Verrecchia (2001) provides a survey of the theoretical literature and of the case for mandatory disclosure.

2 Thus, within certain limits, this problem can be addressed through optimal contract design; see Lambert (2001) for a review of this literature.

3 These, for example, are the assumptions under which the precommitment approach to banking regulation would ensure that firms had incentives to reveal their risk levels correctly (Kupiec and O’ Brien (1997)).

reporting. However, it is not uncommon for a trade-off between relevance and verifiability to arise, especially with information that involves a forward-looking element, such as value or risk information. For instance, measuring loan provisions in a forward-looking way is superior to doing so on a more backward-looking basis in terms of relevance: having to wait for a clear credit event before provisions can be taken (eg default) would fail to take into account relevant information about the deterioration of loan quality before that event. At the same time, this forward-looking element raises the discretion over what can be reported and hence the potential for misreporting. Depending on the goal of the agent requiring the information, the bar may be set at a different level. For instance, securities regulators have traditionally attached greater importance to verifiability in loan provisioning, as they have been especially concerned with the potential for what they see as artificial profit smoothing and understatement of profits. By contrast, prudential regulators, being more concerned with understatement, have been more willing to allow such a forward-looking element.

that the effectiveness of the demand for information is handicapped from the outset. Either there is no demand for public information (in long-term relationship arrangements) or, if there is, the mechanisms to elicit it may not be very effective. This implies that the demand generally has to be channelled through bodies that, de facto, internalise the externalities faced by investors, rendering effective their latent call for high-quality and comparable information across firms. These bodies can do so by developing common standards and by enforcing them.

The strength of the constituencies varies across types of information in ways that can help to explain the patterns of availability actually observed. Consider, in turn, the distinction between macro and micro information and that between the different types of micro information.

Except perhaps for first-moment macro information, well developed in the context of traditional macroeconomic analysis, constituencies are weaker for macro than for micro information. Macro information concerning risk and measurement error seems deceptively of less immediate relevance. This is clearly true for investors, who focus on expected returns and actively seek to diversify risk primarily through granular portfolio configurations – although in the absence of information about shared exposures the basis for constructing those diversified portfolios may turn out to be less than fully adequate. It also partly reflects the fact that, traditionally, standard setters concerned with financial stability have tended to have a predominantly microprudential focus, paying particular attention to *individual* institutions in the identification of vulnerabilities and in the calibration of their policy tools (eg Borio (2003a)). The demand for macro risk information has begun to grow only recently, as financial instability has become a major policy concern, as the importance of its macro origins has been recognised, and as the macroprudential dimension in the pursuit of financial stability has been strengthened (eg White (2004) and BIS (2005b)).

At the micro level, the reasons for the emphasis on first-moment information are not hard to find either. This emphasis is consistent with the fact that, historically, shareholders have represented the lion's share of outside investors, with banks being by far the largest player in the creditors' community. Banks, after all, have their own sources of information, while equity investors focus on expected returns and upside potential. This configuration of claimants on firms may help to explain the focus on first-moment information by the accounting profession and securities regulators. It was only when prudential supervisors decided to enhance the market orientation of their approach and thus sought to enlist the market's disciplinary forces that a natural constituency for risk information emerged. This, however, has necessarily been limited to supervised firms.¹⁸ Looking forward, if sustained, the rapid growth of open market debt instruments could help to intensify this trend, by contributing to the development of a new constituency of private investors more concerned with downside risks (eg BIS (2001a), CGFS (2003) and (2005) and Amato and Gyntelberg (2005)).

On the **supply side**, in addition to the technical production costs of information already discussed, there are two potential obstacles to incentives to supply high-quality information. The first is represented by proprietary concerns; the second is the temptation to misreport information.

Proprietary concerns may be relatively more constraining in the financial sector than elsewhere. True, the success of *any* firm in profiting from its activities largely depends on its ability to capitalise on

¹⁸ To be sure, accounting conceptual frameworks do explicitly recognise risk information and measurement uncertainty (eg IASB (2002) and FASB (1980)) and these areas are regarded as very relevant (eg Schipper (2002), on measurement uncertainty). However, they receive far less attention than first-moment information.

proprietary information. Indeed, there is considerable theoretical (Verrecchia (2001) and Dye (2001)) and empirical literature documenting this aspect, with the empirical literature focusing mainly on disclosures of profits by business segment (Healy and Palepu (2001), Kothari (2001) and Birt et al (2003)). However, in the non-financial sector, accounting information is primarily a way of recording the degree of success or failure of an enterprise, while the task of protecting strategic competitive advantage is mainly left to product patents. In contrast, in the financial sector, the information provided could more easily risk giving away part of that advantage, since success or failure depends to a greater extent on the way in which *financial* information is processed. Under these circumstances, certain disclosures can be seen as revealing too much of a business strategy. In particular, this is perceived as an issue when the information is of a directional nature, making public directly or indirectly the underlying exposures of the firm – the raw material for macro risk information. For instance, indicating whether a firm is short or long in a specific asset class or the distribution and quality of its loan portfolio could provide valuable information to its competitors. It is no coincidence that, say, the disclosure of stress tests with respect to interest rate risk is more common among insurance companies than among those engaged in more active trading. Even when the information is purely non-directional, such as of the VaR variety, there has typically been considerable reluctance to provide it (BCBS (1999)). Not least, firms often seem to be concerned with first-move *disadvantages*, which points to the desirability of some mechanism to ensure coordinated disclosures. While, as argued below, such concerns can easily be exaggerated, they have been a significant obstacle to attempts to strengthen the information publicly available.

Whenever the interests of those obtaining funds and those providing them do not coincide, there is an incentive for the users of the funds to ***withhold or misreport information***, to the extent that by so doing they can further their own interests (Box). These incentives are well known, hence the development of many mechanisms that seek to limit their scope. The mechanisms include contracting provisions (eg covenants in debt instruments, specific compensation arrangements), and independent certification of the quality of the information provided, which is precisely the task of the auditors.¹⁹ The verifiability of the information is essential in this context (see below).

Different perspectives on the right information set

Regardless of their intrinsic validity, differences in perspective on what the right information set should be can result in gaps in the information supplied to the extent that they lead to disagreements over the standards to be put in place. It is therefore important to understand the nature of these disagreements. The main questions here concern micro information.²⁰

At the cost of some oversimplification, the main disagreements seem to revolve around three closely related issues. While sometimes conflated in the debate, for clarity it is best to think of them as distinct. The first issue is the disagreement over the proper objective of accounting standards per se. This is best encapsulated in the distinction between accounting seen as portraying an “unbiased” (sometimes referred to as “true and fair”) or, alternatively, a “conservative” view of the firm. The second issue is disagreement over what constitutes an “unbiased” view. The third is the tension between objectives of different authorities, in particular those of accounting standard setters, on the one hand, and those of prudential authorities, on the other.

What is the right objective for accounting? Unbiasedness versus conservatism

The debate over the proper ***objective of accounting*** is a long-standing one. While it may be natural to think that prudential authorities would be instinctively more inclined to favour some form of conservatism, given the premium they naturally assign to prudent assessments, differences of view have traditionally been very prominent also within the accounting profession.²¹ In fact, some form of

¹⁹ Of course, independent verification is also useful for spotting unintentional errors, but it acquires additional significance when the possibility of intentional misreporting exists.

²⁰ To be sure, issues may also arise with respect to macro information. For instance, confidentiality restrictions and differences in perspective on the value of information could result in restrictions on the transfer of information necessary to develop macro risk information.

²¹ We are interested here in normative, as opposed to positive, arguments for conservatism. There is in fact a considerable literature arguing that conservatism can arise in order to save on taxes, avoid litigation costs, or as a result of political

conservatism has been very common in accounting standards since their very inception. From Pacioli's day, accounting developed initially as a method for recording the flow of resources through the firm and their allocation, so as to prevent fraud; only subsequently did it evolve into a mechanism to measure profitability and value per se (eg Benston (1989) and FASB (1980)). And while the current IFRS under elaboration eschew the notion of conservatism,²² historically the principle has actually been enshrined in several national accounting standards, such as in Germany.²³

But what does a "conservative" view of the firm actually mean? Different interpretations of the term imply different justifications for conservatism.

One interpretation is that the accounts should *deliberately* seek to underestimate the value of the firm (and period-to-period profits). One such example is the principle of valuing assets at the minimum of their market or acquisition value, regardless of how marketable a particular asset is and hence of the availability of objective benchmarks with which to assess its value. Prudential authorities and debt holders, for instance, might conceivably find such accounting reassuring to the extent that it generates hidden cushions that the firm can draw upon in case of financial difficulties. After all, both constituencies focus on limiting downside risks, as the upside potential for them is limited.

Another, more subtle, interpretation is that conservatism arises *as a consequence* of tougher recognition standards for gains than for losses (Watts (2002) and (2003)). In turn, this asymmetry is rationalised mainly as a way of overcoming the tendency of firms to systematically misreport their financial results, by overstating profits and understating losses. Much as a deliberate attempt to underestimate value, this would over time give a higher degree of comfort to debt holders or supervisors, such as by limiting the risk of excessive dividend payments. Moreover, these types of valuation principles have been seen as providing a useful basis for various forms of contracting, such as debt covenants or types of executive compensation.²⁴

Neither of these justifications, however, appears fully satisfactory.

On the one hand, the deliberate attempt to underestimate value in order to establish hidden cushions begs the question of why cushions should be *hidden* in the first place. This would inevitably hinder the transparency of the condition of the firm and it could, paradoxically, make manipulation of the hidden cushions easier. Such a strategy would seem to be justified only as a second best solution to the problem, to the extent that it was not feasible to establish appropriate cushions in a transparent way. We argue below that establishing such cushions may indeed be feasible.

On the other hand, relying on asymmetrically stringent verifiability criteria for the recognition of gains and losses begs the question of why the *zero profit boundary* should be the relevant threshold. As described in the Box, the incentive to misreport depends on the perceived benefits and costs to the reporter, and there does not seem to be a strong argument to expect the corresponding marginal benefits and costs to meet at the zero profit point. Why should there not be a similar incentive to understate losses too? Presumably the size of the perceived penalty tends to increase with the size of the losses, especially if they approach critical values. More generally, are not firms penalised through

economy pressures on standard setters (eg Watts (2002) and (2003)). Our focus, by contrast, is on whether accounting standards *should* be conservative in order to perform their designated function effectively.

²² The IASB conceptual framework endorses conservatism only in the sense of caution or prudence in exercising judgments under conditions of uncertainty, and as long as this does not compromise the faithfulness with which the measures represent what they are intended to represent (IASB (2002)). While the language is not extremely precise, this seems to mean essentially that the degree of uncertainty in estimates should be explicitly recognised. For a discussion along very similar lines, see FASB (1980). Using our terminology, the accounts seek to provide an unbiased picture.

²³ For a very useful, although not up-to-date, discussion of differences in accounting standards across countries and the different degrees of conservatism, see Gray (1980).

²⁴ There is an extensive empirical literature, including cross-countries studies, on earnings conservatism, notably including Basu (1997), which is reviewed in Watts (2002); see also Pope and Walker (1999). However, earnings conservatism need not result in balance sheet conservatism if it only affects the *timing* of the recognition of gains and losses, with losses being recognised first. From our perspective, balance sheet conservatism, resulting from cumulative measurement biases, is more important. On the relationship between the two, see, for example, Pae et al (2004).

the performance of their share price whenever they fail to meet market projections as such (eg Skinner and Sloan (2002) and Graham et al (2004))?²⁵

In other words, while it makes sense to have tough verifiability criteria to limit mismeasurement, what seems to be far less clear is that this justifies a *systematically* tougher criterion for the recognition of gains than of losses, especially when the bar for verifiability is set at very different levels. One such example is valuing assets at the lower of market and book value. Such a procedure can be thought of as assuming that gains are verifiable, and hence can be recognised, only upon realisation whereas losses need not be realised for recognition (over the range for which market values fall below the acquisition cost). All this, of course, still leaves open the question of where exactly the verifiability bar for recognition should justifiably be set, an issue over which legitimate disagreements may arise.²⁶ Nor does it preclude the possibility of providing information based on complementary valuation principles, which can be of specific interest to different users of information (eg measures of going concern and liquidation value alongside each other). We return to these issues below.

What constitutes “true” value? Market versus other measures of value

Even if it is agreed that the objective of accounting is to provide an unbiased view of the value of the firm, subject to the appropriate verifiability criteria, legitimate differences of opinion can arise about **what constitutes “true” value**. This has been especially hotly debated with regard to the merits of market values. To simplify, those who argue that markets are “efficient” would also believe that they represent the best estimate of value. By contrast, those who argue that markets may, at least occasionally, be prone to misalignments would be reluctant to concede this point.²⁷ To them, “market value” may still be the best objective approximation to *realisable* value at a point in time for an asset for which a well developed and liquid market exists; but it may fail to reflect correctly the future cash flow stream arising from the asset.²⁸

There is no doubt that, as experience clearly indicates, markets are indeed vulnerable to occasional serious misalignments; the stock market boom of the 1990s is one of the most recent examples, as may well be the recent surge in house prices in many countries around the world (eg BIS (2005b)). Even so, *if* it is agreed that the objective of accounting is providing an unbiased view of the financial condition of the firm, it is, on balance, hard to object to the use of market values, *where available and reliable*, as a first, if highly imperfect, approximation. At least in the presence of well developed and liquid markets serving as benchmarks for the item concerned, it seems too much to ask of accounting to provide estimates of “true” value other than those provided by the market.²⁹ The scope for disagreement over other measures of true value is simply too great. And occasional misalignments cannot provide the basis for changing the onus of proof. In fact, this seems to be the prevailing view

²⁵ Moreover, it is well known that, because of tax provisions, in several circumstances there may be an incentive to overestimate, rather than underestimate, losses, precisely in order to reduce the tax burden. This has been a traditional concern, for instance, in the case of loan provisioning (see also below).

²⁶ It also leaves open the important question of what the appropriate “discount factor” should be, as a function of the uncertainty surrounding the estimates. From this perspective, accounting conservatism could *conceivably* be seen as a mechanism for applying discounts to uncertain information. In other words, if two items had the same estimated value (for given cash flows *and* risk profiles), but one was subject to a higher estimation error, then the one with the higher error would receive a larger discount. In this case, recognition rules could be seen as substituting for market-induced discounts, ie for the discounts that agents would apply if faced with such uncertainty. *If consistently and transparently applied*, however, this approach would not necessarily amount so much to “conservative” valuations as to a way of mimicking unbiased valuations that did take into account estimation error and hence applied a price discount given the corresponding uncertainty. Whether these valuations would be “conservative” or not would depend on the benchmark chosen. In any case, it hardly seems to be the case with prevailing arrangements, given their apparent ad hoc nature. Note that the adjustments could be made to the discount factor or to the value of the cash flows themselves, through some form of explicit margining. Transparency in any adjustments made is essential here. This is discussed further below and in Annex I in the context of the “decoupling” principle.

²⁷ See Kothari (2001) for a recent review of market efficiency from an accounting perspective.

²⁸ More generally, it is sometimes not sufficiently well appreciated that a sizeable part of the movement in asset prices appears to reflect not so much changes in expectations of future cash flows as changes in time-varying risk premia, whose origin is not well understood. The source of the change can have significant implications for the interpretation of the information content of market prices.

²⁹ This still leaves open the question of what the appropriate valuation methods should be when these conditions are not met, which is in turn closely tied to issues of reliability and verifiability, as discussed further below.

nowadays. The main disagreements arise where such clear and objective benchmarks for measurement are not obviously available (see below).

What tensions arise with the objectives of other authorities? The financial stability question

Even if one accepts the previous propositions, disagreement over appropriate accounting measures can still arise because the portrayal of the best (average) approximation to an unbiased view may generate **tension with the objectives of other standard-setting authorities**. For instance, it might be agreed that, for items for which liquid markets exist, fair value accounting is the most objective measure of realisable value. Nevertheless, this might be seen as generating excessive time variation in the recorded value of the firm from the perspective of financial stability, either at high frequencies (short-term volatility) or, arguably more importantly, at business cycle frequencies (“procyclicality”).³⁰ This can ultimately be traced back to some form of market failure, related to difficulties in measuring value/risks and in responding to them in a way that results in appropriate outcomes (eg Borio (2003a)).

One way of rephrasing this is that, given different objectives, prudential authorities might assign different weights to the Type I and Type II errors associated with the proposition that market values reflect true value. From a financial stability perspective, given that asset price misalignments can generate crashes that can in turn give rise to serious strains for financial institutions, valuation methods that apply them uncritically can be seen as potentially generating serious costs. While this may occur only occasionally, it is very much in the nature of those extreme outcomes that prudential authorities are seeking to avoid. Those who argue along these lines believe on balance that more “prudent” (conservative) valuation methods, as long as they are effective in identifying losses, may be more consistent with financial stability.

At the core of this tension is the *endogeneity* of value.³¹ In other words, the evolution of value/risks over time is not exogenous with respect to the way value/risks are perceived at any given point in time, as these perceptions influence behaviour and hence outcomes. And reactions to market values may, over time, generate undesirable variations that can result in financial instability (eg Borio (2003a) and Danielsson et al (2004)). For example, as asset prices rise, agents may be more inclined, and find it easier, to take more risks (increase leverage), as their perceived wealth increases and financing constraints are relaxed. This in turn tends to raise asset prices further.³² If this process goes too far, asset values and leverage are taken beyond sustainable levels, and the resulting overextension at some point has to be corrected, with the process going into reverse. Unless the system has built up sufficient cushions during the expansion phase, considerable financial strains and broader financial instability can emerge. It is in fact possible to trace patterns of this kind behind most of the episodes of serious financial stress, with respect to both banking crises and market distress. Examples of the former include many of the banking crises experienced in industrial and emerging market countries since the 1980s (eg Borio (2003a)); examples of the latter include episodes such as the stock market crash of 1987 and the market turbulence in autumn 1998 surrounding the demise of Long-Term Capital Management (eg Borio (2000) and (2003b) and CGFS (1999)).

This is a fully legitimate concern. But does it necessarily require forsaking the objective of providing measures of value that, on average, are the best approximations to underlying values? As elaborated in the next section, in our view this need not be the case.

³⁰ These issues have been examined quite extensively; on procyclicality, see, for example, Borio et al (2001), Borio and Lowe (2001) and references therein; on short-term volatility, see, for example, Jackson and Lodge (2000) and their bibliography. Jackson and Lodge also consider more broadly the debate over the suitability of fair value accounting.

³¹ To be more precise, what we have in mind is a kind of “Heisenberg uncertainty principle” applied to financial reporting, in the sense that the very act of measurement affects what is being measured. Different ways of measuring and reporting values will result in differences in behaviour that, *in the aggregate* (ie *in general equilibrium*), will inevitably affect the prices prevailing in the market and the economy. See, for instance, Cifuentes et al (2005) for a possible formalisation of this point. Whenever we think of approximation to “unbiased valuations”, we are taking those prices as given. In other words, these “unbiased valuations” may be thought of as the relevant ones *given (conditional on)* the value measurement/financial reporting regime in place. The general principle applies across regimes as well as over time within regimes, this latter point being the one stressed in the main text.

³² Moreover, since the incentives to withhold bad news/misreport are stronger when shares are overvalued, to the extent that this in turn can have a reinforcing effect on asset overvaluation, it can also give rise to perverse incentives and impacts on prices. The stock market boom of the late 1990s and the subsequent bust provide an obvious such example. On these perverse incentives, see D’Avolio et al (2001), Crockett et al (2004) and Jensen (2004)).

III. Filling the gaps: a way forward

Having identified the various information gaps and the factors behind them, it is now time to outline a strategy to fill them. Our intention here is not to be comprehensive. Nor do we wish to imply that these gaps could be filled any time soon. Far from it; doing so will be an evolutionary and gradual process. Rather, our goal is simply to highlight the broad contours of a roadmap and the general direction of desirable future efforts, many of which have been under way for a long time.

It is best to address the various obstacles to greater and better public information sequentially, in the same order in which they were raised. We thus next consider technological constraints, incentive limitations, and the frictions between different perspectives. We elaborate, in particular, on how to overcome differences in perspective, since how to address the other obstacles is better-trodden territory.

Overcoming measurement technology limitations

The constraints on measurement technology that limit the availability of information may at first sight appear entirely exogenous with respect to the range of options available to policymakers. In fact, this is by no means so. Policymakers can provide the right incentives to private sector participants to overcome the technological limitations. And, to some extent, they may also address these limitations directly, at least those concerning know-how.

The best way to **provide the right incentives** is to incorporate advances in risk and value measurement technologies into standards as soon as this is practical and to articulate those standards in such a way as to encourage the adoption of improvements in measurement technology. An obvious example of this approach is the one followed by the Basel Committee in its revision of the Capital Accord. Whatever the limitations of Basel II, arguably its most enduring and fundamental contribution to sound banking is precisely the distilling, spreading and hard-wiring of best practice across the industry, thereby also contributing to the consolidation of a credit culture. Providing incentives in the form of saving on regulatory capital for those banks able to adopt the better risk management technologies is a key element of that strategy. In turn, this can lay the basis for more ambitious disclosure standards by raising the bar for the industry as a whole.

At the same time, there are also areas where policymakers can **contribute directly to improvements in measurement technology**. The measurement of macro risk and of macro measurement error information is the best example. Central banks, in particular, seem best placed to make advances in this area, given their intimate knowledge of the macroeconomy and of financial markets as well as their natural tendency to think of the interaction between the financial and real sides of the economy. It is no coincidence that, as noted earlier, improvements in these measurement technologies have been made largely within the central banking community. There is clearly scope to intensify efforts in this field. Close cooperation with the prudential authorities is crucial. In those cases where central banks are not themselves in charge of supervision, access to the underlying data may require special arrangements, owing to their confidentiality. And there is little point in developing the relevant information unless it will be used purposefully, which requires a conscious understanding of its potential and a willingness to calibrate policy instruments based on it; most of the corresponding tools are in the hands of prudential authorities. Hence the importance of strengthening the macroprudential orientation of current regulatory and supervisory frameworks (eg Crockett (2001), Borio (2003a), White (2004) and BIS (2005b)). The shift in this direction that has been taking place in recent years should be encouraged.

Overcoming incentive limitations

Policymakers also have a range of options at their disposal to overcome some of the incentive obstacles that limit the availability and quality of firm-level information on both the demand and the supply side.

As regards the availability of information, what is required is a **full appreciation by policymakers of the market failures in the provision of information**, ie of the fact that if information is not spontaneously provided as an “equilibrium outcome” of market forces, this does not necessarily mean that it is not valuable (eg Verrecchia (2002)). For the reasons previously outlined, the presumption is that, on balance, market forces will tend to result in underprovision of information. This implies an

active role of policymakers in addressing coordination failures, as “delegated elicitors and coordinators of information”.

More concretely, this can be implemented in a number of ways. First, it implies a shift in the onus of proof about the type of information that should be made publicly available. Second, it calls for a determined use of instruments at policymakers’ disposal to provide incentives to supply information publicly, in terms of both carrots (eg lifting of other costly forms of intervention) and sticks, including mandatory requirements. For instance, basing disclosures on information actively used within the firm can help to reduce the cost of providing it. Similarly, the fact that, historically, the set of what has been regarded as private information has steadily been shrinking suggests that concerns over proprietary information can be exaggerated.³³ Finally, in cases where legitimate proprietary concerns do arise, the authorities can collect the information and release it in such a way as to protect its confidentiality. As noted, this is especially important in the field of macro information, and has been common practice for a long time. While no doubt significant improvements have been made in all of these dimensions in recent years, their scope has by no means been exhausted.

As regards the quality of information, there are three broad complementary options.

The first is to **strengthen verification efforts**. The authorities can make investments in verification technologies. This, for instance, is what prudential authorities have been doing in the context of the upgrading of supervisory frameworks, not least through investments in better qualified staff. In addition, the authorities can spend more effort in verifying compliance. One such example is the strengthening of Pillar 2 (supervisory review) and its link to Pillar 3 (market discipline, and hence disclosure) that has taken place in Basel II. Above all, however, more thinking should be devoted to disclosures that would, over time, allow a better assessment of the quality of the information provided. The most useful approach here is to compare outcomes with previous estimates. This has already been encouraged in the context of market risk and, in a more determined way, credit risk. But there is clearly scope to strengthen and systematise the approach. Similarly, as stressed in CGFS (1994) and (2001b), another underused approach is to provide information relating to the *period between reporting dates*, such as the range of values taken by the measure of interest over the period. This is especially important to avoid window-dressing in those cases where adjustments are relatively costless. Finally, whenever the powers to verify may not be sufficient, these can be enhanced.

The second option is to **improve incentives for those verifying the information**, wherever verification is not done by the authorities themselves. In principle, responsibility for verification lies with a wide set of market participants but, of course, the auditing profession is first in line. Examples falling under this category include the efforts made to limit conflicts of interest and strengthen legal liability in the auditing world following the corporate malfeasance exposed by the recent bust in equity markets. These steps involve difficult trade-offs, and achieving a balance between them may not be easy.

The third option is to **improve incentives for the truthful disclosure of information**. Some of the possibilities here are analogous to those applicable to the agents in charge of verifying the information (eg Volcker (2004)). Examples include the efforts to strengthen corporate governance arrangements, legal liability and other penalties for misreporting, such as those made in the context of the Sarbanes-Oxley Act in the United States and similar initiatives in Europe. As in the case of those steps taken to improve incentives to verify information, calibrating these instruments involves difficult trade-offs. Another, arguably underused, possibility is to tie the information provided more closely to that being actively used within the enterprise. For instance, according to the revised Basel II, one of the requirements for banks to qualify for the more advanced options for calculating minimum capital standards, which rely more on banks’ own inputs, is that those inputs/information be actively used in the day-to-day running of the firm. This clearly increases the cost of misreporting.

³³ For instance, information was initially limited to the balance sheet rather than earnings; and when earnings information became public, revenue information was originally regarded as proprietary.

Overcoming differences in perspective

How can the obstacles posed by different perspectives be overcome? We distinguish here between the long-term goal and the transition towards it. It is essential to keep the distinction between the two clearly in mind. We then outline some outstanding issues.

The long-term goal: decoupling?

In our view, ideally, an appropriate long-term goal would be to decouple two quite distinct objectives, namely providing unbiased public information about the characteristics of the firm, on the one hand, and instilling the desired degree of prudence in its behaviour, on the other.³⁴ That is, *subject to the necessary verifiability requirements*, the information provided would seek to supply an unbiased portrayal of the condition of the firm, while prudential instruments would be employed to exert the necessary discipline on behaviour. In particular, this would rule out seeking to instil prudence through deliberately conservative estimates of value and income in the primary financial statements; ideally, it would imply starting from a unique, common set of valuations. Importantly, however, as our analysis has stressed, that unbiased portrayal *should go well beyond first-moment information and extend to both risk and measurement error information*. And it should include information valuing the firm as a going concern as well as in liquidation. While some of the reasons for this are implicit in our previous analysis, it is worth bringing them together here.

First, relative to the alternative — namely including cushions in the valuations themselves through intentionally conservative estimates — this approach has the great **advantage of transparency**. Conservative estimates, regardless of the type of information to which they relate, make it hard for the user of the information to disentangle the cushions from the underlying condition of the firm, ultimately hindering the attainment of a clear and reliable picture.

Second, the enlarged set of information that includes also risk and measurement error in principle should **allow the prudential authorities to instil the desired degree of prudence** in the firms they supervise. They can do this by calibrating their instruments based on the enlarged information set. In Annex I, we illustrate this point in the context of alternative ways of valuing loans. But the approach is quite general.

Third, decoupling should **facilitate reaching agreement on a common set of information across different sectors**. The desired degree of prudence in the behaviour of different firms varies with the sector to which they belong, given differences in the perceived costs of imprudence and hence failure. It is generally higher in the financial sector, especially in banking, and considerably lower in the non-financial sector. By freeing the information tool, decoupling allows the two separate goals to be attained more easily, without suboptimal compromises. As Tinbergen noted in the past, two goals can be more easily attained with two independent instruments, each directed to one of the goals.

Fourth, decoupling should also **facilitate reaching agreement on a common set of information across countries**, notably on internationally agreed financial reporting standards. The reason is similar to the previous one. National financial reporting standards differ considerably in their degree of conservatism. Decoupling would thus contribute to convergence, as long as the legitimate degree of conservatism could be instilled through other instruments. And a common set of internationally agreed standards is a worthy objective in an increasingly globalised world, as demonstrated by the major efforts under way to make it a reality.

Finally, decoupling helps to reduce internal compliance costs for the firms providing the information, as its objective is to have as a *starting point* the same information system, to which prudential tools could then be applied. Such tools could also include application of different confidence levels or safety margins for the calculation of regulatory cushions (see also Annex I).

Is there a risk that, if decoupling was eventually achieved, the effectiveness of prudential policies could be diminished? The main objection to decoupling as a long-term goal is that the influence on behaviour may be stronger for information provided in the “financial statements” (essentially the income, cash flow and balance sheet accounts), ie for items that are “recognised”, than through

³⁴ On this proposal and other alternatives in the specific context of loan provisioning, see Borio and Lowe (2001).

supplementary disclosures. To the extent that the information relating to risk and measurement error is not in the financial statements, this may reduce the effectiveness of the offsetting action taken by supervisors through their instruments. Indeed, preparers of accounts and firms consider this distinction important. Think, for instance, of the recent debate in the United States over whether the cost of options should be mandatorily recognised in the income statement as opposed to allowing firms to decide whether simply to disclose it or recognise it, as at present (eg Aboody et al (2003) and Volcker (2003)). A number of related factors could explain the reasons for a differential impact on behaviour. Examples include the “seal of approval” regarding the quality and importance of the information associated with formal recognition, the use of financial statement information as a basis for contracting, such as for restrictions on dividend payments, taxes, and forms of compensation (eg Hughes and Levine (2003)), costs of processing information (Bloomfield (2002) and Barth et al (2003)), and other processing limitations and psychological biases, such as those leading agents to focus on “salient” items (Hirshleifer and Teoh (2002)).

This is a legitimate concern. At the same time, while it is hard to speculate on this question, we do not think that the effectiveness of prudential policies need be impaired. First, in contrast to the views expressed by preparers of accounts and firms, although a number of studies have indeed found evidence favouring a differential impact of the two components of information on behaviour, the admittedly limited formal empirical evidence is somewhat inconclusive.³⁵ Second, to the extent that this differential impact may now arise from a “seal of approval” or salience linked to the financial statements, these properties could be extended to at least segments of the additional disclosures. Indeed, as argued further below, over time it is possible to imagine a set of equivalent “recognised statements” for risk and, possibly even, measurement error information. Third, to the extent that the differential impact may arise from restrictions on behaviour tied to the financial statements, this could be addressed either by changing the relevant provisions or by appropriate offsetting action by prudential authorities. For instance, if the concern is that dividend payments are related to information in the financial statements, the prudential authorities could instil the desired degree of prudence through a corresponding adjustment in capital requirements. Finally, nothing constrains the range over which the prudential instruments can be set, as long as the prudential authorities are willing to adjust them.

In fact, it is even possible that the effectiveness of prudential policies could be strengthened. This is because the increased transparency about the firm, quite apart from potentially enhancing market discipline, could also facilitate a more timely adjustment in prudential instruments. This could be so either because the prudential authorities themselves could have a clearer understanding of the condition of the firm or because the increased transparency could reduce the incentive to forbear in cases of impending distress. As suggested by past experience, for political economy reasons the pressure to forbear can be quite strong; less transparency allows greater discretion in this regard. Just think of the experience with the savings and loan crisis of the 1980s in the United States.

The transition: coordinated progress

The transition to the long-term goal is at least as important as the goal itself. Initial conditions heavily influence the desirable adjustment path. Uneven progress towards the goal could easily undermine the achievement of its potential benefits, and, as a result, impede its achievement. In this context, we would like to highlight just two points.

The most important concern here is that ***progress should be made in parallel***. In particular, it is essential that *at all points in time* the prudential authorities be in a position to offset any undesirable implications for financial stability of changes in financial reporting standards. The use of so-called

³⁵ See, for instance, Graham et al (2004) for survey evidence on management’s strong focus on earnings numbers and Hutton (2004) for an argument that reconciles this potentially more discerning attitude by markets, despite management’s perceptions. Empirical exercises finding a material difference between recognition and disclosure, all from the United States, include Amir (1993) and, less clearly, Davis-Friday et al (2002), both on post-retirement benefits, Aboody (1997), on writedowns in the oil and gas industry, and Aboody et al (2003), on (voluntary recognition of) stock option compensation. Experimental studies are generally consistent with this (see Hirshleifer and Teoh (2002) for references).

“prudential filters”, for instance, can be particularly useful in this context.³⁶ Parallel progress will require close cooperation between accounting and prudential standard setters. While recent frictions around the implementation of international financial reporting standards have reflected a variety of factors, including, partly, a failure to agree on a common long-term goal, they have also probably resulted from the concern that prudential authorities would not have been in a position to take timely offsetting action.

The difficulties in proceeding in parallel put a premium on the need to avoid **introducing further artificial volatility in the accounts** as the process unfolds. The current mixed attribute system, combining very heterogeneous elements of fair value and historical cost, is facing serious strains (eg Large (2004)). Greater convergence, probably based on a more articulated use of forward-looking risk information, appears desirable (see below). At the same time, uneven progress towards any final framework, *whatever its specific characteristics might be*, could increase artificial volatility. This would clearly be deleterious not only because of its impact on the ability of supervisors to pursue their goals, but also because it could undermine the quality of the information supplied in the first place. An obvious case in point relates to the potential implications for the insurance industry of the shift to market valuations for the asset side of the balance sheets before a new standard for the valuation of liabilities is put in place (eg IAA (2003) and Tiner (2004)). But the issue of artificial volatility applies to banking too, as exemplified by the controversies over hedge accounting.

Selected outstanding issues

While the previous analysis outlines the broad contours of a roadmap for the way ahead, it also leaves open a number of issues. At least four of them deserve attention: the appropriate degree of verifiability; the appropriate degree of harmonisation of information across firms; the allocation of responsibilities across standard setters for information provision; and the limitations of disclosure.

Our discussion has left open what the **appropriate degree of verifiability** of the information is.³⁷ While it is possible to outline in theory the relevant considerations that should determine a decision, clearly disagreements over specific judgments are bound to arise in practice.³⁸ Because of the differences in objectives and perspective, accounting standard setters and prudential supervisors may be inclined to set the verifiability bar at different levels. In particular, in their judgment, supervisors might naturally tend to assign greater weight than accounting standard setters to encouraging *prudent* behaviour and *prudent* risk management. This is one reason for their insistence on tighter verifiability criteria and restrictions in IAS 39 on the use of the fair value option, on which agreement was finally reached in 2005 (eg IASB (2004b) and (2005), BCBS (2004e) and (2005) and Tweedie (2004b)). Among other things, supervisors were concerned that the room for manoeuvre could be exploited to inflate earnings artificially. It is also consistent with the prudential authorities' greater willingness to accept a lower tolerance threshold of verifiability for forward-looking provisioning, being prepared to allow the use of statistical estimates designed to calculate expected losses; by contrast, accounting standard setters and securities regulators have been more concerned with the risk of misreporting, including through what they see as “artificial profit smoothing” (Borio and Lowe (2001), Annex I, IAS 39 in IASB (2003b) and BCBS (2002)). Another possible example is the willingness of supervisors to allow the use of banks' statistical models to measure the “normal” maturity of demand deposits, which stands in sharp contrast with the accountant standard setters' preference to categorise them on a contractual basis, in the context of hedge accounting (IASB (2003c) and (2004c) and BCBS (2003c)). Using a contractual basis, in effect, can be thought of as assuming a “run” on the bank and is equivalent to considering the behaviour of these liabilities only under extreme stress. The legitimate concern of the supervisors is that this could hinder proper risk management; one of the concerns of

³⁶ An example of such a filter is the exclusion from the definition of regulatory capital of the gains in the value of equity resulting from the deterioration of the own credit quality of an institution, which tends to reduce the value of its debt traded in the markets (BCBS (2004c)); for other examples, see also BCBS (2004d).

³⁷ While not discussed explicitly in this paper, this issue is also quite relevant to the thorny question of the recognition of intangibles, which is another source of possible “conservatism” in the accounts. For a survey of the vast literature on intangibles, see Cañibano et al (2000); and for a fervent advocacy of their recognition, see Lev (2001).

³⁸ See, in particular, the discussion by Bies (2005), who highlights drawbacks in fair value accounting proposals from the perspective of the reliability of the estimates and associated verification difficulties.

accounting standard setters is that the assumptions made in the models may not be sufficiently verifiable and robust, increasing the scope for window-dressing.³⁹

Clearly, these differences of view will need to be reconciled. To some extent, they appear to stem not only from differences in objectives, but also from differences in conceptual approaches. In particular, accountants tend to consider only *individual* and *existing* contracts as the relevant unit of analysis, with the focus on existing contracts seen as deriving from the principle that the accounts should reflect only “past transactions and events”. This approach implies that statistical estimates of the likelihood of “renewal” or “rollover” in the stock of demand deposits should not enter the calculations, regardless of the degree of certainty attached to them.⁴⁰ This basic philosophy in turn seems to reflect, at least in part, the way the two professions have evolved. In particular, in contrast to their prudential counterparts, accounting standard setters appear to feel less at home when addressing risk management issues, given their historically strong focus on first-moment information.

If so, we would expect these differences to be purely transitional. First, as argued, risk management and valuation are bound to become increasingly intertwined, as risk measurement technology makes further advances (Knight (2005)).⁴¹ Indeed, in our view the progress made so far justifies a greater inclusion of well established risk modelling elements in valuations. Second, paying greater attention to risk information, as we propose, would necessarily lead to greater familiarity. Third, as with loan provisioning, this is an area where the requirement that the models used be closely integrated in the day-to-day risk management of the firm can helpfully limit the risk of misreporting and window-dressing. Finally, these differences of view are likely to be somewhat defused within the context of the roadmap outlined above, given the higher degree of comfort that it could provide to the various authorities.⁴²

Currently, the **degree of harmonisation** differs markedly between first-moment information and risk information, being much higher for the former. Inevitably, this reflects to a considerable extent the fact that measurement technology is not as well advanced for risk information. For much the same reasons, linking the disclosure of risk information to that actually used in the running of the firm favours tailored, as opposed to harmonised, information. Even so, comparability is a desirable quality of information. As advances in risk measurement technology proceed, paying greater attention to this goal than hitherto would seem appropriate (eg CGFS (2001b)). Just as for first-moment information, one could imagine in the long run a core set of common risk disclosures, without of course preventing firms from providing additional ones.⁴³

So far, a natural division of labour seems to have emerged in the **allocation of responsibilities for standard-setting** in information, with accounting and securities regulators largely focusing on first-moment information and prudential authorities de facto advancing disclosure practices concerning risk information in the regulated segment of the financial sector. At the same time, as the previous analysis

³⁹ Admittedly, this is a simplification of the various concerns. For a fuller discussion, see IASB (2003c) and (2004c).

⁴⁰ There is an analogous issue in the context of the renewal of insurance policies, which actuaries feel they can estimate with a high degree of precision. See IASB (2003d) and IAIS (2003). For a broader discussion of accounting issues related to insurance, see Geneva Association (2003) and Tiner (2004).

⁴¹ See, for instance, Berger et al (1991) for an early suggestion in the same spirit, as an alternative to market value accounting for loans. Consistent with the gradual shift in views, the IASB has recently allowed losses on loans to be calculated on a portfolio, as opposed to individual, basis, even for “individually significant” loans; compare IAS 39 in IASB (2002) with its new version (IASB (2003b)).

⁴² Another related source of tension is the fact that accounting information, or at least financial statements, are normally portrayed as presenting the economic *history* of an enterprise. In other words, in the FASB’s terminology, for example, financial statements are supposed to relate to “transactions and events that have already happened” (FASB (1978)). Sometimes this is interpreted as leaving no room for the recognition of future cash flows (eg Lee (1999)). However, once it is recognised that market values reflect precisely such estimates, it is clear that the real distinction is between estimates that pass and those that do not pass the verifiability threshold.

⁴³ It goes without saying that the information most suitable for providing an unbiased view of the firm need not be the most suitable for contracting purposes. For instance, even if the information is most appropriate for valuing the firm and hence for establishing a good basis for valuing its equity, relating compensation to the value of equity is suboptimal from a principal-agent perspective. The reason is that the value of the equity (firm) does not distinguish the contribution of management from that of factors outside management’s control, such as the strength of the economy. See Lambert (2001) for a detailed discussion of these issues. More generally, this suggests that it may be too onerous and inappropriate to set as a goal for accounting information that of providing the best basis for contracting.

makes clear, the intimate relationship between risk measurement and valuation puts a premium on an intense dialogue between the two sets of standard setters in elaborating the ideal information set (eg Knight (2004) and (2005)). It strongly suggests that prudential authorities can have a very useful role in helping to develop not just risk and measurement error information, but also first-moment information, leveraging their expertise in risk measurement and validation. This dialogue is especially important now that accounting standard setters have begun to pay closer attention to risk information too. While the dialogue has intensified in recent years, a further intensification is desirable. This would serve multiple purposes. It could foster a greater common understanding of the issues. It could help to narrow existing differences in perspective. It could limit the risk of inconsistencies and excessive information burdens. And it could strengthen the “bite” of the disclosure practices encouraged by prudential authorities, at present confined to regulated financial institutions. In particular, the involvement of accounting standard setters could help to spread sound information disclosure principles beyond purely financial enterprises.

The roadmap outlined in this paper is based on the conviction that the type and quality of information provided fall short of what is desirable. At the same time, it is clear that **information disclosure has limitations**. Market participants may not be in a position to process it correctly or may not have the right incentives to do so. For instance, the deleterious effect of overly generous safety nets in banking has long been recognised (eg Borio et al (2004)). In addition, quite apart from the technological costs of producing information, more information provision is not necessarily always desirable. For instance, under some conditions it can be destabilising, possibly precipitating distress (eg Morris and Shin (1999) and Borio (2003b)). Likewise, it can have unintended consequences, such as potentially leading to a drying-up of liquidity in markets if it undercuts the informational advantage of those providing it (eg O’Hara (1995) and BIS (2001b)). We interpret these arguments as pointing to the need for further policy initiatives in complementary areas and for further analytical work designed to identify the limitations of information disclosure more precisely.

Conclusions

In this essay, we have outlined an ideal set of information that would support the efficient functioning of the financial system and the economy, have identified existing gaps and have proposed a way forward to fill them. Here, we would simply like to stress again the four basic conclusions concerning, respectively, the content of the information to be provided, the long-term goal, the process for securing that goal and the role of different authorities.

First, as regards the content of the information, considerable efforts are needed to extend the information available with respect to both the financial characteristics of interest and the object of the analysis. With respect to financial characteristics, we now have in place, or are putting in place, a broadly consistent framework covering “first-moment” information, relating to profitability, cash flows and balance sheets. Surprisingly, however, far less attention has been devoted to developing and implementing an equally consistent framework for “risk information” and to understanding the uncertainty that surrounds the first two types of information (“measurement error information”). With respect to the object of the analysis, much of what is available relates to individual firms (the “micro” level) while much less relates to sectors or the economy as a whole (the “macro” level). And yet, filling these gaps is important in order to be able to form a better view of risk-adjusted returns, of financial vulnerabilities and of the uncertainty that surrounds judgments about them, both in the small and in the large. It is also important as a means of improving the quality of the more abundant measures of first-moment information, such as those of current valuations: the risk premia that underlie these valuations are critically determined by risk and uncertainty.

Second, a worthwhile long-term goal would be to decouple as far as possible the objective of providing unbiased information about financial characteristics, on the one hand, and instilling the desired degree of prudence in behaviour, on the other. This would facilitate the achievement of the two objectives simultaneously, would improve transparency, would make it easier to reach agreement on a common set of information across sectors and countries, and would limit compliance costs.

Third, at the same time, given initial conditions and the importance that information has for prudential policy, achieving this long-term goal — “decoupling” — also puts important constraints on the process towards it. In particular, it implies that progress on the two fronts should be made in parallel, so that at

all times the prudential authorities are in a position to adjust their policy instruments to the changes in information provided.

Finally, the achievement of the long-term goal and the transition towards it put a premium on very close cooperation between policymakers in various fields. As regards micro information, accounting standard setters and prudential authorities are in the front line. While international standard-setting in financial reporting has traditionally been the preserve of accounting authorities, prudential supervisors have an important role to play in helping to shape the final information set. They can do so by leveraging their expertise in risk management issues and validation, increasingly relevant in the formulation of the three types of information outlined in this paper, viz first-moment, risk and measurement error information. Consistency between accounting and risk management is essential. The dialogue between the two communities has indeed intensified in recent years and has led to considerable progress. Our analysis calls for a further intensification in future. As regards macro information, it is prudential authorities and central banks more generally that are in the front line. Central banks can bring to bear their greater familiarity with system-wide and macroeconomic questions — a know-how which is critical in developing the corresponding measurement technology. Here, too, encouraging steps have been made in recent years, but the road ahead is still a long one.

We are fully aware that our analysis has a number of limitations. For one, it leads to a very ambitious set of proposals. Filling the gaps requires major analytical and practical efforts. Moreover, as in many other areas, the devil is *truly* in the detail. Our framework, by contrast, is at a very high level of generality. Even so, we would like to think of it as providing a broad canvas or roadmap against which the multitude of efforts under way could be assessed. Agreement on general principles can help provide a broad sense of direction, a compass that the traveller can resort to in those difficult moments when the right path seems to become tougher or harder to discern.

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Annex: A stylised example

We have identified three types of information pertaining to the financial condition of the firm that an ideal reporting framework should provide to outsiders/stakeholders: estimates of value, estimates of risk profile, and measures of the uncertainty surrounding both of these sets of estimates. In this Annex, we present a highly stylised example that illustrates these types of information as they relate to loan accounting. We also show the possibility of decoupling the pursuit of prudential objectives from accounting arrangements.

We assume that the reporting entity (a bank) owns a loan with face value of 100 that is to be repaid in one year at a nominal interest rate i while the risk-free interest rate is equal to $r = 5\%$. We abstract from strategic default and associated verification issues by assuming that the borrower is expected to repay in full as long as the means are available. The repayment capacity is determined by the level of the net asset value of the borrower's enterprise at the end of the period, which the lender models as following a log-normal distribution. More precisely, if A is the repayment capacity, then its distribution is assumed to be $\log(A) \sim N(m_0 + m_s, s)$, where m_0 is the company-specific mean and m_s represents overall economic conditions, or the influence of the macro factor on performance. The parameters (m_0, m_s, s) are inputs into the bank's credit risk model, most likely estimated on the basis of historical data on this kind of exposure. We assume for the moment that these parameters are equal to $(106, 0, 6\%)$ respectively. Under these assumptions (and risk neutrality), the "actuarially fair" rate i^* charged on this loan would be the one that equates the expected cash flow associated with the loan $E\{\min[100(1+i), (A-100(1+i))]\}$ to the payoff of the risk-free asset $(100(1+r))$, namely $i^* = 9.54\%$.

The three types of information

The first type of information relates to the estimated value of the asset (first moment). The value of the loan today is the same (ie 100) regardless of whether the bank accounts for it at (i) book value or (ii) at the expected payoffs discounted at the risk-free rate of return, $(105/100(1+5\%))$, or (iii) at the contracted payback amount discounted at the contracted interest rate $(100(1+9.54\%)/(1+9.54\%))$.

For the second type of information, namely the prospective range of outcomes or statistical dispersion in the evolution of the value of the asset, the bank could supply the corresponding value-at-risk for a certain level of confidence (ie the probability that the VaR will not be breached). In this case, the 99% VaR is 92.26, meaning that the bank expects losses to exceed 7.74 with a probability of 1%. It is worth noting that given the assumption of normality, the VaR describes fully the postulated distribution of outcomes and estimated risk. This would not be the case under alternative distributional assumptions.

Finally, the third type of information relates to the uncertainty surrounding the point estimates of value and of the associated risk, ie to "model error". In this case, the bank could report the impact on its estimates of alternative assumptions about the parameter that captures the "macro" risk of the position, m_s . Specifically, it could report the ranges in the value of the loan and the VaR stemming from different assumptions regarding this parameter. The various rows in Table A1 report those values for four levels of m_s (the "macroeconomic" factor) in addition to the central scenario, ranging from a very positive to a very negative outlook. This exercise is akin to a "stress test" of the assumptions underlying the estimates. Reporting the range of outcomes would allow outsiders to form a view about the plausibility and likelihood of the central scenario.

So far we have dealt with balance sheet reporting; in order to illustrate the three dimensions in the context of the income statement, we will assume that the loan shortly after origination is downgraded by the bank. The downgrade takes the form of a shift to the mean of the asset distribution by -0.7 (ie assuming that $m_s = 105.3$). In this case, for the central scenario the expected (discounted) value of the loan would be equal to 99.5 and the bank would book provisions against the expected loss equal to 0.5 — assuming this specific form of provisioning, for the sake of the argument. The reported figures relating to the second and third types of information following the downgrade are shown in the right-hand columns of the table. The values reported are naturally lower and risks higher compared to those prior to the downgrade.

Table A1
Three types of information illustrated

Scenario	Original valuation		Valuation after downgrade		
	First moment: Value	Risk profile: VaR (99.0%)	First moment:		Risk profile: VaR (99.0%)
			Value	Income	
Very optimistic (top of range)	101.2	94.00	100.8	-0.4	93.39
Moderately optimistic	100.6	93.13	100.2	-0.4	92.52
Neutral (point estimate)	100.0	92.26	99.5	-0.5	91.65
Moderately pessimistic	99.3	91.39	98.8	-0.5	90.78
Very pessimistic (bottom of range)	98.6	90.52	98.0	-0.6	89.91

Note: The different scenarios correspond to different assumptions about the value of the parameter m_s from the set $\{-2, -1, 0, 1, 2\}$.

Ideally, the reporting standards would ensure that the recipients of the information (outside the firm) would be able to do two things: first, to form an independent assessment of the firm's financial outlook on the basis of the information supplied; and second, to judge *ex post* the validity of the assumptions, by comparing the subsequent future outcomes to the *ex ante* estimates of value and risk initially provided. This means that the estimates of risk and of model uncertainty — the second and third types of information — should be reported in a way that gives a sense of the likelihood of the range of outcomes, thereby allowing the predictions to be confronted with future realisations of this value. Facilitating this *ex post* verification of *ex ante* estimates is a mechanism that would strengthen the reporter's discipline and embed a type of intertemporal consistency in the reported figures.

Decoupling the prudential and accounting objectives

Banks are regulated institutions and subject to prudential capital requirements commensurate with the risks they assume. We will illustrate here that, while highly dependent on accounting standards, the prudential objectives may be achieved through reliance on supervisory tools that can be adjusted to accounting practices (Borio and Lowe (2001)). We assume that the objective is to set minimum capital requirements corresponding to a given VaR threshold, say 99%, so as to set the probability of failure, here then 1%. We also assume that the supervisors do not explicitly take into account measurement error information in their calibration, although, if it were provided, they could clearly do so. We will take the example of the downgrade of the loan.

Assume first that the verification bar for impairment in the accounting regime is consistent with the extent of forward-looking behaviour that the supervisors would like to allow for. In this case, then, there is no tension between the two objectives. The assessment by the lender would also imply an increase in loan loss provisions and hence a reduction in available capital. After the downgrade of the loan, to restore the probability of failure and meet the unchanged capital requirement, the bank is obliged to replenish its capital by the extent of the loan provision, or by 0.61, from 7.74 to 8.35.

Assume next that the verification bar set by the accounting standards is higher, so that in the specific example impairment could not be recognised, as could be the case in current arrangements. In this case, the supervisors could add the embedded loss to the minimum capital requirement and, moreover, have this disclosed to the public. This supplementary "prudential provisioning requirement" can restore the targeted probability of failure. To the extent that it does so, supervisors would be indifferent between the two situations. Admittedly, the two situations might not be exactly equivalent. In particular, this would be the case if the distinction between recognition and disclosure did matter for market perceptions of value and risks, which could in turn have an impact on the cost of capital. But these additional effects could also be taken into account by prudential tools.

While the example is necessarily illustrative, the principle is quite general. It could be equally applied to alternative accounting arrangements. This would be so, for instance, if loans were recorded on a fair value basis. It is the inherent substitutability between accounting and prudential instruments that allows the decoupling of the objective of portraying “unbiased” valuations from that of instilling the desired degree of prudence into behaviour.

Two points are worth stressing, though. First, the range of prudential tools is quite broad. We have described just one possibility, namely capital requirements based on given accounting valuations. But one can think of others too, not least explicit margins or “haircuts” applied to those valuations, such as to signal a more conservative view about the uncertainty surrounding specific estimates. Second, as elaborated in the main text, it is important to seek to reconcile differences of opinion on what constitutes “unbiased” valuations, based on a common reference framework. Such differences should, as far as possible, be resolved through an intensified dialogue between standard setters, aimed at cross-fertilising their respective expertise.