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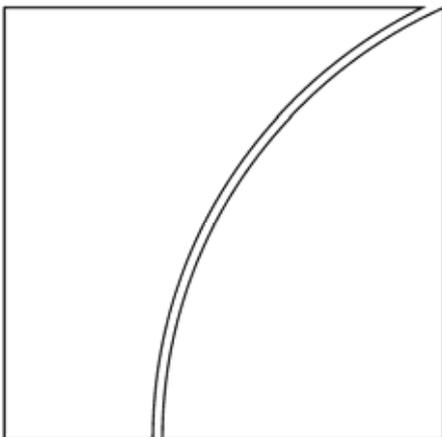
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### Risk in financial reporting: status, challenges and suggested directions

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Monetary and Economic Department

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## **Foreword**

On 11-12 November 2005, the BIS held a Workshop on “Accounting, risk management and prudential regulation”, which brought together a multi-disciplinary group of around 35 external participants including senior accounting practitioners, standard setters, finance academics, supervisors and central bank officials. The workshop programme is attached. This paper was presented at the workshop. The views expressed are those of the author(s) and not those of the BIS.

## **Abstract**

Advances in risk measurement technology have reshaped financial markets and the functioning of the financial system. More recently, they have been reshaping the prudential framework. Looking forward, they have the potential to reshape financial reporting too. Recent initiatives to improve financial reporting standards have brought to the fore significant differences in perspective between accounting standard setters and prudential authorities. Building on previous work, we argue that risk measurement and management technology can be instrumental in bridging this gap and, by the same token, in improving financial reporting. Risk measurement plays a crucial role in the measurement, verification and validation of valuations. It is the basis for giving more prominence to risk and measurement error information in public disclosures. And it could act as more of a focal point in the design of accounting standards, as greater consistency between sound risk management practices and accounting standards can help to narrow the wedge between accounting and underlying economic valuations.

# Workshop on “Accounting, risk management and prudential regulation”

Room D, Bank for International Settlements  
11-12 November 2005, Basel

Friday, 11 November 2005

**Welcome by Malcolm Knight, General Manager, BIS**

**Session 1: Chairperson: William White, BIS**

**Paper 1: “Including estimates of the future in today’s financial statements”**

by Mary Barth, Professor of Accounting, Stanford University

Discussants: Russell Picot, Group Chief Accounting Officer, HSBC Holdings London  
Arnold Schilder, Executive Director of Supervision, Netherlands Bank

**Paper 2: “Fair value accounting for financial instruments: some implications for bank regulation”**

by Wayne Landsman, Professor of Accounting, University of North Carolina

Discussants: James O’Brien, Senior Economist, Division of Research and Statistics, Board of Governors of the Federal Reserve System  
Thomas Daula, Chief Risk Officer, Morgan Stanley New York

**Session 2: Chairperson: Sylvie Mathérat, French Banking Commission**

**Paper 3: “Institution-specific value”**

by Ken Peasnell, Professor of Accounting and Finance, Lancaster University Management School

Discussants: Philip Lowe, Assistant Governor, Financial System, Reserve Bank of Australia  
David Andrews, Director, Fitch Ratings Ltd

**Paper 4: “Do accounting changes affect the economic behaviour of financial firms?”**

by Anne Beatty, Professor of Accounting, Ohio State University

Discussants: Patricia Jackson, Ernst and Young, London  
Gerard Gil, Group Chief Accountant, BNP Paribas

## **Saturday, 12 November 2005**

**Session 3: Chairperson: José Maria Roldán, Banco de España**

**Paper 5: “Implications of marking to market for market/system behaviour”**

by Hyun Shin, Professor of Finance, London School of Economics

Discussants: Mauro Grande, Director, Financial Stability and Supervision,  
European Central Bank  
Richard Herring, Professor of Finance,  
Wharton University of Pennsylvania

**Paper 6: “Risk in financial reporting: status, challenges and suggested directions”**

by Claudio Borio, Head of Research and Policy Analysis and  
Kostas Tsatsaronis, Head of Financial Institutions and Infrastructure,  
Bank for International Settlements

Discussants: Gerald Edwards, Jr, Financial Stability Forum  
Philippe Jorion, Professor of Finance, University of California – Irvine

**End of Conference**

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# Risk in financial reporting: status, challenges and suggested directions<sup>1</sup>

Claudio Borio and Kostas Tsatsaronis

## Introduction<sup>2</sup>

Uncertainty is a defining feature of the economic environment. Economic agents' perceptions of risk, together with their willingness and ability to bear it, fundamentally shape decisions, transactions and market prices. Well-considered decisions should be based on information that embodies and helps to highlight existing risks and uncertainties. An important component of the information system of an economy is financial reporting,<sup>3</sup> through which an enterprise conveys information about its financial performance and condition to external users, often identified with its actual and potential claimants. It stands to reason, therefore, that financial reporting should provide a good sense of the impact of those risks and uncertainties on measures of valuation, income and cash flows.

In previous work we argued that this aspect of financial reporting has not received the attention that it deserves (Borio and Tsatsaronis (2004) and (2005)). We noted that progress on this front could also hold the key to reconciling the perspectives of accounting standard setters, on the one hand, and prudential authorities, on the other, on what information should be reported and on how it should be portrayed.<sup>4</sup> The final goal is a financial reporting system that is consistent as far as possible with sound risk measurement and management practices and that can serve as a basis for well-informed decisions by outside investors as well as prudential authorities.

More specifically, in that work we argued that reconciliation of the two perspectives could be facilitated by a strategy based on three basic elements. First, in the long term, the “decoupling” of the accounting objective of providing an “unbiased” picture of the financial performance and condition of the firm from the regulatory one of instilling the desired degree of prudence in its behaviour. This would imply that prudential regulatory instruments would be calibrated taking as a **starting point** a common set of valuations that was not deliberately conservative.<sup>5</sup> Second, a “parallel” process towards that long term goal so that at all points the prudential authorities could neutralise any undesirable implications for financial stability of changes in financial reporting standards through the instruments at their disposal. Finally, an agreed, richer information set about the financial characteristics of a firm that would cover not just the traditional point-estimates of its current financial condition, as captured in the income, balance sheet and cash flow statements (“first-moment information”), but also estimates of

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<sup>1</sup> Paper prepared for the BIS Workshop on Accounting, Risk Management and Prudential Regulation, Basel, Switzerland, 11–12 November 2005.

<sup>2</sup> The views expressed are our own and should not be interpreted as those of the Bank for International Settlements. We would like to thank Mary Barth, Donna Bovolaneas and Gerald Edwards for helpful comments. Any errors and omissions are the authors' sole responsibility.

<sup>3</sup> More specifically, financial reporting generally involves the public issuance of financial statements and their related notes and disclosures as set forth in accounting standards and requirements.

<sup>4</sup> See also Borio (2005) for an analysis of the historical developments in the global financial system that have brought prudential supervisors and accounting standard setters into closer contact with each other.

<sup>5</sup> This calibration could also include *explicit* additional risk margins applied to the common valuations.

risk profiles (“risk information”) and measures of the uncertainty surrounding both kinds of estimate (“measurement error information”). Close cooperation between accounting standard setters and supervisory authorities is called for both in **developing** the final set of information and in **implementing** it. Although very encouraging steps have been taken more recently, the process should go further.

In this paper we change the focus somewhat. Rather than elaborating in detail on the nexus between accounting and prudential considerations, we focus more on the relationship between accounting, on the one hand, and risk measurement and risk management, on the other. We highlight a point that was largely implicit in our previous work, viz. it is risk measurement, owing to its link to the measurement of valuations, that has the potential to bridge the gap between the perspectives of accounting standard setters and prudential authorities. We also take forward that work in at least two respects. First, we discuss in more detail what is meant by “unbiased”. This is important because once the pervasiveness of risk premia in valuations is taken into account the concept of unbiasedness requires careful interpretation. Here we pay particular attention to the relationship between unbiased valuations and market prices. Second, we explore further the tensions between risk measurement practices and the current approach to financial reporting. Here we pay particular attention to the possibility that accounting standards might distort valuations and induce “artificial” volatility in a firm’s financial statements, thereby also influencing its behaviour, not least its risk management decisions, in ways that are contrary to economic logic.

We reach a number of conclusions.

First, in a world characterised by imperfect and costly information – the only world in which financial reporting has a *raison d’être* in the first place – **valuations are not uniquely and objectively defined**. As a result, the concept of unbiasedness should be interpreted cautiously. In such a world, the way one measures value through accounting conventions fundamentally affects valuations by influencing the behaviour of economic agents. This is the case regardless of whether valuations are actually observed in the markets or not. The corresponding economy-wide (“general equilibrium”) effects should be duly considered when assessing the implications of alternative accounting principles (“measurement attributes” or “measurement bases”), such as fair value vs. historical cost.

Second, **risk measurement technology** plays a key role in the measurement of value. This is because valuations are necessarily forward looking and because risks must be measured and priced. Risk measurement plays a role even in traditional historical cost accounting whenever such forward-looking elements are present; the assessment of loan impairment is an obvious such example.<sup>6</sup> Its role is more pervasive in the other available accounting principles, such as in fair value or entity-specific value. And it is bound to grow further in future, reflecting the deepening of markets, the development of new instruments and financial innovation.

Third, the current shift towards incorporating more explicitly forward-looking elements in accounting, not least through fair values, puts a premium on the **verifiability** of the corresponding measures. This is especially important when the estimates of valuations and other information reported are based on models (“marking-to-model”) as opposed to relying directly on market prices. Model estimates greatly raise the scope for measurement error, be this as a result of model error or of intentional misreporting. The ability to verify the measures is an important criterion in deciding what accounting principles to allow in specific circumstances. Ex post validation of measurement methodologies and their outputs, with a

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<sup>6</sup> We use the term “historical cost” accounting broadly here; the same situation could also be described as the coexistence of different measurement bases in a predominantly historical cost system.

view to assessing their performance and integrity, is critical. In addition, borrowing from the experience of prudential supervisors, requiring ex ante that such systems be properly integrated in the running of the firm, such as in its pricing, risk management and capital allocation decisions, can be a useful mechanism to discourage gaming. Risk measurement technology plays a key role in validation while integration into risk management processes plays an equally important one in safeguarding against intentional misreporting.

Fourth, the same shift towards relying on more forward-looking valuations also puts a premium on **transparency**. For one, it is important to provide some sense of what drives valuations, so as to interpret them better. This is true regardless of whether valuations are measured top-down, by direct reference to an observable market price, or bottom-up, by combining individual components through marking-to-model (eg, expected cash flows and discount factors, including risk premia) based on risk measurement technologies. The importance of transparency in bottom-up approaches is easily recognised. Paradoxically, however, even market prices are quite opaque, since they are completely silent about the factors that drive them. For instance, do changes in market prices reflect changes in interest rates or in credit quality? In addition, in all cases except for prices of assets traded in deep and liquid markets, it is critical to provide a sense of the possible measurement error surrounding the estimates of value. This would allow outside investors, as well as prudential regulators, to assess the quality of the estimates and to adjust their behaviour accordingly.

Finally, in our view, despite the progress made, there is considerable **scope for bringing accounting valuations closer to underlying economic valuations**. Many factors can drive a wedge between the two. These include definitions of assets/liabilities and their recognition, the co-existence of different accounting principles (“mixed-attribute” systems) as well as differing standards of verifiability of estimates about the future. While some of these differences are inevitable, many are not. Paying greater attention to the requirements of sound risk management can provide a useful guide to close this gap. We illustrate this with the case of the treatment of demand deposits, insurance renewal policies and loan impairment.

Thus, there are many ways in which risk measurement and management can help to bridge the gap between the perspectives of accounting standard setters, on the one hand, and prudential authorities, on the other. Risk measurement technology plays a key role in the enhanced information set needed for a proper functioning of markets, which should be extended to give more prominence to risk and measurement error information. It plays a crucial function in the measurement, verification and validation of valuations. And sound risk management could act as more of a focal point in the design of accounting standards as a means of closing the gap between accounting and underlying economic valuations. Over the last couple of decades, alongside the unprecedented development of markets, advances in risk measurement technology have reshaped the financial system. More recently, they have been reshaping the prudential framework. Looking forward, they have the potential to reshape financial reporting too.<sup>7</sup>

The structure of the paper is the following. In the first section we recall the three types of financial information that in our view make up an ideal information set and how current financial reporting practices compare with that ideal. Information on risk and on measurement error is highlighted. In the second section we discuss the concept of unbiasedness as well as its implications for various valuation principles and for the level of aggregation of the information portrayed. In the third section we explore in more detail the gap that can arise between accounting valuations, on the one hand, and underlying economic valuations, on the other, as a result of the definition and recognition of

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<sup>7</sup> On these issues, see also Knight (2004) and (2005).

assets/liabilities as well as of the use of mixed-attribute accounting systems. Here we highlight how this gap can go hand-in-hand with tensions between accounting and risk measurement/management practices, and the role that sound risk management can play in helping to narrow it. The conclusions draw some implications for the future.

## **Risk and the ideal information set<sup>8</sup>**

What information would outside investors, be these equity or debt holders, wish to have about the financial performance of a firm so as to guide their decisions? They would surely wish to form a view about the firm's past and current profitability, solvency and liquidity at a given point in time. No doubt, they would also like to develop a picture of the risk profile of those attributes over time and hence of their potential future evolution. And they would presumably also wish to get a sense of how reliable or accurate those measures are. Combined, these three elements would provide the raw material to inform views about expected returns properly adjusted for risk and for the inevitable uncertainties that surround measurement. Roughly speaking, these three types of information correspond to the key categories into which the ideal set can be divided, namely first-moment, risk and measurement error information<sup>9</sup> (see Table 1).

**First-moment information** describes income, the balance sheet and cash flows at a point in time. It 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. In historical cost accounting, much of this information is of a contemporaneous or backward-looking nature. However, even according to this valuation principle, it would inevitably include forward-looking elements too, whenever the valuation of an item is based on expectations about the future.<sup>10</sup> This is true (implicitly) at inception, when the transaction occurs. But it can also be true in subsequent periods, whenever the value of an item is adjusted based on some estimate of future cash flows, and the earnings figure is seen as the period-to-period change in those estimates. For example, at least once a trigger event is judged to have happened, loan loss provisions are based on future discounted cash flows. More generally, forward looking elements are inherent in accruals adjustments. By contrast, the forward-looking component is intrinsic, for instance, 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.

**Risk information** is fundamentally forward-looking. Future profits, future cash flows and future valuations are intrinsically uncertain. Risk information is designed to capture the prospective range of outcomes or statistical dispersion for the variables of interest as measured at a particular point in time. More specifically, to the extent that the behaviour of these variables can be represented by probability distributions, risk information would ideally provide the best estimate of the corresponding (unconditional) probability distributions. Value-at-risk or cash-flow-at-risk measures, for example, are summary statistics of such estimated probability distributions of future outcomes. But one should include in this category also information that is not so easily captured by probability measures, such as the outcome of stress tests and sensitivity analyses. Importantly, any such directional information, which indicates whether firms are long or short specific risk factors, could also help to assess the

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<sup>8</sup> This section draws heavily on Borio and Tsatsaronis (2004) and (2005).

<sup>9</sup> See also Crockett (2002). Loosely speaking, one may wish to think of first-moment and risk information as referring, respectively, to level and volatility information.

<sup>10</sup> For a more detailed discussion of the use of assessments of the future in financial reporting, see Barth (2005).

potential *co-variation* in performance measures across firms, particularly relevant to allow investors to assess the degree of diversification in their portfolios.

Table 1  
The ideal information set

Financial characteristic	Illustrations	Availability
First-moment	Point estimates of profitability, balance sheet valuations and cash flows	
	eg: - income statement - balance-sheet statement - cash flow statement	very high
Risk	Point estimates of measures of statistical variation in first-moment information	
	eg: - earnings-at-risk and value-at-risk - portfolio stress tests	medium
Measurement error	Measures of the uncertainty surrounding first-moment and risk information	
	eg: - sensitivity analysis to parameter values - comparison of outcomes with previous estimates	low

**Measurement error information** designates the margin of error or uncertainty that surrounds the measurement of the variables of interest, including those that quantify risk.<sup>11</sup>

The need for this type of information arises whenever these variables have to be estimated. For instance, measurement error would be zero for first-moment information concerning items that were valued at observable market prices and for which a deep and liquid market existed. But it would be positive if, say, such items were marked to model and/or traded in illiquid markets, 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**”.<sup>12</sup> Or whoever is the source of the information may intentionally misreport it,

<sup>11</sup> In this context, uncertainty refers not to the randomness of future outcomes, which is captured by the above concept of risk, but to the fact that the nature of this randomness is itself unknown and frequently hypothesised. It is akin to the term “uncertainty” as used by Frank Knight to describe randomness of an unknown form. In contrast to Knight, though, we suggest that this type of uncertainty is, at least in part, quantifiable.

<sup>12</sup> Model error, in turn, can arise from various factors, including error in the structure of the model itself, the estimation of its parameters and its implementation.

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 that could give rise to a gain if not reported truthfully. For instance, profit figures could be purposefully inflated if the compensation of the manager was tied to short-term share performance, as painfully revealed in the aftermath of the recent equity market bust.<sup>13</sup> Similarly, the management of a bank might be tempted to underestimate its VaR measure if by so doing it can 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. Falling short of an ex ante range, information about the sensitivity of the estimates to a variety of alternative assumptions would be helpful (eg the choice of model parameters). In contrast, 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 it would not necessarily allow one 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 by tightening the stringency of the standards of verifiability whenever the risk of misreporting is seen as “too high” or by strengthening the incentives not to misreport, such as through appropriate penalties.

How does current reporting practice compare with this ideal benchmark?

By now, there is a full set of **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. This is the type of information with which much of the current efforts to develop internationally accepted financial reporting standards are primarily concerned.

**Risk information** is of more recent vintage and has not developed as much.<sup>14</sup> 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, largely under the prodding of prudential supervisors and central banks.<sup>15</sup> This development has mainly been limited to financial firms, for which these risks may be more important, given the higher degree of leverage with

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<sup>13</sup> For an excellent discussion of the perverse incentives associated with equity market overvaluation, see Jensen (2004) and Jensen et al (2004).

<sup>14</sup> The Joint Forum provides a very useful overview of the current state of disclosure by financial firms, comparing it with the recommendations made by the Fisher II report (see below) (Joint Forum (2004)).

<sup>15</sup> The most ambitious such exercise was the so-called Fisher II report, prepared by a multidisciplinary task force of prudential supervisors and central banks and designed to develop a common template for risk disclosures by all financial institutions; see CGFS (2001a).

which they operate. Examples of the genre include value-at-risk measures for the trading portfolios of banks or securities firms (eg BCBS (1999) and (2003)), various types of sensitivity analysis of net worth to changes in risk factors (eg, the impact on the balance sheet of a given change in interest rates, as commonly done by insurance companies) and, more indirectly, inputs into the assessment of more articulated risk profile measures (eg rough indicators of credit risk exposures, as in the context of the implementation of Basel II (BCBS (2004))). It is only more recently that international accounting standard setters have been paying more attention to risk disclosures, with requirements that are consistent with, if necessarily less ambitious than, those of prudential authorities (eg IFRS 7, IASB (2005)).

**Measurement error information** is even less developed, although here, too, significant improvements have been made or proposed more recently. Estimates of first-moment and risk information are generally provided by firms as if they had *no uncertainty attached to them*. One important long-standing exception to this common practice is that sometimes firms have disclosed 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). A more recent, important, example is the indirect information provided by sub-dividing the items to be valued on a fair value accounting basis into categories, depending on a rough indicator of the reliability of the corresponding estimates, together with more direct information in the form of rough estimates of the sensitivity of valuations to the underlying assumptions made (eg, IFRS 7, IASB (2005)). In addition, the disclosure of a comparison of previous forecasts with actual outcomes remains very unsystematic. To our knowledge, this has largely been limited, and in a very uneven way, to VaR information, again with the encouragement of supervisory authorities and central banks (CGFS (1994) and (2001a); BCBS (1999) and (2003) and Joint Forum (2004)).<sup>16</sup>

While the broad thrust of the steps taken in recent years towards greater disclosure of risk and measurement error information is very welcome, arguably the state of affairs still falls short of what is desirable and feasible. There are a number of reasons for this.

First, unless it is assumed that market participants somehow “see through” the information provided in financial statements and reach for any missing elements, the information disclosed does not as yet seem sufficient to form a proper view of the potential benefits and risks of investing in a firm. By comparison with the reporting of first-moment information, that of risk information is quite limited. This is so whether the information relates to the risks specific to the firm or to their potential co-variation with those of other firms, through the disclosure of directional information. And the failure to provide a better sense of the measurement error in both first-moment and risk information can easily give a false sense of precision and security to users. *This will become even more important as the prominence of model-based estimates in financial statements and in first-moment information increases* (see below). It is just as important to acknowledge what we know as the limits of our knowledge. Arguing, as some may, that the additional information is largely redundant, since it is surely already impounded in secondary market prices for claims on the firm, is missing the point. For, in effect, it assumes that those prices reflect information that has not been supplied in the first place.

Second, the changing composition of the investor base lends further support to the need to go beyond first-moment information. It has sometimes been argued that the emphasis on first-moment information is a natural result of the focus on the needs of equity holders, the

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<sup>16</sup> This type of disclosure was first recommended in the Fisher I Report (CGFS (1994)). It is also the type of disclosure which, combined with ex post penalties for violations of model forecasts, was part of the so-called “pre-commitment” approach to the regulation of market risks in the trading book (see Kupiec and O’ Brien (1997)).

owners of the firm on whose behalf the enterprise is managed. According to this view, shareholders hold diversified portfolios, are primarily interested in expected returns, and do not care about states in which the firm defaults, with their downside risks constrained by limited liability. This view, however, underestimates the importance of risk and measurement error information for shareholders too, at the very least that of indicators of co-variation and undiversifiable risk. Moreover, it is likely to become less relevant to the extent that the rapid growth of open market debt instruments continues. This growth is contributing to the development of a new constituency of private investors more concerned with downside risks and returns in default states. Indeed, this suggests that financial reporting *should also seek to provide information helping to form a view of potential losses given default*, thereby abandoning the current premise that valuations should reflect only going concern assumptions. This type of information is becoming increasingly available, hand-in-hand with advances in credit risk measurement technology and the development of markets for credit instruments.

Third, historical experience suggests that a key objection to the disclosure of information, namely proprietary concerns, can easily be exaggerated. In particular, the set of what has been regarded as private information has steadily been shrinking. 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.<sup>17</sup> With hindsight, those concerns have proved unfounded.

Fourth, measurement technology has already proceeded to a point that additional meaningful information could be supplied, at relatively low cost. Advances in measurement technology over the last 30 years or so have been enormous. 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) and (2005)). The art of stress testing has made considerable progress (eg CGFS (2000) and (2001b)). True, the technology has not developed sufficiently to provide a coherent set of disclosures that could match the one already available for first-moment information (eg, Joint Forum (2004)). But firms' search for the holy grail of integrated risk management across business units and types of risk, while still in its infancy, augurs well for the future (Joint Forum (2003)).

Fifth, the process of edging closer towards the ideal information set should be seen as evolutionary and as tailored to the characteristics of reporting entities. It should be seen as evolutionary because it is important that progress be made at a measured pace consistent with the developments in, and the spreading of, risk measurement technology. As noted, the state of risk measurement technology is still a long way from allowing the production of a comprehensive set of information at a sufficiently low cost. And human capital will have to be developed further, both within firms and among those responsible for certifying the quality of the corresponding information. The process should be seen as tailored to the characteristics of reporting entities because materiality thresholds are essential and because the more sophisticated types of information are obviously not within the reach of all firms. It is not surprising that greater progress has been made within the financial sector, where financial risk information is crucial to the day-to-day running of the business and, as a result, the returns on the corresponding human capital investment are more easily appreciated. At the same time, the trend towards more forward-looking measures of value will make aspects of

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<sup>17</sup> Moreover, in cases where legitimate proprietary concerns do arise, the competent authorities could collect the information and release it in such a way as to protect its confidentiality. This could be the case with some of the more sensitive directional information. Think, for example, of exposure concentrations in certain markets or incurred by certain categories of investment firm.

this information much more generally relevant. In particular, measurement error information surrounding valuations is critical, however simple and crude.

Finally, and more generally, valuations are fundamentally affected by risk and uncertainties and by attitudes towards risk, as captured by risk premia. Therefore, first-moment, risk and measurement error information are inextricably linked. The quality of first-moment information itself is dependent on the quality of risk and measurement error information. As an accounting framework for first-moment information which incorporates more forward-looking elements is developed, *the importance of risk and measurement error information will inevitably become more obvious*. These pieces of information will be increasingly perceived as the modular components of an integrated whole. It is to these issues that we now turn.

## **Risk and unbiased valuations: nature and trade offs**

We have argued that a key objective of financial reporting should be that of providing *unbiased estimates* of the variables of interest, as opposed to deliberately conservative ones. This applies, in particular, to valuations of assets and liabilities and to the corresponding income streams. As elaborated in previous work, we feel that this would have a number of merits: it would avoid a degree of arbitrariness in financial statements (eg what degree of conservatism is appropriate? for what purpose?), would improve transparency, would make it easier to reach agreement on a common set of information across sectors and across countries, would limit compliance costs, and above all, *provided it was part of a comprehensive and co-ordinated package*, could provide a set of valuations on which prudential instruments could build upon to instil the desired degree of prudence in behaviour, either through transparent adjustments to those valuations themselves or through the calibration of other instruments (eg minimum capital and/or liquidity requirements for banks, etc.).

But the very meaning of “unbiased” is somewhat ambiguous once it is recognised that information production and acquisition is costly, information is scarce and heterogeneous, risk and uncertainty are pervasive, attitudes to risk differ across agents, and providers of the information may have incentives to misreport. It is worth exploring these issues in more detail, so as to highlight the ambiguities involved, the tradeoffs to which they give rise and possible ways of addressing them.

Let's start from an ideal world in which these ambiguities would *not* arise. This is the archetypal world of complete and efficient markets, with perfect information and no limits to arbitrage. In such a world, agents can insure against all possible contingencies that are material for their welfare by transacting in perfectly competitive markets (as price takers), either through state-contingent contracts or through securities that in effect “span” all such contingencies. In this world, valuations would not only be uniquely determined but would also provide unambiguous and correct signals for resource allocation (eg, Beaver and Demski (1979), Beaver (1998) and Strong and Walker (1987)). This, however, would also be a world in which there would be *no need* for specific mechanisms to provide information and in which financial institutions would just be collections of securities, ie balance sheets without any particular economic function. Moreover, distinctions between different forms of firms' financing would be immaterial (eg, Modigliani and Miller (1958)).

Arguably, the world in which we live is a far cry from this archetype. Information acquisition is costly. Problems of asymmetric information and moral hazard are endemic, and so are incentives to misreport. Markets are not complete. Financial institutions arise as competing mechanisms with open markets to address some of these problems by internalising transactions. Some valuations are observable in market transactions, but these may not be independent of the parties entering them. Others are simply not observable; in the absence of a market to “reconcile” subjective perspectives, they remain distinct across agents. Value-

in-use will generally differ from value-in-exchange, and so will entry value from exit value. Correspondingly, risk premia to be applied to the same set of assets will also generally differ. The valuation of individual assets on a stand-alone basis will typically differ from valuations of the same assets done on a portfolio basis. Concepts like “liquidity” become meaningful and can have a first order effect on valuations and prices (eg, Holström and Tirole (2001)). And the capital structure, leverage and hedging decisions of firms can have a material impact on valuations (eg, Froot and Stein (1998)). Interestingly, this is a world in which financial reporting *does* have a role to play and *can* influence behaviour. But it is also one in which valuations are not uniquely determined and in which the market prices that do exist may fail to provide the right signals for economic behaviour.

A well-known example of such distorted signals relates to the occasional but persistent and significant “misalignments” in asset prices. What typically happens in these cases is that the self-reinforcing interaction between perceptions and attitudes towards risk, perceptions of asset valuations and financing constraints results in potentially disruptive fluctuations in asset prices. In a common pattern, for instance, these interactions may take prices to unsustainable levels and stretch balance-sheet exposures, thereby sowing the seeds of subsequent adjustments that are economically costly (eg, Borio et al (2001), Borio (2003a) and (2003b)). The dynamics of financial distress typically exhibit these characteristics. Under such conditions using market values as the basis for accounting valuations would embed into financial reporting those same distortions, potentially amplifying their impact on economic decisions. Hence, for instance, concerns about the so-called excessive “procyclicality” of the measures of value and risk that would be embedded in fair value accounting (eg, Borio et al (2001), Goodhart and Taylor (2004) and Kashyap (2005), Cifuentes et al (2005) and Shin (2005)).

Put differently, the notion of “unbiasedness” is a relative one. Value estimates that are calibrated to observable market prices may be “unbiased” with respect to market valuations. But those same valuations, in turn, may well be “biased” (misaligned) with respect to a counterfactual benchmark in which prices reflected the right signals for economic behaviour (sometimes captured in the short-hand “economic fundamentals”).

The broader and more subtle point is that in such a world the very act of measurement, *in general equilibrium*, changes the prevailing set of prices and transactions. Valuations, in other words, are fundamentally endogenous with respect to the measurement (accounting) approach adopted precisely because that system is intended to influence, and does influence, behaviour. This is a sort of “Heisenberg uncertainty principle” applied to financial reporting, in the sense that the very act of measurement affects what is being measured. The main reason for this endogeneity is the non-uniqueness of valuations which results from informational and market imperfections intrinsic to the economic environment. In other words, given the degree of ambiguity of pricing in incomplete markets, the accounting system in operation, by interacting with the private incentives of reporters and of the users of the corresponding information, can set in motion aggregate dynamics that fundamentally affect risk-return trade-offs. In essence, there is a fundamental endogenous component to economic and financial risk that is driven by institutional characteristics, including accounting standards and practices.<sup>18</sup>

Thus, we can distinguish two meanings of “unbiased”. One, the more ambitious, is unbiasedness with respect to the (unobservable) economic-fundamentals benchmark. The

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<sup>18</sup> For a further elaboration of this endogenous aspect of risk, see Crockett (2001), Borio et al (2001), Goodhart et al (2001) and Borio (2003). For a formal model of how the interaction between risk management and market prices may feedback on, and magnify, asset price volatility, see Danielsson et al (2004).

second, and less ambitious one, is unbiasedness with respect to (*conditional on*) a particular measurement system (accounting principle) in general equilibrium.

This distinction has two implications. The first is that the less ambitious definition is clearly also the more operational one. It is the perspective that is followed by standard setters and firms' management. It is also the definition on which our current analysis is based. In other words, we abstract from general equilibrium effects. The second implication is that even if one does abstract from such effects, a full analysis of the merits and drawbacks of alternative accounting principles inevitably also calls for a judgement about its *general equilibrium characteristics*. In other words, since the accounting principle has "macro" effects, the choice of an approach should be guided not only by its "micro" characteristics, but also by its system-wide ("systemic") implications. As noted at the outset, what we have argued elsewhere is precisely that pursuing an approximation to conditionally unbiased estimates of value in financial reporting is the right strategy *provided this is embedded in the fuller information set described earlier and is properly coordinated with prudential authorities*.

Even after narrowing the problem this way, a number of difficulties exist stemming from the strong limitations in available information sets. What can be regarded as the best approximation to (conditionally) unbiased valuations in a world of heavily imperfect information in which different valuations can coexist?

While it is not easy to define such a benchmark from first principles, it is possible to identify a set of desirable characteristics for the benchmark and the corresponding measurement system that take into account explicitly the implications of imperfect information. The value benchmark should represent the **realisable cash** from an asset; this would generally depend on attitudes towards risk.<sup>19</sup> The corresponding measure approximating the benchmark should be sufficiently **verifiable**, so that both model error and reporting bias could be assessed, at least ex post. And it should be **transparent**, so that users could form a judgement about its usefulness and make any adjustments to it that they may find appropriate.

Based on these criteria, at least for *items for which deep and liquid secondary markets exist*, the fair value-market price pair appears a reasonable candidate for the "unbiased" valuation benchmark-measure pair. When such markets exist, fair value is the best approximation to what values can be realised (cash in) at any given point in time.<sup>20</sup> The corresponding measure – the market price – has a number of useful characteristics. Being perfectly observable and unambiguous, it is highly verifiable. Almost by definition, no model approximations/assumptions are needed; model error is non-existent. And to the extent that the price cannot be manipulated at will, reporting bias error is also non-existent. Paradoxically, though, market prices can be rather opaque from a different perspective. While the prices themselves are observable, *the factors behind their evolution are not*. Is a price change reflecting changing expectations about future cash flows, changing perceptions of risk, changing attitudes towards risk, or short-run (disequilibrium) market dynamics, such as distress sales? This is very hard to infer and, yet, is very valuable information for

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<sup>19</sup> At this stage, we leave intentionally vague the treatment of aspects related to the timing and conditions under which those cash flows could be realised.

<sup>20</sup> Fair value is technically defined as "the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction". It can therefore be thought of as the conceptual approximation to the price that would rule in a deep, liquid and highly competitive spot market, in so far as it implicitly assumes that *the identities of the buyer and seller do not matter*. Note that this definition also assumes that the transaction does not involve any counterparty risk, since in that case the correct price would have to reflect the identities of the counterparties involved. Note also that, in this section, we assume that there is no ambiguity about the definition of an asset and that all the cash flows potentially associated with it are covered by fair (or entity-specific) value estimates. These assumptions are relaxed in the next section.

assessing the underlying economic value and the financial risk associated with an item. In other words, market prices are *completely transparent* representations of total realisable value, but also *completely opaque* as regards its components and drivers.<sup>21</sup>

For any other measure, however, measurement error becomes a key issue, whose significance depends on how “close” the instrument is to realisable valuations. Here, two approaches to valuation can be distinguished, depending on their starting point: a top-down and a bottom-up approach.

The **top-down** approach consists of finding the closest market counterpart to the instrument in question. At one end, the instrument may be valued directly based on market prices for the closest equivalent (eg, through “matrix pricing”). Even here, important issues of liquidity arise. They can introduce considerable noise in valuations and can lead to an overestimation of value unless properly taken into account.

More often than not, though, there is no obvious close counterpart in the market on which the investor community can somehow reconcile differing views about the value of an item; in this case, the valuation methodology can be **bottom-up**, ie, based on some underlying model that builds up a measure of valuation from its underlying components. A natural starting point to frame the question is to think of asset (liability) valuations (V) as discounted (d) present values of future expected cash flows (EF), with the discount factor (d) being a combination of a riskless rate (r) and a risk premium (p).<sup>22</sup> Increasingly, this is *the* common building block used to discipline one’s thinking about valuations. It is the workhorse of finance. And it is the basic tool in the world of risk measurement and management. In symbols, letting f(.) stand for a general functional operator, we have:

$$(1) \quad V = d * EF$$

$$(2) \quad d = f(r+p)$$

This model of valuation would then seek to capture an unbiased valuation by calculating values bottom up, plugging in the individual components. Note that, in turn, this valuation can be split into two components, namely the **actuarial component** (EV) and the **risk adjustment** (RV). The former is purely an actuarial estimate of future cash flows adjusted for the time value of money; the latter is the “margin” that incorporates attitudes towards risk given those expectations:

$$(3) \quad V = EV + RV$$

Even if this is agreed as the starting point for a valuation benchmark, from where would the inputs be obtained? Different answers to this question result in different valuation principles. To be sure, the riskless rate can be approximated by some market rate. But whose expectations and whose risk premia should be included? Various possibilities arise. Estimates of fair value would seek to replicate “market” expectations and risk premia. Estimates of entity-specific value would reflect those of the entity (firm) holding the asset (liability).<sup>23</sup>

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<sup>21</sup> Having said this, there is considerable evidence suggesting that time-varying risk premia play an important role in price fluctuations, especially for certain asset classes. In particular, for credit instruments see eg, Bertt et al (2005) and Amato (2005).

<sup>22</sup> An alternative representation is to think of the expected cash flows as embodying risk preferences, assigning lower (higher) probabilities to outcomes which are more (less) preferred, ie converting the statistical into so-called risk-neutral probabilities, and then discounting at the riskless rate.

<sup>23</sup> Note two implications of this. First, in entity-specific value the cash flows would not necessarily reflect the cash flows in a competitive market, the ideal of fair value, but also any monopolistic power included in the pricing. This is one reason why prices could be either above or below (when seeking to gain market share) fair value. Second, in a sense, historical cost accounting can be thought of as a special case, in which at inception the

We do not wish to take a stand here on which would be better; this arguably depends on circumstances. For instance, in cases where corresponding markets are close to non-existent, it would seem preferable (inevitable?) to take as a basis a firm's own expectations of cash flows. We do wish to highlight, however, a number of points.

First, whatever approach is chosen, the issue of measurement error is critical. For one, there should be a minimum availability of raw data to ensure that the statistical error is not too large. In addition, the more complex the instrument and the greater its "distance" from market counterparts, the harder it is to value it and the more important is the impact of the methodology used, including that of the embedded assumptions. Distance and complexity also increase the scope for misreporting.<sup>24</sup> Disclosure of ex ante measures of model error and the feasibility of ex post validation/verification are crucial in this context. And so are mechanisms to encourage truthful reporting. Among these, the requirement that the measures be embedded in the firm's business processes, such as its pricing, risk measurement and capital allocation systems, is especially helpful. Prudential supervisors have relied extensively on this "use test" requirement to encourage truthful revelation when prudential controls have been based on firms' own models.<sup>25</sup> There may also be a *critical threshold beyond which the validation of the corresponding measure is inherently so unreliable that the corresponding valuation benchmark (eg, fair value) may undoubtedly be inappropriate*. This would depend, inter alia, on the costs and benefits of alternatives, not least historical cost accounting, on which judgements can easily differ.

Second, the meaning of verification can vary across the components of the pricing, particularly as between the actuarial forecast of cash flows and the risk adjustment in (3). For example, as the cash flow streams can be measured ex post, the reliability of the forecasts can be assessed through back testing. Here the validation of *outputs* is possible. The corresponding input would, more often than not, be the institution's own forecast (eg, of the cash flows from insurance contracts). For other elements, such as the risk premium, however, the validation concerns primarily the integrity of the *process*. This is because, strictly speaking, market risk premia are unobservable and, if the institution uses an own premium, reflecting its own "risk preferences", there is no obvious way of disputing it provided it lies within a reasonable range.<sup>26</sup> A common example might be the varying confidence levels used by some insurance companies to calculate the risk margins needed to adjust the value of their liabilities.

Third, importantly, issues of verification arise *regardless* of the accounting principle employed as long as expectations about the future are embedded in valuations. For instance, a bone of contention between accounting standard setters, risk managers and prudential supervisors is the basis on which to recognise impairment in asset values, notably loans. This issue arises regardless of whether the loan is valued at amortised cost (in which case the interest rate, including any risk premium, is in effect assumed constant until impairment occurs) or on a fair-value/entity-specific basis (in which case they are assumed to vary over time). What is at stake here is the measurement of the changing expectation of the cash flow component (EF).

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transaction price is the measure of valuation but subsequent adjustments follow a predetermined rule that does not generally seek to track changes in the time value of money or in cash flow expectations. For a further discussion of entity-specific and fair value, see Peasnell (2005).

<sup>24</sup> See, for instance, Bies (2005) for references to cases of systematic overvaluation of certain tranches in securitisations in recent years.

<sup>25</sup> See BCBS (2005) for a discussion of some of these aspects and of broader safeguards in the context of the use of the fair value option by banks. See also Group of Thirty (2003) concerning best practices in this regard.

<sup>26</sup> This is an oversimplification, of course. In a number of cases risk adjustments do not explicitly enter the pricing models. For example, in the canonical Black-Scholes options model, based on arbitrage arguments, the risk premium does not appear (it is in fact included in the asset on which the option is written).

In particular, what evidence of a deterioration in prospects is admissible? Accounting standards tend to be rather restrictive here, stressing that a clear present or past “trigger event” should be identified (the so-called “incurred-loss” model).<sup>27</sup> Prudential supervisors and firms would prefer a different criterion, which permitted more forward-looking assessments based on statistical patterns and past experience. In our view, ensuring more forward-looking assessments is critical, since it is views about *events taking place over the residual maturity of the instrument* that are relevant for the assessment of its value. Ultimately, an approach more consistent with a rigorous treatment of risk would define statistical validation criteria based on appropriate back testing procedures.<sup>28</sup>

Finally, and more generally, all this highlights the importance of the transparency of the corresponding measures. This is not just a matter of providing estimates of ex ante measurement errors and summary statistics of ex post performance, where applicable. It also implies providing a sense of the methodology and of the basic building blocks, including for the risk premium. This would allow outsiders to form a view about the reliability of the numbers and hence adjust their behaviour accordingly.<sup>29</sup>

## Risk and the gap between accounting and economic valuations

It is now time to explore in more detail the factors that can lead to a gap between accounting valuations, on the one hand, and underlying economic (unbiased) valuations, on the other, and how this gap might be narrowed. We will argue that greater consistency with sound risk management can help to bridge the divide.

So far we have considered the concept of unbiasedness and the implications of measurement systems based on some implicit assumptions that have greatly simplified the analysis of their characteristics and merits. While useful at the level of abstraction of the analysis so far, these assumptions need to be relaxed when considering valuations more concretely. Specifically, we have assumed that the item to be measured is unambiguously defined and that all the corresponding cash flows are included in measurement in the financial statements; ie we have assumed away the issues of definition and, in technical accounting terms, of “recognition”.<sup>30</sup> And even though we raised the possibility, we have not considered the implications of applying differential valuation principles to different items in a balance sheet; ie what is technically referred to as “mixed-attribute” accounting (eg, the co-existence of fair value and historical cost accounting).

In fact, failure of these assumptions to hold is a major reason for the gap between accounting and underlying economic valuations. Moreover, the most controversial issues giving rise to tensions between the accounting standard setters, risk managers and prudential supervisors often arise precisely for the same reasons. Consider the implications of each assumption in turn.

First, the **definitions** of assets and liabilities may not necessarily include all the cash flows that the firm (or the “market”) considers when making decisions; typically, in fact, they are

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<sup>27</sup> On this, see also Barth (2005) and Borio and Lowe (2001). IAS 39 states, in particular, that “Losses expected as a result of future events, no matter how likely, should not be recognised” p. 43, (IASB (2003)). This goes back at least to IAS 5 in the mid-1970s.

<sup>28</sup> This question is separate from whether impairment could be allowed at inception, which depends on the initial pricing. These issues are discussed in more detail in Borio and Lowe (2001).

<sup>29</sup> See also Bies (2005) on these issues.

<sup>30</sup> See, in particular, Barth (2005) for a discussion of definitions of assets and liabilities and their recognition.

more restrictive. Examples of the genre include, in particular, intangibles, growth options, and, more generally, cash flows associated with anticipated, but as yet not contracted, income streams. Depending on the predictability of such cash flows, the firm may understandably wish to take them into account in its business and hedging decisions. Accounting standard setters, however, may not find it consistent with their framework.

Second, even if the asset/liability meets the relevant accounting definition, it might not meet the standards for **recognition** on the balance sheet. Failure to recognise internally generated intangibles is a clear case in point. In this case, the results are analogous to those where the accounting definitions do not correspond to those effectively employed in the running of the business.

Finally, even absent the previous two types of wedge between “economic” and “reported” values, a gap may arise from the use of **different valuation principles** for different items in the balance sheet. The most common source of such mismatches is the current mix of historical and fair value principles applied to the accounts.

What gives rise to such discrepancies? One factor may simply be the piecemeal evolution of the accounting standards, particularly relevant in relation to aspects of the coexistence of different measurement attributes, such as historical and fair-value elements. A second factor relates to specific aspects of the definitions. For instance, an entity should have a sufficient degree of “control” over the cash flows associated with an asset before the item is deemed to meet the definition of an asset and “past transactions and events” have to be clearly associated with its control. More fundamentally perhaps, a third factor relates to the degree of verifiability of the cash flows associated with the assets (liabilities). Indeed, issues of control or the stress on the relevance of “past transactions and events” may arguably at least partly be traced to difficulties in verifying the corresponding cash flows, especially when future cash flows are involved.

Note that it is partly the binary nature of the accounting decisions that is responsible for the gap. Items either meet or do not meet the corresponding definition; they either meet or do not meet certain criteria; the corresponding cash flows are generally either fully included or excluded. This contrasts with the more nuanced treatment in a risk management framework, in which probabilistic statements play a key role.

The gap between accounting and closer approximations to underlying economic valuations can clearly distort the accounts and, in a world of imperfect and costly information, also economic behaviour.

One concern relates to the possible systematic over- or under-estimation of value. For example, for a given approach to valuation, failure to identify a liability correctly or to recognise the full set of cash flows related to it would result in an overvaluation of net worth and would distort the time profile of the corresponding income measures. For instance, one reason for concerns with valuing liabilities at market values is that a deterioration in the credit standing of the issuer could actually result in a profit if the corresponding deterioration on the asset side was not properly recognised (eg, Barth et al (2004) and Lipe (2002)).<sup>31</sup>

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<sup>31</sup> For prudential supervisors, including the own-credit standing effect is particularly troubling. But quite apart from misleading signals arising from failure to recognise all cash flows potentially relevant for the equity value of a firm, there is another problem. At bottom, conceptually, fair value accounting does away with insolvency, *even if all potential cash flows from a firm were to be recognised*. This is so because, given limited liability, the value of the equity of a firm cannot be negative; in fact, the value of equity as an option will generally be positive. In such a world, the rules of the game for the orderly exit of firms and early intervention by prudential authorities would have to be rewritten. Failure to recognise some of the cash flows on the asset side simply complicates matters further.

A second, even more widespread, concern is that the mismatch can result in “artificial” volatility in net worth and income measures, ie volatility that in some sense does not reflect “underlying economic volatility”. On the one hand, this artificial volatility could distort the behaviour of investors, unnecessarily increasing financing costs. In some sense, the firm would be perceived as “artificially risky”.<sup>32</sup> On the other hand, it could encourage inappropriate hedging practices, as the firm came under pressure to hedge the volatility in the accounting numbers as opposed to the one that might be closer to the underlying economic volatility associated with the economic substance of the transactions. The complex apparatus of hedge accounting is precisely aimed at limiting the effects of the mismatches on the volatility of the balance sheet and the income statements arising from mixed-attribute accounting. This measured volatility would still exist, but would be smaller, if only entity-specific and fair values coexisted in the same framework, because of the different inputs, as discussed above. The accounting standard for insurance, for instance, seems to be going in this direction. But the volatility would not be eliminated completely even in a full fair value arrangement. In part, this would arise from the inevitable coexistence of marking-to-model and marking-to-market elements. In addition, it could also derive from the implications of definitional and recognition issues.

Revealing illustrations of the potential tensions between accounting and firms’ perspectives on valuation and volatility arising from definitional and recognition issues include the treatment of demand deposits and that of the renewal of insurance policies, which have attracted much attention in recent years. In both cases, for the purposes of their business planning and risk management, financial institutions have been accustomed to treat the corresponding instruments on the basis of their behavioural (“expected”), as opposed to contractual, maturity, with this (statistically) expected maturity being estimated with reference to historical patterns. This has obvious implications, inter alia, for the hedging of interest rate risk, as actual maturities are much longer than contractual ones, especially if the latter are interpreted as the shortest time interval within which the withdrawal/cancellation option can be exercised.

Let’s consider in more detail the case of demand deposits, although broadly analogous arguments could be made for insurance policies (see Table 2). The accountant would treat the deposits individually. And would consider each deposit as the outstanding balance at a point in time, with potential future additions and withdrawals even by the same depositor representing new, future transactions over which the institution has no control. As such, these transactions would be excluded from consideration, as not meeting the definition of an outstanding asset/liability. The corresponding expected maturity of the deposit would then be very short, days, weeks or months rather than years. In contrast, the perspective of the firm is entirely different. Even for a single deposit account, it would consider the average balance as being the relevant criterion. Moreover, it would tend to focus on the whole stock of deposits at a point in time across all deposit holders, normally even offsetting the transactions of new depositors against those done by old depositors. The resulting expected maturity of the deposit base would be quite long, typically years. In fact, banks regard such core deposits as one of the most stable sources of funds at their disposal.

This contrast also leads to counterintuitive implications for valuations and for the profit and loss account. Accountants value demand deposits at their face value, because they can be turned into cash at any moment for that amount. Thus, changes in interest rates do not have any effect on their valuation even in a fair value world. In contrast, based on their behavioural maturity, to the extent that the interest rates on deposits are sluggish with respect to market

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<sup>32</sup> These concerns are distinct from those relating to excessive procyclicality noted earlier. Even so, they are also a concrete manifestation of the more general point made earlier: in the real world, market and informational imperfections give rise to non-uniqueness of valuations and accounting has a direct impact on behaviour.

rates, changes in market rates do result in economic gains and losses. A rise in market rates, for instance, should lead to a gain for the institution (the so-called “endowment effect”).

Table 2  
**Narrowing the gap: demand deposits**

	<b>Accounting</b>	<b>Risk management</b>
Unit of analysis	individual basis	portfolio basis
Future changes in balance	excluded	included (statistical basis)
Maturity	very short	long (behavioural)
Impact of a rise in market rates on valuations <sup>1</sup>	zero (face value)	fall (profit)

<sup>1</sup> Assuming that deposit rates are “sticky” relative to market rates.

This suggests that it would be desirable to seek to close the gap between the way these issues are dealt with in the accounting and in the internal running of the firm. It seems to us that the economic substance of the transactions is closer to the latter than to the former. The risk is that prudent economic hedging may be discouraged at the expense of uneconomic hedging aimed exclusively at accounting numbers and that, more generally, information signals may be distorted. How exactly this could be done is not clear. The possible solutions do depend on detailed interpretations of definitions and concepts and also on potential knock-on effects on other parts of the accounting framework.<sup>33</sup> But the general direction is clear: paying closer attention to consistency with sound risk management practices holds useful clues about how to narrow the gap.<sup>34</sup>

These examples are just illustrations of a much more general point. It is clearly unrealistic to expect that the needs of accounting and risk management could be fully reconciled. Tensions are bound to remain as a result of differences in the objectives and “degrees of freedom” in the two disciplines. Questions of what can and cannot be recognised as assets and liabilities, based on criteria such as the verifiability of the corresponding amounts, are an obvious example. Even so, there seems to be considerable scope for a narrowing of the gap between the two perspectives. It is desirable to strengthen efforts to this end.

## Concluding remarks

*“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.”* This quote from Enron’s internal risk management manual in all probability overstates the primacy of accounting over sound risk management. But it does remind us that the numbers that accounting produces act as a focal point for how outsiders perceive the performance of the firm and inevitably condition management’s decisions. Acting as such a

<sup>33</sup> Barth (2005) discusses some options.

<sup>34</sup> The qualification “sound” is key: not all risk management practices are appropriate and based on robust economic principles.

focal point is indeed the whole purpose of accounting in the first place. This must be so, logically, since otherwise the information provided would be unnecessary and would in no way provide useful signals to outsiders.

The strong influence of accounting on behaviour highlights the need to narrow the gap between accounting and economic reality. In an ideal world, there would be no tension between accounting, underlying economic realities and sound risk management. This would be so despite the undeniable difficulties and ambiguities that arise in properly identifying and agreeing on what those “underlying economic realities” are.

In recent years, important steps have been taken to try to close this gap. The language of risk management is increasingly finding its way in the accounting world, as part of the complex search for estimates of valuations that are “closer to economic realities”. In the process, this has also helped to bring the worlds of accounting standard setters and prudential supervisors closer together. The relationship between these three worlds has by no means been easy. But the progress in the dialogue between the three has been unmistakable.

In this paper we have argued that this dialogue should be strengthened and that the path to narrow the gap should assign a key role to risk measurement and management technologies. It is unrealistic to expect that the gap could be closed completely, but there does appear to be scope for considerable improvements. Such technologies are a key component of the enhanced information set needed for a proper functioning of markets, which should be extended to give more prominence to risk and measurement error information. They play a crucial function in the measurement, verification and validation of valuations. And they could act as more of a focal point in the design of accounting standards, with these exhibiting a heightened sensitivity to the needs of sound risk management.

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