Moving the Conceptual Framework Forward:

Accounting for Uncertainty

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Abstract

In seeking to meet the objectives of financial reporting stated in the IASB's Conceptual Framework, the current 'balance-sheet' approach is necessary but not sufficient. Critical, but largely overlooked in the Framework, is the role of uncertainty, which we argue defines the role of accrual accounting in providing useful information to investors. This role is in some sense paradoxical: on the one hand, uncertainty undermines both the balance sheet (because uncertain assets are unrecognized) and the income statement (because mismatching is unavoidable); yet, on the other hand, the presence of uncertainty gives purpose to accrual accounting, as a distinctive source of information in helping investors to distinguish between the certain and the uncertain, and to thereby embed such information in both stock-based and flow-based valuation. This informational value cannot be realised by application of a balance-sheet approach alone. We argue instead for the application of balance sheet recognition and measurement criteria that are motivated by consideration of subsequent impact on the income statement, which in turn requires conceptualising different categories of matching (and mismatching) in financial reporting. We show that this combination of balance-sheet and income-statement approaches enhances the communication of information to investors under conditions of uncertainty, thereby giving greater clarity and purpose to the Framework in conceptualising decision-useful, accrual-based accounting information.

Moving the Conceptual Framework Forward: Accounting for Uncertainty

The recognition and measurement of assets and liabilities and the consequent implications for income and expenses are the key issues in accounting—they define the balance sheet and the income statement. Thus, Recognition and Measurement are key operational features of the emerging Conceptual Framework of the International Accounting Standards Board for which other aspects of the Framework are largely a preamble. However, the resolution of these issues is far from satisfactory in the (draft) Framework, driven by definitions of assets and liabilities that omit a key feature and by the application of qualitative characteristics that, while admirable, are too vague to produce discriminating accounting principles.

This paper provides a solution for recognition and measurement in accounting. The solution involves the incorporation of uncertainty when booking assets and liabilities to the balance sheet. The definition of assets and liabilities in the Framework are based on expected values—benefits and outflows—but do not entertain the uncertainty around those expected values, the likelihood that the expected values may not be realized. Incorporation of uncertainty qualifies the recognition of assets and liabilities and resolves the issue of the measurement of the assets and liabilities recognized. Further, it leads to a clear definition of the concept of income (and expense) that articulates with the balance sheet.

The Framework embraces a balance sheet approach for recognition and measurement, seemingly in rejection of an income statement approach involving the matching of expenses to revenues; (net) income is viewed as a by-product of the measurement of assets and liabilities in the balance sheet.[1] The incorporating of uncertainty maintains the balance sheet approach, but also defines accounting for (net) income that maintains a matching concept, albeit matching that accommodates uncertainty in the recognition of assets and liabilities in the balance sheet. Accordingly, our approach can be characterized as a mixed

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[1] The income statement approach is advocated and contrasted with the balance sheet approach in Dichev (2007).

balance sheet and income statement approach, but one that has the important feature of conveying uncertainty, an issue about which investors are quite concerned.

Uncertainty in the Conceptual Framework

The starting point for the argument in this paper is that the Framework understates the importance of uncertainty. This point is easily missed, given that uncertainty is pervasive in practice. Yet, in the hypothetical case where there is no uncertainty, there would be limited use for the 'technology' of accrual accounting, and thereby for the balance sheet or the income statement. It is uncertainty that gives accounting the potential to be useful.

Because the Framework does not adequately capture this central role of uncertainty, the 'valuation-relevance' and 'stewardship' objectives in the Framework are not explicitly linked to the technology of accrual accounting; after stating these objectives, the Framework simply presumes that accrual accounting is useful. We argue that uncertainty defines that problem, and is therefore the key concept that links accrual accounting to the objectives of and shapes the solutions for recognition, measurement, presentation and disclosure. In brief, the central role of accounting is to shed light on uncertainty in investing and the evaluation of stewardship, and explicit acknowledgement of this role is therefore needed in the Framework to guide conceptual thinking.

We set our argument against the benchmark setting of a certain world. In this setting, all assets and liabilities can be recognised at their economic value, and while perfect matching is possible in the income statement, it is also the case that the income statement is redundant as a source of useful information. The introduction of uncertainty changes these conclusions: it raises the prospect of the non-recognition of assets and liabilities and it leads to the problem that perfect matching is impossible, yet it also suggests the possibility of earnings conveying useful information, so bringing the income statement to life. We argue that, under uncertainty, a balance-sheet approach is insufficient without explicit consideration of the income statement consequences of recognition and measurement, which concern the provision of useful information for flow-based valuation. To that end, we

identify four different types of (mis)matching – revenue matching, *ex ante* matching, *ex post* matching and mismatching – and we show how this typology can be applied to issues of recognition, measurement and presentation. In effect, we propose an income statement approach to financial reporting that extends the balance sheet approach that is embedded already in the Framework.

First we consider the objectives of financial reporting, and the critical role of uncertainty in both understanding the nature of these objectives and in laying a foundation for how best they can be met.

Framework Objectives and the Demand for Accrual Accounting

We take as given the IASB's stated objective in the Framework to 'provide useful financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity.' (para. 1.2) We also agree with the implication that follows from this objective, which is that investors and others (hereafter 'investors') will seek information with respect to 'the amount, timing and uncertainty of (the prospects for) future net cash inflows to the entity…' (para 1.3)[2]

In itself, this objective is, of course, little more than an expression of the discounted cash flow model that underpins basic finance theory. As such, it does not say anything directly about the role of accounting. Likewise, the Framework's Qualitative Characteristics are not so much a description of the properties of accounting information but, rather, of useful information in general. It is difficult to argue against a definition of relevant information that is 'capable of making a difference in the decisions made by users.' (para. 28)[3] Nor is it unreasonable that information should 'faithfully represent the phenomena that it purports to represent' (para. 2.14), nor that it should be 'complete, neutral and free from error' (para. 2.15). Yet such characteristics are in themselves rather anodyne, in that they do not

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[2] We note that the sentence adds further '… and their assessment of management's stewardship of the entity's resources.' We come back to this issue of stewardship later in the paper.
[3] Later in the paper, we come back to the issue of 'predictive' vs 'confirmatory' value.

lead to discriminating decisions with respect to accounting: they might be characterised as virtuous but not concrete.

Although the Framework does not explicitly link accounting variables to the discounted cash flow model, some insight can be introduced here from the residual income model, which has long existed in the research literature (Peasnell, 1982; Ohlson, 1995). At one level, the residual income model can be viewed as little more than a formal restatement of the discounted cash flow model; it just substitutes the accounting variables, book value and earnings, for cash flows, but is silent on how book values and earnings are to be recognized and measured. Thus, the residual income model does not in itself demonstrate that the mechanism of accrual accounting provides information to investors. At another level, however, and as will be explored later in the paper, the residual income model offers useful insights, because it makes transparent a formal relationship between accounting and valuation. In turn, this suggests (even though it does not in itself demonstrate) that accrual accounting – the balance sheet and the income statement – can potentially serve as a 'technology' that captures and structures data in order to provide useful information.

Something of this insight is implied (but not explored) in the Framework's description of accrual accounting. The Framework asserts that 'accrual accounting … is important because information about a reporting entity's economic resources and claims and changes in its economic resources and claims during a period provides a better basis for assessing the entity's past and future performance than information solely about cash receipts and payments during that period.' (para. 1.17) There is an explicit role here for both the balance sheet and the income statement, a role that is 'important' because accrual accounting is asserted to have informational superiority over the cash flow statement. There is not, however, any justification for this assertion.

In the next paragraph, the Framework goes on to claim that information in the income statement '… indicates the extent to which the reporting entity has increased its available economic resources, and thus its capacity for generating net cash inflows through its operations … (and) may also indicate the extent to which events such as changes in market prices or interest rates have … (affected) the entity's ability to generate net cash inflows.' (para. 1.18) This statement hints more strongly at why accounting information might be

considered to be useful, and also at how it might be used, yet the picture remains incomplete. The question that remains unanswered is the following: why, in principle, are users helped to understand 'the amount, timing and uncertainty of (the prospects for) future net cash inflows' by means of the structuring of economic resources and claims into a balance sheet, alongside the presentation of changes in those resources and claims in the income statement?

What is missing here is a characterisation of the problem that accounting is trying to solve. Without defining that problem, the Framework proceeds directly (from its Objective and Qualitative Characteristics) to a proposed solution, which takes the form of a conceptual analysis of criteria for recognition and measurement.

In this paper, we propose a different route to a solution. We identify uncertainty as the central problem that links the objectives of financial reporting with the technology of accrual accounting. The context for financial reporting is that investors face uncertainty (risk) in making investments, and so they seek information about that uncertainty; while expected economic benefits are important, so is the uncertainty that those expected economic benefits may not be realized.[4] It is the practical implication of uncertainty that justifies the need for accounting and that shapes the appropriate criteria for recognition, measurement, presentation and disclosure. In brief, the central role of accounting is to shed light with respect to the problem of uncertainty, and explicit acknowledgement of this role is therefore needed in the Framework to guide conceptual thinking.[5]

We develop the ideas in this paper by first considering accounting under certainty and then asking how that accounting might change with uncertainty.[6]

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[4] The literature sometimes distinguishes between "risk" and "uncertainty", with "uncertainty" broader than "risk" (Knight, 1921). We simplify by making no such distinction, using "uncertainty" to mean any case where outcomes are not certain.

[5] Note uncertainty exists now, with respect to amounts and timings of cash flows that do not yet exist. The challenge for accounting is to capture and structure currently-available data (an input) in order to help mitigate the problem of uncertainty with respect to forecasting (an output).

[6] In our discussion, we express expected economic benefits as (the more familiar) expected cash flows, with the understanding that benefits can be received (or resources disbursed) in cash-equivalent kind. This is just for simplicity of exposition; we believe this does not take away from the Framework definitions of assets and liabilities.

Accounting in a Certain World

In a world of certainty, we can identify three characteristics of accounting information that can be used as a benchmark for evaluating the real-world setting of uncertainty.

First, a feature of certainty is that expected cash flows have no variance around them. In such a world, cash flows are perfectly 'matched' to time periods, in the sense that it is known precisely when they will occur. It follows that their present value is also known, and that the economic values of assets and liabilities is unambiguous, for the determination of these values requires only that non-zero certain future cash flows are discounted at the certain risk-free rate.

Second, it follows from the above that stocks and flows of economic value are equivalent, in that the value of the former is the flip-side of the sum of present values of the latter, meaning that there is no obvious prior claim of either a balance sheet approach or an income statement approach to financial reporting. Moreover, the above perfect matching of cash flows also implies the possibility of an equivalent perfect matching of income and expenses in the income statement: the amount and timing of future revenues is certain, and the associated allocation of expenses can be set such that both *ex ante* and *ex post* there is no mismatching. Alternatively stated, there would be no unexpected ('windfall') gains or losses, and so Hicks' distinctions between alternative earnings streams collapses (Hicks, 1946; Bromwich et al., 2010). The net from the matching produces earnings that just reflect the net assets on the balance sheet earning at the risk-free rate.

Third, and as demonstrated by Beaver and Demski (1979), it follows directly from the above that there is actually no demand in a certainty setting for the income statement (nor for the cash flow statement).[7] This is because all information about economic benefits is given by the balance sheet and the risk-free rate. Indeed, the 'balance sheet' has little meaning other than being the place where the economic value of the reporting entity's net claims are straightforwardly aggregated. Or, stated somewhat differently, the technology of accrual accounting serves no useful purpose, for the simple reason that cash flows are both known

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[7] Strictly, the Beaver and Demski argument requires the assumption of perfect and complete markets. This includes markets for human capital, which are in practice ruled out of accounting recognition. This is not, however a demanding assumption in a hypothetical, certainty setting.

and sufficient for valuation. There is no need to recognise revenues as they are 'earned', nor to allocate or amortise in order to recognise expenses as they are 'incurred', nor therefore to establish the articulated relationship between balance sheet and income statement that enables the accrual technology to be applied.[8] The role of accounting in this world is therefore at best trivial, and there is nothing which leads to the expanded discussion of recognition and management approaches in the Framework.

In summary of the above, the certainty setting provides a benchmark with three characteristics: first, all assets and liabilities can be recognised at their economic value; second, perfect matching is possible in the income statement; third, notwithstanding the possibility of perfect matching, the income statement is redundant as a source of useful information.

Accounting under Uncertainty

The world of certainty is, of course, highly stylized. It is valuable conceptually as a benchmark, but it fails almost entirely as a description of the world in which business actually operates. Perhaps the closest case is the accounting for a held-to-maturity (risk-free) government bond under the effective interest method. Yet even here the certainty case does not strictly apply, not least because it requires that the bond be held to maturity.

The certainty case is, however, a useful device to understand accounting under uncertainty, for uncertainty requires a consideration of the appropriate accounting where the three conclusions above do not hold.

With respect to the first characteristic, the presence of uncertainty raises the prospect of the non-recognition of assets and liabilities. Consideration of the second characteristic leads to the problem that, under uncertainty, perfect matching is impossible. Finally, it is uncertainty that suggests the possibility of earnings conveying useful information, and which thereby brings the income statement to life.

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[8] There is also no 'stewardship' demand, because management performance is entirely determined.

The introduction of uncertainty therefore changes the picture, and forces us to think differently about how the technology of accounting can be useful. If, under uncertainty, the balance sheet cannot capture the economic value of the entity, then what should it capture, and in what way does it remain useful, in spite of its reduced scope? If matching is impossible, then what is the meaning in earnings? And how, if at all, can the income statement convey information under uncertainty given the inevitable mismatching that results? These are the essential problems with which financial reporting must grapple, and they arise entirely upon the introduction of uncertainty.

It is insightful at this point to return briefly to the residual income model, and to consider the implied informational roles of the balance sheet and the income statement. In doing so, conclusions for the 'real world' follow that relate to each of the thee benchmark characteristics of the certainty setting outlined above – that book value is equal to economic value, that the income statement can be perfectly matched, and that notwithstanding this matching the income statement is informationally redundant.

First, it follows from the residual income model that, if book value does not capture the economic value of the entity, then earnings become value-relevant: if the price-book value ratio (PBV) is different from one, the 'missing' value is explained by the sequence of expected residual income (or 'abnormal earnings') in the future. This possibility is acknowledged – indeed, assumed – in the Framework (para 1.7): 'general purpose financial reports are not designed to show the value of an entity.' Yet the Framework neither identifies uncertainty as the underlying reason for this position, nor does it identify the consequential valuation role for the income statement in providing flow-based value-relevant information, to supplement the stock-based information that is (incompletely) provided in the balance sheet.

 This point can be illustrated by contrasting the case of assets that are independent of one another and have observable market prices, with all other assets. For the former, market-based valuations are known, PBV equals one, and earnings are informationally redundant. For the latter, in contrast, valuations are uncertain and consequently asset are not recognised, PBV is less than one, and valuation therefore relies upon the extrapolation of income statement data. It follows that the income statement can in principle play a role in

valuation whenever, for example, cost-based measurement is used in preference to fair value, which might arise where entry value is historical and therefore 'known', while exit value depends upon uncertain future market conditions and can therefore only be subjectively estimated.[9]

This in-principle usefulness of the income statement is, however, problematic in practice. This is because the income statement can be perfectly matched in a certainty setting, yet not under conditions of uncertainty. In the latter setting, the uncertainty of future revenues implies the uncertainty of amortisation schedules by which currently-incurred resource outflows can be attributed (via the accrual mechanism) to corresponding future resource inflows. While perfect matching in this setting is desirable, because of the valuation role identified above for the income statement, it is also impossible. This impossibility of matching is the underlying weakness in calls for an 'income-statement framework', as an alternative to the balance sheet approach adopted by the IASB (Storey and Storey, 1998). It is, of course, desirable, that – in the presence of uncertainty – the past can serve as a guide to the future, for which a 'matched' income statement would be ideally suited, and in the context of which the concept of a Price-Earnings (PE) ratio would have its surest practical foundation (Black, 1980). Yet such an approach would be to will a solution by denying the problem. While desirable as the basis for valuation under uncertainty, perfectly 'matched' earnings is unachievable for precisely the reasons why it is desirable, namely that (both *ex ante* and *ex post*) it exists only in the absence of uncertainty (Solomons, 1961).

This discussion suggests a conundrum – a Catch 22 – which is most evident if we now turn to the third characteristic of the certainty setting, namely that the income statement in a certainty setting is informationally redundant. The conundrum is this: perfectly matched earnings can only be known in a setting where they do not need to be known, while earnings become in principle useful only in a setting where they cannot be known.[10]

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[9] In practice, of course, historical cost is 'adjusted' for depreciation and impairment, both of which challenge the notion that historical cost can be 'known'.

[10] Moreover, there is a need to accommodate information asymmetry and agency in order to describe the real world of uncertainty for the investor, because information uncertainty for investors concerns both intrinsic uncertainty and uncertainty about reporting.

We are not directly helped by either the Framework or the residual income model in addressing this problem, because both are silent on the underlying problem of uncertainty and on how this might be addressed. While the Framework does refer to the notion of 'predictive value', and thereby to some relationship between a 'known' past and an uncertain future, the reference is vague and unhelpful.

The above Catch 22 is, however, stated in stark terms, with reference to the impossibility of *perfect* matching. We will argue that addressing the conundrum requires acknowledging that imperfection is unavoidable, yet that its consequences can be minimised. Our approach is to consider how accounting can be *informative* with respect to uncertainty, whereby the unavoidable existence of uncertainty is acknowledged and the role of accounting is conceptualised as a mechanism for enabling investors to better understand the consequences of uncertainty and thereby to make better informed resource allocation decisions. We start with a consideration of accounting for the inflow of economic resources, in the form of revenue, and then proceed to consider the more problematic and more complex case of accounting for the outflow of economic resources, and the associated distinction between capitalisation and expensing.

Revenue Recognition under Uncertainty

With respect to revenue, IFRS accounting in both the balance sheet and the income statement can be described as *implicitly* acknowledging the presence of uncertainty, and as providing the most useful information in that regard. Moreover, the above Catch 22 with respect to the income statement is also largely avoided.

With uncertainty, expected cash flows have variance around them.[11] In itself, this need not constrain their recognition on the balance sheet – because they could simply be estimated – yet the Framework does constrain recognition: the requirement of expected cash inflows is a necessary, yet not sufficient, for recognition. The Framework defines assets and liabilities

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[11] We use variance to refer to all moments of the distribution, not just the second moment (the "variance").

as follows (where an 'economic resource' is in turn defined as 'a right that is capable of producing economic benefits').

> The definition of an asset: *A present economic resource controlled by the entity as a result of past events.*

> The definition of a liability: *A present obligation of the entity to transfer an economic resource as a result of past events.*

Centrally important, for the purposes of this paper, is that the definitions of assets and liabilities exclude recognition based on future events (with no current rights, obligations, or control by the firm).[12] Accordingly, potential assets and liabilities that arise from (uncertain) future transactions with customers are excluded from recognition until the asset or liability definitions can be satisfied. This approach goes some way in delineating accounting under uncertainty. Under IFRS 15, accounts receivable are not recognized until the uncertainty has been resolved; revenue recognition books an asset only when there is low variance around the expected cash flows (typically with the recognition of a receivable, discounted to cash-equivalent for non-collection and with any liability booked for unfulfilled firm performance).[13] The accounting says: prospective customers may well suggest expected cash flows, but that expectation is not booked as an asset because of uncertainty around the expectation. Accordingly, while investors may anticipate future revenues and price the firm accordingly, the accounting informs that those anticipated revenues are risky—the anticipated customers may not show up. Or, in the words of the Framework, the rights and control of an asset as a result of a past event have not been established.[14] [15]

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[12] In practice, this even includes future events committed to under executory contracts.

[13] IFRS 15, the new revenue recognition standard, invokes the criterion of "satisfying a performance obligation", but also requires the consideration to be received as "highly probable". While the language is the IFRS standard and language like "income must be earned" (without any further obligation for performance by the firm) differ from ours, we essentially see it as capturing the same economic idea; the resolution about the risk of receiving cash is paramount, with the various criteria the instruments to operationalize the idea. See AAA (2011) for an alternative revenue recognition scheme explicitly built around the resolution of uncertainty.

[14] Barker (2015) points out that the delay in recognizing expected revenues that is implicit in the Framework definition of an asset amounts to a prescription for (conservative) accounting whereby book value is typically less than price. Barker and McGeachin (2015) document a number of illustrations in the Framework and actual IFRS standards where uncertainty impinges on asset recognition and measurement.

[15] The connection of revenue recognition to uncertainty resolution corresponds to asset pricing theory, the area of research in finance that studies investor risk: The accounting says that the expected benefit (and the associated asset) cannot be recognized until the firm has a low-beta asset, cash or a cash equivalent

An implication of this accounting is that it gives partial definition to the income statement, albeit as the by-product of a balance-sheet approach. Revenues are recognized when "earned" in satisfaction of the asset and liability definitions, in other words with the resolution of uncertainty. The effect is one of 'perfect' matching, albeit *ex post* rather than *ex ante*. In the absence of certain information concerning the future, the forward-looking investor's next best port of call is to employ the past as a guide to the future, to look for evidence of a past flow that can be capitalised into the value of an estimated future flow. In this regard, it can be seen that, in contrast with the certainty setting, the balance sheet and income statement convey different information. Accounts receivable is a current claim with respect to whatever component of consideration remains unpaid from the satisfied performance of past revenue contracts. It has a PBV of one (given unbiased estimates of bad debts). In contrast, accrued income in the (historical) income statement is a basis for forecasting, and so for valuation, yet of course the valuation is not of accounts receivable. The balance sheet and the income statement are serving a different informational purpose, and while the former is a stock and the latter a flow, they do not correspond directly to one another.

The significance of this can be evidenced by returning to the residual income model. By excluding revenues anticipated in stock price but not yet recognized, the income statement conveys risk via the non-recognition. For the investor, a high price-to-sales ratio conveys that the higher future sales and earnings indicated by the price are risky, for those expected sales have not yet been realized. Accordingly, the evolution of the income statement (and

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(discounted) receivable. Indeed, revenue recognition imbeds the fundamental principle underlying asset pricing theory: the no-arbitrage principle. In holding stocks, shareholders bear risk that the expected return may not be realized and thus require a return commensurate with the risk. But, when they sell stocks and invest the cash proceeds in the risk-free asset—they realize the return—the risk is reduced, and so is the expected return (to the risk-free rate). A stock is a claim on the expected cash flows of a firm, so when the firm realizes those expected earnings into cash or a near-cash asset on shareholders' behalf, the investors' risk and expected return are correspondingly reduced. On a consolidated basis, the firm's accounts are part of the shareholders' accounts, so it makes no difference if the shareholder "realizes" or the firm "realizes" on the shareholder's behalf— the shareholders (the 100 percent owners) have the claim to the same cash. A no-arbitrage condition so dictates (frictions aside): Cash payout has no effect on cum-dividend value, so cash held in the firm has the same value as cash on personal account. That is the (no-arbitrage) Miller and Modigliani theorem which stands as a foundation for modern finance. (Realization typically results in a receivable rather than cash, but receivables are discounted to a cash equivalent value for the risk of not receiving the cash, at least in principle.) Penman (2016) connects accounting under uncertainty to the required return for investing, and reports on empirical research where features of accounting that involve delayed recognition of earnings are associated with risk to investment outcomes and with average stock returns that are a reward for that risk.

the corresponding balance-sheet) revolves around uncertainty and its resolution over time. Price-to-sales ratios converge to the mean overtime as the expected sales are realized (in the denominator) or as prices (in the numerator) fall because prospective sales are not realized.[16]

Accounting for Expenditures under Uncertainty

The case of revenue is, however, relatively straightforward. However, in other respects the delineation of the accounting under uncertainty is incomplete under the Framework. Specifically, while IFRS 15 defines the recognition and measurement of net assets arising from revenue recognition, there is also the issue of recording net assets from expenditures incurred to generate future (uncertain and unearned) revenues.[17] These expenditures meet the Framework definition of an asset but have variance around them. Such assets include inventory, fixed assets, research and development investments, brand building investment through promotion and advertising, supply chain development, investment in product distribution systems, investment in human capital, start-up costs, software costs, to name a few. While inventory, fixed assets, some development, and some software costs appear on the balance sheet under IFRS, many of the other investments are expensed immediately, but with little definition in the Framework of where the line is to be drawn.[18]

Under the Framework, the question here is whether a past event creates an economic resource. A balance-sheet approach suggests that there are three possible answers to that question, and thereby three alternative approaches to dealing with uncertainty. The first is not to recognise any assets, in effect treating all outflows as sunk costs and rendering the income statement no different from the cash flow statement. The alternative extreme

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[16] Note the distinction being applied between valuation inputs and valuation outputs, for example a price to sales ratio 1 if both is assumed and in normal if current revenues are recurring; there would be no such ratio in the absence of effective matching.

[17] For revenue, the accounting model approximates the case of perfect matching, albeit with exceptions such as telecom and insurance.

[18] Uncertainty has been invoked in drawing the line in the past. In IAS 38, the IASB applied the criterion of "probable future economic benefits" to distinguish between "research" (which is expensed) and "development" (which is capitalized and amortized). In justifying the immediate expensing of R&D in FASB Statement No. 2, the FASB focused on the "uncertainty of future benefits." IAS 12 recognizes deferred tax assets only if it is probable that taxable profits will we realized in the future against which the deferred taxes can be applied.

would be the recognition of all assets with non-zero expected economic benefits, irrespective of the variance around the expectation. This would admits all items to the balance sheet—even expenditure with a very low probability of yielding cash flows would be booked as an asset. The propensity for "water in the balance sheet" would be high. This alternative does have the feature that the outcome to uncertainty is revealed in due course: an asset that fails to yield the expected cash flow is written off when it is deemed not to yield "economic benefits", which is of course more likely for the asset with low *ex ante* probability of producing future benefits. But that matching would report on the uncertainty *ex post*, taking investors by surprise. In practice, investors seek instead an *ex ante* indication of the uncertainty they face, because investment decisions are not made *ex post*. A list of assets on the balance sheet that fails to discriminate with respect to uncertainty does not satisfy this *ex ante* demand.

The in-between option is the recognition of assets under a defined threshold for uncertainty.[19] The Framework hints at this approach in applying a test of relevance for whether 'measurement uncertainty is high' (para. 2.13). However, measurement uncertainty is not uncertainty about outcomes—research expenditures can be measured quite precisely but the outcomes to research are usually quite uncertain. Non-recognition when outcome uncertainty is above a threshold conveys information about the uncertainty to investors *ex ante*, such that a higher PBV ratio conveys that economic value is not expected to be achieved through the relatively certain recovery of amounts previously invested. There is also, however, an income statement dimension to take into consideration here, which a balance-sheet approach is conceptually predisposed to overlook, and which we seek to develop in the remainder of this paper. Taking into account this dimension, it becomes possible to convey additional information that helps investors to understand the consequences of uncertainty.

The approach proposed here requires consideration of the effects on the income statement of the accounting in the balance sheet. It was noted above that the uncertainty of future revenues implies the uncertainty of amortisation schedules by which currently-incurred resource outflows can be attributed (via the accrual mechanism) to corresponding future

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[19] Cade, Ikuta-Mendoza, and Koonce (2016) report on two experiments where individuals use a probability threshold to determine whether an asset or liability exists.

resource inflows. Yet this does not imply that we should give up on amortisation schedules altogether. In short, our approach, explored in the next section, is that determination of the threshold for admitting uncertainty to the balance sheet should explicitly reference the associated effect on the income statement. This is an "income-statement approach" to implement the "balance-sheet approach" of the Framework. It is based on an underlying argument that a balance-sheet approach is necessary but not sufficient in the presence of uncertainty.

A Scheme for Expense Recognition under Uncertainty

It was argued above that revenues are recognized under a principle that connects the income statement to uncertainty resolution, which in turn provides useful income statement information for the purposes of flow-based valuation. A corresponding argument for expense recognition is, however, more difficult to make, because of the inevitable mismatching that arises under conditions of uncertainty, along with the corrupting of earnings information that follows from this mismatching.

Taking this mismatching into account, we propose in this section of the paper, a conceptual approach to the recognition of assets under uncertainty. This approach, which will be developed in the remainder of the paper, can be stated as follows.

> Assets should be recognised if an evidence-based amortization scheme can be established *ex ante* such that the consequent mismatching is not likely to affect the income statement significantly.[20]

Thus we propose that assets and liabilities be recognized with a view to the mismatching consequences in the income statement. That is, recognition revolves around the uncertainty about the appropriate amortization schedule: if the accountant can establish an evidence-based amortization rate that is likely to result in approximate *ex post* matching, then an asset should be recognized. One can think of the issue as determining the likelihood of *ex post* asset write-downs, that result from *ex post* amortization differing from the *ex ante*

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[20] Note that we require the solution to be evidence-based, consistent with the 'enhancing' qualitative characteristic of 'verifiability'.

scheme. That likelihood might be ascertained from the risk of not realizing revenues. So, for example, and as implemented in IAS 38, that likelihood might be too high for Research but acceptable for Development or for software that has passed the "technical feasibility" point. Amortization uncertainty might alternatively be established from the likelihood of a sizable gain or loss on de-recognition; that gain or loss should be small (*ex ante*) relative to revenues over the life of the asset. Write-downs and de-recognition gains and losses (so-called remeasurements) reveal risk *ex post* rather than *ex ante*, and so a desirable property of financial reporting is that the likelihood of write-downs is minimized, reducing the *ex post* reporting of risk.[21] In effect, the write-down is taken *ex ante*, with immediate expensing arising from non-recognition. That means mismatching in the current period, but a mismatching that coveys risk *ex ante*, with lower earnings and particularly risky assets omitted from the balance sheet. Just as uncertain prospective revenues are omitted from the balance sheet, so too are expenditures for which revenue outcomes are deemed to be particularly uncertain. Accordingly, while mismatching is inevitable—it must occur, either *ex ante* or *ex post*—the mismatching is employed in an informative way.

It should be acknowledged that adopting this approach might not actually lead to many changes in practice in the recognition and measurement of (net) assets in the balance sheet. This is because the recognition and measurement criteria in the Framework and in individual standards already lean heavily towards excluding uncertain values for reasons of measurement uncertainty. What the above approach would do, however, is two things. First, it would clarify the Framework's conceptualisation of balance sheet recognition, making more explicit the determining role of uncertainty. Second, it would have conceptual and practical consequences for the income statement: it would introduce a conceptualisation of the income statement to the Framework, filling a gap that is currently created by the exclusive application of a balance-sheet approach (O'Brien, 2009); it would also change the way that income statement information is presented in practice, which would have practical consequences for the application of accrual accounting in helping investors to understand valuation in the presence of uncertainty.

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[21] Remeasurements are defined in Barker (2004) as 'revisions of prices or estimates that change the carrying amounts of assets or liabilities.'

These are fairly strong claims, and they require further substantiation. In particular, the execution of the approach outlined above requires judgement, and it remains to be demonstrated that the application of such judgement is feasible. It can perhaps be argued that the above offers more guidance and specificity in dealing with uncertainty than the Framework's current, vaguely-stated "relevance" and "faithful representation" criteria. Nevertheless, we have not at this stage clarified what it means in practice to identify a list of criteria in determining an "amortization uncertainty" evaluation. In the next section of the paper, we therefore seek to identify different levels of recognition, ordered on their amortization uncertainty. This, we argue, is a process that first requires giving further thought to the notion of matching, and therefore to the resulting implications arising from the inevitable mismatching that occurs under uncertainty.

Conceptualising Expense Uncertainty

The term 'matching' is commonly used, yet rarely defined in any systematic way. Definitions of the matching concept in the literature are neither current nor helpfully discriminatory – for example Hylton (1965) defines matching as: 'assigning revenue earned and expense incurred to the accounting period in which these events occur.' The 'concept' of matching is therefore open to the criticism that it is no more than a traditionally accepted convention, unsupported by underlying conceptual rigour. Moreover, and for the reasons discussed earlier in the paper, mismatching is anyway inevitable under uncertainty, making the pursuit of matching something of an implausible reaching for the unattainable. And under a balance-sheet approach, the pursuit of matching appears, in any event, to be conceptually irrelevant, because it is balance sheet recognition and measurement that drives accounting conceptually, and not consideration of the income statement. In the light of all of this, it is therefore not surprising that matching plays no explicit role in the Framework, and neither in IASB standards-level decision-making. This is in spite of the long history of the application of matching in accounting practice (Paton and Littleton, 1940; Bierman, 2009)

We will argue, however, that the impossibility of perfect matching does not render the concept of matching redundant. More strongly, we argue that consideration of the extent

to which matching can, or cannot, be achieved, is fundamentally important in evaluating the usefulness of the income statement under conditions of uncertainty and, so too therefore, for consideration of recognition and measurement in the balance sheet. In short, we argue that a fundamental limitation of the Framework lies in its exclusion of any analysis of matching.

We propose an exhaustive classification that distinguishes four different levels of matching – Types 1 through 4 – each of which has different implications for the appropriate method of accounting under uncertainty. We describe Types 1, 2, 3 and 4 as, respectively, revenue matching, *ex ante* matching, *ex post* matching and mismatching. The identification of types must be evidence-based, upholding the characteristic of 'verifiability'.

Type 1 – revenue matching – refers to expenses that can be described as 'directly recoverable'. The archetype here is cost of goods sold or, more broadly, any cost which can be described as direct, as opposed to indirect. The defining feature of Type 1 is a direct relationship between revenue that is earned and expense that is incurred. For example, when a retailer sells a product, the initial cost to the retailer of acquiring that product is unambiguously and uniquely associated with the revenue generated from the sale of that product; indeed, under IFRS 15 it is transfer over control of the asset that satisfies the performance obligation and triggers revenue recognition. To the extent that the revenue is matched to the appropriate reporting period, then so too is the corresponding expense said to be matched. Similarly, Type 1 matching includes the acquisition cost to sale proceeds for the realized profit from securities. Amortization that allocates on a production basis (as with mine acquisition and development costs allocated to periods on the basis of percentage of known reserves extracted) also fits this level, though with more uncertainty (about known reserves). In general, however, a reasonable and workable approximation is that matching is achievable in the case of Type 1.

Moreover, while it finds no place currently in the Framework, this application of matching is prevalent both in IFRS requirements and in the conventional application of those requirements. It is, for example, the (implicit) notion of cost recovery that justifies the (cost-based) recognition of inventory on the balance sheet, notwithstanding the absence in the Framework of any explicit recognition of this approach (Barker, 2015). Moreover, while

IAS 1 does not define either cost of goods sold or gross profit, and neither does it require the presentation of either amount by reporting entities, these metrics are of course widely reported in practice and highly consequential. The conceptual blindspot here in IAS 1, which follows directly from the corresponding omission in the Framework, is that Type 1 represents an evidence-based matching process, involving balance sheet recognition of recoverable amount and corresponding expensing as and when revenue is recognised. In line with revenue recognition, this mechanism is valuable to investors because it informs flow-based valuation, based upon the reporting of 'resolved uncertainty' through the entity's recognition of earnings at the level of gross profit.

Type 2 – *ex ante* matching – refers to expenses that can be matched, *ex ante*, to periods of time. They cannot be matched directly to units of revenue, even though there remains an implicit presumption that they are nevertheless recoverable. The archetype here is a fixed overhead, such as rent, although the category generalises to all indirect overheads, such as selling and general administration costs, and also deprecation of tangible non-current assets and amortisation of certain intangible assets (an example would be the acquisition cost of a patent right with a known patent term). The defining feature of Type 2 is that the period over which expenses are incurred is known with a reasonable degree of certainty, such that expenses can be allocated to the periods of time in which they can be said to be incurred. While there is no direct matching with revenue, there is nevertheless a matching with reporting period.[22] In some cases, such as depreciation, there remains an inevitable degree of arbitrariness about the specific time periods into which the overall costs of the underlying asset are allocated (see Thomas, 1975), yet there is nevertheless an estimable useful life, which makes possible an *ex ante* expense schedule, that is unlikely to be subject to significant *ex post* adjustment. From an investors' perspective, there is a an allocation of cost that facilitates flow-based valuation, while there is also sufficient confidence that the amounts charged in any one period are not exposed to significant uncertainty. Broadly, this category corresponds to recurring items that are reported within operating profit, but outside gross profit.

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[22] The matching does not necessarily imply straight-line amortization, though an alternative that matches to varying revenues over periods would be appropriate only if that variation could be assessed *ex ante* with a little uncertainty.

Type 3 – *ex post* matching – refers to expenses (and also income) that can be matched to any given reporting period, yet where the matching can only be evidence-based *ex post*. The archetype here is gains or losses on mark-to-market financial instruments, where the defining feature is that year-end market prices (and hence reported gains or losses) can be known at the end of the reporting period but not at the beginning. In this context, it is instructive to note the absence in the Framework of a distinction between 'gains and losses' and other forms of 'income or expense', even though such a distinction in terminology is widely used in practice, including in IFRS itself. Such a distinction does not arise in a pure balance-sheet approach, because in that context it matters only whether there is a change in the carrying amount of (net) assets, and not whether the change was, in the language used here, either Type 2 or Type 3. Yet that distinction is of great importance to investors, because the former corresponds to a recurring expense, which is appropriately valued via a multiple in a flow-based valuation, while the latter corresponds to a valuation 'shock', to a one-off gain or loss that attracts a valuation multiple of one, and which corresponds to a direct adjustment to economic value rather to an amount to be capitalised in a flow-based valuation (Barker, 2004). It is in this sense that Hicks (1946, p.179) argues that 'theoretical confusion between income *ex post* and *ex ante* corresponds to practical confusion between income and capital.' The balance sheet carrying amounts are in effect of different types, because an evidence-based *ex ante* amortisation schedule is possible for Type 2 but not for Type 3.

Type 4 – mismatching – refers to expenses that cannot be matched, either *ex ante* or *ex post*, to either revenue or accounting period. The archetype here is research expenditure, where recoverability cannot be assumed to take place over a reliably estimable period of time, if at all. Similar examples include expenditure on brands, organisational know-how, and other such intangibles. The point here is that, because of underlying uncertainty concerning the recoverability of the outflow of economic resources, there is no basis on which an evidence-based amortization scheme could be established, either *ex ante* or *ex post*, The implication is that there is little guarantee of avoiding subsequent mismatching that would significantly affect the income statement. Given the inevitability of mismatching, assets should not be recognised, because to do so would be to give 'false' reassurance with respect to uncertainty. There is instead information conveyed by the

absence of recognition. All of the mismatching under this approach takes place in the reporting period in which the outflow of economic resources takes place. In other words, expenditure in immediately amortized, because of uncertainty about establishing conditions that satisfy Types 1, 2 or 3.

It might be noted that there is a unit of account issue in applying the above classifications. One might make the determination of Types 2 and 3 on a pooled (portfolio) basis for a class of assets such that the average *ex post* matching error is small (as seems to be the case with plant and equipment historically). The ability to identify an asset component in an expenditure (disentangled from an expense component that has no future benefit) would also enter the recognition assessment. For example, assets can be embedded in salaries, bonuses, and retention allowance for employees, but these are difficult to identify. To restrain judgment, the "evidence-based" requirement means that an accepted amortization scheme must be consistent with evidence from the time-series and cross-sectional history that such a scheme does not typically result in substantial remeasurement.

We see the approach applying to both liabilities as well as assets, though we see it being applied more conservatively in the case of liabilities. The issue arises with excessive liabilities for restructuring charges which result in subsequent mismatching when those excessive charges are "bled back" to the income statement. FASB Statement No. 146 applies criteria to restrict restructuring and the consequent mismatching. Uncertainty is the issue with which IAS 37 grapples; a "more likely than not" criterion is applied. In FASB Statement No. 5, the "probable" criterion for the recognition of the liability reduces the (probable) subsequent mismatching if there were non-recognition, as does the "remote" criterion where a likely subsequent gain is booked to the income statement if the liability is recognized. For pension accounting, a liability from a vested accumulated pension obligation (ABO) has different uncertainty around it than that the projected benefit obligation (PBO).

Derecognition principles follow readily. Recognized assets and liabilities are extinguished when they fail to satisfy the Framework definitions. For continuing assets and liabilities, the embraced amortization scheme that passes the threshold governs the gradual derecognition over time, subject to *ex post* write-downs (now minimized) if, based on new evidence, the threshold is no longer satisfied. The size of any derecognition gain or loss reports on the *ex*

post validity of the *ex ante* recognition under uncertainty. The history of such gains and losses then provides an input to evidence-based recognition under uncertainty.

The discussion here can be reduced to an algorithm, as follows. If there is a direct relationship between the expense and revenue of the reporting period, then the expense is Type 1. If not, then the expense is Type 2 if it can be *ex ante* allocated to time period, with insignificant risk of subsequent remeasurement. If not, then the expense is Type 3 if it can be *ex post* allocated to time period. And if not, then the expense is Type 4.

In the remainder of this paper, we illustrate the application of the above typology, including evaluating its consequences for investor decision-making under uncertainty. We first consider implications for measurement.

Measurement

The argument above is that Types 1-4 are a discriminating categorisation for the purposes of recognition. Moreover, the categorisation extends the conceptual analysis of recognition in the Framework, because it has the benefit of explicitly linking a balance-sheet approach with the provision of decision-relevant information in the income statement.

The argument is so far incomplete, however, because consideration needs to be given not just to recognition but also to measurement. In this section, we therefore extend our discussion of the Types 1-4 categorisation, and we argue that it has direct implications for the selection of measurement attributes. We contrast our analysis with that in the Framework, which - while being rather vague on which measurement attribute should be applied in which circumstance - broadly proposes two measurement bases, historical cost and current value, with the latter being either current exit price ("fair value") or value-in-use.[23]

As with our earlier analysis of recognition, we start with consideration of the certainty case. Here, assets and liabilities can be measured at their value-in-use with no uncertainty around

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[23] While current input price is mentioned in paragraph 6.18, it does not get much traction in the Framework.

that value: value is equal to the present value of the certain future cash flows, discounted at the certain risk-free rate. Price (fair value) and cost are always equal to this value if the item is traded in an efficient asset market with zero transaction costs; any other valuation would violate no-arbitrage (in this case, riskless no-arbitrage). There is no measurement issue: cost, fair value, and value-in-use coincide. Further, the value of a portfolio of assets is equal to the sum of the (certain) values of each asset in the portfolio. As with recognition, therefore, so also with measurement: the accounting is simple in the case of certainty, with there being nothing to choose among measurement attributes.

In considering how uncertainty changes the position, we can start with Type 1, where the defining feature is a direct (matched) relationship between revenue that is earned and expense that is incurred, meaning that resource outflows can be described as directly recoverable costs. It was argued above that Type 1 represents an evidence-based matching process, involving balance sheet recognition of recoverable amount and corresponding expensing as and when revenue is recognised. It follows that the appropriate measurement attribute is cost, because this enables the value-added to be reported on a matched basis, and to thereby be a foundation for flow-based valuation. In contrast, measurement at fair value would represent a mismatching, and hence a loss of value-relevant information, because of the disconnection in timing between marking to market and recognising revenue (Penman, 2007). In this regard, the rationale for historical cost is not just as a default, as a measurement attribute to be applied when some form of current value is difficult to determine. Instead, the underlying insight is that historical cost differs from fair value because of the ability of firms to add value (Penman, 2007 and Nissim and Penman, 2008). But that added value is uncertain. As was discussed above, IFRS 15 rules out booking the added value for uncertain expected revenue, which in turn has two implications: first, value cannot be added to the cost of inventory because of uncertainty; second, when the uncertainty is resolved sufficiently for the revenue to be recognised, so too the accounting recognises the costs directly associated with that revenue, and thereby the accounting also recognises the margin that captures the economic distinction between the initial, uncertain cost of the investment in the inventory and the later, certain outcome when that investment in inventory is realised at fair value. In short, the accounting reveals the gains from uncertainties resolved during the reporting period.

Much the same argument can be made for Type 2. It was argued above that, because the period over which Type 2 expenses are incurred is known with a reasonable degree of certainty, flow-based valuation is enhanced by means of an approximate matching. Here again, the matching of revenue to *cost* is important, because it is the value added in the reporting period that underpins estimates of the same in future periods.

While Types 1 and 2 are similar, there are also important differences. With Type 1, there is uncertainty with respect to the recoverability of cost, in that the asset sitting on the balance sheet may – or may not – be exchanged for an alternative asset (receivables or cash) with (most likely) a higher value. With Type 2, in contrast, costs incurred might more insightfully be viewed as sunk, rather than recoverable: they 'belong' to the reporting period whether or not revenue is also recognised in the corresponding period. While the Framework does not make a distinction between 'variable' and 'fixed' costs, this is in substance the difference that separates Type 1 and Type 2. Consistent with the argument in Horngren and Sorter (1961), and also with an informational distinction useful to investors, there is informational value in reporting the resolution of uncertainty for Type 1 by means of matching revenues with expenses, yet there is no unresolved uncertainty to report in the case of Type 2, where there is an evidence-based (hence, relatively certain) allocation of expenses that is independent of recognised revenue.

A common feature of Types 1 and 2 is the sharp contrast with the certainty case, and the resulting emphasis on the income statement over the balance sheet in terms of the provision of value-relevant information. It is clear, for example, that the balance sheet amounts of working capital are in themselves of little value-relevance, while in sharp contrast the corresponding income statement variables – revenue and cost of goods sold – are of central importance. It is this income statement emphasis which makes cost the appropriate balance sheet measurement attribute.

While a common feature of Types 1 and 2 is an emphasis on the income statement over the balance sheet, the relative roles of these financial statements is reversed in the case of Type 3. As described above, the defining feature of Type 3 is that market prices (and hence reported gains or losses) can be known at any given point in time. Valuation can thereby be grounded in the balance-sheet and, in common with the general case under conditions of

certainty, the income statement can be viewed as redundant. The case of stand-alone securities, such as shares and bonds, is particularly pertinent. In this case, asset pricing theory shows that the contribution of each asset to the uncertainty for the portfolio is defined. Indeed, an asset's value is defined in terms of its contribution to the risk of the portfolio, its beta. There the value of a portfolio is always equal to the sum of the values of the component securities, and security betas are determinable and aggregate to the portfolio beta.[24]

The final category is Type 4, which is of course straightforward in that measurement issues are pre-empted by the absence of recognition and thereby do not arise. Importantly, however, while Type 4 is in itself straightforward, its accounting treatment is not inconsequential, because – for the reasons described above – it indirectly affects consideration of measurement attributes for Types 1, 2 and 3. This point is fairly subtle, but in practice it is very important. It can be seen by taking value-in-use as the point-of departure between the cases of certainty (where measurement attributes are equivalent) and uncertainty (where measurement attributes diverge, and where in any practical application one must be chosen in preference to the others).

Conceptually, value-in-use unambiguously conveys value to the specific enterprise. Value-in-use can only be applied to recognized assets and liabilities if their value is separable from that of unrecognized assets and liabilities (and, indeed, from each other). However, value is generated in business by using (recognized and unrecognized) assets and liabilities jointly; indeed, the basic notion of business is to combine assets and liabilities (with other factors of production) under an entrepreneurial plan to create value for investors. Business value is thus determined by expected cash flows and the uncertainty around those expectations for the whole portfolio of (recognized and unrecognized) assets and liabilities. The portfolio property for the certainty case and Type 3 no longer holds: portfolio value cannot be determined as the sum of individual assets and liability values. In short, the notion of stand-alone asset value is misconceived, as paragraph 6.45 in the Framework recognizes, and there is no accounting solution to the allocation problem when assets contribute jointly to portfolio value (Thomas, 1969). For example, if inventory is a recognized asset but the

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[24] Debt can be conceptualised similarly if separable from the operating net assets of the business.

promotion asset (brand) is not, one cannot ascribe a value to the inventory if it is dependent on the uncertainty about the promotion campaign. Nor can one impute a value to a delivery truck if the sale of products from the truck is dependent on product research or on the product distribution channels the firm has invested in, the outcome of which is uncertain.

The alternative current value metric, fair (exit) value presents a potential solution if traded fair values represent the contribution of the recognized assets or liabilities to the joint value of assets and liabilities in the entity. Yet that is a very unlikely situation: different firms use assets for different purposes, combining them (often uniquely) in carrying out businesses under various degrees of uncertainty. For example, the current exit price for a warranty liability—the amount paid to transfer the liability under paragraph 6.21—is the amount charged by the acquirer to service the liability, but that may be different from the in-house cost to the entity with their expertize with their own products; the entity "adds value" (with less uncertainty) with a comparative advantage to service warranties on its own products that no outsider can replicate. Again, traded securities with stand-alone value come to mind as an exception, but even there, value is different for the passive investor versus the active investor who holds the securities because the value is judged to be less than the current price. The latter is, of course, a business that attempts to add value to market prices.

The non-recognition of Type 4 assets therefore reinforces the case for the recognition of Types 1 and 2 at cost rather than value, because the presence of uncertainty renders the concept of an individual asset value problematic, while also making cost a useful informational input in the resolution of uncertainty. This reasoning also, however, makes the interpretation of Type 3 somewhat more problematic than the earlier discussion might suggest. In general, value-in-use can only be applied to separable assets with stand-alone value where those values sum to portfolio value (issues of estimating value-in-use aside). For business assets and liabilities, such a situation would appear to be uncommon, even in the case of Type 3 to the extent that assets are employed jointly in the business.

Moreover, Type 3 can be problematic in practice even when there are separable assets with stand-alone values. While measurement uncertainty (as described in the Framework) may be resolved in such cases through the existence of market prices, or fair values, these need not indicate value-in-use to the entity. In finance theory, financial assets and liabilities are

separable from operating business assets and liabilities under specific assumptions (Modigliani and Miller, 1961), and usually separable from each other. So net financial assets lend themselves to value-in-use measurement, and it is common that fair (exit) value equates to value-in-use. However, just as historical cost accounting requires income statement matching to be effective, fair values require balance sheet matching: fair valuing debt liabilities that yield a gain on deterioration of the debt price, for example, must be matched with a fair valuing of the assets whose value deterioration gives rise to the additional credit risk that re-values the debt. In short, the accounting for debt and operating assets is not separable. However, fair valuing assets that typically do not have stand-alone value in operations is not feasible.

This discussion of measurement, along with the earlier, associated, discussion of recognition, has immediate implications for the way in which income and expenses can be presented in an informationally useful way, with the underlying aim of helping investors to make decisions under conditions of uncertainty. The next section of the paper therefore outlines an illustrative format for the income statement.

Presentation of the Financial Statements

Our discussion on measurement concludes that, while a balance sheet approach is appropriate for recognition, the accountant cannot communicate value via the balance sheet, not least because of the portfolio issue of assets and liabilities creating value jointly. However, there is also an income statement, and the significant feature of the income statement is that it reports revenues and earnings from using assets jointly; the earnings from both recognized and unrecognized assets are recognized, as are the earnings from employing them together (Penman, 2009). Accordingly, the income statement should be designed to highlight this number, but with attention to the inevitable mismatching under uncertainty that corrupts it.

We suggest the following divisions in the income statement, within sections that separate operating activities from financing activities. We do not address directly the issue of other comprehensive income.

Income Statement

Revenue	100	These are Type 1: revenues are reported as earned, and expenses are matched to revenues
Cost of Goods Sold	25	
Gross Profit	**75**	
Overheads	40	These are Type 2: revenues are reported as earned, and expenses are matched to time periods
Underlying Profit	**35**	
Mismatched expenses	10	These are Type 4: resource outflows expensed in the absence of evidence-based amortisation plus any ex post mismatching from write-downs (for example)
Profit before Gains and Losses	**25**	
Gains and Losses	5	These are Type 3: gains and losses that are matched *ex post* to time periods
Profit before Interest and Tax	**20**	
Financing expenses (income)	8	(Amounts here represent the separation of financing from operating activities)
Profit before Tax	12	
Tax	3	
Profit/Loss	**9**	

According to this presentation, there is a separation of profit and loss from recognized revenue and corresponding matching (Type 1), amounts that are matched to the reporting period either *ex ante* (Type 2) or *ex post* (Type 3), and amounts resulting from mismatching (Type 4). Broadly, Types 1 and 2 together form the basis for flow-based valuation, because they allocate with a reasonable degree of confidence income earned and expense incurred during the reporting period; they have the potential to forecast the net income from future, potentially realizable revenues. Type 3 is also measured with confidence, but it carries a valuation multiple of one, as opposed to attracting an earnings multiple. These are the fair value gains and losses, which pertain only to the current period and (except for an expected return component) are zero in expectation.[25]

Type 4 includes gains and losses and write-downs from *ex post* mismatching (now minimal) as well as uncertain investments expensed *ex ante*. It requires more subjective judgement on the part of the investor. The component due to *ex post* mismatching informs about the

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[25] To the extent the fair value gains and loses concern financing net assets, they are reported with financing expenses (income) so that Profit before Interest and Tax is a number that refers to operations.

success of the accountants initial typing of expenditures to minimize *ex post* mismatching. The *ex ante* 'expenses' indicate greater uncertainty in investing, with valuation implications being relatively difficult to determine. The separate categorisation of Type 4 implicitly carries a 'health warning', while simultaneously avoiding contamination of amounts reported further up the income statement. Compared to current reporting, the division brings some clarity to SG&A where many uncertain investment expenditures are expensed. SG&A is often a significant percentage of sales but includes mismatching elements that corrupt operating profit margins.[26]

There is a particular situation where (in absence of *ex post* write-downs), the total in Profit before Gains and Losses is not affected by the separate presentation of mismatched expenses. The cancelling error property of accounting says that, in steady state, earnings are unaffected by asset recognition or the amortization scheme applied to the recognized assets: for given revenues, R&D expense and earnings are the same under a policy of expensing R&D or capitalizing or amortising it, provided that there is no growth in R&D expenditures; it is the growth in R&D where earnings are affected.[27] Accordingly, the accounting reduces earnings only in the case of growth in unrecognized investment (all else held constant). In this case, the separate categorisation of Type 4 communicates that, while the firm is reporting earnings from current revenues due to past investment, the firm is adding more risky investment that bears on the uncertainty about revenues in the future.

Beyond the income statement, the discussion in this paper also has implications for the presentation of the cash flow statement. In current practice, cash flows relating to recognized, non-current assets appear in the investing section of the statement, while cash flows relating to unrecognized assets appear in the cash flow from operations section. Thus, the investing section is not cash incurred on investments, but rather cash incurred on investments that the accountant has chosen to recognize. Cash flow from operations (CFO) is therefore a misnomer—it includes investments in unrecognized assets such as brand

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[26] There is, of course, subjectivity in the distinction made 'through the eyes of management' between Types 2 and 4, and the implicit assumption here is that suppressing that distinction is less informative than revealing it.
[27] The cancelling error property is formally stated as earnings are unaffected if the error from omission of net assets in the balance sheet is the same at the end of the earnings period as at the beginning.

building and research development. CFO is in fact an accrual measure, reflecting the accountant's recognition decision for assets.

These considerations suggest the following presentation: report CFO as the cash flow from the Underlying Profit section of the income statement above—the net cash from trading with customers—with the investment section involving the cash flow from all investments, both those recognized in the balance sheet and those recognized in the mismatching section of the income statement. A weaker prescription would dispense with the distinction between CFO and investing cash flows altogether. The cash flow statement would then have just two sections, cash from all operating activities (including investment) and cash from financing activities. The former is free cash flow, a familiar measure to investors.

Properties of the Financial Statements

In summary, we lay out the features of the financial statements under the design proposed here. We judge these features by how they meet the two-part objective of the Framework, concerning, first, decision-relevance and, second, stewardship.

The decision-relevance objective is to provide useful information to investors about "the amount, timing, and uncertainty of future net cash flows." To the extent that current revenues are an indication of future revenues, the matching section of the income statement provides a basis for the estimate of the *amount* of future earnings and resultant cash flows from customers. To the extent that revenues are expected to be different in the future, the expense matching produces a profit margin which, applied to those revenues, again communicates an estimate of future earnings and cash flows. In short, the Gross Profit and Underlying Profit sections of the income statement provide a sound anchor for forecasting, adding meaning to the Framework's concept of 'predictive value'. These numbers inform that, if the future will be the same as the present, the reported earnings are the indication of future earnings. To that the investor can then add any information (outside the financial statements) that indicates that sales and/or profit margins will be

different in the future. Importantly, this section of the income statement has no accounting feature for which the investor has to adjust in forecasting future earnings and cash flows.[28]

To complement this information, the non-recognition of particularly risky investments and their identification in the mismatching section of the income statement reports on the *uncertainty* of future revenue, earnings, and cash flow forecasts. The income in the matching section is from realized sales, so the ratio of the income in that section to the expenses arising from unrecognized assets reported in the mismatching section conveys the extent of the uncertainty: a low ratio indicates that not much income is being realized relative to the risky investment being made. As Underlying Profit also includes *ex post* write-downs, it informs on how well the numerator of this ratio has been measured; for example, an impairment of PPE informs that the evidence-based *ex ante* matching was in the event more uncertain than had previously been assumed by management and communicated to investors.[29] This adds meaning to the Framework's concept of 'confirmatory value'.

The reporting of fair-value gains and losses in a separate section of the income statement not only ensures that the net income flows in the other sections are not corrupted by value changes, but also informs that, to the extent the income is unrealized, the corresponding value of assets in the balance sheet is at risk of not being realized. Hence, the role of the recognized amounts is to help investors verify (or challenge) a valuation that is already given, as opposed to estimating (via extrapolation of profit before gains and losses) an uncertain valuation that is by design excluded from the financial statements.

As for the balance sheet, it contains only operating assets and liabilities that have significant probability of yielding cash flows. The investor sees inventory and non-current assets, for example and concludes: this is a firm that can produce revenues. That contrasts with a start-up with no inventory or non-current assets but large research expenditures in the income statement. The balance sheet contains no element that has a significant probability of reversing and therefore of surprising the investor later because the asset did not exist *ex ante*; there is no "water in the balance sheet" that is likely to evaporate later. Consequently,

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[28] There is no pretense that matched and mismatched expenses can be identified perfectly. There will be grey areas (as in most accounting)—for example, elements of employee wages and bonuses that are paid to encourage (uncertain) retention. But it must be that an analyst cannot readily identify a misclassification to make an explicit adjustment.

[29] See also Prakash and Sinha (2013).

in forecasting future revenues, earnings, and cash flows from the income statement, that investor does not have to anticipate that those earnings will be shocked by value in the balance sheet that fails to be realized. The balance sheet is also one that creditors can lend against.

As to measurement, the limited use of current value accounting also means that the balance sheet is less risky. In fair valuing, the accounting recognizes unrealized value, so erosion of balance sheet value can hit the investor later as the value added to historical cost is not realized. That is *ex post* risk revelation.

The proposed accounting implies that equity price will typically be greater than book value. Net assets will be missing from the balance sheet. But these so-called intangible assets are those around which there is considerable uncertainty which the accountant is communicating.

As for the revised cash flow statement, it now provides a cash flow measure that reports the cash flow from trading with customers, uncorrupted by investment in uncertain assets and liabilities. That is relevant to both the debt investor and the equity investor.

The accounting and its presentation resonates with the residual income valuation model that values equity based on accrual accounting rather than cash flows. That valuation starts with the balance sheet and adds the present value of forecasted (residual) earnings to the balance sheet. As above, the income statement facilitates the forecasting of the earnings to add to book value. While the forecasted earnings are discounted for risk in the valuation—they are risky—the balance sheet is not. That must then be a relatively low-risk balance sheet that does not have to be discounted for the probability that it can come back and hit the investor later.

All of the above aligns comfortably with the Framework's second objective, which is to provide useful information to investors about "management's stewardship of the entity's resources." If earnings is used as a performance measure, the deferred recognition of revenues requires the management to consummate sales in order to be rewarded. Plans, prospects, and promises are not enough; the manager must see the plan though to realization to be rewarded; uncertainty must be resolved and, after matching expenses,

profitably so. As sales are realized on the resolution of uncertainty, that locates the issue of managing under uncertainty with the manager. Similarly, with the non-recognition of assets above threshold uncertainty, the management is not likely be rewarded on earnings that later will be erased with a write-down of assets of uncertain value (after the manager leaves). The scenario of a manager being rewarded on earnings, then leaving, to be followed by "big-bath" write-downs by a new manager is mitigated.

Indeed, earnings are penalized by non-recognized assets, informing investors that the manager's reward might be delayed because he or she has now imposed an added risky gamble on investors.[30] One might argue that this might provide a disincentive for managers to make risky investments. But the risky investment is transparent in the mismatching section of the income statement. And it does not corrupt the earnings in the matching section. A successful manager will deliver strong earnings in this section because there is no amortization from risky investments already expensed. When income from realized sales in the matching section is low relative to the unrecognized, uncertain investments in the mismatching section, the manager has yet to perform in realizing income from uncertain investing; a Board can reward him or her accordingly.

Summary Statement

While there are several issues raised in this paper, the essence of them can be summarised briefly. The balance-sheet approach in the Framework is a reasonable starting point for evaluating issues of recognition and measurement. However, taking into consideration the implications of uncertainty, the balance-sheet approach cannot be executed satisfactorily if the income statement is implicitly treated simply as a by-product. As the Framework recognizes, the income statement and the balance sheet are structurally linked, so consideration of the income statement is important in implementing the balance sheet approach.

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[30] Much of the principal-agent literature in accounting and economics deals with incentives for agents (managers) for making investment decisions under uncertainty and with how agents share that risk with the principal.

The rejection of an income statement approach defined by matching (and the downplaying of matching in paragraph 5.8 of the Framework) is understandable, for perfect matching is only feasible under certainty. Under uncertainty, mismatching is inevitable, yet an informative income statement should convey a measure of value added (profit) from sales, and that requires some form of matching. A balance sheet approach for recognizing assets and liabilities under uncertainty resolves this tension for it provides a way to minimize the mismatching and convey information about the uncertainty.

The balance sheet approach is thus implemented with respect to the consequences in the income statement. One might call it a mixed balance sheet and income statement approach. From this perspective the sharp division between a balance sheet approach and income statement approach, which has become such a controversial issue, now becomes a more comprehensive conceptual approach in which there are complementary roles for both of these primary financial statements.[31]

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[31] While this paper endorses the balance sheet approach in the Framework as a starting point for Recognition and Measurement, it is implicitly critical of the suppression of "prudence" in the Framework. The proposed approach for recognition under uncertainty resonates with these characteristics: The resultant balance sheet is a prudent, conservative one. Effectively, the approach says the uncertainty requires prudence in the execution of the accounting.

Appendix: Case Studies on Recognition under Historical Cost Measurement

Amazon.com, Inc. reported a loss for the third quarter of 2013, as it had done for the full year, 2012. The losses continued into 2014 on rising sales. The losses were attributed to "spending on technology and content, such as video streaming and grocery delivery to mobile devices" and the firm's "willingness to win customers by losing money." Stated differently, the losses were not due to profits from current sales, but to the expensing of these investments with uncertain outcomes. While high expectations were built into the share price, the accounting conveyed uncertainty: The added revenues from these investments have yet to be realized.[32] In the totality of things, the accounting informs that, yes, there is income from current sales, but the amount of new risky investment is high relative to that income, and the current price is subject to erosion if the risky investments do not pay off. (Unfortunately, analysts have trouble under the current reporting to disentangle these risky investment expenses from expenses supporting current sales.)

Twitter, Inc. went to IPO in November 2013, closing on its first trading day priced at 26 times estimated 2014 sales, a price imbedding significant earnings expectations. The firm was reporting losses due largely to the expensing of R&D, advertising and promotion that amounted to 80 percent of revenue. These expenditures were investments to generate revenue growth, but there was uncertainty about whether the expected revenues and earnings would be realized. While the market built high sales expectations into the IPO price, the accounting that expensed the investments informed about the uncertainty around these expectations. The ratio of income recognized from current sales to these risky investments is low.

Mature, pharmaceutical companies typically report high margins on sales and a fairly constant R&D to sales over time. They are firms where the R&D investment in the past continues to pay off, successful firms in (roughly) steady state with respect to their R&D investments. The ratio of income in the proposed matching section to that in the mismatching section is high. In contrast, start-up biotech firms report losses, largely due to

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[32] See press reports in *The Wall Street Journal*, October 25, 2013, p. B3 and *Financial Times* of the same date, p. 13. *The Wall Street Journal* also reported (p. C1) a study by Morgan Stanley that 89 percent of a present value calculation on Amazon related to cash flow forecasted for years after 2020, that is, on growth expectations in the long term.

the expensing of R&D but with few revenues yet to the realized. The expensing of R&D on low revenues reports that the firm's investments are risky; the R&D investment is yet to payoff.

The Coca-Cola Company is a successful company where the investment in brand building has paid off. It has high sales and operating income from sales (before promotion expenses) relative to the promotion expenses that generate future sales. According it is low risk: It has a beta of 0.4.

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