

Comments on the Discussion Paper

Measurement Bases for Financial Accounting – Measurement on Initial Recognition

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Foreword

It is good to have this opportunity to comment on the *Discussion Paper: Measurement Bases for Financial Accounting – Measurement on Initial Recognition*. If one accepts the fundamental idea of the paper to apply fair values, then it is acceptable for the most part. However, irrespective of whether one wants apply fair values or not, there are a few concepts in the suggested framework that are truly misleading. They are in sore need of redefinition.

What is most questionable about the proposed conceptual framework is its quasi-scientific nature. On one hand the framework adopts scientific concepts such as measurement, representational faithfulness, and reliability. On the other hand it creates “homemade” contents for them and even invents additional concepts such as measurement uncertainty and economic indeterminacy to obscure its basic weaknesses. They should be openly acknowledged instead.

This commentary focuses on three basic concepts of the *Discussion Paper*: 1) measurement, 2) reliability and 3) asset, and in addition, on three auxiliary concepts of it: 1) representational faithfulness, 2) measurement uncertainty and 3) economic indeterminacy. For some of them redefinitions are offered, and for the rest it is suggested that accountancy should shift to terminology that is common practice in the more scientific literature.

The key concept of measurement is strangely defined in an *ad hoc* manner to give it a unique meaning that can be found nowhere else outside the accounting literature. This can hardly be justified in the modern environment, where accounting has significant social objectives. The *ad hoc* definition is clearly a source of misunderstandings, and it must definitely be corrected.

What is peculiar about the definition of measurement in the framework is it being at the same time extremely narrow (“the process of determining the monetary amounts”) and excessively allowing (no restrictions whatsoever are placed on the process of determining). It is likely that the less one knows about the accounting theory and practice the more he or she will be misled because in those cases the concept of measurement will probably have its commonsense meaning, which is typically far from what is suggested in the framework.

Redefinition of measurement has important consequences. Most importantly, if the concept of measurement is redefined to be more in line with what is common in both empirical science and everyday life, then the concept of asset must also be redefined. This is necessary because in the proposed framework an asset is defined in such a way that actually no assets can ever be measured in the normal scientific sense (see the IASB Framework, par. 49 (a)).

The IASB Framework defines an asset in terms of the expectations regarding the future economic benefits that are expected to flow to the entity. This means that all assets depend on the future. On the other hand, all true measurements relate to current observable phenomena. Consequently, there are actually no assets that could ever be measured in the true sense.

Redefinition of these two concepts and some others will result in many useful consequences: 1) accounting terminology will be more closely aligned with the scientific terminology; 2) some assets will turn out to be measurable in the true scientific sense; 3) some other assets are understood to be non-measurable in the true scientific sense; and 4) all the assets can be reclassified in the balance sheet on the basis of their measurement related ambiguity.

1. Background

In the Appendix A of the *Discussion Paper: Measurement Bases for Financial Accounting – Measurement on Initial Recognition (long version)* an asset is defined as follows. “An asset is a resource controlled by the entity as a result of past events and from which future economic benefits are expected to flow to the entity.” The IASB Framework for the Preparation and Presentation of Financial Statements defines an asset in the same words (par. 49 (a)). What is essential in this definition is that the contents of *all* assets are made to depend on the future economic benefits. They in turn are defined in terms of the potential to contribute to the flow of cash and cash equivalents, which leads to strange consequences when one considers why cash and cash equivalents are assets. They seem to qualify as assets simply because they have potential to generate additional cash and cash equivalents.

The peculiarity of this definition becomes even more obvious when one tries to assess the value of cash assets. For example, what is the value of one hundred euros in cash? To answer, one must first speculate how much future economic benefit the given one hundred euros are likely to generate. This means that different values should be attached to the hundred euros if different ways to use them are found and they result in different amounts of economic benefit.

The joint IASB/FASB conceptual framework project seems to proceed along the same lines. It has proposed only a slightly revised working definition of an asset, which does not bring anything new in this regard: “An asset of an entity is a present right, or other access, to an existing economic resource with the ability to generate economic benefits to the entity” (IASB Update, December 2005). Two months later the Board suggested explicitly that the definition of an asset should not specify that cash held by the entity and a present right of the entity to cash are assets because they meet part (c) of the definition, which explains that an asset can generate economic benefits directly or indirectly (IASB Update, February 2006). That is, the Board continues to define all assets in terms of the future economic benefits.

There must be something wrong with this approach. If it were consistently applied, even liquidation values would depend on the future as Sterling (1979, p. 27) has brilliantly shown. The core of the problem is that the definition makes the value of *all* assets depend on the future. Nothing is considered to have value now. In other words, there is no *current standard* for value. This is comparable to an attempt to measure distances without first setting a standard, for example, a meter or a yard. For precisely the same reason that one needs a standard for measuring distances, one needs a standard for measuring values as well. This, however, is not acknowledged in the IASB Framework or in the Discussion Paper.

In the IASB Framework all the assets are said to comprise future economic benefits, and the future economic benefits embodied in an asset are defined as the potential to contribute, directly or indirectly, to the flow of cash and cash equivalents to the entity (par. 53). The potential in assets is explained to take several forms. It may be a productive one that is part of the operating activities of the entity. It may also take the form of convertibility into cash or cash equivalents or a capability to reduce cash outflows (par. 53). In addition, all assets are defined to take the form of a resource, that is, they are defined as resources.

The concept of resource is used in the Framework without being explicitly defined. Its precise meaning must therefore be taken from somewhere else. For example, Ijiri (1975, p. 52) defines resources as objects that the entity intends to place under its control because they have utility in reaching the goal of the entity. Moreover, Ijiri explains that utility alone is not a

sufficient reason for an entity to place an object under its control. To rule out free goods, the object must be scarce as well. Even this does not suffice. Ijiri's definition would lead to the same circularity that was identified in the definition of an asset, unless one allowed some resources to have current value. Therefore, in this commentary a resource is defined as a scarce object, tangible or intangible, that the entity intends to place under its control because it embodies economic benefits (in one form or the other).

According to the definition of an asset in the IASB Framework, all the assets of an entity are resources (controlled by the entity as a result of past events). Moreover, with respect to every asset there is a current expectation that future economic benefits will flow to the entity. Future economic benefits in turn refer to the hidden potential of an asset to contribute to the flow of cash and cash equivalents to the entity. Sooner or later this potential is expected to become real, which means that sooner or later cash and cash equivalents are expected to flow to the entity. In other words, *all* the assets of an entity are thought to have such positive net effects to the entity that can be expressed in terms of the *future* cash and cash equivalents.

For most assets there is nothing wrong with this definition. For cash and cash equivalents, however, the definition is strange. Although it does not imply that cash and cash equivalents are not assets, it does imply that they are assets for an intuitively unacceptable reason. That is, cash and cash equivalents (controlled by the entity as a result of past events) are assets because they are expected to be able to make more cash and cash equivalents flow to the entity in the future. From the measurement theoretic point of view, this circularity is unacceptable. To eliminate it, the concept of asset must be redefined. That will be done in this commentary.

The need to redefine the concept of asset is not so obvious in the IASB Framework. It is obscured by the misleading explanations and examples regarding the concept of future economic benefits. The future economic benefit embodied in an asset is first defined as the potential to contribute, directly or indirectly, to the flow of cash and cash equivalents to the entity (par. 53). Later on, however, this clear connection between the future economic benefits and the flow of cash and cash equivalents to the entity is obscured by stating that the future economic benefits embodied in an asset may flow to the entity in a number of ways (par. 55). In order to clarify this claim, the Framework gives a list of examples proposing that an asset may be:

- (a) used singly or in combination with other assets in the production of goods or services to be sold by the entity;
- (b) exchanged for other assets;
- (c) used to settle a liability; or
- (d) distributed to the owners of the entity.

What this list ultimately does is that it practically hides the unique role of cash and cash equivalents. They seem to be like any other assets. For example, cash and cash equivalents may be said to embody future economic benefits because they can be exchanged for other assets (item b), or used to settle a liability (item c), or distributed to the owners of the entity (item d). Hence cash and cash equivalents seem to be assets because they embody *future* economic benefits – not because (i) they set a *current* value standard and (ii) offer a means to *maintain* a quantitative value. The lack of the value standard raises severe problems when one tries to produce measurements in a rigorous manner.

The IASB Framework defines *measurement* as the process of determining the monetary amounts at which the elements of the financial statements are to be recognized and carried in

the balance sheet and income statement. This is said to involve the selection of the particular basis of measurement (par. 99). Moreover, according to the Framework a number of different measurement bases are employed in financial statements including the following: (a) historical cost, (b) current cost, (c) realizable (settlement) value, and (d) present value (par. 100).

From the surface the above definition of measurement may seem like a harmless clarification of a fundamental concept. However, the definition is not harmless at all. It is an accounting representative of the tradition that defines the concept of measurement in surprisingly loose and fruitless terms. The tradition originates in the works of psychology professor S. S. Stevens, who defined measurement as “the assignment of numerals to objects or events according to rules” (Stevens 1946, p. 677). To emphasize that literally no restrictions should be made, he later gave even a more ambiguous definition saying that “measurement [is] the assignment of numerals to objects or events according to rule – any rule” (Stevens 1959, p. 19).

That is not all. Besides being loose in specifying allowed assignment rules, these definitions also fail to say what it is exactly that the numerals are actually associated with. Is it really just an object or event? From the more advanced theory of measurement one learns that numerals are assigned to assumed properties (sometimes called attributes) of objects or events rather than the objects or events themselves (see, e.g., Caws 1959, p. 3, or Ellis 1966, pp. 25-38). Properties may be quantitative (showing varying degrees, such as weight) or qualitative (showing only existence or non-existence, such as truth), and it is the *quantitative properties* that are the targets of measurement.

For example, it is not assets as such that accountants should try to measure but some specified property (or attribute) of them, say, realizable or settlement value. This is quite correctly formulated in the paragraph 19 of the Discussion Paper (condensed version): “Since it is the cash-equivalent expectations attribute of assets and liabilities that is the primary focus of business activities, it seems appropriate to conclude that this attribute should be the primary focus of accounting measurement.” On the other hand, however, there are loose expressions, too, in the Discussion Paper talking about “measuring assets” or “measurement of assets” (see, e.g., paragraphs 24, 30, 31, 75 and 179). Just as we do not talk about “measuring a person” but measuring his or her height or weight or any other property, we should not talk about measuring an asset but measuring an asset’s well-specified property.

The definition of measurement in the IASB Framework is at the same time extremely narrow (“the process of determining the monetary amounts”) and excessively allowing (no restrictions are set on the process of determining). These characteristics make the concept of measurement redundant and misleading. It is likely that the less one knows about the accounting theory and practice the more he or she will be misled because in those cases the concept of measurement will probably have its commonsense meaning. That is typically far from what is suggested in the Framework as everyone knows by experience.

Among the first significant publications in accounting welcoming the idea of extremely loose definition of measurement is the committee report on the foundations of accounting measurement (AAA 1971). The report characterized accounting measurement as follows:

“... accounting measurement is an assignment of numerals to an entity’s past, present, or future economic phenomena, on the basis of past or present observation and according to rules. ..., the rules employed need not be good ones and observations made need not be correct to qualify as accounting measurement.” (AAA 1971, p. 1 and pp. 46-47).

In one form or the other, this definition has been widely accepted and used in accounting. Among others, the IASB Framework uses its basic idea. It does not place any restrictions on the process to be followed in determining “the monetary amounts at which the elements of the financial statements are to be recognized and carried in the balance sheet and income statement” (par. 99).

For the rigorous analysis of measurements associated with the specific properties of assets, these definitions are too ambiguous. They do not recognize that *there are several kinds of numerical assignments*. For example, these definitions carelessly qualify all allocations, forecasts and valuations as true measurements, and they give the false impression that measurements and other kinds of assignments of numerals used in the financial statements are all alike. In order to clearly distinguish them from one another, the key concepts related to measurement must be distinctly defined and related to one another. That will be done below.

2. Purpose of the commentary

This commentary carries out a conceptual analysis. Its ultimate aim is to redefine the concepts of measurement and asset as they are used in the Discussion Paper and in the IASB Framework. The redefinitions are believed to be more fruitful and sound.

To reach the aim a few auxiliary concepts are introduced and defined as well. The need of all these redefinitions arises from two observations. First, the concept of measurement as defined in the Discussion Paper and the IASB Framework is not only fruitless but even misleading because it does not tie measurement explicitly to current observation. Second, the concept of asset is inappropriate because due to the circularity of its definition it does not actually allow true measurement at all. This flaw is not only scientifically inappropriate but it is evidently questionable from the practical credibility perspective of accounting as well.

The conceptual analysis of this commentary relates directly to question Q1 of the Discussion Paper: “Do you agree that the list of identified possible measurement bases ... sets out the bases that should be considered?” The purpose of the conceptual analysis in this commentary is to show that the whole question is based on misleading and inappropriate concepts. The listed bases are not measurement bases in general. They are bases for assigning numerical values to the elements of the financial statements, but they result in several kinds of outcomes (for example, allocations and forecasts) instead of only one kind (that is, measurements). This and some of its immediate consequences will be shown in the commentary.

3. Measurement and some auxiliary concepts

Definition – The first concept to be characterized and related to measurement is the concept of definition. In scientific inquiry definition is closely related to measurement but the two concepts have distinct meanings and purposes. Definitions have the specific purpose of clarifying the meaning of underlying concepts while the unique purpose of measurement is to add precision to them (Ackoff 1962, pp. 141 and 174; Hempel 1952, pp. 1-6). Measurement accomplishes this with the help of numbers that refer to the degrees of the underlying properties.

The meaning of concepts must be specified because some concepts are new and do not have a meaning while some others are borrowed from the everyday language and are too vague. The

meaning of a concept can be set in many ways one of them being *explicit definition* (Hempel 1952, p. 1). An explicit definition expresses the concept in terms of one or more other concepts. Their meaning in turn is either defined or taken for granted. Explicit definitions are the kind of definitions that will be used here for giving concepts their meaning.

Knowing the plain meaning, however, does not always suffice. For example, knowing the meaning of properties like length or wealth is not sufficient for determining the actual length or wealth of the given object. That requires measurement, which specifies the degree to which the specific property is present. This quantitative information is particularly desirable because it facilitates comparisons of objects or events.

Note, however, that not just any assignment of numerals to objects or events will qualify as measurement, if measurements are expected to be useful for comparisons. The assignments must relate to one another in the same way as the specific properties in question do. That aspect must be brought into the definition of measurement as well. Therefore, the above definitions of measurement proposed by Stevens and his followers must be rejected.

Measurement – An illuminating definition of measurement is given by Bunge (1967, p. 194). It focuses precisely on the key aspects of measurement: “Quantitative observation is measurement. Whenever numbers are assigned to certain traits on the basis of observation, measurements are being taken.” Note that the term “number” is used here, not the term “numeral” that refers to a symbol standing for a number.

For a process to qualify as a measurement process, it must involve empirical observations. This simple requirement binds measurement tightly to the present. Observations always take place in the present. They cannot be made in the past or in the future. We may have, say, documents from the past but they can only be observed in the present. Similarly, we may have forecasts that depend on observed measurements and at the same time say something about the future, but the future as such cannot be observed. Therefore, measurements must be independent of any future events, for example, disposing of a machine when it has come to the end of its economic life. This is the fundamental characteristic of measurements that distinguishes them from forecasts.

Forecasting – From the above it follows that the future can only be anticipated, not measured. Therefore the distinct concept of forecasting is needed to describe a state or event in the future. Forecasting is to say in advance what is likely to happen in the future. For example, it is a forecast, not a measurement, to say that the economic life of the given machine is five years. Also, any expression that is a function of a forecast is itself a forecast. For example, if it is assumed that the capability of a machine to generate future economic benefits deteriorates uniformly over its economic life of five years and if it is therefore said that the annual depreciation should be one fifth of the depreciation basis, then one is making a forecast and not a measurement. It is important to notice that the truth of a forecast cannot be resolved at the present but only in the future. That is the distinctive characteristic of all forecasts.

Measurement requires current observation, but all current observations are not measurements. There are additional requirements for measurement. Most importantly, for a process to qualify as a measurement process, it must also be quantitative. This distinguishes measurement from defining, which is basically qualitative. That is, definitions typically relate (qualitative) concepts to one another to express their meaning without any reference to the (quantitative) degrees of properties (or attributes). The concept can only become quantitative when a way of

assigning numbers on the basis of empirical observation is related to it by imputation. That process is called quantification (or quantitation).

Quantification – The conceptual operation of introducing quantitative concepts is called quantification (Bunge 1973, pp. 105-106). Quantification suggests a functional correspondence between the degrees of some assumed property and numbers. Quantification is an invention that operates as a link between qualitative definition and measurement. It should be kept distinct from measuring, however. It is a conceptual operation (and thus close to qualitative defining) that is based on theoretical knowledge and imagination, while measurement is an empirical operation that is based on observation and the previously quantified concept. The purpose of quantification is to invent a new concept that is quantitative and able to make the qualitatively defined notion sufficiently precise so that actual measurement becomes possible.

For example, the statistical concept of probability quantifies the property of propensity, where propensity refers to the natural (or deliberately caused) tendency for something to happen. The quantification is done by a well-known ratio of favorable events to all plausible events (Bunge 1973, pp. 105-108). This step is precisely the innovation that makes the empirical measurement of statistical probabilities possible in terms of observable phenomena.

Similarly, the economic concept of profit may be defined and quantified in several ways. For example, it may be defined as the change in the property of “being well-off” (see, e.g., Ijiri 1975, pp. 54-55). Quantification requires an additional step because “being well-off” is a qualitative expression meaning about the same as “being rich”. Its meaning may be expressed purely in terms of other qualitative concepts. If “being well-off” is quantified, for example, in terms of realizable values, then the underlying property begins to refer to empirical phenomena that may be observed. “Being well-off” can now be represented by numbers, and the same is true about the concept of profit as defined above. Therefore, it becomes quantified, too.

Measurement process – To summarize the above, one can say that to obtain measurements from any specific property of the given object or event, one has to proceed via three steps:

- (i) The interesting concept must first be properly *defined*. That is, the meaning of the qualitative concept referring to a property must be given. In an explicit definition this is done in terms of other qualitative concepts.
- (ii) The concept must then be *quantified*, that is, a way of assigning numbers (not just numerals) to the concept must be specified in terms of empirical observations and functional correspondence. At this stage no numbers are assigned, yet. Quantification is a conceptual operation.
- (iii) Finally, the interesting property may be empirically *measured*, that is, numbers are actually assigned to the quantified concept with the help of current empirical observations and appropriate instruments of measurement.

As far as the validity of the measurement process is concerned, quantification plays the key role. It must be made so that the functional correspondence between the observed degrees of the given property and the assigned numbers becomes a *faithful representation*. In the theory of measurement, the issue of how to create an appropriate functional correspondence is called the representation problem (for the details of it, see, e.g., Krantz et al. 1971, Scott & Suppes 1969, or Suppes & Zinnes 1963). It is concerned with the isomorphism between the *observable* degrees of the given property and the relational numerical system that is selected to represent the empirical system in which the degrees of the property may be observed.

The issue of faithful representation is understood differently in the Discussion Paper, where representational faithfulness is seen as an aspect of the general reliability problem that may also relate to future (currently unobservable) phenomena (see paragraphs 16 and 88 of the condensed version). The difficulty is that we have no means whatsoever to test the appropriateness of any representation referring to future phenomena that are currently unobservable.

Prediction – Forecast and prediction should not be equated as accountants erroneously tend to do (Sterling 1979, p. 78). Forecasting is to say something in advance about what is likely to happen in the so distant future that the only way to determine the correctness of the statement is to wait sufficiently long and see. There is simply no experiment that could substitute for waiting. This is not true with prediction. In science prediction means to say something in advance about what is likely to happen in the so near future that the correctness of the statement may be resolved by making an experiment. By repeating the experiment and studying the results one may eventually discover a (natural) law. At this stage, the outcome of the experiment may be predicted on the basis of the law instead of actually making the experiment.

For example, natural scientists do not have to expend the heat energy of a coal reserve by actually burning the reserve in order to be able to say how much potential energy the reserve contains. Instead the amount of potential heat energy may be predicted with the help of the natural law that has been previously discovered and is therefore currently known (Sterling 1979, p. 71). The same may be said, for example, about used cars in the second-hand market.

Actual and potential measurement – The concept of prediction is used in science to distinguish between the two broad categories of measurement: actual and potential. *Actual* measurement refers to the above explained process of actually making quantitative observations that result in a faithful representation in terms of a functional correspondence between the observed property and numbers. Actual measurement may be labeled as measurement by empirical fact. *Potential* measurement refers to the process of predicting an outcome that could be quantitatively observed in the sense of actual measurement if one so wished. Potential measurement is sometimes called measurement by (scientific) law (see, e.g., Ellis 1966, p. 54, or Campbell 1928, chapter 6).

For example, Sterling (1979, p. 70) proposes a property (or an attribute as he calls it) of assets that can be measured in the sense of potential measurement. The property is “exit value”, and he defines it as the amount of money that could be received from an immediate sale of an asset. As market exchanges are observable phenomena, also exit values of assets may be observed as soon as assets are sold. For common assets, however, one does not have to actually sell the asset in order to make a prediction of the amount of money that could be received if the asset were in fact sold. This prediction is a potential measurement or measurement by law precisely in the same sense as numbers representing potential heat energy are measurements by law. The only difference is related to the amount of evidence supporting the underlying law. For heat energy the cumulative evidence is substantial, while for many assets the available evidence may be weak. This, however, does not prevent measurement. It only increases the error of measurement, but to some extent errors are unavoidable in all measurement.

Allocation – Allocation is typically defined as the process of partitioning a set or amount and the assignment of the resulting subsets to separate classifications or periods of time (Hendriksen 1977, p. 205). The process of partitioning and the assignment of the resulting subsets may be based on any rule. This makes allocation similar to loose measurement (see above).

Neither one of them restricts the process of assigning numerals to objects or events. Here, however, the processes of both actual and potential measurement are defined in terms of quantitative observation, which is not a requirement of allocations. Therefore, typical accounting allocations do not satisfy the requirements of actual or potential measurement, and they should be kept clearly apart. More specifically, in most cases it is misleading to call accounting allocations as measurements, because they cannot be confirmed or refuted by empirical observation.

Most accounting allocations are assigned portions of a joint total to factors that are presumably related to this total (Ijiri 1975, pp. 183-186). For example, the purchase price of a machine is a joint total that is presumably related to the time that the machine is in use, that is, the economic life time of the machine. Depreciation is thus an allocation process, where the purchase price of the machine is partitioned into subsets according to a rule and the economic life time of the machine is expressed in a number of equal periods. The subsets are then assigned to the given periods.

From the verification point of view, assignments of this kind are overwhelming because they are not based on a causal model but subjective discretion (see, e.g., Sterling 1979, pp. 31-33). Consequently, allocations can neither be supported nor refuted by empirical evidence. For example, the suggested pattern of depreciation can neither be confirmed nor refuted on the basis of what may currently be observed. The choice of the depreciation method is thus purely a matter of discretion and in that sense arbitrary (see, e.g., Thomas 1969 and 1974).

Let us next relate the above definitions of measurement, forecasting and allocation to what the Discussion Paper says about the reliability of the measurement basis. It is not difficult to agree with the opening statement: "The paper reasons that the basic underpinning of reliability is 'faithful representation' and that the appropriate starting point for the analysis of reliability of a measurement basis is to examine what it purports to measure." (par. 88 of the condensed version) This statement only emphasizes the key role of *faithful representation* to the reliability of measurement in general, and of course, there is nothing wrong with that.

It is much more difficult to see the fruitfulness of the two new concepts that are introduced a couple of paragraphs later where the Discussion Paper considers the limitations on the reliability of a measurement basis: "Limitations on the reliability of a measurement basis result from some form of measurement uncertainty ... Two sources of measurement uncertainty are identified: (a) estimation uncertainty; and (b) economic indeterminacy."

These limitations are real, but it is misleading to call them "limitations on the reliability of a measurement basis". As for *estimation uncertainty*, it would be more straightforward and informative to say that instruments for true measurements are not available in these situations (at least not for the time being), and therefore one just has to use other means than measurement. This applies to both of the examples in the Discussion Paper (par. 91 of the condensed version). In the first example there are uncertainties in estimating the quantity of gold in a gold mine (that is, there are no instruments available), and in the second example there are uncertainties in estimating the future timing and amounts of cash flow to be received (this is obvious because future events can never be currently observed and thus measured).

As for the *economic indeterminacy*, the Discussion Paper states: "The reliability of measurements involving economic indeterminacy must be interpreted carefully, recognizing their inherent limitations." (par. 96 of the condensed version) It is difficult to see how even "careful

interpretation” could be of help in these situations where one is actually dealing with arbitrary allocations as the Discussion Paper later quite correctly points out: “A basic economic indeterminacy in accounting involves arbitrary allocations or attributions when the cost or value of an item must be allocated among two or more assets or liabilities.” (par. 95 of the condensed version) When it is clear that the process under consideration involves arbitrary allocations, should we not openly acknowledge it rather than label it quasi-scientifically as “a measurement process involving economic indeterminacy”?

Valuation – Theoretical accounting publications do not normally define valuation (see, e.g., Abdel-Khalik 1998, p. 308; Belkaoui 2000, pp. 298, 483, and 515; Hendriksen & van Breda 1992, pp. 465-466 and 905; Horngren & Harrison 1989, p. 386; Horngren et al. 1994, p. 968; Ijiri 1975, pp. 71-76; and Sterling 1979, pp. 117-157). The more practical literature of accounting does not define it, either. For example, there is no explicit definition for valuation in the IASB Framework or in the Discussion Paper: Measurement Bases for Financial Accounting – Measurement on Initial Recognition. Why not? Is the concept of valuation really so self-evident that it does not require an explicit definition? Let us consider that next.

From typical definitions in dictionaries one gets the impression that valuation is something that falls outside the range of accounting. For example, the New Webster’s Dictionary (1993, p. 1087) defines valuation as “an estimation of a thing’s worth, especially by a professional appraiser”. Similarly, the Advanced Learner’s Dictionary (1966, p. 1108) defines valuation as a “process of deciding the value of something or somebody”.

This impression is also supported by many accounting researchers. For example, Peloubet has remarked (see Chambers 2002, p. 490) that the accountant cannot make valuations. In any true or important sense valuation is not a matter for the accountants. Similarly, Berle and Fisher have said (see Chambers 2002, p. 490) that technically speaking valuation is not an accounting problem though the accountant has to reckon with it quite frequently. What happens is that the accountant must check up on other people’s valuations. Using Littleton’s words, accounting has a record function, not a valuation function (see Chambers 2002, p. 490).

The values that are recorded by the accountant may come from various sources. Adam Smith argued in 1776 that the word “value” has two different meanings: 1) it may express the utility of some particular object, or 2) it may express the power of purchasing other goods which the possession of that object conveys. The former is called “value in use” and the latter “value in exchange” (see Chambers 2002, p. 126). Limperg applies the same idea but he uses different terminology (see Burgert 1972, pp. 111-113). Instead of “value in use” he uses the term “indirect realizable value” and instead of “value in exchange” he uses the phrase “direct realizable value”.

Corresponding terminology is used in the IASB Framework and the Discussion Paper as well. The term “value in use” is used as such in the Discussion Paper (par. 44 of the condensed version), while the IASB Framework talks about “present value” (par. 100 (d)) in this context. The term “value in exchange” or “direct realizable value” is in the form “net realizable value” in the Discussion Paper (par. 42 of the condensed version), and in the form “realizable (or settlement) value” in the IASB Framework. There are minor differences in the definitions, too, but that is not important here. The point is that according to the widely accepted view the accountant’s role is to record the given values, not actually determine them. That is the task for the management or professional appraisers to do.

As far as the meaning of value is concerned, the two interpretations given above (i.e., the utility of an object and its power to purchase other objects) are not the only meanings that are given to it in the literature. For example, Cairncross has argued that at least five different meanings of the concept “value” may be distinguished (see Chambers 2002, p. 127). Even more meanings may be found. According to Peloubet, the report of the special committee on accounting terminology of the American Institute of Accountants gives definitions of as many as thirty-one different sorts of value, which are met in accounting or financial transactions (see Chambers 2002, p. 127). These details are not considered here any further.

Even this brief introduction shows that there is not a single definition of value or valuation. These concepts may have several meanings, but many of them also seem to share the following: valuation results in a value symbol indicating the worth of the object in some sense.

Valuation is therefore defined here as a process of assigning a value symbol to an object that may be tangible or intangible. The origins of values may vary. In business contexts the origins typically lie in market phenomena as indicated above. The task of the accountant is to obtain the relevant values, record them, and possibly process them before reporting. In accounting a *dualistic* concept of value is applied (see, e.g., Ijiri 1975, pp. 64-65). Accordingly, the specific value to be recorded is based either on *input* values (sacrifices) or *output* values (benefits). Input values may be *actual* (historical costs) or *potential* (current costs, that is, reproduction costs or replacement costs). Output values, too, may be actual (realized sales prices) or potential. In the latter case they may be *direct* (realizable values) or *indirect* (values in use).

In the dualistic approach to values, actual and potential values differ significantly from one another. This is particularly true from the measurement theoretic point of view. Actual input and output values are unconditional and observable. They are realized prices, and their quantities may be measured in the strict sense by observing actual market exchanges. The resulting measurements have many desirable characteristics. For example, they are additive (see, e.g., Sterling 1979, pp. 162-174), and they do not involve subjective discretion.

The same cannot be said about potential input and output values. They are conditional, and they typically depend on a number of factors requiring subjective discretion. For example, potential output prices are different in different markets and at different times (see, e.g., Sterling 1979, p. 73, and paragraphs 74-82 of the condensed version of the Discussion Paper). Moreover, the level of aggregation or categorization of products may make a big difference. That is, a product may be sold as a whole for one price and as parts for prices that do not add up to the price of the whole (see, e.g., Sterling 1979, pp. 171-173, and paragraphs 71-73 of the condensed version of the Discussion Paper).

As a consequence, only some potential values are measurements in the strict sense. An essential requirement of strict measurement is that the underlying phenomena must be observable. Therefore it must be possible to predict, not only forecast, the actual outcome of the potential value. For example, the direct realizable value of a given product is typically predictable and satisfies this requirement. However, the value in use of the given machine is an indirect value that requires forecasting. It takes a long period of time over which actual production and selling take place and convert the value in use into actual observable money. Another essential requirement of strict measurement is related to quantification: it should preferably result in measurements that are additive. Because of synergies, however, this requirement is not typically satisfied in the context of economic values (see, e.g., Sterling 1979, pp. 162-171).

4. Redefinition of assets

The main problem with the definition of an asset in the IASB Framework (and the Discussion Paper) is that it does not identify the property that lends itself to *quantitative observation*. The joint IASB/FASB conceptual framework project does not promise any change in this regard. These two definitions of an asset prohibit measurement in the strict sense. Strict measurements are desirable for precisely the same reason as in any scientific inquiry: they set the verifiable foundation for the numerical information.

In what follows, two alternative definitions are given for the concept of asset. Either one of them could be adopted without sacrificing the crucial point that this commentary is trying to make. The first definition is based on the expression used in the current IASB Framework. The second definition follows the previously cited working definition of the joint IASB/FASB conceptual framework project. In both of these definitions an asset is explicitly defined in terms of other concepts. Some of them are left undefined. The fundamental key concepts, however, will be explicitly defined. Moreover, the property selected to serve as the object of measurement will be specified, and a classification of the numerals that are reported as assets in the balance sheet will be proposed and analyzed.

1. An asset is a resource controlled by the entity as a result of past events. This definition is based on the current IASB Framework. The meaning of an asset depends directly on the definition of a resource. The same is true about the second definition that is given below.

2. An asset of an entity is a present right, or other access, to an existing economic resource. This definition is based on the working definition of the joint IASB/FASB conceptual framework project. Either one of these definitions could here be adopted because they both satisfy the measurement theoretic requirements that are set in this commentary.

A resource is a scarce object, tangible or intangible, that the entity intends to place under its control because it embodies economic benefits. Economic benefits embodied in a resource may be actual or potential. From the measurement theoretic point of view this distinction is crucial, but it is not made in the IASB Framework, where all the benefits embodied in an asset are considered potential.

The actual economic benefit of the given resource X, denoted by AEB(X), is the measurable quantity of the resource X expressing how much of it is present. This definition is equivalent to Ijiri's (1975, p. 75) first axiom in the axiomatic structure of historical cost valuation. The axiom proposes that the "value" (here "economic benefit") of the resources in one particular class of resources is always equal to its quantity. That must hold for exactly one class of resources called the "basic resource". Ijiri selected the monetary class of resources (that is, cash and cash equivalents) to serve as the basic resource. This is to say that the economic benefit of the basic resources (cash and cash equivalents) is always equal to their quantity.

The potential economic benefit of the given resource Y, denoted by PEB(Y), is the potential of the resource Y to contribute, directly or indirectly, to the flow Q of the basic resource X to the entity, denoted by $Q(Y \rightarrow X)$. That is, $PEB(Y) = Q(Y \rightarrow X)$.

The basic resource X is the class of resources that has been selected to represent the current observable amount of the economic benefit (or "value"). From this it follows that the

property or attribute that is reported in the financial statements should be expressed in terms of the basic resource. More specifically, *the property reported in the financial statements is the quantity of the basic resource that the entity has under its control*. This means that the selection of the basic resource has two specific purposes: First, to serve as a means to expressing the economic benefit embodied in any non-basic resource and second, to maintain the economic benefit that amounts to the quantity of the basic resource. This means also that the basic resource is the resource that has utility in terms of actual economic benefits.

A non-basic resource is a class of resources that has utility in terms of potential economic benefits. From this it follows that all non-basic resources that are controlled by the entity as a result of past events qualify as assets according to the definition in the IASB Framework. As soon as cash and cash equivalents are selected to serve as the basic resource, *potential economic benefits* will actually be exactly those *future economic benefits* that the IASB Framework expresses in terms of cash and cash equivalents.

Potential economic benefits are economic benefits embodied in a non-basic resource that have potential to contribute, directly or indirectly, to the flow of basic resources to the entity. This definition is almost the same as the definition for the future economic benefits in the IASB Framework. The major difference is that the definition of the potential economic benefits is more general than the definition of future economic benefits. Instead of being defined directly in terms of cash and cash equivalents, potential economic benefits are defined more generally in terms of the basic resource. In principle, any class of resources could be selected to serve as the basic resource. The natural choice for the basic resource, however, is the class of monetary resources, that is, money or cash and cash equivalents. After having made this selection for the basic resource, the two definitions considered above will become identical.

Money (monetary resources, cash and cash equivalents) is here selected to serve as the basic resource. This makes the redefinition of asset resemble the definition of asset in the IASB Framework with one important difference: here the basic and non-basic resources are distinguished from one another. Money (cash and cash equivalents) is the basic resource that has economic benefit or value in itself. The economic benefit of money is equal to its quantity, and that may be observed and measured in the strict sense.

Non-basic resources are valued in terms of the basic resource. That is, after having selected money (cash and cash equivalents) to serve as the basic resource all future economic benefits are expressed in terms of money. If the benefits may be predicted, then the value of the corresponding asset may be measured in the sense of potential measurement. If, however, the benefits can only be forecasted, then the value of the corresponding asset cannot be verified by empirical observation, and the reported numeral is a forecast. Thus true measurement of some but not all non-basic resources is possible in terms of the quantities of money.

5. Reclassification of assets and the bases of measurement

What does the above mean with respect to the financial reporting of assets? It means that *the property of assets being reported in the balance sheet is the amount of money (cash and cash equivalents) that the entity is actually or potentially having in its control*. As a consequence, assets may be reclassified into three categories, where each category represents an amount of actual or potential money (cash and cash equivalents): (1) actual measurements; (2) potential measurements; and (3) forecasts (which are potential, too).

1. Actual measurements. This category contains the observable amounts of money (cash and cash equivalents) that the entity actually has under its control. These assets are the actual measurements of the quantities of the basic resource. For these assets their quantity is equal to their economic benefit. The level of certainty regarding these measurements is high, and therefore the error of measurement in these measurements is typically close to nonexistent.

2. Potential measurements. In this category there are the “in principle observable” amounts of money that the entity has under its control. The expression “in principle observable” means that the amounts of money that can be collected are not currently observable, but they can be predicted on the basis of past experience and more or less convincing empirical laws. These amounts are true measurements, because they may be verified in a short period of time if one so wished. For example, some receivables, investments and inventories fall into this category.

3. Forecasts. All other assets fall into this category. Typically they have long-term potential to contribute, directly or indirectly, to the flow of cash and cash equivalents to the entity. These amounts may not be predicted, however. They can only be forecasted, which means that the numerals in this category are not strict measurements but forecasted values (or amounts). The correctness of these values cannot be currently determined. It will always take time to find out whether these values are correct or not. Eventually empirical phenomena will show, however, whether these values were more or less correct or not.

How does this classification compare with the four “measurement bases” that are presented in the IASB Framework: (a) historical cost, (b) current cost, (c) realizable (settlement) value, and (d) present value (par. 100)? The same question could be made with respect to the even more numerous “bases of measurement on initial recognition” in the Discussion Paper: (a) historical cost, (b) current cost, (c) net realizable value, (d) value in use, (e) fair value, and (f) deprival value (paragraphs 34-50 of the condensed version). In what follows, all these bases are briefly discussed in terms of the concepts that were introduced in this commentary.

Historical cost. According to the Discussion Paper, assets are recorded at the fair value of the consideration given to acquire them at the time of their acquisition, that is, at their historical cost (par. 34 of the condensed version). This expression is a generalization of the formulation in the IASB Framework (par. 100 (a)) excluding the other possible recording basis given there (“cash or cash equivalents paid”) because the amount of cash or cash equivalents paid should always equal the fair value of the consideration given. However, no matter which one of these definitions is used, the amount that is paid at the time of a cash based acquisition is an observable amount of money representing the quantity that is being transferred out of the control of the entity. Therefore, to the extent that assets are recorded at these paid amounts their reported values are actual measurements in the strict sense. The property being measured, however, is the exchange value at the time of the exchange and not any current amount of money.

Note further that only historical costs as such are measurements, not any modifications of them. They are measurements of the exchange value of the asset at the time of acquisition and that is it. If these values are modified in any way, for example, assigned to periods of time according to a predetermined rule (that is, depreciated), the link to observations is lost and resulting assignments cease to be measurements and become discretionary allocations.

Let us take an example. According to IAS 16, paragraph 58, land has an unlimited useful life, and with few exceptions, the acquisition price paid for land is not depreciated. Consequently, the recorded value of land in the balance sheet is typically a measurement of its exchange

value at the time of acquisition. Let us take another example. Buildings have a limited useful life and therefore they are depreciable assets (IAS 16, par. 58). Consequently, the values to be shown in the balance sheet stop being measurements as soon as the process of depreciation is started. The values based on depreciated acquisition prices cannot be verified by observable phenomena. They can only be forecasted. As forecasts they represent the amount of money (basic resource) that the entity anticipates to be recoverable through the use of the building.

Current cost. In the IASB Framework current cost refers to the amount of cash or cash equivalents that would have to be paid if the same or an equivalent asset was acquired currently (par. 100 (b)). In the Discussion Paper current cost is defined as the most economic cost of an asset or of its equivalent productive capacity or service potential (par. 38 of the condensed paper). This is further said to embody two alternatives: (a) reproduction cost and (b) replacement cost. Reproduction cost is the most economic current cost of replacing an existing asset with an identical one. Replacement cost is the most economic current cost of replacing an existing asset with an asset of equivalent productive capacity or service potential.

No matter which one of these two definitions is adopted, current costs are not actually paid. Thus their quantities are not currently observed. However, when enough knowledge of how they behave has been gained over time, they may be predicted. This means that current costs are in principle observable, that is, the asset could be acquired and the corresponding acquisition price actually observed. Therefore, current costs are true potential measurements. Depending on how well the market behavior is known on the basis of past experience and developed theory, the error of measurement may vary, but that is typical of all measurement.

Note, however, that as measurements current costs cannot be modified in any way. The same remark was previously made about historical costs. Current costs are potential measurements of the exchange value of the asset at the time that the acquisition is considered, and that is it. If these measurements were modified in any way, for example, assigned to periods of time according to a predetermined rule (that is, depreciated), then the link to observations would be lost just as in the case of historical costs. The resulting assignments would no longer be potential measurements but discretionary allocations.

Let us take an example. According to IAS 2, paragraph 32, when a decline in the price of materials indicates that the cost of the finished products exceeds net realizable value, the materials are written down to net realizable value. In such circumstances, the replacement cost of the materials may be the best available measure of their net realizable value. Here the replacement cost of the materials is assumed to be predictable, and thus it satisfies the requirements of potential measurement.

Let us take another example. According to the revaluation model in IAS 16, paragraph 31, an item of property, plant and equipment whose fair value can be measured reliably shall be carried at a revalued amount, being its fair value at the date of the revaluation less any subsequent accumulated depreciation and subsequent accumulated impairment losses. Here the revalued amount is a measurement in the sense of potential measurement but only at the date of the revaluation. Later on, as soon as any subsequent accumulated depreciation is deducted, the remaining value of the asset ceases to be a measurement and becomes an allocation of the original potential measurement. The resulting figure tries to forecast the recoverable amount. Moreover, paragraph 33 of the revaluation model says that if there is no market-based evidence of fair value because of the specialized nature of the item of property, plant and equipment and the item is rarely sold, an entity may need to estimate fair value using a depreciated

replacement cost approach. This procedure does not result in true measurements but allocations of the replacement cost. The replacement cost is a true potential measurement only at the date when the replacement cost is determined.

Realizable (settlement) value. In the IASB Framework realizable value refers to the amount of cash or cash equivalents that could currently be obtained by selling the asset in an orderly disposal (par. 100 (c)). In the Discussion Paper net realizable value is defined as the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale (par. 42 of the condensed version). These definitions mean that neither realizable values nor net realizable values are actually paid amounts of money, and therefore these values cannot be currently observed. However, when items of assets are sold frequently enough information of realizable values and net realizable values will accumulate and more or less accurate generalizations become possible. Therefore in many cases realizable values and net realizable values may be predicted, and therefore they often satisfy the requirements of measurement in the sense of potential measurement.

Let us take an illustrative example. According to IAS 2, paragraph 7, net realizable value refers to the net amount that an entity expects to realize from the sale of inventory in the ordinary course of business. According to paragraph 9, inventories shall be measured at the lower of cost and net realizable value. In the former case inventories are measured at the actual paid amounts, in the latter case potential measurement is applied to inventory valuation.

Fair value. In the Discussion Paper fair value is defined as the amount for which an asset (or liability) could be exchanged between knowledgeable, willing parties in an arm's length transaction (par. 46 of the condensed version). It is worth emphasizing that the previously discussed concept of net realizable value is an entity-specific value while the concept of fair value is not. As a consequence, there is typically more information supporting fair values than corresponding net realizable values. In either case, however, resulting values are potential measurements. They do not differ in principle but in terms of how much evidence there is to support the underlying (natural) law that is used in making the prediction.

Present value and value in use. According to the IASB Framework some assets are carried at the present discounted value of the future net cash inflows that the item is expected to generate in the normal course of business (par. 100 (d)). Present values would be measurements only in the loose sense of measurement. In the Discussion Paper, too, it is pointed out that "present value is not a measurement basis, but is rather a technique that can be applied to estimate a number of the above measurements in certain circumstances" (par. 51). This is true, and therefore it is surprising that the same remark is not made about the value in use that is defined as "the present value of estimated future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life" (par. 44). According to the terminology of this commentary both present values and values in use are simply forecasts. There is no way to resolve their truth at the present time. Waiting until the relevant events take place is the only possibility to determine the correctness of present values or values in use.

Let us continue with examples. According to IAS 36, paragraph 1, if an asset of the entity is impaired an impairment loss must be recognized. According to paragraph 8, an asset is impaired when its carrying amount exceeds its recoverable amount. According to paragraph 6, the recoverable amount of an asset is the higher of its fair value (as defined above) less costs to sell and its value in use, where the value in use is the present value of the future cash flows

expected to be derived from the asset. This valuation rule involves both potential measurement and forecasting. Fair values are potential measurements. They are not entity-specific, and therefore it is typical that fair values have substantial empirical evidence to support their prediction. Values in use, however, are not measurements in the strict sense but forecasts. As a consequence, any value on the balance sheet that is determined using the test for impairment is a forecast unless the recoverable amount is simply considered to equal the fair value.

Deprival value. In the Discussion Paper the deprival value (or “value to the business”) is defined as the loss that an entity would suffer if it were deprived of an asset (par. 49 of the condensed version). The upper boundary is its replacement cost. The lower boundary is its recoverable amount, which is the higher of its net realizable value and value in use. The components of deprival value have been defined above. From the definitions and the analyses that followed them one can conclude that deprival values are at best potential measurements (replacement costs or net realizable values) and at worst only forecasts (values in use).

According to the terminology in this commentary, the “different measurement bases” referred to in the IASB Framework (par. 100) and the “possible bases of measurement on initial recognition” considered in the Discussion Paper (paragraphs 33-51 of the condensed version) are true measurement bases only in a limited number of occasions. Consequently, values of assets shown on the balance sheet are not typically true measurements but some other kinds of numerical assignments. Historical costs as such are actual measurements but the property being measured refers to history. Moreover, modifications of these measurements (e.g., depreciated amounts) are typically arbitrary allocations. Current costs as such are potential measurements but any modifications of them, too, typically result in arbitrary allocations. Realizable values and net realizable values are potential measurements. The available empirical support for them may vary affecting the error of measurement, but this does not change their nature as measurements. Fair values are typically potential measurements. Deprival values may be potential measurements or plain forecasts. Present values are never measurements, because verifying their truth takes such a long period of time that present values are typically forecasts.

6. Concluding remarks

There is a significant inconsistency in the recent history of financial accounting, and it is quite obviously reflected in the Discussion Paper. On one hand, the modifications in the definition of accounting (see, e.g., Belkaoui 2000, pp. 31-34) and the continuing pursuit after observable, market-oriented bases for valuation (see, e.g., the condensed version of the Discussion Paper, pp. 7-10) indicate that scientifically sound and empirically testable accounting figures are considered desirable. On the other hand, however, the adoption of an extremely loose concept of measurement and its applications in accounting make accounting figures drift away from the scientifically sound bases. “Asset measurement” is a striking example of the truly unscientific approach to measurement. The very first step would be to modify the language that is used in financial accounting (see, e.g., Sterling 1979, pp. 35-46).

The ultimate purpose of this commentary was to redefine the concepts of *measurement* and *asset* as they are used in the Discussion Paper and in the IASB Framework. To achieve the purpose some auxiliary concepts were introduced and defined as well. The need to redefine measurement arose from the observation that the current definition does not tie measurement explicitly to observable phenomena. The need to redefine asset arose from the observation that for cash and cash equivalents the current definition is circular. Therefore, currently no assets can be measured in the true sense of measurement.

Two definitions of asset were suggested following the IASB Framework in the first one and the joint IASB/FASB conceptual framework project in the second one. *An asset* is a resource controlled by the entity as a result of past events, or *an asset* of an entity is a present right, or other access, to an existing economic resource. Both of these definitions are based on the concept of resource. A *resource* was defined as a scarce object, tangible or intangible, that the entity intends to place under its control because it embodies economic benefits.

Economic benefits embodied in a resource may be actual or potential. *The actual economic benefit* of the given resource X was defined as the measurable quantity of the resource X expressing how much of it is present. It was denoted by $AEB(X)$. *The potential economic benefit* of the given resource Y , denoted by $PEB(Y)$, was defined as the potential of the resource Y to contribute, directly or indirectly, to the flow Q of the basic resource X to the entity, denoted by $Q(Y \rightarrow X)$. Using the adopted notations, $PEB(Y) = Q(Y \rightarrow X)$.

The actual economic benefit must be known for exactly one class of resources for which the economic benefit of the resource is equal to its quantity. This class of resources is called the “basic resource”. *The basic resource* X is thus the class of resources that has been selected to represent the current observable amount of the economic benefit (that is, “value”). A *non-basic resource* is a class of resources that has utility in terms of potential economic benefits, that is, in terms of the potential to contribute, directly or indirectly, to the flow of the basic resource to the entity.

Monetary resources or *cash and cash equivalents* were selected to serve as the basic resource. This made the first redefinition of asset resemble the definition of asset in the IASB Framework with one important difference: here the basic and non-basic resources are distinguished from one another. Cash and cash equivalents are the basic resource that has economic benefit or value in itself. The economic benefit of cash and cash equivalents is equal to their quantity. That may be observed and measured in the strict sense.

Separation of the basic and non-basic resources makes the true measurement of some non-basic resources possible in terms of the quantities of the basic resource. Therefore, from the measurement theoretic perspective there are exactly two kinds of assets in the balance sheet: *measurements* and *forecasts*. Measurements may be actual or potential. Forecasts may be of many kinds. Most of them, however, try to anticipate the future net cash inflows. The process of anticipation may involve depreciation, which means that discretionary allocations are used. Yet the ultimate aim even in these occasions is to say something in advance about the future net cash inflows.

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