A Business Valuation Framework for Asset Measurement

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ABSTRACT: The primary objective of this commentary is to offer a framework for addressing the questions – which asset measurement approach provides investors with decision-useful financial reporting information and why? We utilize a business valuation perspective and focus on the information needs of external users ultimately interested in assessing the going concern value of the firm (i.e. “investors”). We argue that the asset measurement investors find useful in determining firm value depends on how the asset is expected to realize value for the firm: in-exchange or in-use. How an asset is expected to realize value for the firm is primarily a function of its business model. We propose that for assets generating value-in-exchange, the measurement basis that provides investors with decision-useful financial information is fair value determined by exit price in a hypothetical market exchange, less expected costs to sell. In contrast to other asset-measurement frameworks, we maintain this conclusion even in the absence of an observable market exchange value for an in-exchange asset. Further, we propose that for assets generating value-in-use, the measurement basis that provides investors with decision-useful financial information is historical cost because historical cost information is useful to investors in forecasting future cash flows from in-use assets.

Key Words: Asset measurement; Business valuation; Decision-useful financial reporting information; Value-in-use; Value-in-exchange; Conceptual framework.
INTRODUCTION

The existing Conceptual Framework provides little guidance on asset measurement (IASB 2013, ¶6.1), which hinders standard setters’ ability to develop consistent concepts-based accounting standards (IASB 2013, ¶1.26). The primary objective of this commentary is to offer an asset measurement framework (diagramed in Figure 1) that presents a way of thinking about decision-useful asset measurement that might prove instructive. In developing this framework we adopt a business valuation perspective and seek to describe circumstances under which fair value and historical cost accounting offer decision-useful information to investors in that context.

In its conceptual framework, the Financial Accounting Standards Board (FASB) characterizes decision-useful financial reporting information as information that is relevant, by virtue of its predictive or confirmatory value, and faithfully represents the substance of an economic phenomenon completely, neutrally, and without material error (FASB 2010). It is difficult to rigorously assess the decision-usefulness of financial reporting information without addressing the question: Decision-useful to whom? We focus on the information needs of external users, lacking the power to direct the management and policies of the entity, ultimately interested in assessing the going concern value of the firm. For ease of exposition, we refer to such users as “investors.”

An explicit or implicit “premise of value” underlies any business valuation (AICPA 2007). The premise of value is, “an assumption regarding the most likely set of transactional circumstances that may be applicable to the subject valuation; for example, going concern, liquidation” (AICPA 2007, 48). We

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1 The opening paragraph of the measurement section of the IASB’s (2013) revisions to its Conceptual Framework states, “The existing Conceptual Framework provides little guidance on measurement and when particular measurement should be used” (¶6.1).

2 Specifically, the Discussion paper states that, “… the primary purpose of the revised Conceptual Framework is to assist the IASB by identifying concepts that it will use consistently when developing and revising IFRSs” (¶1.26).

3 A rigorous consideration of the information needs of all users is impractical and we believe the users we focus on comprise a significant and important set. Dichev et al. (2013) find that 94.7% of the public company-CFOs they survey identify valuation as the primary reason earnings are important to users. The authors point out that this emphasis on business valuation is consistent with prior surveys of investors, analysts and financial executives, a wealth of research in financial capital markets, and the stated goals of standard setters.
build our framework upon a going concern premise of value for two reasons. First, we believe this premise of value most often captures the likely set of transactional circumstances. Second, much of financial accounting and reporting rests upon the fundamental assumption that the entity is a going concern (e.g. Kieso, Weygandt and Warfield 2013). Nonetheless, we address the implications of a liquidation premise of value in a separate section of the paper.

In a world of perfect and complete markets all participants have complete information regarding the value of all goods and services and a market exists for every good and service, as well as every combination of goods and services. In this setting, fair value is observable and equals market value, and the sum of the fair values of a firm’s assets including the market value of goodwill equals total firm value (Barth and Landsman 1995; Hitz 2007).

In a world of imperfect and incomplete markets, however, a market does not exist for some goods and services or some combinations of goods and services. In this setting, due to market frictions, imperfect information, or illiquid markets, the fair value of a firm’s assets or combinations of its assets including the fair value of its goodwill might not be observable and must be estimated. In this factually more descriptive setting, the question of what constitutes decision-useful financial reporting information for investors arises. Using a business valuation perspective as a foundation we construct a framework, which proposes that the asset measurement investors find useful in determining firm value is linked to how the asset is expected to realize value for the firm.

Value realization occurs via two alternative mechanisms: in-exchange or in-use. In-exchange assets are expected to realize their contribution to firm value on a standalone basis in exchange for cash or other economically valuable assets. In-exchange assets derive no additional value from being used in combination with other assets. In contrast, in-use assets are expected to realize their contribution to firm

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4 A going concern premise of value assumes the business is expected to continue to operate into the future (AICPA 2007).
value employed in combination with other assets. This combination of assets is referred to as a “cash generating unit.”

The in-use value of the cash generating unit is expected to exceed the sum of the individual assets’ standalone exchange values (Fortgang and Mayer 1985). This excess value is sometimes referred to as “goodwill” (Feltham and Ohlson 1995; Hitz 2007). Materials from the National Association of Certified Valuators and Analysts (NACVA, 2011a) describe this excess value as “the intangible elements of Going Concern Value result[ing] from factors such as having a trained work force, an operational plant, and the necessary licenses, systems and procedures in place” (16). Thus, a component of the excess value can be attributable to managers’ and employees’ skill at employing the assets to create value for the firm, as well as the particular combination of assets comprising the cash generating unit. Consequently, the value of a firm’s in-use assets is entity-specific.

In our framework, for assets generating value-in-exchange, the measurement basis that provides investors with decision-useful financial information is fair value determined by exit price in a hypothetical market exchange, less expected costs to sell. In contrast to other asset-measurement frameworks, we maintain this conclusion even in the absence of an observable market exchange value for an in-exchange asset. In such circumstances the frequently proposed alternative to fair value is historical cost. From a business valuation perspective, however, historical cost not only fails to faithfully represent value-in-exchange completely, neutrally, and without material error, it is also irrelevant to investors attempting to estimate value-in-exchange. Thus, even when imperfectly determined, estimated

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5 A cash generating unit is the smallest group of assets used in combination that are largely independent of the entity’s other assets (IASB 2009a, ¶6). For our purposes it is sufficient to assume that all of a firm’s in-use assets comprise a single cash generating unit.

6 The “goodwill” referred to in our paper encompasses the excess value created by all of the firm’s in-use assets. This concept of goodwill is broader than goodwill reported on the balance sheet under generally accepted accounting principles, which limits reported goodwill to that acquired in a business combination.

7 Such as Nissim and Penman (2008) and the Institute of Chartered Accountants of England and Wales (ICAEW, 2010).
fair value has greater potential than historical cost to be decision-useful to investors interested in
determining the value of a firm’s in-exchange assets.\(^8\)

For assets generating value-in-use, our framework proposes that the measurement basis which
provides investors with decision-useful financial information is historical cost.\(^9\) For reasons explained
herein, we conclude that historical cost is decision-useful to investors attempting to forecast the future
cash flows required to estimate value-in-use even though historical cost does not faithfully represent
value-in-use completely, neutrally, or without material error. Thus our concept of decision-usefulness,
developed in the context of a business valuation, deviates from that found in the extant standard setting
literature. Further, we argue that for assets that derive value-in-use, the frequently proposed alternative of
fair value not only fails to faithfully represent value-in-use, but also is not relevant to investors attempting
to estimate value-in-use.

We also note that although there is substantial overlap between the concepts of financial and in-
exchange assets and non-financial and in-use assets, the mapping between these concepts is imperfect.
Failing to recognize these concepts as distinct impedes the asset measurement discussion. In addition, we
argue that the debate about the relative reliability of fair value versus historical cost measures can act as a
red herring that impedes progress toward conceptually sound guidance for asset measurement. In our
framework, the choice of fair value or historical cost is a function of how the asset realizes value (in
exchange or in-use); it is not a function of the perceived relative reliability of fair value versus historical
cost measurements.

How an asset is expected to realize value is primarily a function of the business model, although
managerial intent can play a secondary role when exceptional circumstances give rise to an asset not
encompassed by the business model (e.g. excess assets). Thus, our framework incorporates a primary role
for the business model and a secondary role for managerial intent to impact the asset measurement that

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\(^8\) Under such circumstances additional disclosure and the audit function play particularly important roles in
restricting opportunities for managerial abuse.

\(^9\) We intend the term “historical cost” to encompass “amortized historical cost.” We provide additional details
pertaining to our definitions of “fair value” and “historical cost” elsewhere in the paper.
provides decision-useful financial reporting information.\textsuperscript{10} Finally, we argue that the concepts of business model and managerial intent are distinct and that the development of a comprehensive framework for addressing asset measurement necessitates roles for both.

In summary, from a business valuation perspective, the measurement basis which provides investors with decision-useful information is linked to how the asset is expected to realize value – in-exchange or in-use. How the asset is expected to realize value is a function of the business model, and for assets outside the business model – managerial intent.

The remainder of our paper is organized as follows. In the next section, we explain our decision to focus on business valuation as a primary objective of financial reporting as well as the implications of this decision for the stewardship objective of financial reporting. In section three we outline the historical development of the concepts of in-exchange and in-use assets in the economics, accounting, and business valuation literatures. Section four investigates the implications of a business valuation perspective for decision-useful asset measurement of in-exchange and in-use assets. Section five explores the roles of business model and managerial intent in our framework. Section six examines the implications of a business valuation perspective for financial statement presentation of income and its components. Section seven concludes our paper.

OBJECTIVES OF FINANCIAL REPORTING

At a recent conference, Financial Accounting Foundation Chairman, Jeffrey J. Diermeier opined that accounting standards focused on the needs of investors attempting to determine firm value would meet the information needs of the vast majority of users.\textsuperscript{11} Mr. Diermeier encouraged standards setters to return to the basic objective of helping investors with the task of business valuation.

\textsuperscript{10} Business model also plays a primary role in measurement frameworks developed in Nissim and Penman (2008) and the ICAEW (2010) framework. Later in the paper we compare and contrast our framework to those developed in the aforementioned papers.

\textsuperscript{11} FASB@40 Conference, New York, September 12, 2013.
Consistent with this, we focus on the information needs of investors interested in assessing firm value. We recognize, however, that this is not the only objective of financial information. The stewardship or accountability objective of accounting is also important. Rosenfield (1974, 126) states the stewardship objective of accounting “… is to report on the control and use of resources by those accountable for their control and use to those to whom they are accountable.” Further, in his model of the stewardship reporting problem, Gjesdal (1981) concludes that information is valuable to stewardship if it is informative of the manager’s decision with respect to the control and use of resources.

While stewardship is an oft touted objective of financial reporting, there is limited analysis of the unique implications of this objective for financial reporting. Gjesdal (1981, 209) concludes, “… once stewardship has been proposed as an objective, one would expect to find a discussion of the implications of this for the choice of reporting system. Few such discussions exist.” Fully thirty plus years later the accounting community seems to have made inappreciable progress. For example, this same concern is voiced in a response to the International Accounting Standards Board’s (IASB) conceptual framework project. Pro-Active Accounting Activities in Europe (2007, 3) acknowledges, “It has also been suggested that the implications of keeping stewardship as a separate objective of financial reporting are not obvious and that some examples of its impact on financial reporting are required to demonstrate the point.”

Despite some puzzlement concerning the unique implications of the stewardship objective for financial reporting, Gjesdal (1981) states that the stewardship objective of accounting is generally believed to imply that historical cost is preferred to current value asset measurements and information about the past is preferred to future-oriented information. The implications of our framework are consistent with this broad principle in at least two respects. First, our framework provides a role for historical cost measurement for in-use assets. Second, we reject estimated value-in-use measures for in-use assets because such measurement necessarily relies on managers’ estimates of future-oriented information including forecasted cash flows and discount rates.

Nevertheless, our framework calls for fair value measurement for in-exchange assets. While it might be inferred that this is inconsistent with the stewardship objective of accounting, Gjesdal (1981,
224) concludes, “It is not immediately clear that historical cost, for example, is preferred to current cost for stewardship purposes, as is sometimes claimed.” In our framework, asset measurement (fair value or historical cost) is linked to asset use (in-exchange or in-use) and accordingly, the measurement basis itself conveys information about how managers intend to employ assets to realize value for the firm. Accordingly, the asset measurement applied conveys information about the use of assets by those accountable for their use. This is consisted with Rosenfield’s (1974) characterization of the stewardship objective of accounting and Gjesdal’s (1981) conclusion regarding the type of information that is valuable in the stewardship reporting problem. Consequently, we conclude that the implications of our framework are generally consistent with the stewardship objective of financial reporting, and focus the remainder of our paper on the business valuation objective initially proposed.

Some have criticized the standard setting process stating, “… the standard-setting process becomes less about the information wants of particular readers of financial statements, and more about the FASB’s ideas concerning the information that users should find useful in their decision-making process” (Young 2006, 589).\(^\text{12}\) Consistent with this we argue that the asset measurement question cannot be answered with reference to theoretical concepts alone. Business valuation and the requisite forecasting of future cash flows are practical endeavors, which are tackled under conditions of uncertainty and incomplete information. Our framework focuses on the informational needs of users undertaking the real-world exercise of assessing firm value. We view the adoption of this perspective as an important addition to the asset measurement debate.

### IN-EXCHANGE AND IN-USE ASSETS

**Value-in-Exchange and In-Use in Economic Theory**

The concepts of value-in-exchange and value-in-use originated with Aristotle (Kauder 1953; Robertson and Taylor 1957; Porter 1965), but these concepts re-emerge in a significant manner in 1776 with the economic philosopher Adam Smith’s *Wealth of Nations* (Tuttle 1891; Robertson and Taylor

\(^{12}\) Emphasis added.
1957; Porter 1965). Smith ascribed two meanings to “value”: value-in-exchange and value-in-use. He writes, “The things which have the greatest value-in-use have frequently little or no value-in-exchange; and, on the contrary, those which have the greatest value-in-exchange have frequently little or no value-in-use” (Smith 1776, Book I, Chapter IV).

To Smith, value is a function of utility, not market price. Since Smith, various schools of economic thought adopted the concepts of value-in-exchange and value-in-use and define these terms with reference to an object’s utility. For example, Tuttle (1891) defines exchange value as market value or the utility an object brings to society and in-use value as the utility an object brings to the individual. Eventually, the philosophical economic discourse on value embraced the concepts of value-in-exchange as economic value proper and value-in-use as utility (Porter 1965). Specifically, value-in-exchange is value derived from market exchange, while value-in-use is value derived from an individual’s use of the material good or service.

**Value-in-Exchange and In-Use in Accounting**

Linking how an asset is expected to realize value for the firm (in-exchange or in-use) to decision-useful asset measurement dates back to the early development of modern accounting. For example, Littleton (1935, 270) ascribes measurement attributes to the concepts of value-in-exchange and value-in-use, stating “What we discuss in accounting as ‘cost versus value’ is, in fact, ‘value-in-use versus value-in-exchange’.” More recently, a 2009 Staff Paper prepared for the IASB and FASB states that “…the relevance of a specific measure for a particular asset or liability depends on how the future value flows it represents will arise. That characteristic is referred to as the method of ‘value realization’.”\(^\text{13}\)

Nevertheless, linking asset measurement to how an asset is expected to realize value for the firm is not without its critics. For example, Leisenring et al. (2012, 341) equate the value realization approach outlined in the 2009 Staff Paper to intent-based accounting and conclude that “…the conceptual arguments for intent-based recognition and measurement standards are not compelling, and that combined relevance and comparability are enhanced by requiring similar recognition and measurement for similar

\(^\text{13}\) Quote drawn from Leisenring et al. (2012, 336-337).
rights and obligations in an item or arrangement, regardless of management intent for that item or arrangement.”

The concepts of value-in-exchange and value-in-use also appear in the accounting literature in the context of “fair value” accounting. Barth and Landsman (1995) define fair value in terms of exchange value determined using entry or exit prices. Barth and Landsman assert that entry or exit values and value-in-use are not necessarily equal and that the valuation of in-use assets can differ from firm to firm.

Financial accounting standard setters have developed working definitions of value-in-exchange and value-in-use that incorporate the themes of utility or value realization. For example, Statement of Financial Accounting Standards 157 (SFAS 157, FASB 2006), defines an asset as an in-exchange asset if, “…the asset would provide maximum value to market participants on a standalone basis” (¶13). SFAS 157 defines an asset as an in-use asset if “…the asset would provide maximum value to market participants principally through its use in combination with other assets as a group” (FASB 2006, ¶13). These definitions incorporate the idea that an asset’s value is a function of how it is used, which might be on a standalone basis (i.e. in-exchange) or in combination with other assets (i.e. in-use).

The IASB has developed notions of value-in-exchange and value-in-use which explicitly consider the way in which an asset realizes value – either directly or indirectly (IASB 2009b). Directly realized assets generate inflows in one step, on a standalone basis, by being exchanged for cash or other economically valuable items (IASB 2009b, ¶ME30). In effect, the IASB’s “directly realized assets” are similar in concept to in-exchange assets. Indirect value realization occurs in more than one step. For example, using machinery to convert raw materials into finished goods, which are sold, indirectly realizes the value of the machinery and raw materials (IASB 2009b, ¶ME32). In effect, the IASB’s “indirectly realized assets” are similar in concept to in-use assets.

**Value-in-Exchange and In-Use in Business Valuation**

Value-in-exchange and value-in-use are critically important concepts in the business valuation literature, which specifies an asset’s worth in terms of how it realizes value. For example, in valuing industrial real estate, an appraiser is obliged to consider the way the property will be used (Hartman 1976;
Skogstad 1976; Hartman 1979). The value-in-exchange of an idle building is determined by comparable market values (Hartman 1976; Skogstad 1976; Hartman 1979), but if the property derives value-in-use, value is determined by the present value of the expected future benefits the property bestows on the user. Comparable market value is deemed an inappropriate measure of value in the latter case because in-exchange value fails to capture the incremental value created by using the asset in combination with other assets.

**Definition of In-Exchange and In-Use Assets for Purposes of Our Framework**

Building on the economic, accounting, and business valuation literatures as well as the definitions found in accounting standards, we adopt the following definitions for in-exchange and in-use assets. In-exchange assets are *assets expected to realize their contribution to firm value on a standalone basis in exchange for cash or other economically valuable assets* (see Figure 1). Using such assets in combination with other firm assets generates little or no incremental firm-specific value. For example, an investment certificate held for sale retained in a bank’s vault is expected to realize its contribution to firm value on a standalone basis in exchange for cash. The investment certificate generates no firm-specific value in excess of exchange-value from being “used” in combination with the vault.

In-use assets are *assets expected to realize their contribution to firm value consumed or used in combination with other assets in the production and sale of goods or services* (see Figure 1). In-use assets are expected to generate firm-specific value in excess of standalone exchange value, such that the value-in-use of the assets used in combination is expected to exceed the sum of the assets’ individual values-in-exchange. For example, retail inventory realizes its contribution to firm value in combination with other assets (e.g. buildings and equipment). The retail inventory combined with these other assets forms a cash generating unit, which is expected to generate value in excess of the sum of the standalone exchange values of the individual assets comprising the cash generating unit. Further, this value is entity-specific since it is a function of the manner and location in which the inventory is presented for sale.
In-Exchange and In-Use Assets versus Financial and Non-Financial Assets

Our definitions of in-exchange and in-use assets are fairly consistent with what is found in existing accounting standards, but our focus on the concepts of in-exchange and in-use assets is a departure from standard setters’ tendency to focus on financial versus non-financial assets when considering questions of asset measurement. For example, SFAS 157 relates assets that provide maximum value through use in combination with other assets to “certain nonfinancial assets” and assets that provide maximum value on a standalone basis to financial assets (FASB 2006, ¶13). Similarly, Accounting Standards Update 2011-04 (FASB 2011, 3) indicates that in-use value is not applicable to the fair value measurement of financial assets because, “… such items do not have alternative uses and their fair values do not depend on their use within a group of other assets or liabilities.” Thus, standard setters tend to focus on financial versus non-financial assets and closely link financial assets to in-exchange assets and non-financial assets to in-use assets.

In contrast, we find it more fruitful from a business valuation perspective to focus on in-exchange and in-use assets and recognize the subtle, but important point, that while there can be substantial overlap, the mapping from financial to in-exchange assets and from non-financial to in-use assets is not one-to-one. The concept of a financial asset is distinct from that of an in-exchange asset and similarly for non-financial and in-use assets. For example, land held for sale is a non-financial in-exchange asset while monetary working capital is a financial in-use asset. We find that focusing on financial and non-financial assets and treating these concepts as interchangeable with in-exchange and in-use assets impedes the asset measurement discussion.

A BUSINESS VALUATION PERSPECTIVE ON DECISION-USEFUL ASSET MEASUREMENT

As discussed in the previous section, prior literature argues that an item’s value is a function of how the item is used (Tuttle 1891; Babcock 1932); it is not a function of the item itself. Consider, for example, land held for sale (an in-exchange asset) versus land used in operations (an in-use asset). Land
held for sale is expected to realize value from exchange, whereas land used in operations is expected to realize value from use in combination with other assets. This has implications for the asset measurement investors will find decision-useful.\textsuperscript{14} This section of our paper explores these asset measurement implications.

The Relation between Firm Value and Financial Reporting Information

We employ the following standard business valuation model in the development of our framework for asset measurement:\textsuperscript{15}

\[ V_t = ie_t + \sum_{T=1}^{\infty} R_F^{-\tau} E_t[\bar{c}_{t+\tau}] \]  \hspace{1cm} (1)\textsuperscript{16}

Where:

\( V_t \) = firm value, date t.
\( ie_t \) = in-exchange assets, date t.
\( R_F \) = one plus the risk-adjusted discount rate.
\( E_t \) = expectation formed based on available information, date t.
\( c_t \) = cash flows from in-use assets, net of investments in those activities, date t.

This model defines firm value in terms of the value of a firm’s in-exchange assets plus the value of its in-use assets that comprise a cash generating unit (or units). As discussed earlier, the value-in-use of a cash generating unit is expected to exceed the sum of the individual assets’ standalone exchange values (Fortgang and Mayer 1985). This excess value is sometimes referred to as “goodwill” (Feltham and Ohlson 1995; Hitz 2007). Thus, value-in-use is a function of both the individual in-use assets and the joint goodwill created by using the assets in combination (see (2) below):

\[ \sum_{T=1}^{\infty} R_F^{-\tau} E_t[\bar{c}_{t+\tau}] = f(iu_t, g_t) \]  \hspace{1cm} (2)

Where:

\( iu_t \) = in-use assets net of operating liabilities, date t.
\( g_t \) = goodwill.

All other variables are defined above.

\textsuperscript{14} It can also have implications for the classification of the asset – current versus long-term – but, this is beyond the scope of the paper.
\textsuperscript{15} This model is presented in most valuation textbooks. See for example, “Steps in Applying the DCF Model” (Easton et al. 2013, 13-6).
\textsuperscript{16} Equation (1) is agnostic regarding whether the cash flows incorporated in the second term are cash flows attributable to equity holders discounted at the cost of equity capital (i.e. a net-equity concept of valuation) or cash flows to all providers of capital discounted at the weighted average cost of capital (i.e. an invested capital concept of valuation). The choice between these two approaches is a matter of taste and has no bearing on the asset measurement issues addressed in this paper.
Goodwill ($g_t$) is the incremental value created by employing the in-use assets in combination. This incremental value is a joint value and cannot be allocated to individual in-use assets in any meaningful fashion. For example, the present value of the future cash flows generated by machinery, raw materials and labor inputs used to create finished goods, which are sold, to produce net cash is expected to exceed the sum of the individual market exchange values of the machinery, raw materials and labor inputs. This excess value cannot be meaningfully attributed to any of these individual assets, however, since it is created by using them in combination. This point is made in Milburn (2012, ¶5) who states, “It is well established that it is impossible to determine, even after the fact, how much an individual input has contributed to revenues achieved during the period. All that can be said unequivocally is that revenue recognized in a period is the result of the interactions of all the inputs to that revenue generating process.”

Equation (1) defines firm value as a function of the value-in-exchange of a firm’s in-exchange assets plus the value-in-use of its in-use assets, which is a function of the discounted cash flows expected to be generated from the firm’s in-use assets used in combination. Thus, the valuation model suggests that investors require sufficient information to assess the value-in-exchange and value-in-use of a firm’s in-exchange and in-use assets, respectively. The next section of our paper addresses the implications for asset measurement of these information needs.

Decision-Useful Financial Reporting Information for In-Exchange Assets

The expected contribution to firm value of an in-exchange asset is a function of what it can be exchanged for on a standalone basis (i.e. its value-in-exchange). The firm does not expect to derive any additional value from using an in-exchange asset in combination with other assets. The information most relevant to investors in assessing value-in-exchange is the expected market exchange value of the asset net of disposal costs. The measurement attribute that most faithfully represents this value completely,

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17 Our paper focuses on asset measurement and accordingly we do not address the recognition or measurement of liabilities. We assume assets are net of liabilities and non-operating obligations measured at fair value are deducted from in-exchange assets, while operating liabilities are included in the computation of value-in-use. Our conclusions regarding asset measurement are not sensitive to this assumption.
neutrally, and without material error is the amount expected to be received upon disposition of the asset (i.e. market exchange value determined using exit prices), less expected costs to sell.

This is somewhat consistent with the FASB’s concept of fair value measurement in SFAS 157. The FASB (2006, ¶7) states, “…the objective of a fair value measurement is to determine the price that would be received to sell the asset … at the measurement date (an exit price).” Our treatment of costs to sell deviates from SFAS 157, however, which excludes transaction costs from the determination of fair value (FASB 2007, ¶9). Nevertheless, within our framework we use “market exchange value” interchangeably with “fair value” to refer to the asset measurement basis that is appropriate for in-exchange assets.

When a liquid market exists, market exchange value is readily available and incorporates common and idiosyncratic information from all sources. It is an information rich measure of value-in-exchange. In the absence of a liquid market, however, value-in-exchange must be estimated based on a hypothetical transaction between a willing buyer and seller both of who have sufficient knowledge of the relevant factors affecting value. In this case, the question becomes, which party – investors or managers – is better equipped to estimate value-in-exchange?

It is not clear investors hold an informational advantage over managers in undertaking this task, since managers are more likely to have knowledge of the relevant factors affecting value. For example, managers might have private information regarding the condition or location of the asset, which impact its estimated value-in-exchange. In addition, the characteristics of in-exchange assets mitigate opportunities for managerial manipulation of estimated in-exchange value. In-exchange assets are expected to be exchanged for cash or other valuable assets, such that the ultimate exchange value is informative of the extent to which the manager’s estimates are unbiased. Also, since market-exchange value is not entity specific, auditors can bring industry expertise to bear in monitoring managers’ estimates of value-in-exchange.

Some opponents of fair value measurement are unmoved by the arguments in the preceding paragraph. Nevertheless, an in-exchange asset exists and must be measured preferably using a basis that
allows investors to assess value-in-exchange, for this is the practical problem they must resolve in determining firm value. Historical cost is sometimes offered as an alternative to fair value measurement under such circumstances. In our framework, the extent to which historical cost is a viable alternative to estimated fair value when liquid markets do not exist depends on the extent to which historical cost provides investors with information useful in estimating value-in-exchange.

Historical cost fairs poorly in this respect. Historical cost is unlikely to faithfully represent market exchange value completely, neutrally, or without material error. Further, historical cost is unlikely to provide information to investors useful in estimating market exchange value. Consider, for example, land held for sale. Unless the land was purchased recently, the amount expended to purchase the land does not faithfully represent market exchange value and does not provide investors with information useful in estimating this value. Thus, within our framework historical cost is not a viable substitute for managers’ estimated market exchange value even when liquid markets do not exist. Accordingly, for in-exchange assets, the asset measurement that provides investors with decision-useful financial reporting information is market exchange (i.e. fair) value determined by exit value, less expected costs to sell.

This recommendation is consistent with other papers that consider the question of decision-useful asset measurement. For example, Nissim and Penman (2008) argue that fair value accounting is sufficient for reporting to shareholders when the firm does not add value to the input through its business model. Similarly, a measurement framework developed by the Institute of Chartered Accountants of England and Wales (ICAEW 2010) advocates for market exchange values for assets that are not being used or created within the firm, i.e. assets that derive value in-exchange (¶3.2). Similarly, a recent Canadian Institute of Chartered Accountants (CICA) asset measurement framework (Milburn 2012) concludes that fair value is the appropriate measurement basis for investing and financing assets, which are not part of the cash-generating process.

Moreover, our conclusion is consistent with empirical research that finds fair value measurement as more relevant than historical cost for a specific class of in-exchange assets: financial securities (see, for example: Barth 1994; Ahmed and Takeda 1995; Bernard et al. 1995; Eccher et al. 1996).
All three of these frameworks, however, limit the use of fair value measurement for in-exchange assets in the absence of an observable proxy for fair value. In contrast, we continue to advocate for the use of fair value for in-exchange assets, even in the absence of an observable proxy for fair value. We argue that investors’ informational needs are best served by allowing investors to observe the manager’s estimate of value-in-exchange. Further, the nature of in-exchange assets allows for some degree of ex-ante and ex-post monitoring of the reasonableness of the manager’s estimate. Thus, in our framework, the appropriate measurement basis is a function of the type of asset (i.e. in-exchange); not of the reliability of the estimate.

Decision-Useful Financial Reporting Information for In-Use Assets

In-use assets are expected to create value for the firm, which is assumed to be a going concern, by being used in combination to create future cash flows (see the second term in (1)). In this section we address the question, which asset measurement basis provides investors with information useful in assessing the value-in-use of a firm’s in-use assets?

Estimated Value-in-Use Measurement Basis for In-Use Assets

The asset measurement that faithfully represents the value of a firm’s in-use assets is estimated value-in-use, but employing estimated value-in-use as the measurement basis for in-use assets gives rise to at least two quandaries. First, value-in-use is only realized by using the assets in combination, such that value-in-use cannot be meaningfully partitioned among a firm’s individual in-use assets. Second, managers must be entrusted to estimate value-in-use. The next several paragraphs expand upon these issues and their implications for estimated value-in-use as a decision-useful asset measurement basis for in-use assets.

Since estimated value-in-use cannot be allocated among the assets in the cash generating unit, using estimated value-in-use as the measurement basis for in-use assets would result in a balance sheet that reports the aggregate value-in-use of each cash-generating unit. One might argue this is simply a unit

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19 If an entity is not a going concern and its assets are held for disposition on a standalone basis, such assets would be in-exchange assets and appropriately measured at fair value.
of account issue and that the appropriate unit of account is the cash generating unit, not the individual in-use assets comprising the unit. The manager could estimate the value-in-use of the cash generating unit (which might be the firm) using a discounted expected cash flow approach and report that value as a single amount on the balance sheet. This idea is present in May (1936, 19) who writes, “…but if the accountant were to assume the task of valuing the business as a whole, he would have met the assumed need, and it would be entirely supererogatory for him to attempt to allocate that value as between the different assets of the business.”

Reporting the manager’s estimated value-in-use of the cash generating unit resolves the partitioning problem, but doing so raises other concerns. First, aggregation eliminates information about the firm’s in-use assets. If we assume managers’ value-in-use estimates are a viable substitute for investors’ estimates, the loss of such information might be of minimal consequence, but the veracity of this assumption is doubtful for several reasons. First, unlike value-in-exchange estimates, value-in-use estimates are difficult to verify ex-ante and ex-post. This lack of verifiability provides much greater opportunities for biased reporting. Since investors would be unable to distinguish between biased and truthful reports, even truthful managers would have difficulty credibly communicating their estimates of value-in-use. Consequently, the provision of such information would be unlikely to support either the business valuation or stewardship objectives of financial reporting.

In addition, managers are not privy to all the information relevant to estimating value-in-use. Academic research finds that although management earnings forecasts impound information not in stock prices, stock prices impound information not in management earnings forecasts (McNichols 1989). Further, Botosan and Stanford (2005) find that the magnitude of analysts’ forecast errors increase after analysts abandon the costly acquisition of private information to rely on enhanced public disclosure of segment information. Thus, academic research suggests that managers and investors possess unique value relevant information and that the information set can be enriched by diverse private information acquisition. If managers were tasked with estimating value-in-use, and investors were to rely on those
estimates, the amount of information impounded in market values might be reduced, resulting in less informative stock prices.

Thus, even though estimated value-in-use is, in theory, the asset measurement that most faithfully represents the value of a firm’s in-use assets, we argue that investors’ information needs are not well-served by employing this measurement basis for in-use assets. The use of this measurement basis would necessitate aggregation, resulting in the loss of information. In addition, limits on the ex-ante and ex-post monitoring of managers’ estimates of value-in-use is a potentially insurmountable problem. Finally, managers’ information for estimating value-in-use might be incomplete. Accordingly, we conclude that estimated value-in-use is not a decision-useful measurement basis for in-use assets.

This is consistent with the findings of a PriceWaterhouseCoopers (2007, 5) survey of investment professionals, which concludes that, “Respondents view the task of estimating the current value of the enterprise as theirs, not the role of management and/or accountants.” Thus, an in-use asset exists and must be measured preferably using a basis that allows investors to estimate value-in-use themselves for this is the practical problem investors must resolve in determining firm value. The next section of our paper addresses the question of which measurement basis assists investors in accomplishing this task.

**Decision-Useful Financial Reporting Information for In-Use Assets**

Investors require financial reporting information useful in estimating the present value of expected future cash flows to be generated from the combined use of a firm’s in-use assets. This estimation exercise presents a practical problem and accordingly we now turn to a discussion of how investors tend to tackle this problem in practice.

Equation (1) suggests that investors forecast future cash flows generated from in-use assets over an infinite horizon. While consistent with valuation theory, it is impossible to accomplish this task in reality. Consequently, investors partition between a finite forecast horizon spanning the foreseeable future and the infinite horizon beyond.\(^{20}\) The length of the finite forecast horizon (generally three to ten years) is chosen to be sufficiently long for expected future cash flows to settle into an assumed pattern of steady

\(^{20}\) See any standard business valuation textbook such as Easton et al. (2013).
non-negative growth. A value, referred to as the “terminal value” \( (TV) \), captures the present value of infinite horizon cash flows beyond the finite forecast horizon. Business valuation equation (1) re-written to incorporate these adjustments is shown below in equation (3):

\[
V_t = i e_t + \sum_{t=1}^{T} R_P^T E_t [\tilde{c}_{t+T}] + R_P^T E_t [TV_{t+T}]
\]

(3)

Where:
- \( T \) = length of finite forecast horizon.
- \( TV_{t+T} \) = terminal value capturing the present value of cash flows beyond the finite forecast horizon, date \( t+T \).
- All other variables are defined above.

**Estimating TV – The earnings capitalization approach**

The terminal value \((TV_{t+T})\) is often estimated using the earnings capitalization approach.\(^{21}\) The main assumption underlying the earnings capitalization approach is that the benefit stream is expected to grow at a constant rate \((g)\) (Campbell 1975). The basic formula is provided below:

\[
TV_{t+T} = \frac{c_{t+T}(1+g)}{r-g}
\]

(4)

Where:
- \( c_{t+T} \) = cash flows from in-use assets, net of investments in those activities, date \( t+T \).
- \( r \) = risk-adjusted discount rate.
- \( g \) = perpetual annual growth in cash flows.

In practice, various measures are employed to proxy for future cash flows in this model, but it is fairly common for investors to employ an earnings figure, such as operating (aka permanent, core, or recurring) earnings in the numerator.\(^{22}\) Substituting operating earnings for cash flows offers a reasonable approximation to the extent that the impact of differences between earnings and cash flows are inconsequential over an infinite horizon. Due to the prevalence of this substitution, this approach has earned the label the “earnings capitalization approach”.

**Investor Information Needs**

From equation (3) and (4) above, investors require the following inputs to estimate the value-in-use of a cash generating unit: forecasted finite horizon cash flows to be realized from in-use assets;

\(^{21}\) See for example, NACVA (2011b) which states, “A terminal or residual value is often determined at the end of the fifth year. The terminal value that is often used is merely the fifth-year earnings projected into perpetuity.” (pg. 7)

\(^{22}\) See for example, Revsine et al. (2011, 320).
forecasted infinite horizon steady-state earnings before growth; forecasted infinite horizon perpetual growth rate; and a risk-adjusted discount rate.

Generally, investors’ assumptions regarding the perpetual growth rate and the discount rate are informed by data not impacted by the asset measurement issue we address. In estimating the appropriate growth rate, investors routinely employ perpetual growth rates ranging from zero to the forecasted rate of growth in the economy (e.g. growth in GDP). For example, instructional materials produced by the NACVA (2011, 12-13) indicate, “It is generally accepted that an Expected Long-term Average Growth Rate is impossible to sustain into perpetuity if it exceeds inflation plus population growth. The rate does not include growth in overall company cash flows depending on future capital investment…Many valuators believe the long-term sustainable growth rate for mature companies should be in the range of three to four percent.” Thus, in arriving at an estimated rate of perpetual growth, investors look to economy-wide, not firm-specific, factors. Consequently, the choice of asset measurement basis is generally inconsequential to investors’ estimates of perpetual growth.

In estimating the appropriate risk-adjusted discount rate investors often turn to single- or multi-factor models employing historical return data and other current inputs (such as estimated risk-free interest rates). The most common single-factor model, the Capital Asset Pricing Model, has as inputs the risk free rate (often the return on ten-year U.S. treasury bills), the market risk premium (generally 4-8% based on historical data), and market beta (generally estimated using historical market and firm return data) (Easton et al. 2013, 12-11-12-12). The Ibbotson Build-Up Model is a popular multi-factor approach which has as inputs the risk free rate, and three premiums – a market risk premium, an industry risk premium, and a size premium – all of which are estimated using historical return data (NACVA 2011, 7-11). Thus, in arriving at an estimated risk-adjusted discount rate investors look to economy-wide interest

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23 Zero percent is the lower bound because the earnings capitalization model is not well-defined when growth is negative in perpetuity. The upper bound is typically no greater than expected growth in the economy because assuming a firm can grow faster than the economy in perpetuity is conceptually flawed. Eventually the firm could subsume the economy. Moreover, economic factors such as an influx of competitors, market saturation, or the effects of an increasingly large base of operations tend to hamper a firm’s ability to grow faster than the economy over an extended period.
rates and historical stock returns, not firm-specific factors. Indeed, assuming investments are held in a well-diversified portfolio, most firm-specific risk should be diversified away and play no role in determining the risk-adjusted discount rate.\textsuperscript{24} Accordingly, the choice of asset measurement basis is generally irrelevant to investors’ estimates of the risk-adjusted discount rate.

Thus, we focus on the extent to which alternative asset measurement bases support investors’ estimates of the amount and timing of future cash flows (or earnings) expected to be realized from in-use assets. The next section of our paper offers our analysis.

\textit{Forecasting cash flows from in-use assets over a finite forecasting horizon}

Figure 2 is similar to a figure provided in Lundholm and Sloan (2013) (Figure 7.1).\textsuperscript{25} It provides an overview of the process of forecasting the balance sheet, income statement and statement of cash flows for a firm. Lundholm and Sloan refer to operating and financial assets, but consistent with our framework, we refer to in-use and in-exchange assets.

Investors begin the process of creating pro forma financial statements by forecasting revenues (Lundholm and Sloan 2013). Forecasted revenues play a central role in forecasting the firm’s net in-use assets and operating expenses as shown in Figure 2.\textsuperscript{26} Net in-use assets and operating expenses are forecasted by applying forecasted asset turnover ratios and expense margins, respectively, to forecasted revenues (Lundholm and Sloan 2013). These three items (forecasted revenues, forecasted operating expenses and forecasted in-use assets) are critical inputs into investors’ assessment of forecasted finite horizon cash flows from in-use assets (Lundholm and Sloan 2013). It follows, therefore, that the asset measurement for in-use assets that is useful to investors is that which provides information useful in forecasting revenues, asset turnover ratios, and/or operating expense margins.

\textsuperscript{24} One exception is information risk, which is a function of the quantity and quality of information available to investors regarding the firm (Botosan (1997)).
\textsuperscript{25} See also Penman (2001).
\textsuperscript{26} This point is common to most standard business valuation textbooks. For example, Easton et al. (2013, 11-5) state it as follows, “The revenues (sales) forecast is, arguably, the most crucial and difficult estimate in the forecasting process. It is a crucial estimate because other income statement and balance sheet accounts derive either directly or indirectly, from the revenues forecast.”
**Fair Value Measurement Basis for In-Use Assets**

We now consider the appropriateness of fair value as a measurement basis for in-use assets. Recall that in-exchange value is *not* entity specific, but in-use value is entity specific. Further, value-in-use is expected to exceed the sum of the in-use assets’ standalone exchange values (Fortgang and Mayer 1985). Indeed, the understanding that value-in-use is not captured by value-in-exchange is a theme throughout the prior economic, business valuation and accounting literatures (e.g. Smith 1776; Littleton 1935; Skogstad 1976; Barth and Landsman 1995). Accordingly, market exchange value (i.e. fair value) does not faithfully represent value-in-use completely, neutrally, or without material error.

Market exchange value is therefore not sufficient for value-in-use, but does knowledge of value-in-exchange provide decision-useful information to investors in estimating value-in-use? In determining value-in-use investors are less concerned with the amount underlying assets could be sold for and are more concerned with the expected future cash flows to be generated through use. In general, the former is not informative of the latter. For example, knowing the market exchange value of land under the manufacturing facility of a manufacturing firm does little to assist investors in projecting future cash flows from using the land, building, and other assets in combination. The point that market exchange value of individual assets comprising a cash generating unit offers little information useful in forecasting the future cash flows expected to be generated from the combined use of those assets is made in May (1936, 20) who writes, “…inasmuch as the value of a successful business is dependent mainly on its earning capacity, it follows that to anyone interested in determining that value [i.e. value-in-use] the greatest service which accounts can render is to throw light on earning capacity – not on the so-called values of assets which are not intended to be sold.” Similarly, in the measurement section of its proposed Conceptual Framework, the IASB (2013, ¶6.13b) states that for assets that derive value in-use: “…some users of financial statements may consider information about current market prices to be less relevant than information about margins generated by past transactions.” Further, a PriceWaterhouseCoopers (2007, 5) survey of investment professionals concludes that investment professionals, “…question the relevance of current value measures for a number of assets that are ‘operational’ in nature.”
Since value-in-use is entity specific an observable market value is not typically available. Unlike in-exchange assets, in-use assets are not expected to be exchanged, such that the ex-post verification of managers’ fair value estimates that normally exists in the case of in-exchange assets is absent in the case of in-use assets. Thus, fair value measurement for in-use assets is difficult to verify ex-ante and ex-post. As with managers’ estimates of value-in-use, this lack of verifiability provides much greater opportunities for biased reporting. Consequently, the provision of fair value information not only fails to support the business valuation objective of financial reporting, it also fails to meet the stewardship objective of financial reporting.

There is limited empirical research regarding the decision-usefulness of fair value measurement for in-use assets and that which exists offers an incomplete picture. For example, research finds that when managers choose to revalue certain non-financial assets the resulting gain or loss is significantly associated with price (Easton et al. 1993), future cash flows and future operating income (Aboody et al. 1999). Nevertheless, the association between the asset revaluation amount and future operating performance depends on industry and asset class (Barth and Clinch 1998). In addition, these studies focus on discretionary asset revaluation, which engenders self-selection bias that confounds the interpretation of results. Finally, these studies do not purport that the non-financial assets included in the analyses are in-use assets, and accordingly the implications of these findings for in-use assets are unclear.

**Replacement Cost Measurement Basis for In-Use Assets**

Early frameworks addressing the question of decision-useful asset measurement for in-use assets advocate for replacement cost. In particular, Edwards and Bell (1961) and Revsine (1973) argue that measuring in-use assets at replacement cost provides investors with a better estimate of a firm’s ‘true’ operating profit by reporting holding gains or losses arising from changes in the entry values of in-use assets.

Capturing “true” operating profit is not, however, an objective that figures prominently in business valuation. Instead, in a business valuation context, the primary objective of financial reporting is to provide information useful in forecasting future cash flows and earnings. Thus, for our purposes, the
relevant question is – Does replacement cost measurement of in-use assets provide investors with information useful in forecasting future cash flows?

Prior literature answers this question in the negative. Revsine (1973) concludes that operating profit defined under replacement cost accounting does not exhibit the predictive ability of historical cost earnings. The ICAEW (2010) affirms the concern that the replacement cost measurement basis does not generate information useful in predicting future cash flows or earnings. The ICAEW (2010, 28) report states, “The argument is not that holding gains are not profits. It is that they are a different type of profits from those attributable to the firm’s business model and that they do not provide a useful figure of income either for judging past performance or for predicting future performance.” Consistent with this concern, prior empirical research on SFAS 33, “Financial Reporting and Changing Prices,” fails to provide reliance evidence of the value relevance of current replacement cost disclosures and replacement cost earnings even during a period of relatively high inflation (e.g. Beaver and Landsman 1983; Beaver and Ryan 1985; Bernard and Ruland 1987; Hopwood and Schaefer 1989; Lobo and Song 1989).

It is interesting to note that investors interested in forecasting future cash flows generally view gross profit produced by first-in first-out (FIFO) inventory accounting to be inferior to that produced by last-in first-out (LIFO) inventory accounting. This is pertinent to the current discussion, since FIFO yields inventory on the balance sheet measured at replacement cost and gross profit comprised of holding gains or losses plus trading gains. In contrast, LIFO yields inventory on the balance sheet measured at “historical” cost and gross profit limited to trading gains. LIFO gross profit is generally considered a “higher quality” income measure because it excludes inventory holding gains and losses, which have less predictive power than gains from trade.

The discussion above raises the question of whether the predictive power of the replacement cost measurement basis could be enhanced via separate disclosure of holding gains or losses. For example,

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27 Emphasis added.
28 For example, Comisky and Mulford (2000) indicate that among the advantages of LIFO is that LIFO provides an “improved measure of net income by matching current costs against current revenues.”
29 This statement is not descriptive in the presence of a LIFO liquidation gain, which results in holding gains once again being included in income.
assume each year a firm purchases a piece of equipment with a two year useful life for $100. In steady state, depreciation expense is $100 per year, which perfectly predicts the future cash outflow necessary to maintain productive capacity. Now assume the replacement cost of the equipment increases to $120, at which point depreciation expense based on historical cost (i.e. $100) no longer predicts the future cash outflow necessary to maintain productive capacity (i.e. $120). The replacement cost measurement basis would result in depreciation expense of $120, but as noted above the holding gain on the property, plant and equipment is not predictive of future cash flows. Thus, one could argue investors’ information needs are well-served by a replacement cost measurement basis provided the holding gain or loss is separately disclosed (Edwards and Bell 1961).

Since the potential benefit of the replacement cost measurement basis is predicated on changing prices, this potential benefit is mitigated during a period of relative price stability. This might explain why serious consideration of the replacement cost measurement basis tends to be more prevalent in highly inflationary environments. Further, the benefit of replacement cost accounting must be weighed against its potential cost including the cost of estimating replacement cost. This cost is compounded to the extent observable replacement cost values are not available. Since in-use assets are not generally expected to be replaced at the time of measurement, but are used by the firm, ex-ante and ex-post verification of managers’ replacement cost estimates can be challenging when observable replacement cost values are absent. This lack of verifiability provides opportunities for biased reporting and consequently the replacement cost measurement basis might fail to meet the stewardship objective of financial reporting. This point is also made in the ICAEW (2010) report. Specifically, the ICAEW (2010, 28) report states, “Because of changes in markets and technologies, current replacement costs can be highly subjective, in which case information about them is likely to be less useful.”

Concerns over verifiability might explain why a PriceWaterhouseCoopers (2007, 9) survey of investment professionals concluded, “There is very little appetite in the primary statements for a measurement basis other than amortized historical cost. However, disclosure is another matter, with 52% seeking information about replacement cost.”
**Historical Cost Measurement Basis for In-Use Assets**

Investors focus on the income statement, not on the balance sheet, when developing the forecasts of future cash flows needed to estimate value in-use. As shown in Figure 2, forecasted revenues are the foundation upon which forecasted financial statements are built, with forecasted in-use assets and operating expenses determined by applying forecasted asset turnover ratios and expense margins, respectively, to forecasted revenues (Lundholm and Sloan 2013). As a result, investors seek information that helps them to understand the level of investment in in-use assets and the level of expenses typically needed to support a given level of revenues. Historical cost information is useful in assessing these essential inputs into the forecasting process.

Investors’ satisfaction with the historical cost measurement basis for in-use assets is noted in the IASB’s (2013) recent revisions to the measurement section of its Conceptual Framework. Specifically, IASB (2013, ¶6.13b) states that for assets deriving value in-use “…some users find cost-based information about property, plant and equipment that is used in operations to be more relevant than information about its current market price.” Similarly in a 2006 survey of 50 buy-side and sell-side investment professionals, PriceWaterhouseCoopers (2007, 9) found that 74% of respondents were “satisfied with the status quo (that is, historical cost less depreciation and impairment)” for property, plant and equipment.

Further, as stated by Penman (2001, 139) historical cost represents “…the cost incurred to generate value.” Thus, the use of historical cost allows investors to understand the relationship between the amount the firm has incurred to generate value and the value ultimately generated. This relationship is typically captured by various measures of accounting return, which are widely viewed as important inputs into the forecasting process (Holthausen and Zmijewski 2014, 35).

Thus, the historical cost measurement basis provides information investors find useful in tackling the practical chore of estimating the present value of expected future net cash flows to be generated from a firm’s in-use assets. This is in contrast to managers’ estimates of value-in-use, and the fair value and
replacement cost measurement bases discussed above. Accordingly, we argue that historical cost is the decision-useful measurement basis for in-use assets (see Figure 1).

This conclusion is more far reaching than that found in Nissim and Penman (2008). Nissim and Penman offer principles for the application of fair value accounting, but do not offer a set of principles for the application of historical cost accounting. The use of the historical cost measurement basis for in-use assets is generally consistent with the ICAEW (2010, 40) framework, which states, “Where the firm’s business model is to transform inputs so as to create new assets or services as outputs, we would expect that historical cost would generally be the most useful basis of measurement.” Our conclusion is in contrast to the CICA asset measurement framework (Milburn 2012), however, which embraces a replacement cost measurement basis for in-use assets.

**Disclosing Supplementary In-Exchange Values for In-Use Assets**

One might argue that in order to assess whether a manager’s decision to continue as a going concern is more profitable than liquidating the firm, investors need information regarding the total exchange value of the firm’s assets. By comparing the sum of the standalone exchange values of all of the entity’s assets, be they in-exchange or in-use, to estimated firm value assuming a going concern, an investor could determine whether the manager’s decision to continue to operate is more or less profitable than liquidation. By providing information regarding the use of resources by managers accountable for their use (Rosenfield, 1974) such information could satisfy the stewardship objective of accounting.

The benefit of providing such information must be weighed against the potential cost of doing so, however, including the cost of estimating in-exchange values for each of the firm’s assets. As noted previously, the cost of obtaining this information is compounded when observable market exchange values are not readily available. Moreover, since in-use assets are not held for sale, one’s ability to verify estimated exchange values for in-use assets is limited ex-post as well as ex-ante. This lack of verifiability

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30 An examination of an exhaustive list of alternative measurement bases is beyond the scope of this paper. For example, deprival value has been offered as an alternative (Macve 2010). Given this limitation we focus on the measurement bases most common to accounting, economic and business valuation literatures.
provides opportunities for biased reporting and consequently the provision of such information could fail to meet the stewardship objective it seeks to achieve.

In extreme cases, in which evidence exists to suggest the firm is not a going concern, current accounting practice requires assets to be remeasured based on exchange values. This is appropriate, since the affected assets are expected to realize value for the firm in-exchange, and as such are properly considered in-exchange assets.

In any event, disclosing the market exchange value of a fraction of the in-use assets comprising a cash generating unit is particularly unhelpful to investors. Addressing the question of whether a manager should liquidate a particular asset within a cash generating unit would require a comparison of that asset’s in-exchange value to its in-use value, but as discussed earlier, the value-in-use of any individual asset within a cash generating unit cannot be reasonably estimated.

**How are market exchange value and historical cost defined?**

Our proposed framework based on a business valuation perspective is intended to provide guidance regarding which asset measurement approach provides investors with financial reporting information useful in determining firm value. For reasons outlined above, we conclude that fair value determined by exit value in a hypothetical market exchange less expected costs to sell provides investors with decision-useful financial reporting information for in-exchange assets, and for in-use assets, the preferred measurement basis is historical cost. We acknowledge our framework does not offer a refined definition of the two measurement attributes. Nevertheless, the business valuation perspective underpinning our framework provides insight into more nuanced aspects of the attributes of decision-useful asset measurement.

For example, should the exit value in a hypothetical market exchange of a debt security expected to be held to maturity (an in-exchange asset) be computed before or after a liquidity discount if no liquid market for the security exists? In addressing this question, we return to the key premise underlying our framework – its focus on the information needs of investors ultimately interested in assessing firm value. In the case of the debt security expected to be held to maturity the appropriate question is, which measure
of market-exchange value is most informative of the cash expected to be realized on exchange – that which is computed before or after the liquidity discount? For a held to maturity security, the liquidity discount is not informative of the future cash inflows expected to be realized, and accordingly an asset measurement which includes the liquidity discount is less likely to be relevant to investors interested in assessing firm value.

For an example involving an in-use asset, we consider whether allocated factory overhead should (i.e. absorption costing) or should not be (i.e. variable costing) included in the cost of manufactured inventory. Focusing on the information needs of investors ultimately interested in assessing firm value, leads one to ask whether the cost produced by absorption costing or variable costing is more relevant to investors intent on forecasting future cash flows and/or earnings.

It is argued that allocating fixed factory overhead, such as supervisors’ salaries, to inventory interferes with investors’ ability to forecast future cash outflows for fixed expenses. This concern is evident in Horngren and Sorter (1961, 91) who state, “We find it strange that variable costing should be widely regarded as helpful to management but as useless, dangerous, or confusing to the intelligent investor. In substance, both management and investors have the same task, decision-making. Both groups are concerned primarily with future results. Why exclude the investor group from a useful analytical device and burden their task of interpretation with irrelevant costs as assets?” Similarly, a report on direct costing by the National Association of Cost Accountants (1953, 49) states, “To cost inventory at direct cost is advantageous to the financial analyst who uses company financial statements.” The disadvantages of absorption (or full) inventory costing for financial analysis are also discussed in some financial analysis textbooks (Revsine et al. 2011, 485-488).

Summary of Decision-Useful Financial Reporting Information

To summarize, we argue that the asset measurement basis that provides investors with decision-useful financial reporting information for a firm’s in-exchange assets is market exchange value or fair value determined by exit value in a hypothetical market exchange less expected costs to sell. For in-use assets historical cost is the decision-useful asset measurement.
Huffman (2013) examines the link between decision useful asset measurement and value realization in the context of biological assets around the adoption of International Accounting Standard 41. Huffman’s sample includes observations for which asset measurement is consistent with value realization (i.e. fair value for in-exchange assets and historical cost for in-use assets) as well as observations for which asset measurement is inconsistent with value realization (i.e. historical cost for in-exchange assets and fair value for in-use assets). Consistent with the proposed implications for decision-usefulness of linking asset measurement and asset use, Huffman finds that the value relevance of asset and income information is significantly greater for the consistent versus inconsistent subsamples.

BUSINESS MODEL AND MANAGERIAL INTENT

Whether an asset is expected to realize value in-exchange or in-use is generally a function of the firm’s business model, but sometimes a change in circumstances or economic conditions can result in a firm holding assets not encompassed by its business model. In such cases managerial intent becomes important in determining the expected use of the asset. In this section we discuss the roles business model and managerial intent play in our framework for guiding the choice of asset measurement that provides decision-useful financial reporting information.

The Role of the Business Model

Business models are created to solve a particular class of business problem and create value via a particular profit formula (Christensen et al. 2011). Christensen et al. (2011) characterize business models as comprised of four interdependent elements: (1) a value proposition, (2) a set of resources assembled to deliver the value proposition, (3) habitual approaches (i.e. processes) employed to deliver the value proposition, and (4) a profit formula, which defines the profit margin and asset turnover designed to achieve an adequate return on investment. These four elements become locked together, such that business models do not evolve easily (Christensen et al. 2011).

31 International Accounting Standard 41: Agriculture. London, UK: IASB.
Characterizing the business model as a feature of a business which is not readily subject to manipulation or change by management is consistent with the characterization found in International Financial Reporting Standard (IFRS) 9 (IASB 2010, BC4.20), which concludes, “The Board noted that an entity’s business model does not relate to a choice (i.e. it is not a voluntary designation) but rather is a matter of fact that can be observed by the way an entity is managed and information is provided to its management.”

The business model specifies the manner by which an entity delivers value to its customers and realizes profits under “normal” operating conditions. In so doing, the business model directs the use of the firm’s assets (i.e. in-exchange or in-use), which, has implications for the value of the asset because, as noted early on in the paper, value is a function of asset use. Accordingly, the business model establishes the main avenues through which a firm realizes the value of its assets. The business model is thus fundamental to asset value and, consequently, in our framework the asset measurement basis which conveys decision-useful financial reporting information to investors cannot be divorced from the firm’s business model (see Figure 1).

To illustrate, consider the following example involving one asset (platinum) and three firms employing asset measurement bases appropriate to whether the platinum is employed as an in-exchange or in-use asset consistent with the firms’ business model.32 The first business model involves a firm that uses platinum in machines that manufacture fiberglass. In this case, platinum is an in-use asset since it is expected to realize value for the firm used in combination with other assets. Fiberglass manufacturers measure platinum at historical cost and account for it as a component of property, plant and equipment. The historical cost of the platinum is depreciated along with property, plant and equipment as these assets are consumed over time in the production process. This is consistent with our framework, which suggests that amortized historical cost measurement provides investors with financial reporting information useful in forecasting future cash flows from the firm’s in-use assets.

32 The authors thank Gregory J. Jonas of the Public Company Accounting Oversight Board for sharing this anecdote based on his experiences while a Managing Director at Moody’s Investor Services.
The second business model involves a manufacturer of catalytic converters. In this case, platinum is a raw material employed in the production process. Once again, platinum is an in-use asset since it is expected to realize value for the firm used in combination with other assets. Catalytic converter manufacturers measure platinum used in the production process at historical cost. This is consistent with our framework, which suggests that historical cost measurement provides investors with information useful in predicting future cash flows from the cash generating unit.

The third business model involves a platinum trader, who buys and sells platinum on the open market. In this case, platinum is an in-exchange asset since the platinum is expected to realize value for the firm in-exchange on a standalone basis. In this case, our framework suggests that fair value measurement based on a market-exchange price, less expected costs to sell provides investors with decision-useful financial reporting information. Once again, this is consistent with the manner in which platinum is accounted for in this industry.

The above examples demonstrate that decision-useful asset measurement is not innate to the asset itself, but is a function of how the asset is employed by the firm to realize value. Further, asset use and the decision-useful asset measurement basis vary across firms as a function of differences in firms’ business models.

The Role of Managerial Intent

“Managerial intent” refers to how a manager intends to employ an asset to realize value. Under normal operating conditions, managerial intent is guided by the business model. Thus under normal operating conditions, there is no substantive difference between the business model and managerial intent. Nevertheless, there are situations that give rise to assets not encompassed by the business model. Often these situations occur when normal operating conditions fail to hold due to new economic circumstances, changing economic conditions or the existence of transactions or events that fall outside of the business model. Leisenring et al. (2012, 331) make a somewhat similar point stating, “…to summarize, we believe there is no substantive distinction to be made between business-model-based accounting and intent-based
accounting except, possibly, at the level of an individual item or arrangement whose characteristics make it amenable to short-term changes in management’s plans for the item’s use, disposition or settlement”.

In such cases managerial intent impacts the manner in which the asset is expected to realize value for the firm and consequently, in our framework, managerial intent can play a role in the determination of the decision useful asset measurement basis (see Figure 1). For example, in response to a decline in demand for its products a manager might decide to downsize operations and dispose of certain assets (e.g. production equipment) previously employed as in-use assets. Since the firm is not in the business of selling equipment, the firm’s business model does not direct the use of these excess assets. Instead, it is the manager’s intent to dispose of the asset, which determines how the asset is expected to realize value for the firm. In this case, a previous in-use asset becomes an in-exchange asset as a result of the manager’s intent to dispose of it. Our framework suggests that prior to the manager’s decision to dispose of the asset amortized historical cost is the decision-useful asset measurement basis, but following the decision to dispose, fair value based on exit value less expected costs to sell provides investors with decision-useful information.

**The Role of Business Model and Managerial Intent in Existing Standards**

While it is beyond the scope of this paper to develop standards of evidence and other regulatory parameters pertaining to the use of business model and managerial intent in accounting measurement standards, we note that it appears such is possible. Business model and managerial intent already play important roles in financial accounting and accounting standards. For example, business model played a role in the FASB’s now defunct Financial Statement Presentation Project, which proposed that entities choose the classification of financing, investing and operating items for financial statement presentation purposes based on managements’ view of what constitutes its business. IFRS 9 requires an entity to measure a financial asset at amortized cost only if the entity’s business model entails holding the asset to collect contractual cash flows. SFAS 131 (FASB 1997) employs the “management approach” to bind the

33 Emphasis added.
definition of an entity’s reportable segments and the determination of reported segment amounts to an entity’s business model.\textsuperscript{34}

There are also examples in which managerial intent plays a role. For example, the amount and timing of the recognition of restructuring charges, the reclassification of short-term debt as a long-term liability, and the reclassification and re-measurement of productive assets held for sale are examples of where the classification and/or measurement of an asset or liability is a function of managerial intent. Several of these examples are consistent with managerial intent playing a role when a change in circumstances or economic conditions results in items not encompassed by the business model.

**Summary of Business Model and Managerial Intent**

The business model plays an essential role in our framework because it establishes the main avenues through which a firm realizes the value of its assets, be it in-use or in-exchange. Under normal operating conditions, managerial intent is dictated by the business model, but when normal operating conditions do not hold, managerial intent can play a role in determining the decision useful basis of asset measurement.

Providing a central role for business model and a secondary role for managerial intent in the framework also allows the asset measurement framework to convey information regarding management’s strategy for making use of company assets, which supports the stewardship objective of accounting.\textsuperscript{35} Financial statements users’ preference for financial reporting that conveys information about the business model is evident in feedback the FASB received in response to changes made to segment disclosure requirements. Specifically, in its Basis for Conclusions in SFAS 131 (FASB 1997, ¶59) the FASB notes, “Almost all of the users and many other constituents who responded to the Exposure Draft or who met with Board and staff members agreed that defining segments based on the structure of an enterprise’s internal organization would result in improved information.”

\textsuperscript{34} The adoption of the management approach in SFAS 131 was in response to investors’ expressed preference for segmentation that corresponded to the internal organization of the entity’s operating activities (AICPA 1994).

\textsuperscript{35} This point is also made in European Financial Reporting Advisory Group (2013).
IMPLICATIONS FOR INCOME STATEMENT PRESENTATION

Provided in-exchange assets are valued at fair value based on current exit value less expected costs to sell as suggested by our framework, the balance sheet provides sufficient information regarding the value of a firm’s in-exchange assets for business valuation purposes. In our framework the balance sheet does not provide sufficient information regarding the value of a firm’s in-use assets, however, nor does it convey sufficient information to allow investors to estimate value-in-use. In the case of in-use assets, the income statement plays an essential role in providing information useful to investors in estimating the present value of expected future cash flows to be realized from an entity’s in-use assets. We explore the implications of our framework for income statement presentation in this section of our paper.

As noted earlier, the terminal value ($TV_t$) is often estimated using the earnings capitalization approach. The numerator in the earnings capitalization model is the estimated level of earnings (i.e. cash flows) expected to be generated by the firm over the long-term (i.e. ad-infinitum). Historical “core,” “permanent” or “non-transitory” earnings can be used as a proxy for this estimate. Investors’ desire for separate income statement disclosure of the transitory components of earnings is linked, in part, to this aspect of the business valuation process.

In addition, historical operating expense margins generally form the basis for projecting expense margins during the finite forecast horizon. This is why investors prefer separate income statement disclosure of items of income or expense that might interfere with the ability of historical operating expense margins to inform investors’ beliefs about the future. For example, the impact of a LIFO liquidation buried in cost of goods sold can materially impact the cost of goods sold percentage, thereby rendering the amounts reported on the income statement less useful in projecting the future. In such cases, investors use information provided in the footnotes to adjust reported information.

Investors also generally prefer that gains and losses arising from fair value measurement be separately disclosed on the income statement. Such items can be transitory in nature and disruptive to historical operating expense margins if not separately disclosed. Consistent with this some research
suggests that more prevalent measurement of assets at fair value increases one-time charges to earnings that decrease the relevance of income statement information to investors (Dichev and Tang 2008).

**CONCLUSION**

This paper offers a framework (summarized in Figure 1) for asset measurement based on the implications of valuation theory and practice for investors’ information needs. We argue that the asset measurement useful to investors in determining firm value cannot be separated from how an asset is expected to realize value for the firm. For assets that render value in-exchange, the measurement basis that provides decision-useful financial information to investors is fair value determined by exit price in a hypothetical market exchange less expected costs to sell. In the case of assets that render value in-use, the historical cost measurement basis provides investors with information useful in projecting future cash flows for use in assessing value-in-use. Further, we argue that in general, the historical cost (fair value) of assets that obtain value-in-exchange (value-in-use) not only fails to faithfully represent the value of such assets completely, neutrally, or without material error, but also is generally not relevant to investors.

We posit that several issues that currently play a central role in the asset measurement discourse hinder the accounting community’s ability to make substantive progress regarding the question of decision-useful asset measurement. First, although there is substantial overlap between the concepts of financial and in-exchange assets and non-financial and in-use assets, the mapping between these concepts is not perfect. Failing to recognize these as distinct concepts impedes the asset measurement discussion. Second, when the use of fair value measurement is restricted to in-exchange assets, concerns regarding the reliability of fair value measurement become less persuasive. In the absence of an observable market exchange value for an in-exchange asset, it is not clear investors are better able than managers to estimate value-in-exchange. Moreover, historical cost is not a viable alternative since it not only fails to faithfully represent value-in-exchange completely, neutrally, or without material error, but also is not useful to investors attempting to estimate value-in-exchange. Thus, in our framework, the choice of fair value
versus historical cost is a function of how the asset realizes value (in exchange or in-use). It is not a function of the perceived relative reliability of fair value versus historical cost measurements.

Third, the business model establishes the main avenues through which a firm realizes the value of its assets. Accordingly, the business model is central to the decision of which asset measurement conveys decision-useful financial reporting information to investors. In addition, managerial intent plays a secondary role when a change in circumstances or economic conditions results in a firm holding assets not encompassed by its business model. Co-mingling the concepts of business model and managerial intent is not productive, and the development of a comprehensive framework for addressing asset measurement necessitates roles for both.

Finally, it is difficult to assess the decision-usefulness of financial reporting information without first addressing the question of decision-useful to whom and then carefully considering such users information needs. Failing to address the “who” and “what” of decision-usefulness hampers progress on several financial reporting issues including asset measurement. As noted in Agrawal (1987) rather than basing the decision usefulness of financial reporting information on a systematic study of user needs, usefulness tends to be proclaimed. We address this criticism by examining the information needs of investors interested in undertaking the practical task of valuing a going concern, and then considering which asset measurement bases support their efforts in accomplishing this task.

The ideas incorporated into our framework are not new to accounting or accounting standard setting. For example, the view that the measurement basis should be linked to how an asset is expected to realize value for the firm appears in standard setters’ deliberations and dates back to early accounting theory. In addition, the concepts of in-exchange and in-use assets are found in existing standards and some accounting standards are a function of the business model or managerial intent. The objective of our paper is not, therefore, to introduce these concepts into the asset measurement debate. Instead, we employ a business valuation perspective to develop a framework that demonstrates how these concepts are interrelated and provide guidance regarding asset measurement. In so doing, we hope to make a useful
contribution to the ongoing debate concerning which asset measurement provides decision-useful financial reporting information to investors.
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Figure 1

Asset Measurement Framework

Business Valuation Framework

\[ V_t = i e_t + \sum_{t=1}^{\infty} R_{F-t} E_t[\tilde{c}_{t+t}] \]

Business Model

Managerial Intent
Asset not Encompassed by Business Model

Value Realization

In-Exchange Assets
Expected to realize their contribution to firm value on a standalone basis in exchange for cash or other economically valuable assets.

Measurement Basis
Fair value determined by exit price in a hypothetical market exchange, less expected costs to sell.

In-Use Assets
Expected to realize their contribution to firm value consumed or used in combination with other assets in the production and sale of goods or services.

Measurement Basis
Historical cost
Figure 2

Model of the Forecasting Process

Forecast Sales
  - Forecast Margins
  - Forecast Operating Expenses
  - Forecast Tax Rate
  - Forecast Tax Expense

Forecast Turnover
  - Forecast Net In-Use Assets
  - Forecast Leverage

Forecast Net In-Use Assets
  - Forecast Net In-Exchange Assets

Pro Forma Income Statement
  - Proforma Balance Sheet

Proforma Statement of Cash Flows