

**A basic theory of financial reporting:  
Designing financial statements to serve investors' need\***

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**Abstract.**

This study develops a theory of financial reporting that aims to design financial statements in accordance with the information need of investors. Firms are modeled as productive units using financial resources to generate value, investors provide resources to earn future returns, and mandatory reporting is instituted as a means to convey firms' operational data, which facilitate capital market trading. The theory demonstrates that to meet investors' information need, the financial report should be structured to depict two dimensions of an entity's operations: input resources contributed by investors (the cost) and output value generated for them (the benefit). A reporting framework emerges that clearly identifies the economic constructs underpinning the balance sheet and the income statement and underscores the complementarity in their informational roles. The theory sheds light on fundamental issues that remain unresolved by standard setting bodies, including the boundary of the balance sheet, the meaning of net income (as opposed to other comprehensive income), the distinction between purchased and developed goodwill, intangibles, and treatment of human resources.

## 1. Introduction

The objective of general-purpose financial reporting is to provide financial information about the reporting entity that is useful to users including existing and potential investors, lenders, and other creditors in making decisions about providing resources to the entity (FASB 2010; IASB 2018). Decision usefulness has been the overarching principle to guide standard setters in establishing a “conceptual framework” and formulating specific reporting standards. However, to date, there has been little theoretical research exploring what specific information economic agents (users) actually need in their respective decisions and how the financial report should be designed to fulfill those needs. Analyzing the decision problems faced by users and knowing what specific information they need are a vital first step towards establishing a financial reporting model and subsequently formulating specific reporting standards that are clearly targeted at users’ needs.

The purpose of this paper is to develop a basic theory of financial reporting that aims to serve the need of capital market investors, one of the primary user groups of financial reporting information.<sup>1</sup> Investors supply financial resources through market trading, which firms require as an input for operations. Financial reporting information is used to evaluate the worthiness of investment in firms. As such, the allocational efficiency in an economy hinges to a large extent on how effectively decision-relevant information is made available through mandatory financial reporting. Although prior theoretical studies have explored the link between the quality of financial reporting information and real investment efficiency in a large economy (e.g., Zhang 2013), the abstract models developed therein have made little headway in capturing *transactional-level* data that the financial report conveys. Indeed, the content of the financial report largely remains a “black box” in the theoretical literature.<sup>2</sup> This study is an attempt to look into the black box, so that the link can be made clearer between what investors need in their decisions, on the one hand, and what the financial report provides, on the other.

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<sup>1</sup> I leave it to future research to examine the needs of other users such as creditors. It is important that standard setters have a clear understanding of the need of each of the main user groups, so that a balanced approach can be taken to formulating reporting standards.

<sup>2</sup> For example, information is typically modeled as a signal of future cash flow or firm value, and it is unclear how such a signal is linked to specific data items in the financial report.

On the basis of this link, we can ascertain the respective roles that the individual financial statements in the financial report serve, and then design their content and format accordingly.

The study is conducted in the context of a simple economy comprising multiple firms and investors as decision-makers. Firms are economic units that use financial resources to generate value.<sup>3</sup> Investors supply financial resources to gain future benefits. I assume that, by regulation, firms issue financial reports on their business activities, which provide essential information for investors to make trading decisions.<sup>4</sup>

To probe the role of financial reporting at the most essential level, I assume away agency problems along with other forms of market frictions. That is, I basically adopt the setting of perfect capital markets (Modigliani and Miller 1959 and Miller Modigliani 1961, hereinafter, MM), but here I give explicit treatment to the representation and reporting of information. In the world of MM, it is taken as given that decision-relevant information is automatically known to all parties in the economy (without explaining how this is plausible). In this study, I recognize that the source of information is business transactions, but the transactions conducted in each given period are so complex that neither a firm's investors nor its own managers are able to gain full knowledge of all detailed transactions. A compelling question is how operational data should be

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<sup>3</sup> This is in line with the view of Paton and Littleton (1940), that the business enterprise is an organization designed to produce income. Economist Milton Friedman also emphasizes profit-making as the firm's central role, stating "the social responsibility of business is to increase its profits" (New York Times Magazine, 13 September 1970, 32-33).

<sup>4</sup> A number of scholars explored the desirability of imposing mandatory reporting rules from a social welfare perspective and the feasibility to create standards that benefit all players in an economy. Hirshleifer (1971), Fama and Laffer (1971), and Demski (1974) demonstrate that the social value of information deviates from private value. This suggests that decisions driven by private incentives are unlikely to produce socially desirable outcomes, thus pointing to a potential need for imposing mandatory reporting rules on firms. Demski (1973), however, conducts a theoretical analysis to show that it is not possible for different parties to rank accounting choices consistently among them so as to reach a consensus. Employing an approach from information economics, Demski (1973) depicts each accounting choice as a particular way of partitioning the underlying state space, and then measures its informativeness by the fineness of the state partitioning that is generated by the accounting choice. However, this way of thinking might not adequately capture the essence of the choice problems facing standard setters. For example, in deciding between fair value and historical cost as the measurement basis, the alternatives are not about different ways of partitioning a state set; rather, they are about which attribute of an asset to select (in exclusion of others) as the measurement basis; that is, it is about what to report concerning an accounting item, not how (finely) to report it. Concerning which attribute to report that is relevant for users, it is conceivable to achieve unanimity among all users (Chamber, 1976). Thus, the usefulness of economic-based theoretical analysis cannot be ruled out for addressing accounting choices and other issues of relevance to financial reporting regulation.

summarized, represented, and presented in a concise yet meaningful way. Note that this question speaks to the most basic communication role of accounting, which needs to be understood even in the absence of any agency conflicts in a firm.

In other words, this study aims to extend the MM setting by adding the dimension of information representation and reporting.<sup>5</sup> I assume that a structured report is used to convey firms' operational data. Choices need to be made as to which aspects of operations should be recognized in the financial report and what measurement basis ought to be used. The recognition and measurement choices rest on an understanding of users' needs, and they should be considered jointly rather than separately in meeting those needs.

In essence, investors' decision is about whether to surrender financial resources now in exchange for expected future gains. The critical information for investors' decisions is each firm's ability to transform input resources to output value. The difficulty is that firm ability is not directly observable and one relies on realized (observable) transaction data to infer it.<sup>6</sup> Accordingly, I assume that the scope of financial reporting is confined to data from realized operations.

Taking the input-output view of firms, investors need to be informed about (i) the input resources deployed by an entity, and (ii) the output value that the entity generates. The former is the *cost* to investors in funding the firm's operation, whereas the latter the *benefit* achieved from the operation in a specific period. Combining the two aspects, investors evaluate cost-benefit tradeoffs, i.e., the firm's ability to perform its economic function. It follows that the financial report should consist of (at least) two components: one conveys the cost that investors bear in providing input resources (designated as the balance sheet), whereas the other conveys the benefit achieved from using the input resources (the income statement). Investors make trading decisions based on assessed firm ability, leading to efficient resource allocation that maximizes total value generation for the economy as a whole.

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<sup>5</sup> While finance researchers do not normally consider information representational issues, this missing element in financial economic theory is naturally left for accounting researchers to fill.

<sup>6</sup> In practice, firm ability is determined by a complex set of factors pertaining to the way in which the firm organizes its business activities and the external environment in which the firm operates.

The theory sheds light on some fundamental issues facing standard setters. On the premise that the balance sheet focuses on reporting the cost of investment made by investors, several implications follow. First, in principle, all assets—tangible or otherwise—should be recognized insofar as the entity has spent financial resources to obtain them, and be measured at cost, i.e., the cost of either developing or acquiring assets. Second, externally acquired and internally generated goodwill should be differentially treated. Although the two appear to be the same from taking a static view of the entity, they are economically different *for investors* who need to distinguish between the input and output of an operation. Acquired goodwill is part of investment cost, i.e., an input, and should be recognized as such; on this ground, acquired goodwill is no different from the investment in identified assets of the acquired firm. In contrast, generated goodwill is (mostly) an output-based notion; it relates to anticipated value generation over and above the cost of recognized assets. The theory does not support recognition of *anticipated* value generation including generated goodwill. Third, in emphasizing the balance sheet's role of reporting input cost, the theory supports neither current (fair) value nor value in use as a measurement basis, as such information would distort the cost-benefit tradeoff for investors. Furthermore, there is no basis for designing the balance sheet to report intrinsic firm value. While some observers have expressed concerns about the wide gap between firms' book value and market value, the phenomenon can be driven by economic incentives to seek profitable investment projects and so it *per se* is not necessarily a symptom of an impaired balance sheet. Fourth, the theory does not, in general, support recognition of human resources, which pertain to another input of operations which is (primarily) not contributed by investors. Nonetheless, the theory does suggest that financial resources spent to enhance human resources should, in principle, be recognized, again, at cost.

Separately, on the basis that the income statement should focus on reporting benefit achieved for investors, the study affords an economic meaning to the notion of accounting income. Specifically, income should be defined in terms of whether it is value generated in a given period that truly adds to investors' consumption power. Ultimately, whether or not an accounting item is income should be ascertained on the ground of investors' well-beings. Not all gains or losses arising in an accounting system pass this

test. For example, gains arising from re-measurement of operating assets (such as plant, property, and equipment) that remain as input resources are not value generation and have no direct effect on investors' consumption power. Likewise, impairment of (acquired) goodwill—which exists under the prevailing reporting standards of both the FASB and the IASB—does not meet the income definition. Goodwill impairment relates to expected *future* value generation, rather than value actually achieved in the current period. On the premise that the income statement is not intended to report *future* value generation, it is unwarranted to recognize changes in future value generation, and inclusion of such information obscures the meaning of reported income.

The theory further underscores the complementarity between the balance sheet and the income statement. While each statement focuses on reporting one dimension of the underlying operation, users need both statements to evaluate a firm's efficiency to perform the input-output transformation. Hence, both statements are integral parts of the financial report to portray the underlying operation. Contrary to the approach that standard setters have taken which emphasizes one of the statements (while relegating the other to a subordinated position), the theory highlights that both statements have a unique role to play, and neither one is made redundant by the other.

Obviously, in the practical context, financial reporting is a vastly complex problem, and the development of a comprehensive theory is far beyond what a single study can hope to achieve. Although the basic theory here is conceived from a highly simplified economy, the basic approach taken to understanding users' decisions has applicability in general; that is, one's optimal choices rest on an analysis of cost-benefit tradeoffs, and the decision-maker is best served by reporting cost and benefit information as directly as possible.

Despite the importance of the topic, there is scarce research on how financial statements should be designed. Patton and Littleton (1940) conducted pioneering work that defines accounting concepts and put forward principles to design accounting standards. This study follows the general approach of Patton and Littleton (1940) and advocates that financial reporting be conducted in regard to what the entity does, as opposed to its owners (although information produced is to serve owners). The study advances this line of work in the following ways. First, by explicitly examining users'

information need, it gives a clearer rationale for defining accounting concepts, making the financial report more purposeful. Second, it demonstrates the validity of the entity-based approach to reporting in facilitating resource allocation in the economy.

Mandatory financial reporting has evolved to be one of the hallmarks of market-based economies. It is a vital channel to communicate information about firms' activities to capital markets. How well this communication channel functions affects the quality of economic decisions in markets and firms and thus has direct consequences for economic efficiency. However, to date, financial reporting theory has not made itself as a well-integrated part of broader financial economic theory. For example, in the established theories of capital budgeting and asset pricing, the role of accounting information seems under-recognized or even suppressed. This study contributes to the broader literature by introducing information representation and reporting in a setting in which firms and capital markets interact. Clearly, much more research is needed along this direction.

The remainder of this paper proceeds as follows. Section 2 lays out a model of a basic economy where firms and individual investors make their respective decisions. From this context, it identifies the theoretical roles that the financial report needs to play to serve investors' information need. Section 3 discusses the implications of the theoretical model for designing the balance sheet and the income statement. Section 4 concludes.

## **2. A Basic Economy**

Consider an economy comprising  $I$  individual investors who are risk neutral,<sup>7</sup> and  $J$  firms, representing the supply and demand sides of financial resources, respectively. Firms need financial resources to conduct business operations for the purpose of generating value,<sup>8</sup> and investors supply financial resources to earn future returns. A capital market exists that enables resource exchange between investors and firms.

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<sup>7</sup> The assumption of risk neutrality is not consequential for the messages of the study which do not depend on whether risk-adjustment is involved in valuation.

<sup>8</sup> My focus here is on a firm's role in the *real* economy where it generates value by deploying resources to produce and sell products. Real economic activities are distinguished from those in the exchange sector where participants aim to gain value through trading. As Zhang (2014) shows, users' information need is distinctly different for these two types of economic activities, and indeed a different measurement basis (fair value versus historical cost) is warranted.



The economy lasts for two time periods from date t-1 to date t (period t) and to date t+1 (period t+1), representing a full operating-reporting-investing cycle. The focal time point in our analysis is date t, when firms have just finished their operations for period t and are faced with new investment decisions for period t+1. Also at date t, firms are mandated to report their operations completed for period t, which provides information for the decisions of investors as well as firms as they move into period t+1.

Firms are collectively owned by investors. To keep the setting simple, I assume away agency problems and other forms of market imperfections, as in the MM's world with perfect capital markets. That is, firms are run by benevolent managers who act in the interest of investors. By assuming away market imperfections, we can focus on the demand for financial reporting that arises from the most basic economic activities.

Below, I first consider firms' production and investment decisions in the real economy, and then turn to investors' consumption-investment allocation through market trading. The interaction between the demand for and supply of financial resources determines the equilibrium of the economy.

## ***2.1 Firms' investment decisions in the real sector***

### *2.1.1 The production functions*

Firms use two types of resources as the inputs of operations: financial resource and human resource. Financial resources are needed to secure the necessary assets for carrying out designated business operations. At the same time, humans are hired to run operations. Both types of resources are indispensable as value generation is not possible just relying on one resource alone. The complementarity between the two factor inputs, is captured by a multiplicative relation below.<sup>9</sup> Because the focus here is on decisions concerning financial resources, I highlight the role of financial resources in the following production function (with the role of human resources made implicit):

$$X_{jt} = (\theta_j + e_{jt}) K_{jt-1}. \quad (1)$$

In equation (1),  $X_{jt}$  is the cash flow (value) generated by firm j in a period t (the output), and  $K_{jt-1}$  is the amount of financial resource that firm j has available at date t-1 (input).

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<sup>9</sup> In the economics literature, a multiplicative function is commonly adopted (such as the Cobb-Douglas function).

Note that both the input and output variables are measured in monetary terms to indicate quantity.  $\theta_j$  is firm  $j$ 's ability (efficiency) to generate value from financial resources, and  $e_{jt}$  is a term attributable to exogenous (uncontrollable) forces in period  $t$  that is ex ante unpredictable and ex post unobservable.

Firm ability ( $\theta$ ) can be viewed as the quality of a firm's operation, but it is unobservable and not measurable directly. This firm attribute embodies the role of human capital in operating a business. In practice, each firm is a unique organization built to undertake designated economic activities in its own way, and its ability to generate value is determined jointly by a multitude of factors, both internal and external to the organization. Internal factors include human resources (management expertise and employee skills), physical assets (facilities and infrastructure), and organizational setup that determines employee motivations and morale (such as explicit and implicit contracts, rules, and culture). And external factors relate to opportunities and readiness of the firm to engage with other parties such as customers, suppliers, and capital providers. Parameter ( $\theta$ ) is a parsimonious way of capturing the overall effect of these various factors in determining the input-output relation. Note that for investors, what ultimately matters is how *much* value is generated from a given amount of input resources.

### 2.1.2 Capital investment

At date  $t-1$  (the beginning of period  $t$ ), firm  $j$  makes an amount of investment,  $K_{jt-1}$ . Using the invested capital as input, the firm produces a cash flow at date  $t$ :  $X_{jt} = (\theta_j + e_{jt}) K_{jt-1}$ . For simplicity, I assume zero economic depreciation on capital assets. That is, the assets employed in period  $t$  remains fully productive in period  $t+1$ .<sup>10</sup>

At date  $t$ , firm  $j$  plans its operation for period  $t+1$  when a new investment project becomes available. If the new project is accepted at date  $t$ , firm  $j$ 's scale of operation is increased by a fixed amount  $K_{jt} \geq 0$ . The existing and new projects together will produce a cash flow at date  $t+1$  equal to  $X_{jt+1} = (\theta_j + e_{jt+1}) (K_{jt-1} + K_{jt})$ . At date  $t+1$ , firm  $j$ 's operation ends and its assets are liquidated to recover a value of  $(K_{jt-1} + K_{jt})$ .

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<sup>10</sup> Issues such as matching and conservatism will arise if some of the assumptions in the setting are relaxed, but that does not affect the central message from the study about the design of financial statements.

On the other hand, if at date  $t$  firm  $j$  decides not to continue its operation into the second period, it liquidates the existing assets and recovers a value of  $K_{jt-1}$ .<sup>11</sup>

It follows that when evaluated at date  $t$ , the true net present value (NPV) of firm  $j$  as a whole, that is, combining the existing asset and the new project, is:

$$NPV(K_{jt-1} + K_{jt}) = E_t(X_{jt+1}) = \theta_j (K_{jt-1} + K_{jt}). \quad (2)$$

Because firm ability ( $\theta_j$ ) is unobservable, it needs to be inferred from data reported from the accounting system. If both the input and output amounts are perfectly measured,  $(X_{jt}, K_{jt-1})$ , the estimate of  $\theta_j$ , denoted as  $\theta_j'$ , is:<sup>12</sup>

$$\theta_j' = X_{jt} / K_{jt-1} = \theta_j + e_{jt}. \quad (3)$$

It follows that the estimated NPV at date  $t$  of firm  $j$ 's operation, combining the existing and new assets, equals  $\theta_j' (K_{jt-1} + K_{jt})$ .

To maximize value generation, firm  $j$ 's optimal investment decision at date  $t$  is (i) to stay in business and make an additional investment  $K_{jt}$  if  $\theta_j' > 0$ , and (ii) to discontinue the operation and liquidate the existing asset if  $\theta_j' < 0$ .

## 2.2 Firms' market values at date $t$

Investors act competitively in the capital market. With risk-neutrality, firm  $j$ 's market value is set to equal its expected future cash flows.

In the case where firm  $j$  decides to stay in business at date  $t$  and expand its operation, the total amount of invested capital is equal  $t$ . These assets produce a cash flow at the end of period  $t+1$  (date  $t+1$ ),  $X_{jt+1}$ , plus the value from liquidating these assets,  $K_{jt-1} + K_{jt}$ . On the other hand, if firm  $j$  decides to discontinue its operation at date  $t$ , its value at date  $t$  is simply the liquidation value from the existing assets,  $K_{jt-1}$ .

The market value of firm  $j$  at date  $t$  ( $V_{jt}$ ) equals the total cash flows from firm  $j$ 's operation and asset liquidation. Then, we have:

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<sup>11</sup> Note that under the assumed conditions, the firm will choose at date  $t$  to either expand its scale by accepting the new project or discontinue the operation entirely.

<sup>12</sup> Without loss of generality, I assume that the prior distribution of  $\theta$  has an infinite variance, underscoring the role of accounting data as a key source of information for making decisions. I use a simple setting to highlight the essential roles of both the input and output variables for economic decisions, but the key message conveyed is a basic one and is applicable to more general settings; see, for example, the valuation model of Zhang (2000), developed from a broader setting with real options, which similarly features the importance of profitability (return on equity) as a signal to guide capital investment decisions and valuation. Profitability incorporating both equity book value and earnings resembles firm ability in this study.

$V_{jt} = E_t [NPV_{jt+1} + (K_{jt-1} + K_{jt})] = (1+\theta_j')(K_{jt-1} + K_{jt})$ , if the firm continues its operation;  
and  $V_{jt} = K_{jt-1}$ , if firm j discontinues the operation. (4)

### 2.3 Investors' consumption-investment decisions at date t

At date t, investors each are endowed with exogenous ownership in firms as carried from date t-1. For investor i (a representative investor), we denote  $a_{ijt-1}$  as the fraction of his ownership in firm j at date t-1.

Investors are all risk neutral and have time-additive utility functions (with a zero discount rate). Let  $C_{it}$  and  $C_{it+1}$  be investor i's consumption amounts at date t and date t+1, respectively. Then, investor i's total utility at date t is:  $U_{it} = C_{it} + E_t(C_{it+1})$ , where  $E_t(\cdot)$  is the expectation operator conditional on the information at date t.

Investor i makes a consumption cum (portfolio) investment decision at date t to maximize his expected utility:

$$\begin{aligned} \text{Max} \quad & U_{it} \equiv C_{it} + E_t(C_{it+1}) \\ \text{ST} \quad & C_{it} + \sum_{j \in J} a_{ijt} V_{jt} \leq W_{it}, \\ & C_{it+1} = \sum_{j \in J} a_{ijt} X_{jt+1} \end{aligned}$$

where  $W_{it} \equiv \sum_{j \in J} a_{ijt-1} (X_{jt} + V_{jt})$  is the total wealth held by investor i at date t, after the cash flows from operations in period t are realized, and J is the set of firms in the economy at date t. This wealth is divided between current consumption (date t) and investment for the purpose of future consumption (date t+1). The expected date t+1 consumption for investor i is the expected cash flows that the investor will collect at date t+1 from all firms that he has invested in.

Given the above assumptions, the maximum utility achievable for investor i ( $U_{it}^*$ ) equals his/her wealth at date t:  $U_{it}^* = W_{it}$ .

### 2.4 The Equilibrium

At date t, firms each maximize total value by making an appropriate capital investment (or divestment) decisions, and investors each make a consumption allocation decision to maximize expected utility. In equilibrium, all projects that increase (reduce) firm value are accepted (rejected) by firms, and a set of prices is established that clears the market.

Note that the decisions that firms make to increase firm value are fully congruent with investors' consumption maximization in this setting.

**Equilibrium.** The equilibrium of the above-described economy is characterized by the following (real) investment criterion and pricing rule:

*The capital investment criterion.* In the real sector, each firm carries on its operation and expands its scale if  $\theta_j' > 0$ , and discontinues the operation and liquidates the assets if  $\theta_j' < 0$ . This leads to a set of firms remaining in operation in the economy  $J^* = \{j \mid \theta_j' > 0\}$ .

*The pricing rule.* The pricing rule that investors adopt is given by equation (4).

The aggregate market value of all firms in the economy is  $M_t \equiv \sum_{j \in J^*} V_{jt}$ .

**Proposition 1.** A unique equilibrium exists and is Pareto optimal.

*Proof.* The aggregate wealth (consumption) at date  $t$  is the sum of total current consumption (date  $t$ ) and total expected future consumption (date  $t+1$ ) across all investors in the economy. Investors maximize expected consumption across dates  $t$  and  $t+1$ , which is derived from firms' cash flows. A firm's capital investment decision that increases its value also increases investors' total consumption. Thus, a firm's decision leading to a higher market value will correspondingly yield higher aggregate consumption and vice versa. In other words, the above criterion for real investment, which maximizes the total market value of all firms in the economy ( $M_t$ ), is socially optimal.

### **2.5 Reporting information to fulfill investors' need**

In the above model, investors use a firm's input and output amounts to infer its efficiency (ability), which is the basis for valuation and trading decisions. Investors' need is best served if the firm provides accurate data pertaining to the input resources used and the output value generated for the reporting period. The relevance of these constructs to investor decisions is obvious: the former is the cost that they bear in contributing resources to the entity, whereas the latter the benefit achieved for their investment.

Combining the information on these two aspects of operations, investors are able to evaluate the cost-benefit tradeoff and make trading decisions accordingly.

The financial report as conventionally adopted contains a balance sheet and an income statement as two of its components. Although the exact constructs underpinning these statements remain a topic of debate, a generally accepted view is that the balance sheet is intended to convey the entity's economic resources and the income statement to convey its performance over a period.<sup>13</sup> To this date, standard setters are yet to clearly define the basic concepts such as "economic resources" and "performance" with a sound economic justification.

Emerging in this theoretical framework are two economic constructs that should occupy a central place in the financial report. On the premise that financial reporting is aimed to serve investors' decision need, the balance statement should convey the amount of financial resources contributed by investors as input of operations. At the same time, the income statement should convey the value generated for investors in the reporting period that can be translated to their consumption power.

**Proposition 2.** On the basis that the financial report is designed to serve investors' need:<sup>14</sup>

- the balance sheet should convey the cost borne by investors in the form of financial resources provided for the entity's operations (input).
- the income statement should convey the benefit achieved in terms of value generation for investors in a given period (output).

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<sup>13</sup> For example, in the Exposure Draft of Conceptual Framework for Financial Reporting issued by the International Accounting Standards Board (IASB 2015), no economic meaning is provided for the concepts of equity and profit. Equity is only indirectly defined, in relation to assets and liabilities, whereas profit is undefined.

<sup>14</sup> If the financial report is intended to serve the needs of investors together with other users, then standard setters should first know the specific need of each user group to see whether the needs are consistent across different user groups. If the different users have different needs, the next question is whether there is sufficient flexibility for a single set of financial statements to satisfy all the different needs, or alternative how the needs of different user groups have to be comprised when designing the financial report that provides a balanced solution overall. In any case, understanding the decision need of each user group should be a necessary first step.

From the view that firms perform an input-output transform for investors, the financial report should be structured to contain (at least) two statements: one focuses on the input dimension of the operation, and the other on the output dimension. Both statements are integral parts of the whole report. Either one of the statements alone gives only a partial and incomplete picture of the underlying operation.<sup>15</sup>

### **3. Guidance for Designing Financial Statements**

With the economic constructs identified as the object of reporting, we have a concrete basis for thinking about the structure and content the financial report. In this section, I discuss the implications of the theory for designing the balance sheet and the income statement. Again, the discussion is centered on the decision need of investors, and the rationale rests on an understanding of the economic function of the reporting entity as an input-output transformation.

#### ***4.1 Designing the Balance Sheet***

On the basis that the balance sheet should focus on reporting the cost of providing financial resources as borne by investors, several guidelines follow to meet this purpose.<sup>16</sup>

*Boundary of the balance sheet.* While standard setting bodies take the position that the balance sheet should record economic resources (assets) that bring future benefit, the question of which economic resources should be recognized, and which ones should not, remains unsettled; see, for example, the IASB's revised conceptual framework (IASB 2018).

According to the above theory, not all economic resources with a potential to bring future benefits should be recognized. In the present context, the boundary of the balance sheet is shaped by the notion of cost (for investors). That is, if financial reporting is intended to serve investors' need, the balance sheet should focus on reporting the cost

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<sup>15</sup> In this setting with no transaction costs, I assume that there is no difference between exit value and replacement cost. Also, I do not consider the contracting role of financial statements.

<sup>16</sup> Actual accounting standards are further shaped by practical feasibility considerations, which is outside the scope of the theoretical discussion here. In other words, the discussion here concerns only what is relevant information.

of providing financial resources borne by investors. All assets, whether tangible or not, should be recognized insofar as financial resources have been used to acquire or develop them, and they should be measured at cost. The purpose is to get a full and complete account of the cost of financial resources contributed by investors, so that investors can conduct a proper cost-benefit analysis.

As explained, not all economic resources should be recognized from investors' standpoint. For example, there is no need to report human capital *per se*, which is another input and is (primarily) not contributed by investors. In particular, investors do not need to know the *quantity* of human resources deployed in their cost-benefit analysis.<sup>17</sup>

As well, the theory does not suggest that the balance sheet should report its intrinsic value (more on this point below), which is an entirely different notion from input cost.

*Historical cost versus fair value as the measurement basis.* To serve investors' cost-benefit analysis, assets (resources) should be measured at original cost. Using current value or any other measurement basis than historical cost, will distort information about the cost truly borne by investors, and therefore obscure inferences about the firm's true ability to generate value. That is, measurement bases other than historical cost are not directly relevant to investors' decisions.

In recent decades, fair value accounting is increasingly adopted. However, under fair value accounting, asset book values—which are remeasured over time as prices change—represent the investment cost for a *hypothetical firm* that have mimicked the activities of the actual firm concerned but at later points in time, and they would not serve the need of investor decisions. Investors are interested in the ability of the actual firm for what it has done, not a hypothetical firm that simply copied what these activities later (at least not to the same extent). An implicit message here is that investors are primarily interested in managers' ability to determine when to start investment projects as well as their ability to execute investment projects afterwards. It is historical cost that captures

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<sup>17</sup> If the need of users other than investors is also considered, it is conceivable that the scope of reporting may expand. But exactly which additional items should be recognized (and why) has to be determined from an expanded theory.



such abilities most faithfully,<sup>18</sup> whereas fair value measures hamper investors' ability to make proper inferences.

*On intangible assets.* Intangible assets are part of resources invested to carry out operations, and should be recognized insofar as costs have been incurred from investors' standpoint. Again, measurement should be based on cost—the cost of either purchasing or developing assets.<sup>19</sup> It is possible that the market value of internally developed intangible assets exceeds the cost of development. But for as long as the firm intends to *use* them for operations, rather than to sell them, it is more relevant to investors' decisions that these assets are measured at cost (input resource), not current value.

Standard setters and accounting scholars debate about whether the scope of the balance sheet should be expanded to include more intangibles. Some hold the view that at present the balance sheet seems too focused on tangible assets, while leaving other valuable resources such as R&D investment and human capital unaccounted for. The above theory suggests that to serve investors' need, the balance sheet should recognize resources that investors have provided as fully as possible, but there is no need for further recognition beyond this purpose in the present context.<sup>20</sup>

In summarize, the theory provides two general guidelines: First, recognition of intangibles should be limited to those that are developed or acquired through using financial resources. Second, measurement should be based on original cost (i.e., financial resources actually spent).

*Purchased versus generated goodwill.* In adopting input-output view of the firm, the above theory provides an economic rationale for differentially treating purchased goodwill and generated goodwill. Although they appear to be identical if one takes a static look of the entity, they are economically different for investors: the former is an input of operations whereas the latter is about output.

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<sup>18</sup> In actual practice, firms typically perform ex post evaluation of their investment activities. This requires a comparison of actual cash flows generated with the *actual* investment costs incurred, which similarly gives rise to a need for historical cost measurement.

<sup>19</sup> Whether this is practicable depends on the uncertainties associated with future benefits, an issue that cannot be addressed in this theoretical setting.

<sup>20</sup> This does not preclude the need for expanded recognition in economic settings not considered here, but the rationale for so doing must be made clear from a user perspective.

Purchased goodwill is part of the price paid to acquire a business. For investors, the whole purchase price—including the goodwill portion—is an investment cost. In the context of the above theory, purchased goodwill is input resources spent by the entity. Essentially, the entity has paid a price the target firm's capacity to generate value, which is made up of (i) the separately identified assets in the acquired business, and (ii) the ways in which these assets are organized and managed for the function of the business unit. While both components are necessary resources to bring future benefits, the latter is mostly “soft” assets pertaining the setting and the environment within which business activities are conducted. And they are intricately related to many aspects of the organization including corporate culture, employee skills, incentive plans, internal control, customer relations, social connections, and so on. For the acquiring firm, these soft assets are part of what makes the target business valuable, and are worth a price to pay.

Viewed in the above theoretical context, purchased goodwill is an input and should be recognized as such. The cost paid for those soft assets is part of the information that investors need to subsequently evaluate the acquisition decision in relation to the actual performance *ex post*.

To the extent that the usefulness of these acquired soft assets declines over time, as do the tangible assets acquired, and consequently new resources need to be spent to sustain their productive capacity (on such areas as employee training, advertising, etc.), acquired goodwill should, in principle, be amortized, just as how tangible assets are commonly treated.

On the other hand, the economic role of internally generated goodwill is in sharp contrast, and the above theory provides no ground for its recognition. Firstly, generated goodwill is not input (resource spent), and so does not belong in the balance sheet. Conceptually, generated goodwill is expected future value generation over and above the (measured) input cost. Recognition of it would amount to directly reporting business value on the balance sheet—a notion that is misconstrued and practically infeasible (explained below). Secondly, because it is not yet output already generated, it does not belong in the income statement either (also explained below). Rather, generated goodwill will be captured gradually through future income statements over the course of value generation.

A point to note is that situations in practice are typically less clear-cut than in the above theoretical model. While generated goodwill is not yet an end outcome in the form of final value generation, it may contain “half-way” achievements including, for example, employee training and infrastructure build-up, which helps to enhance the ability to generate value. Such internally generated assets are analogous to specific intangible assets that arise from R&D projects. In principle, they may be capitalized. The above theory suggests that capitalization, if any, should be limited to the amount of financial resources spent (cost).

*More on human capital.* Human capital is the ultimate force driving technological and managerial innovations. In a knowledge-based economy, human capital plays an ever greater role in business organizations. In the above model, financial and human resources as viewed as complementary inputs of a firm’s production. A pertinent question is whether human resources should be recognized and to what extent.

As a vital input of firms’ operations, human capital also seems to meet the definition of assets put forward by standard setting bodies (e.g., IASB 2018). After all, companies are founded and run by humans who decide how to use financial resources. However, as the above theory shows, from investors’ viewpoint, there is no demand for reporting human resources in the same way as for reporting financial resources. What investors need is the firms’ value generation in relation to the amount of financial resources they have contributed. That is, the relevant information to investors is *financial* resources, not human resources.

This is not to say that investors do not care about the firm’s human resources at all. Investors need to know human capital insofar as it helps them to evaluate the entity’s ability to transform financial input into value. In the above model, investors only make an imperfect inference of firm ability from reported input and output amounts due to uncontrollable factors, and further information can be helpful insofar it helps to improve inferences of firm ability. But there is no justification here that such additional information should be conveyed through the balance sheet. Also noteworthy is that firm ability should mainly be determined by the *quality* of human resources, rather than the

quantity (amount).<sup>21</sup> Those proposing to expand the balance sheet to incorporate human resources must face a number of questions: is it be the quantity or quality of human resources that should be recognized? Exactly how can such information help to improve the decisions of investors (or other users)? Furthermore, if some aspect of human resources is indeed recognized on the balance sheet, how would it be aggregated with existing items—which are expressed in financial amounts—to yield a meaningful summary measure?

*Should the balance sheet be designed to report firm value?* Some academics and standard setters seem to hold the view that the balance sheet should ideally report firm value. This notion might have played a role in the push for the increased adoption of fair value accounting and the standard setters' emphasis in recent times on the balance sheet as opposed to the income statement. However, the approach of directly reporting business value is incompatible with accounting practice that is firmly anchored to *realized* economic activities. By definition, firm value is about future value generation. For as long as standard setters are not prepared to move away from transaction-based reporting, recorded book value which reflects past input resources will remain an inherently distinct concept from intrinsic value which stems from future value generation, and there is no reason to expect that the two will be equal in general. Indeed, if we maintain that the accounting measurement is historical cost based and that firms seek to undertake projects with positive net present value, intrinsic firm value is expected to generally exceed book value.

Nonetheless, a valid question is whether the balance sheet has fully accounted for all input costs in the form of financial resources spent. Expanded recognition can be

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<sup>21</sup> In the real world, business activities are carried out sequentially through the various stages of operations, and a firm builds capacity to conduct business through the intermediate stages (such as patents, production processes, distribution channels, and customer bases). Human resources are used to achieve intermediate outcomes. Potentially, these operational capacities built up at intermediate stages could be capitalized for the financial costs incurred in developing them (where practicable). Relatedly, to the extent practicable, the cost of employee training could be capitalized. Again, measurement should be anchored to the cost spent, as suggested by the above input-output model.

justified insofar as the balance sheet has not completely recognized investment costs. But the purpose here is not to close the gap between book value and market value per se.<sup>22</sup>

It is also noteworthy is that directly reporting firm value (even if feasible) would result in information loss for decision-making. If the balance sheet simply reports firm value, rather than input cost, investors would not be equipped with necessary information to compute the output-to-input ratio and assess the firm's ability (efficiency), which is an essential signal for guiding capital allocation both within firms and across firms.<sup>23</sup> To reiterate, both input cost and output benefit are required information in making investment decisions.

#### ***4.2 Designing the income statement***

Complementing the role of the balance sheet to report input resources, the income statement reports output value actually achieved. This economic construct is the basis for defining net income and understanding the nature of other comprehensive income.

*Definition of new income.* Investors need to know the entity's output in terms of value generation. Accounting income measured and reported to convey this construct most directly serves investors' decision need.

To faithfully capture the notion of value generation over the reporting period, income recognition should meet the following criteria. First, income is the output of operations. Second, income is value actually generated in the reporting period, which is distinguished from value yet to be generated in the future. Third, importantly, income pertains to what truly matters to investors' well-being (i.e., consumption). Accounting gains and losses that have no obvious consequences for consumption are not income.

These guidelines delineate the boundary of net income from other comprehensive income. Presently, standard setting bodies are yet to clearly define income in economic terms. For example, in the revised conceptual framework of the IASB, the notion of profit is actually left undefined (IASB 2018). Without knowing what profit (net income)

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<sup>22</sup> Note that the discussion here does not preclude the need for disclosing information outside financial statements that enables investors to better infer firm ability to generate value.

<sup>23</sup> Also see the valuation model of Zhang (2000) which features profitability (efficiency) as a key signal for guiding capital investment decisions.

is, there is little basis to classify, and interpret, other comprehensive income (OCI) in an economically meaningful way.

*Other comprehensive income.* Certain accounting gains and losses fail to meet the above income definition. In an extended setting with long-lived assets whose prices change over time, accounting gains and losses arise from re-measurement of these assets. However, such gains and losses fail to meet the above income criteria, since they are not output of operations and have no direct consequences for investors' consumption power.<sup>24</sup> Furthermore, changes in asset prices after initial acquisition are not resources spent, and they do not reflect changes in physical production capacity. In other words, no gain or loss has occurred in the real sense for investors.

Likewise, gains and losses on operating assets from foreign currency translations are not income, which again pertain to changes in measured amount of input assets. There is no real consequences for physical production capacity (input) or value generation (output).

*On goodwill impairment.* Under the prevailing reporting standards, impairment tests are conducted to assess whether a business unit has experienced a decline in expected value generation from future periods. An impairment thus reflects declines in value as determined by expected future performance. Then, by its very nature, goodwill impairment is incompatible with the notion of income set forth above (i.e., value actually achieved). If the income statement is intended to convey value generated in the reporting period, not expected value generation from the future, there is no basis for including impairment of purchased goodwill—changes in future value generation—as income.

As explained above, the theory here justifies amortization of purchased goodwill, for the same reason as we depreciate physical assets.

*On alternative notions of income.* Economists have proposed various notions of income, but they are not specifically coined for financial reporting purposes. One notion that has

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<sup>24</sup> As Zhang (2014) shows, investors' information need for evaluating firms' trading activities in financial markets is very different from that for evaluating operating activities in the real sector. This study does not consider firms' trading activities.

had significant influence on accounting scholars and standard setters is Hicksian income. Hicks (1946, p.172) considers “a man’s income as the maximum value which he can consume during a week, and still expect to be as well off at the end of period as he was at the beginning”. This notion pertains to the amount of increase or decrease in an individual’s total wealth.

In the context of financial reporting, the Hicksian income would suggest that we measure the change in investment value over a period (which resembles stock returns). But this notion is distinctly different from the income definition that emerges from the above framework that distinguishes between investment by firms and that by investors. In this framework, income is defined in terms of the entity’s value generation in a given period, not investors’ wealth change. This income notion, together with book value (financial resources spent), forms the informational basis for assessing investors’ investment value. To the extent that the balance sheet is not intended to account for firm value, Hicksian income is not applicable to financial reporting.<sup>25</sup>

#### ***4.3 Relation between the Two Financial Statements***

Diverging views exist on whether the financial report should be designed to emphasize the balance sheet or the income statement. Indeed, over the years the position of standard setting bodies such as the Financial Accounting Standards Board of the US has oscillated between the two alternative positions.

Some people might hold the view that if we could design the balance sheet properly to convey firm value, income could be computed as the change in the balance sheet over a period. Alternatively, if we could have a way to determine permanent income (see the above discussion) which alone is sufficient for valuation, the balance sheet would be made redundant. In this section, I explain that neither approach—which relies on one of the statements only—is warranted. Both statements are integral parts of the financial report, and they complement each other in portraying the firm’s business operation.

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<sup>25</sup> Beaver and Demski (1979) also probe measurement of income from a social welfare perspective and point out challenges in doing so when markets are incomplete. However, their setting omits the role of financial markets as a mechanism for trading and guiding resource allocation across firms.

*The income statement is not a derivative of the balance sheet.* Because value generation is predicted on input resources, there is a natural link between the input and output of operations. However, the input-output relation is not a fixed one, and output cannot be readily inferred from input information. Crucially, value generation also depends on the firm's ability to transform resources into value, which is a firm specific and unobservable attribute. Reflecting the underlying economic process, income cannot simply be derived from the balance sheet.<sup>26</sup>

*The balance sheet is not made redundant by the income statement.* Investors need both financial statements to infer a firm's ability to generate value, and the income statement alone does not provide sufficient information for determining value.<sup>27</sup> Income-statement information appears to be sufficient in special cases where firms are expected to operate in a steady state. But, to ascertain whether or not a firm will remain in a steady state, investors need to assess its ability to generate value, which again requires both financial statements.

Given that the balance sheet and the income statement need to be used together to convey relevant information to investors, a financial reporting model that emphasizes only one of the statements, not both, will be flawed, which inevitably compromises the integrity of the report in portraying the underlying business.

#### **4. Concluding Remarks**

In this study, I develop a basic theory of financial reporting that focuses on the information need of investors. The demand for financial reporting information is examined in a setting where firms undertake productive activities using economic resources, investors contribute resources in exchange for future returns, and a capital market serves as a mechanism to allocate resources in the economy. The central question is how a firm's operational data should be represented and reported to meet the decision need of investors.

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<sup>26</sup> Although the accounting process ensures that income is a source of book value changes, book value changes per se are not income. Rather, changes in book value reflect changes in resources, and they are dictated by investment activities.

<sup>27</sup> Zhang (2000) demonstrates this point in a more general setting for equity valuation.



From the standpoint of investors, firms perform the economic function of transforming input financial resources into value output. Mirroring this input-output view of the firm, financial reporting should focus on the most essential aspects of operations, which pertain to input resources used, on the one hand, and output value generated, on the other. The former represents the cost of providing resources for investors, whereas the latter the benefit earned for their investment. Based on the cost-benefit tradeoff, investors evaluate the entity's economic viability (ability) to continue and grow. The theory proves that when accurate cost and benefit information is provided, investors make trading decisions that lead to efficient resource allocation in the sense that aggregate-level value generation is maximized for the economy.

The theory presented here has important implications for the structure and content of the financial report. One of key messages is that the financial report should be designed to contain (at least) two components: a balance sheet to report the input of an entity's operations (the cost for investors), and an income statement to report the output value generated (the benefit). With a clear purpose that financial reporting should achieve, the economic constructs underpinning these two financial statements are made clear, which serve as the conceptual basis for designing the statements. The study sheds light on some of the fundamental issues that remain unresolved in the standard setting arena, including the boundary of the balance sheet, the meaning of net income versus other comprehensive income, distinction between purchased and generated goodwill, treatment of intangible assets and human resources, and the complementarity between the balance sheet and the income statement.

This study approaches the financial reporting problem from the perspective of market investors, who are one of the primary user groups. In the practical setting, multiple user groups exist, and therefore reporting standards should take into consideration the needs of other user groups as well. In this sense, probing the decision need of equity investors is only a first step towards a comprehensive understanding of the financial reporting task. To formulate effective reporting standards and rules, it is important that standard setters clearly understand the needs of *all* important user groups and then strike a balance among those different needs. For research purposes, however, it would be challenging, or even counterproductive, to try to tackle the complex problem of

financial reporting in a single theoretical model. A gradual and incremental approach is likely better suited whereby the decisions of different user groups are separately explored step by step. And even focusing on equity investors alone, the setting considered in this study is highly simplified, and an extended version is required to explore further issues such as matching and conservatism. Nonetheless, the basic economic thinking put forward in the study is of fundamental importance and has general relevance: namely, the principle of cost-benefit tradeoffs for economic decision-making and the centrality of information about an entity's ability to perform its economic function. In this regard, the implications drawn from the study are likely to be valid beyond the setting examined here.

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