Accounting Errors and Errors of Accounting

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ABSTRACT: Accounting should pay more attention to errors, as errors are essential for the updating of beliefs. Accounting is an information system, and errors are the carriers of information according to Bayes’ Theorem. Accountants are primarily concerned with the mean (value), but the variance of accounting numbers is equally important. Only autocorrelation makes historical accounting relevant for decision purposes. Endogenous errors of accounting are more common than acknowledged. First, the accounting model is linear, whereas the world is nonlinear. Second, accounting is not the only information channel, and accountants must consider the role of accounting when it supplements other information sources. This commentary discusses the consequences of endogenous errors. Errors are inherent to accounting, and accountants must address them.

Keywords: information perspective; accounting errors; permanent earnings; nonlinearity; alternative information sources.

I. INTRODUCTION

The accounting system is a closely managed information system. Financial data about the firm are collected with the purpose of guiding decisions related to the firm. The recognition rules govern the inclusion of information in the accounting library. Recognition rules also govern the exclusion of data from the accounting system. The accounting system is based upon old technology dating back to Pacioli in 1494. This technology continues to be used, and the market has proved it useful. Basically, it is a double entry system that simultaneously keeps track of the financial stocks and flows of the company, with the comparative advantage that it is hard to manipulate. Accountants have a long track record in maintaining the accounting system based upon financial data.

Even with this inherent security, the accounting system is by no means flawless (cf. Beaver 1998). The net result is that not all information of relevance for economic decisions is included in the accounting system. The accounting system is effectively limited to information that can be measured reliably. Thus, all troublesome items are carefully excluded, and, as a consequence, the accounting system steps back from the valuation of many intangible assets and writes off such investments at acquisition.

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The accounting system serves many purposes in a multi-person world. A conflict among uses is inevitable, as pointed out by Gjesdal (1981). Thus, errors are inevitable. More to the point is that it is an information system, and information is imbedded in the errors. Hence, the question of how to extract information from the endogenous errors of the accounting system must be addressed. This brings the time-series properties of accounting numbers into focus. Extracting permanent and transitory earnings components from errors becomes an important exercise, as I discuss in Section II.

Costing and the managerial accounting system also contain endogenous errors. Most of these errors originate from the discrepancy between the accounting model and the underlying economics of the firm. The old variable-cost-versus-fixed-cost controversy might be seen as belonging to this type of error. The bigger picture is that the accounting model is linear, whereas the world is hardly linear. Economies of scale and scope are part of most businesses, and they certainly form the basis for most multi-product firms. The discrepancy between the linear accounting model and the nonlinear economics induces errors into the accounting system and reduces its usefulness for decision purposes. The activity-based costing (ABC) accounting system offers a finely tuned system, which mirrors the production technology of the firm, albeit using a linear costing technique. The alternative is a simple accounting system using fewer cost drivers. Both are infected by errors, although it is not clear that one should favor the more complex system. I return to this issue in Section III.

Another set of errors of the accounting system relates to the fact that accounting is constructed as if it were the only information source providing information to decision makers. Thus, much effort is directed to ensuring that the accounting system reflects all available information. For example, consider the fair-value debate. The point here is that the accounting system is not necessarily the best aggregator of information. The accounting system has a comparative advantage when it comes to providing information about the financial history of the firm. Market-related information might also reach the decision makers through other channels such as the pricing mechanism. In fact, the market mechanism is a powerful information aggregator, as suggested by Roll (1984). Hence, there is a horse race between the accounting system and the market mechanism in aggregating market information. When this aggregation is performed by the accounting system, the system will potentially be less efficient in providing historical financial information. As both types of information are in demand, there is a conflict. I return to this issue in Section IV.

II. THE INFORMATION PERSPECTIVE

Accounting provides information to decision makers. It produces numbers that have proven useful in pricing commodities and produces data that serve as inputs into the managerial performance evaluation exercise (Horngren et al. 2009). Thus, accounting provides information for the decision making and control purposes of the firm in general (Sunder 1997).

Bayes taught us how our beliefs are updated once new information arrives. The event of interest is called A, and the new piece of information is denoted y. The beliefs of the decision maker are encoded in the probability distribution, P. Bayes’ formula shows that the updated probabilities reflect the relative likelihood of y when y has occurred:

\[ P(A|y) = \frac{P(A \cap y)}{P(y)}. \]  

(1)

More insight might be obtained when information is placed in a normal distribution framework. The value of the object in question is x, which is normally distributed with mean \( \mu \) and variance \( \sigma^2 \). The new information signal is y, which is normal with mean \( \mu \) and variance \( \sigma^2 \). Consistent updating of the expectation of \( x \) given the information in \( y \) results in the following expression:
As anticipated, the updated expectation depends both on \( y \) and on the prior mean \( \mu \). The interesting observation is that the updated expectation of \( x \) also depends on the variances. The amount of updating depends upon the relative variance of the new information as compared to the prior variance. If the new source of information has very little variance—reliable information—then the updated value is equal to the signal. When the signal is of lower quality, the updating adjusts accordingly, as the magnitude of the updating is a decreasing function of the variance \( \sigma_x^2 \).

The implication of this for an accounting context can be shown in a simple setting, adapted from Christensen and Demski (2003a). Suppose that the firm has a lifetime of three periods and faces perfect capital markets with an interest rate of \( r \). Initially, the owners invest \(-CF_0\) > 0, generating uncertain cash flows over the following three periods of:

\[
CF_1 = \bar{c}_1 + \epsilon + \epsilon_1
\]

\[
CF_2 = \bar{c}_2 + \theta \epsilon + \epsilon_2
\]

\[
CF_3 = \bar{c}_3 + \gamma \epsilon + \epsilon_3.
\)

The expected value of all the error terms \( \epsilon, \epsilon_1, \epsilon_2, \) and \( \epsilon_3 \) is zero and the expected net present value of the investment is also zero. All error terms are independent, implying that the \( \epsilon_i \)’s are transitory earnings components, whereas \( \epsilon \) has a permanent effect, as it affects all three periods. It is assumed that all cash is transferred to the owners as immediate dividends. Thus, the firm never holds cash.

The risk-neutral value of the firm is given at time 0 (value = \(-CF_0\)) and time 3 (value = 0). The interesting valuation questions are found at time 1 and 2. Suppose only cash flows are observed by the market participants as time progresses. Given the efficiency of markets, the market valuation at time 1 will be:

\[
E[PV_{1|CF_1} = \bar{c}_1 + \epsilon + \epsilon_1] = E[CF_2|\epsilon + \epsilon_1](1 + r)^{-1} + E[CF_3|\epsilon + \epsilon_1](1 + r)^{-2} = (\bar{c}_2 + \theta E[\epsilon|\epsilon + \epsilon_1])(1 + r)^{-1} + (\bar{c}_3 + \gamma E[\epsilon|\epsilon + \epsilon_1])(1 + r)^{-2}.
\)

The error terms provide the information for Bayesian updating. Furthermore, the autocorrelation of the error terms is what makes the valuation exercise interesting. Only the permanent component of the error term enters the value calculation.

The accounting system will also reflect the first period error term, but in a different way. Accounting is governed by accounting conventions and recognition rules. Under historical cost accounting, the accounting valuation will start from the book value (= acquisition value) and then use periodic depreciation to adjust the value. The depreciation charge is predetermined as \( \delta_i \). The first period accounting value is then \( A_1 = A_0 - \delta_1 \) and the period 1 accounting income is \( I_1 = CF_1 - \delta_1 \). The accounting income reflects the error terms. Since the accounting system reflects the same information as the market value, it is possible to calculate the market value using...
accounting data. Contrary to the accounting income, the accounting valuation contains no information about the error term. The expected future residual income measures will counterbalance the error made in the accounting valuation, as in Feltham and Ohlson (1995). The calculation is as follows:

\[
E[PV_t | \varepsilon_t + \varepsilon_t] = A_1 + E[I_2 - rA_1 | \varepsilon_t + \varepsilon_t](1 + r)^{-1} + E[I_3 - rA_2 | \varepsilon_t + \varepsilon_t](1 + r)^{-2}.
\]  

The general point here is that the accounting valuation seldom coincides with the market valuation. The recognition rules of accounting dictate a more conservative information processing compared to the market valuation. When pricing the securities in a risk-free market, the market participants use their information to estimate the mean value and are not constrained by accounting conventions.

When the market valuation and the accounting valuation are based upon the same information set, it is possible to find the market valuation from the accounting valuation, making it important to extract the information about the permanent error term from the reported income. This analysis suggests that an important role of the accounting system is to provide information about the error terms, and yet how to fulfill that role is not predominant in the accounting literature.

When the market valuation is based on more information than the information contained in the accounting reports, it becomes more difficult to analyze the role of the accounting information. The errors are important, as suggested by Bayesian updating, but the question remains as to whether the accounting information should be confined to transaction information or whether market information should be part of the accounting system. I will return to this question in Section IV, after considering the effects of nonlinearity in accounting in Section III below.

### III. NONLINEARITIES IN ACCOUNTING—COSTING

Costing is an old art of accountants and the ABC literature has given rise to a new interest (cf. Christensen and Demski 1995). One of the important insights to be gained from the activity-based accounting system is that the accounting system is improved when the accounting structure reflects the structure of production. In this way, ABC is better able to produce product costs that are in line with the underlying economic cost. The basic activity-based construction of product cost is a two-stage linear cost allocation. The errors of ABC have been the subject of recent research such as Cardinalis and Labro (2008). The decision problem regarding production plans, make-or-buy, or acquisitions might take on many disguises, but according to economics, marginal cost or incremental cost is the statistic that guides optimal decisions when confronted with the marginal revenue. Furthermore, cost functions are often nonlinear, as increasing or decreasing returns to scale are commonplace, such that nonlinearity is often cited as the reason for a particular size of an operation or even the existence of multi-product firms.

Accounting cost usually assumes a linear cost function. The accounting construction of unit cost is a prominent example of this. When the cost function is nonlinear, an endogenous error in the accounting system is the result.

Consider a facility that produces several products in quantities described by the vector \( q \), as in Christensen and Demski (1997). Assume three indirect cost pools named after the production function: \( f \), \( g \), and \( h \). Cost pool \( f \) uses the inputs \( x_1 \) and \( x_5 \) to produce the products in the quantity \( q \). The products use the output from the cost pool in a Leontief technology described by \( A_1 \). This means that there is a linear use of the resources produced by \( f \). In this way, \( A_1 \) illustrates the cost driver for pool one, as each unit of the first product uses the number represented by the first element of \( A_1 \) of the resource \( f \). Cost pool \( g \) is similar to cost pool \( f \). Cost pool \( h \) is an intermediate cost pool. The output of \( h \) is also Leontief, as it produces the inputs \( x_4 \) and \( x_6 \), which are used as inputs in \( f \) and \( g \), respectively. The production function \( h \) uses the inputs \( x_3 \) and \( x_4 \). The production functions \( f \), \( g \), and \( h \) describe the transformation process of inputs to outputs for each of the cost
pools. In addition to these cost pools, production gives rise to labor cost, \( L \), and material cost, \( M \). These two cost categories are linear by default.

The cost function of the operation is derived from the following optimization:

\[
c(q) = \text{Min} \left[ Lq + Mq + \sum_{i=1}^{4} p_i x_i \right]
\]

s.t.

\[
A_1 q \leq f(x_1, x_5)
\]

\[
A_2 q \leq g(x_2, x_6)
\]

\[
x_5 + x_6 \leq h(x_3, x_4)
\]

The marginal cost is the relevant cost statistic for incremental decisions. The Lagrange multipliers on the constraints are useful in characterizing the marginal cost:

\[
MC_i(q) = L_i + M_i + \lambda_1(q) A_{1i} + \lambda_2(q) A_{2i}
\]

(7)

The Leontief coefficients fully capture the differences of the products’ marginal costs, and there is a linear relationship between the marginal costs of the products. It is noteworthy that the intermediate cost pool is not present in this marginal cost calculation, though it is accounted for indirectly through Lagrange multipliers of cost pools \( f \) and \( g \). The marginal cost is not necessarily linear in the products \( q \). That depends upon the production functions \( f, g, \) and \( h \), as the Lagrange multipliers are not necessarily constant.

The costs are accumulated in the three obvious cost pools. The costs are exactly as suggested by the cost functions and the production functions as in Equation (6). There are no error terms and there are no inefficiencies. Now apply cost calculations of the ABC type to find the product costs. First, the intermediate cost pool is allocated to the indirect cost pools \( f \) and \( g \) using the available cost drivers describing the activity of the intermediate cost pool. Second, the total cost in the indirect cost pools is allocated to the cost objects using the Leontief coefficients of the production functions. These will form the natural and available cost drivers. The calculations are summarized in Equation (8):

\[
C_h = p_3 x_3 + p_4 x_4
\]

\[
C_f = \frac{p_1 x_1 + \frac{x_5}{x_5 + x_6} C_h}{A_1 q}
\]

\[
C_g = \frac{p_2 x_2 + \frac{x_6}{x_5 + x_6} C_h}{A_2 q}
\]

\[
C_i = L_i + M_i + C_f A_{1i} + C_g A_{2i}
\]

(8)

It is noteworthy that the structure of the ABC calculation is identical to the structure of the marginal cost calculation. The direct cost components are identical and the Leontief coefficients \( A_{1i} \) and \( A_{2i} \) are also found in the ABC calculation. Thus, the differences among the products with
respect to cost structure are precisely reflected in the ABC system, due to the Leontief structure of the production function. Furthermore, any discrepancy between ABC cost and marginal cost must be found in the Lagrange multipliers, which represent the marginal costs of the indirect cost pools. As noted, the multipliers indirectly account for the cost of the intermediate cost pool as in the ABC system. When the production functions \( f, g, \) and \( h \) are all linear, the ABC approach results in the marginal cost for all of the products simultaneously.

When one or more of the production functions show increasing returns to scale, the ABC system will estimate the marginal cost too high, whereas the opposite is the case for decreasing returns to scale.

The activity-based accounting system was introduced as an improvement of the traditional accounting system, particularly for firms that produce multiple products. In comparison, the traditional accounting system is a single cost pool system using direct labor as the cost driver. The product cost calculation runs according to the following pattern:

\[
C_L = \frac{p_1x_1 + p_2x_2 + p_3x_3 + p_4x_4}{Lq}
\]

\[
C_i = L_i(1 + C_L) + M_i. \tag{9}
\]

This costing system is simpler than the ABC system, as it has only one independent parameter to describe the differences of the product cost of the products in \( q \). The input of labor, \( L_i \), is the only source of assigning overhead costs to the products.

However, as the ABC system is also an approximation, it is worthwhile to run the horse race between these two systems, as in Christensen and Demski (1997). The actual marginal cost of the products is used to evaluate the performance of the two accounting systems. The performance of an accounting system is measured by the mean squared error of the unit cost reported by the accounting system. Christensen and Demski (1997) found that the traditional accounting system based solely on labor input for some combinations of the production functions outperformed the more refined ABC system. The picture is more pronounced when the individual products are evaluated. For some products, one accounting system performs best, whereas for other products, the other accounting system performs best. There is no uniform winner.

This finding is not restricted to nonlinear production functions. Datar and Gupta (1994) found similar results when they studied the combined effect of an erroneous choice of cost driver and different levels of aggregation. They found that the two factors interact, such that repairing the system on one dimension does not necessarily lead to an overall improvement. They also used the Euclidean distance measure to determine the performance of the accounting systems. Labro and Vanhoucke (2007) took the analysis one step further by performing a large simulation analysis. The underlying “true” economics of the firm is linear and with a multi-layer system like an ABC system. Their setting included a large number of cost pools that are allocated to activity cost pools and further to cost objects. All the allocations are linear, using pre-specified cost drivers. In their simulation, Labro and Vanhoucke (2007) varied the number of cost pools both at the resource cost pool level and the activity cost pool level. They also varied the cost drivers used in the cost allocations. Results supported the findings of Datar and Gupta (1994), revealing interaction effects between errors. An incremental refinement of the accounting system does not always lead to a superior system.

The same pattern of results arises when the accounting system is used to induce efficient behavior. The economic relationships in the division are as described in Equation (6). It is assumed that part of the production from this division is sold for profit in the market, and part of the
production is delivered to other divisions in return for cost reimbursement. The cost reimbursement is based on the realized cost and observed drivers, as measured by the accounting system.

The evaluation of the division is based upon divisional profit. Inefficient decisions result in excessive costs, but perhaps divisional profit will increase. The question is whether the division is able to pass more than the excessive cost on to the other division through clever but inefficient decision making. The control system prevents this from happening to some extent. Christensen and Demski (2003b) found that, when the technology exhibits constant returns to scale, the ABC-type accounting system will always induce efficiency. However, if the indirect cost pools show increasing returns to scale or if the intermediate cost pool has non-constant returns to scale, then it is possible for the division to profit from using resources inefficiently. The inefficiency is passed on to the other division via the cost allocation. The scheme relies heavily on substitution of factors of production. The scheme allows the division to employ the more productive resources for the products sold for profit, whereas the less productive inputs are used for internal transfers. There is nothing in the system itself which limits the amount of inefficiency. Such limits must be found in the control system.

When the possibility of such inefficiencies exists, a simpler traditional accounting system might be better at promoting efficiency. Christensen and Demski (2003b) analyzed the horse race between a labor-cost-based allocation system and an activity-based accounting system. The production technology suggests an activity-based system. The inefficiencies of an ABC system are confined to the indirect cost categories.

If labor is used to allocate cost and if it is possible to use too much labor for the internal division, then the internal division absorbs a larger share of the indirect cost. The inefficiency is confined to the direct labor and also in this case the control system limits the inefficiency.

The net result is that the winner of the contest is determined by the control system. Are the controls better at limiting the inefficiencies in the labor domain than in the indirect cost domain? Accounting provides a mapping and illustration of the economics of the firm. The accounting model has many parameters, and selecting the model just to mirror the structure of the firm is too simplistic. The underlying economics play a crucial role. The other dimension is the control system, which might result in one seemingly inferior accounting model winning the horse race against a more refined accounting model. Unlike accounting, the world is hardly ever linear, and the analysis of accounting has to take that reality into consideration.

IV. ALTERNATIVE INFORMATION SOURCES

Traditionally, accounting has been based upon historical cost and revenue measures. Only historical information or realized cash flows could penetrate the recognition rules of accounting. Accruals also have a historical orientation, but contain certain forward-looking elements. The valuation of material assets starts out with historical cost and is then depreciated according to a predetermined scheme. The scheme is determined at the time of acquisition. Only hard evidence will make it possible to deviate from the scheme. Recently, there has been a trend toward substituting the historical valuation of assets with a fair market valuation, in which the current market value of the asset is used in the accounting valuation of the asset.

Fair-value accounting changes recognition rules to include market information in the accounts to a larger extent. The implication is that the aggregation within the accounting system reduces the information content of the accounting statement with respect to historical information. Consequently, fair-value accounting poses a new horse race concerning introduction of alternative information sources into the accounting system. One system would be the historical accounting system, which is transaction based, and opposed to that is a fair-value accounting system, which allows market information to be aggregated into the accounting system. Market information is available in the market by definition and market participants also have access to this type of information.
information. Therefore, the horse race could also be coined into a question of who is best at performing the aggregation of market-wide information with historical cost information. The contestants for this competition are the market participants or the accountants. The analysis of this problem follows Christensen and Frimor (2007).

Inherently, the value of a firm is uncertain. To keep the presentation simple, suppose that the uncertainty consists of two components: one that summarizes the internal factors and the other that summarizes the external factors of the firm.

$$V = e_A + e_E.$$  

(10)

It is assumed that the firm observes the first error term and only observes the second error term with error. Thus, the firm and its auditor observe:

$$y_A = e_A, \quad y_F = e_E + e_{AU}. $$  

(11)

The firm and its accountant are confined to a single aggregated report stating the expected value of the firm conditional on the information that is allowed by the recognition rules. There are two possibilities for the recognition rules that lead to two reporting options. One is a historical cost model in which the recognition rule only allows the internal factors of the firm into the accounting valuation, $V_H$. The alternative set of recognition rules allows the accountant to aggregate the observed external factors into the reported value of the firm. This set of recognition rules brings market observations into the accounting valuation, and in this sense it has the flavor of fair-value accounting, $V_F$. In both cases, the accountant is disclosing an unbiased report subject to his/her information constraint. The report published by the firm under the two regimes can be calculated assuming that all information variables are normally distributed with zero means:

$$V_H = E(V|y_A) = y_A$$

$$V_F = E(V|y_A, y_E) = y_A + \frac{\sigma_E^2}{\sigma_E^2 + \sigma_{AU}^2} y_E.$$  

(12)

Investors observe the accounting report prior to trading. Each investor also makes his/her own private observation of the external factor, and the error term for each investor is personal but follows the same distribution. To simplify, it is assumed that all the error terms of the investors are uncorrelated. In addition, the investors observe the price, $P$, at which the stock of the firm is traded. Thus, the investors observe:

$$y_{E,i} = e_E + e_i P, V_i.$$  

(13)

The security is traded in the open market, and the price is formed when the investors meet and decide on their individual trading. There is uncertainty in the market, as all individual endowments are stochastic and assumed normal with variance $\sigma_i^2$. This structure leaves the model tractable and prevents prices from being too informative. Supposedly, the investors participate in an anonymous trading mechanism transforming the individual bids and forming a price. The investors only disclose their private information through the pricing mechanism, and there is no direct information exchange among the investors. The investors are rational, and when entering into the pricing game, they anticipate the reaction of their co-traders. The market clearing price reflects this conjecture, such that the resulting price is a rational expectations equilibrium. The model used for this analysis stems from Hellwig (1980).

The equilibrium price for this mechanism reflects the market uncertainty, $\sigma_i^2$, the private information of the investors, and the information content in the accounting report.
The important question is how to evaluate the two accounting options. One method is to analyze how the accounting valuation is aligned with the market valuation. The relevant measure for this is the squared difference between the accounting valuation and the market value. This difference is often used in empirical research, as both measures are readily available (Schipper and Vincent 2003). This measure would clearly favor the market-based accounting valuation as the accounting valuation includes the second error term.

An evaluation of the accounting system is closely linked to the ability of the accounting system to provide useful information for decision making. The final outcome of the decisions is what matters to the investor.

The market value might be a good proxy for the final outcome. At the same time, the market value works as an information aggregator, compounding all information available to investors, including the private information and the accounting information. The aggregator role is not highlighted when only the difference between the accounting value and the market value is evaluated. Using the market value as a measure provides only a partial view of the relative performance of the two accounting systems. Consequently, market value is not necessarily a good measure of the merits of the accounting system. Furthermore, another measure of the merits of the two accounting options would be the squared difference between the price of the asset and the final payout from the investment. This is a measure of the aggregate informativeness of the accounting system. It is difficult to measure the final payout empirically, as the final dividend only materializes with a considerable time lag for most investments. In the present setting it is possible to evaluate this measure analytically. The measure reflects the ability of the price to reflect the information available to the market participants. It is of no relevance to the measure how the information is transferred to the price. As a result, it provides a measure of who is best at aggregating the information: the accountant or the market.

It is not easy to get a closed form solution to show exactly which accounting system is optimal, but it is possible to calculate the value of the valuation error as a variance, \( \text{Var}(.) \). The valuation error is calculated for the two accounting systems. The historical accounting system is independent of the accountant’s ability to measure the market component. The accounting valuation of the fair-value accounting system depends on the quality of the accountant. Consequently, the variance is calculated as a function of the ability of the accountant to estimate the “market” information for the fair value accounting system—i.e., as a function of the variance \( \sigma_{M}^2 \). For example, if the auditor is very good at estimating the market factor \( \epsilon_F \), then the variance \( \sigma_{M}^2 \) is very small.

In Figure 1, the performances of the two accounting systems are calculated when market uncertainty is large—that is, when the variance of the initial wealth of the investors is large. In that case, it is expected that the market price will carry little information from the individual investors and, consequently, even less-able accountants will be able to provide useful market information to the price mechanism. The graph for the fair value accounting system shows a smaller variance, even for relatively large \( \sigma_{M}^2 \).

The calculations are repeated for smaller market uncertainty in Figure 2. In that case, it is expected that the market price will reflect the investors’ private information to a large extent, and as a result there is a greater demand for accounting information to supplement the information that is already available in the market. Therefore, it is expected that the historical accounting system will outperform the fair-value accounting system. A comparison of the graphs in Figure 2 reveals that this is indeed the case. The two graphs intersect at \( \sigma_{M}^2 = 0.02 \), implying that the accountant should outperform the average investor 50 times when it comes to estimating the market influence on the performance of the firm.

These findings support the view that the optimal accounting system depends on the finer details. In some cases, it is optimal to aggregate other information into the accounting system, and
in other cases, it is optimal to let the market do the aggregation. The other message is that the accounting system is not the only system available and it is a serious error to pretend that the accounting system should be the only information system.

V. CONCLUDING REMARKS

The common theme of this discussion has been the errors of accounting systems. Errors are important and often neglected when the design of accounting systems is evaluated. Accounting carries information, as is often recognized, but the full impact of that statement is not endogenized in the analysis (Demski 2004).

First, the information perspective calls for using the accounting information to update our expectation of the future events of the firm, cost, cash flows, etc. The important element of this is what we learn from the accounting statement and what we knew beforehand. The quality of both pieces of information is important for consistent updating of beliefs in a manner consistent with Bayes’ theorem.

The accounting mapping is a linear construction, using a linear aggregation of transactions in the accumulation accounts, in the allocation of cost and benefits to cost objects, and in the presentation in the balance sheet. Yet, the world is hardly linear. Economies of scale and scope are found everywhere and are often the reason for the existence and size of firms. Thus, the assumed linearity in accounting results in structural errors. There are many reasons for sticking to the linearity assumption, as estimating the “correct” functional form of some accounts is an impossible task. The result is that the errors persist, and the system designer can counter this through the allocation mechanisms employed. Understanding the error structure is important.

Finally, the accounting system is not the only information system in the world. Other and perhaps more timely information sources exist. The accounting system must acknowledge this fact.
and act accordingly. The comparative advantage of the accounting system must be considered, with some tasks better left for other information sources. The debate on fair-value accounting provides an example of this reasoning. The accounting system has a non-disputed advantage when it comes to reporting of firm specific information. Aggregating market information into the accounting system might or might not be a good idea. The basic question here is who is best at performing the aggregation of the market information. The market mechanism is a powerful information aggregator, and it might be better suited for aggregating firm-specific information with market information.

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