

The Role of Intangible Assets in Enhancing Corporate Financial Transparency

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Abstract: *The incapacity and imprecision of financial and earnings projections are the focus of intangible assets, intellectual property, and estimating cash flow and rates of return. The primary source of information used by accountants, financial managers, and economic forecasters to project future cash flow and profitability (per share or overall) is financial reporting. However, expert estimates and their records have often resulted in poor performance. Prior research focused on producing proof that accrual accounting supports improved forecasting performance or on historical study of previous profits forecasting methodologies. There are a variety of ways to object to these fields of research. It is inappropriate to defend accrual accounting by claiming that it performs well when key elements influencing profit projections are not included in the used methodologies. Additionally, intangible asset financial reporting is often inaccurate or nonexistent. Economic forecasters are aware that one major source of forecasting mistake is the reporting of assets, which has a significant impact on cash flow and, therefore, earnings forecasts. Even though others have shown that using advanced models for forecasting with error corrections may increase prediction accuracy, examining intangible assets alone can still provide erroneous findings. We can solve this issue with the use of estimation theory, which will also encourage accountants to accurately report information regarding intellectual property rights and related assets.*

Keywords: Intangible Assets; Intellectual Property; Estimation Theory; M&A; Earnings Forecasts

I. INTRODUCTION

According to Dechow's (1994) and Strand's (2004) theory, accrual-based accounting techniques enhanced the capacity of accounting-based predictions to gauge how well a company is doing as shown by returns on equity investments. It was argued that matching, realization, and other timing issues pertaining to the timing of the recognition of expenses and revenues are likely to impair cash flow accuracy. Numerous researchers have examined the accuracy of financial reports, including Brandon and Jarrett (1974), Jarrett (1983), Jarrett and Khumawala (1987), and Jarrett (1992). In an effort to understand how forecast models might be evaluated and perhaps enhanced to provide more accurate results, they examined several approaches to accounting profit forecasting. Although sources of accuracy were mentioned in the questions, accrual accounting was not thought to be the primary cause of the incorrect findings.

Despite extensive research on the issue, no one has developed a theoretical connection between the matching principle and the sources of inaccuracy and the precision of financial analysts' projections [Brandon and Jarrett, 1974, Clement, 1999, Gu and Wu, 2003, Ramnath, Rock and Shane, 2008, and Grosyberg et al. 2011]. Gu and Wang (2005), however, raised the prospect of an additional source of error in the profits, cash flow, and rates of return forecasts. These researchers came to the conclusion that the size and value of intangible assets are significantly correlated with analysts' projections. The forecasting strategy that the researchers presented in their many and thorough investigations did not take intangible assets into account.

If analysts' forecasting techniques for cash flow, rates of return, and earnings per share do not take into account the value of intangible assets, it may lead to significant errors. Gu and Wang claimed that "the rise of intangible assets in size and contribution to corporate growth over the last two decades poses an interesting dilemma for analysts" when

intangible asset adjustments are made to the analyst's projections. The majority of intangible assets are not recorded in financial statements, and companies are not required by current accounting standards to present distinct metrics for intangibles. Gu and Wang (2005), p. 673. Trademarks, brand names, patents, and other valuable things that are often not included in a company's financial reports are examples of intangible assets.

Many of these things have a technological component and are crucial when making financial choices, such as mergers and acquisitions. Since they play a complex role in business development, they are statistically tied to the total projections provided by analysts and accountants. In a different forecasting research, Matolesy and Wyatt (2015) discovered a correlation between the firm's industry's technical circumstances, growth rate prediction inaccuracy, and EPS projection. They discovered a statistical relationship between analysts' estimates and current EPS and technology circumstances as the forecast horizon lengthens. A long horizon makes it possible to draw the conclusion that analysts' EPS and growth projections are linked to the interactions between present EPS and technical circumstances.

This finding is consistent with Jung, Shane, and Yang (2012), who proposed that attempts to assess analysts' growth projections may result in long-term projections that are optimistically skewed. Analysts' projections may provide less accurate estimates of profitability, cash flow, and rate of return since intangible assets—which are often technology-based—occupy a larger portion of many companies' balance sheets. Dechow's (1992) findings lose significance. Although certain accounting procedures are still in use, balance sheets often have little to nothing to do with the valuation of intangibles. Additionally, accounting firms adhered to a set of guidelines that control their financial reporting processes in order to value intellectual property and other intangibles. These guidelines adhere to the widely accepted guidelines that control the process of determining the monetary worth of intangible assets and comparable things.

They must, first and foremost, be uniquely recognized by appropriate descriptive names, and there must be some proof of their existence. The intangibles have to be developed within a certain time frame and terminated at a specified moment or event. Second, the intangibles need to be produced domestically or obtained via purchase. In this method, paying for professional services would be covered. Thirdly, the asset should be the outcome of an identifiable occurrence or have an identifiable life. Although a monetary receipt is not necessary, the value of the intangible asset or intellectual property should be estimated. Finally, the intangibles may be leased or licensed to other parties, or they can be bought and sold in cash and noncash transactions.

All of these may happen in a merger or purchase of a whole company or entity, in which case the exchange's worth could be estimated. The topic of changing the value of intangibles and how it impacts a company's net worth and the precision of financial projections has been extensively studied. Beneish (1991), Beneish (1999), Beneish, Lee and Nichols (2013), Beneish, Lee and Nichols (2015), Beneish, Marshall and Yang (2016), Jarrett (2016), Jarrett (2017), and Jarrett (2018) are among these studies. According to this literature, financial reporting should give more thought to estimates of the value of intangible assets, intellectual property, and comparable assets, particularly when capital budgeting, acquisition mergers, and other similar events are a part of the financial event decision-making process.

The literature on Estimation Theory in Financial Accounting and Traditional Accounting Methodology

According to [Brief and Owen, 1968, 1969, 1970, 1977; Jarrett, 1971, 1974, and 1983; Roberts and Roberts, 1970; Bierman, 1971, Barnea and Sadan, 1974; Pappas, 1977 and Brief, 1978], merger and acquisition activity frequently does not include the timing of revenue recognition for intellectual property [IP, see WTO 2016] in financial statements. These activities are provided by the Financial Accounting Standards Board (FASB), however they are often disregarded since they are vague or lack sufficient information in their typically organized guidelines. Since obtaining high rates of return is the aim of accrual rules, non-profit organizations often do not employ them at all. The idea here is to see intellectual property (IP) as intangible assets that are protected by law against illegal use by people who are not in charge of the IP rights.

Therefore, according to the World Trade Organization (2016), intellectual property rights are defined as the safeguarding of distinctive symbols, such as patents, trademarks for products and services, and other like objects that are protected from unlawful use. This covers works of art, music, and writing, including computer software, as well as related things like discoveries, inventions, words, symbols, and designs. In order to comprehend the seriousness of

disregarding or undervaluing intellectual property rights, refer to Hagendorff et al. (2012) and Jarrett (2016), 2017, and 2018. According to this finding, which has been discussed earlier [Brief and Owen, 1969; Pappas' 1977' Brief, 1977, and Matolcsy, and Wyatt 2006], adding earnings risk may

Contemporary Accounting Methods

In order to generate more accurate estimates from the projections of accounting analysts, accounting now proposes two techniques to ascertain the value of intellectual property rights. The "lower of cost or market" convention is founded on the conservative principle of asset valuation, which predicts future losses rather than profits. The strategy may result in an underestimate of income, cash flow, profits, and rates of return since it tends to understate rather than overestimate the value of net assets. In order to provide a rate of return on cash flow that is compatible with the aim of creating accurate predictions of cash flow and its rate of return for financial and decision-making reasons, the study's objective is to neither exaggerate nor understate cash flow. Intangible assets are often written about as a residual in accounting rules.

A flawed approach, this value is often referred to as goodwill (White et al., 1994). A residual value is used to assess this concept of goodwill. Since it takes into account a portion of the outcome of a negotiation process, the value of intangible property may be flawed. In this situation, the buyer and seller may have varying levels of market power, which has a significant impact on the outcome of the negotiation process and results in a skewed or inaccurate assessment of the intangible assets' worth. Listing patents, trademarks, brands, and other IP in the company's financial reports is another approach that was proposed throughout the M&A process. According to Hagendorff, Hernando, Nieto, and Wall (2012), the accounting principles board's effort and recommendation provide minimal assistance with regard to the economic worth of intellectual property rights and goods for a corporation during M&A transactions.

The evaluator may draw conclusions about the biases associated with interpreting the financial reports in the problem's last stage. At least Einstein and Bohr were wealthy and got Nobel Prizes, but Meitner, maybe because of her gender and religious inclination, never received the honor. There was no financial reward from the Nobel Prize Committees for the three conductors and composers. Although they anticipate a company's total rate of return, accountants do not disregard the "conservatism" tradition. Every year, accounting practices value a company's intellectual property rights for each and every one of the rights in question. IP may increase asset prices, but it also affects cash flow's rate of return since it changes the rate of return's denominator.

Estimating Cash Flow Attributable to Intangible Assets

As part of the basis of contemporary accounting, estimation theory presupposes the goal and is compatible with conventional accounting [Brief and Owen, 1968]. The accounting rate of return is expressed using estimation techniques, which are cost-based allocation processes. The value of intangible assets and the cash flow related to rates of return on cash flow are predicted using accounting data. There is a correlation between the growth in the value of intangible assets and the cash flow related to a company's assets, according to the theory and empirical data. Estimation theory is a way to relate information, such as the rate of return for a decision model. [See Jarrett, 1978; Gordon and Halpern, 1974] We may examine the set of allocation techniques, p_i , whose allocation system is as follows, without duplicating the generic model developed by Brief and Owen (1968) and implemented in another allocation model by Jarrett (1978):

$$p_i = \frac{X_i}{C} - \frac{W_i}{\sum W_i} \left[\frac{\sum W_i - C}{C} \right] \quad (1)$$

Where

c = joint cost

P_i = Proportion of C allocated to the i^{th} joint product, activity, division, etc.,

X_i = A numerical characteristic or assigned to the i^{th} product, division, etc.,

W_i = A numerical characteristic chosen to standardize the differences, $(X_i - p_i C)^2$, (4, p.194).

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The actual cost assigned to the i^{th} product or division is the product or division is the product of

and C . We can further show that the solution to $P_i C$ is:

$$p_i C = X_i - \frac{W_i}{\sum W_i} \left[\frac{\sum W_i - C}{C} \right] \quad (2)$$

We can now define the fraction

$$\frac{X_i - p_i C}{W_i} \quad (3)$$

as a constant equivalent to the product asset's rate of return. By changing (1) to (2), we can demonstrate

$$r_i = \frac{X_i - p_i C}{W_i} = \frac{X_i - X_i - \frac{W_i}{\sum W_i} (\sum X_i - C)}{W_i} \quad (4)$$

which reduces to

$$r_i = \frac{\sum X_i - C}{\sum W_i} \quad (5)$$

We should note at this point that the fraction

$$\frac{\sum X_i - C}{\sum W_i} \quad (6)$$

is represented by the firm's rate of return on cash flow. According to Brief and Owen (1968, p.195), it is challenging to understand equality (6) unless the selected feature is a value measure or is thought to have a strong correlation with one. However, when value metrics are used, earnings are allocated based on value. Moreover, approaches that create a value equivalence across assets seem more logical than those that don't. Similarly, the techniques used to allocate joint expenses to the firm's various assets are almost identical to those used for depreciation accounting. These techniques are the outcome of specifying.

Allocating depreciation on accruals is thus comparable to methods of allocating joint asset expenses to separate asset divisions. This is also true in cases when earnings are commensurate with the value generated by each asset or division of a business. At this stage, we see that adding uncertainty to the issue of assigning costs and revenues to a product or business segment always makes it worse. Anytime we are unsure of the exact proportion of the combined costs or income that has to go to a certain asset, uncertainty enters the process. Our issue becomes one of statistical estimating theory when we include uncertainty into the allocation scheme selection procedure. Let g_{jt} represent the cash flow growth rate of company j in period t , g_{it} represent the cash flow growth rate of firm j 's asset i in period t , and g_{mt} represent the cash flow growth rate of a diversified portfolio of businesses in time t . Regressing g_{jt} on g_{mt} over a specified duration yields

$$g_{jt} = \hat{\alpha}_j + \hat{C}_j g_{mt} \quad (7)$$

By dividing the company's joint costs across the divisions, we can calculate the increase in revenue attributed to each division. Therefore, the following is a possible rewriting of equation (1) for a division.

$$g_{it} = \hat{\alpha}_{ij} + \hat{C}_i g_{mt} \quad (7A)$$

Based on the rate of increase in the income due to the asset, the estimate of the covariance-variance ratio of the systematic risk of the firm's division is found in (7A). Gordon-Halpern hypothesizes a strong correlation between the measure of systematic risk from the Markowitz-Sharpe CAPM (sometimes referred to as β) and the estimators of the systematic risk, and, from equations (7) and (7A). In order to calculate the firm's actual growth rate during the time, we allow

Y_{jt} = earnings before interest and taxes during t ,
 I_t = interest payment on debt outstanding during t .

For the sake of simplicity, we assume that both the interest rate and the amount of debt owed stay constant throughout time. is thus constant throughout all time periods, and the average growth rate of wages during t is

$$g_{it} = \frac{\hat{Y}_{jt} - \hat{Y}_{jt-1}}{Y_{jt-1} - I_t} \quad (8)$$

The residual of sales less costs is the simplest definition of a company's profits. This is stated as follows for a firm:

$$Y_{jt} = \sum_{i=1}^n X_i - C \quad (9)$$

where the issue of assigning joint expenses or revenues to an asset is solved by an estimating theory using net cash flows (sales less variable, i.e., other direct costs). Now let's address the issue of distributing shared expenses (and income) when there is uncertainty. The following allocation system determines the percentage of joint values allotted to each asset:

$$p_i = \frac{E^{-1}(X_i)}{\sum_{i=1}^n E^{-1}(X_i)} \frac{M_i}{1 + b_1^2} \left[\frac{1}{\sum_{i=1}^n (M_i / (1 + b_1^2))} \right] \quad (10)$$

The standard deviation is the coefficient of variation of the predicted cash flow for the asset, which is the mean for the asset. The aforementioned formula makes the assumption that the only relevant indicator of variability for the cash flow distribution is the coefficient of variation. According to equation (10) the magnitude of the allocation will be impacted by the degree of uncertainty around the amount of cash flow related to each asset. PJ A larger degree of uncertainty will result in a smaller share of the joint expenses going to that division, product, or segment. The outcome aligns with the objective of conservatism, as stated by accountants in Thomas's 1974 assessment. Solutions to reporting issues related to the use of estimating techniques in financial accounting are also provided by Lev, 2001. When we are unsure about how much to allocate, we put less money into an account. As we can see in (10), the coefficient of variation b_i introduces uncertainty. P_i falls when b_i rises in value, which is in line with how accountants work. Calculating Total Cash Flow Implementing the estimation of an intangible assets cash flow and determining its total or aggregate is the last stage in estimating cash flow to determine and develop the contribution of intangible assets to anticipate analysts' profits. We specify

$$(Y_{it,est}) = X_i - C \quad (11)$$

Keep in mind that lower values overestimate income while higher ones will underestimate it. Income is higher when there is more uncertainty, i.e., when b_i is big. Naturally, the opposite is true when uncertainty is low. For intangible asset I , small values for $Y_{it, est}$ [$t=1, 2, 3$] raise the realized rate of growth, $g_{it, est}$, for time t . This answer is due to the fact that the denominator (7A) becomes smaller while the numerator (7A) stays the same. Naturally, an upward bias in the rate of return for a single asset follows from an upward bias in $g_{it, est}$, or the realized rate of growth. As a result, it becomes very dangerous to estimate and anticipate a rate of return using accounting data for cash flow, incomes, and other factors.

Since the pace of growth is rarely accurately foreseen, underestimating the cash flow due to evaluating the value of intangible assets often leads to an error in predicting the rate of return. An Example of Determining the Value of Intangible Assets, Such as IPRs When one variable in the analysis changes, the three examples in the appendix demonstrate the variance. When $S(X)$ varies, we determine the monetary worth of intangible or intellectual property rights in Table 1. The value of the IPR will fall as the variation's value rises. Other sources of decision modeling in financial accounting applications, such as G. Thornton (2013), Kimouche and Rouabhi (2016), and several others

included in these works, are likely to provide this. When the cost of debt (the interest rate) rises, Table 2 shows the effects, and the IPR will once again go in the wrong direction. It goes without saying that the decline is what one would anticipate from a rise in interest rates. Lastly, the changes related to the shift in the debt/equity ratio are shown in Table 3. Forecasts made by analysts who support management in good data analysis and decision analysis with complete information are impacted by changes in the factors linked to sound decision making, which also affects the estimation of the value of IPR \$. An example of how to value intangibles using the previously stated estimate theory in financial accounting is provided in the next section.

Illustration of Estimating the Value of Intangibles

When one variable in the analysis changes, the three examples in the appendix demonstrate the variance. When $S(X)$ varies, Table 1 determines the intangible's or IPR's monetary worth. The IPR \$ will drop in value as the variation's value rises. As previously mentioned by others included in these research, this is to be anticipated from additional sources of decision modeling in financial accounting applications. As the cost of debt (the interest rate) rises, Table 2 shows that the IPR will once again go in the wrong direction. It goes without saying that the decline is what one would anticipate from a rise in interest rates. Lastly, the changes related to the shift in the debt/equity ratio are shown in Table 3. The predictions of analysts, who support management in good data analysis and decision analysis with complete information, are impacted by changes in the factors linked to smart decision making, and they also affect the estimation of the value of IPR \$.

In conclusion, issues with analysts' profits, cash flow, and rate of return projections often persist because intangible assets are either improperly evaluated or not taken into account at all throughout the forecasting process. Even when forecast methodologies are used correctly, errors may still occur in analysts' predictions regardless of whether accrual accounting standards are followed or not. The amount of forecast mistakes will be correlated with the rise of intangible assets, also known as intellectual property, if their effect keeps increasing and is not recorded in financial accounts. To understand that improvements in cash flow are linked to the growth and usage of intellectual property, it is not enough to test the hypothesis that using accruals would raise analysts' prediction accuracy. In order to identify the value of IPR (intellectual capital and other intangible assets), which are frequently the main source of error in the prediction of rates of return, risk as measured by the CAPM, and other variables that are part of the issues associated with M&A and other business combinations, including abandonment, this study aims to use estimation in financial accounting to enable analysis, financial reporting, and analysts' forecasts.

Analysts' predictions of profits and rates of return, which have a long history in financial reporting, are systematically inaccurate when non-monetary variable estimation is neglected. The concepts of matching and realization, which have been shown to be the same issue in earlier research, led to issues with revenue recognition and cost-revenue matching. Only rudimentary accounting textbooks would distinguish between timing and allocation difficulties, which are based on the same idea. It should be noted that financial accounting's allocation issues are well-known. Keep in mind that enterprises' rates of return are inflated when cash flow is overestimated, which leads to an overestimation of income. Forecasts from analysts are especially significant when making judgments about portfolio management.

II. CONCLUSION

Because intangible assets are either improperly evaluated or not taken into account at all throughout the forecasting process, issues with analysts' profits, cash flow, and rate of return projections often persist. Even when prediction methodologies are used correctly, errors may still occur in analysts' forecasts regardless of whether accrual accounting standards are followed or not. The amount of forecast mistakes will be correlated with the rise of intangible assets, also known as intellectual property, if their effect keeps increasing and is not recorded in financial accounts. Recognizing that improvements in cash flow are linked to the expansion and usage of intellectual property requires more than just verifying the hypothesis that using accruals would raise analysts' prediction accuracy. In order to recognize the value of intellectual property rights, which are frequently the main source of error in the prediction of rates of return, risk as measured by the CAPM, and other variables that are part of the problems associated with M&A and other business combinations, including abandonment, the study aims to use estimation in financial accounting to permit analysis, financial reporting, and analyst forecasts.

A systematic inaccuracy in analysts' profits and rate of return projections that has a long history in financial reporting is ignoring the assessment of non-monetary factors. The concepts of matching and realization, which have been shown to be the same issue in earlier research, led to issues with revenue recognition and cost-revenue matching. Only rudimentary accounting textbooks would distinguish between timing and allocation difficulties, which are based on the same idea. It should be noted that matching and realization are already names for the allocation issues in financial accounting. Additionally, keep in mind that businesses' rates of return are inflated when cash flow is overestimated, which leads to an overestimation of income. Forecasts from analysts are especially significant when making judgments about portfolio management.

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