International Journal of Academic Research
ISSN: 2348-7666; Vol.4, Issue-5(1), May, 2017
Impact Factor: 4.535; Email: drtvramana@yahoo.co.in

A Comprehensive Financial Reporting Quality Measure

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Abstract: *This study reviews previous studies concerning financial reporting quality ;in order to develop an aggregated measure for FRQ; financial reporting quality measure (FRQM). Results revealed that there are three main proxies used in measuring FRQ; namely: earnings quality (including: accrual quality, earnings persistence and earnings predictability), accounting conservatism and value relevance. The contribution of this study is developing FRQM through computing the sum of the standard value of the three FRQ proxies, which can be used as a measure for FRQ.*
Keywords: *Earnings quality, accrual quality, earnings persistence, earnings predictability, accounting conservatism, value relevance.*

1. Introduction

This study aims to assess the financial reporting quality (FRQ), through identifying quantifiable metrics that would track the absolute as well as the relative FRQ. Recently, there have been many scandals and financial collapses of the most famous firms in the world such as; WorldCom, Global Grossing, and Enron. These were further followed by a series of collapses in financial institutions such as; Lehman Brothers and Fortis. This resulted in a loss of $ 460 billion in the capital market, as well as a loss of users' confidence in financial reports. Accordingly, FRQ received great interest from researchers and stakeholders. The International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) have determined the required characteristics of information that meets FRQ. Moreover, they have attempted to find indicators that can be used to infer the quality of the financial reports either descriptively or quantitatively.

As a response to the need for FRQ improvement, IASB and FASB issued an exposure draft titled "an improved conceptual framework for financial reporting" in 2008. According to this framework, the qualitative characteristics of accounting information quality are the attributes that make financial information useful and comprise relevance, faithful representation, comparability, verifiability, timeliness and understandability.

Although there is no uniform definition of FRQ, Statement of Financial Accounting Concepts No. 1 (1978) stated that one objective of financial reporting is aiding present as well as potential investors in making rational investment decisions and in assessing the expected firm cash flows. Moreover, IASB (2006, 2008) stated that: "the objective of financial reporting is to provide financial information about the reporting entity that is useful to present and potential equity investors, lenders and other creditors in making decisions in their capacity as capital providers". According to this objective, Verdi (2006) defined

FRQ as: “the precision with which financial reports convey information about the firm’s operations, in particular its cash flows, in order to inform equity investors”. In addition to this, Biddle et al. (2009) defined FRQ as: "the precision with which financial reporting conveys information about the firm's operations, in particular its expected cash flows that inform equity investors".

FRQ is not something that can be observed directly out of the financials. Accordingly, there is no universally accepted measure for it, and proxies should be developed (Verleun et al. 2011). Previous research has identified several different metrics of FRQ, with the most applied measures being: earnings management, accrual quality, earnings quality, conservatism, and value relevance (Hope et al. 2013, Chen et al. 2016).

In this paper, the researcher tried to propose a comprehensive measure for FRQ, which includes more than one dimension. That is because using one proxy for FRQ (such as earnings quality) would not reflect all FRQ aspects.

The paper proceeds as follows: section 2 (research method), section 3 (conceptual framework), section 4 (conclusion).

2. Method

The researcher depended on critical analysis of previous studies; in order to identify different dimensions of FRQ that can be used in measuring it. Where one proxy would not reflect all FRQ aspects, the researcher analyzed previous studies to choose metrics for measuring FRQ. FRQ proxies could be classified as the follows:

1- Earnings quality.

2- Conservatism accounting.

3- Value relevance.

It should be noted that the researcher considered some criteria when selecting and analyzing these studies These criteria are:

1- The studies considered FRQ as a major variable and used more than one quantitative index to measure it. Accordingly, studies that used one quantitative indicator to infer FRQ were excluded.

2- The researcher focused on studies during the period from 2010 to 2016; these were 29 studies from the total surveyed studies.

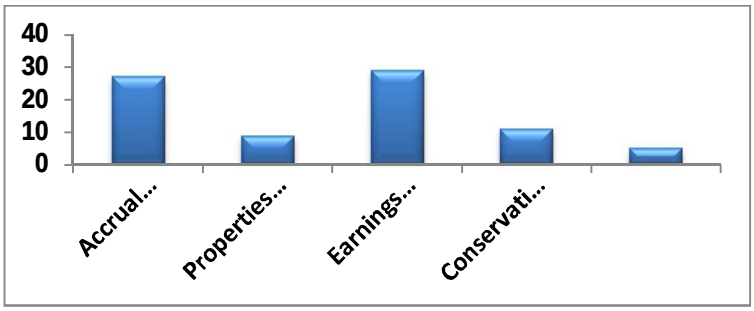
3- The researcher tried to link the division of quantitative indicators with the characteristics of accounting information quality; as FRQ measure should cover different aspects of the quality of financial reporting (Verleun et al. 2011). For example, the value relevance relates to the relevance of information, the conservatism accounting relates to the fair representation, and the accrual quality can affect both the relevance and fair representation of accounting information.

Table 1: The proxies of FRQ

Study	Earnings quality		Conservatism accounting	Value relevance	Other
	Accrual quality	Properties of earnings			
1- Balakrishnan (2010)	×	×		×	
2- Beatty et al. (2010)	×××				
3- Choi & Pae (2011)	××		×		
4- Chen et al. (2011)	×××				
5- Krishnan et al. (2011)	××				
6- Verleun et al. (2011)	×		×	×	
7- Al-Zmor (2012)	×		×		×
8- Shteiwi (2012)	×	×××	××	×	
9- Habib (2012)	××		×		××
10- Huang et al. (2012)	×	×			
11- Dehaan et al. (2013)		×			×
12- Ghosh & Lee (2013)	××				
13- Hope et al. (2013)	××××		××		
14- Koh et al. (2013)	×	×		×	
15- Skaife & Wangerin (2013)	×				××××
16- Meligy (2014)	×	×	×		
17- Hanlon et al. (2014)	××				
18- Garrett et al. (2014)	×				×
19- Martínez-Ferrero (2014)	××		××		
20- Radwan (2015)	××	×			
21- Gajevszky (2015)	××				
22- He (2015)	××				××
23- Imhof (2015)	×	××			
24- Filip et al. (2015)	×××××		×	×	
25- Martínez-Ferrero et al. (2015)	××		×		
26- Tanyi & Smith (2015)	××				××
27- Al-Madbouli (2016)		××	×		
28- Chen et al. (2016)	××××				×
29- Elayan et al. (2016)	××				
Sum of indicators	**27**	**9**	**11**	**5**	**8**

where
X : refers to one indictors used as a proxy of FRQ.
XX : refers to two indictors used as a proxy of FRQ.
XXX : refers to three indictors used as a proxy of FRQ.
XXXX : refers to four indictors used as a proxy of FRQ.
XXXXX: refers to five indictors used as a proxy of FRQ.

Figure 1: FRQ proxies



Regarding table (1), the following points should be discussed:

1) The accrual quality is considered a basic component of the earnings quality; as the earnings are composed of two main components: accruals and cash flows.

2) There are 27 studies that used accrual quality as an indicator of FRQ. Some studies relied on more than one measure of the accrual quality. The accrual quality is very important for the fair representation of the financial statements. The reduction of accrual quality is often due to the use of accruals by managers for achieving personal desires, which affects the neutrality of financial reports as well as their fair representation.

3) There are 9 studies that used earnings persistence and predictability (the properties of earnings) as FRQ Proxy. This is considered few compared to the number of studies that used the accrual quality. The earnings persistence and predictability are very important; due to their impact on the relevance; being one of the basic characteristics of accounting information quality.

4) There are 11 studies that used the accounting conservatism as a FRQ proxy. This should be considered as FRQ proxy.

5) There are 5 studies that used the value relevance as one of FRQ indicators. Accordingly, so it should not be excluded. The relevance value is related to the information relevance, that is one of the basic characteristics of accounting information quality .

6) Other indicators were used only within the scope of each study; such as: meeting or beating benchmarking earnings (He 2015; Tanyi and Smith 2015), and auditor's opinion (Shteiwi 2012).

3. Conceptual Framework

As for dividing FRQ measures into three groups: earnings quality, conservatism accounting, and value relevance, the researcher would discuss the measures of each group, that would be used in building a comprehensive FRQ measure.

3.1 Earnings quality

This paper focuses on the properties of earnings as an indicator of earnings quality, namely: the earnings persistence and predictability; as they affect information relevance (Schipper & Vincent 2003, Dechow et al., 2010, Ewert & Wagenhofer 2011). In addition to this, the researcher focuses on the accrual quality, where the accruals are a key component of the earnings (Dechow et al., 2010).

3.1.1 Earnings persistence

Earnings persistence could be defined as: the volume of variation in earnings is lower than the last period, so future performance could be predicted whenever increasing the rate of earnings persistence. Dechow et al. (2010) indicated that the studies are limited in their contribution to evaluating persistence as a proxy for earnings quality; because of the maintained assumption that more persistent earnings are more decision useful for equity valuation. The following is a simple model specification for estimating

earnings persistence (Francis et al. 2008; Dechow et al. 2010):

$$Earnings_{t+1} = \alpha + \beta Earnings_t + \varepsilon_t \quad (1)$$

Where:

Earnings $_{t+1}$: earnings for the next period.

Earnings $_t$: current earnings, all variables are scaled by total assets.

A higher β implies a more persistent earnings stream. If earnings are highly persistent, this slope coefficient is likely to be close to one. The logic behind earnings persistence being earnings quality metric is as follows: (1) If firm A has a more persistent earnings stream than firm B, the current earnings of firm A is a more useful summary measure of future performance, and (2) the current earnings of firm A will give smaller valuation errors than current earnings of firm B. Thus higher earnings persistence is of higher quality when the earnings are also value-relevant (Dechow et al., 2010).

3.1.2 Earnings predictability

Predictive ability is the capacity of the entire financial reporting package, including earnings components and other disaggregation of the summary earnings number, for improving users' abilities to forecast items of interest. Viewed this way, predictive ability is linked to decision usefulness and is therefore idiosyncratic to a given user's particular prediction process and goal **(**Schipper & Vincent 2003**).** Francis et al. (2008) documented that earnings predictable as a measure of earnings quality is based on the view that an earnings number that tends to repeat itself is of high quality.

Common measure of earnings predictability is derived from the same firm-specific models used to estimate earnings persistence; this measure is the square root of the error variance from equation (1). Large (small) values of predictability imply lower (higher) quality earnings.

$$Predictability = \sqrt{\sigma^2(\hat{\varepsilon}_j)}$$

3.1.3 Accrual quality

Accrual quality indicates the extent to which accruals, (the difference between earnings and operating cash flow) are free noise (induced by, for example, inaccurate accounting assumptions and estimates. Accrual quality also indicates the extent to which earnings are free from noise and are better able to predict future cash flows (Vander Bauwhede et al. 2015).

Dechow and Dichev (2002) suggested a model of accruals that focuses on working capital accruals; as cash flow realizations related to working capital generally occur within one year, making both the theory and the empirics more tractable. While the intuition about errors in estimation applies to all accruals, the long lags between noncurrent accruals and cash flow realizations practically restrict the application of their approach to only short-term accruals. They presented an empirical magnitude of error estimation for measuring accrual quality as the residuals from firm-specific regressions of changes in working capital on past, present, and future operating cash flows, as follows:

$$\Delta WC_{it} = \alpha + \beta_1 CF_{it-1} + \beta_2 CF_t + \beta_3 CF_{it+1} + \varepsilon_{it} \quad (2)$$

Where:

ΔWC : ΔAccounts Receivable + ΔInventory – ΔAccounts Payable – ΔTaxes Payable + ΔOther Assets.

CF : is the operating cash flow.

The residuals from the regression reflect the accruals that are unrelated to cash flow realizations, and the standard deviation of these residuals is a firm-level measure of accrual quality, where higher standard deviation denotes lower quality.

McNichols (2002) modified the previous model, by adding the following independent variables: the change in revenue (ΔREV) and the gross property, plant and equipment (PPE). These variables contribute to the strengthening of the explanatory power. With a further adjustment, Francis et al. (2005) estimated total accruals (TA) instead of working capital accruals; because the long-term accruals may also have errors and it is necessary to predict the magnitude of such errors. The model after these amendments became as follows:

$$TA_{it} = \alpha + \beta_1 CF_{it-1} + \beta_2 CF_t + \beta_3 CF_{it+1} + \beta_4 \Delta Rev_{it} + \beta_5 PPE_{it} + \varepsilon_{it} \quad (3)$$

3.2 Accounting conservatism

The second indicator of FRQ is the accounting conservatism. The previous studies confirmed that FRQ can be estimated by measuring the level of accounting conservatism; as it is one of the most important accounting principles that have a significant impact on the relevance and faithful representation of accounting information (Hope et al. 2013; Filip et al., 2015; Martínez-Ferrero et al. 2015).

The conceptual framework for financial reporting exposure draft produced by IASB and FASB in 2015 indicated that neutrality is supported by the exercise of prudence. Prudence is the exercise of caution when making judgements under conditions of uncertainty. The exercise of prudence means that assets and income are not overstated and liabilities and expenses are not understated. Equally, the exercise of prudence does not allow for the understatement of assets and income or the overstatement of liabilities and expenses; because such mis-statements can lead to the overstatement of income or the understatement of expenses in future periods.

There are two views about the impact of accounting conservatism on FRQ. The first view is that conservatism is desirable because it constrains managerial opportunistic behavior, offsets managerial biases with its asymmetrical verifiability requirements, and presents an efficient contracting mechanism (Watts 2003). Similarly, Ball and Shivakumar (2005) suggested that conservatism improves FRQ by making financial statements more useful to parties contracting with the firm. Furthermore, timely loss recognition deters managers from taking poor projects and investments and provides debt holders with more accurate information for loan pricing. On the other hand, the second view is that conservative accounting is undesirable; because the hidden reserves that it generates might facilitate earnings management, thus reducing the predictive ability of current earnings with respect to the firm's future performance (Penman & Zhang 2002). The researcher views that accounting conservatism is desirable, especially after confirmation of

the IASB and FASB in 2015 that neutrality is supported by the exercise of prudence. However, the exercise of prudence does not allow for the understatement of assets and income or the overstatement of liabilities and expenses.

Previous studies used several measures; to determine accounting conservatism level (Hope et al. 2013; Filip et al., 2015; Martínez-Ferrero et al. 2015). The researcher will use Basu (1997) model to measure accounting conservatism.

Basu (1997) indicated that conservatism results in earnings reflecting bad news more quickly than good news. This interpretation implies systematic differences between bad news and good news periods in the timelines and persistence of earnings.

The market is likely to be the basis for bad news, and thereby, the level of accounting conservatism, rather than the good news. If there is bad news as a result of expected losses, the financial statements will reflect the net profit reduction as a result of recognition of these losses. These bad news might lead also to a reduction in stock market prices. On the other hand, if there is good news as a result of expected gains, the accounting system will not be recognized, while the higher equity prices would be reflected. As a result, the correlation coefficient R between returns with potential losses (accounting conservatism) is stronger than net returns with potential profits.

The study presented the following model using reverse regression: where EPS is used as a dependent variable and returns as independent variable (EPS). It was applied to a cross section regression, consisting of businesses in the same industry:

$$X_{it}/P_{it-1} = \alpha_0 + \alpha_1 DR_{it} + \beta_0 R_{it} + \beta_1 DR_{it} * R_{it} + \varepsilon_{it} \quad (4)$$

Where:

$\boldsymbol{X_{it}}$ **:** Earnings per shares for i firm in fiscal year t .

$\boldsymbol{P_{it-1}}$ **:** The price per share at the beginning of the fiscal year.

$\boldsymbol{R_{it}}$ **:** Return share price (the return of the last three months of the year) for (i) firm in the end of (t) year.

$\boldsymbol{DR_{it}}$ **:** Dummy variable: 1 if R_{it} < 0, = 0 otherwise.

Through the previous model, conservatism could be measured as follows:

1) **The slope coefficient ($\boldsymbol{\beta_1}$):** If conservatism is high, this slope coefficient is likely to be close to one.
2) **$\mathbf{R^2}$:** The higher its value, the greater the conservatism level.
3) The concurrent sensitivity of earnings to negative returns is two to six times as large as the concurrent sensitivity of earnings to positive returns:

$$= [\boldsymbol{\beta_1} + \boldsymbol{\beta_0}]/\boldsymbol{\beta_0}$$

3.3 Value Relevance

Value relevance criteria are referred to the ability of accounting numbers (independent variables) to explain the differences in stock prices in capital markets (dependent variable), under valuation purposes. This ability could be measured with the explanatory power of the independent variables coefficient

significance and the adjusted R number of significance of the whole used model (Durán Vázquez et al. 2007). Al-Zmor (2012) defined value relevance criteria as the statistical relation between accounting information and stock prices or returns.

Based on the above discussion, there are two approaches to determine value relevance:

1) **The relation between accounting information and stock prices:**

The main function of accounting systems is to provide investors with relevant information that might be useful for decision-making concerning efficient resource allocation. Following this purpose, different valuation models have been used in the accounting literature in order to contrast the value relevance of each (Durán Vázquez et al. 2007). Book values and earnings have been suggested as the two fundamental accounting variables when trying to explain stock prices (Ohlson 1995).

Verleun et al. (2011) indicated that the Ohlson (1995) model is the most popular model for measuring value relevance. This model is especially applicable when value relevance is examined over multiple periods because it allows for inter-period comparison. It regresses book values on market values. Subsequently, the explanatory power of this regression can be used as a proxy for value relevance, on a per share basis to scale for firm size effects, as follows:

$$P_{it} = \beta_{0i} + \beta_{1i}E_{it} + \beta_{2i}BV_{it} + \varepsilon_i \quad (5)$$

Where:

P_{it} : Price per share for firm (i) in year (t).

E_{it} : Book value of equity per share for firm (i) in year (t).

BV_{it} : Earnings per share for firm (i) in year (t).

In this model, the coefficient on β_{1i} describes the relation between the earnings of a firm and the market value of the firm, while β_{2i} describes the relation between the book value of equity and its market value. However, the combined value relevance of book values is best summarized by the explanatory power of the model; the higher its value, the greater the level of the value relevance.

2) **The relation between accounting information and stock return:**

The return model describes the relationship between stock returns and accounting earnings. Alali and Foote (2012) used the following model (Easton and Harris 1991) that describes this relation:

$$R_{it} = \beta_{0i} + \beta_{1i}E_{it} + \beta_{2i}\Delta E_{it} + \varepsilon_i \quad (6)$$

Where:

R_{it} : [Price of firm (i) in month (t) −Price of firm (i) in month (t −1)] / Price of firm (i) in month (t −1). Returns are accumulated during the 12-month period, covering trading months preceding March 31 of each year.

E_{it} : Earnings per share for firm (i) in month (t) / Price of firm (i) in month (t −1).

ΔE_{it} : [Earnings per share for firm (i) in month (t) −Earnings per share for firm (i) in month (t −1)] / Price of firm (i) in month (t −1).

The explanatory power of this model is used as a proxy for the value relevance.

3.4 Aggregated measure of FRQ (FRQM)

The purpose of this research is to generate an aggregate measure for FRQ, called FRQM. This variable is the sum of the abovementioned variables, noting that their values are different. The researcher followed Biddle et al. (2009) and used the standard value of these variables to normalize all proxies. The researcher depended on the following steps to generate a comprehensive FRQ measure:

1) The used variables in generating an aggregate FRQ measure are:
   - ☒ **Earnings persistence:** the slope coefficient (β) from Eq. (1). The model is estimated time series for each firm with at least 4 years.
   - ☒ **Earnings predictability:** the square root of the error variance (standard deviation) from equation (1) of the firm-level during the years (t-4) to (t) and multiplied by negative one.
   - ☒ **Accrual quality:** the standard deviation of the firm-level residuals from equation (3) during the years (t-4) to (t) and multiplied by negative one. The model is estimated cross-sectionally for each industry with at least 7 observations in a given year.
   - ☒ **Accounting conservatism:** the slope coefficient (β) from equation (4). This model is estimated cross-sectionally for each industry with at least 7 observations in a given year.
   - ☒ **Value relevance:** the Adjusted R^2 from equation (5) and (6). The model estimation is time series for each firm with at least 4 years.
2) The standard value for each variable is computed as follows:

$$Z = \frac{X - \mu}{\sigma}$$

Where:

X : the observation value of the variable.

μ : the mean value of the variable.

σ : the standard deviation of the variable.

3) Aggregate FRQ measure:

FRQM $= Sum\ of\ standard\ value\ of$**:**

$$Earnings\ persistence + Earnings\ predictability + Accrual\ quality + Accounting\ conservatism + Value\ relevance$$

This measure mitigates the measurement error in individual FRQ components and provides evidence based on an overall FRQ (Chen et al. 2011).

4. Conclusion

The purpose of this study is to generate an aggregated FRQ measure, called FRQM. The motivation for this research is that there is no defined measure for FRQ and the previous studies used many proxies to indicate FRQ, such as: earnings quality, accrual quality, accounting conservatism, value relevance and other indictors. The researcher critically analyzed previous studies; in order to identify the different dimensions that could be used in measuring FRQ, and found that there are three most used proxies. These proxies are: earnings quality (which include accrual quality, earnings persistence and earnings predictability), accounting conservatism, and value relevance.These variables were used in generating FRQM, by computing the standard value of each variable and then computing the total value. The contribution of this study is that future studies might use this proposed measure as an indicator of FRQ, instead of focusing only on one dimension of FRQ.

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