

## ASSESSING THE MEASURES OF QUALITY OF EARNINGS: EVIDENCE FROM INDIA

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**ABSTRACT:** *The purpose of this study is to investigate whether there is consistency among the measure of earnings quality. So far, there is no agreed definition of earnings quality in accounting and finance arena. We used secondary data draw from Prowess data base for companies listed in Bombay stock exchange from 2006 to 2012. We employed non-parametric test using spearman rank correlation to investigate the consistency among earnings quality measures. We used five commonly used measures of earnings quality persistence, predictability, smoothness, earnings surprise and accrual quality (Penman, & Zhang 2002; Francis et al. 2004; Abdelghany 2005, Dechow et al. 2010). We find in general there is no completely consistency among the measures of earnings quality. Evidence from this study suggests that analyst, investors and market participants should not use one measure of earnings quality since one measure of earnings quality cannot complement other measure of earnings quality. We therefore request analyst to use more than one measure. In case of inconsistency when more than one measure of earnings quality is used further analysis is inevitable.*

**KEYWORDS:** Earnings quality, persistence, predictability, smoothness, accrual quality.

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### INTRODUCTION

During recent years, earnings quality has emerged issue of interest to analyst, investors, managers and other market participants (Lipe 1990; Chan et al. 2006; and Cahan et al. 2009). Managers are much concerned about meeting analyst forecast by maintaining sustainable growth of the companies as means to protect themselves. On the other hand, analysts are interested on how best to measure the quality of earnings so as to maximize portfolio of investors. Therefore it is becoming now difficult for analyst, managers and investors in general to ignore the role quality of earnings in resources allocation.

A considerable number of studies of studies so far have documented the influence of earnings quality in resources allocation. For example Francis et al. (2004) find that higher earnings quality is associated with low cost of capital in USA. Similarly, Setterberg (2011) investigated the association between earnings quality measured by timelines and values relevance and cost of capital for Swedish listed firms from 1994 to 2008 and find significant negative relationship between the qualities of earnings the implied cost of capital of firms. Moreover, Chan et al. (2006) investigated the association of earnings quality and stock returns in USA and revel that poor earnings quality is associated with poor future returns.

Recent interests in earnings quality and involvement of both standard setter and management of companies have influenced the process of measuring earnings quality (Dechow et al. 2010). Standard setters set methods to be used and management have option to make estimation and select method to use. The involvements of these two actors and recent interest have resulted into many indicators to measure the quality of reported earnings (Teets 2002 and Dechow et al. 2010).

Notable indicators that are commonly used in assessing quality of reported earnings include accrual quality, persistence, predictability, smoothness, timeliness, conservatism and earnings surprise (Penman, & Zhang 2002; Francis et al. 2004; Abdelghany 2005; Dechow et al. 2010). Despite these recent developments of earnings quality indicators still there is no agreed definition of earnings quality so far (Chan et al. 2006; Penman & Zhang 2002, and Bellovary et al. 2005).

So far the lack of universal agreed definition on the earnings quality, influence of actors and influx of earnings quality indicators cast doubt on the ability of these indicators to measure consistently the quality of reported earnings. Therefore, this study is interested to investigate whether there is completely consistency among earnings quality in India. We specifically investigate consistency among five earnings quality measures persistence, predictability, smoothness; earnings surprise indicator and accrual quality.

This study is important due to three main reasons. First, it is done in emerging market particularly India where few studies on this type have been done. Second, recently foreign direct investment in India have increased tremendous, the need to improve earnings quality is so to improve resources allocation is currently inevitable. Third, lack of universally accepted definition of earnings quality cast doubt on ability of earnings quality indicators to measure consistency earnings quality of firms.

The remainder of this paper is structured as follows. Section two covers literature review. Section three covers research design. Finally, section four and five covers empirical results and conclusion.

## **LITERATURE REVIEW**

In this section we discussed the definition of earnings, earnings quality indicators and last empirical findings relating to earnings quality.

### **Definitions of Earnings quality**

Penman & Zhang (2002), defined earnings quality from perspective of analyst as reported earnings before extraordinary reported in income statement that is good indicator of future earnings. Their notion is that consistency use of accounting methods lead to sustainable reported which is deemed of high quality that can be used to predict future earnings. However, Teets 2002, define earnings quality as accounting earnings that reflect information about value of company.

In contrast to Penman & Zhang (2002) and Teets (2002), Schipper & Vicent (2003) defined the earning quality as the degree to which reported earnings of entity truly reflect the Hicksian income. The quality of earnings is under this definition is measured with reference to Hicksian income where the closeness of earnings to hicksian income infer higher quality.

Subsequently, Chan et al. (2006) defined the quality of earnings as the degree to which reported earnings indicate operating fundamental of an entity. This measure of quality is interested on the ability of reported earnings to predict future performance of entity.

Dechow et al. (2010) defined the quality of earnings as relevant of the fundamental earnings reported to the decision context of users. Likewise, Vincent (2004) defined the quality of earnings as decision usefulness of the reported earnings to the users. In this context the quality of earnings is how earnings information is indispensable to markets participants in making decision of resources allocation in the capital markets.

Srinidhi et al. (2011), describes earnings quality as the ability of current reported earnings to reflect the future cash flow and earnings. In this context earnings quality refers to how best current reported earnings can predict future performance of entity. Similarly, Bellovary et al. (2005), and Li (2011) defined earnings quality as the ability of earnings to reflect company permanent earnings.

## **INDICATORS OF MEASURING THE QUALITY OF EARNINGS**

### **Accrual Quality**

The difference between cash from operating and recorded earnings generated by business indicates accrual quality (Richardson et al. 2001, Desai et al. 2006). Likewise, error on estimating the accrual has also been used in measuring the quality of accrual (Francis et al. 2004, Jing 2007 and Johnston 2009). So far the first method that focus on magnitude and second focusing on error on estimating accrual are commonly used as proxy for earnings quality (Richardson et al. 2001; Francis et al. 2004; Desai et al. 2006). The large the value obtained from each method imply poor earnings quality and small value obtained from each method indicates high quality earnings.

### **Persistence**

Persistence of the reported earning is commonly used measure of earnings quality which is measured by the sustainability of the reported earnings of firm (Penman & Zhang 2002; Francis, et al. 2004). Earnings which are more persistent are more sustainable and are of high quality; likewise earnings which are less persistent are more transitory are considered to be of lower quality (Penman & Zhang 2002; Francis et al. 2004).

### **Predictability**

Predictability of earnings represents the ability of the reported earnings to predict future component of operating income (Lipe 1990, and Penman & Zhang 2002). The higher ability to predict future earnings indicates high earnings quality and poor ability to predict future earnings indicates poor earnings quality.

### **Smoothness**

The term income smoothing refers to effort done by managers of entity to reduce irregular variation in earnings (Tucker & Zarowin 2006). Moreover, Tucker & Zarowin (2006) reveal that managers exercises their power to reduce abnormality on the earnings as means to inform interested users about their assessment of the future earnings to the degree allowed by accounting standard. Francis et al. (2004) and Tucker & Zarowin (2006) reveal that

smoothened earnings indicates high earnings quality that users of accounting information need, likewise un-smoothened represents poor quality earnings.

### **Earning Surprise indicator**

Earnings surprise indicator is given by value of net operating assets at beggung scaled by total sales (Barton & Simko 2002; Abdelghany (2005). Large the ratio of earnings surprise indicates poor earnings quality and small ratio indicates high earnings quality.

### **Empirical findings on earning quality**

Since Ball & Brown (1968) reveals significant relationship between earnings and returns, it has become difficult to ignore the importance of earnings quality in trading. Many studies have emerged so far to investigating the effect of earnings quality on resources allocation (Francis et al. 2004, Chan et al. 2006, and Cahan et al. 2009).

Chan et al (2006) examines the association of earnings quality and stock returns for USA companies listed in New York stock exchange and NASDAQ markets. The study reveals that high accrual quality as measured by magnitude is associated with more stock returns. Similarly, Dimitropoulos & Asterious (2009) examine the impact of red flag ratio on stock prices for 101 firms listed in Athens stock exchange from 1994-2004. They find that accrual quality, ratio of sales to total assets and sales have positively related to the stock returns. However, they also find that ratio of net profit to sales is negatively related to stock price returns. The result indicates inconsistency of the measure of earnings quality.

Setterberg (2011) investigates the association between cost of capital and earnings quality measured by both timelines and values relevance in Swedish listed firms from 1994 to 2008. The study reveals high quality of earnings measured by both relevance and timelines is associated with low implied cost of capital of firms.

Jing (2007) examines the association between stock price synchronicity and seven earnings quality measures (accrual quality, persistence, predictability, smoothness, value relevance, timeliness and conservatism). The study reveals that positive association between accrual quality and stock price synchronicity. However, conservatism shows insignificant relationship with stock price synchronicity.

In addition, Srinidhi et al. (2011) examine the association between female board directors and quality of earnings using 13, 848 firm year observation for USA firms. The study reveals that the quality of earnings as measured by accrual quality and benchmark is positively related to the number of female directors in the board. Furthermore, Demerjian et al. (2013) investigates the association between managerial ability and earnings quality. They find that high earnings quality measured by restatements, accrual quality, persistence, error in the bad debts provisions is positively related to the managerial ability. Therefore, results of this study show consistency of all measure of earnings quality; restatement, accrual quality, persistence and error in the bad debt provisions.

Consequently, Cahan et al. (2009) conducted study to analyze the association between returns and earnings quality for 13 countries. Their finding suggest that the quality of earnings is not uniform vary from country to country. Also, their findings reveal that countries with higher investor protection have high level of earnings quality as compared to those with less investor

protection. Likewise, Ebaid (2012) conducted a study in Egypt to measure the ability of accounting performance measure to capture stock return using eight indicators. The study reveals that the magnitude of value relevance to capture stock return varies extensively among the measure of performance with highest value relevance attributable to income before extraordinary and lowest attributable from operating cash flow.

Work of Doyle et al. (2007) investigate the association between accrual quality and internal control of USA firms from 2002 to 2005. Using 2,943 firm observations the finding documents that firm with weak internal controls are associated with poor accrual quality and firms with strong internal controls are also associated with high quality accruals. Likewise Kim et al. (2012) examine the association between earnings quality measured by accrual quality and corporate social responsibility of companies in USA. The study finds that engagement in corporate social responsibility improved earnings quality by reducing incident of earnings manipulation measured by accrual.

Francis et al. (2004) examine the association between earnings quality indicators (accrual quality, persistence, predictability, value relevance, timeliness and conservatism and) cost of capital in USA. Their finding show that firms with favorable earnings quality indicators have lower cost of equity than firms with poor attributes of earnings quality indicators. However, their findings reveal that two earnings quality indicators predictability and conservatism show insignificant relationship with cost of capital. Therefore, this result reveals inconsistency among the measure of earnings quality.

Abdelghany (2005), conducted study to assess the consistency of three earnings indicators earnings surprise, smoothness and ratio of cash flow from operation to net income using small sample of 90 companies listed in USA. The study finds that there is no consistency among the three earnings quality measures in assessing the quality based on industrial classification.

Collectively these studies reveal the lack of consistency among the measure of earnings quality. Therefore, the purpose of this paper is to extend the literature by investigating whether there is consistency among earnings quality indicators. Specifically we study the consistency of five earnings quality measures (accrual quality, persistence, predictability, smoothness and earnings surprise) in measuring the quality of reported earnings.

## METHODOLOGY

We employed non-parametric measure to study the relationship among five indicators, accrual quality, persistence, predictability, smoothness and earnings surprise. We specifically used spearman rank correlation ranked our earnings indicators to assess their correlation in assessing earnings quality. We used Stata statistical package to calculate the correlation, however we presented the formula for computing correlation using spearman rank correlation equation one.

$$r_{a,b} = 1 - \left\{ \sum d_i^2 / n(n^2 - 1) \right\} \quad (1)$$

Our indicators for measuring earnings quality are based on prior research. We measure each indicators based on prior studies as discussed below.

We measure accrual quality using similar method used by Richardson (2003) and Desai et al. (2006) as given below in equation 2.

$$AccrualQuality = (Earnings - CFO / AverageAssets) \quad (2)$$

Where,

Earnings stand for earnings before extraordinary,

CFO=cash flow from operation

The lower the value of accrual quality represent better quality of the reported earnings and the higher the value of accrual represent poor quality of the reported earnings. We negate the value of accrual so that large value indicates high accrual quality and small value indicates poor quality for purpose of ranking our earnings quality indicators similar with prior studies (Francis et al. 2004; Jing 2007)

We measure the value of persistence as the slope of equation 3 ( $\chi_1$ ) and predictability as square root of error variance of the same equation (Ali & Zarowin 1992; Francis et al. 2004). The higher the value of the slope indicates high quality. Likewise large value of error variance indicates low earnings quality while small value indicates high earnings quality. We negate the value of predictability for the purpose of ranking our earnings quality attributes

$$EPS_{i,t} = \chi_0 + \chi_1 EPS_{i,t-1} + \sigma_{i,t} \quad (3)$$

Where;

$EPS_{i,t}$  = Earnings per share for firm i at time t. and  $\sigma_{i,t}$  = Error term of the equation.

We estimated the. Likewise, higher value of

We also measure smoothness as as ratio of standard deviation of net income divide by total assets to standard deviation of cash flow divide by total assets similar with prior studies (Leuz et al. 2003; Francis et al. 2004).

$$SM = sd(NP/TAB) / sd(CF/TAB) \quad (4)$$

Where;

$SM$  = Smoothness  $sd$  = Standard deviation,  $NP$  = Net income before extra ordinary activities

$TAB$  = Total assets at the beginning of the year for firm i in time t.

$CF$  = Cash flow from operation for firm i in time t.

We used rolling ten years to compute the value of smoothness in line with prior studies (Leuz et al. 2003 and Francis et al. 2004). Since, the higher the value of smoothness indicates low earnings quality and small value indicates good earnings quality we negate our values for purpose of ranking (Francis et al. 2004).

Moreover, we computed the value of earning surprise indicator as the ratio of net operating assets at the beginning to sales (Barton & Simko 2002, and Abdelghany 2005).

$$Earnings\ surprise = Net\ operating\ assets\ at\ beginning / Sales \quad (5)$$

Since smaller the earnings surprise indicates higher quality of the reported earnings and the large the ratio the poor the quality of the reported earnings, we therefore negate the value for purpose of ranking our earnings quality indicator (Francis et al. 2004; Jing 2007).

We arranged all our earnings attribute such that higher value indicates higher earnings quality and lower value of attributes represent lower earnings quality. We then ranked them in ascending order and hypothesized that;

Ha: Earnings quality indicators ranked are independent

Hb: Earnings quality indicators are not independent of each other

### Sample and selection criteria

We used secondary data obtained from Prowess database that is maintained by the Center for Monitoring Indian Economy. Our sample period is seven years spanning from 2006 to 2012. We used companies listed in Bombay stock exchange BSE 500, however we excluded all banking and financing companies. We also exclude companies without enough information for computing all our earnings indicators; therefore this reduced our sample to 175 companies each year.

### EMPIRICAL RESULTS

Our analysis basically focuses on testing whether there is consistency among our five measures of earnings quality accrual quality, persistence, predictability, earnings surprise and smoothness. We follow ordering scheme of our variables so that higher value of earnings quality indicator indicates high quality and lower value of earnings quality indicator indicates low earning quality. We then ranked our earnings quality indicators in year basis.

Table 1 -7 present result on year basis of spearman rank correlation for five earnings quality indicators from 2006 to 2012. We rank our variables on year basis and run rank correlation using spearman rank for the entire sample. Table 1 present the spearman rank correlation for year 2006. We find that, for each pair of earning quality indicator the value of p-value is greater than 0.05, therefore we fail to reject the null hypothesis that the rank are independent. Therefore the result shows that there is no consistency among the earnings quality indicators in year 2006.

**Table 1: Spearman rank correlation results 2006**

	rpers	rpred	rsm	res	racr
rpers					
rpred	0.156 (0.0597)				
rsm	-0.128 (0.112)	0.155 (0.154)			
res	0.097 (0.2293)	-0.1032 (0.32)	-0.0296 (0.715)		
racr	-0.0733 (0.3645)	0.4165 (0.4165)	0.058 (0.474)	0.067 (0.404)	

Notes: Table report spearman rank correlation value. The values presented in parentheses represent the probability values attached to the coefficient. rpers stands for persistence, rpred

stand for predictability, rsm also stand for smoothness, res is earnings surprise and last racr stand for accrual quality.

Table 2 report spearman rank correlation results among earnings quality indicators for 2007. Out of 10 options we only find one option with consistency in measuring the quality of earnings. We find that quality of earning completely consistency when using earnings surprise and accrual quality with p-value of 0.0172.

**Table 2: Spearman rank correlation results 2007**

	rpers	rpred	rsm	res	racr
rpers					
rpred	0.0463 (0.5623)				
rsm	-0.1300 (0.1023)	0.059 (0.459)			
res	0.0551 (0.4903)	0.0135 (0.866)	0.0086 (0.9139)		
racr	0.0427 (0.5930)	0.0980 (0.219)	0.0905 (0.2567)	0.188 (0.01721)	

Table 3 present results for spearman rank correlation year 2008. We find that only earnings quality is completely consistency when using persistence and predictability (p-0.0024).

**Table 3: Spearman rank correlation results 2008**

	rpers	rpred	rsm	res	racr
rpers					
rpred	0.2305 (0.0024)				
rsm	-0.0085 (0.9118)	0.068 (0.3717)			
res	0.136 (0.0762)	-0.024 (0.7551)	0.0537 (0.4852)		
racr	0.0239 (0.756)	0.0812 (0.2909)	0.0789 (0.3051)	0.0317 (0.6802)	

Table 4 report the results of spearman rank correlation among our earnings quality measure for year 2009. We find completely consistency when using persistence and predictability (p-value 0.0429). Also we find consistency when using earnings surprise indicator and accrual quality (p-value 0.099). However, no consistency we found among the remaining measures of earnings quality.

**Table 4: Spearman rank correlation results 2009**

	rpers	rpred	rsm	res	racr
rpers					
rpred	0.153 (0.0429)				
rsm	-0.050 (0.5098)	0.1003 (0.185)			
res	0.1431 (0.0582)	-0.034 (0.654)	-0.0083 (0.9125)		
racr	0.0385 (0.6117)	-0.0949 (0.2101)	0.0226 (0.766)	0.125 (0.099)	

Table 5 reports the output of spearman rank correlation for 2010. We find results similar to year 2009. We find that persistence and predictability (p-value 0.0303) have the same rank for earnings quality. Also we find that there is consistency when using earnings surprise and accrual quality (p-value 0.0017). However, the remaining options did not indicate any consistency.

**Table 5: Spearman rank correlation results 2010**

	rpers	rpred	rsm	res	racr
rpers					
rpred	0.163 (0.0303)				
rsm	-0.0223 (0.768)	0.136 (0.0713)			
res	0.0967 (0.201)	-0.044 (0.565)	0.0075 (0.921)		
racr	0.0385 (0.611)	0.0516 (0.495)	0.002 (0.998)	0.234 (0.0017)	

We presented finding of year 2011 in table 6. We find that there is consistency when using predictability and smoothness (p-value 0.0364) and also we using earnings surprise and accrual quality (p-value 0.00). We did not find any consistency in the other measures.

**Table 6: Spearman rank correlation results 2011**

	rpers	rpred	rsm	res	racr
rpers					
rpred	0.137 (0.069)				
rsm	0.0364 (0.631)	0.216 (0.0039)			
res	0.0517 (0.495)	-0.0228 (0.7636)	-0.0192 (0.799)		
racr	0.057 (0.455)	0.0334 (0.659)	0.0807 (0.286)	0.3024 (0.00)	

Table 7 reports the results of spearman rank correlation for 2012. We find results similar to those of 2011, there is consistency when using predictability and smoothness (p-value 0.026)

and also we using earnings surprise and accrual quality (p-value 0.0194). We did not find any consistency in the other measures.

**Table 7: Spearman rank correlation results 2012**

	rpers	rpred	rsm	res	racr
rpers					
rpred	0.0552 (0.466)				
rsm	0.0719 (0.341)	0.168 (0.026)			
res	0.012 (0.874)	-0.0489 (0.518)	0.0206 (0.785)		
racr	0.055 (0.464)	0.0465 (0.538)	0.0522 (0.490)	0.1756 (0.0194)	

## DISCUSSION

The overall finding shows that there is no consistency among the earnings quality indicators. In 2006 we fail to reject the null hypothesis that the ranks are independent for all ten option of ranking our measure of earnings quality. Likewise, in 2007 we rejected the null hypothesis that ranks are independent rank for only one option out of 10 options (accrual quality and earnings surprise). Moreover, in year 2009 we rejected the null of independent rank for only one option out of 10 options (persistence and predictability). In both 2009 and 2010, we find rejected the null hypothesis of independent ranking of our earnings quality. We rejected null hypothesis for persistence and predictability, likewise for earnings surprise and accrual quality. Furthermore, in 2011 and 2012 we rejected the null hypothesis of independent rank for only two options out of ten. We rejected null hypothesis that ranks are independent for persistence and smoothness and for earnings surprise and accrual quality. Therefore, our findings suggest that there is inconsistency among the measures of earnings quality and are similar with prior study conducted by Abdelghany (2005).

## IMPLICATION TO RESEARCH AND PRACTICE

Our results have implication to analyst and investors. Since in general one measure of earnings quality cannot complement other measure of earnings quality, therefore we require analyst to use more than one measure. In case of inconsistency when more than one measure is used further analysis should be conducted and the companies under investigation.

## CONCLUSION

The aim of this paper is to investigate whether there is consistency among the measure of earning quality. Previous study done by Abdelghany (2005) in USA revealed lack of completely consistency among the measure of earnings quality.

We conducted year basis investigation of five commonly used earnings quality indicators persistence, predictability, smoothness; earnings surprise indicator and accrual quality (Francis et al. 2004, Jing 2007, Johnston 2009). We find in general there is no completely consistency among the measure of earnings quality.

However our results should be interpreted with care, first we did not use industry wise ranking of our earnings quality indicators, we used pooled companies from different industries. This might have influenced our results since different industries have different business cycles. Second, we did not use all measure of earnings quality therefore we cannot generalize our findings over all measures of earnings quality.

### **FUTURE RESEARCH**

We also recommend further studies to be carried investigating the consistency among measures using industrywise rank of each earnings quality indicator in year basis. We also recommend other measures of earnings quality should also be used.

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