Research Note

A Study of Tobin’s Q on Indian Stock Exchange using Economic Profit Measurement Indicators

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Abstract

Profit measurement indicators explored by researchers over a period of time like Created Shareholder Value (CSV), Shareholder Value Added (SVA), Economic Value Added (EVA), Market Value Added (MVA), Cash Value Added (CVA), Adjusted Economic Value Added (AEVA), Refined Economic Value Added (REVA), and Residual Income (RI)  have been well explored by many scholars for examining the profitability of different companies. Each of these indicators has its own way of presenting and reflecting the performance and values of the companies. However, there are two other performance metrics, namely Equity Economic Value Added (EEVA) and True Value Added (TVA), which have not yet been adequately investigated for the Indian capital market. The focus of this paper is on a study of Tobin’s q using two economic profit measurement indicators, namely: Equity Economic Value Added (EEVA) and True Value Added (TVA). Data was collected on Tobin’s q of 50 selected listed companies of National Stock Exchange (NSE), India, between 2003 to 2013. The analysis of the data was based on the belief that its sample size is large enough for the assumption of normality. The results of our data analysis shows that there is presence of significant association between EEVA, TVA and Tobin’s q.

Key words: EEVA, TVA, Tobin’s q, NSE, India

1. Introduction

Performance evaluations using performance metrics or performance measurement tools are increasingly becoming important for all companies. The major responsibility of a Management Accountant is to assess performance properly using suitable performance metric. In most of the cases, performance assessment is expressed in terms of earnings per share (EPS), accounting profit (PBT/PAT) etc. Even it has been observed that a few companies having satisfactory financial position suffer from liquidity due to use of improper accounting performance metrics resulting in reduction in market capitalisation of the company. Hence the traditional indicators are quickly replaced by different other indicators to measure economic profit or residual income.

Economic profit is viewed as a source of value creation for businesses which boosts their share prices on the market. Economic profit making means value creation for enterprises, increased share price on the market and more wealth for
shareholders. A wide range of indicators of wealth generation have been developed. These include Economic Value Added (EVA), Market Value Added (MVA), Refined Economic Value Added (REVA), Adjusted Economic Value Added (AEVA), Shareholder Value Added (SVA), Created Shareholder Value (CSV), Cash Flow Return on Investment (CFROI), and Cash Value Added (CVA). These indicators have been well explored by many researchers for examining the profitability of different companies.

However, there are two other performance metrics, namely Equity Economic Value Added (EEVA) and True Value Added (TVA), which have not yet been adequately investigated for the Indian capital market. EEVA was proposed by Damodaran (2002) and TVA was the concept introduced by Mohanty (2003). In addition to these, a third performance assessment measure which has not been well investigated for the Indian capital market is Tobin’s q, which is basically calculated with the help of information of financial statements and information of market value of a company. This paper focuses on explanation of Tobin’s q and on determining the differences between the two indicators in terms of their interpretation and explanatory predictive ability towards Tobin’s q. The purpose of this is to help the investors to take the right decision by using the most appropriate performance measurement indicators.

2. Literature Review

Kavosi (2001) found a significant relationship between EVA and Tobin’s q. Wolf (2003) suggested that Tobin’s q is an important technique for the evaluation of management operations. Arcelus et al (2005) investigated the relationship between return on investment (ROI) and the economic return calculated by Tobin’s q and their results suggested a non-linear relationship between the two mentioned variables. Heidarpour & Mostoufi (2009) opined a significant relationship between Tobin’s q and refined economic value added (REVA). Modarres & Farajzadeh (2009) suggested that Tobin’s q should not be used alone to evaluate any financial performance of a company. Namazi & Zara-atgari (2009) conducted a feasibility study on application of Tobin’s q compared to other performance criteria. Catapan et al (2012) examined the relationship between profitability indicators and Tobin’s q in the Brazilian electric sector and found that Tobin’s q is significantly correlated with profitability indicators ROE, ROAE, EBITDA/TA, EBITDA/NW.

Joneidiyekta (2012) observed through Iranian stock market that there is a positive and significant relationship between Tobin’s q and P/B ratio and no significant relationship between P/E ratio and shareholders return. Raeeszadeh et al (2012) showed that there is a positive relationship between Tobin’s q and dividend per share (DPS) but concluded that Tobin’s q could not replace DPS.

3. Research Hypotheses, Model Variables and Parameters and Research Model
3.1. Research Hypothesis

Our research hypotheses are as follows:
Hypothesis 1: Equity Economic Value Added (EEVA) conveys explanatory information in regard to Tobin’s q.
Hypothesis 2: True Value Added (TVA) conveys explanatory information regarding Tobin’s q.

Tobin’s q, the dependent variable (criterion variable), is obtained by dividing the market value of equity plus book value of debt by book value of equity and debt. That is

\[
\text{Tobin’s q} = \frac{\text{Market Value of Equity} + \text{Book Value of Liability}}{\text{Book Value of Equity} + \text{Book Value of Liability}}
\]

3.2. Model variables and Parameters

The independent variables are:
- Equity Economic Value Added (EEVA) = (Return on Equity – Cost of Equity) (Equity Invested) and
- True Value Added (TVA) = Free Cash Flow – Capital Gains – (Market Value X (1 + WACC))

Weighted Average Cost of Capital (WACC) = \left(\frac{D}{D+E}\right) k_d + \left(\frac{E}{D+E}\right) k_e

Where D is Total Debt, E is Total Equity; k_d is Cost of Debt and k_e is Cost of Equity.

Cost of equity is calculated by applying Gordon Model (Dividend Discount Model) which is given by

\[
k_e = \frac{D_1}{P_0(1-F)} + g
\]

Where:
- \(k_e\) = Cost of Equity,
- \(D_1\) = dividends during the first growth period,
- \(P_0\) = current equity share price,
- \(g\) = growth rate. The firm sales growth is considered as the control variable and defined as sales changes at each period.

3.3. Research Model

The research models are as follows:

\[
\text{Tobin Q}_{i,t} = \beta_0 + \beta_1 \text{EEVA}_{i,t} + \beta_2 \text{OPG}_{i,t} + \epsilon_{i,t}
\]

\[
\text{Tobin Q}_{i,t} = \beta_0 + \beta_1 \text{TVA}_{i,t} + \beta_2 \text{OPG}_{i,t} + \epsilon_{i,t}
\]
where:

- \( \text{Tobin's } Q_{it} = \text{Tobin’s ratio of firm } i \text{ at time } t \) (dependent variable);
- \( \beta_0 = \text{the model’s constant factor}; \)
- \( \text{EEVA} = \text{equity economic value added (independent variable)}; \)
- \( \text{TVA} = \text{true value added (independent variable)}; \)
- \( \text{OPG} = \text{sales growth of the firm as the control variable defined as changes in sales}; \)
- \( \varepsilon_{it} = \text{error factor which is independent for each period with a normal distribution and independent of regression factors}. \)

4. Data analysis

We collected data on Tobin’s q of 50 selected listed companies. This is a relatively large sample size. We believe that the sample size is large enough for the assumption of normality. That is, we believe that, the sample size is large enough and, therefore, in our analysis, we assume that the data is approximately normally distributed – by the Law of Large Numbers.

4.1. Correlation analysis

We calculated and tested the Spearman’s correlations between each pair of the variables at 0.01 and 0.05 significance levels. The results show that TVA and the control variable OPG are significantly and inversely correlated but Tobin’s q is directly correlated with OPG. Tobin’s Q is inversely related with TVA and EEVA.

Table 1. The results of Correlations Matrix for Dependent and Independent Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Significance of the correlation coefficients</th>
<th>TVA</th>
<th>EEVA</th>
<th>Tobin Q</th>
<th>OPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVA</td>
<td>Correlation coefficient sig. (2-tailed)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EEVA</td>
<td>Correlation coefficient sig. (2-tailed)</td>
<td>.171(^x) (.000)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobin Q</td>
<td>Correlation coefficient sig. (2-tailed)</td>
<td>-.315(^x) (.000)</td>
<td>-.019 (.677)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>OPG</td>
<td>Correlation coefficient sig. (2-tailed)</td>
<td>-.142(^x) (.002)</td>
<td>.000 (.992)</td>
<td>.124(^x) (.007)</td>
<td>1</td>
</tr>
</tbody>
</table>

\(^{xx}\). Correlation is significant at the .01 level (2-tailed).

\(^{x}\). Correlation is significant at the .01 level (2-tailed).

5. Findings and Conclusion

The results in this paper show that an insight can be provided to the investors and managers for taking correct financial decisions with the help of value based indicators like EEVA, TVA and their implication on Tobin’s q. We have found that EEVA and TVA cannot be used by decision makers as predictors of Tobin’s q.
Company performance can be better judged and highlighted with the use of different economic value added versions but this study finds that assumptions of EEVA and TVA as the predictors of Tobin’s q should not be relied on by financial managers as they explained different kind of information which may not be relevant to Tobin’s q. Actually, the use of TVA and EEVA in this study have their own calculative complicacies and involve collection of large volume of financial data.

One can claim EVA and REVA are good indicators of Tobin’s q. However they convey significantly different information from that of EEVA and TVA, which cannot be used as substitutes to Tobin’s q in investment decisions by the investors and other stakeholders. Finally, for further research, we recommend that focus should be directed on the relationships among EEVA, TVA and the other economic and accounting profit-based indicators used in the stock market.

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