Survey the Effective Factors on Tobin's Index in Tehran Stock Exchange

Farzaneh Heidarpoor and Somayeh Malekpoor

1Islamic Azad University-Central Tehran Branch, Iran
2Accounting Islamic Azad University-Central Tehran Branch, Iran

Abstract: With the formation of the subject of separation between ownership and management and a wide conflict of interests between owners and managers, evaluating the performance of companies is considered by different groups including owners, creditors, government, stockholders and even managers. One of criteria in evaluating companies' performance is Tobin's Q. However, variable factors may be related to this indicator. The purpose of this research is to evaluate the relationship between market liquidity, changes in stock price, return on capital, financial leverage, return on assets and size of corporations with Tobin's Q indicator in stock exchange of Tehran. To evaluate this issue, 100 sample was selected from statistical society which included necessary information for a 6-year period of research from (2005-2010), then the information related to six independent variables was studied and Tobin's Q was considered as a dependent indicator. For a testing hypothesis, the statistical technique of liner regression was used. The meaningfulness of regression was tested by T and F statistics. Research findings show that there is no meaningful relationship among Tobin's Q and size of corporations. Tobin's Q has a meaningful relationship with market liquidity, stock price, return on capital, financial leverage and return on assets.

Key words: Tobin's Q ∙ Market Liquidity ∙ Return on Capital ∙ Financial Leverage ∙ Return on Assets

INTRODUCTION

By advent of big companies and separating the management from ownership and following it by emersion of representative theory, evaluation of performance is regarded as a one of the most important accounting issues especially in management accounting. Representative relation is treaty which according it the owner or employer, behalf of themselves appoint their agent or representation and submit the decision authority to them thought there is a assumption that both sides are attended to maximizing their benefits but maybe the representative don't always action in this way and for the owner rent. The owner (stockholder) can balance the deficit of their benefit via paying salary, appropriate premium for representative and adopting the surveillance costs for limiting the aberrant initiations. The presence of conflict in benefits cause the owners (stockholder) concern in so far as for being ensured of allocating optimal resources from managers, they value their performance. Also from the stockholders view of points the increase of worth either via price gain and company's value or cash interest is important. From managers sight these evaluations because of valuation of themselves and other sections and also the proportional award that pay to them which is their definite right, is critical. From government regard these assessments run for meeting these three purposes: optimum devotion of resources as a prime goal, income distribution equally and stabilizing the economic conditions for communion in economic activities. From the banks and credit and financial institutes look, also continuity of company action and trust to company's survival for offering the loans and dative convenience considering the rate and unit are important. This article first survey the performance and valuation indexes and then by reviewing the performance index (Q), informational issues and its power and expressive aspects along with pecuniary stock, price variations, capital yield, financial lever, assets yield and company's size attempt totake efficient steps towards evaluation of company's performance and finally lead to help stockholders for adopting the correct decisions.
Theoretical Framework: In Q equation there is one normal value (in competitive economic) which include capital replacement value and economic normal growth rate. In practice without the enumerating the statistic variations, the normal value is more than one via capitalizing the rents value or exclusive interests. On the other hand, the events, policies and expectations reduce and increase Q and cause motivations or omit the motivation for investment represent the comparison between final capital yield and the cost of capital financial security. The existent mistake in Keinz's general theory is investment relation to yield rate level. The capital final yield is equal to yield rate which determine in capital stock equation. In such a long-term balance the pure investment in static economic will be equal zero. From Keinz view points in short term which the capital final yield and yield rate would be different (not equal) the important point is that investment has relate to both yield rate and their difference. Calculation of Q in general economic, neuter the deviations of this ratio to companies and various investments stuff. When Q is high, companies want to invest high. This nonlinear relation reinforces correlation between investments in massive level with Q. The yield rate which derives from capital final yield in regular (legal) investment is tacit reduction rate in exchange which is used for capital stock and future interests. This rate is proper for valuation of future yield flows according temporal patterns, uncertainty and cash flows covariance of company. This yield rate is different from the yield rate of state long term bond or company's long term bond or from the yield rate of contacts which have fix sum. Keinz in his common theory confuse the subjects who take this assumption easy. Because companies significantly meet their financial needs by stockholders and the necessary rate for motivating the stockholders is relate to the risky rate which they accept, so the real rate of capital cost is blend of bond rate, stock owners' salary rate and other rates. Thus cannot express it alone. Whatever we want are the conditions that if optimally allocate between various resources of financial providing including stock owners' salary, bond and other debts, would be the financial cost which is used. Because the optimum structure of financial meet in companies is different so we will have varied construct of market rates. Central bank can influence capital cost and Q. These changes are indirect but important. Central bank act through chain or asset replacement net. The bonds and stock owners' salary for each other and for the other assets which are in hand of many investors aren't appropriate replacement. The other assets include depositing in bank and other intermediates and short term treasure sheets or commercial documents. The central bank for example, acts on short term rates with fix sum. Instead portfolio replacements are influenced by both common level of these rates and also their predictable future yield. Assume for example the company's probable interests increase or tendency and consent of investors for accepting the risk reduce, so the capital cost would increase, Q independent of monetary policies would be change. When changing the estimation of future interests, this issue automatically relates and develops to the other economic variations. But Keinz concentrate just in subjective concept and the capital final yield variant. If company is in the normal position the final quantity of Q would be one. On the other hand the investments continue till the final Q reduces to one. If in some situations the final Q be more than one, company would increase its investment for buying and installing the equipments but if final Q is smaller than one so company should reduce capital store. The emphasis of Q theory on financial markets is because of that individuals or companies are free for investment in actual section or in financial sector. So investment has a close relationship with financial markets. Thus if the company medium Q be lower than the dominant level, it is better instead of buying the equipments and investment in this field, purchase the stock of other companies. It means that stock market tend to equal the value of all companies so that all of them show the same reflect to general shocks. From the other side if the Q of a company be bigger than one, company's market value would be higher than its replacement value. If the companies' entry to that industry be free, so the other companies via buying the stock of existent companies in that industry would be entrance to. Because the market value in this special industry is more than replacement value so the investment value of newcomer companies will increase. Thus by assumption of not being te barriers and survival of company despite the new companies, Q would be decrease. He can capitalize the market of these revenues so the market value of company will be more than the replacement value of capital stock. So Q is more than one.  

Cash of Stock Market and Company Performance: There are theoretical reasons that cash of market positively has effect on companies' performance. Because stockholders conduct cash flows and have control right, so conduction of cash flow has a main impress in leadership, valuation and company performance. Theoretical studies reveal that
Cash markets improve the effective management and motive business through entrance of conscious investors. In total different reasons have provided for being the relation between market performance and companies' cash. Among them Khana and Sonati (2004) [1] and Titman (2001)[2], argue that the companies by high cash, have the better market performance cause cash motive the arrival of aware investors. Holmstro (2001) [3] claim that companies by high cash have good market performance because cash by available information enable investors to do aggressive transaction. Baker and Stein (2004)[4], assign market nice performance derive from emotional action of some investors.

**Literature Review:** Goldstein (2008) [5] studied the relationship between amount of transactions and Q index and found the positive relation among them. Saibal (2007) [6] surveyed the linkage of Q ratio in banking and the relevant ownership with company's valuation. Chin and cooperators (2006)[7] studied the relation between excess exclusive ownership of research costs and developing by Q ratio in electronic industry in Thai. The results signify that exclusive ownership, excess of research costs and the expansion of Q ratio have more identity into other indexes. Hung (2006)[8] by studying the Thia electronic industry showed significant relation between the percent of patent stock behalf of board of directors with the Q ratio. Arklos and Teammates studied the relation of return on the amount of investment by company. If calculated Q index into P/E for predicting the actual yield rate is more reliability. Gulger and Yurtoglu (2003) [11] expressed that the average isn't an adequate index for evaluating of the performance. Sauaia (2001) [12] surveyed Q as a valuation index of multinational companies' performance. Research results show that the companies which have higher Q than one have the better turover. Demszt and Villalonga (2000) [13] in their researches regarded company performance as a dependent variable and for evaluating that used Q index. Results revealed that there isn't a relation between the ownership structure and company performance.

**Research Hypotheses:** The hypotheses of this research would be as follows:

**Hypothesis 1:** There is a relation between Tubin index and stock cash.

**Hypothesis 2:** There is a relation between Tubin index and stock price variation.

**Hypothesis 3:** There is a relation between Tubin index and capital yield.

**Hypothesis 4:** There is a relation between Tubin index and financial leverage.

**Hypothesis 5:** There is a relation between Tubin index and assets yield.

**Hypothesis 6:** There is a relation between Tubin index and company size.

**Variables' Definitions:** Tubin Q ratio obtain via division of company fair value to replacement value of company assets. This ratio introduced by Mr. James Tubin in 1987[14].His goal was the relation between Q index and the amount of investment by company. If calculated Q index for a company is higher than one, then the more motive would be for investment. On the other hand the high Q actually is a sign of validation of growth opportunities. If Q ratio be lower than one so the investment would be stop.

\[
\text{Tubin } Q = \frac{\text{debits book value + stock fair value}}{\text{Assets book value}}
\]

Q can be written as :[14]

\[
Q = \frac{1^*}{\text{OIP}} \frac{1}{\text{leverage}} * \text{OIOA}
\]

**OIP :** Action interest division to stock fair value at the end of the financial year.

**Leverage :** Stock fair value division to stock fair value and debts book value at the end of the financial year.

**OIOA :** Action interest division to assets book value at the end of the financial year.

**Liquidity :** Stock cash evaluation index
Table 1: Regression of Independent Variables and Tubin Log Index

<table>
<thead>
<tr>
<th>P-Value</th>
<th>t statistic</th>
<th>Standard factors</th>
<th>Estimate error mount</th>
<th>factor</th>
<th>Single-variable models</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.001</td>
<td>9.608</td>
<td>-</td>
<td>0.037</td>
<td>0.357</td>
<td>a    Stock cash rank</td>
</tr>
<tr>
<td>0.045</td>
<td>2.011</td>
<td>0.084</td>
<td>0.0002</td>
<td>0.0004</td>
<td>b    Stock price variation</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>20.965</td>
<td>-</td>
<td>0.018</td>
<td>0.387</td>
<td>a    Capital yield</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>-6.999</td>
<td>-0.280</td>
<td>0.00003</td>
<td>-0.0002</td>
<td>b    Financial leverage</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>24.029</td>
<td>-</td>
<td>0.020</td>
<td>0.490</td>
<td>a    Assets yield</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>-6.787</td>
<td>-0.273</td>
<td>0.034</td>
<td>-0.229</td>
<td>b    Company size</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>-</td>
<td>-</td>
<td>0.030</td>
<td>-0.352</td>
<td>a    Fix mounted</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>27.544</td>
<td>0.754</td>
<td>0.056</td>
<td>1.537</td>
<td>b    Stock cash rank</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>12.590</td>
<td>-</td>
<td>0.023</td>
<td>0.294</td>
<td>a    Stock price variation</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>7.969</td>
<td>0.315</td>
<td>0.083</td>
<td>0.662</td>
<td>b    Capital yield</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>7.095</td>
<td>-</td>
<td>0.185</td>
<td>1.313</td>
<td>a    Financial leverage</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>-4.881</td>
<td>-0.199</td>
<td>0.014</td>
<td>-0.068</td>
<td>b    Assets yield</td>
</tr>
</tbody>
</table>

Table 2: Multiple Lineer Regression between Independent Variables and Tubin Index log

<table>
<thead>
<tr>
<th>Durbin-Vatson statistic</th>
<th>(P-Value)</th>
<th>F statistic</th>
<th>Balanced nomination factor</th>
<th>Nomination factor</th>
<th>Multiple model</th>
<th>Multiple correlation factor</th>
<th>Multiple model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.81</td>
<td>&lt;0.0001</td>
<td>178.83</td>
<td>0.61</td>
<td>0.61</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Value</th>
<th>t statistic</th>
<th>Standard coefficients</th>
<th>Estimate error mount</th>
<th>Multiple model</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;0.001</td>
<td>-8.140</td>
<td>-</td>
<td>0.040</td>
<td>-0.330</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>3.881</td>
<td>0.102</td>
<td>0.0001</td>
<td>0.0005</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>-5.807</td>
<td>-0.156</td>
<td>0.00002</td>
<td>-0.00001</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>-3.957</td>
<td>-0.133</td>
<td>0.028</td>
<td>-0.112</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>18.752</td>
<td>0.638</td>
<td>0.069</td>
<td>1.290</td>
</tr>
<tr>
<td>&lt;0.001</td>
<td>3.701</td>
<td>0.130</td>
<td>0.072</td>
<td>0.266</td>
</tr>
<tr>
<td>0.333</td>
<td>-0.97</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Liquidity = \frac{1}{\frac{1}{V} + \frac{1}{D} + \frac{1}{F} + \frac{1}{B} + \frac{1}{C} + \frac{1}{N}}

That:

V : The number of exchange days in each period
F : The mean number of exchange in each day
B : The average of buyer numbers in each day
N : The average of exchanged stock
C : The average of capital value in each period

Stock price variations = stock price at end minus stock price at the beginning period.
LOG-BVTA: The normal log of assets book value at the end of the financial year (company size).

Research Method: The research method is correlation. For testing the hypotheses first assayed the variables relation via simple liner regression and at the existent of liner relation for getting the pragmatism and giving the final mathematic relation is used from multiple liner regression. Statistic population limited by below conditions:

These companies should be accepted in Tehran Stock Exchange before 1994 and are production companies.

The sample size is 64 companies that are chosen by using formula.

Research Findings: For testing normality of dependent variable distribution, Kolmogrov-Smirnov test was used [15]. For exploring the normality of Tubin Q index (dependent variable) K-S test is used that results showed it is not normal.

For changing the Tubin Q index variable distribution to normal distribution, first its log was calculated and again data normality was tested which results showed it is normal.

Now we can use new variable for evaluating the regression model and results are showed in Table 1.

Table 1 Analyze the results of first hypothesis test by using single variable regression model.

It shows that for all independent variables : stock cash rank, stock price variations, capital yield, financial leverage, assets yield and company size have liner relation with Tubin Q index log.
Research findings by using multiple linear regression is showed in Table 2. According to Table 2 we can conclude that there is a significant linear relation between Tubin index log and independent variables. Thus these variables remain in model and the multiple model would be as follows:

\[ \text{Tubin } Q \text{ index log} = (-0.330) + 0.0005 \times (\text{stock cash rank}) + (-0.00001) \times (\text{stock price variations}) + (-0.112) \times (\text{capital yield}) + 1.290 \times (\text{financial leverage}) + 0.266 \times (\text{assets yield}) + E \]

**CONCLUSIONS**

What is important is performance valuation from investor view cause this group are reluctant to investment in companies which have the high risk so, if do so the more risk, would have the more yield for them. Thus evaluation of managers’ performance has special importance. For appraising the managers’ performance, the owners use different tools and indexes. In each era the various tools and scales have been given and each nominee regarding to their opinions applied from these indexes for valuation of managers' performance. Research findings showed that there is no meaningful relationship among Tobin’s Q and size of corporations. Tobin's Q has a meaningful relationship with market liquidity, stock price, return on capital, financial leverage and return on assets.

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15. Online Available at: http://en.wikipedia.org/wiki/Kolmogorov%E2%80%93Smirnov_test