**Advances in mathematical finance & applications, 3 (1), (2018), 91-96**

**Published by IA University of Arak, Iran**
**Homepage: www.amfa.iau-arak.ac.ir**

# Analysis of Financial Leverage, Operating Leverage and Capital Venture Effect on Tobin's Q Ratio of Investment and Holding Companies Listed in Tehran Stock Exchange

***Saeid Baseri***[a]***, Amir Hakaki*** [b,*]

[a]*Department Management and Accounting, Kashan Branch, Islamic Azad University, Kashan, Iran*
[b]*Department of Accounting, Natanz Branch, Islamic Azad University, Natanz, Iran*

ARTICLE INFO

*Article history:*
Received 13 July 2017
Accepted 2 September 2017

Keywords:
Financial Leverage
Operating Leverage
Venture Capital
Tobin's Q ratio

ABSTRACT

The main purpose of this research is the study on effect of Financial and Operating Leverage and Venture Capital on Tobin's Q ratio amongst companies listed in Tehran Stock Exchange. In this research, the Holdings and Investment companies are used as statistical samples and 73 enterprises that are listed in Tehran Stock Exchange within 2001 to 2016 have been studied. The results driven by this research show that Venture Capital, hereafter called "VC", and Operating Leverage, hereafter called "OPL", are positively related to Tobin's Q ratio while Financial Leverage, hereafter called "FL", has negative relation. At the same time, combined variables “FL” and “VC” are negatively correlated with Tobin's Q ratio and combined variable “OPL” and “VC” are neutral on Tobin's Q ratio. The effect estimation of independent variables, namely FL, OPL and VC and control variables, over dependent variable of Tobin's Q ratio is 55%, which is in fact noticeable.

## 1 Introduction



Investment is one of the important tools of economic development in every country. In order to finance in any kind of investments, different methods have so far been introduced one of those is formation of Investment Funds. Another type of financing is a hazardous investment called "Venture Capital", "Risky Investment" or "Private Equity". VC is money supply to those newly established companies who do not have much record of investment from traditional fund resources like conventional markets or lender institutes. Emerging companies are entrepreneurs who need fund to develop their business plans and more often are in lack of tangible assets to be used as a loan guarantee. Furthermore, the negative cash flow in these companies is another reason why banks, other lender institutes and stock exchange markets are reluctant to support them.

A Venture Capitalist plays as a financial broker in the market, via whom the lenders and borrowers are connecting together at a high expense. These costs are because of inappropriate selection, moral

* Corresponding author Tel.: *+98 913 272 1182 Fax: +98 31 34215033*
E-mail address: ***Amirhakaki1364@gmail.com***

risks, administrative expenses, data collection and inspection measures. VC is usually used in order to propound a creative idea or new product, which is of high-risked type but is capable to make a bigger return more than average profit. This type of investment is mainly deployed in those companies, which are potentially innovative or have a specific research on advanced technologies and are susceptible to be profitable or unprofitable. This is the reason why this investment is called risky or Venture Capital.

## 2 Research Background

The study of relationship between liquidity and FL on Return of companies listed in Tehran Stock Exchange - automotive, chemical and pharmaceutical industries [13]. Profit is one of the promising indices of performance measurement in a business unit. The researchers describe its different aspects in a scientific findings framework and enhances its accuracy by examining the ideas. In this article, the effect of liquidity and FL on return of the listed firms in Tehran Stock Exchange who act in Automotive, chemical and pharmaceutical industries will be evaluated. Financial statement of 62 firms have been reviewed over a 5-year period (2010-2014). In general, findings show that there is a significant relationship between liquidity and return in automotive and chemical industry while in pharmaceutical industry no relation observed. We can find the relation in pharmaceutical industry as well, provided that the reliability increases up to 90%. FL and company return in Automotive, chemical and pharmaceutical industry are statistically significant. "Review of the FL and free cash flows (FCF) effect on the diversification of equities and companies return (Hosseini [5]", considered as an applicable study in a descriptive method is a correlation and causal-comparative type research, as far as objective is concerned. In this research, the financial statement of 105 enlisted firms in Tehran Stock Exchange have been examined within 2008-2013. Data analysis started using the stock exchange board data. Data will then be fitted by classic regression model. The results suggest a direct and significant effect of FL and FCFs on variability of the firms. FCFs are also in a significant and positive correlation with the financial return while FL is negatively correlated to the financial return. "Relationship between FL, VC and financial return" [15]. The objective of the research is study on the relationship between investment, FL and firm performances in China. Data related to the Stock Exchange listed companies gathered from 2010 to 2015 from "CSMAR" data, 1212 samples have been annually taken. Data analysed using SPSS 19 and the relation between variables were evaluated and analysed with 99% reliability. Empirical results indicate that VC is positively related with the company return while FL has negative correlation. Further research show that the combined variable of VC*FL is negatively correlated with the company return. He carried out a research about the liquidity effect over the financial return in Chartered Bank of Pakistan. He employed 120 stock exchange companies within 2012-2015 using Quick Ratio to represent the liquidity. The results indicate a weak positive relation between liquidity and "Return on Assets (ROA)". Also he carried out a research on the relationship between FL and "Return on Equity (ROE)" in cement sector of Pakistan. He studied 18 cement factories out of 21 in this regard. He focused on a six-year period from 2005 to 2010 and found out FL, with 99% reliability, is negatively correlated to the financial return.

## 3 Tobin Q

Tobin Q ratio is one of the important information for economic decision making in this regard. This ratio used by James Tobin to evaluate the profitability of investment projects. To calculate the ratio, the market value of a company's equity and its corresponding book values is compared as follows [9]:

$Q_s$= (VOCSILOY+EMVOPSILOY+BVLTLILOY+BVCLILOY)/BVTAILOY (1)

Where:

VOCSILOY: value of common stocks at the end of the year

EMVOPSILOY: estimation of market value of preferred stock at the end of the year

BVLTLILOY: book value of long-term liabilities at the end of the year

BVCLILOY: book value of current liabilities at the end of the year

BVTAILOY: book value of total assets at the end of the year

Tobin intended to make a cause & effect relationship between Q index and the amount being invested by a corporation in such a way that if the calculated Q is greater than one, it means the company has a big potential to invest and grow. In other words, the higher the Q ratio is, the higher the possibility of investment and growth will be. Conversely, Q ratio less than 1 implies the unfavourable conditions and indicates the investment in the company will soon be stopped. The demand of a company equity will be increased as the return does. Contrariwise, if shareholders believe the return is not desired enough, firm value and its Tobin's Q ratio will decline accordingly. The main advantage of using this ratio is the simplicity in understanding for financial analysts and other users and also the availability of information in order to calculate it, provided that Q factor is defined as simple as possible. Q factor in Iran is readily available because there is no bond and preferred equity being published by the companies [8]. Studies and researches on Tobin Q ratio is one of the most enormous researches carried out in accountancy history. Financial indicators including Tobin Q ratio has always been regarded as management efficiency evaluation tool and a device for forecasting and assessment of decisions being made by investors, managers and financial analysts [16]. On this basis, researchers tried to find the key elements on Q factor of the companies. On the other hand, VC is regarded as an important factor of profitability and financial managers have always paid attention to it [11]. If a company does not have any performance it will not have any profit, consequently, however, without investment, it cannot be viable anymore. That reflects the importance of investment in the companies [3]. Moreover, the loan amount plays also a role on profitability and desirable performance of the companies. Liabilities (FL and OPL) can affect the company value as a main way to finance the companies. Tax advantage driven by debts brings about the increase on company value. Insolvency and financial crisis and failure in performing the commitments, on the other hand, will offset this advantage. The optimum leverage can be obtained by making a balance and compromise between the advantages exerted by liabilities. This research intends to survey whether VC, FL and OPL have any effect on Tobin's Q ratio of firms or not.

## 4 Research Model

The model is taken from Yang (2017) study;

Tobin`s qi,t=β0+ β1VCi,t + β2LEVi,t+ β3LEv*VCi,t+ β4OPLi,t+ β5OPL*VCi,t+β6Sizei,t+ β7Growthi,t+εi,t (2)

Dependent Variables are as follows:

Tobin's Q ratio; offered by James Tobin, Nobel prized economist from Yale university and equals to: (book value of total assets+ book value of liabilities) / (book value of assets)

Independent Variables are described as follows:

1- VC (dummy variable of VC) to measure the participation of venture capital, if a company supported by venture capital, then the value of VC is 1, otherwise the value is 0;

The conditions of VC can be stated as follows:

- An investment which is expected to be high return while it is of high-risked type.
- A long term investment which lasts normally between 5 to 10 years.

2- Financial Leverage (LEV) is (total liabilities / total assets) to measure the financial leverage of the enterprise
3- LEV*VC: the combined variable of financial leverage and dummy variable of VC
4- Operating Leverages (OPL): is operating profit changes divided by sales changes [15]
5- OPL*VC: the combined variable of operating leverage and dummy variable of VC

Control variables are as follows:

Size: The natural logarithm of company assets

Growth: (Sales revenue in year (t) – Sales revenue in year (t-1)) / (Sales revenue in year (t-1).

**Table 1:** Description of Research variables

| **Variables** | **Average** | **Median** | **Standard Deviation** | **Skewness** | ***Kurtosis*** |
|---|---|---|---|---|---|
| Companies growth changes | 1.08 | -0.13 | 31.16 | 16.70 | 394.60 |
| Operating Leverage | 0.62 | 0.93 | 1.86 | -11.89 | 220.13 |
| Financial Leverage | 0.31 | 0.27 | 0.20 | 0.77 | 3.14 |
| Corporate size | 6.1 | 6.11 | 0.74 | -0.29 | 3.15 |
| Tobin's Q ration | 1.31 | 1.06 | 0.97 | 3.6 | 29.49 |

## 5 Methodology

Research method, in terms of nature and content, is a correlation type using financial statement of the listed companies in Tehran Stock Exchange for the correlation analysis. This research will be carried out in an analogous- inductive framework. In order to discover the relation between the variables, the correlation method is used. Correlation research is a type of descriptive research. In this research, correlation between the concerned variables are examined. In case any correlation is found between those, the multiple regression models estimation will start. This research is of causal-comparative type (semi empirical), namely based on historic data (financial statement of the corporations). The statistical population of the research includes the primary and secondary holding and investment companies between 2001-2016. Since the population is limited, the statistical population has been concerned as a statistical sample and 73 companies have been selected, accordingly.

## 6 Data Analysis and Findings

Descriptive findings are shown in Table 1. Taking Table.1 into account, one can say most variables in this research have had positive skewness. This finding is in accordance with the results of most financial empirical studies which indicate an extra kurtosis in variables. Normal curve is slightly higher and slenderer, compared to natural condition. The objective of this research is to investigate whether VC, FL and OPL have any impact on Tobin Q ratio for listed companies in Tehran Stock Exchange or not. The results driven by statistical analysis for this hypothesis is mentioned in Table 2.The significance level of F-statistic is less than the test error level ($\alpha$=0.05), thus, H0 hypothesis, namely "regression model is not statistically significant" is not accepted and the model proved to be statistically significant. The relation between research parameters are linear. The adjusted coefficient of determination has been approximately obtained 55% which implies a considerable connection between dependent variable changes via independent variables.

**Table 2:** Summary of statistical result – first model

$$\text{Tobin's } q_{i,t}=\beta_0+\beta_1 VC_{i,t}+\beta_2 LEV_{i,t}+\beta_3 LEV*VC_{i,t}+\beta_4 OPL_{i,t}+\beta_5 OPL*VC_{i,t}+\beta_6 Size_{i,t}+\beta_7 Growth_{i,t}+\varepsilon_{i,t}$$

| Variables | Coefficients | Statistic- t | *Significance level* |
|---|---|---|---|
| Fixed | 3.17 | 1.71 | 0.08 |
| Venture Capital | 0.13 | 2.98 | 0.005 |
| Financial Leverage | -0.03 | -2.06 | 0.04 |
| Operating Leverage | 0.06 | 8.04 | 0.00 |
| Combined variable of VC*FL | -0.58 | -4.9 | 0.04 |
| Combined variable of VC*OPL | 0.007 | 1.002 | 0.85 |
| Growth ratio | 0.0001 | 0.54 | 0.52 |
| Corporate size | -0.32 | -1.09 | 0.27 |
| Coefficient of determination | 0.56 | | |
| Adjusted coefficient of determination | 0.55 | | |
| F-Statistic | 12.33 | | |
| F-Significance level | 0.00 | | |

## 7 Conclusion and Suggestions

In general, the obtained evidences of the study showed a reliability of 95%. Furthermore, FL was negatively correlated with Tobin Q ratio while OPL was positively related.VC had a positive relation with Tobin Q ratio and combined variable FL*VC was negatively correlated, in turn. Combined variables OPL and VC had also no impact on Tobin Q ratio. The impact of independent and control variables on dependent variable obtained 55% which is sufficiently considerable. Giving the above conclusion, it is suggested that:

Since the risk-seeking approach has positive effect on the company return, investors would therefore need to pay more attention to the firms which are considered as "Risk takers". Research results indicate the FL and OL in risk-taking firms more affect the return (Tobin Q ratio), compared to those of other companies. Thus, in Iran market, such considerations are to be taken into account during investment decision making.

## References


[1] Dahiyat A., *Does Liquidity and Solvency Affect Banks Profitability? Evidence from Listed Banks in Jordan*. International Journal of Academic Research in Accounting, Finance and Management Science, 2016, **6**(1), P.35–40.

[2] Asadzadeh H., *Study of financial leverage effect on profitability and ROE*, Master thesis, Islamic Azad University, Marvdasht Branch, 2014.

[3] Darabi R., Molaei, A., *Effect of variables of liquidity, inflation, capital protection and gross domestic product on profitability of Mellat Bank*, Financial science magazine, 2011, **10**, P.234-255.

[4] Fabozzi F.J., *Handbook of Finance, Volume 1, Financial Markets and Instrument*, Jong Wiley & Sons, 2008, P.561-573.

[5] Hosseini Z., *Defining of economic leverage degree power to sensitivity ratio test and company performance measurement*. Case study: Iran Khodro Diesel. PhD. thesis Islamic Azad University, Oloom & Tahghighat Branch, 2009.

[6] Hosseini Z., *Investigation of the Effect of Financial Leverage and Free Cash Flow on Diversification of Stocks and Financial Performance of Listed Companies*, Financial strategy journal, 2015, **24**, P.12-35.

[7] Jafar F., *Investigation of Financial, Operating and Combined Leverage and Their Effect on Adjusted ROE Based on Risk,* study samples: Tehran Stock Exchange listed companies. Conference of Management, 2013.

[8] Kashanipour M., Rasaeian A., *Review of Relationship Between ROE and Performance Evaluation Criterion*, Humanities and social science magazine, 2007, **25**, P.23-45.

[9] Leewillen W. G., Badernet S. G., *On the Measurement of Tobin`s Q*, Journal of Financial Economics, 1977, **44** (1), P.77-122.

[10] Nagi S., *Venture capital or private equity? The Asian experience*, Journal of Business Horizons, 2007, **50**, P.335-344.

[11] Qaderi K., Qaderi S., Qaderzadeh S.K., *Investigation of Liquidity Effect on Companies Profitability, bounds technic approach*, Accounting and Auditing Science Journal, 3rd year, 2014, **9**, P. 24-55.

[12] Salmab M., *Determinants of Capital Structure of Banks in Ghana: An Empirical Approach*, Baltic Journal of Management, 2015, **2**(1), P.67-79.

[13] Taleb T., *The study of relationship between liquidity and financial leverage on Return of Companies Listed in Tehran Stock Exchange (Automotive, chemical and pharmaceutical industry)*, master thesis, Islamic Azad University, Neishabour Branch, Humanities faculty, 2016.

[14] Tit, K., *Emerging markets clean up their act,* Journal of Euro money, 2006, **37**(442), P.158-160.

[15] Yang K. X., Hongxing W., *Venture capital, financial leverage and enterprise performance*, 2017, **3**(1), P.66-105.

[16] Zhang J., *The Relationship Between Working Capital Management and The Corporate Cash Holdings*, University of Eastern Finland, Faculty of Social Sciences and Business Studies, Master's thesis, 2011, **67**, P. 223-245.