

## EFFECT OF IT CAPITAL ON FUTURE EFFICIENCY IN CAPITAL MARKET

Meysam ghaderi\*

Dr.Mohsen Hamidian\*\*

Dr.Hossein Jabbar\*\*\*

### **Abstract**

In this paper, the relationship between IT capitals with future efficiency of the company in capital market is investigated. Independent variables of the research include IT capital and dependent variable is the future efficiency of the company. Capital duration, invested capitals, company size and financial leverage are control variables of research. To carry out this research, one hypothesis are considered and tested. Research methodology is applied and statistical method includes regression model of regular least squares. Statistical population includes 50 companies in capital market during 2009 – 2013. Results of research hypotheses tests reveal that company efficiency increases with improvement in IT capital .Other results illustrate that IT capital has the most contribution to future efficiency of companies and in this regard, subsets of intellectual and communication capitals have the most effect.

**Keywords:** return on equities, IT capital,Capital market, future efficiency

\* Department of accounting, Electronic Branch, Islamic Azad University, Tehran, Iran

\*\* Department of accounting, South Tehran Branch, Islamic Azad University, Tehran, Iran

\*\*\* Department of accounting, Kashan Branch, Islamic Azad University, Kashan, Iran

## Introduction

Today, using various tools such as computer, email and fax, IT provided personnel with opportunity to be able to do their jobs in parts of engineering, financial, design and other divisions of an administration from home and transfer the outcome of their works to office through available systems.

In general, IT refers to using tools of administration and information management including tools and services which are used for production, storage, processing, distribution and exchange of information. From another viewpoint, IT implies to technology based on computer and internet for providing information and communication services to a wide range of users. Therefore, IT is one of the important tools for extending marketing and new services to companies in modern digital economy. Planned investments in the field of IT are along with company goals as well as its size and structure leading to facilitation of activities between various parts, time and costs. Hence, it can be expected that efficiency of companies is affected by IT. According to what stated above, IT can be considered as a driver which result in growth and dynamism of company and establishment of a new type of economy which is known as knowledge-based economy.

According to results stating that there is a difference between market value of companies and whatever they register in their bookings, it is generally accepted that one of the reasons for such difference is the presence of intangible assets which are not included in balance sheet of companies. One of the intangible assets is intellectual property. It is the main cause of making value for companies and companies are moving toward making value through intellectual property of companies. In fact, previous viewpoint of managers about making value by means of physical assets has changed. Intellectual property is one of the appearing topics in companies accounting and is already evolving. In today's competitive economy which is based on modern market accompanying with rapid international changes and revolutions and leading to transition from industrial community to an information one, intellectual property is considered as the driver of economic development which can play a pivotal role in economic growth of companies and consequently countries as well as employment and social welfare. Marr (2004) introduces intellectual property as a set of knowledge properties belonging to company which leads to improvement in value of companies and is classified into three classes: customer capital, organizational capital and innovation capital. Such capitals are form properties which greatly contribute to the success of each company. However, they have no place in balance sheet and financial document of companies and this increases the necessity of managing them.

Therefore, the main question of research is that:

Can IT capital be effective for improving future efficiency of companies?

## Literature review

- Mediations et.al (2010) carried out a research to investigate the effect of intellectual capital on market value and financial efficiency of the companies. Results illustrated that there is only a significant relationship between human capital and one of the criteria of financial efficiency; that is efficiency of capital. However, there is no significant relationship between other criteria of financial efficiency (income growth and return on asset) and human capital. Moreover, other results revealed that no relationship can be considered between intellectual capital and its components with market value.
- Chang and Hsieh (2011) investigated the relationship between components of intellectual capital and three operational, financial and market performance in Taiwan stock market in electronic industries. To measure intellectual capital, moderated factor of intellectual capital added value model is used. Results reveal that operational performance has a positive relationship with investment and no relationship with structural and human capital. Furthermore, components of intellectual capital have negative relationship with market performance and financial performance. Costs of research and development have positive relationship with three performances. However, intellectual capital has only positive relationship with operational performance.
- Rey et.al (2012) explored the effect of IT on company efficiency. By assuming normal combination of companies and diversity of equities along with components of intellectual capital, they concluded that IT has a positive and significant relationship with efficiency of studied companies.
- Khani et.al (2014) investigated the relationship between research and development costs and return on equities. To test hypotheses, two models; Fama and Macbeth and Fama and French were used. Statistical population includes 27 pharmaceutical companies listed in Tehran stock market during 2003-2011. Statistical model used in this research includes multivariate regression model. Results of hypotheses test reveal that there is no significant relationship between R&D costs and return on equities. Moreover, no significant relationship was found between these costs and risk coverage portfolio.

## Research hypothesis

**Main hypothesis:** there is a significant relationship between IT and future efficiency of company.

**1<sup>st</sup> hypothesis:** there is a significant relationship between IT capital and future efficiency of company.

## Research methodology

This is a semi-empirical research in the context of confirmatory works on accounting based on real information in financial bills of companies. Moreover, it is correlative and data collection

method is descriptive. Research methodology is after event and since it can be applied for the process of using information, it is an applied research. To carry out the current research and collect data, library method was used. To test research hypothesis and their analysis, SPSS and Eviews ver. 7 and multivariate linear regression was used.

### Statistical population and sample of research

Statistical population of current research includes all investing companies, banks, post, telecommunication and insurance during 2009-13. To select sample, systematic eliminatory sampling method is used. In this way, among all available companies, those which lack the following specifications will be disregarded and other companies will be selected as sample:

1. Are listed in Tehran stock market before 2009.
2. Their financial year ends to March 20.
3. They have no activity change or change in financial year during study period.
4. Their research data are accessible.

After considering above cases, 50 companies (250 data year – company) which meet all criteria were selected as statistical sample.

### Models of hypothesis test

Model which are used to assess the research hypotheses are as follows:

$$R_{it+1} = \beta_0 + \beta_1 \text{IT Capital}_{it} + \beta_2 \text{Lev}_{it} + \beta_3 \text{Age}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{Invest}_{it} + \varepsilon_{it}$$

### Research variables and their measurement

In this section, all independent, dependent and control variables corresponding to research, method of measurement and operational definition of them will be provided.

#### Dependent variable

Dependent variable of this model is the future efficiency of the company. Criterion used for the measurement of company's future efficiency is the return on equities.

Actual return on equities in this model is the future efficiency of company. It is the rate of return achieved in a period for stockholders. It can be measured as follows:

1. If the company has no investment increase and equities separation in the period, to measure the return on equities, following relationship will be used:

$$R_{it} = \frac{P_{it} - P_{i0} + DPS_{it}}{P_{i0}}$$

Where,

- $R_{it}$  is the Rate of return on equity  $i$  at the end of year  $t$
  - $P_{it}$  is the price of equity  $i$  at the end of year  $t$
  - $P_{i0}$  is the price of equity  $i$  at the beginning of year  $t$
  - $DPS_{it}$  is the cash profit of equity  $i$  in year  $t$
2. If the company increased its capital through depositions or cash flow, to measure the return on equities, following relationship will be used

$$R_{it} = \frac{(1 + X + Y)P_{it} - P_{i0} - Y P_{ni} + DPS_{it}}{P_{i0} + Y P_{ni}}$$

Where,

- $R_{it}$  is the Rate of return on equity  $i$  at the end of year  $t$
- $P_{it}$  is the price of equity  $i$  at the end of year  $t$
- $P_{i0}$  is the price of equity  $i$  at the beginning of year  $t$
- $P_{ni}$  is the nominal value of equity  $i$
- $DPS_{it}$  is the cash profit of equity  $i$  in year  $t$
- $X$  is the percent of increase in capital through depositions
- $Y$  is the percent of increase in capital through debts and cash flows

### Independent variable

#### IT capital

It is calculated from overall hardware and software assets of the company. Since information corresponding to investment in computer hardware, network and so on is not available in notes attached to the financial bills and since tourism standard of Iran is classified in investment on hardware and fixtures and furniture of the table of constant assets, by considering such limitation, investment on IT will be calculated as follows:

IT investment = (fixture and furniture at the end of year+ other software assets at the end of year)  
- (fixture and furniture at the beginning of year+ other software assets at the beginning of year)

To make the model homogenized, investment on IT is divided by assets of the beginning of the year.

#### Control variables

In this work, some variables are used as follows to control the effect of variables which can affect the relationship between independent and dependent variables and are the same in all models (Rey et.al, 2012).

### Capital duration

Capital duration is calculated by dividing the gross assets and machineries by depreciation:

$$\text{capital duration} = \frac{\text{gross assets and machineries}}{\text{depreciation}}$$

### Investment cash

Invested cash is obtained by dividing company investment by sales:

$$\text{invested cash} = \frac{\text{company investment}}{\text{marketing revenue}}$$

### Company size

Company size is the natural logarithm of all assets which is included in model to control the size.

### Financial leverage

Financial leverage is calculated by dividing debts by shares of stockholders.

$$\text{financial leverage} = \frac{\text{all debts}}{\text{shares of stockholders}}$$

### Results

Table 1 represents the descriptive statistics corresponding to research variables.

Table 1: descriptive statistics of research variables

Skewness	Standard deviation	Mean	Max	Min	No.	Variable
0/351	0/525	0/386	0/998	-0/32	250	Future return on equities
0/980	0/283	0/075	0/215	0/008	250	IT capital
1/399	0/215	0/157	0/387	0/009	250	Invested cash
0/866	0/315	0/587	1/854	0/037	250	Financial leverage
1/742	1/214	23/124	76/012	6/952	250	Capital duration
1/568	1/425	26/425	29/425	23/161	250	Company size

### Inferential statistics

To investigate and understand the role of information asymmetry on evaluation errors made by investors and to test research hypothesis, first model of linear regression which is used for estimation of parameters using regular least squares method was fitted with tabular data. In what follows, results of the following model will be analyzed.



### Test of first secondary hypothesis

This research includes one hypothesis as follows:

**1<sup>st</sup> hypothesis:** there is a significant relationship between IT capital and future efficiency of company.

This hypothesis tries to investigate the significance of the effect of IT capital on future efficiency of the company.

### Data analysis

First, to be able to use regression analysis and approve research results, it must be determined that essential assumptions of regression including normality of residuals, their independence and collinearity of independent variables apply. Results are summarized in table 2 whose interpretation is presented below:

- a) First of all, it must be determined that data are normal or not. To test the normality of residuals, Jark Bra testing will be used. The value of probability corresponding to JarkBra testing is as much as 0.175 which is higher than 5%. Therefore, with 95% confidence, normality of data is approved.
- b) To investigate the independence of residuals, Durbin – Watson statistic is used. The value of DW test is 1.754 and according to being in [1.5-2.5] interval, independence of residuals is approved.
- c) To study the collinearity, variance analysis is used. Since the value of test is less than 5, there is no problem of collinearity between independent variables.

According to confirmation of above hypotheses, results obtained from fitted model are reliable.

### Chow test

First, to determine that whether combined data or tabular ones can be used, Chow test is used. Results of test are provided in table 3.

Table 2: results of Chow test

Significance level	F-test
0/637	1/695

As can be observed, significance level of the test is 0.637 higher than 0.05. Therefore, null hypothesis based on using combined data is approved and it is necessary to estimate the model in this way. As such, there is no need to Hausmann test.

### Results of regression analysis

Results of the 2<sup>nd</sup> model of research are summarized in table 3.

Table 3: ANOVA results

VIF	P-value	t-test	Standard error	beta	Independent variable
	0/381	-0/875	0/296	-0/259	Intercept
1/954	0/027	3/115	0/026	0/278	IT capital
3/178	0/045	2/005	0/0002	0/0004	Organizational capital
1/651	0/004	2/902	0/021	0/061	Communication capital
1/763	0/044	2/017	0/012	0/024	Innovation capital
1/983	0/752	0/315	0/008	0/002	Invested cash
2/213	0/408	0/827	0/082	0/068	Financial leverage
3/450	0/505	0/667	0/026	0/017	Capital duration
2/851	0/019	2/344	0/006	0/014	Company size
1/754	DW		0/446		Determination factor
0/017	F-test		7/421		F-test
0/175	JB-test		3/483		JB test

Value of f-test and its level of significance in ANOVA table illustrates the significance in 95% confidence level. Coefficients of fitted model show that about 44.6% of future efficiency changes in studied sample of the research are explained by independent variables.

Coefficient of independent variable of IT is equal to 0.278 and its significance level is as much as 0.027 which is less than 5%. Therefore, coefficient of independent variable of IT is positive and significant. It means that 1<sup>st</sup> secondary hypothesis is approved with 95% confidence level.

Ascending rate of technological changes, complexity and turbulence and movement toward global economy are characteristics of business in modern world. In addition, commercial competition is continuously increasing. Consequently, companies and profit institutions changed their operational models by means of innovative approaches supported by IT such as E-Commerce, mass customization, management of relationship with customer and so on whose outcome is improvement in company productivity and profit growth.

Results are in accordance with that of Rey et.al (2012), King et.al (2009), Farazmand et.al (2013) and Hoseini et.al (2012).

### Conclusion

Planned investments in the field of IT along with company goals and in accordance with size and structure of company resulted in improvement in activities of the various divisions as well as time and costs. This caused the efficiency of companies to be affected increasingly by IT and to be dependent upon it. In addition, intellectual capital is one of the intangible values which alter financial bills of companies and this is what directs organizations toward achieving competitive



advantages and superior financial return and illustrates the fact that nowadays, resources of financial value are the outcome of intellectual capitals not materialistic production.

According to results of 1<sup>st</sup> hypothesis, it is recommended that company managers must concentrate mainly on investing on IT and by its effective management; they can contribute to improvement of the future efficiency of companies. Regarding results of the remaining hypotheses, it can be suggested that managers and investors pay more attention to the highlighted role of intellectual capital and its components in improving physical capitals and by means of strengthening such investments, they can pave the way for future progress of their companies.

In addition, recommendations for future research include: study of the relationship between IT and intellectual capital and non-financial performances such as customer and personnel satisfaction, relationship between IT and intellectual capital and performance using efficiency criteria, relationship between IT and intellectual capital and performance using measurement criteria for IT and intellectual capital, prediction of the future efficiency by means of IT and intellectual capital through intelligent networks (neural network and fuzzy method and so on).

## References

- Khani, A., Ghajavand, Z., (2012), "effect of market competition range on the relationship between information asymmetry and costs of equities", financial accounting research magazine, 4<sup>th</sup> year, pp. 67-88
- Rahimian, N., Hemmati, H., SoleimaniFard, M., (2012), "investigation of the relationship between profit quality and information asymmetry in companies listed in Tehran stock market", accounting knowledge, 3<sup>rd</sup> year, vol. 10, pp. 157-181
- Mousavi Shiri, M., Khalatbari, H., Vaghfi, H., (2012), "effect of evaluation of equities on profit management", accounting knowledge, 3<sup>rd</sup> year, vol. 9, pp. 143-163
- Nourvash, I., Hoseini, A., (2009), "investigation of the relationship between disclosure quality (reliability and being on-time) and profit management", accounting and survey studies, vol. 55, pp. 117-134
- Badertscher, Brad A., (2010), "Overvaluation and Its Effect on Management's Choice of Alternative Earnings Management Mechanisms", The Accounting Review. Vol.86 (5), PP 1491-1518.
- Badertscher, Brad A., D. W. Collins, and T. Z. Lys., (2012), "Earning Management and the Predictive Ability of Accruals With Respect to Future Cash Flows", Journal of Accounting and Economics. Vol.53 (1-2), PP 1-488.
- Bhattacharya, N., H. Desai, and K. Venkataraman., (2010), "EarningsQuality and Information Asymmetry: Evidence from Trading Costs", Under Review in Second Round at Contemporary Accounting Review.

Brown, S., S. A. Hillegeist, and K. Lo., (2009), "The Effect of Earnings Surprises on Information Asymmetry", Journal of Accounting and Economics. Vol.47 (3), PP 208-225.

Cai, J., L. Yixin, and Q. Yiming., (2008), "Information Asymmetry and Corporate Governance", Available at: <http://ssrn.com>, Available online 30 June 2009.

Chi, J., M. Gupta (200), "Overvaluation and Earning Management", Journal of Banking and Finance. Vol.33 (9), PP 1652-1663.

