



Uluslararası Sosyal Araştırmalar Dergisi

The Journal of International Social Research

Cilt: 9 Sayı: 46 Volume: 9 Issue: 46

Ekim 2016 October 2016

www.sosyalarastirmalar.com Issn: 1307-9581

## EFFECT OF INTELLECTUAL CAPITAL AND SPECULATIVE ACTIVITIES ON MARKET VALUE

İ. Emre GÖKTÜRK\*

H. Serdar YALÇINKAYA\*\*

### Abstract

Purpose of this study is to investigate and to discuss the methods to distinguish the intellectual capital, one of the important structures of market value of enterprises, from its market value which will occur in a speculative way.

When we mention about the firm value, we face with very different value concepts. For example: book value, market price, and specified value (theoretical value) etc. These value concepts contain very different meanings. For an investor operating in the capital markets, these concepts have rather a complex structure. What underlies these concepts? Also where does intellectual capital start and end? Are the prices forming in the stock markets true? How are they speculative? In order to answer to these questions, these concepts will be explored; also intellectual capital and its speculative value will be determined based on data of elected enterprises operating at Istanbul Stock Exchange (BIST).

General behaviors of investors  $g_r$  (real FCFE growth rate) and  $g_t$  (theoretical FCFE constant growth rate) became different according to data of Arçelik I.C. Investors generally perceive the future as either very optimistic or very pessimistic. Investor and theoretical values became close to each other only in 2012 year. In particular, the investors showed a quite pessimistic approach in and after 2008 and until 2012. It is believed that mortgage crisis that occurred in 2008 causes that. Even if the firm has a good FCFE performance in this period, the investors have estimated a lower growth rate even a negative growth rate.

**Keywords:** Intellectual Capital, Company Value, Market Value.

### 1. Introduction

Especially firm value and measurement of firm value is one of the most important issues of the financial markets. Firm value is a concept that can be described in quite different ways.

Accurate measurement of the market value is of a vital importance. The firm value that cannot be measured in a correct way causes many interest groups to make mistakes and therefore it leads firstly financial crisis and later economic crisis due to losses arising from these false actions.

Firm value is a very important value used both in enterprises operating at the stock exchange and unlisted enterprises. Firm value provides information to enterprises to determine the investment performance of firm. The determination of firm value that is an important value for investors at the same time influences the decisions related to purchasing stock certificates of enterprises operating at the stock exchange through public offering. In this case, the market value of firm should be calculated realistically to esteem how the prices forming in the market reflect the truth. Otherwise risk to be taken by investor will be more than expected.

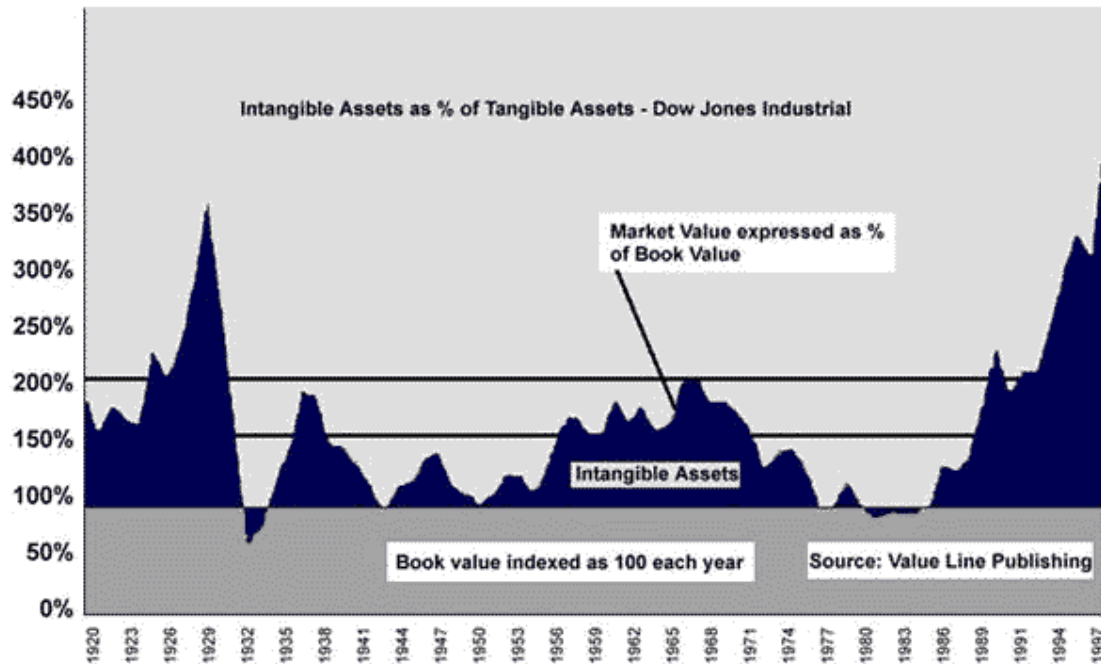
An important objective of the financial valuations of firms is to provide the increase of their current values in a realistic way by using their visible and invisible assets in the most efficient way in determination of their finance, investment and dividend policies. The current market value is a value appraised by fully-equipped and full knowledgeable individuals who are willing get into the market as both buyer and seller without any pressure (Copeland, Koller, Murrin, 1996: 3). Matter to be taken into consideration by enterprises in creation of current value is the question; "how does this value forming in the market reflect the truth? To determine how intellectual capital and speculative elements affect the market values is one of the major problems faced by enterprises at this stage.

Figure below belongs to Dow Jones Industrial Index at New York stock market which we can show as an example of developed markets in the world. Figure 1 show us in recent years the importance of the intellectual capital change and also it shows that it is imperative to research the difference between market value and realistic value of the intellectual capital.

\* Asst. Prof.Dr, Necmettin Erbakan University, iegokturk@gmail.com

\*\* Asst. Prof.Dr., Necmettin Erbakan University, syalcinkaya@konya.edu.tr

Figure 1: Average MV / BV ratios occurring at Dow Jones Index between 1920-2000 years.



Source: <http://www.sveiby.com/articles/EmergingStandard.html>

While the book value of 100% is given in this figure, the curve shows the market value of book value shown as %. Sections established between MV / BV curve and book value shows the assets of enterprise that we can define as the intellectual capital. It is accepted that the most important change after the 1929 economic crisis is the very important differences composed in market value after the information intensive technology after 1980's in the markets is started.

It is accepted that investors basically exhibit rational behaviors in determining the firm value and therefore valuation model is created based on this assumption. The basic reason of these models is that firm value consists of sum of present value of cash flows in the future. The main factors affecting the value of the firm are specified below;

- Cash to be gained by firm in the future
- Rate to be used in discount of cash in accordance with the present value
- The average growth rate of cash flows of investor to be occurred in the future

Cash flow will provide the future relationship between the company and the risk incurred by investors for the realization of this cash flow will determine the value of the company. At the same time the risk the company will be the fundamental basis of cash flows which will be generated in the future and the company's assets that have endured to this day will be a risk that in the future the most effective way to convert in to cash (Akgüç, 1998).

The basic reason of cash flows to be gained by the firm in the future is the possibility of turning assets of firm into cash in the future. This situation is not only arisen from firm's tangible assets but also from the firm's intellectual accumulation. Intellectual accumulation expressing the invisible assets of enterprise in the balance sheet can be defined as a positive difference between market value and book value of enterprise.

While reduction ratio to be used to reduce the cash to present value is determined, CAPM model is being used and the most important element here is to calculate the cost rates of funds used in this model.

Another important element of valuation is the growth rate of cash flows in the future. In determining this ratio, investors cannot achieve to act fully rational. The reason for this is the full obscurity of factors that will affect the cash flows which will occur in the future. Investors cannot use a model for the determination of these growth rates.

In this study we are going to examine the size of the relationship between the real growth rate of the cash flows of firms and investor's probable estimations.

## 2. Intellectual Capital

Dynamic structure established by competition in firms producing information intensive change and transformation makes the consideration of intellectual capital existing in the firms obligatory but increases the value when used. Companies failing to perceive this value cannot capture the transformation and change in this dynamic structure and cannot create value added and are not able to maintain their existence in the

sector. Intellectual capital in the scope of the existing structure must be revealed and developed by means of defining intellectual capital in the enterprises (Lynn, 2000).

Intellectual capital has become popular as a concept in the scientific world through the article named as "Brain Power: How does intellectual capital become the most valuable asset in America" and written in 1991 by Tom Stewart, one of the authors of Fortune Magazine. According to Stewart, intellectual capital is expressed as anything that will provide a competitive advantage for enterprise in the market and owned by enterprise's employees (Liebowitzjy, 1995). Stewart expresses the intellectual capital in another article written by him in 1997 as an intellectual knowledge suitable for use and obtained as an element increasing the welfare level in the enterprises. Intellectual knowledge can be defined here as a combination of information, knowledge, intellectual property and experience (Marquardt and Loan, 2006).

When this subject is asked to relevant experts, each of them can give different answers and make different definitions. In definition made by OECD, intellectual capital is defined as the economic value of the intangible assets of firms (Erikson and Nerdrum, 2001). In this definition, intellectual capital's structure that creates a value could not be fully explained. In another definition, intellectual capital is expressed as the ability to convert the new ideas into products and services by firms and pricing offered in this subject by investors (Ercan Öztürk and Demirgüneş, 2003:). As it is understood, intellectual capital for investor underlies the cash flows to be gained by firms in the future. The power of the intellectual structure of the firms affects the market value of firms.

When intellectual capital is considered from the viewpoint of finance, it is defined as difference between book value belonging to the firm and the value of the share certificates belonging to the firm and emerging in the market against this book value (Brooking, 1997). It will be especially useful to put emphasis on positive difference used in this definition. Market value will be important for the firm as long as it will be converted into profit. Alternative differences to be provided by enterprise compared to rival firms operating in the market in the process of converting the market value of firm into profit are the most important point that will enable the firm to make profit.

Company used in the process of converting the output of the raw material by determining the information that differentiates them from other businesses to portray it as a value and benefits to be provided in accordance with the value of the competitors will create added value to the business is transformed in to the intellectual capital value(Lynn, 2000).

Identification of intellectual capital and understanding abstract concepts for assets due to a very difficult issue. The concept of intellectual capital and intangible assets in some literature, knowledge-based assets, special assessment, human capital, intellectual assets are used as. Obviously these concepts are clearly not define intellectual capital to close to each other and are interrelated concepts.(Mehralian G. etc., 2012).

In accordance with the common expressions of the intellectual capital definitions we have already stated above, it is seen that we mention from a structure that processes and assets composing a value in a company but becoming difficult to detect through current accounting methods can be determined via some modern accounting methods and also we mention from a structure that contains licenses, patents, intangible assets and the sum of the data obtained from all of the stakeholders associated with the company (Carroll and Tansey, 2000). Intellectual capital includes assets do not appear on the balance sheet. Meter measured the unseen. People are a study conducted to demonstrate the relationship between ideas and information. Therefore, intellectual capital is not one thing or one goal, is a matter for the relationship (Edvinsson and Malone, 1997).

When this structure influencing the value of the firm is analyzed in a detailed way, it is understood that it consists of several sub-groups. Human capital that is composed as a result of using of knowledge, skills, abilities and creative capacity of individuals working in the enterprise at the highest level and that contains values such as professional competence, know-how, training, knowledge accumulation, problem solving skills, entrepreneurship, leadership and invention (Guthrie, 2001) and that may also be expressed as brainpower that consists of three elements such as structural capital that differs from enterprise to enterprise and contains the information technologies, the culture of the organization, relationship of financial system, patents, copyrights, trade secrets, etc. without being connected to the employees (Önce, 1999; Yereli and Gerşil, 2005) and customer capital that provides the suppliers that will ensure necessary inputs in a quality way and continuously in order to maintain the company's production process in desired characteristics and that will offer the efficient output and that will be established as a result of organizational value composed by individuals who were included in this process.

Businesses that can not be obtained from the balance sheet and the intellectual capital expressed as the sum of the invisible presence of the most important handicap in being visible and measurement issues are occurring. Again, however, especially in the intellectual capital of the company increases or decreases occur in the future, it is possible to make measurable and may appear (Ross and Ross, 1997) . Determine the

increase and the decrease can be named as intellectual performance will contribute to the determination of the market value of the company.

### 2.1 Valuation Models According to Reduced Cash Flows

Market value is the value occurring between people who launch the share certificates belonging to firm to market at the stock market environment and people who request these share certificates. Valuation models according to reduced cash flows are defined as the sum of present values of cash flows to be carried out by individual (investor) who requests these share certificates based on firm or equity capital. Valuation methods that base on the reduced cash flows need to estimate many factors such as sale volume and increase, expenses related to the activities, working capital, fixed investment amount and capital cost for next years. Things estimates should be identified properly and if cyclical period taking into account seasonal variations can be made in a healthy manner with the minimum error (Copeland, etc., 1996). Estimations should be realistic and should not contradict with each other. Errors to be made in the estimations lead to significant changes in firm value; approaches and qualifications of analysts are extremely important (Ercan and Üreten, 2000).

Intellectual capital that we may accept as the most valuable asset of enterprises has become an important competitive weapon recently. Utilization of this power for firms needs to be able to determine the exact assets owned by them (Roos and Roos, 1997). It is difficult to measure the intellectual capital since it forms from intangible assets. Various approaches and models are produced to ensure that firms can determine their intellectual capitals and thus reveal the objective performance measurements that will provide a competitive advantage for firms (Lavie and Miller, 2008).

One of these models is valuation models established according to the reduced cash flows. According to this model, company value is the net present value reached by means of reducing of cash flows planned to be obtained due to assets owned by the company in accordance with today's conditions using discount rate containing the expected risks that will arise in the future ( Damodaran, 2007).

The main types of these valuation models are as following;

- Free Cash Flows Belonging to Equity Capital (FCFE)
- Free Cash Flows Belonging to Firm (FCFF)

#### Free Cash Flows Belonging to Equity Capital (FCFE)

This model is very similar to the pattern related to reduction of free cash flow dividends belonging to equity capital. It is formed as a result of reduction of dividends depending on change in dividend distribution policies of firms. In the valuation model, FCFE is calculated based on balance sheet and income statement of the firm and estimations are made for the next periods. Calculated cash flows are discounted by the cost of equity capital in accordance with today's conditions. The sum of the discounted cash flows is firm's intrinsic value and it should be very close to market value (Ercan and Üreten, 2000).

Calculation and valuation model of FCFE are as follows:

FCFE = Net profit  
 + Depreciations  
 – Capital Expenditures  
 – Δ Working Capital  
 – Principal Repayments  
 + New Debts

$$P = \frac{FCFE_1}{k_e - g} = \frac{FCFE_0 \times (1 + g)}{k_e - g}$$

P: Firm Value

FCFE: Free Cash Flow Belonging to Equity Capital

$k_e$ : Equity Capital Cost Ratio

g: FCFE Rate of the growth at next periods

The most difficult aspect of this model, calculation and application of which are quite easy is to calculate the cost of equity capital and continuous growth rates. CAPM model is used to calculate the equity capital cost ratio, but in calculation of continuous growth rate, the experience and abilities of the individual who applies this model come to the forefront.

The individual or investor who makes the valuation sometimes fails to act rationally at this point. We believe that the difference between the market value of the firm and the intrinsic value of the firm stems from this situation. If individuals who perform the valuation make rational choices, continuous growth rate should be similar to realized ratio. If individuals who perform the valuation fail to act rationally, the difference between the two rates will increase.

### Free Cash Flows Belonging to Firm (FCFF)

In this model, firm value is found by means of reducing of total debts of the firm after calculation of the current total value of net cash flows of the firm. But the discount rate is not equity capital cost rate, it is the weighted average cost of the firm's total resources.

The calculation of net cash flows of the firm is carried out as specified below (Ercan, etc. 2003):

FCFF = EBITDA (1-Tax)

+ Depreciations

– Capital Expenditures

– Δ Working Capital

$$P = \frac{FCFF_1}{k_w - g} = \frac{FCFF_0 \times (1 + g)}{k_w - g}$$

P: Firm Value

FCFF: Free Cash Flow Belonging to Firm

$k_w$ : Weighted capital cost rate

g: FCFF Rate of the growth at next periods

### Application

There are many models developed to determine the irrational structure on market value of firms operating at the stock exchange. These models are complex and difficult to understand. The main objective is to provide investors with the ability to understand these matters easily and give correct decisions comprehending the degree of irrationality on firm value.

It is believed that market value of the firm will reach to firm's intrinsic value (theoretical) as a result of arbitrage activities performed by rational investors. However, the market values of the firms at the stock exchange take a value beyond intrinsic value. In model to be created, it is aimed to calculate the constant growth rate and realized constant growth rates in reducing model (FCFE) the free cash flows belonging to equity capital used to determine the intrinsic values of the firms and to determine the difference between them (Kaviani and Meysam, 2013).

### Data Set

In this study, annual balance sheet and income statement data belonging to 2004 -2014 years of Arcelik I.C. operating within Istanbul Stock Exchange (BIST) 30 index is used. Also inflation rates, public borrowing interest rates and rates of return of capital market are taken from website of Turkey Statistical Institute (TUIK) as data.

### Model

It is adopted that FCFE model will be used in calculation of firm value considered for rational investments to be carried out by the firm and accordingly continuous growth rate is calculated of free cash flows belonging to equity capital that will be reached to market value of the investors with the help of this model. In addition, real growth rates of FCFEs in the given periods are calculated by formula numbered 2. The difference between these two rates will be an indicator to determine whether investor gives irrational decision or not.

$$g_i = \left( \frac{(P \times k_e) - FCFE_0}{P + FCFE_0} \right) \quad (1)$$

P: Market Value of the Firm

FCFE: Free cash flows belonging to equity capital

$k_e$ : Equity Capital Cost Ratio

$g_i$ : FCFE Rate of the growth at next periods

$$\left[ \frac{[(FCFE)_1(n+1)] - [(FCFE)_1(n)]}{[(FCFE)_1(n)]} \right]$$

$$g_r = \quad (2)$$

$g_r$ : FCFE Rate of the growth at next periods

$$i = g_i - g_r \quad (3)$$

i: irrational rate

### Discussion & Conclusion

In this study, a model is set to determine how investors converge to the intrinsic value or move away from intrinsic value. When creating this model, FCFE valuation model is used and infinite term growth in g rate is accepted. Of course, there are some limitations of the valuation model used in this study, but despite

all the constraints it gives a general idea about how the investors move away from intrinsic value. Behavior of the investors can be analyzed by using different valuation models and the scope of this study will be expanded later.

General behaviors of investors  $g_r$  (reel FCFE growth rate) and  $g_i$  (theoretical FCFE constant growth rate) became different according to data of Arçelik I.C. investors generally perceive the future as either very optimistic or very pessimistic. Investor and theoretical values became close to each other only in 2012 year. In particular, the investors showed a quite pessimistic approach in and after 2008 and until 2012. It is believed that mortgage crisis that occurred in 2008 causes that. Even if the firm has a good FCFE performance in this period, the investors have estimated a lower growth rate even a negative growth rate.

**Table 1: Model Data Set**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Net profit	293.201.000	312.153.000	324.147.000	157.765.000	6.556.000	503.026.000	549.247.000	541.087.000	551.688.000	622.695.000
Amortization (+)	143.557.000	149.809.000	156.308.000	144.487.000	166.090.000	181.553.000	192.538.000	217.834.000	260.788.000	302.181.000
Capital Expenditures (-)	78.328.000	483.509.000	495.364.000	217.435.000	148.500.000	-	304.617.000	590.584.000	327.571.000	263.013.000
Change in net working capital (-)	129.060.000	150.498.000	-	-	350.028.000	-	1.015.726.000	1.188.631.000	283.687.000	772.321.000
Principal Payments (-)	83.128.000		208.061.000	347.260.000	0	454.307.000	0	0	0	0
New Obligations (+)	349.919.000	330.120.000	1.231.454.000	278.579.000	642.929.000	188.035.000	1.068.544.000	1.632.087.000	754.806.000	971.242.000
FCFE	496.161.000	158.075.000	1.424.606.000	571.638.000	220.949.000	125.440.000	406.218.600	611.793.000	956.024.000	860.784.000
Number of Shares	399.960.000	399.960.000	399.960.000	399.960.000	399.960.000	675.728.000	675.728.000	675.728.000	675.728.000	675.728.000
FCFE per share	1,24052655 3	0,39522702 3	3,56187118 7	1,42923792 4	0,55242774 3	0,18563682 4	0,60115697 4	0,90538352 7	1,41480596	1,2738616 72
R (f)	0,2459	0,1637	0,1777	0,1827	0,1768	0,2166	0,1126	0,0768	0,0911	0,0789
R (o)	0,223	0,1216	0,2333	0,0637	0,0556	0,1842	0,178	0,1667	0,073	0,0728
Inflation	0,086	0,0818	0,096	0,0876	0,1044	0,0625	0,0857	0,0647	0,0889	0,0749
β	1,026	1,017	1,036	1,0622	0,8972	0,9600	1,1171	1,036	1,0025	1,0289
R (e)	0,2224046	0,1208843	0,2353016	0,0562982	0,06805936	0,185496	0,18565834	0,1699364	0,07295475	0,0726237 1
Reel R(e)	0,12560276 2	0,03612895 2	0,1271	-	-	0,11576094 1	0,09206810 4	0,09884136 4	-0,0146434	-
P	3,9857	4,1409	5,4518	5,51	2,6033	2,4909	6,2782	6,3691	8,4667	11,9392
g(r)		801,22%	-59,87%	-61,35%	-66,40%	223,83%	50,61%	56,27%	-9,96%	
g(t)		2,75%	-37,33%	-10,50%	-19,88%	-10,00%	1,83%	-4,39%	-5,85%	-10,96%
I		-798,47%	22,54%	50,84%	46,52%	-233,83%	-48,78%	-60,65%	4,11%	

## REFERENCES

- AKGÜÇ, Öztin (1998). *Finansal Yönetim*, İstanbul: Avcıol Basın Yayın,
- BROOKING, Annie (1997). "The Management of Intellectual Capital", *Journal of Long Range Planning*, Vol: 30, No: 3. pp. 364-365
- CARROLL, Ray F., TANSEY, Richard R. (2000). "Intellectual Capital in the New Internet Economy", *Journal of Intellectual Capital*, Vol. 1, No: 4, pp 296-312
- COPELAND, Tom, KOLLER, Tim, MURRIN Jack (1996). *Valuation Measuring and Managing The Value of Companies*, New York: John Wiley & Sons Inc
- DAMODARAN, Aswath (2007). "Valuation Approaches and Metrics: A Survey of the Theory and Evidence", *Foundations and Trends in Finance*, Vol. 1: No. 8, pp 693-784.
- ERCAN, M. Kamil., ÖZTÜRK, Başaran, DEMİRGÜNEŞ Kartal (2003). *Değere Dayalı Yönetim ve Entelektüel Sermaye*, Ankara: Gazi Kitabevi
- ERCAN, M. Kamil, ÜRETEK, Aykan (2000). *Firma Değeri*, Ankara: Gazi Kitabevi
- EDVINSSON, Leif, MALONE, Michael (1997). *Intellectual Capital: Realising Your Company's True Value By Finding Its Hidden Brainpower*, First Edition, NY: Harper Collins.
- ERIKSON, Truls, NERDRUM, Lars (2001). "Intellectual Capital: a Human Capital Perspective", *Journal of Intellectual Capital*, Vol.2, No.2, pp.127-135
- GUTHRIE, James (2001). "The Management, Measurement and the Reporting of Intellectual Capital", *Journal of Intellectual Capital*, Vol: 2, No: 1. pp 27-41
- <http://www.sveiby.com/articles/EmergingStandard.html>

- LAVIE, Dovev, MILLER, Stewart (2008). "Alliance Portfolio Internationalization and Firm Performance", *Organization Science*, Vol: 19, No: 4, July-August, pp. 623-646 )
- LIEBOWITZ, Jay (1995). "Integrating Expertsystems Throughout The Undergraduate Curriculum", *Journal of Information System Education*, vol. 7, Spring , pp: 34-38
- LYNN, Bernadatte (2000). "Entelektüel Sermaye Gelecek Binyılın Katma Deger Basarisında Anahtar", Trans. Bayazıtlı, Ercan. *Muhasebe ve Denetim Bakis Dergisi*, Yıl:1, S:2. pp. 119-126
- MARQUARDT, Micheal, LOAN, Peter (2006). *The Manageras Mentor Praeger*, London: Greenwood Publishing Group.
- MEHRALIAN, Gholamhossein, RASEKH, H. Reza, AKHAVAN, Peyman, FARZANDY, Gholamhossein (2012). "An assessment of Structural (organizational) and Relational Capital Indicators in Knowledge- Intensive Industries Evidence from Pharmaceutical Industry ", *Journal of Basic and Applied Scientific Research*, Vol. 2, No. 8, pp. 8240-82
- KAVIANI, Meysam, FAEZINIA, Vahid, SAGHAFI, Vahid (2013). "Valuation of Firm through CVFCFF and CVFCFE as New Models Based on Free Cash Flow", *International Journal of Economy, Management and Social Sciences*, Volume: 2 No: 6 June, p.p. 329-333
- ÖNCE, Saime (1999). *Muhasebe Bakis Açısı ile Entelektüel Sermaye*, Eskisehir: Anadolu Üniversitesi Yayınları, No: 1100,
- ROOS, Goran, ROOS, Johan (1997). "Measuring Your Company's Intellectual Performance", *Journal of Long Range Planning*, Vol. 30 No. 3, June, p.p. 413-426.
- YERELİ, Ayşe N., GERŞİL, Gülşen (2005). "Entelektüel Sermayeyi Ölçme ve Raporlama Yöntemleri" , *Celal Bayar Üniversitesi I.I.B.F. Yönetim ve Ekonomi Dergisi*, C. 12, S. 2. ss. 17-30