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Studying Co-Alignment Model of the Petrochemical Industry

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ABSTRACT

Co-alignment model has been studied by many scientists. This model examines the relationship between environment risks, company's strategies, and capital structure and their effects on firms performance.
In order to examine the relationship between structures and dimensions and to understand such a relationship, some alternatives had been studied which had been previously researched.
In planning this project, data of petrochemical enterprises have been studied during a 5-year-period from 2006 to 2010. Statistical population in this research includes petrochemical companies which have entered Tehran stock market. To analyze data, descriptive statistics such as mean, standard deviation, and inferential statistics such Pearson coefficient Correlation and ANOVA test were applied using SPSS software.
On the whole, the results indicated that the variables of co_alignment model including environment risks, companies' strategy, and capital structure affect the enterprise performance separately. Besides, applying a model such as co_alignment modelhas a positive effect on enterprises performance.
KEY WORDS: environment risk, companies' strategy, capital structure, enterprise performance, liquidity

INTRODUCTION

Strategic thinking is inevitably necessary in third millennium management. Amazing constant changes and developments in all commercial and economic aspects indicate the existence of strategic thinking.

Developing the goals and domain of financial management and its impressive role in decision making has increased the importance of strategic thinking in this regard. The constant changes and evolution of financial management and its professional specification have made the value creation as the main goal of financial management and the key responsibility of economic enterprise. Considering the role of financial management in decisions of economic enterprise management, the above said key responsibility that is attempts to maximize the enterprise value is counted as the main responsibility of financial management. The success of this depends on ongoing and effective use of various tools and compromise among them to provide economic benefits.

The main purpose of financial management is to enhance the firm value which is actually enhancing the assets of that firm which becomes meaningful through applying various strategies and methods in decision making and executing financial management tasks.

Among the goals of financial management are applying financial engineering to evaluate and use financial tools , applying the strategy of optimal allocation of resources in short and long terms , doing the responsibilities and directing and mobilizing existing resources and facilities with regard to strategic goals and analyzing investment decision by means of capital budgeting , enforcing international financial management in global arena with regard to economic globalization , and using supplementary methods in various financial decisions and stuffs like them.

Most often, from the investor's points of view, financial status is counted as the sole factor or criterion which determines competitive situation of an organization. To develop strategies effectively, the weaknesses and strengths of an organization must be determined financially. Liquidity power, loan rates, working capital, profitability, optimum use of assets, cash flows and owners' equity could be such that some of the strategies might not be cared for as a possible option. Frequently, financial affairs make the current strategies and executive procedures change.

1.1. Co-alignment concept

Co-alignment model was first used by Olsen in 1998. He investigated the relationship between four variables: environment risk, companies' strategy, capital structure and companies' performance.

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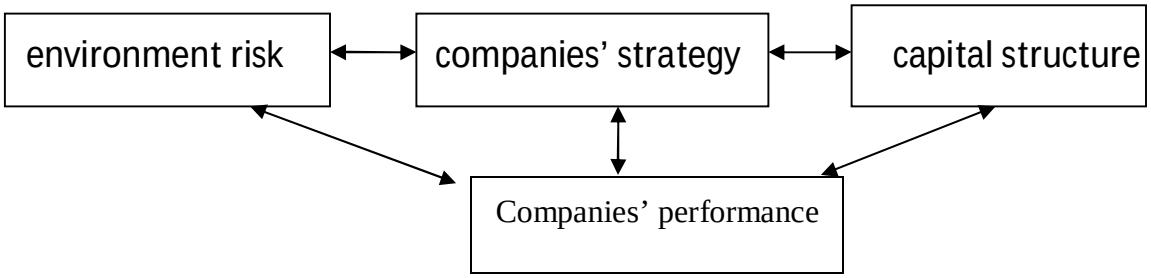

Diagram 1-1. **The relationship between environment risk, companies' strategy, and capital structure and their effect on companies' performance**

Co-alignment model refers to the capability of the firm management in aligning itself with forces which are making changes in environment and create make competition. This alignment makes the manager to invest on competitive approaches which provide the highest financial value for the firm. Therefore, he must make a trade structure which constantly allocate resources to those competitive approaches that bring the highest value for the firm over time. If the firm is able to recognize the chances which lie in changing forces , and then invest on competitive approaches which use these opportunities , and allocate resources to what that bring the highest value , then the financial outcomes of the owners and investors will be better and more appropriate. This relationship is called co-alignment principle(Olsen , 1982).

Management based on value, as a novel restoring thinking through value adding in business, has an effective role in a firm success or failure. The foundation of this thinking is that the firm management must know and learn that all decisions have to be made for value adding.

Value adding means to earn more than to spend capital or to gain positive economic benefit while the income is less than expenses and the capital expense is more than zero.

The new paradigm of business is to take lesson from value adding and if you want to move toward success and prosperity you should think of value adding.

According to Peter Drucker, one of the greatest thinkers of 20th century, the main work of an organization is to create value. In today insecure environment, most business investments must be accepted by financial sector.

Key management strategies, approaches, decisions, and their cash flow have a significant relationship with creating value for the firm. Value adding occurs by means of the positive flow of cash as a result of increasing capital expenses in a particular period of time. This certainly happens in a long time.

The foundation of management success is developing and applying a series of strategies, investment goals, operational goals and financing policies. They should be selected carefully and analyzed accurately in various economic conditions. Evaluating criteria must be applied to have acceptable results for stockholders in short and long term (Rahnemay-e Roodposhti, 2006:5).

Co-alignment model examines the relationship between variables in two domains of strategic management and financial management with emphasis on value adding.

Introducing constructs

Identified constructs in present study are the components and variables of co-alignment model which include environment risk, companies' strategy, capital structure and companies' performance which will be discussed completely.

It's quite clear that each organization experiences various risks based own the identity of its own work. In today's changing condition, each enterprise success is basically based on its command on risks and the kind management which is applied for various risks. Risk management becomes meaningful when there is possibility of getting loss and insecure conditions. This kind of management includes larges domains which encompass financial, trading, operational, strategic issues and a wider area named danger-making events.

Every managerial decision and even an innovation and applying a new method can be also risky. Therefore, it is observed that organizations face risks even in doing their common tasks which is called operational risk (Babaee, 2006 : 383).

In finance management, determining the relationship between capital expenses, capital structure, and the total value of the firm is very important. The goal of determining capital structure is to identify financial resources in order to maximize the stockholders share. A finance manager should know which financial source or sources must be used to achieve the highest output (Reimond P. Nov, 2001 :383).

In fact, capital structure is defined by applying sources based on looking at the related strategy to determine how to use stockholders' share or properties as the firm assets which affect the total value of the firm (Salimi, 2004:1).
Organization management should not just rely on budgets and executive program. On the contrary, strategy could be defined as a single comprehensive and integrative schedule which relates the advantages or the strength of the organization to environmental factors and changes and is planned in a way the main goals of organization are certainly achieved by implementing it correctly (Industrial management organization, 1998: 29).

1. Hypotheses and models:
Variables of co-alignment model, environment risks, companies' strategy, and capital structure, display an important amount of variance in performance of companies which have been accepted in Tehran stock market and which are active in petrochemical industry.

Environment risk has an effect on performance.
1. Environment risks have an effect on the rate of owners' equity.
2. Environment risks have an effect on the flow of cash stock.

Strategy has an effect on performance.
3. Strategy has an effect on the rate of owners' equity.
4. Strategy has an effect on the flow of cash stock.

Capital structure has an effect on performance.
5. Capital structure has an effect on the rate of owner's equity.
6. Capital structure has an effect on the flow of cash stock.
Finally, capital structure will be used as an alternative for its real amount with regard to the effects of environment risks and strategy on capital structure so that we can ultimately examine the effect of these variables on companies' performance when they are placed in co-alignment model.
As a result, the capital structure which has been selected with regard to risk-affected strategies has an effect on performance.
7. Predicted capital structure has an effect on the flow of cash stock.
8. Predicted capital structure has an effect on the rate of owner's equity.

1.1. Introducing and measuring variables
In order to understand which factors related to capital structure, environment risks, and companies' strategycan better determine the companies' performance, both administration value and market value have been used in this research to assess the variables.
The variables which will be discussed in this research are:
1. environment risks
2. companies' strategy
3. capital structure
4. companies' performance
It should be noted that the variable of environment risk is considered as independent variable and the variables of companies' strategy, capital structure, and companies' performance as dependent ones. Of course, companies' strategy and capital structure are also considered as independent variables for the companies' performance.

Environment Risk Construct
Three dimensions of environment risks which are studied in this research are economic, business, and market risks.

1. ECONBETA:
This variable became operational with the help of GDP growth rate in 2006-2010 and the dales growth rate has also been calculated. This variable became operational by calculating the slope of the function with annualized quarterly GDP growth rate of Iran economy as the independent variable and the firm's annualized quarterly sales growth rate as the dependent variable.

SALESGR=a + b GDP(1)
b=ECONBETA

Since our case includes Iranian firms, GDP growth represents Iran economy during these years. The beta, i.e. b1 in the above equation that represents the covariance between the firm's sales growth rate and the GDP growth rate was used as ECONBETA for further analysis.
GDP growth of the country is a variable of macroeconomics which shows economy condition. Note that economic risk as a variable helps us understand the relationship between economic environment and working environment of a firm. Since gross domestic production growth is a general index of economic situation, economic risk is a variable which leads to a better understanding of the relationship between the factors impressed by economic situation.

2. OPCASHBETA :
This variable became operational by calculating the slope of the function with the average cash flow from operations of firms listed on 50 top firms as the independent variable and the petrochemical firm's cash flow from operations as the dependent variable.
(2) a+b= the cash flow of top firms +cash flow of petrochemical firms

b = OPCASHBETA

3. MBETA :
This variable became operational by calculating the slope of the function with the average market price per share of 50 top firms as the independent variable and petrochemical firm's market price per share as the dependent variable and applied criterion was data related to market rate and accessing it.
(3) a + b= market price of petrochemical firms + average market price per share of top firms
(4) b = MBETA

Companies' strategy Construct
1. SALESGR
The first dimension of companies' strategy construct is sales growth. This growth was studied during 2006-2010. The average sales was calculated to obtain a single measure rate. Sales growth helps to discover growth fluctuations and understand them.

$$\text{(5) SALESGR} = \frac{\text{last year sale}}{\text{this year sale}} * 100$$

2. ASSETGR
The second dimension of companies' strategy construct is the assets growth rate which becomes operation by using market value of the assets. The market value of the firm's assets was calculated by adding the difference between the market value of equity and the book value of equity to the firm's book value of total assets .The growth rates obtained for the period 2006 through 2010 were then averaged to obtain a single measure of the firm's market value of asset growth rate or ASSETGR.

(6) Market value of assets= book value of assets + (book value of equity – market value of equity)
(7) Market value of equity= (number of stocks* price)

3. GROPTEN
The third dimension is the future growth potential of the firm which is obtained by the ratio of market value of the firm's assets over the book value of assets . The ratio more than 1 means a good investment strategy and the ratio less than 1 means the poor one. Authors believe the point that the value of tangible and intangible assets are not reflected in the book value of assets. Growth potential tells us whether the whole opportunities of firm growth has been the result of investment strategy or not. The relationship between this construct and capital structure construct and companies' performance construct leads us to dynamic meaning of growth. This variable became operational by dividing the firm's market value of total assets by their book value of total assets. As indicated earlier, the market value of the firm's assets was calculated by adding the difference between the market value of equity and the book value of equity to the firm's book value of total assets. This was then averaged over the period 2006 through 2010 to obtain a single measure of the firm's growth potential or GRPOTEN.

$$\text{GRPOTEN} = \frac{\text{Average of market value}}{\text{Total assets}} \qquad (8)$$

4. LIQRAT
This variable was obtained using the firm's cash and
short-term investments, which was then divided by the firm's total assets .This was then averaged for the period 2006 through 2010 to obtain a single measure of the firm's liquidity position or LIQRAT.

$$\text{LIQRAT} = \frac{\text{Capital + Cash}}{\text{Short term}} \qquad (9)$$

Capital Structure Construct

1. DEBTRAT
This ratio was calculated by adding the firm's long-term debt and the portion of debt in the current liabilities to obtain the firm's total debt, which was then divided by the firm's book value of assets .The debt ratio for each individual quarter between the period 2006 through 2010 was then averaged to obtain a single measure of the firm's debt ratio or DEBTRAT.

$$(10)\ \text{DEBTRAT} = \frac{\text{average debt}}{\text{Total assets}}$$

Companies' performance Construct
The performance construct will become operational to include measures that are a barometer of stakeholder satisfaction, categorized as two distinct types, i.e. accounting measures and cash flow measures. Indicators such as return on equity and return on assets are accounting measures which reflect stockholder satisfaction, and indicators such as free cash flow per share are finance-related ratios that may indicate bondholders' willingness to invest in the firm. In this research both criteria are used to measure the companies' performance including:

1. RETONEQ:
This ratio, i.e. the return on equity of firms was calculated by dividing the firm's net income by their total equity. This was then averaged to obtain a single measure of the firm's return on equity or RETONEQ.

$$(11)\ \text{RETONEQ} = \frac{\text{firm's net income}}{\text{Total equity}}$$

2. FCFPERSHARE:
The free cash flow per share was obtained by dividing the firm's free cash flow by the number of common equity outstanding. The free cash flow per share was calculated by subtracting the firm's capital expenditure from the firm's earnings before depreciation, interest, and taxes. This was then averaged to obtain a single measure of the firm's free cash flow per share or FCFPERSHARE.

$$(12)\ \text{Free cash flow} = \frac{\text{firm's net income}}{\text{The number of common equity}}$$

(13) Free cash flow per share = firm's capital expenditure – firm's ending before depreciation, interest, and taxes

(14) Net capital expenses= ending net fix asset –beginning net fix asset + depreciation

(15) Net capital flow = total asset – total liability

SIZELOG:
SIZELOG: This variable became operational by averaging firm's market value of assets and then calculating the natural logarithm of it. This was used as the control variable for subsequent analyses.

3. RESEARCH METHODOLOGY

In this research 32 petrochemical firms which have entered Tehran stock market have been examined during a time period of 5 years from 2006 to 2010.

4. Data Collection Tools

- Referring to documents
- Tehran stock market website
- Tadbipardaz software
- Rah Avard-e Novin software

5. Data Analysis

To analyze collected date, both descriptive and inferential statistics were used together. Descriptive statistics aimed to collect, organize and present data clearly and to calculate population parameters and also to determine the relationship between collected data. Tehran stock market data are collected with Tadbir Pardaz Software and Rah Avard-e Novin software and are available.

After collecting data by means of existing software, they entered Excel and its functions were used to calculate research variables.

Then the results obtained from measuring variables were applied by SPSS software for statistical calculation and the relationship between variables was examined using this software.

6. Conclusion

Research findings showed that the rate of return on owners' equity cannot be considered as a linear function of the market size, economic risk, market risk, and trade risk in the effects of environment risks on companies' performance.

Considering the fact that coefficients of economic risk, market risk, and trade risk were not significant none of them had an important effect on return rate.

With regard to these findings it could be concluded that among the environment risks, market risk had the highest effect of the firms' performance.

Since the market risk has been the average of market price of each share of top firms over the average market price of each share of petrochemical firms, it could be inferred that as the price of the top firms share increases, the managers of petrochemical firms help the price of petrochemical shares to increase by better performance and are looking for ways to reduce this difference.

In relation to the effect of strategy on performance it could be said that the rate of return on owners' equity could be considered as a linear function of assets growth, sales growth, growth potential, and liquidity so that assets growth has the highest effect on the rate of return on owners' equity and sales growth, growth potential and liquidity have the lowest effect.

According to the research results it could be said that for each 1 point of increase in assets growth, there is 0.73 point decrease in the rate of return on owners' equity. Strategic variables do not have a linear effect on the free cash flow per share. In spite of this, coefficients of liquidity and market size were meaningful. This shows that these variables have an effect on performance which is not linear. This non-linear effect can be seen in the following diagrams which display the relationship between liquidity and market size with free cash flow per share.

In examining the effect of capital structure on performance it could be said that increase of liabilities will decrease performance. That is, by more liabilities the free cash flow per share which actually represents the firms market performance decreases so that for every point of increase in liabilities, there will be 9.8 units of decrease in free cash flow. Even though increase of liabilities will decrease the cash flow, this one-unit increase in liabilities will increase the return on owners' equity as much as 0.53%. Increasing liabilities might contribute to increase of a firm profitability but this does not mean that the firm is able to deal with its expenses. In other word, the rate of return on owners' equity can be increased by increasing liabilities, but it couldn't mean a better performance.

It is observed that even though linear models were used in applying each variable for examining performance, the effect of equivalent amounts of variables of environment risk , companies' strategyand capital structure on performance has actually decreased , so that this effect is not linear in some cases. Moreover, they have no effect on capital structure, assets growth, and sales growth. These two indices affect performance by themselves but do not have any effect on capital structure.

In other words, using variables in co-alignment model, has reduced the effect. When the effects of each variable on performance are calculated, they are more than the time when they are placed in the model and are examined.

It is also concluded that environment risks affect strategy and when we choose the capital structure of the firm with regard to these effects, it affects our performance but it is much less than the time when we just assess the effect of capital structure on performance. In fact our hypothesis is proved that variables of co-alignment model which include environment risk, companies' strategy, and capital structure display some deviation from the normal

performance of the firms. Besides this derivation has a positive effect on the firm's performance. This positive effect was observed in a research which was conducted by Pollalis. This positive effect in this study is in such a way that if we choose to provide the firm finance with regard to the firm strategies which have been chosen under risky conditions we will notice that every 1 unit of increase in liabilities which has been considered with regard to risks and strategies will lead to 0.7 unit decrease of cash flow. This decrease in performance will grow more when we consider debts without paying attention to other variables. So that for every one unit of increase in liabilities without considering other variables we will face 9.8 units of decrease in cash flow which represents the real performance of firms not their profitability which is evaluated through the rate of return on owners' equity. This effect on the rate of return on owners' equity is not linear and is proved by means on non-linear relationships.

Therefore it could be concluded that when we have strategic thinking and we make decisions based on the factors which will greatly affect our performance, we will certainly make better decisions.

Co-alignment model also focuses all its attention on this matter that all factors in an organization are co-aligned and each variable with regard to being impressed by other variables can help the firm managers make better decisions.

Another goal of this research was to make managers familiar with co-alignment model between financial and strategic management of firms and to prove that it is possible to apply finance structures and variables which actually are sometimes common between finance and strategic management of firms.

Management scientists such as Burton and Gardner (1998) have emphasized the importance of co-alignment between financial and strategic management researches.

Co-alignment between two dimensions occurs when researchers define structures and apply key variables which are common in both dimensions. Although the majority of the constructs used in this research could be attributed to financial management it should be noted that co-alignment model was launched by strategic management and researchers have used co-alignment model in other researches such as co-alignment model in information organizations by Pollalis which was studied in 2003. In this research the co-alignment between commerce and information technology was studied and it was proved that it can have a positive trading effect. In present research it was also concluded that the use of co-alignment model could have a positive effect on the performance of petrochemical firms.

Table 1 . Models summary

	models
1	**Does not exist**
2	$FCFPERSHARE = 4.93 \times MBETA - 4.52 \times SIZELOG$
3	$RETONEQ = 0.44 - 0.73 \times ASSETGR$
4	**Does not exist**
5	$RETONEQ = 8.2 \times DEBTRAT - 7.7 \times SIZELOG$
6	**z**
7	$RETONEQ = 0.818 \times preDEBTRAT$
8	$FCFPERSHARE = 7821.7 - 0.7 \times preDEBTRAT$

Table 2. Coefficients being significant

	$\overline{R}^2$ rate	Coefficients being significant
1	0.51	None of the coefficients is significant (model is not significant)
2	0.53	market size and market risk coefficients are -4.52 and 4.93 respectively (other coefficients are not significant) width from source and asset growth are 0.44 and -0.73 respectively(other coefficients are not significant)
3	0.46	None of the coefficients is significant (model is not significant)
4	0.54	Market size and debt are -7.7 and 8.2 respectively
5	0.43	Market size and debt are -9.8 and 10.2 respectively
6	0.34	width from source and asset growth are 7.8721 and -0.73 respectively(other coefficients are not significant)
7	0.417	
8	0.615	market size is 0.818 (other coefficients are not significant)

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REFERENCES

[1] Beard, D. W., & Dess, G. G. (1981). Corporate-level strategy, business-level strategy, and firm performance. The Academy of Management Journal,

[2] Barton, S. L., & Gordon, P. J. (1988).Corporate strategy and capital structure. StrategicManagement Journal 9(6),

[3] Edelman ,Linda F. Brush, Candida G. Manolova, Tatiana ((Co-alignment in the resource-performance relationship: Strategy as mediator)).Journal of Business Venturing 20, no 3, (May) 2005, 359/ United State.

[4] Industrial management organizations, Strategic Management, J.Tadbir Journal32, 1382

[5] Olsen, M. D., West, J. J., & Tse, E. C. (1998). Strategic management in the hospitality industry, Boston: Wiley.

[6] Parakash K.Chathoth .((Co-alignment between Environment Risk,Corporate Strategy Capital Structure and firm performance))may 2,2002 Blacksburg.

[7] Prakash K. Chathoth, Michael D Olsen ((The effect of environment risk,corporate strategy,and capital structure on firm performance))Journal of Hospitality Management, 2006.03.007.

[8] Polaris.A.Yannis ((Patterns of co_alignment in information-intensive organization :business performance through integration strategies)).internatinal journal of information management 23 (2003)

[9] Raie R. and S. Ali, ((Principles of Financial Engineering and Risk Management)), first edition, 1383

[10] Rahnamay Roodposhti, F, Strategic Financial Management.(value Creation), 1385

[11] Raymond, Pei, Novo "Financial Management", translated by A.and A. Jhankhany Parsaeian, the publisher, Tehran, Volume II, 1380

[12] Salimi, S. “Impact on the capital structure of companies in industry and size”, Master's thesis, Humanities and Social Sciences University of Mazandaran, 1383

[13] Sharma ,Amit ((Co-alignment framework for Evaluating the Implementation of the Tourism Satellite Accounts)) June 17, 2002 . Blacksburg, Virginia.

[14] The National Petrochemical Company (1382) 25 years in the petrochemical industry (82-57) Planning and development managemen

[15] Wiley John &Sons,lnc. (Environment-strategy co-evolution andco- alignment: A staged model of Chinese SOEs under transition) StrategicManagment Journal 26,no2(February) 2005 United State