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Optimal Analysis of Valuation of Petrochemical Stock in the Capital Market by Total Interpretive Structural Model

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ABSTRACT

With the growth of analytical level in financial decisions, valuation of cost-effective stocks is considered as one of the functions of analyzing the returns and risks of financial investment, which balances the behavioral effect of investment and analytical processes in the market. And it makes the gap between current values and corporate stock market values as a signal in financial decisions to increase returns and control risk in investors' decisions. The purpose of this study is to level the optimal analytical topics for evaluating the cost of petrochemical stock in the capital market. In this study, which was synthetic and inductive-deductive in terms of data collection method, 12 accounting and financial management specialists at the university level participated as panel members in the quality department. In fact, in the qualitative part, which used meta-synthesis and Delphi analysis, the aim was to identify the optimal analytical themes for the valuation of cost-effective stocks and then, in a small section with the participation of 16 petrochemical brokers, to classify the identified statements in the form of a total interpretive structural modelling based on impact priority. Therefore, relying on meta-synthesis analysis, 12 studies were first evaluated as the basis for evaluation to determine the optimal analytical themes of cost-based stock valuation based on critical evaluation, based on which 11 themes were selected propositions and entered into Delphi analysis to determine theoretical adequacy. In this stage, 3 propositions were removed during the two stages of Delphi analysis and a total of 8 analytical propositions of stock valuation were economically entered into the quantitative analysis section, ie total interpretive structural analysis. In this section, the results show the most influential analytical themes of cost-effective stock valuation in the petrochemical industry, two statements of normal stock market price analysis based on the current rated price of "K2" and a focus on the net asset value is "K3", which is at the fourth level of this model. In fact, the results show that petrochemical companies as one of the most

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important industries in the capital market will be able to focus on the difference between real value and stock market value on the one hand and the difference between the value of assets and corporate debt on the other hand to reduce financial constraints due to confidence in the capital market, to provide the financial resources needed to advance its investment plans and projects, even in an unstable economy and encourage more investors to invest in petrochemical stocks by continuing to increase their stock market value.

1. Introduction

With economic changes since the end of the last century, capital markets have played a more cohesive role in the circulation of capital and the industrialization of many large countries. Markets that have evolved from traditional to more mechanized, and beyond the borders of countries into emerging markets around the world, such as the Forex market; CFD markets emerged which have played an effective role in investment dynamics with higher returns for investors (Callagher et al., 2015). With the development of markets, investors in these markets have a higher capacity to earn higher profits that are better acquainted with the financial functions of companies. Because investing in companies as a generator of cash flows, have a significant role in long-term performance for the continuity and stability of the economy and future values of companies for development (Rahmani Norouzabad and Mohammadi, 2019). Therefore, investors need to know the stimuli to enter the capital markets while controlling the risk, it is possible for them to gain more returns in the investment period. Some of these stimuli are based on fundamental analysis and some are based on technical analysis (Moosa and Li, 2011). Clearly, investors cannot be expected to be very successful in technical analysis due to the complexity and reliability of economic forecasts without accurate information support. But focusing on fundamental analysis, either in the form of individual investment knowledge or with the help of brokerage advice, can help investors better understand these stimuli in investing in the capital market (Kubinska et al., 2016). One of the fundamental analyzes in investing stocks in the capital market is the optimal analysis of valuing stocks. Valuation of corporate stocks is one of the fundamental analysis factors that gives meaning to investment values for analysts and investors. Because the basis of any investment is its correct and accurate evaluation (Badavar Nahandi and Sarafraz, 2018). Lack of accurate and accurate valuation of stocks will cause investors to face many risks and if they invest without accurate valuation, they will throw an arrow in the dark. By accepting very high risk, they may never get a return commensurate with accepting that risk. Understanding the factors affecting stock valuation on the one hand helps analysts and legislators of upstream institutions to control stock market crises and drastic stock price changes, and on the other hand helps investors and stockbrokers to trade more accurately and thus understand the difference between stock price and price. The nature of stocks helps investors to make decisions to gain more returns by controlling risk within certain limits (Taleb Bidokhti and Alishahi, 2011). It is noteworthy that in a developed market, due to information transparency, not much change occurs in the short run to widen the gap between the market price and the intrinsic stock price, while the existence of economic crises can cause severe crises in the market and cause deeper The narrowing of the market price and intrinsic price gaps will only give more returns to those investors who have a more accurate analysis of market changes based on speculative behavior (Shaffer, 2019). In fact, when the market is inefficient, the degree to which market value deviates from the intrinsic value of companies' stock prices leads to random errors and ambiguity about the relationship between market valuation and corporate investment, causing investment attractiveness to plummet (Dhaliwal et al., 2012). Therefore, according to the explanations provided, it should be stated that the Iranian capital market, especially the shares of petrochemical companies over the past few years, has been one of the stocks considered in investments at the capital market level. However, severe fluctuations in the market have caused the stock market confidence to decline significantly. Therefore, invoking analytical functions in the financial performance of companies, especially their assets and income levels as an analytical basis for stock valuation can lead to increased returns from shareholder investments in the market even in inefficient market conditions. Because analytical capabilities in valuing cost-effective stocks help analysts and investors gain a better understanding of past performance; have the present and future of companies. Therefore, due to the sudden growth of the market during

the last year and its sudden decline over the past few months since 2020, caused a tendency to decrease sharply among the investment markets to the capital market. Doing this research, despite the lack of accurate and transparent information and the existence of problems in studying and evaluating effective financial decision-making models for investment, can help to better understand the information content in financial statements. And assist investors in developing the application of accounting information disclosed by companies to make the best investment decision. Therefore, this study, understanding the importance of stock valuation functions, seeks to determine the most important analytical themes of cost-effective stock valuation of petrochemical companies in order to help stockbrokers, while controlling risk, create more returns on investing in these companies for investors. Therefore, the main question in this study is what are the most effective analytical themes of the optimal valuation of costly petrochemical stocks in the capital market? In the continuation of the chapter, while stating the theoretical foundations and empirical support, an attempt is made to help identify the analytical themes of stock valuation by relying on the level of theoretical knowledge. Finally, in the last part of the research, discussion and conclusion of the findings are presented and the necessary suggestions are explained.

2. Literature review

2.1. Cognitive functions of the market in investor behavior

In general, investing means spending the available money to make more money in the future; In other words, investing means postponing current consumption to achieve more consumption in the future. In investing, there are two different and important characteristics that are: time and risk. The importance of these two issues is due to the fact that in investing, money is spent in the present and its amount is definite. While the reward is obtained in the future and is usually accompanied by a lack of confidence. In some cases, the nature of time prevails (such as government bonds), and in some cases, risk takes precedence in terms of importance (such as a common stock option), and in other cases, both are important (such as common stock) (Barary et al., 2020). Therefore, investors' knowledge of the functions of each of these factors can lead to a change in investment behavior.

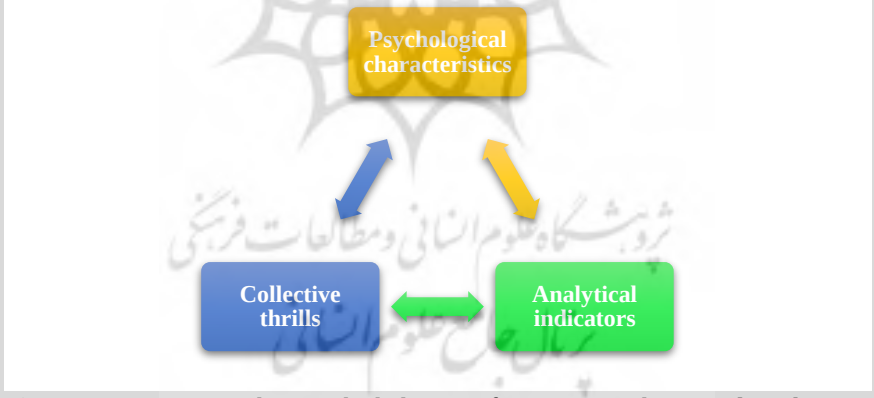

Figure 1: Dimensions shaping the behavior of investors in the capital market

As can be seen from the above framework, there are three dimensions of psychological characteristics; Market norms and analytical indicators are a set of factors that make investors decide. In fact, based on these behavioral characteristics, investors' behavior can be interpreted as a tendency to buy and sell stocks, which is done to achieve higher returns and avoid risk in investing (Wallmeroth, 2019). In addition to the psychological characteristics in shaping investment behavior, market indicators can also help develop individual and collective decisions of investors. For example, when financial market watchers are aware of the capital market boom in various ways, investors move from other markets to try to make more returns by buying stocks in the market, but this does not necessarily mean that in time market downturn cannot be profitable, Rather, it is the difference in understanding the nature of such market signals that can shape differences in investor decisions (Liu and Krystyniak, 2021). In other words, investors who rely on analytical knowledge, while better understanding the market, are able to invest in stocks, which are defined as hot stocks. A stock that brings investors closer to

potential returns through financial and information analysis. The difference in these behaviors can be a reasoned explanation for the extreme reaction of investors who simply choose to be in the market for more profit, an interest that may have been done without any support and only based on mass behaviors (Yazdani et al., 2018).

2.2. Equity stock evaluation

The development of industry and trade and financial relations and processes today has made it necessary for the stock market to easily create the information needed by investors and stakeholders so that they can analyze and invest with a high degree of confidence. With this process, the stock market can lead to economic growth by attracting small and small stagnant capital. It should be noted that the basis of any investment is its correct and accurate evaluation. Choosing an appropriate valuation method for stock valuation can cover risk and cost characteristics in a limited time frame and meet the needs of investors in determining the fairest value for decision making. Despite the fact that the calculation of the company's income has a special credibility for evaluating and determining the price of shares traded among financial analysts and investors, evidence shows that most revenues are affected by managerial manipulations, which in practice challenges stock valuation (Nel and Roux, 2017). Such manipulations, which more or less indicate the expected revenue, meet the specific objectives of management, reduce the quality of revenue, and this requires real analysis of investors when making decisions in an inefficient market (Faseruk and Faseruk, 2008). According to the efficient market hypothesis, it is very difficult to find securities that are priced below intrinsic value. Capital market analysts often use different models to discover these bonds, because investors are always looking to buy growth stocks in order to get higher returns than other investment opportunities. Given that the shares of companies listed on the stock exchange market are first evaluated by the stock price committee and then offered to the capital market, however, after a short period of time, the automatic process of rising or falling stock prices resulting from the flow of stock supply and demand; It is the expectations and predictions of shareholders and investors, causing a huge difference from the initial price presented by the pricing committee, in which case due to the incompatibility of the pricing committee evaluation model with market conditions, the stock market is practically disturbed and knowledgeable. Buy or sell their shares to get higher returns (Islami Bidgoli and Karimkhani, 2016). This simple reasoning process is known as stock valuation, which can bring the best results for investors by focusing on analytical processes by investing in equity stocks evaluation. Capital market analysts try to establish a line of communication between how a company's market value and other factors affecting it, such as distributed profit or residual profit, and often determine this line of communication by using forecasting models. This is because the goal is to prevent market imbalances (Reschreiter, 2009). For example, financial analysts focus on the discount cash flow model (DCFM) as an accepted model for valuing ordinary stock accounting, trying to assume that the firm's price is equal to the discounted value of the future cash flow; Because they believe that this causes cash dividends to be applied with binding policies so that there is not much difference between the market price and the real stock price and lead investors to react quickly in the market. But most of the methods and techniques introduced in the teachings of the financial management and investment texts for stock valuation are generally usable as a theoretical framework and cannot express the true value of a stock alone. Therefore, a look at the experiences of some successful countries shows that the liberalization of information flow while balancing supply and demand in stocks, achieving higher returns in such markets depends on the existence of analytical knowledge in various fields such as stock valuation. Or by separating the specialized level of stockbrokers in the industries and stocks of different companies, they seek to provide specialized consultants at the level of such markets (Heidarzadeh Hanzaee and Hosseinzadeh Zorofchi, 2019). In fact, the application of scientific and applied methods of evaluation according to local conditions and a set of factors that are effective in determining the value of a company, is another point that can help increase integration in this area with the growth of research and development in the market. Therefore, according to the theoretical foundations described, the research questions are presented in the following order:

1. The first research question) what are the optimal analytical components of equity valuating petrochemical stocks in the capital market?
2. The second research question) what are the optimal analytical themes for equity evaluating petrochemical stocks in the capital market?
3. The third research question) what are the most effective analytical themes for equity evaluating petrochemical stocks in the capital market?

It should be noted that the qualitative analysis process is used to answer the first two questions of the research and the quantitative analysis process is used to answer the third research question.

2.3. Research background

Sharma et al (2021) conducted a study entitled "Stock valuation as an analytical basis for corporate assets using the fractional-jump Heston model." In this study, in order to evaluate stocks, considering that the prices of basic assets in the financial markets are subject to sudden changes due to various factors, an attempt has been made to present a new model of fractional-jump bread by adding the Hurst jump and power criterion. Therefore, by determining the characteristic function of the underlying asset price process in the form of the mentioned model, an attempt was made to create a new criterion for pricing of subordinated securities and based on the Monte Carlo method along with the technique of reducing variance of stock valuation based on assets. The results based on analytical comparison showed that the valuation by the Heston fractional-jump model is closer to the actual results of the bond price and has a better performance compared to the two well-known models of random fluctuations, Heston and Bates. Kim et al (2020) conducted a study with the aim of combining the process of jumping and fractional Brownian motion to consider fluctuations and long-term memory characteristics in return on assets for stock valuation. In this study of the model, fractional-jump Heston was performed based on time intervals of 3, 6 and 12 months and the results showed that the above model is a good basis for evaluating stocks in return on assets in short time intervals of 3 months. Fatma and Hidayat (2020) research on Earnings persistence; earnings power and stock valuation in consumer goods companies. This study, which was conducted in the period from 2010 to 2014, used multiple regression analysis by systematically reviewing 100 selected companies based on annual reports and financial statements of companies. The results showed that the stability of corporate profits has a negative effect on the valuation of investors' stocks, while the profitability of companies increases the positive valuation of stocks by investors. Barary et al (2012) conducted a study entitled "Modeling investor behavior using psychological variables with an interpretive structural modeling approach to identify decision-making errors in investment." For this purpose, experts in this field were used and 12 psychological variables affecting the behavior / decision of investors were identified and then by the initial access matrix, their impact on the behavior / decision model of investors on each other were coded. Finally, they were graded using the final matrix. The results of interpretive structural modeling showed that psychological variables affecting investors' decisions were modeled at 6 or 6 levels. And the concept of variability is at the highest level and has more impact than other psychological variables and the variable of delay is also at the lowest level. Nikbakht et al (2020) conducted a study entitled "The effect of management profit forecasting error on the stability of cash and accrual components of earnings and overvaluation of stocks" of the statistical population, companies listed on the Tehran Stock Exchange and research sample, that included 64 companies. Research findings using multivariate linear regression; the use of panel data and the fixed effects method confirms the hypotheses and indicates that with increasing the level of management profit forecasting error, the stability of cash and accrual components of earnings decreases and overvaluation of stocks increases.

3. Methodology

In terms of purpose, this research is in the category of descriptive research with the aim of explaining the phenomenon in question in the shares of the petrochemical industry in the capital market. In terms of results, it is part of developmental research, because first the concepts related to the petrochemical advantageous equity evaluating stocks are identified based on related research and based on various theories, and then based on matrix analysis, prioritize each of the identified criteria. Therefore, relying on the fact that there is no coherent framework in the field of equity valuating stock in the petrochemical industry, this study tries to create an integrated model through development functions. Finally, in terms of data collection logic, this research is inductive-deductive. Because in the qualitative part, first relying on the inductive approach of the theoretical foundations of the optimal model of valuation of high-cost petrochemical stocks, it is analyzed and then on the basis of induction, the contents of the statements identified in the target community, ie the stock exchange broker, are explained. In this research, which is a mixed-method research, meta-synthesis is used in the qualitative part. Meta-synthesis includes steps to reach components and propositions that perhaps the most important way to do is process steps, which range from recognizing the root cause of the problem in the form of research question to providing a specific model based on identifying propositional themes from previous research based on member participation includes the panel. Then,

based on Delphi analysis, in order to determine the theoretical adequacy according to the two criteria of Mean and coefficient of agreement, an attempt is made to confirm the propositions in terms of theoretical adequacy. Finally, in a quantitative part, through the analysis of a comprehensive interpretive and structured model, the identified layers are explained in the form of a prioritization model in terms of influence and effectiveness.

3.1. Statistical population and research sampling method

Based on the nature of the research, which is mixed method, the target population in the qualitative section includes the relevant research on the subject and 12 accounting and financial management specialists at the university level who identify the content propositions of the research based on the process of meta-synthesis, critical evaluation and Delphi analysis. . In order to select these individuals, a homogeneous qualitative sampling method was used in the form of panel group members. In this sampling method, the researcher tries to select research participants in order to gain in-depth knowledge, to select experts who have the necessary experience and analytical knowledge in relation to the research topic. The target audience in the small section is 16 petrochemical stock exchange brokers at the capital market level, which, based on the nature of the analysis based on the limited number of research participants, tries to explain the components and propositions identified in the qualitative sector at the capital market level through cross-matrix analysis. Because the purpose of quantitative analysis is to use cross-matrix questionnaires with the participation of 15 to 30 people according to Singh and Kant (2011) research; Malone (2014); Ramesh et al (2008) and Attri et al (2013) confirmed the optimal sample size selection in the range of 15 to 30 people.

3.2. Research findings

In this section, according to the nature of the research methodology, the analysis are presented in two parts, qualitative and quantitative, in order to create a more coherent understanding of the research findings.

3.3. Qualitative section analyzes

In this section, two meta-combined and Delphi analyzes have been used. First, in doing this section, it is necessary to review the valid scientific databases to select similar research in the period 2018 to 2021 in domestic and foreign research. This will help to obtain newer research on the research phenomenon. Therefore, in order to achieve research related to the field of research, in the next step, screening should be done in the first three stages, including title screening; Content and action analysis. To create a more specific perception, Figure (2) is used to perform the second step.

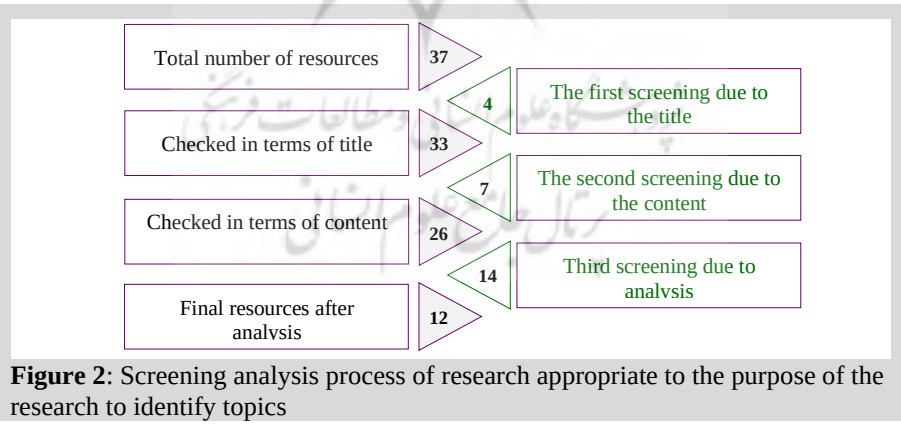

Figure 2: Screening analysis process of research appropriate to the purpose of the research to identify topics

It should be noted that the first 12 researches should be analyzed in the third step in terms of critical appraisal process with the participation of research experts. This process includes the following 10 criteria, which are examined based on a minimum (1) and a maximum (5) score. The total score based on 10 criteria can be 50, and if a research score of 30 or more, it enters the fourth step.

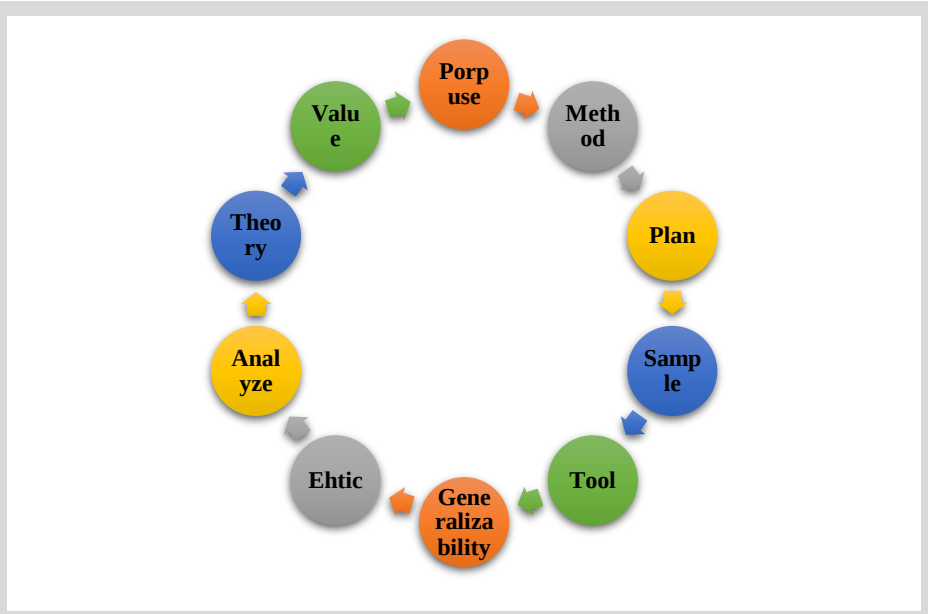

Figure 3: Criteria for the critical appraisal process

Now, based on a better understanding of the analysis process in this step, with the participation of research experts, 12 approved initial researches will be analyzed for points based on critical evaluation analysis.

Table 1: Critical evaluation analysis

		International researches									Internal researches		
		1	2	3	4	5	6	7	8	9	10	11	12
	Approved research	Agbodjo et al (2021)	Sharma et al (2021)	Fatma & Hidayat (2020)	Boisjoly et al (2020)	Gao et al 92019)	Vasconcelos & Martins (2019)	Beisland (2019)	Badu & Appiah (2018)	Ma et al (2018)	Kebriaii & Dehghan (2020)	Ghanbari-Mamshi (2020)	Hekmat et al (2019)
Critical appraisal criteria	Purpose	3	3	4	2	3	2	3	2	2	3	3	4
	Method	3	3	3	1	4	2	3	1	3	4	5	3
	Plan	4	4	4	3	4	3	3	2	2	3	4	3
	Sampling	3	3	3	2	4	3	4	3	3	3	3	3
	Collecting	5	4	3	3	4	3	3	2	2	2	4	3
	Generalization	4	3	3	2	4	3	4	3	3	3	3	4
	Ethic	3	3	5	3	4	2	4	3	3	2	3	3
	Analyze	4	3	4	2	4	3	3	3	3	3	3	3
	Theoretical	5	3	3	2	4	3	4	2	3	2	4	3
	Value	4	4	4	3	4	3	4	2	3	3	4	3
	Total	38	33	36	23	36	27	34	23	27	28	36	32

After performing the critical appraisal process, 4 researches were identified in row "4"; "6"; "8" and "10" were excluded from the approved studies because they scored below 30. In order to determine the optimal

themes for the equity evaluation stocks, the process of selecting the largest frequency distribution group is used by content analysis in the heart of approved research. Therefore, based on the approved researches, first all the criteria related to stock valuation are determined and given in the column (2) of the table, so that by placing a "☑" sign in front of each research, it is finally determined which is the most frequent component of stock valuation. In other words, based on each researcher's use of the sub-criteria written in the table column, the symbol "☑" is inserted, then the scores of each ☑ are added together in the sub-criteria column, and the scores above the Mean of the researches performed as research components are selected.

Table 2: The process of determining the components of stock valuation

		E	D	C	B	A		
Approved international researches	Agbodjo et al (2021)	-	-	-	-	☑	A	Stock valuation based on company assets
		-	-	-	-	-	B	Stock valuation based on market indicators
		-	-	☑	-	-	C	Stock valuation based on industry indicators
		-	-	-	-	-	D	Stock valuation based on company profitability
		☑	-	-	-	-	E	Stock valuation based on economic indicators
	Sharm et al (2020)	-	-	-	☑	-	A	Stock valuation based on company assets
		-	-	-	-	-	B	Stock valuation based on market indicators
		-	-	-	-	-	C	Stock valuation based on industry indicators
			☑	-	-	-	D	Stock valuation based on company profitability
		-	-	-	-	-	E	Stock valuation based on economic indicators
	Fatma & Hidayat (2020)	-	-	-	-	☑	A	Stock valuation based on company assets
		-	-	-	-	-	B	Stock valuation based on market indicators
		-	-	-	-	-	C	Stock valuation based on industry indicators
		-	☑	-	-	-	D	Stock valuation based on company profitability
		☑	-	-	-	-	E	Stock valuation based on economic indicators
	Gao et al (2019)	-	-	-	-	-	A	Stock valuation based on company assets
		-	-	-	☑	-	B	Stock valuation based on market indicators
		-	-	☑	-	-	C	Stock valuation based on industry indicators
		-	-	-	-	-	D	Stock valuation based on company profitability
		☑	-	-	-	-	E	Stock valuation based on economic indicators
	Beisland (2019)	-	-	-	-	☑	A	Stock valuation based on company assets
		-	-	-	-	-	B	Stock valuation based on market indicators
		-	-	-	-	-	C	Stock valuation based on industry indicators
		-	☑	-	-	-	D	Stock valuation based on company profitability
		-	-	-	-	-	E	Stock valuation based on economic indicators
	Ma et al (2018)	-	-	-	-	☑	A	Stock valuation based on company assets
		-	-	-	-	-	B	Stock valuation based on market indicators
		-	-	☑	-	-	C	Stock valuation based on industry indicators
		-	☑	-	-	-	D	Stock valuation based on company profitability
		-	-	-	-	-	E	Stock valuation based on economic indicators
Approved internal researches	Ghanbari-Mamshi et al (2020)	-	-	-	-	-	A	Stock valuation based on company assets
		-	-	-	☑		B	Stock valuation based on market indicators
		-	-	-	-	-	C	Stock valuation based on industry indicators
		-	☑	-	-	-	D	Stock valuation based on company profitability
		-	-	-	-	-	E	Stock valuation based on economic indicators
	Hekmat et al (2019)	-	-	-	-	☑	A	Stock valuation based on company assets
		-	-	-	-	-	B	Stock valuation based on market indicators
		-	-	-	-	-	C	Stock valuation based on industry indicators
		-	☑	-	-	-	D	Stock valuation based on company profitability

		-	-	-	-	-	E	Stock valuation based on economic indicators
		3	**6**	3	3	**5**		
		Total						

The results of the process of determining the analytical components of stock valuation showed that the two components of stock valuation analysis based on company assets and stock valuation analysis based on company profitability were selected as the analytical basis for cost-effective stock valuation of petrochemical industry. In this section, after analyzing the basics of the approved components of the above researches, the themes for each main component are determined separately.

Table 3: The process of determining stock valuation themes

		7-point rating scale								
		1	2	3	4	5	6	7		
The main components of equity valuation stock	**Valuation of equity stocks based on the functions of the company's assets**								Focus on nominal stock value through the ratio of capital stock to number of shares	**Equity stock valuation propositions**
									Focus on stock book value through the ratio of total equity to number of shares	
									Focus on net asset value through the ratio of the difference between the present value of assets and total liabilities to the number of common stock	
									Focus on the value of stock liquidation through the ratio of resources from the sale of assets to the number of ordinary shares	
									Focus on replacement value through the ratio of resources needed to start a new company to the number of common stock	
	Evaluate of equity stocks based on the company's profitability functions								Analysis of the fixed growth rate of the dividend paid through the ratio of expected value to dividend	
									Single-stage analysis of ordinary dividends through the ratio of dividend growth to the difference between the growth rate and the normal dividend discount rate	
									Two-stage analysis of the share of ordinary earnings through the ratio of excessive earnings to equity	
									Analysis of earnings method through the ratio of earnings share to the difference between the growth rate and the normal dividend discount rate	
									Analysis of limited earnings through the ratio of dividend payout rates to stock holding years	
									Normal stock market price analysis based on the current price	

In the next step, in order to determine the consensus of experts for the appropriateness of research propositions with the main components, Delphi analysis based on two criteria of mean and coefficient of agreement is used. Therefore, according to Table (4), the results of Delphi analysis are presented to perform this section according to the scale of 7 evaluation options.

Table 4: Delphi analysis process to determine the consensus of experts

		First round of Delphi		Second round of Delphi		Result		
		Mean	Coefficient of	Mean	Coefficient of			
The main components of equity stock valuation	Valuation of equity stocks	3	0.20	Delete			Focus on nominal stock value through the ratio of capital stock to number of shares	Equity stock valuation propositions
		4	0.35	Delete			Focus on stock book value through the ratio of total equity to number of shares	
		5.30	0.65	5.50	0.75	Confirm	Focus on net asset value through the ratio of the difference between the present value of assets and total liabilities to the number of common stock	
		5.20	0.60	5.30	0.65	Confirm	Focus on the value of stock liquidation through the ratio of resources from the sale of assets to the number of ordinary shares	
		5.50	0.75	6.10	0.82	Confirm	Focus on replacement value through the ratio of resources needed to start a new company to the number of common stock	
	Evaluate cost-based stocks	5.20	0.65	5.50	0.75	Confirm	Analysis of the fixed growth rate of the dividend paid through the ratio of expected value to dividend	
		3	0.20	Delete			Single-stage analysis of ordinary dividends through the ratio of dividend growth to the difference between the growth rate and the normal dividend discount rate	
		6	0.80	6.20	0/85	Confirm	Two-stage analysis of the share of ordinary earnings through the ratio of excessive earnings to equity	
		5	0.50	5.10	0.55	Confirm	Analysis of earnings method through the ratio of earnings share to the difference between the growth rate and the normal dividend discount rate	
		5.30	0.65	5.50	0.75	Confirm	Analysis of limited earnings through the ratio of dividend payout rates to stock holding years	
		5	0.50	5.10	0.55	Confirm	Normal stock market price analysis based on the current price	

The results after two rounds of analysis in the Delphi step showed that the three propositions were omitted because they had an agreement coefficient below 0.5 and a Mean below 5. Therefore, a total of 8 statements based on two main components were approved as a basis for comparing the matrix of optimal analytical themes for the valuation of cost-effective stocks on the shares of petrochemical companies in the capital market. In this section, as the last step of qualitative analysis, the theoretical model of the research is presented for an optimal analysis of the valuation of equity stocks on the shares of petrochemical companies in the capital market.

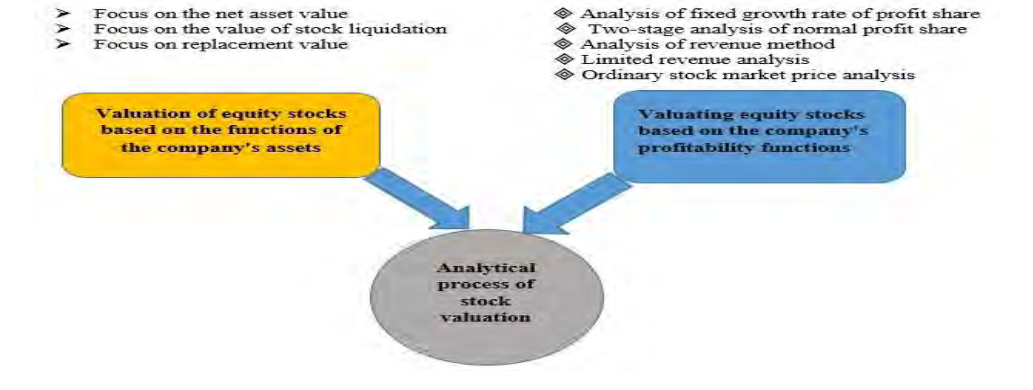

Figure 4: Theoretical model of research

As further explained, in this section, the research seeks to evaluate the optimal analytical content of the evaluation of petrochemical stocks in the capital market through comprehensive structural interpretive analysis. First, the propositional contents of each of the main components must be randomly coded.

Table 5: Coding of analytical themes of cost-effective stock valuation of petrochemical industry

Research proposition		
Focus on replacement value through the ratio of resources needed to start a new company to the number of common stock	K1	Abbreviation
Normal stock market price analysis based on the current price	K2	
Focus on net asset value through the ratio of the difference between the present value of assets and total liabilities to the number of common stock	K3	
Analysis of earnings method through the ratio of earnings share to the difference between the growth rate and the normal dividend discount rate	K4	
Two-stage analysis of the share of ordinary earnings through the ratio of excessive earnings to equity	K5	
Analysis of the fixed growth rate of the dividend paid through the ratio of expected value to dividend	K6	
Analysis of limited earnings through the ratio of dividend payout rates to stock holding years	K7	
Focus on the value of stock liquidation through the ratio of resources from the sale of assets to the number of ordinary shares	K8	

After assigning specific codes, a matrix should be formed with the participation of 16 stock exchange brokers in the petrochemical industry. This matrix performs a pairwise comparison process based on rows and columns, and according to the "mode" index, the highest frequency distribution of rows and columns is placed at the intersection of two propositional themes. After comparing the pairs of rows and columns of the research propositions, the achievement matrix is formed. In other words, in this step, the symbols of the structural matrix relations to the numbers zero and one can be formed according to the table below.

Table 6: Achievement matrix formation

Proposal contents in column "*i*"										
K8	K7	K6	K5	K4	K3	K2	K1			
0	0	0	0	0	0	0	**1**	K1	Proposition contents in line "j"	Focus on replacement value
0	0	1	0	1	1	**1**	1	K2		Normal stock market price analysis based on the current price
1	0	0	0	0	**1**	1	1	K3		Focus on the net asset value
0	1	1	1	**1**	0	0	1	K4		Analysis of revenue method
1	0	0	**1**	0	0	0	1	K5		Two-step analysis of normal profit share

0	1	**1**	0	1	0	0	1	K6		Analysis of the fixed growth rate of dividends paid
0	**1**	1	1	1	0	0	1	K7		Limited revenue analysis
1	0	0	1	0	0	0	1	K8		Focus on the value of stock liquidation

In the following analysis to determine the indirect relationship between the contents of cost-effective stock valuation propositions in the petrochemical industry, a pairwise comparison of the first proposition is compared in pairs with all elements from (i + 1) to nth. For each relationship, the answer is yes "Y" or "N" and if the answer is yes, the reason is stated. But if the answer is "N", the participants must comment on the pair of variables.

Table 7: Pair comparison between propositional themes based on matrix form

	Number	**Couple comparison**	**Yes/No**		
Focus on replacement value K1■	1	K1 – K2	Yes ☐ NO ☒		**Description of the indirect effect of row "*i*" on column "*j*"**
	2	K2 – K1	Yes ☒ NO ☐	Normal stock market price analysis based on the currently assessed price is the basis for alternative value in the valuation of equity stocks.	
	3	K1 – K3	Yes ☐ NO ☒		
	4	K3 – K1	Yes ☒ NO ☐	Focus on net Asset value basis for equity value in valuating petrochemical industry stocks	
	5	K1 – K4	Yes ☐ NO ☒		
	6	K4 – K1	Yes ☒ NO ☐	Analysis of income methods basis for equity value in valuating stocks of petrochemical industry	
	7	K1 – K5	Yes ☐ NO ☒		
	8	K5 – K1	Yes ☒ NO ☐	Two-step analysis of ordinary profit shares basis for equity value in valuing petrochemical industry stocks	
	9	K1 – K6	Yes ☐ NO ☒		
	10	K6 – K1	Yes ☒ NO ☐	Fixed Growth Rate Analysis of Profit Sharing Basis for Alternative Value in Valuing Petrochemical Industry Stocks	
	11	K1 – K7	Yes ☐ NO ☒		
	12	K7 – K1	Yes ☒ NO ☐	Limited revenue analysis is the basis for alternative value in the valuation of equity petrochemical stocks	
	13	K1 – K8	Yes ☐ NO ☒		
	14	K8 – K1	Yes ☒ NO ☐	Focus on stock liquidation value as a basis for alternative value in valuing equity petrochemical stocks	

Normal stock market price analysis based on the current price K2	15	K2 – K3	Yes ☒ NO ☐	Ordinary stock market price analysis based on the current estimated price is a basis for focusing on the net asset value in valuing equity stocks.	
	16	K3 – K2	Yes ☒ NO ☐	Focus on net asset value basis for analyzing ordinary share market price based on current price estimated in valuating equity stocks	
	17	K2 – K4	Yes ☒ NO ☐	Normal stock market price analysis based on the currently assessed price is the basis for analyzing the method of earning income in valuating equity stocks.	
	18	K4 – K2	Yes ☐ NO ☒		
	19	K2 – K5	Yes ☐ NO ☒		
	20	K5 – K2	Yes ☐ NO ☒		
	21	K2 – K6	Yes ☒ NO ☐	Normal stock market price analysis based on the current estimated price is the basis for analyzing the fixed growth rate of dividends in stock valuation.	
	22	K6 – K2	Yes ☐ NO ☒		
	23	K2 – K7	Yes ☐ NO ☒		
	24	K7 – K2	Yes ☐ NO ☒		
	25	K2 – K8	Yes ☐ NO ☒		
	26	K8 – K2	Yes ☐ NO ☒		

Next, the SSIM structural self-interaction matrix should be formed based on pairwise comparisons of cost-effective stock valuation themes in the petrochemical industry according to the results of the table above. Therefore, for each connection in which the answer "Y" or "N" is given while stating the reason, the cell with the option "Yes" is placed as "1 *" at the intersection of row "i" and column "j". In fact, this matrix is obtained by converting its structural interaction matrix into a zero and one binary matrix.

Table 8: Achievement matrix in terms of the degree of transferability of the relationship between propositional themes

			Proposal contents in column "*i*"							
			K1	K2	K3	K4	K5	K6	K7	K8
Focus on replacement value	**Proposition contents in line "*j*"**	K1	**1**	0	0	0	0	0	0	0
Normal stock market price analysis based on the current price		K2	1	**1**	1	1	1*	1	0	1*
Focus on the net asset value		K3	1*	1	**1**	1*	1*	1*	1*	1
Analysis of revenue method		K4	1	0	0	**1**	1	1	1	0
Two-step analysis of normal profit share		K5	1	0	0	0	**1**	0	0	1
Analysis of the fixed growth rate of dividends paid		K6	1	0	0	1	0	**1**	1	0
Limited revenue analysis		K7	1	0	0	1	1	1	**1**	0
Focus on the value of stock liquidation		K8	1	0	0	0	1	0	0	**1**

As can be seen in the table above, the concept symbols assigned according to the mode proposition have been converted to 0, 1, and 1* points according to the definition of the conceptual relationship to the numbers according to the previous table. In the following table, specify the penetration power (1 point obtained from the row) and the dependency power (1 point obtained from the column):

Table 9: The process of determining the influence and dependence of propositional themes

			Influence power	Dependency power	
Themes of equity stock valuation propositions	Focus on replacement value	**K1**	1	8	The sum of the rows "*i*" and the column "*j*" are the contents of the proposition
	Normal stock market price analysis based on the current price	**K2**	8	2	
	Focus on the net asset value	**K3**	8	2	
	Analysis of revenue method	**K4**	5	5	
	Two-step analysis of normal profit share	**K5**	3	6	
	Analysis of the fixed growth rate of dividends paid	**K6**	4	5	
	Limited income analysis	**K7**	5	4	
	Focus on the value of stock liquidation	**K8**	3	4	

By determining the influence power and the dependency power, the output set is found to form a conical matrix; Formed common input and elements to determine the most effective priorities of propositional themes. Here the goal is to get to know the most effective propositions.

Table 10: Formation of a conical matrix of propositional themes

			Output statement	Input statement	Common elements		
Themes of equity stock valuation propositions	Focus on replacement value	K1	1	1,2,3,4,5,6,7,8	1	I	**Leveling the effectiveness of propositional themes**
	Normal stock market price analysis based on current estimated price *	K2	1,2,3,4,5,6,7,8	2,3	2,3	IV	
	Focus on Net Asset Value *	K3	1,2,3,4,5,6,7,8	2,3	2,3	IV	
	Analysis of income method	K4	1,4,5,6,7	2,3,4,6,7	4,6,7	III	
	Two-step analysis of normal profit share	K5	1,5,8	2,3,4,5,7,8	5,8	II	
	Analysis of the fixed growth rate of dividends paid	K6	1,4,5,6,7	2,3,4,6,7	4,6,7	III	
	Limited equity analysis	K7	1,4,5,6,7	2,3,4,6,7	4,6,7	III	
	Focus on the value of stock liquidation	K8	1,5,8	2,3,5,6,8	5,8	II	

The results of similarity of outputs and common elements showed that the most influential analytical themes of equity stock valuation in the petrochemical industry are the two statements of normal stock market price analysis based on the current estimated price of "K2" and the focus on net asset value of "K3" the model is located.

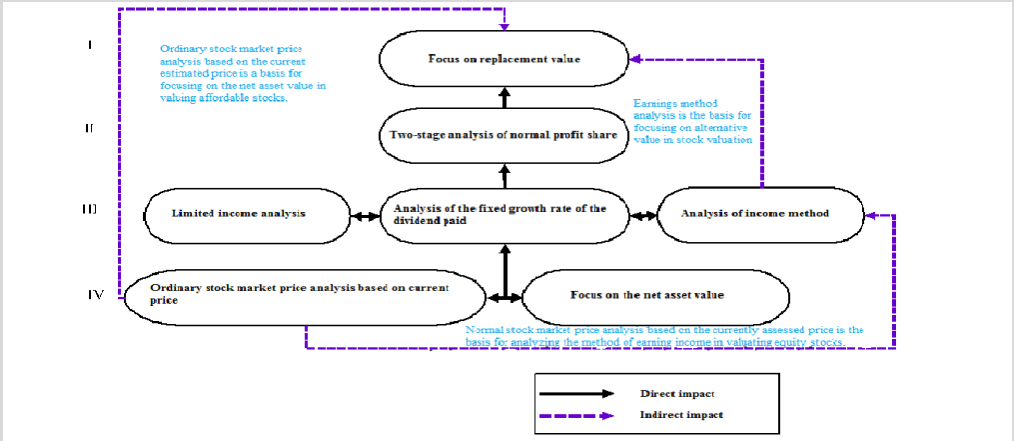

Figure 5: Optimal analytical model for evaluating equity petrochemical stocks based on prioritization

4. Conclusions

The purpose of this study was to level the optimal analytical topics for evaluating the cost of petrochemical stock in the capital market. In fact, this study showed that valuing equity stocks as one of the mechanisms for investing in petrochemical stocks, while it can help investors to carry out a specialized investment process with less risk, can also increase the attractiveness of investing in corporate stocks. Petrochemicals help and develop the capital market. The results showed that the analysis of the normal stock market price based on the current price evaluated as a statement of equity stock valuation based on the company's profitability functions and focusing on net asset value as a stock valuation proposition based on corporate asset performance is the most important factor in stock valuation. It is considered profitable for petrochemical companies. In fact, normal stock market price analysis based on estimated price is an analysis that an investor or broker will be able to buy when the current value of the common stock is below the current market price ratio. In other words, if the current value of a stock is higher than the current market price, then the stocks of petrochemical companies will be undervalued and investors will be able to buy at a lower price than the normal market price, that the market is closer to the real price to buy and thus gain higher returns. Usually, the right of pre-emption created by petrochemical companies for the current shareholders of the company can have such conditions and cause the shareholders to benefit from the future cash yield of the purchased shares and experience less risk. Conversely, when the calculated price per share value of a petrochemical company is lower than the market price, then the market price of the desired share of the company is overvalued, in which case investors can sell their shares at the price Sell higher than the market and get higher returns And in the verse that the market price is close to the real price, buy the same stock again. Therefore, assuming the correctness of the analyzed information, the continuously calculated current value of "P0" can be the criterion for decision of investors and brokers, and the current market price of petrochemical companies based on the impact of environmental factors, affect the real price. And investors and brokers to regulate their investment behavior by analyzing it. On the other hand, focusing on the net asset value through the ratio of the difference between the present value of assets and total liabilities to the number of common stock is another basis that can analytically target investment behavior. In fact, focusing on the net worth of assets through the ratio of the difference between the daily value of assets and total liabilities to the number of common stock can help shareholders to buy shares of petrochemical companies. In other words, if a broker determines by analyzing the petrochemical company's shares that the difference between the daily value of assets and total liabilities in relation to the number of ordinary shares offered to the market is more than 1, it can be seen that it is a good time to invest This is because the value of stocks is growing and it can achieve higher returns in the future due to the reduction of debts and increase of the company's assets. The value of shares based on net asset value also reflects the basis of the company's leverage capacity, indicating that the company seeks to develop plans and projects through debt that can yield higher returns due to the increased market value of the stock purchased for them. In fact, the

results show that petrochemical companies, as one of the most important industries in the capital market, will be able to focus on the difference between real value and stock market value on the one hand and the difference between the value of assets and corporate debt on the other hand. While reducing financial constraints due to confidence in the capital market, provide the financial resources needed to advance its investment plans and projects even in an unstable economy, and by continuing to increase its stock market value, attract more investors to invest in corporate stocks encourage petrochemicals. Results obtained by Sharma et al (2020); Fatma and Hidayat (2020); Beisland (2019) and Hekmat et al (2019). Based on the obtained results, it is suggested that petrochemical companies, in order to create value for investing in their stocks, use strategies to develop interoperability, transparency and shareholder dignity, such as preemptive rights, in order to build their trust and confidence based on positive evaluation of the industry stocks. Upgrade the capital market to provide the required cash and thus gain more success in the market. On the other hand, the financial managers of petrochemical companies through their financial agility should be able to maintain the level of financial flexibility based on maintaining the current values of assets against their incoming debts, in order to maintain their competitive position in the face of economic sanctions do not lose among other companies. Because companies in the petrochemical industry are more successful in these economic conditions, they have a better understanding of economic forecasts and thus are less likely to fall. Therefore, timely disclosure of information based on debt and asset decision-making functions puts the company in a more competitive position.

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