AN EMPIRICAL STUDY OF RELATIONSHIP BETWEEN SHARE PRICE AND INTRINSIC VALUE OF COMPANY

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Abstract

A company price should be determined by value. Value can be calculated by different valuation method. Investors need to understand the valuation method usage and calculation. In fact, there is no one-valuation method to estimate value of companies. Valuation can be related with the companies' price. Comparable valuation can show signals of companies in different positions. Hong Kong companies in different industries may suffer from different factors. Different valuation method is estimation in different situation or data source to transfer as value of companies. Valuation and share price become supportive relationship and explanation of companies' value. Ten valuation methods can be summarized as typical approaches. There is a simple analysis for different type valuation to have different effect on share price and companies valuation. Also, the research mentioned that valuation is related to share price. The relationship can be a signal for companies and investors' trend study or business analysis. Also, research summaries residual difference with ten valuations, correlation for valuation and share price and regression model for valuation and share price. The research can base on different testing to carry out conclusion and finding on valuation application and share price. Hong Kong Thirty companies from 2006 to 2010 can be tested for research purposes.

Keywords: intrinsic value, finance, valuation, share price

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1. Introduction and Background of the Research

People always decide how to spend our money in daily life. They always compare the price and valuation of everything because they want to make a good decision. After 2008 financial tsunami, the stock price decreases very much. Investors will think more and carefully about value of their investment. Value and price are useful for many stakeholders of company. Their relationship can make clear the company position in the market. Intrinsic value represents an analytical judgment of value based on the perceived characteristics inherent in the investment and amount that an investor considers, on the basis of an evaluation of available facts. (Pratt and Niculiță, 2007) All stakeholders will try to compare the price and intrinsic value of company. Company may base on intrinsic value to adopt policies to keep good position because companies have undervalued or overvalued in the stock market. Whenever any company goes public, it is very difficult to judge how much investors will be prepared to pay for the stock. (Brealey, Myers and Allen, 2010) Company cannot always base on share price to determine value of company. Therefore, a detailed study on relationship between value and price is important for people to decide investment.

Value is a certain measure of performance because it takes into account the long-term interests of all stakeholders in a company (Koller, Goedhart and Wessels, 2010). Price can provide message to different users. They can trust price in an efficient market because all information reflects in price and no more valuable information can be used for any gains. Price come from the point that buyer is willing to pay and sellers is willing also accept but the competition is allowing at the price point. Investor and other stakeholders will plan their investment action and decision for the future. People will get information from different valuation approach for their decision and judge for any mispricing. That's mean there is an opportunity to gain from mispricing. The reason is that information valuation difference or expectation difference can make people to gain for investment decision in market.

1.1. Statement of Aim and objectives

The study starts from stock mispricing. Price mean expectation of certain investors and implies valuation of company. When people have different expectation on company, the price will differ. The different valuation approach will get different result

because of capture of different kinds of information. Therefore, mispricing will make different between valuation and price. The study will select the common approach for valuation estimation and compare with share price. Then, different approaches in the testing can explain price and compare with price. Testing can provide more information from price and valuation.

The study refers to National Association of Certified Valuators and Analysts (NACVA) to summarize objectives for the misprice of company:

1.　Review of application of the valuation approach and price;

2.　Review of valuation approaches and explain approaches application to estimate the price of Hong Kong companies;

3.　The research adopt residual difference to select valuation approach to compare with share price and relationship of price and valuation;

4.　Formulation of a mathematical model to capture the price of the companies from a group of valuation method;

5.　Summarize the relationship between share price and companies value;

6.　Summarize the limitations in the research and make recommendation or improvement for the further investigation to foresee company valuation.

1.2. Problem Statement and reason for research

The main problem statement in the research is "what is the relationship between price and valuation for company?" People would like to know how to estimate the price of company in the market. The study will make a suitable valuation method to estimate valuation of company and compare with price. (Fernandez, 2002) Also, the price and selected valuation method will be concluded their relationship of company. The selected companies valuation and price will be overseen to support conclusion.

The research review summarizes the major components for the valuation and price in our research. In fact, there is no one-valuation method to fulfill all need for different users and purposes. The research will review different valuation method and find out suitable grouping for selected methods including in our components for the model. The research should maintain conclusion for model for estimation of price and valuation. Also, the research will explain relationship between value of companies and price.

2. Literature Review of Valuation approaches

The study will base on different information to review the valuation approach and point out brief definition, usages and application of different approach application. Fundamental analysis is the method of analyzing information in current and past financial statements, in conjunction with other firm specific, industry, and macroeconomic data to forecast future payoffs and eventually arrive at a firm's intrinsic value because of mispriced stocks for investment. The research separates three difference approach including income approach, asset approach, and Market-based approach. There is some common method for company valuation estimation. (Torrez, 2006) The testing will conclude the result from each valuation method from income, asset and market value method.

Income Approach

The income approaches determine fair market value by selected company times a discount or capitalization rate. The most correct method for a going-concern operating company. Company keep to continue their business and their income is stable. Income should be their valuable resource. Smaller companies are difficult to project future earnings and set up an appropriate discount rate. Stable and sizable companies can be easier to estimate their earning power to transfer the business valuation.

Discounted cash flow method (DCF): It emphasizes on peer companies with matching payout, risk and growth characteristics but less reliance on current market valuations Also, it focus on the full-information estimation of free cash flows over a multi-period, the choice of an appropriate finite horizon, estimation of growth beyond the horizon, and in its standard implementation, estimation of an appropriate weighted average cost of capital (*WACC*). If riskier firms are harder to forecast, *DCF* will have higher forecast residual difference because the research cannot capture the value of risk easily. *DCF* more frequently value small firms. However, high-risk firms, loss making firms and firms with a limited number of industry peers will be difficult to get information for valuation. (Demirakos, Strong and Walker, 2009) An ideal constant growth rate of cash flows is defined for no opportunities for extra-profitability in the long-term. An ideal growth rate shows the asymptotic equivalence between profitability and cost of capital and the determination of ideal target prices that respect the long-term steady-state assumptions. They get

a sample of 784 equity reports for European companies in the period 2003-2005. (Cassia and Vismara, 2009)

Many people apply this method to estimate company valuation from internal figure and not including market effect. It is common method for people to know the company valuation even it is not completely accuracy. It can be easy and worthy to have a preliminary valuation and appropriate valuation method on companies for research. (Berkman, Bradbury, Ferguson, 2000).

Dividend discount models (Gordon Growth Model) (DDM): A model determines the intrinsic value of a stock and bases on a future series of dividends that grow at an annualized constant rate. It can determine value by growing dividends at a constant rate for an infinite period if a stock is mispricing in the current market. Stock market prices from as dividends is very substantial with the bivariate *DDM*. (Jiang and Lee, 2005)

Residual income valuation (RIV): The intrinsic value of the firm has two components: The current book value of equity, and the present value of future residual income. Residual income model is more useful and meaningful because accounting earning and book values can bring more information than dividend. (Jiang and Lee, 2005) Asset returns can be predictable by accounting value. (Lee, 2006). Performance and return of company can generate company valuation. A firm's intrinsic value by an expectation of future earnings using future stock returns estimates (Barniv et al., 2010) Also, valuation should include relative costs, cost leadership, industry demand conditions, and the information content of sales for capital expenditure. (Walker, Wang, 2002) There are difference between actual share price and estimate of share value from risk-free rates of return because of both systematic risk and total volatility in residual return on equity. (Baginski and Wahlen, 2003)

Arbitrage Pricing Theory (APT): The expected return of a financial asset can be treated as a linear of various factors, where sensitivity to changes in each factor is represented by a factor-specific beta coefficient. The researchers Beenstock and Chan test UK securities market and review US market by APT, they conclude that systematic risk should be priced. A firm's risk means its value and ability to develop business. (Beenstock and Chan, 1986) Value of risk can be important valuation part of companies.

Capital Asset Pricing Model (CAPM): A model relates an expected profitability of an asset in a certain market and equilibrium

with its undiversified risks. (Filho, Garcia and Imoniana, 2009) It is good for calculating the cost of equity since it takes into consideration the business level of systematic risk relative to the stock market. It is not possible to test the *CAPM* by a "true" beta. No precise method for calculating the beta and the market risk premium. (Hickman and Petry, 1990) < Beenstock and Chan 1986> test *CAPM* and *APT* in the context of the UK securities market. Tests of *CAPM* model were very disappointing. More and more people feel *CAPM* not get a good result for the valuation. (Beenstock and Chan 1986)

Market Approach:

It is useful when it attempts to apply actual public valuations to value a similar company. The value of business in the economic rationale of competition affect directly by a free market means the demand and supply.

Investment Models / Tobin's q Model (TQM): The model bases on efficient capital markets and perfect information. No one can gain because they equally access to capital markets regardless of risk, therefore the amount borrowed and the cost of capital will only differ because of investment demand. The ratio of the stock market value of the firm to its replacement cost (*Tobin's Q*) should be a sufficient statistic for investment. (Bond et al., 2004) Fixed investment depends on Tobin's q measured by the output capital ratio. (Franke and Semmler, 1999) Ownership positively related to firm value. (Wei, Xie Zhang, 2005) The quality of control directly affects firm policies and value.

Guideline Publicly Traded Company Method (GPT): Company valuation can base on stocks prices of similar companies in a public market, a publicly traded equivalent value. Company marks as market valuation. If companies are in same industry, normally structures are similar. Company valuation can refer other similar companies' value and other companies' actual price in public market.

Guideline Merged and Acquired Company Method (GMAC): The valuation is actual transactions of comparable companies, a valuation reference for investment decision. Buyer or injectors will partly acquire company and offer the price.

Asset-based Approach

Value of companies is liquidated by tangible assets or high quality balance sheet, business book values that are similar with fair market values. Good presentation on asset and liabilities can represent the position of companies and value at the date.

Tangible Book Value (TBV): Intangible asset is estimation or difference for pricing of company. It base on a company position and ability. If a company's development tend to be worse, intangible assets will be useless. Tangible valuation means book value deducts from intangible assets.

Economic Book Value (EBV): An analysis adjusts the assets to their market value. Such as, goodwill, real estate, inventories and so on. That's mean book value mark to market. It base on company's property to count the value by market trading price.

The Capitalized Excess Earnings Method (CEE): A procedure generates value from net tangible assets that subtracting adjusted liabilities. Also, calculate the excess earnings from the total business earnings and the net tangible assets. (E.g. goodwill) A company values its future and its ability net tangible asset.

Asset Accumulated Method (AAM): According to balance sheet format, fair market value of all business assets, both tangible and intangible is determined and contingent liabilities. It also includes some off-balance sheet assets including intellectual property items, customer contracts and so on. However, unrecorded liabilities are difficult to value for a company in normal position. When company is allocated to the purchase price, unrecorded liabilities can be treated as a realistic value. This requires expertise in valuation standard and method.

3. Empirical Methodology

According to study, the research should set up a model to estimate a share price and a model to apply intrinsic value of company for relationship with share price. Then, the relationship between share price and intrinsic value of company can bring investment signal or deeply business analysis. The model should consider different valuation approach as the followings:

3.1. Data Sources

Stock price: Price comes from Hong Kong public market for the selected companies' year ended at the date. Also, each company also refer similar company price to estimate value. The closing prices as at year ended are used for comparison and data analysis.

Financial record: The research review selected companies' financial figure for valuation. E.g. cash, asset, liabilities, net book value or other contingencies value. The research bases on different valuation method to collect financial data. Valuation methods need to

collect different financial data in different year ended. All financial data come from relevant companies' website and investment website.

Interest rate: Data subtract from discount window rates - Hong Kong Monetary Authority (HKMA). Also, company bears different interest rate on their deposit or debts. Hence, the research base on financial report to define interest bearing. Present value and market risk will affected by this factors.

3.2. Process and design of testing

Data collected and hypotheses setting by researcher. The research assumed the null hypothesis (H_0) to be true, alternative hypothesis (H_1) represented to reject the result of sample to the population. The importance of the research hypothesis as a method of organizing inquiry was obscured. (Shields and Tajalli, 2006) In this research, the hypotheses were defined as followings:

H_0: intrinsic value of companies are positive affect to the to share price

H_1: intrinsic value of companies is not positive affect to share price

The research bases on different nature on the study to define the following point:

1.   Relationship between share price and valuation and Comparison valuation with share price;

2.   Suitable valuation method to estimate companies value and price;

The testing for different valuation method separates following parts:

Part A: Share price and valuation explanation analysis

Residual difference: absolute value for difference between each valuation and share price. Correlation of valuation and share price: relationship of share price and valuation itself.

Part B: The precise of valuation method for share price by approach type

I) The importance on each method for each approach;

II) The importance on different approach on testing by income, market and asset approach.

To use testing (T-test and F-test) prove effectiveness of each valuation with share price.

Part C: a model for intrinsic value of companies and the trend explanation for model and share price. To build up a model explain and estimate share price of companies.

All methods in testing were selected and normally apply in valuation. Also, there are many valuation methods in real. Research mentioned common valuation in real for further study and testing.

The research should compare each company valuation to know the approach effect. "Comparability" is valuation study's base requirement. In this study, population referred to valuation of all companies in Hong Kong. "Feasibility" also becomes our study criteria. It is impossible to conduct whole testing on all companies' valuation. The sample should be set greater than 30. The testing conducts for 30 companies. In order to know different condition and more precise on estimation value on selected companies. The data is collected from 2005 to 2010. Therefore, the sampling becomes larger. Therefore, the sample size was determined as 150 valuations in this research.

To fulfill the target, the research should select different industries companies. Then, the data will cover different structure companies and capture different effect on valuation method. Hence, 30 companies for 5 years should be tested by research. The data in five year can show different status of companies. The valuation result also can provide different kinds of economy effect. Also, the testing needs to find most suitable approach to company. The research should apply further testing on different analysis and all of approach on the finding.

3.3. Data Collection and Calculation

The testing includes 30 (15 pairs) Hong Kong listed companies' data to test different approaches for 5 years data analysis (2006 to 2010). Every two companies are same industry. It is easy to know different effect of valuation approach for same industry company. All data are made as the following treatment for valuation calculation. The research applies 5 years data of 30 same companies because there are different situations of companies. Valuation can easily conclude the result on completely view. Also, data collect as at companies' financial years. It reduces any timing difference problem. All data can be stated at the same point and disclosed more. The testing compares share price with each valuation. There are some conclusions for method selecting, analysis, trend study and so on.

Discounted cash flow method (DCF): The research bases on cash balance to discount all value as at year 2010 by discount Window rates from HKMA. Also, the discounted cash value will add share capital par value in total value because cash flow balance only shows the operation abilities of companies. Par value means the share original value. Hence, total value becomes more reliable.

Dividend discount models (DDM): The value comes from dividend by different between dividend growth rate and *WACC*. Dividend growth rate is equal to return on equity and Plowback ratio.

Residual income valuation (RIV): Retained earnings are discounted as present value by *WACC* at year 2010. Also, the value adds on book value on the total value. It is an income approach to estimate value of companies.

Arbitrage Pricing Theory (APT): The total amount includes interest from HKMA and the interest bearing from the company bearing. That's mean the company bears interest from bank deposit or loan. It value company market risk free cost and interest bearing for their business.

Capital Asset Pricing Model (CAPM): The research applies difference for market returns, price of Hang Seng Index to calculate "E (Rm)". Beta comes from difference of companies' return and difference of market return. The value bases on market returns and companies returns to estimate value.

$$E(R_i) = R_f + \beta_i \left(E(R_m) - R_f \right)$$

Tobin's q Model (TQM): The research summarizes total price including share price and quantities and net book value of companies in this method. This method marks companies' value as market price.

Guideline Publicly Traded Company Method (GPT): The Company value mark as market value that come from similar company's share price and base on company book value to mark as market value. The pricing of other companies in same industries is applied to estimate companies' value.

Guideline Merged and Acquired Company Method (GMAC): This method will not apply in the research since the data is not comparable. "Comparability" can be standard of the research. There are not all of companies to mark this valuation method. When the companies get merged or acquired by others, companies' value will be offered. However, the value should be partly component in companies or offered at specific time. The value cannot be applied in

different years or some companies that did not get any offered price. Also, the offered price can be judged as objective or not because the price may not be fair value of companies.

Tangible Book Value (TBV): The amount deducts intangible value of companies. However, if the company did not have any intangible part, value equal to net book value. However, the amount still can apply because no intangible part mean book value accompany with relevant from physical event and not estimation.

Economic Book Value (EBV): This method marks all balance value as market. It is difficult to define all market value of balance sheet components. There is no objective standard to judge value for liabilities and intangible asset. Also, research is limited source to review value and adjust a value.

The Capitalized Excess Earnings Method (CEE): The value comes from net tangible assets that subtracting adjusted liabilities. There is same situation for EBV. It is lack of information to make adjusted value for liabilities.

Asset Accumulated Method (AAM): It will include all unrecorded items. For examples, contingency liabilities and any leased income and expenses. Therefore, valuation can be included future information and increase value of instable.

3.4. Data Analysis

Mispricing can vary companies' valuation from many methods because the result of testing can support relationship between share price and valuation. Share price can be supported and explained by valuation. Valuation from different source can show share price suffer from different factors or different situation. Share price should be undervalued or overvalued if the share price cannot have evidence to link of them.

Part A: Share price and valuation explanation analysis

Residual difference with share price**:** This major objective focuses on the different valuation method and approach to explain share price. It is simple analysis for different valuation method and companies. This analysis bases on difference between valuation result and share price. The negative or positive difference per share price can show residual difference, simple trend of result of valuation. Firstly, research assumes absolute value of the residual difference because the testing purpose is explanation from the valuation for share price. Different mean overvalue or undervalue of companies.

Both of them also reduce explanation of share price. Therefore, absolute value is easy to have a trend analysis for different valuation. The residual difference separates six level by each 20% from the least "below 20%" and the worst "over 100%". Range setting can be analyzed valuation trend with share price. It is simple and preliminary study of companies' value.

Correlation of valuation and share price: In this part, the research adopts correlation between share price *(Y)* and other valuation method (X_1) to (X_{10}). Higher Coefficients of *X* mean become higher relationship with *Y*. The testing base on price and each valuation result to set up a correlation by Microsoft excel. Also, this testing can compare with each valuation because correlation of each valuation. It is easy to estimate different trend of different approach. The trend can show different methods in each approach and result of different approaches.

Part B: The precise of valuation method for share price

I) The importance on each method for each approach.

II) The importance on different approach on testing by income, market and asset approach.

The analysis applies t-test and f-test for each valuation with share price. The hypothesis testing set up purpose as price and valuation are same direction. Hence,

H_0: intrinsic value of companies are positive affect to the to share price

H_1: intrinsic value of companies is not positive affect to share price

This is a two-tail t-test and the reject regions are below:

$T > T_{\alpha/2}$ or $T < T_{1-\alpha/2}$

Also, one-trail f-test is adopts and the reject regions are below:

$F > F_{\alpha}$,or $F < F_{1-\alpha}$

Testing can show feasibility of each valuation. The result can show the suitable valuation for estimation of share price. Also, the components of model can be determined.

Part C: a model for intrinsic value and share price

The research bases on all valuation method to set up a model to explain the relationship for all valuation method and share price. Also, another model can be made by elements from previous testing result. The model can show us the importance of each valuation and

explanation of price. Two models can compare different valuation method explanation. Therefore, the model can explain relationship between share price and all valuation methods.

The multiple regression line:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} ,$$

where:
Dependent variable *(Y)* - share price of relevant companies;
Independent variables *(X)*:
Discounted cash flow method *[DCF (X_1)]*
Dividend discount models *[DDM (X_2)]*
Residual income valuation *[RIV (X_3)]*
Arbitrage Pricing Theory *[APT (X_4)]*
Capital Asset Pricing Model *[CAPM (X_5)]*
Tobin's q Model *[TQM (X_6)]*
Guideline Publicly Traded Company Method *[GPT (X_7)]*
Net book value *[NBV (X_8)]*
Tangible Book Value *[TBV (X_9)]*
Asset Accumulated Method *[AAM (X_{10})]*

3.5. Limitations for research

The incorporation of foreign firms: The incorporation of foreign firms with different accounting and regulatory standards raises complications. Data need to be arranged at the same presentation and comparable form. Also, companies in different countries suffer from different factors. Valuation cannot be analyzed at the same situation. Any fluctuation can be occurred and affected in different factors from different countries. If companies locate in same country, valuation can be easily summarized a conclusion. Such as, economy or government regulation and so on.

Special events: Some matters suddenly occur and factors should be known. Such as financial tsunami or financial crisis. However, it is no any adjustment on valuation because the research base on raw data to estimate value. The analysis can be affected from raw effect. Also, any factors effect on share price and valuation are not same. Unadjusted value can show actual difference from all factors for price and valuation.

Sample size: Researcher cannot adopt more samples because limited resources. The sample can be accessed limited to 15 industries for estimation for 5 years data of 30 companies. Research

adopts 5 years because data can be included different situation of companies. Users need to compare more valuation and data source of each valuation. "Feasibility" and "comparability" need to be considered by users. Not all valuation can apply in real because valuation method can be applied in all companies. Limit of "feasibility" and "comparability will reduce valuation testing reliability.

Data disclosure for listed companies: The research adopts for listed companies because the data can be collected in public other than private companies. However, for companies' valuation comparison, private companies and listed companies comparison should be more informative. Also, the sizes of companies can also alternative analysis for valuation by listed or private because sizable companies will face different resource problem and factors. Size of companies affects the cost, income, and human resource. Therefore, valuation becomes more complex and valuable for comparison.

4. Research Findings and Analysis

Before showing testing result, a model including all valuation can be generated (Table 1, Annex).

The R square shows that 95.41% and intercept is –0.549 only. Hence, that's ten valuation can explain with share price closely. Therefore, the testing is performed and major valuations are selected to explain for share price.

Findings in Part A: Share price and valuation explanation analysis

Residual difference calculation: The testing generates residual difference from different valuation with price. In order to simply result of residual difference, the testing set out total six ranges for ranking. The research selects 30 companies for valuation calculation comparison from year 2006 to 2010. There are 150 testing results for residual difference. If valuation explains better for price, the ranking percentage becomes less. The least residual difference implies that relevant valuation method can estimate price easily (Table 1a, Annex)

It is a brief testing on the valuation method. In order to be objective and reliable, tangible book value and Asset Accumulated Method will not include in our testing. They adjust net book value to a new valuation. The testing also can state that their results are very similar nature. There are no material effects on the result to omit them in research. No testing result occurs within 20% to 40%. Most valuation method based on historical data to estimate value of

companies by different source. Historical data may not estimate any occasional events on share price or other unpredictable factors. Hence, the result becomes not precise. (Residual difference >40%) The valuation method can estimate price easily within 20% residual difference. Therefore, residual difference from 20% to 40% may not exist for testing.

Residual difference below 20% for valuation is much precise. From table 1a and 1b, testing result is 29% of total sample in below 20% residual difference. That's all ranking occupied largest percentage. According to result, research can select suitable method to explain price. Some element in this group can effectively explain the price because of ranking percentage. When residual difference of valuation method is over 29% in below 20% residual difference, explanation of valuation with price is better than total. Residual difference of *DDM (X_2)*, *TQM (X_6), GPT (X_7)* and *NBV (X_8)* are 43%, 37%, 33% and 39%. All are over 29%. Therefore, the precise of share price estimation is better than others valuation method. In contrast, the residual difference over 60% mean less precise on estimation. Residual difference over 60% in all samples is 57%. *DDM (X_2), RIV (X_3) TQM (X_6), GPT (X_7)* and *NBV (X_8)* are 51%, 56%, 53%, 55% and 34%. That's mean those valuation is less error on estimation with share price (Table 1a 1 and Table 1b 1, Annex).

According to the result, researcher can briefly oversee the suitable method to explain share price. For residual difference below 20%, the research selects the most suitable 4 methods. The total residual differences become more precise from 29% to 39%. Also, the total residual differences become less precise from 34% to 56%. There is a trend on this testing. The fluctuation on testing occurs because of using historical data for valuation. Hence, ***DDM (X_2), RIV (X_3) TQM (X_6), GPT (X_7) and NBV (X_8) are selected in this testing for future modeling.***

Correlation: The result can show the explanation of valuation for share price. The coefficients of correlation between all valuations can focus on relationship between share prices *(Y)* and other valuation *(X_1 … X_{10})*. *DDM (X_2)* and *CAPM (X_5)* are negative relationship with share price *(Y)*. Also, they are opposite to other methods. However, *CAPM* is totally negative relationship with all methods and share price. The coefficients of correlation show relationship for price and valuation.

Also, there is same reason as testing (Residual difference calculation). *NBV, TBV and AAM* are also same nature valuation (Table 2, Annex). *RIV, TQM, GPT* and *NBV* can be more relevant to share price. Income approach becomes less relationship with share price because income approach comes from various sources. E.g. dividend retained earning, cash flow and so on. The valuation in income approach may not have same result. Mostly, valuation and share price are positive relationship. The coefficients of correlation for *RIV, TQM, GPT* and *NBV* are 47%, 87.66%, 80.79% and 88.91%. All are nearly half or above. That's mean their value is closely related with share price. *RIV (X_3), TQM (X_6), GPT (X_7) and NBV (X_8) are selected in this testing for future modeling.*

Part B: The precise of valuation method for share price

F-test is adopts to determine evidence to the population. When F is less then F with one tail, the hypothesis is accepted. That's mean the method is positive relationship with share price. The following calculation decides whether to reject the null hypothesis or not (Table 3, Annex):

$F > F\alpha/ 2, v1, v2 = F .025,149,149 \sim F .025,148, 148 = 1.48$

Or

$F < F \alpha/ 2, v1, v2 = F .975,31,31 = 1/F.025,149, 149 \sim 1/F.025,148,148 = 0.676$

Rejection region:

$1.48 < F$ or $F < 0.676$

DCF (X_1): $F = 62.63$ fall into the reject region because it is greater than 1.48, we reject the null hypothesis.

DDM (X_2): $F = 0.08$ do not fall into the reject region, because it is not greater than 1.48 or smaller than 0.676, we accept the null hypothesis.

RIV (X_3): $F = 8.736$ fall into the reject region; because it is greater than 1.48 we reject the null hypothesis.

APT (X_4): $F = 132.77$ fall into the reject region; because it is greater than 1.48 we reject the null hypothesis.

CAPM (X_5): $F = 7644.676$ fall into the reject region because it is

greater than 1.48, we reject the null hypothesis.

TQM (X_6): F = 0.139, do not fall into the reject region because it is not greater than 1.48 or smaller than 0.676, we accept the null hypothesis.

GPT (X_7): F = 0.3926 do not fall into the reject region because it is not greater than 1.48, or smaller than 0.676, we accept the null hypothesis

NBV (X_8): F = 2.536 fall into the reject region because it is greater than 1.48, we reject the null hypothesis.

TBV (X_9): F = 2.678 fall into the reject region because it is greater than 1.48, we reject the null hypothesis.

AAM (X_{10}): F = 2.592 fall into the reject region because it is greater than 1.48, we reject the null hypothesis.

According to result, DDM, TQM and GPT are accepted. Therefore, market approach is closed relationship with share price.

When t Stat is small than t Critical one-tail, 1.6551, the sample will fail in rejection region. Also, P-value exceeds 0.1 say not significant, then accept H_0.

DCF (X_1): T = 5.577 fall into the reject region because it is greater than 1.6551. Also, when p-value is 0.000000056 (<0.1), we reject the null hypothesis.

DDM (X_2): T = 0.2581 did not fall into the reject region because it is not greater than 1.6551. Also, when p-value is 0.79666 (> 0.1), we accept the null hypothesis.

RIV (X_3): T = 4.587 fall into the reject region because it is greater than 1.6551. Also, when p-value is 0.00000472 (<0.1), we reject the null hypothesis.

APT (X_4): T = 4.594 fall into the reject region because it is greater than 1.6551. Also, when p-value is 0.00000459 (<0.1), we reject the null hypothesis.

CAPM (X_5): T = 6.246 fall into the reject region because it is greater than 1.6551. Also, when p-value is 0.00000000209 (<0.1), we reject the null hypothesis.

TQM (X_6): T = -2.977 did not fall into the reject region because it is

not greater than 1.6551. Also, when p-value is 0.001696 (<0.1), so we reject the null hypothesis. T test and P value have different result.

GPT (X_7): *T* = -0.8394 did not fall into the reject region because it is not greater than 1.6551. Also, when p-value is 0.201 (>0.1), we accept the null hypothesis.

NBV (X_8): *T* = 4.039 fall into the reject region because it is greater than 1.6551. Also, when p-value is 0.0000427 (<0.1), so we reject the null hypothesis.

TBV (X_9): *T* = 4.60 fall into the reject region because it is greater than 1.6551. Also, when p-value is 0.00000443 (<0.1), so we reject the null hypothesis

AAM (X_{10}): *T* = 4.472 fall into the reject region because it is greater than 1.6551. Also, when p-value is 0.00000762 (<0.1), so we reject the null hypothesis

Table 4 (in the Annex) shows the summary of result for T-test. T-test is any statistical hypothesis under a research's t distribution if the null hypothesis is supported. When the test statistic would follow a normal distribution and the value in the test statistic were known, T test can be done.

T< t Critical one-tail because Test Statistics falls outside the Critical Region, *H0* will be accepted. The T stat of *DDM (X_2), TQM (X_6) and GPT (X_7) are* 0.258, -2.9775 and -0.8394. The t Critical one-tail of them is 1.655. Therefore, other methods are not accepted to *H0*. **DDM (X_2), TQM (X_6) and GPT (X_7) are selected in this testing for future modeling.**

The p-value can measure statistical evidence amount to support the alternative hypothesis. Normally, the p-value > 0.1 is not significant for alternative hypothesis to be true. Hence, P-value >0.1, H0 is accepted. The result concludes that **DDM (X_2) and GPT (X_7) are selected in this testing for future modeling.**

Summary of testing result

According to our testing, residual difference can show the valuation precise.

Summary of acceptance of testing on each valuation
H0 : intrinsic value of companies are positive affect to the to share price
H1 : intrinsic value of companies are not positive affect to share price

	DCF (X1)	DDM (X2)	RIV (X3)	APT (X4)	CAPM (X5)	TQM (X6)	GPT (X7)	NBV (X8)	TBV (X9)	AAM (X10)
Residual difference		Accept H0	Accept H0			Accept H0	Accept H0	Accept H0		
Correlation			Accept H0			Accept H0	Accept H0	Accept H0		
f test		Accept H0				Accept H0	Accept H0			
t test		Accept H0				Accept H0	Accept H0			
P value Result		Accept H0				Accept H0				

Correlation can show the valuation how to relate with share price. F test and t test can show our hypothesis to be accepted for the result of each valuation. Finally, the model will include all methods that support by any testing. *DDM (X2), RIV (X3), TQM (X6), GPT (X7) and NBV (X8)* are selected in the modeling. Share price are explained by those method.

Part C: a model - intrinsic value and share price - Multiple Regression Model

As per chapter 3, valuation investigates the different method to explain on share price. The equation of multiple regression line is shown in Table 5 (Annex).

The detail is same as chapter 3 and "Data Calculation" mentioned. *α* (Alpha) means intercept of the equation. *β* (Beta) refers the slope (coefficient) for each independent variable (*X*).

Before section mentioned, *TBV* and *AAM* related to *NBV*. Result of correlation concludes that *RIV (X3), TQM (X6), GPT (X7)* and *NBV (X8)* are over 40% relationship with share price. F test and T test support evidence for relationship for *DDM (X2), TQM (X6)* and *GPT (X7)* with share price. After testing result, model revised as the following:

Y = α+β2 X2 +β3 X3 +β6 X6+β7X7+β8 X8

According to revised model, R square becomes 95.222% for share price that is explained by five kind valuation methods. Hence, the major five valuations can explain 95.222%. Hence, other five valuations become less important explanation for share price. The revised model still can maintain explain on share price. 95.222% is high performance of the model. Hence, it can conclude the valuation is positive relationship with share price.

The model revised as the following:

Y = 1.19+ (-0.00175) X_2 + (0.089) X_3 + (0.181) X_6+ (0.084) X_7+ (0.72) X_8

Findings in the multiple regression models

Share price= 1.19+ (-0.00175) *DDM*+ (0.089) *RIV*+ (0.181) *TQM*+ (0.084) *GPT*+ (0.72) *NBV*

The coefficients *(β)* of each independent variable *(X)* describe the relationship between the share price and different valuations. The model to make conclusion as below:

Intercept: The value of intercept (*α*=1.19) is meaningless and irrelevant in this model. However, α value is not in major items in model.

Dividend discount models: From the model, T-stat value is -0.326 and p-value is 0.745. The coefficient *(β)* of -0.175% means adverse relationship for this valuation method and share price. This valuation comes from dividend. More dividends for shareholders will make less investment on companies' activities. From the calculation of this model, data come from Plowback ratio. It can explain that more dividends will make less investment return. Hence, the share price will decrease because less value added from companies' activities. Hence, it shows the negative relationship with share price. ***The higher valuation in DDM comes to lower share price.***

Residual income valuation: T-stat value is 0.910 and p-value is 0.364. The coefficient *(β)* of 8.9% means this valuation is linear relationship with share price. It is less important items on the model. When *RIV* valuation increases 1 unit, share price increases 8.9%. When income increases, people's expectation on companies also increase. The share price also increases. Also, income increase means the valuation of companies increase. The share price will be affected positively. ***RIV and share price are same direction***

Tobin's q Model: T-stat value is 16.72 and p-value is nearly Zero. The coefficient *(β)* of 18.13% means this valuation is linear relationship with share price. It is important items on the model. It is a market-based method and better to estimate the share price. Since valuation base on book value to mark as market rate. ***This valuation can have direct relationship with share price.***

Guideline Publicly Traded Company Method: T-stat value is 4.225 and p-value is nearly Zero. The coefficient *(β)* of 8.45% means this valuation is linear relationship with share price. It is less important items on the model. The price refers from other companies.

Since it is difficult to find a good and relevant reference, the valuation may not have an objective base. However, other companies in same industries may provide some signals for companies' valuation. Companies' valuation cannot rely on this method fully because different companies get various structure and business performance. Therefore, ***this valuation can affect share price lightly.***

Net book value: T-stat value is 9.182 and p-value is nearly Zero. The coefficient *(β)* of 72.16% means this valuation is linear relationship with share price. It is an important item for share price. Companies' net asset value means companies' ability to generate future economic income. It affects the people expectation. Also, more asset value can show the company more investment performance. Companies' book value can imply the companies earning power. When companies have an enough power to earn future income, people's expectation and companies' business opportunities will also increase. Share price is reasonable to increase at the same time with net book value. ***Net book value is linear relationship with share price.***

Finally, the correlation expressed in table 6 (Annex) can show their relationship of the valuations that are not selected in the model. They are same direction and it mean they can explain with share price. The negative relationship is with share price.

5. Conclusion

Mispricing of companies implies opportunities of investment. Normally, valuation is related to share price. Different valuation can be in different position on share price. However, there are many valuation methods to be less important. Also, No one valuation can explain share price. Valuation comes from different source of companies. Income, market and asset approach are typical method data to estimate companies valuation. Share price need to be estimated by different valuation. Share price come from different aspect of information and expectation. Each valuation only can explain one aspect. More valuation method can provide more information on share price estimation. Relationship between share price and valuation can show the trend of companies and different view of companies.

Therefore, a model should include a group of valuation that can explain and estimate share price. *DDM (X_2), RIV (X_3), TQM (X_6), GPT (X_7) and NBV (X_8)* are suitable to explain share price from result

of residual difference, correlation, f test and t test for hypothesis of research. *DDM* (X_2) can show information of investment for the companies. *RIV (X_3)* show the income for the companies. *TQM (X_6)* is market value of the companies. *GPT (X_7)* is companies' value mark from competitor price. *NBV (X_8)* is value of companies to generate future income. Hence, this model includes income, asset, competitor, and investment signals in the model. Those factors are necessary for a company's development or business operation. Valuation can explain closely with share price. They mostly are in positive relationship. Positive relationship means that valuation can explain share price. A group of valuation can estimate price. Companies' intrinsic value can directly affect and estimate the share price. *NBV (X_8)* is major element of the model because earning power is major factor in a company. It is important because companies depend on income to survive. Therefore, the model can explain share price. Valuation and price are close relationship. The intrinsic value of companies is directly related to and affects the share price. The modeling of research can estimates share price of companies.

6. Recommendations and further research

Share price and valuation are direct relationship. There is no evidence for a best valuation to explain share price well. To know relationship of them, it can understand more companies worth and how to know what factors to affect share price. It is not a tool for earning because an analysis cannot have a precise estimation and complete modeling. The result of testing is not criteria to select best valuation method. Different valuation should be applied in different position and companies.

Valuation in research follow by income, market and asset based. There are many factors not include in our study. A complete valuation based can provide more information and smooth estimation. The research can provide a brief conclusion on valuation. Surely, the sampling is limit. Further testing and research can provide more and deeply information for further study.

This empirical research may raise some implication for future research. Larger scale of research, valuation can have more detailed study on share price between different companies in different industries. Also, further research on valuation can be categorized by different base approach. There is different structure or result for all

companies in same industries. Research can adopt more samples to conclude different companies' responses of different events.

Further study should adopt more valuation method to include different environment factors and estimate with effect of news in Hong Kong. Different companies will have different level of effect from all news or factors.

Also, from our testing result, positive relationship for valuation with share price becomes components of model. However, negative relationship also can provide more information and make the model more precise. It is lack of information to explain more on negative relationship. Hence, more samples on testing and detailed study on negative relationship can provide more information on amendment of model. More valuation method includes in research and sample in testing. It will summarize a model to make intrinsic value of companies.

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Table 1

Table of outcome of model for variables X_1, X_2, X_3, $X4$, X_5, X_6, X_7, X_8, X_9 and X_{10}

Regression Statistics	
Multiple R	0.976807453
R Square	0.9541528
Adjusted R Square	0.95085444
Standard Error	9.394841548
Observations	150

ANOVA

	df	SS	MS	F	Significance F
Regression	10	255328.226	25532.8226	289.2809988	8.50759E-88
Residual	139	12268.56363	88.26304771		
Total	149	267596.7896			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Intercept	-0.549642826	1.974125706	-0.278423418	0.781101102	-4.452840196	3.353554545	-4.452840196	3.353554545
DCF (X_1)	0.078944066	0.159713828	0.494284475	0.621885543	-0.236838557	0.394726688	-0.236838557	0.394726688
DDM (X_2)	-0.00314542	0.005391696	-0.583382367	0.560581297	-0.013805762	0.007514921	-0.013805762	0.007514921
RIV (X_3)	0.03149552	0.105019621	0.299901289	0.764700468	-0.176146935	0.239137974	-0.176146935	0.239137974
APT ($X4$)	0.208547424	0.218785615	0.953204463	0.342141148	-0.224030619	0.641125468	-0.224030619	0.641125468
CAPM (X_5)	-0.242257654	1.636424022	-0.148040881	0.882525043	-3.477758777	2.993243469	-3.477758777	2.993243469
TQM (X_6)	0.175047663	0.011168372	15.67351676	1.59236E-32	0.152965807	0.19712952	0.152965807	0.19712952
GPT (X_7)	0.075770982	0.021143965	3.583574861	0.000467963	0.033965605	0.117576359	0.033965605	0.117576359
NBV (X_8)	1.258922425	0.25518411	4.933388789	2.2743E-06	0.754378088	1.763466762	0.754378088	1.763466762
TBV (X_9)	-0.481598725	0.276985019	-1.738717589	0.084298588	-1.029247335	0.066049885	-1.029247335	0.066049885
AAM (X_{10})	-0.025333698	0.168487707	-0.150359323	0.880699101	-0.358463838	0.307796443	-0.358463838	0.307796443

Table 1a

Summary of residual difference for 150 testing

	Income	Income	Income	Income	Income	Market	Market	Asset-based	Asset-based	Asset-based	
	DCF (X_1)	DDM (X_2)	RIV (X_3)	APT ($X4$)	CAPM (X_5)	TQM (X_6)	GPT (X_7)	NBV (X_8)	TBV (X_9)	AAM (X_{10})	Total
x<20%	25	65	36	29	14	55	49	59	57	53	442
20%<x<40%	-	-	-	-	-	-	-	-	-	-	-
40%<x<60%	22	8	30	17	8	15	19	40	26	24	209
60%<x<80%	23	5	36	20	8	23	23	27	38	28	231
80%<x<100%	76	32	37	38	110	14	20	8	9	17	361
Over 100%	4	40	11	46	10	43	39	16	20	28	257
	150	150	150	150	150	150	150	150	150	150	1,500

Table 1b

Summary of % for residual difference for 150 testing

	Income	Income	Income	Income	Income	Market	Market	Asset-based	Asset-based	Asset-based	
	DCF (X_1)	DDM (X_2)	RIV (X_3)	APT ($X4$)	CAPM (X_5)	TQM (X_6)	GPT (X_7)	NBV (X_8)	TBV (X_9)	AAM (X_{10})	Total
x<20%	17%	43%	24%	19%	9%	37%	33%	39%	38%	35%	29%
20%<x<40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
40%<x<60%	15%	5%	20%	11%	5%	10%	13%	27%	17%	16%	14%
60%<x<80%	15%	3%	24%	13%	5%	15%	15%	18%	25%	19%	15%
80%<x<100%	51%	21%	25%	25%	73%	9%	13%	5%	6%	11%	24%
Over 100%	3%	27%	7%	31%	7%	29%	26%	11%	13%	19%	17%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Over 60%	69%	51%	56%	69%	85%	53%	55%	34%	45%	49%	57%

Table 1a.1
Summary of residual difference for 150 testing

	DDM (X₂)	RIV (X₃)	TQM (X₆)	GPT (X₇)	NBV (X₈)
x<20%	65	36	55	49	59
20%<x<40%	-	-	-	-	-
40%<x<60%	8	30	15	19	40
60%<x<80%	5	36	23	23	27
80%<x<100%	32	37	14	20	8
Over 100%	40	11	43	39	16
	150	150	150	150	150

Table 1b.1
Summary of % for residual difference for 150 testing

	DDM (X₂)	RIV (X₃)	TQM (X₆)	GPT (X₇)	NBV (X₃)
x<20%	43%	24%	37%	33%	39%
20%<x<40%	0%	0%	0%	0%	0%
40%<x<60%	5%	20%	10%	13%	27%
60%<x<80%	3%	24%	15%	15%	18%
80%<x<100%	21%	25%	9%	13%	5%
Over 100%	27%	7%	29%	26%	11%
	100%	100%	100%	100%	100%
Over 60%	51%	56%	53%	55%	34%

Table 2

Table 2
The table of correlation between share price and the various parameters (different approach)

		Share price (Y)	DCF (X₁)	DDM (X₂)	RIV (X₃)	APT (X₄)	CAPM (X₅)	TQM (X₆)	GPT (X₇)	NBV (X₈)	TBV (X₉)	AAM (X₁₀)
	Share price (Y)	1										
Income	DCF (X1)	0.280880266	1									
Income	DDM (X2)	-0.078725089	0.03164645	1								
Income	RIV (X3)	0.473375318	0.235983286	-0.186734036	1							
Income	APT (X4)	0.122532103	-0.098041765	0.048825071	-0.031173651	1						
Income	CAPM (X5)	-0.152479395	-0.050935487	-0.001873818	-0.118885244	-0.06405636	1					
Market	TQM (X6)	0.876646012	0.20817591	-0.022253425	0.167868595	0.152402855	-0.135346595	1				
Market	GPT (X7)	0.807895513	0.350019572	0.044352486	0.284257098	0.102870262	-0.075385978	0.68410606	1			
Asset-based	NBV (X8)	0.889062346	0.26720553	-0.137094749	0.711039044	0.046852214	-0.139999357	0.648054098	0.73394423	1		
Asset-based	TBV (X9)	0.866490896	0.260216267	-0.150342788	0.700972397	0.049189441	-0.118103242	0.626157081	0.715751914	0.990838071	1	
Asset-based	AAM (X10)	0.866005105	0.265619723	-0.144611253	0.653511935	0.021586784	-0.106582688	0.642116867	0.721131105	0.975177425	0.982741257	1

Table 3

Table 3
Hypothesis
H0 : intrinsic value of companies are positive affect to the to share price
H1 : intrinsic value of companies are not positive affect to share price

null hypothesis : independent variable - intrinsic value of companies (X) is positive relationship to the dependent variable - price (Y) significantly
alternative hypothesis : independent variable - intrinsic value of companies (X) is not positive relationship to the dependent variable - price (Y) significantly

	DCF (X₁)	DDM (X₂)	RIV (X₃)	APT (X₄)	CAPM (X₅)	TQM (X₆)	GPT (X₇)	NBV (X₈)	TBV (X₉)	AAM (X₁₀)
F	62.63373358	0.081426094	8.73627627	132.7742185	7644.675738	0.139426401	0.392637688	2.5366648	2.678431445	2.591559282
P(F<=f) one-tail	3.11553E-92	0	2.10634E-34	5.1999E-116	1.118E-246	0	1.08761E-08	1.24334E-08	1.95366E-09	6.06148E-09
F Critical one-tail	1.310442985	0.763100731	1.310442985	1.310442985	1.310442985	0.763100731	0.763100731	1.310442985	1.310442985	1.310442985
Outcome	F > F CL	F < F CL	F > F CL	F > F CL	F > F CL	F < F CL	F < F CL	F > F CL	F > F CL	F > F CL
Result	Don't accept H0	Accept H0	Don't accept H0	Don't accept H0	Don't accept H0	Accept H0	Accept H0	Don't accept H0	Don't accept H0	Don't accept H0

Table 4

Table 4
Hypothesis
H_0 : intrinsic value of companies are positive affect to the to share price
H_1 : intrinsic value of companies are not positive affect to share price

null hypothesis : independent variable - intrinsic value of companies (X) is positive relationship to the dependent variable - price (Y) significantly
alternative hypothesis : independent variable - intrinsic value of companies (X) is not positive relationship to the dependent variable - price (Y) significantly
The rejection region is t Stat >t Critical one-tail
p-value exceeds 0.1 say not significant, accept H_0

	DCF(X₁)	DDM(X₂)	RIV(X₃)	APT(X₄)	CAPM(X₅)	TQM(X₆)	GPT(X₇)	NBV(X₈)	TBV(X₉)	AAM(X₁₀)
t Stat	5.576952455	0.258130288	4.587467135	4.594142824	6.246242944	-2.977466022	-0.839426541	4.03936326	4.602597821	4.472326485
P(T<=t) one-tail	5.60128E-08	0.398331278	4.72361E-06	4.59314E-06	2.08755E-09	0.001696698	0.201287399	4.27649E-05	4.43287E-06	7.6243E-06
t Critical one-tail	1.655144534	1.655144534	1.655144534	1.655144534	1.655144534	1.655144534	1.655144534	1.655144534	1.655144534	1.655144534
P(T<=t) two-tail	1.12E-07	0.796662555	9.44723E-06	9.18627E-06	4.17509E-09	0.003393396	0.402574799	8.55299E-05	8.86574E-06	1.52486E-05
t Critical two-tail	1.976013178	1.976013178	1.976013178	1.976013178	1.976013178	1.976013178	1.976013178	1.976013178	1.976013178	1.976013178
Outcome	t Stat >t CL	t Stat <t CL	t Stat >t CL	t Stat >t CL	t Stat >t CL	t Stat <t CL				
T test Result	Don't accept H_0	Accept H_0	Don't accept H_0	Don't accept H_0	Don't accept H_0	Accept H_0	Accept H_0	Don't accept H_0	Don't accept H_0	Don't accept H_0
P value Result	Don't accept H_0	Accept H_0	Don't accept H_0	Don't accept H_0	Don't accept H_0	Don't accept H_0	Accept H_0	Don't accept H_0	Don't accept H_0	Don't accept H_0

Table 5

Table 5
Table of outcome of model for variables X₂, X₃, X₆, X₇ and X₈

Regression Statistics	
Multiple R	0.975819677
R Square	0.952224043
Adjusted R Square	0.950565155
Standard Error	9.422451327
Observations	150

ANOVA

	df	SS	MS	F	Significance F
Regression	5	254812.0968	50962.41936	574.0136656	3.50915E-93
Residual	144	12784.69282	88.78258901		
Total	149	267596.7896			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Intercept	1.19177461	0.923400865	1.290636229	0.198898229	-0.633396516	3.016945735	-0.633396516	3.016945735
DDM (X₂)	-0.001753234	0.005375324	-0.326163515	0.744774171	-0.012377965	0.008871496	-0.012377965	0.008871496
RIV (X₃)	0.089347525	0.098136557	0.910440799	0.364111548	-0.104626746	0.283321796	-0.104626746	0.283321796
TQM (X₆)	0.181303026	0.010845961	16.716179	1.52938E-35	0.15986517	0.202740883	0.15986517	0.202740883
GPT (X₇)	0.084517471	0.020004037	4.225020741	4.21882E-05	0.04497799	0.124056952	0.04497799	0.124056952
NBV (X₈)	0.721599788	0.078585367	9.182368383	4.17709E-16	0.566269911	0.876929665	0.566269911	0.876929665

Table 6

Table 6

	DDM (X2)	APT (X4)	CAPM (X5)
DDM (X2)	1		
APT (X4)	0.049492478	1	
CAPM (X5)	0.000935416	-0.065327975	1