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DIVIDEND YIELD INVESTMENT STRATEGIES IN THE VIETNAMESE STOCK MARKET

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TABLE OF CONTENTS **page**

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ABSTRACT

This study examines the performance of dividend yield investment strategies in the Vietnam stock market over the period from 2003 to 2012. One of the most well-known strategies is commonly referred to as 'Dogs of the Dow' strategy (DoD), which involves investing equal amounts in the 10 highest-yielding stocks of a market index. In addition to the standard DoD-10, the performance of the DoD-5 version is also investigated. The performance of the strategies is analyzed on an absolute and risk adjusted bases. Beside Sharpe ratio and Treynor index, the market-adjusted model and 'Modigliani-squared'-adjusted model are used to measure the abnormal return of the investment strategies. Furthermore, the transaction costs and taxes payment are taken into account to test the economic significance of the strategies. Finally, the size effect and book value effect are examined to find explanations for the DoD phenomenon.

The empirical findings suggest that the all of the investigated DoD strategies strongly outperform the market index. In particular, the average annual abnormal return of the DoD-10 is 15.3%, whereas, the corresponding return of the DoD-5 strategy is 29.7%. Although the abnormal returns after taxes and transaction costs are positive, they are albeit statistically insignificant. These findings indicate that the DoD investment strategy may not be economically significant. Finally, this study provides evidence to support that the DoD phenomenon is not caused by the value effect. The finding seems to be consistent with many previous studies. Conversely, the DoD phenomenon can probably be explained with the size effect.

KEYWORDS: Dividend yield anomaly, Dogs of the Dow, Vietnamese stock market, Market efficiency, Size effect, Value effect

1. INTRODUCTION

In 1988, analyst John Slatter suggested a simple strategy for investing in stock market based on dividend yield. He proposed investing equal amounts in the 10 highest dividend yield stocks of the Dow Jones Industrial Average (DJIA) index and holding these high-yielding stocks for one year. After one year, the portfolio is rebalanced and updated with equally weighted investments in the new highest-yielding stocks. Slatter examined the performance of the strategy in the U.S stock market over the period from 1972 to 1987 and found that the strategy outperforms the DJIA index by 7.6% on an annual basis. Slatter's investment strategy is commonly referred to as the 'Dogs of the Dow' strategy (DoD).

After Slatter's work, there have been a number of other researches investigating the effectiveness of the simple investment strategy. One of the most outstanding works is the book named "Beating the Dow" of O'Higgins and Downes (1991), which gained considerable attention of investors and media. The book revealed that the DoD strategy provides an annual abnormal return of 6.2% in DJIA over the period from 1973 to 1991. The success of the strategy in the U.S stock market has been confirmed by many other authors such as Knowles & Petty 1992; Gardner & Gardner 1996; and McQueen, Shields and Thorley (1997). In addition to the U.S, the strategy has been studied in numerous other markets, for example in the U.K, Canada, Poland, China, Chile, Germany, Brazil and so on. During the past decade, the existence of the DoD phenomenon, like many other return anomalies, has been a controversy issue in financial academic. Clearly, the existence of the return anomalies contradicts the efficient market hypothesis (EMH), which states that new price-relevant information is the only things affecting stock prices. According to EMH, there is no investment strategy could remain profitable since the pursue of abnormal returns should instantaneously force the prices to the level predicted by the underlying asset pricing model.

Several possible explanations for the outperformance of the DoD strategy have been proposed. O'Higgins et al. (1991) stated that since 1970 there were an increasing number of

institutional investors. Near the year or quarter ends, to improve the appearance of the portfolios performance before sending to clients, the institutional investors could sell poorly performance stocks at prices below their intrinsic values. The phenomenon is commonly referred to as "window dressing". The DoD strategy seems to select these undervalued stocks that tend to increase value in good market conditions. Additionally, Domian, Louton and Mossman (1998) explained the DoD phenomenon by "winner-loser" overreaction effect. Some authors suppose that the outperformance of the DoD strategy is simply a compensation for higher risks or even a result of data snooping (see e.g. Hirschey 2000). Although there has been not a convincing explanation for the DoD phenomenon, the vast majority of researchers favor the existence of the anomaly.

DoD investment strategy has been studied extensively by academics; however, little attention focuses on the emerging stock markets, especially those in Asia. This master thesis studies the effectiveness of the DoD strategy in the Vietnam stock market. The Vietnam stock market is a developing market which was newly established in 2000. Thus, it is very essential to have more researches concerning about the market, especially about investment strategies. Despite the fact that the DoD strategy has been gained considerable attention of world-wide investors, it has never been investigated in the Vietnam stock market. The contribution of this thesis is to begin filling this gap in the literature. Over the past two decades, Vietnam has experienced an impressive economic growth and becomes the Asia's second fastest growing economy after China. Vietnam started to develop its stock market in 2000. There are two stock exchanges in Vietnam, the Ho Chi Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX), which were established in 2000 and 2005, respectively. By the end of 2011, there were 352 companies listed on the HOSE with total market capitalization of USD 83.01 billion and 397 companies listed on the HNX with total market capitalization of USD 41.85 billion.

This master thesis contributes to the literature by providing the empirical evidences for the profitability of dividend-yield strategy using data from the emerging Vietnam stock market. The evidences can be used to compare with findings from other markets and form a more

general conclusion about the effectiveness of the investment strategy in emerging economies.

1.1. Purpose of the study

This master thesis firstly examines performance of the DoD investment strategy in the Vietnam stock market over the period from 2003 to 2012. In addition to the standard 10-stock DoD strategy, I will test other version of DoD strategy, the DoD-5, which investing equally in the 5 highest dividend yield stocks in the market. The strategy is initially suggested by Knowles et al. (1997) and then followed by many other authors. The performances of the strategies are analyzed on both absolute and risk adjusted bases. The market-adjusted model and 'Modigliani-squared'-adjusted model will be used to measure the abnormal return of the investment strategy. Additionally, I will follow many previous studies to use the Sharpe ratio and the Treynor index to measure the risk-adjusted performance of the DoD portfolios. Most of previous academic studies examine portfolio performance only in statically sense. This study, however, will examine if the DoD strategy is economically significant by considering the effect of transaction costs and taxes payment factors. Finally, I will test if the size effect and book value effect are possible explanations for the DoD phenomenon.

1.2. Structure of the study

The thesis is organized as follows. The first chapter provides background information on the topic and introduces the research problems. Chapter 2 introduces an overview about the Vietnam Stock market including organization and operation, the performance during 2000-2011, transaction costs and taxes payment. The efficiency of Vietnam stock market also is represented in chapter 2. The third chapter explains the concept of market efficiency and market anomalies. After providing a brief introduction about forms of market efficiency, I

present some of the most well-known market pricing anomalies. Chapter 4 and chapter 5 give some theoretical information about equity evaluation models and portfolio management, respectively. Chapter 6 presents the previous research related to this study including dividend policy and dividend-yield investment strategies background. The data and methodology are introduced in chapter 7. The empirical results are discussed in chapter 8 and conclusion is presented in chapter 9.

2. THE VIETNAMESE STOCK MARKET

2.1. Organization and operation of the stock market

The Sate Securities Commission of Vietnam (SSC) that was officially established in November 1996 is responsible for organization, development and supervision of the country's security market. There are two stock trading centers in Vietnam, the Ho Chi Minh City Stock Trading Centre (HOSE) and the Hanoi Stock Trading Centre (HASTC), which are supervised by SSC. These centers were established in 2000 and 2006, respectively. HOSE is the market for big enterprises, which have the capital greater than VND 80,000 million (USD 4.99 million). On the other hand, small and medium corporations with capital from VND 10,000 million (USD 0.62 million) are listed in HASTC.

According to table 1, over the 6-year period from 2005 to 2011, the number of security companies in Vietnam were licensed by the SSC significantly rose significantly from 13 to 106. The main business activities of these companies include brokerage, own-account trading, and financial consulting. By the end of 2011, security companies with foreign equity of up to 49% and 100% foreign subsidiary were allowed to be licensed. So far, there are 47 fund management companies (seven folds higher than the end of 2005); 1,377 foreign institutional investors, about 460,000 trading accounts owned by individual domestic investors and 13,200 trading accounts of individual foreign investors in the Vietnam stock market.

Foreign investors (institution and individual) can trade in both HOSE and HASTC. However, their ownership in listed companies is limited 49% of the total issued share capital, 30% for listed banks; and 30% for non-listed companies in certain business sectors or industries. In addition, there are some other requirements for foreign investors, including foreign exchange control and registration and disclosure requirements. All the transactions have to been denominated in Vietnamese Dong (VND) with a standardized par value for each of VND 10,000. All foreign investors have to obtain a securities trading code from STC via a depository member, they also must appoint a representative to represent for their transactions at the Stock Exchange

or STC and open one "securities trading account" and one "securities depository account" for transactions.

Table 1. The Vietnam Stock Market at a glance in 2011.

	Number	**Market capitalization (in VND million)**	**Market capitalization (in USD million)**
Security companies	106	56,797,186	2,718
Fund management companies	47	3,097,615	148
Investment funds (both domestic and foreign)	60	N/A	N/A
Foreign institutional investors	1,377	N/A	N/A
Domestic individual trading account	460,000	N/A	N/A
Foreign individual Trading account	13,200	N/A	N/A

Exchange rate VND/USD: 20,900

Table 2 and Figure 1 represent the sector summary of listed companies in the Vietnam stock market. Manufacturing sector has 279 companies, being the largest proportion (42%) among the total number of listed companies in the market. The sector has market capitalization of VND 84,597 million. Financial industry has 94 companies ranking after the manufacturing sector. However its market capitalization is VND 260,128 million, which is considerably higher than manufacturing sector. Consumer goods sector and materials sector have 89 and 76 listed companies, respectively. There is only 8 banks listing in the Vietnam stock market, but they have the capitalization of VND 163,982 million, accounting for more than 20% of the total market capitalization. Consumer services sector has 42 listed companies and capitalization of VND 16,922 million. Additionally, the market has 29 listed companies in utilities sector, 23 information technology companies and 19 listed companies working in pharmaceutical industry. There are only 4 petroleum companies being listed in the market, accounting for 1%. It is noted from the table that there is no any telecommunication company listing in the market since all the telecommunication corporations in Vietnam are 100% state-owned.

Table 2. Sector summary in 2011.

Sector	Number of companies	Market Capitalization (in VND million)	Foreign Holding (%)
Banking	8	163,982	23.50
Consumer Goods	89	119,400	20.50
Consumer Services	42	16,922	7.60
Financials	94	260,128	17.40
Industrials	279	84,597	8.40
Information Technology	23	18,125	20.70
Materials	76	72,705	14.60
Petroleum	4	19,766	22.90
Pharmaceuticals	18	8,006	23.20
Telecommunications	0	0	0.00
Utilities	28	15,540	11.30

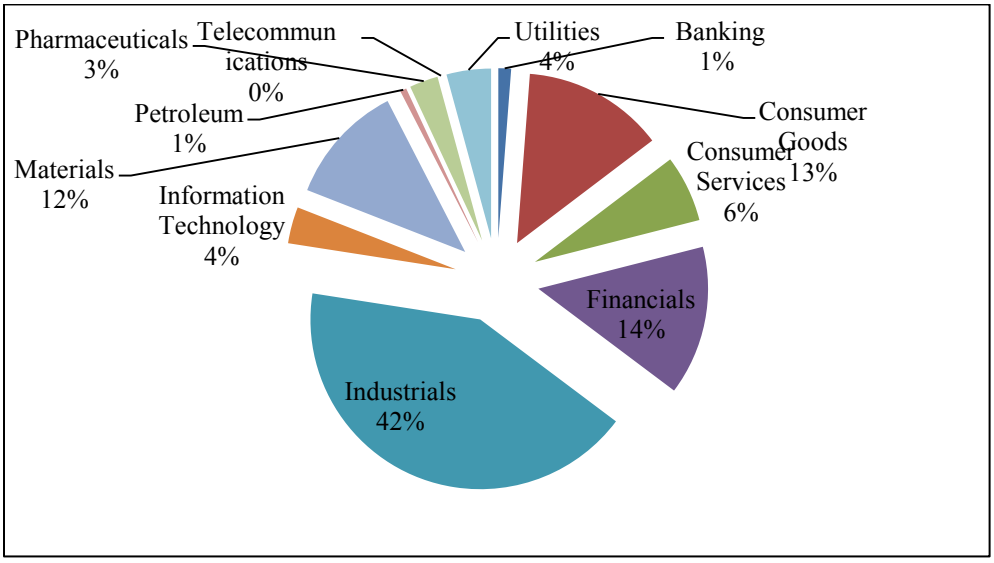

Figure 1. Sector of listed companies in 2011.

2.2. The performance of the Vietnamese stock market

Table 3 represents some key performance indicators for the Vietnam stock market over the period from 2000 to 2011. The Vietnam Stock Market was launched on July 2000 with just two

firms listed. From 2000 to 2005, the number of listed companies slowly increased. By the end of 2005, there were only 32 listed companies, which were all state-owned enterprises (except North Kinh Do Food Joint-Stock Company and Kinh Do Corporation). During this period, the market capitalization increased from VND 444,000 million (USD 28.20 million) at the first trading session (28 July 2000) to VND 6,337,480 million (USD 396.06 million) on 30 December 2005.

Table 3. Key performance indicators for the Vietnam stock market over the period 2000 – 2011.

Indicators	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Number of listed companies	5	10	20	23	26	32
Yearly trading value (bill VND)	91	925	762	422	1,692	2,435
Trading value on GDP (%)	0.02	0.19	0.14	0.07	0.24	0.29
Average trading value (bill VND)	1.39	6.13	3.23	1.71	6.8	9.82
Vn-INDEX	206	235	183	166	239	307
Percentage change in Vn-index (%)	n/a	13.8	-22.1	-8.9	43.3	28.5
HNX-INDEX	n/a	n/a	n/a	n/a	n/a	n/a
Percentage change in HN-index (%)	n/a	n/a	n/a	n/a	n/a	n/a
Indicators	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Number of listed companies	164	237	317	445	603	703
Yearly trading value (bill VND)	37,951	253,130	168,172	586,782	552,097	199,629
Trading value on GDP (%)	3.9	22.1	11.4	35.4	27.9	7.9
Average trading value (bill VND)	153	1,020.70	678.1	2,366.10	2,226.20	805
Vn-INDEX	751	927	315	494	484	351
Percentage change in Vn-index (%)	144.5	23.3	-66	56.8	-2	-27.5
HNX-INDEX	n/a	323.6	105.1	168.2	114.2	58.7
Percentage change in HN-index (%)	n/a	n/a	-67.5	60	-32.1	-48.6

Information source: http://finance.vietstock.vn/du-lieu-vi-mo/43/Thu-nhap.htm
http://www.gso.gov.vn/default.aspx?tabid=429&idmid=3
http://www.hsc.com.vn/hscportal/

However, the period from 2006-2011 experienced a surge in the development of the market. The number of listed firms and the market capitalization rose dramatically. By the end of 2011, a

total of 703 companies have been given permission to float their shares on the Stock Trading Center (STC) and the market capitalization soared nearly 40 times compared to the last period to VND 245,302,721 million (USD 11,736.97 million)

It is noted from Table 3, yearly trading value over the period from 2000 to 2005 was tiny. Although it rose dramatically from VND 91.4 billion in 2000 to VND 2,435 billion in 2005, the trading value on GDP for the period was still negligible, accounting for only about nearly 0.3% of the total GDP. However, the yearly trading value remarkably soared in the two consecutive following years (2006 and 2007). It rocketed to VND 37,951 billion in 2006 and VND 253,130 billion in 2007. The trading value on GDP ratio surged to about 3.9% and 22.1% in two years, respectively. The trading value temporarily decreased by almost 50% in 2008, before extraordinarily peaking in 2009 at VND 586,782 billion, accounting for 35.4% of Vietnam GDP. The number remained high in 2010 before surprisingly plunging dramatically in 2011 to nearly 9%.

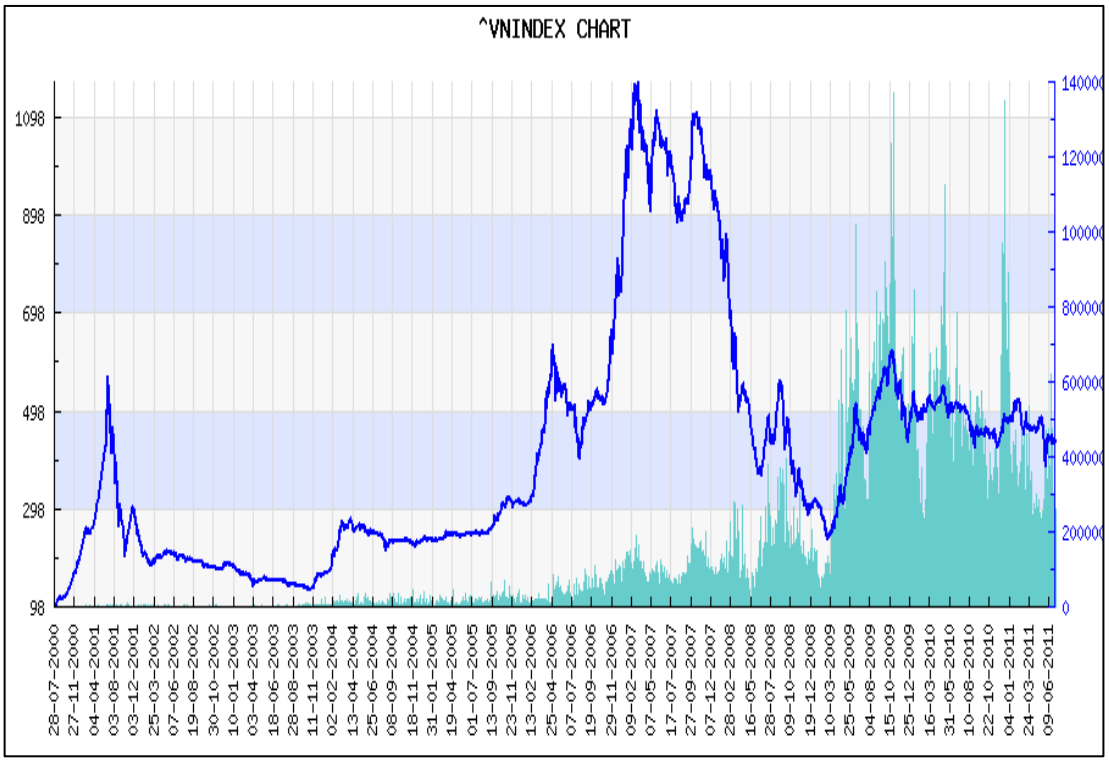

Figure 2. Vn-index from 2000 to 2011.

Information source: http://www.cophieu68.com/chartindex.php?stcid=0&lang=en

Figure 2 gives overview about the performance of the Vn-index from 2000 to 2011. During the first year of launching, the price of all listed companies increased daily, which resulted in the Vn-index considerably and continuously rose, moving from the initial base level of 100 to 571.04 in June 2001. One of main reasons for the strong upward trend is that the acute imbalance between the demand and supply; specifically, there was only 10 companies listed in the Vn-index at that time. Since then, as there have been more commodities for the market, the index fell deeply to a bottom of 130.9 in October 2003. After falling to the bottom, the market gradually recovered and remained fairly stable at level of nearly 300 in two years (2004 and 2005). The period of 2006 and 2007 experienced a boom in the Vietnam stock market, which rocketed by almost 400%, reached the peak at 1167.36 in February 2007. Similar to another stock market in the world, the financial crisis in 2008 had negatively and widely impacted on the Vn-index. The index was off its 2007 peak and plunged dramatically to a low of 230 in March 2009. Over the rest of 2009, the market partially recovered from the bottom point to nearly 600, before went down again and fluctuating around 500 during the period from 2010 to 2011.

2.3. Dividends payment

Cash dividend and stock dividend are the most common form of payment in the Vietnam stock market. Listed companies in Vietnam generally pay dividend two times in a year. In July or August, they pay the interim dividends which are dividend payments made before a company's annual general meeting and final financial statements. This declared dividend usually accompanies the company's interim financial statements. After a fiscal year, the companies announce audited financial statements and declare dividend payout ratio for the second time of a year.

Any dividend that is declared must be approved by a company's Board of Directors before it is paid. For public companies, there are four important dates to remember regarding dividends.

- Dividend declaration date: The declaration date is the day the Board of Director's announces their intention to pay a dividend. On the declaration date, the Board will also announce a date of record and a payment date.
- Ex-dividend date: It is the day upon which the stockholders of record are entitled to the upcoming dividend payment. In other words, only the owners of the shares on or before that date will receive the dividend.
- Holder-of-Record Date: It is the date that Vietnam Securities Depository recorded the list of shareholders entitled to the dividend payment. In Vietnam trading rule is T+3; therefore, the holder-of-record date is usually after three days of the Ex-dividend date.
- Dividend payment date: It is the date on which the actual dividend is paid out to the stockholders of record, often after 2-3 weeks of Holder-of-Record Date.

Table 4. The number of listed companies based on the dividend payment from 2009-2011.

Dividend payment	2009	2010	2011
0%-5%	122	258	187
5%-10%	100	133	139
10%-15%	126	147	181
15%-20%	37	75	144
20%-25%	7	30	45
25%-30%	5	14	25
>30%	6	13	27

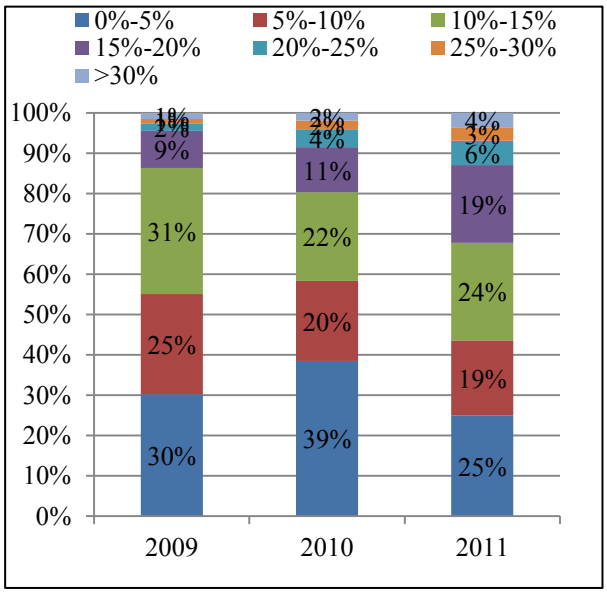

Figure 3. The percentage of listed companies classifying by dividend payout ratio from 2009 to 2011.

It is noted from figure 3, the percentages of listed companies classifying by dividend payout ratio remain fairly stable from 2009 to 2011. The number of companies paid dividend ranging from 0%-5% is in a majority over the period (accounting for 25%-40% of total listed companies). The second largest group including companies paid dividend ranging from 10%-15%, and the third largest one group of companies that paid dividend ranging from 5%-10%. It is noticed that the proportion of companies paid dividend more than 30% per year is smallest; however, the proportion rises gradually during the period. Specifically, the figure is 1% in 2009; 2% in 2010 and 4% in 2011. Similarly, there is an obvious upward trend in number of companies paid dividend from 15% to 30%, increase from 12% of total listed companies in 2009 to 29% in 2011. The trend is in accordance with the quick growth in the interest rate and inflation rate in Vietnam from 2009 to 2011.

Table 5. Dividend yield from 2007 to 2011.

Dividend Yield (%)	**2007**	**2008**	**2009**	**2010**	**2011**
Min	3.16	10.94	4.00	5.15	4.05
Max	22.50	38.10	13.92	27.08	38.10
Average	3.52	11.92	4.39	5.65	11.96

The dividend yield of Vietnam listed companies over 5-year period from 2007 to 2011 fluctuated dramatically. In 2007, the average number was nearly 4%; however, it significantly increased to 11.92% in 2008, because of the big fall of the Vietnam stock market, which decreased by 66% in one year. From 2009 to 2010, the average dividend yield went down to the previous rate around 5% per year, before reaching the peak at 11.96% in 2011. It is noticed that the Vietnam stock market fell by nearly 30% in 2011. These figures represent the fact that Vietnamese investors often ignore the dividend yield ratio to focus on the profit from trading during the bull market.

2.4. Taxes and transaction costs

Before 2010, to encourage the participation of investors, there was no tax on income from dividends as well as capital gains. However, according to the Personal Income Tax Law, which became effective since January 2010, the investors have to pay taxes. Specifically,

- For income from securities trading, the investor can choose and register in one of two ways to pay tax: pay per transaction or pay tax in the end of the year. The tax rate is 0.1% per transaction (buying or selling) or 20% per year, after deducting related expenses.
- For income from capital investments (including interest rates, dividends and other income from investment, except for interest rates of government bonds) will be subject to a tax rate of 5%. If investors receive dividends in shares, the taxable income will be based on market price at the time of receiving the dividends.

In 2011, the government issued a number of tax measures to help investors overcome difficulties from bear market. The personal income tax from dividends is exempt from 1/8/2011 through 31/12/2012, including dividends for the year 2012 but pay after 31/12/2012. However, dividend income does not include dividends from Banks, Investment Funds and Financial Institutions. Personal income tax relating to the transfer of securities shall be reduced by 50%.

Regarding the transaction costs, investors have to pay a fee of 1% - 2% per transaction in Vietnam stock market. The brokerage fee depends on the fee policy of security companies and type of transactions.

2.5. Efficiency of the Vietnamese stock market

According to Fama (1970), a market in which prices always fully reflect available information can be called efficient. The concept of market efficiency is a key concept of all modern investment theory. When studying market anomalies, the issue is more vital because the market anomaly can be defined as market inefficiency which contradicts the efficient market hypothesis.

There are three forms of efficient market hypothesis, including weak form, semi-strong form and the strong form. Under weak form of efficient market hypothesis, stock prices are assumed to reflect all historical contained in the past prices. If a market is weak-form efficient, it is impossible to forecast the future prices using the technical analysis of past price pattern. In other words, there is no way to earn abnormal return by looking the historical price behavior. Instead, the price follows the random –walk model, which is the theory state that the past movements or trends of a stock price cannot be used to predict its future movements.

Under semi-strong form of efficient market hypothesis, stock prices are assumed to reflect all publicly information. If a market is semi-strong efficient, it is impossible to forecast the future prices using the fundamental analysis i.e., analyzing publicly available information such as financial statements, earning forecasts, quality of managements, relevant news etc.

Under strong form of efficient market hypothesis, stock prices are assumed to reflect all relevant information, both public and private. The strong-form of market efficient implies that no investor can earn excess returns using any information, whether publicly available or not.

While studies testing the efficient market hypothesis are widely available, so far not much studies focusing on the Vietnam stock market. Truong et al. (2010) conclude that the Vietnam stock market is inefficient in the weak-form. Testing for weak-form efficiency is the logical first step in examining market efficiency in a certain market. The reason is if the evidences support that the market is inefficient in the weak-form; it is unnecessary to investigate the further forms. The authors use autocorrelation tests, run tests and variance-ratio tests, which conduct with the data of Vn-index weekly price during the period from 2000 to 2004. All the tests give the same results, which indicate that the null hypothesis of random-walk behavior is significantly rejected for the Vn-index. Nguyen (2011) also tests the hypothesis if stock prices in Vietnam market do follow random walk. She found that the market had the day of week effect, negatively lowest return on Monday and positively highest return on Thursday. The evidence indicates that there was a pattern in the movement of stock price or the market prices are not completely unpredictable. The author comes to conclude that the Vietnam stock market does not follow

random walk and is not efficient in weak form of the efficient market hypothesis. Jea H. Kim et al. (2008) test the efficient market hypothesis for some Asian stock markets. Although they did not directly investigate the Vietnam market but their result suggests that the pricing efficiency of market depends on the level of equity market development and the regulatory framework conductive of transparent corporate governance. The author found that the Hong Kong, Japanese, Korean and Taiwanese markets have been efficient in the weak-form while the markets of less developed countries such as Indonesia, Malaysia and Philippines have shown no sign of market efficiency. Compared to other markets in the region, the development of Vietnam stock market is close to Indonesia, Malaysia or Philippines. Consequently, there is evidence to support that the Vietnam market is not efficient.

3. MARKET EFFICIENCY AND MARKET ANOMALIES

In an efficient market, the market price incorporates with available information. If market prices do not fully reflect the information, then abnormal return may earn from gathering and processing of information. Therefore, the existence of market efficiency is the great interest of portfolio managers and investors. The issue also is concerned by government and market regulator since an efficient market can promote the growth of the whole economy. Efficient market implies that price accurately incorporates available information about fundamental values. The main function of capital market is transferring capital from lender to borrower, and the market price of capital help determine which borrowers obtain capital. If the price is not informative, the fund could be misdirected and inefficiently used. By contrast, informative price help allocate scare capital efficiently from lenders to borrower with highest-valued uses. Therefore, the informative prices promote the economic development. The efficiency of the capital markets is an important characteristic of well-functioning financial system of a country.
Because of the importance of market efficiency in studying investment strategies in general and DoD strategy in particular, this chapter will introduce an overview of market efficiency and several market anomalies (apparent market inefficiencies). The remainder of this chapter is organized as follows. Section 1 provides details about how the efficiency of market is described and the factors affecting the efficient market. Section 2 gives three forms of market efficiency and discusses its implications for fundamental analysis, technical analysis and portfolio management. Section 3 introduces some well-known market anomalies, which contradict efficient market.

3.1. The concept of market efficiency

According to Fama (1970), an efficient capital market is a market that is efficient in processing information. That means the price reflects all past and present information quickly and rationally. In his book, Haugen (2001) mentions that if there is new information about a particular company, how quickly do market participants know about it and react based on the information and how quickly do the prices of the company's stock adjust to reflect the new information? If

prices respond to all new information quickly, we say the market is relatively efficient. In general, most of concept about market efficiency mention about the quick reflection of information into market price, but what is the time frame of "quickly"? Although, the original theory of market efficiency does not point out this speed, the basic idea is that it is sufficiently swift to make it impossible to consistently earn abnormal return. It takes time to execute trades to exploit an inefficiency of the market; therefore, the time needed may provide the measure to evaluate the speed of reflecting. The time frame for information is absorbed into assets' price at least equals to the time need for a trading order is executed. In some developed equity markets and foreign exchange, to study the efficiency of the market, the time frame used as short as minutes or less. If the time frame of price adjustment allows many investors to earn abnormal return without additional risk, then the market is not efficient. According to Patell and Wolfson (1984), the information about dividend and earning announcement of companies disturb the usual pattern of stock return for at least fifteen minutes; and the prices just come back totally to normal pattern after more than ninety minutes. Busse and Green (2002) report that the financial news relating to a particular stock on television network CNBC are incorporated into stock prices within one or two minutes. Chorida et al. (2005) investigate how long it takes market to achieve efficiency using the daily returns for stock listed on the New York Exchange (NYSE). Their results suggest that the adjustment to information on NYSE is between five and sixty minutes.

In addition, it is noted that in efficient market, price should react only to "unexpected" or "surprise" information, which is not fully foreseen by investors. That means expected information should not cause the adjustment of the price. If there is positive unexpected information related to companies (for examples, about the new project development, high dividend announcement, or increasing asset's future cash flow), market participants process the information and come to decision that the current price is underestimated will tend to buy it; thus the stock price may increase. Conversely, negative surprise news can make the price decreases since investors revise their expectation, believe that the current price is not sufficient to compensate for its risk and tend to sell it.

In reality, the financial markets are not classified at the two extremes as either completely inefficient or completely efficient but rather, as exhibiting various degrees of efficiency. The

degree of the market efficiency depends on some factors of the market such as: market participants; information availability and financial disclosure; limits to trading; and transaction costs and information-acquisition costs. Firstly, a large number of investors, and financial analysts that follow the market should make the market more efficient. The reason is that if there is any mispricing of the price exists in the market, the market participants will act so that the mispricing disappears quickly. Inversely, if stocks are not followed by many professional investors, the surprise information of the companies will not be noticed by majority of market participant. It may take a few days for them to react toward the new information. The companies shares' price; therefore, will change slowly to reflect the information and the mispricing will exist for a longer time. This implies the fact that the market for the companies' shares is not fully efficient. In fact, in many developing markets like Vietnam, there is still trading restriction for many listed stocks, which can reduce the number of market participant, limit the trading activities, which can reduce the market efficiency. Secondly, information availability and financial disclosure help promote the efficiency of the market since the investors easily access necessary information to evaluate the price of stocks. As a result, the price more accurately reflects the information and increase the market efficiency. Thirdly, impediments to trading such as difficulties in executing trades, high transaction cost, restriction on short selling and other financial productions can reduce market efficiency. Arbitrage activities, which refer to buying an asset in one market and selling it at higher price in another market, will help to reduce the mispricing of the market. Impediments to trading will restrict arbitrage activities; therefore increase the degree of inefficiency of the market. Another factor can affect market efficiency is transaction and information cost. Higher transaction and information costs reduce the efficiency of the market. Higher transaction costs prevent investors from exploiting mispricing of the asset's price since the difference in the price discrepancy is not enough to compensate for the transaction cost. Higher information costs prevent market participants from collecting and analyzing information; therefore, limits the trading activities.

3.2. Forms of market efficiency

In his seminal review in 1970, Fama defined three forms of market efficiency as weak, semi-strong, and strong efficiency. These forms defined based on the level of information that is reflected in prices.

Table 6. Forms of market efficiency.

Forms of Market Efficiency	Market price reflect		
	Past market data	Public information	Private information
Weak form	√		
Semi-strong form	√	√	
Strong form	√	√	√

(i) Weak form

In the weak form of market efficiency, the price reflects all past information such as all historical price and trading volume. It implies that if markets are weak-form efficient, investors cannot predict future price changes by observing prices or patterns of prices from the past since past trading data have already been reflected in current prices.

One way to test whether market is weak-form efficient is investigating the serial correlation in security return, which would imply a predictable pattern. Empirical results suggest that although there is some weak correlation in daily security returns, there is not sufficient correlation to make profit by using this trading rule after considering transaction costs. Another way to test weak-form efficiency is to examine the trading rule, which exploiting historical trading data. The trading is commonly referred to as technical analysis. If technical analysis consistently generates abnormal risk-adjusted returns after considering tax and transaction costs, the market is inefficient in weak-form. The empirical results regarding the efficiency of technical analysis are mixed. In general, the evidences suggest that investors cannot consistently earn abnormal returns using technical analysis strategies in developed market. In emerging markets, however, there are opportunities to make profit using technical analysis.

(ii) Semi-strong form

In semi-strong-form efficient market, the market prices reflect all publicly available information including financial statements (such as earnings, dividends, new projects, managements, etc.) and financial market data (such as closing prices, trading volume, etc.). If a market is semi-strong form efficient, then it must also be weak-form efficient.

If market is semi-strong efficient, no investors can gain an advantage in predicting future price since all public available information is already reflected quickly and accurately into security price. Therefore it is impossible for investors to earn abnormal return by using fundamental analysis i.e., analyzing financial information related to particular companies such as financial statement, dividends, corporate managements change, etc. and economic conditions.

A common test the semi-strong form of markets is the event study. The methodology examines the impact of many different company-specific events (such as earning announcements, dividend change, stock split, merger and takeover announcement, etc.) or economy-wide events (such as monetary of fiscal policy change, tax change, etc.) on security prices.

(iii) Strong form

In strong-form efficient market, security prices reflect all public and non-public information. If a market is strong-form efficient, it must be also weak-form and semi-strong form efficient. The strong-form efficiency of markets implies that the insider investors would not able to earn abnormal return by trading based on private information. It also means that the price reflects everything that the management and employee of a company know about the financial condition of the company that has not been public yet.

Researches test if market is strong-form efficient by examining if insider investors or market participant own private information could earn abnormal return consistently. Empirical papers suggesting that market is not strong-form efficient include Jaffe (1974) and Zaman et al. (1988).

To sum up, the hypothesis about market efficiency is very important to portfolio managers, investors and analysts because it affect the value of securities and how these securities are managed. If a market is strong-efficient, a passive investment strategy (i.e., buying and holding a

broad market portfolio) is preferred to an active investment strategy (i.e., seeking mispricing securities) because of lower costs. Conversely, an active investment strategy can outperform a passive investment strategy in an inefficient market.

3.3. Market pricing anomalies

Beside considerable evidences on market efficiency, there is increasingly number of researchers report about market anomalies, which implies inefficient market. In particular, market anomaly occurs if a change in the asset's price cannot be explained by available relevant information or by the release of new information in the market. Stock market anomalies are of wide interested for investors since they result in the mispricing of securities. Therefore, investors may construct investment strategies based on these anomalies to earn abnormal returns. This section defines the most famous anomalies into two categories depending on the research method that identified the anomaly. Time-series anomalies are indicated by using time series of data. Cross-sectional anomalies are identified by analyzing a cross section of companies that differ on some key characteristics.

Table 7. Some significant market pricing anomalies.

Time Series Anomalies	Cross-Sectional Anomalies
January effect	Size effect
Day-of-the week effect	Value effect
Weekend effect	Book-to-market ratios
Turn-of-the month effect	P/E ratio effect
Holiday effect	
Time-of-day effect	
Momentum	
Overreaction	

3.3.1. Time-series anomalies

The efficient market hypotheses have been widely questioned since 1970s. By now calendar anomalies and momentum and overreaction anomalies are well-documented and reflect the inefficiency of financial markets in that past returns can be used to predict future returns.

(i) Calendar anomalies

One of the famous calendar anomalies is called January Effect and a similar anomaly called Other January Effect (OJE). Since Rozeff and Kinney (1976) who report that monthly stock returns in January are higher than other months of the year, a significant amount of researches have been conducted to examine this January Effect. Hypothesis concerning the predicting power of January is first mention in 1972 by Yale Hirsch. It is suggested that if the stock market rises in January, it is likely to continue to rise by the end of December. Three decades later, Cooper et al (2006) follow a different approach and perform a comprehensive analysis of this phenomenon and its possible explanations. They compare the 11-month holding period returns following positive Januarys and negative Januarys and find that the 11-month holding period returns conditional on positive January returns are significantly higher than those conditional on negative January returns. To make a distinction from the January Effect, they designate this finding as the Other January Effect (OJE). Following the same approach, Stephen and Sean (2007) investigate whether the OJE is an international phenomenon. They analyze excess market return over 11 months following positive and negative January excess market return in 39 countries including U.S .The result reveal that there is limited support for the OJE. Furthermore, Martin and Salm (2009) apply the same method to 18 countries with different institutional and regulatory characteristics and find that the anomaly is statistically significant only in Norway and Switzerland, which brings to the same conclusion that the OJE is not an international phenomenon. Based also on international markets, Stivers, using the same method developed by Cooper et al (2006), Sun and Sun (2009) provide a style and sub period evidence for the OJE. They find that it is primarily a U.S. market-level-based phenomenon and has shrunk over time after it was first unveiled in 1970s (originally called January Barometer).

While the OJE is well established in the U.S stock market, there is no consensus regarding the possible explanations for it. Business cycle risk, short-horizon autocorrelations, the presidential cycles, and sentiments have been examined and excluded by Cooper et al (2006) in their original article. Brusa, Hernando and Liu (2010) examine whether the anomaly can be explained with systematic risk and unsystematic risk, ranking portfolios by beta and standard deviation. They find that the OJE is as well distributed across high-level risk portfolios as across low-level risk portfolios, therefore doesn't depend on risk factor. Whereas Hensel and Ziemba (1995b) suppose that the general January Effect occurs mainly due to the beginning of the fiscal year thereby suggesting that in other countries where the beginning of the fiscal year starts in a different month, that month may have more predictive power rather than January.

There are several other well-known calendar anomalies such as Turn-of-the-month effect, Day-of-the-week effect, Weekend effect, and Holiday effect. Table 8 summarizes these anomalies.

Table 8. Anomalies summary.

Anomalies	Observation	Possible explanations
Day-of-the week effect	Average stock returns tend to be negative and lower in Monday compared to other four days in a week	"- Lower trading volume in Monday and releases of macroeconomic news at the end of the week (Berument & Klymaz 2001; Draper & Paudyal 2002.)
Turn-of-the month effect	Stock returns tend to be higher on the last trading of the month and the some first trading days of the next month	"- Investors receives salary at the end of the month and invest in the stock market, which cause increase in price of stocks (Hawawini et al. 1995: 528) - Macroeconomic announcements often release at the beginning of the month, cause the effects Nikkinen, Sahlström and Äijö (2007)
Holiday effect	Returns on stocks in the day prior to market holidays tend to be higher than other days	"- Investors tend to buy shares before holiday because of "high spirits" and "holiday euphoria" (George J. Marretta and Andrew C. Worthington, 2009)

(ii) Momentum and overreaction anomalies

DeBondt and Thaler (1985) are one of the earliest researchers who reported the overreaction anomaly. They argue that most of investors tend to overreact to the release of unexpected and dramatic news. As a result, the stock prices will increase if the company announces positive news while the stock will decrease if the company releases negative information. They define stocks as "winners" and "losers" based on their total returns over the last three or five years and conclude that portfolios of prior "losers" outperform prior "winners". "Thirty-six months after the portfolio formation, the losing stocks have earned about 25% more than the winners, even though the latter are significantly more risky" (DeBondt and Thaler,1985)

Another exception of market efficiency is momentum anomaly, which indicates that securities experienced high return in short-term tend to continue this trend in following periods. Jegadeesh and Titman (1993) firstly examine the effect using the time horizon of three to 12 months. They report that past winner portfolios outperform past loser portfolios. It is noticed that the momentum anomaly in theory does not contrast to the overreaction effect, since the time horizon of momentum anomaly is short term while overreaction anomaly is tested in longer period. In fact, they could be related. For a company having positive information, its stock price keeps increasing extremely high, even too high in a short time (i.e., momentum anomaly) and then in longer term (three-to-five years), its price of winner correct itself and then increase (i.e., overreaction anomaly). One of the common ways used to explain the momentum anomaly and overreaction anomaly is behavioral finance, which studies the psychology and sociology of the market participants, which are ignored by traditional finance theory. Behavioral finance attempts to explain why individuals make decision, whether these decisions are rational or irrational and how these decisions affect the financial markets.

3.3.2. Cross-sectional anomalies

Small firm effect and value effect are two of most popular cross-sectional anomalies. Small firm anomaly shows that on average, small firms have higher risk-adjusted returns compared to larger

firms. This anomaly is examined by a number of researchers in many markets; however, there are still not satisfactory explanations for this effect. Some researchers tried to explain by the errors in risk valuations such as Roll (1981), Booth and Smith (1987); some others attempt to explain this effect by the errors in return estimation such as Roll (1983), Blume and Stambaugh (1983), Booth and Smith (1987). Some other researchers conclude that the reason for the effect is differential information such as Banz (1981), Klein and Bawa (1977), Barry and Brown (1985). They argue that due to insufficient information available for small firms, their stocks can be excluded in the investors' portfolios. As a result, undesirable small firms would have higher risk-adjusted returns.

Another well-known anomaly is value effect, which implies that value stocks outperform growth stocks on average. Value stocks include stocks with below-average price-to-earnings (P/E) and market-to-book (M/B) and above-average dividend yields; while growth stocks have higher P/E, M/B and lower dividend yield. Capaul et al (1993) analyzed stock returns from six countries: France, Germany, Switzerland, the United Kingdom, Japan and the United States over the period from 1981 to 1992. The results suggest that portfolios including value stocks outperform growth stock portfolio on average during the studied period, both absolutely and after adjustment for risk. Fama and French (1998) argue that value effect can be found in stocks market around the world. "Sorting on book-to-market equity, value stocks outperform growth stocks in twelve of thirteen major markets during the 1975-1995 period" When sorting on P/E, cash flow/price (CF/P) and dividend/price, there are similar value premiums. Global portfolios of high B/M stocks have average return 7.68 percent per year higher than portfolios of lower B/M. Clearly, the existing of value effect contradicts semi-strong market efficiency because the publicly available information such as earning, dividend, book value can predict the return of the stocks. There are not satisfactory explanations for the anomaly. Some researchers believe that the anomaly is simply the result of inadequacies in the asset pricing model (Schwert 2002: 11–13); while some others argue that the inefficiency of the market lead to the effect.

It is not easy for investors to apply the anomalies into practice to make benefit despite the fact that these anomalies are very famous. In fact, many researchers argue that these anomalies are the results of uncorrected statistical methodologies rather than inefficient markets (Fama, 1998).

To sum up the anomalies in the market, we can consider the quote from Economist ("Frontiers of Finance Survey," 9 October 1993):

"Many can be explained away. When transactions costs are taken into account, the fact that stock prices tend to over-react to news, falling back the day after good news and bouncing up the day after bad news, proves exploitable: price reversals are always within the bid-ask spread. Others such as the small-firm effect, work for a few years and then fail for a few years. Others prove to be merely proxies for the reward for risk taking. Many have disappeared since (and because) attention has been drawn to them."

4. EQUITY VALUATION MODELS

Equity valuation models are used to estimate the intrinsic value (fundamental value) of a security based on an analysis of fundamental information. Intrinsic value, in general, is defined as the present value of all expected future cash flow of the asset. If the market is efficient, market prices accurately reflect the intrinsic value of securities. However, if investors believe that market is not efficient, they would try to develop equity valuation models to estimate the securities' intrinsic value. By estimating the value of a security and comparing with market price, investors could indicate if the security is undervalued, overvalued or fairly valued and then buying below-perceived-intrinsic value assets, selling or sell short above-perceived-intrinsic value assets. Basically, equity valuation models are different methods to estimate expected future cash flow and discount to the present value. However, in reality, it is not so simple since analysts need to consider about the size, timing, and riskiness of the future cash flows associated with the asset. To increase the accuracy in the estimates of intrinsic value, analysts often use a variety of models and data inputs. Using more than one model and a range of inputs also helps analysts to examine the sensitivity of value estimates to different models and inputs.

This chapter presents three main categories of equity valuation models as follows: Present value models, multiplier models, and asset-based valuation models.

4.1. Present value models

The dividend discount model (DDM) is the simplest present value models. The model assumes that the expected cash flows from common stock investment are dividends, and the required rate of return is constant over the time (Bodie et al. 2010:590). The intrinsic value of a common stock then can be calculated in the following way:

(1) $$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+r)^t}$$

Where:

V_0 = value of a common stock today at $t = 0$

D_t = expected dividend in year t, assumed to be paid at the end of the year

r = required rate of return on the stock

For investors expect to sell the stock at time t=n, cash received from the stock includes any dividend received from t=0 to t=n and expected selling price P_n. The intrinsic value of a stock can be expressed as:

(2) $$V_0 = \sum_{t=1}^{n} \frac{D_t}{(1+r)^t} + \frac{P_n}{(1+r)^t}$$

Obviously, one of the most difficult problems when applying the equation (1) to estimate the intrinsic value of a stock is to forecast an infinite series of expected dividends. The Gordon Growth Model, also known the constant-growth DDM assumes that dividends grow indefinitely at a constant rate. The equation (1) can be rewritten as:

$$V_0 = \sum_{t=1}^{\infty} \frac{D_0(1+g)^t}{(1+r)^t}$$

$$= D_0 \left[\frac{(1+g)}{(1+r)} + \frac{(1+g)^2}{(1+r)^2} + \cdots + \frac{(1+g)^\infty}{(1+r)^\infty} \right]$$

$$= D_0 \frac{(1+g)}{r-g}$$

(4) $$= \frac{D_1}{r-g}$$

Where:

g = constant growth rate of dividend

To estimate g, analysts can use the industry median growth rate or use the equation following:

$$g = b \times ROE$$

Where:

b = earnings retention rate = (1 – Dividend payout ratio)

ROE = return on equity

Although the Gordon model is simple and easy to apply, it has some disadvantages since its assumptions are too simplistic to reflect the characteristics of the company being evaluated. The Gordon model assumes that:

(i) Dividends are only and correct cash flow used to evaluate stocks' valuation
(ii) Dividends growth at the same rate forever
(iii) The required rate of return is constant over time
(iv) The growth rate of dividend must be less than required rate of return.

One of alternative methods used to evaluate the stock of rapidly growing companies is two-stage dividend discount model. This model assumes the development of companies divided into two stages. At the first stage, because of the lack of competitors, the companies grow rapidly and pay dividends at a rate which is higher than in long-term rate. At the second stage, the companies experience a sustainable growth and pay dividends at constant long-term rate. Therefore, the two-stage dividend discount model uses two growth rates: a high growth rate g_1 for n first years followed by a lower and constant growth rate into perpetuity g_2. The model can be expressed as following:

$$V_0 = \sum_{t=1}^{n} \frac{D_0(1+g_1)^t}{(1+r)^t} + \frac{V_n}{(1+r)^n} \quad (5)$$

Where

V_n represents the value of the dividends receive during the sustainble growth period at year n;

V_n calculated by using the Gordon growth model as flollowing:

$$V_n = \frac{V_{n+1}}{r-g_2} = \frac{D_0(1+g_1)^n(1+g_2)}{r-g_2} \quad (6)$$

In reality, the model can be extended to n stages if necessary. According to Sharpe, Alexander, and Bailey (1999), most companies' development divides into three stages: growth, transition and maturity. Therefore, the most suitable model is three-stage model using three growth rates: a

high growth rate for the first stage following by a lower growth rate for the transition period and then following by a lower, sustainable growth rate forever.

However, it is difficult for investors to use the DDM to estimate the value of non-dividend-paying stocks since investors need to forecast the timing and amount of the first dividends and all the dividends or dividend growth thereafter. One of alternative solutions is free-cash-flow-to-equity (FCFE) valuation model. The model assumes that the dividend-paying capacity of company could be reflected in the free-cash-flow; therefore, FCFE can be used to estimate the intrinsic value of the company's stock. It can be said that the FCFE valuation model discounts potential dividends rather than actual dividends. FCFE define as available cash to be paid to common stockholders after meeting reinvestment needs. FCFE can be calculated as following:

(7)
$$\begin{aligned}\text{FCFE} = {} & \text{Net Income} \\ & -(\text{Capital Expenditures} - \text{Depreciation}) \\ & -(\text{Change in Non} - \text{cash Working Capital}) \\ & + (\text{New Debt Issued} - \text{Debt Repayments})\end{aligned}$$

Or

(8)
$$\begin{aligned}\text{FCFE} = {} & \text{Cash flow from operations (CFO)} \\ & - \text{Fixed capital investment (FCInv)} \\ & + \text{Net borrowing}\end{aligned}$$

Historical FCFE can be obtained from financial statement of companies such as cash flow statements, balance sheet and financial disclosures. The value of stock using the FCFE valuation model can be calculated as following:

(9)
$$V_0 = \sum_{t=1}^{\infty} \frac{\text{FCFE}_t}{(1+r)^t}$$

4.2. Multiplier models

Multiplier models include comparing the price multiple ratios among a group or sector of stocks to evaluate the relative worth of a company's stock. Price multiple ratios are the ratios of share price with some fundamental value of a company such as price-to-earnings ratio (P/E), price-to-book ratio (P/B), price-to-sale ratio (P/S), price-to-cash-flow ratio (P/CF). If the ratios of a stock are lower than a specific value or average value of the group, the stock could be a good choice for buying. Conversely, if these ratios are higher than a specific value or average value, it could be a candidate for sale. There are many researchers report the evidence of a return advantage to low price multiple ratios. The works of McWilliams (1966), Miller and Widmann (1966), Nicholson (1968), Dreman (1977), and Basu (1977) show that low-P/E-ratio stocks could give higher return compared to high-P/E ratio stocks. Fama and French (1995) suggest that P/B multiples are inversely related to future rate of return. O'Shaughnessy (2005) reports the evidence that low P/S ratio stocks could give higher return compared to high P/S ratio stocks.

Another multiplier model is enterprise value (EV) multiplies model using EV/EBITDA ratio, which is widely used when comparing companies with significant capital structure differences. EV is often seen as the cost of a takeover and can be estimated as following:

$$\text{EV} = (\text{Market capitalization} + \text{Market value of preferred stock} + \text{Market value of debt} - (\text{cash} + \text{cash equivalent} + \text{short term investment}) \quad (10)$$

EBITDA is earnings before tax, depreciation and amortization. It can be viewed as source of funds to pay interest to bondholder, dividends for stockholders and taxes. When earning of a company is negative, calculating P/E ratio is problematic, the EV/EBITDA multiple can be used instead because EBITDA is usually positive.

The multiplier models are popular since they allow investors to compare not only different stocks in the market but also a stock in different time. The models are especially useful when analyzing an industry or sector and choose the best performing stocks within the industry. One of the major advantages of the models is that it is easily calculated and many multiples are readily available

from financial websites and newspapers. However, the models receive many criticisms because of some disadvantages. First disadvantage is that they only concern about the past data not future prediction. Second disadvantage of the models is that it can be affected by the chosen accounting methods, which can cause the difference in earning, book values, revenue and cash flows. Therefore, it is not easy to compare the ratios between companies using different accounting methods. Finally, sometimes the results from multiplier models conflict with the results from DDM model. It is necessary for investors to undertake further analysis.

4.3. Asset-based valuation models

Asset-based valuation models estimate the value of equity based on the market or fair value of a company's total assets minus its total liabilities (Nagorniak 2013:274). It is important to note that the market (fair) value of assets or liabilities of a company are often different from the book value (balance sheet value), therefore, the model is suitable when the market value of the assets is readily determinable and the intangible assets, which are typically difficult to value, are relatively small percentage of total assets. The model is widely used for private or unlisted companies. Public companies, which have significant property, plant, and equipment, are difficult to apply asset-based valuation model because it is not easy to determine market (fair) value of the used assets. Some intangible assets occur in the financial statements of companies; however, some others may not be shown such as companies' reputation, customers' loyalty. These intangible assets are not been considered under asset-based valuation model, so the results may not be accurate. In the situation, DDM or forward-looking cash flow valuation can give more accurate results.

5. PORTFOLIO MANAGEMENT

5.1. Modern portfolio theory

The modern portfolio theory (MPT) includes principles underlying analysis and evaluation of rational portfolio choices based on risk-return trade-offs and efficient diversification (Bodie et al. 2010:998). The foundation of MPT was firstly presented by Markowitz in 1952. The most important conclusion of his works is that investors should focus on selecting individual stocks, which do not move together exactly to reduce the risk of investment portfolio. From 1950s through early 1970s, the MPT was developed by many researchers such as Sharpe (1964), Lintner (1965), and Treynor (1961). They demonstrated that beside diversification benefit, the investment portfolios play an important role in determining the appropriate individual asset risk premium (Singal 2012: 233). To fully understand the MPT, the remainder of this section is organized as follows. I start with a general discussion about risk and expected return of a portfolio, and then focus on how to allocate assets, description about efficient diversification and portfolio optimization.

According to Copeland et al. 2005, the expected return of a portfolio is a weighted average of the expected returns of the individual investment or asset. The portfolio expected return can be calculated as:

$$E(R_p) = \sum_{t=1}^{n} w_i E(R_i) \tag{11}$$

Where:

$E(R_p) =$ expected return of porfolio p

$E(R_i) =$ expected return of asset i

$w_i =$ relaltive weight of asset i in the portfolio

$n =$ number of assets in the portfolio

In finance, total risk of an asset is measured by its standard deviation, which is the square root of variance. The variance is measured as the average squared deviation from the mean of return; therefore, it is a measure of the volatility of the return. The variance is calculated as:

$$\sigma^2 = \frac{\sum_{t=1}^{T}(R_t - \mu)^2}{T} \quad (12)$$

Where:

R_t = Return for the period t

T = the number of periods

μ = the mean of T returns

Portfolio risk is also measured by variance, which evaluate the amount of uncertainty in portfolio returns. The variance of a portfolio is not simple the weighted average of the variances of individual assets in the portfolio. When calculating the portfolio variance, it is necessary to consider about the covariance of returns. The covariance is the measure of the degree to which returns on two assets move together. According to Copeland et al. 2005, the variance of a portfolio can be calculated as follows:

$$\mathrm{Var}(R_p) = \sum_{i=1}^{n}\sum_{j=1}^{n} w_i w_j \sigma_{ij} \quad (13)$$

$$= \sum_{i=1}^{n}\sum_{j=1}^{n} w_i w_j \sigma_i \sigma_j \rho_{ij}$$

Where:

σ_{ij} = covariance between asset i and j

ρ_{ij} is the correlation between return R_i, R_j

w_i = relative weight of asset i in the portfolio

w_j = relative weight of asset j in the portfolio

ρ_{ij} can be positive or negative and ranges from -1 and 1.

Obviously, an investor can reduce the portfolio risk (i.e., reduce the portfolio variance) by selecting assets which are not perfectly positively correlated (i.e., $\rho_{ij} < 1$). It means that by diversifying the portfolio with lower correlation assets, investors can reduce risk while having the same portfolio expected return. However, the risk cannot be eliminated totally by diversification. Market risk, also called system or non-diversifiable risk remains after extensive diversification, while firm-specific risk, also called unique or diversifiable risk can be eliminated totally by diversification (Bodie et al. 2010).

According to Markowitz's MPT (1952) choosing an optimal portfolio is based on the expected return and variance. The Markowitz portfolio selection model includes three steps. The first step is to determine the minimum-variance frontier of risky asset. This frontier is a graph of the lowest possible variance that can be attained for a given portfolio expected return (Bodie et al. 2010:210). This frontier lies on the solid curve drawn in figure 4**.** The left-most point on the minimum-variance frontier is the global minimum-variance portfolio, which is defined as the portfolio with the minimum variance among all portfolios of risky assets. The second step is to find the efficient frontier of risky asset, which is the set of portfolio that minimize the variance for any target expected return. Obviously, the part of minimum-variance frontier lies above the global minimum-variance portfolio provides the highest expected return with given variance.

This frontier is referred as the Markowitz efficient frontier because it contains all portfolios of risky assets that rational, risk-averse investors will choose. The third step of Markowitz portfolio selection model is to add the risk-free asset in the portfolio. The combination of a risky-asset portfolio with a risk-free asset with return R_f and variance Var = 0 is a straight line from R_f called capital allocation line (CAL). The CAL with the highest slope is desirable because it provides the highest expected return with given variance. The portfolio P, which is the tangency point of the CAL to the efficient frontier, is optimal risky portfolio. We cannot move the CAL further northwest to get better portfolio because the portfolios are above the efficient frontier, therefore are unachievable.

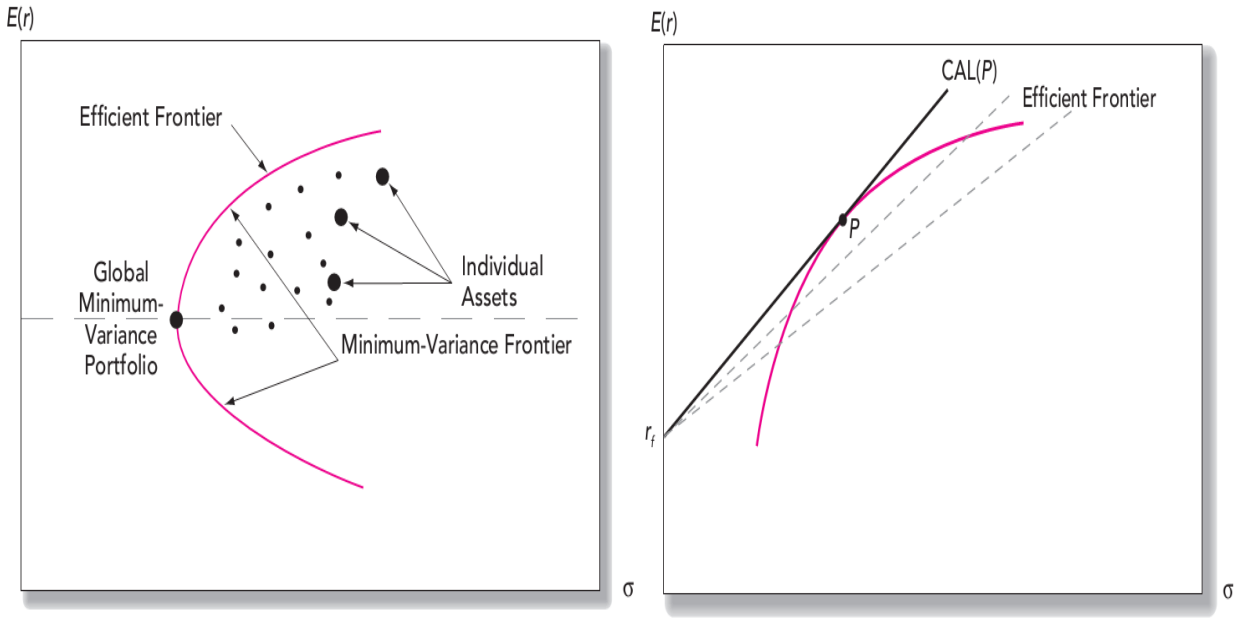

Figure 4. Determination of the optimal overall portfolio (Bodie et al. 2010:210)

5.2. The capital asset pricing model

The capital asset pricing model (CAPM) is a center-piece of modern financial economics. The model gives us a precise prediction of the relationship that we should observe between the risk of an asset and its expected return. (Bodie et al. 2010: 279). The CAPM was presented independently by Sharpe (1964), Lintner (1965), Treynor (1961), and Mossin (1966) and based on Markowitz's earlier work on diversification and modern portfolio theory. (Singal 2012: 346).

The CAPM model describes the linear relationship between expected return of assets and their systematic risk as measured by beta coefficient. In detail, the expected return of an asset $E(R_i)$ is sum of risk-free rate of return, R_f, and risk premium, which is calculated as multiplication of expected market return minus risk-free return $(E(R_m) - R_f)$ and beta coefficient (β_i) between the asset return and the market return. The equation of the CAPM is:

(14) $$E(R_i) = R_f + \beta_i[E(R_m) - R_f]$$

$$\beta_i = \frac{\mathrm{Cov}(R_i, R_m)}{{\sigma_m}^2} \quad (15)$$

Where:

$\mathrm{Cov}(R_i, R_m) =$ covariance between asset i and market return

${\sigma_m}^2 =$ market variance

As shown in the equation (15), beta coefficient β_i is a measure of how sensitive an asset's return is to the market return. The CAPM implies that all assets can be defined only by their beta coefficient with the market. If two assets have the same beta, they will have the same expected returns.

Although the CAPM is powerful, it is criticized because of its constrained assumptions, which ignores many of the complexities of real financial markets. The first assumption is that markets do not have transaction costs and taxes. Secondly, all investors are rational mean-variance optimizers, meaning that they are all use the Markowitz portfolio selection model. Thirdly, all investors have homogeneous expectations or beliefs, which mean they analyze securities in the same way and share the same economic view of the world. Furthermore, investors can access to unlimited lending and borrowing at the fixed, risk-free rate. They also can buy and sell all kind of assets, including human capital, private enterprises, and governmentally funded assets such as town halls and international airport in the markets. (Bodie et al. 2010:280)

The security market line (SML) presented graphically the CAPM with beta on the x-axis and expected return on the y-axis. The SML intersects the y-axis at the risk-free rate R_f, and has the slope is the market risk premium $(E(R_m) - R_f)$. The SML is different from the CAL because the CAL only applies for efficient portfolios while SML applies to all assets and portfolios, efficient or not. The CAL presents the total risk of assets (i.e., variance) rather than systematic risk like SML. Because only systematic risk is priced, then CAL only applies for portfolios, which have total risk equals to systematic risk. That means efficient portfolio because those portfolio have no unsystematic risk after extensive diversification. (Singal 2012: 349). The SML, therefore, becomes popular because it can be used to price individual securities and inefficient portfolios. Investors can plot expected return and beta of an asset against SML to decide whether the asset is

fairly valued, overvalued or undervalued. All fairly valued assets have to lie exactly on the SML, that means their expected returns compensate enough for their risk. Assets plot above the SML means that given their beta, their expected returns are greater than dictated by the CAPM. Those assets are underpriced and become candidates for buy. Conversely, overvalued stocks plot below the SML. Their expected returns are not enough to compensate for their risks.

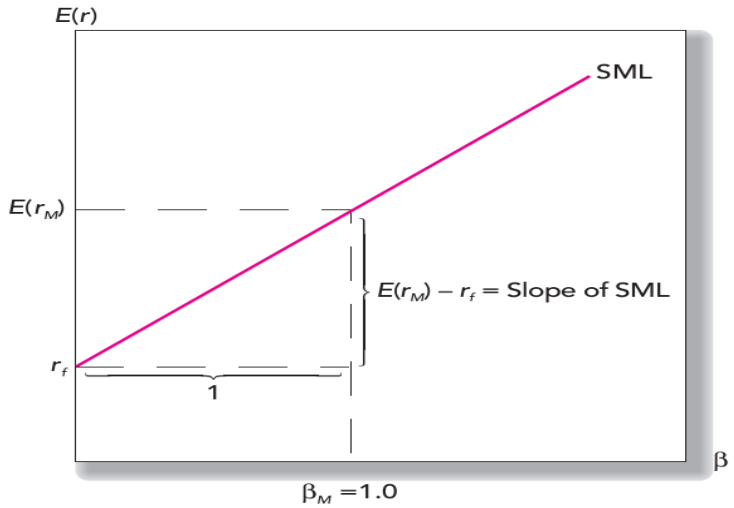

Figure 5. The security market line.

Although the CAPM is one of the most important models of modern finance, it has many limitations. Empirical results suggest that the CAPM is a poor predictor of returns. Tests of the CAPM show that asset returns are not determined only by systematic risks. (Singal 2012: 363). Therefore, there are some other models were developed to address the limitations of the CAPM. Two of them are arbitrage pricing theory and multifactor model, which are introduced in the next part of this chapter.

5.3. Arbitrage pricing theory and multifactor model of risk and return

The arbitrage pricing theory (APT) was presented by Ross (1976). The theory like CAPM describes the linear relationship between expected returns and risk. However, APT allows numerous risk factors-as many as are relevant to a particular asset. Furthermore, except the risk-

free rate, the risk factors need not be the same and may be different from an asset to another (Singal 2012: 364). According to APT, expected return of an asset can be calculated as follow:

$$E(R_i) = R_f + \beta_1 R_{\text{factor 1}} + \beta_2 R_{\text{factor 2}} + \cdots + \beta_k R_{\text{factor k}} \quad (16)$$

Where:

$E(R_i)$ = the expected return of an asset or a portfolio

R_f = the risk − free rate

β_j = the beta coefficient measured the sensitivity of the asset to factor j

$R_{\text{factor j}}$ = the risk premium (expected return in excess of the risk free rate)for factor j

k = the number of risk factors

The most important assumption of the APT is that the markets do not allow for the persistence of arbitrage opportunities, which arises when an investor can earn riskless profit without making a net investment (Bodie et al. 2010:325). Compared to the CAPM, the APT is less restrictive in its assumptions since it allows each investor hold a unique portfolio with its own set of betas and does not require testing the performance of the market portfolio. However in practical, the APT is not used widely because the model itself does not determine any of risk factors. It is difficult to specify risk factors and estimate the beta for each factor. There are some researchers suggesting different factors. For example Chen, Roll and Ross (1986) proposed the macro-economic factors including change in industrial production, changes in expected inflation, change in unanticipated inflation, excess return of long-term corporate bonds over long-term government bonds, excess return of long-term government bonds over T-bills (Bodie et al. 2010:334)

Based on APT, there are many multifactor models that were developed to estimate expected returns. One of the most famous models is Fama-French Three Factor Model (1993) (FF model). According to the FF model, the expected returns are explained by market index, firm size and book-to-market ratio. The market index is expected to capture systematic risk originating from macroeconomics factor (Bodie et al. 2010:336). Two latter factors are chosen because significant number of empirical results suggests the existing of size effect and book-to-market ratio effect on stock returns. The average stock returns of small companies and of high book-to-market ratio

companies are often higher than predicted by the SML of the CAPM. The FF model can be expressed as follow:

(17) $$R_i = R_f + \alpha_i + \beta_i(R_m - R_f) + \varphi_i SMB + \theta_i HML + \varepsilon_i$$

Where:

SMB = Small Minus Big, i.e., the return of a portfolio of small stocks in excess of the return on a portfolio of large stocks.

HML = High Minus Low, i.e., the return of a portfolio of stocks with a high book-to-market ratio in excess of the return on a portfolio of stocks with a low book-to-market ratio.

α_i= intercept of the regression

β_i= factor loading on the market return premium

φi= factor loading on the small size premium (SMB)

θ_i= factor loading on the high book-to-market premium (HML)

ε_i= unsystematic risk of asset i

The coefficients $\beta_i, \varphi i, \varepsilon_i$ are estimated by using a time-series regression for portfolios formed based on the sizes and the book-to-market values.

Carhart (1997) adds one more factor into the FF model to create the four-factor model. This is the momentum factor shows the difference in returns of the prior year's winner and loser's. The four-factor can be written as follows:

(18) $$R_i = R_f + \alpha_i + \beta_i(R_m - R_f) + \varphi_i SMB + \theta_i HML + \vartheta_i UMD + \varepsilon_i$$

When:

UMD = the difference in returns of the prior year's winner and loser's

Regression results suggest that the coefficient on market return premium (β_i) is not significantly different from zero, which implies that the stock return is not related to the market. The three remaining factors are significant and can explain the expected returns. The FF model and the four-factor model have been found to predict asset return much better than the CAPM and extensively used in estimating return for U.S stocks (Singal 2012: 365)

6. DIVIDEND POLICIES AND DIVIDEND INVESTMENT STRATEGIES

6.1. Dividend policies

Financial economists considered dividend policy has been one of the most challenging problems to explain. A major finance textbook of Brealey and Myers (2003) considered that dividend is one of the ten important unsolved problems in finance. There is mixed empirical evidence about the factors that influence dividend policy and the way in which these factors interact. The question remains whether paying out of earnings would essentially create value for the shareholders or not. Because the dividend payment provides cash flows to the shareholders but simultaneously causes a decline in the share price and reduces firm's recourses for investment (Porterfield 1959). On this issue, financial economists fall into two main groups. The first group originated with a paper published by Miller and Modigliani (1961) believes that dividend policy is not relevant to share value of a company. They suggest that share valuation depends on corporate earnings, which reflects a company's investment policy, rather on a company's earnings paid out policy. The other group argues that dividend policy is relevant to share valuation. They suppose that an increase in dividend payment could increase share value. Some arguments support for the idea are (i) the *bird in the hand* argument, that means dividends are preferred to capital gains due to their certainty, (ii) *The agency cost model* argues that higher dividends help solve the agency problem and (iii) the *signaling model*, that means high dividends is positive signal about the expected future returns. In this section, I briefly introduce in turn all of these opinions.

6.1.1. Dividend irrelevance

According to Miller and Modigliani irrelevance theorems (1961), with investment policy fixed, all feasible dividend policies are optimal because all imply identical stockholder wealth, and so the choice among them is irrelevant. The theory assumes three basic assumptions including (i) perfect capital market (i.e., all buyers and sellers are price takers, no brokerage fees, transfer taxes or other transaction costs are incurred); (ii) rational behavior of investors (i.e., they always

make the choice that maximizes their wealth and are indifferent to whether they receive capital gain or dividends on their shares) and (iii) perfect certainty (i.e., complete assurance on the part of every investor as to the future investment program and the future profits of every corporation). Under these assumptions, they conclude that the stockholder wealth is determined only by investment policy and the payout decisions have no impact on share value of the company. Specifically, an increase in current dividends must necessarily reduce the terminal value of exiting shares. The reason is that in order to increase current dividends, a part of the future dividend stream must be used to attract the outside capital; so the future dividend stream paying to existing shareholders must decrease. The increase in current dividends is exactly equal to the decrease in the future dividend stream that means the wealth of existing shareholders is irrelevant to the firm's payout policies (Miller and Modigliani 1961). Under Miller and Modigliani's theory, the dividends are not residual payment, which are retained earnings left over paying to shareholders after investment. They argue that investment decision is separate from the dividend decision because as long as company followed its optimal investment policy, its value was completely unaffected by its dividend policy. In addition, Miller and Modigliani assume that investors do not concern whether they receive a dividend or not. If a company does not pay dividends for shareholders because all earnings had been invested in company's optimum investment, the company's share price would increase. The increase reflects the expected future dividend payments or increasing share prices because of the investment returns. The increase of share price is exactly the same as the dividend payments which should be paid. The existing shareholders, therefore, can generate a 'home-made' dividend by selling some of their shares to receive cash. (Watson et al. 2007:288)

6.1.2. Dividends relevance

One of the dividend relevance arguments is called the *bird in the hand* argument. The argument means that an investor will prefer to receive a certain dividend payment now rather than leaving the equivalent amount in an investment whose future value is uncertain (Watson et al. 2007:288). Lintner (1956) was the first author who provides empirical evidence on dividend policy relevance. According to his survey with corporate managers, the existing dividend rate becomes

the most important benchmark for the management to make current dividend policy. They try to keep the dividend rate unchanged and are unwilling to increase the rate. Most of the managers determine one reasonable target payout ratio. The dividend payments are increasing slowly over time; so the actual payout ratio moves closer to the target ratio. The companies, on the other hand, are reluctant to decrease the dividend rate. Low dividends may results in a fall in share price since investors exchange their share to a higher dividend company.

The agency cost model explains dividend payment is a solution of shareholders to overcome agency problems (see Megginson 1997). The agency problems cause from the separation of ownership and management of the firm. According to agency theory, management of a company must act on behalf of the owners. However, in some situation, they act for their own benefit rather than in the best interests of the owners (i.e., the shareholders) such as buying luxury offices and furniture, expensive dinners with customers and business flights than necessary and so on. The agency problems are more significant in firms which generate large free cash flow and do not distribute it out to the shareholders. Therefore, the shareholders prefer firm which pay higher dividends since lower cash holding could prevent managers from activities that are unprofitable for them. As a result, announcement of dividend payments or increases could lead to the rise of stock prices.

According to the *signaling model*, the dividend policies are a way for managers to inform financial situation of companies to the market (see Megginson 1997). An increase in dividend payment can be seen as a positive signal that the managers expect the company will develop and earn more money in the future. In contrast, a decrease can be considered as a signal that the company will earn less money. There are two important reasons supporting for the existence of dividend signaling model. First, investors believe that dividend payment is a good predictor of the company's ability to generate cash flow and its financial performance in the future. Only good one could pay high dividends. Thus, investors tend to appreciate a stock with higher dividend. Second, there is a variety of empirical results suggest that increases in dividend payment are related to future stock market return. Higher dividend stocks could give higher returns on the market price.

6.2. Dividend investment strategies

6.2.1. Dividend-yield investment strategies background

Dividend-yield strategies belong to the broader class of value investment strategies. Value investment strategy is the strategy of selecting stocks that trade below their intrinsic value. The logic behind the value-investing strategy is that investors overreact to good and bad news causing the difference between stock price and company's long-term fundamentals. Therefore, investors can earn abnormal return by buying undervalued stocks, which are often referred as value stocks. Value stocks are characterized by high dividend yield, low price-to-earnings ratio, and low expected growth rate (Visscher and Filbeck: 2003).

The effectiveness of value investment strategies is confirmed by many researchers. Numerous studies have found that value stocks outperform the market in the U.S stock markets (Basu 1977; Ambachtsheer and Farrell 1979; Estep, Hanson, and Johnson 1983; Chan, Jegadeesh, and Lakonishok 1995). However, there is a debate about the effectiveness of dividend-yield strategies in many years. Some studies suggest that the dividend yield has no power to predict stock returns; therefore, the dividend-yield investment strategies are ineffective. The paper of Black and Scholes (1974) is considered as a pioneering study on the effects of dividend on stock prices. This paper tests the relationship between dividend yield and stock price in New York Stock Exchange (NYSE) over the period from 1926 to 1966. Using the extended CAPM equation with dividend yield term and "best available empirical methods", the authors suggest that "it is not possible to demonstrate that the expected returns on high yield common stocks differ from the expected return on low yield common stocks either before or after taxes" (Black and Scholes: 1974). Their findings are referred as the dividend-neutrality hypothesis. Goetzmann and Jorion (1993; 1995) confirmed the findings of Black and Scholes by testing the predictive power of dividend yield. They use the monthly U.S stock returns and yearly U.K stock returns over the period from 1872 to 1992. The results of their test show that there is no relationship between future returns and the dividend yield.

In contrast to the findings of Black et al. (1974) and Goetzmann et al. (1993, 1995), many other studies found a positive relationship between dividend yield and stock price. Fama and French (1988) use dividend yield to forecast returns on the value and equal weighted portfolio of stocks in NYSE for holding period from one month to four years. They found that the forecast ability of dividend yield depends on the holding period of the portfolio. Regressions of returns on dividend yield explain less than five percent of the variation in monthly or quarterly stock returns. While the regression can explain more than 25% of the variation of two to four year returns. The regression provides reliable evidence for the whole studied period from 1927 to 1986 as well as the sub-period from 1926 to 1940.

The paper of Hodrick (1992) re-examined the correlation between dividend yield and stock returns in U.S market from 1926 to 1987 with different horizons from one month to four years. To increase power of the test, he used three alternative methods in Monte Carlo experiments. Although the results at the one month horizon do not provide strong evidence for the correlation, the annual and longer horizons give strong evidence to support the positive relationship between dividend yield and stock returns. Grant (1995) also tests the yield effect in common stock return in U.S market over the period from 1980 to 1992. His findings suggest that over the thirteen-yield period, high dividend yield stocks of both small and large firms outperform the market.

The dividend-yield investment strategy also has been tested in international markets outside U.S. Keppler (1991) examines the importance of dividends in long-term investment performance over the period of twenty years. He suggests that investors can earn excess risk-adjusted return by selecting markets with higher-than-average dividend yields. He uses the dividend yield of national country indexes rather than the dividend yield of individual stock and concludes that the highest dividend yield markets could give the highest risk-adjusted return over long period.

Levis (1989) tests a number of stock market anomalies on the London Stock Exchange (LSE) using the data from 1961 to 1985. According to his findings, investment strategy based on dividend yields and price to earnings ratio seems outperform the strategy focusing on market value and share price.

Another research about U.K market is conducted by Morgan et al. (1998). This paper tests whether tax-based theory could predict a positive correlation between stock returns and dividend yields. Tax-based theory has been suggested firstly by Litzenberger and Ramaswamy (1979, 1982) and others. The theory explains the positive relationship between stock returns and dividend yields in U.S market based on American tax policies, which penalized dividend income relative to capital gains. Therefore, investors require higher before-tax returns from stocks which have a large proportion of dividends in their total return. The U.K tax system contradicts to U.S system while treating dividend income relatively leniently compared to the capital gains. As a result, the tax-based theory has to suggest a negative relationship between stock returns and dividend yields. However, Morgan et al. find out that high dividend-yield stocks provide positive risk-adjusted return while low dividend-yield stocks give negative risk-adjusted return. They also suggest that the dividend signaling by managers and delayed price reaction to such signals by investors possibly result in the positive relationship.

Recently, Janusz et al. (2008) test whether an investment strategy based on high dividend yield stocks is profitable. Using the data from British stock market over the period from 1994 to 2007, they conclude that the high dividend yield portfolios outperform the market index in longer period while their returns can vary in shorter period. In addition, their findings suggest that the high-dividend-yield portfolios outperform the market index both statistically and economically. That means these portfolios beat the market index even when considering risk, transaction cost and taxes factors.

In summary, the financial literature related to dividend yield investment strategy is relatively extensive and well-developed. Most of empirical results support for the positive relationship between stock price and dividend yield and the effectiveness of dividend-yield strategies.

6.2.2. The Dogs of the Dow

Although the Dogs of Dow strategy has become popular recently, the findings about its effectiveness are quite mixed. John Slatter (1988) firstly suggested a new and simple investment

strategy by investing equally in the 10 highest dividend yield stocks of the Dow Jones Industrial Average (DJIA) index and holding these high-yielding stocks for 1 year. The finding shows that the strategy outperforms the DJIA index by 7.6% per year during the period from 1972 to 1987. However, the study has some drawbacks since it only focuses on the absolute returns and ignores risk-adjusted returns. In addition, it does not consider transaction costs and taxes when calculating the real return of the investment strategy.

O'Higgins and Downes (1991); Knowles and Petty (1992) published books investigating the strategy over longer periods. Their findings confirmed the success of the strategy. O'Higgins et al. reported an average annual excess return of about 6.2% for the DoD strategy compared to the DJIA during 1973-1991. O'Higgins and Downes (1991) also suggested that "window dressing" and an increase in the number of institutional investors during 1970s are main causes for the DoD superior performance. Near the year or quarter ends, to improve the appearance of the portfolios performance before sending to clients, institutional investors could sell poorly performance stocks at prices below their intrinsic values. The DoD seems to select these undervalued stocks that tend to increase value in good market conditions. According to Knowles et al. (1992), the DoD strategy provides an average annual excess return of nearly 4% compared to the DJIA over the period from 1957 to 1990. Furthermore, they suggest an alternative strategy by selecting five highest dividend yield stocks instead of ten. The portfolio provides a higher average return (15.4%) than the traditional DoD portfolio (14.2%).

Despite the promising results from three first studies, some following researches reported inconsistent performance for the DoD strategy. McQueen, Shields, and Thorley (1997) became the first authors to publish study on the DoD strategy on a financial academic journal. The authors tried to answer the question whether the investment strategy "beat the Dow statistically and economically". They compared the performance of a portfolio including the 10 highest dividend yield stocks in DJIA (the Dow-10) with a portfolio of all 30 stocks in DJIA (the Dow-30) and the results showed that the Dow-10 outperformed the Dow-30 annually by 3.06% over 50-year-period from 1946 to 1995. However, they also indicated that after adjusting with higher risk, transaction cost and tax, the Dow-10 performance was not economically significant. Dow-10 portfolio has higher standard deviation (i.e., risk) than the Dow-30 portfolio because some

unsystematic risk remains. Furthermore, following the DoD strategy results in higher transaction cost (due to the volatility of 10 firms in Dow-10 portfolio) and higher taxes payment (because the Dow-10 delivers more of its return than the Dow-30 in the form of dividends).

To correct the Dow-10 portfolio for its higher degree of risk, McQueen et al. (1997) used the Sharpe's portfolio performance measure. After adjustment for risk, the difference between two portfolio returns decrease from 3.06% to 1.52%. Therefore, risk alone can explain half of Dow-10 premium. 0.59% percent of Dow-10's wealth is lost due to transaction costs, while only 0.02% of the Dow-30's value disappears because of trading cost. The reason is the volatility of 10 firms in Dow-10 portfolio. During the studied period, 2.96 out of 10 firms in Dow-10 changed each year, when the rate in Dow-30 was only 0.35 out of 30 firms. After considering the transaction costs, the risk-adjusted premium of Dow-10 continue decreases from 1.52% to only 0.95%. The DoD strategy results in higher taxes payment because large proportion of return are received in form of dividends rather than capital gains. In U.S tax system, with the exception of the 1987 to 1990, capital gains have received favorable tax treatment. McQueen et al. (1997) stated that it is impossible to undertake a formal analysis of the tax advantages of the Dow-30 over the Dow-10 because it depends on individual's marginal tax rate and other factors. Therefore, after consideration of risk, transaction costs and taxes factors, the authors concluded that the Dow-10 "probably not beat the Dow-30 economically".

Furthermore, McQueen et al. (1997) also examined performance of the Dow-10 over shorter horizons (sub periods). They divided the whole 50 years into 10-year sub-periods. Their findings showed that after taking account risk, transaction costs and taxes, the Dow-10 outperformed the market in only 2 out of 5 periods. McQueen et al. believe that the success of DoD strategy could result from data mining and may disappear after it becomes widely known by investors. As more and more investors try to buy the same 10 undervalued stocks, the prices of these stocks will increase and therefore, eliminating the dividend anomaly. Keating (1998) confirmed the argument of McQueen et al by stating that the Dogs have lost their bite since 1995. According to him, if more and more people learn about the strategy, then so much capital may flow into these stocks, therefore, arbitrage away the abnormal profits associated with the Dogs. He showed that in 1997, when Dow gained 24%, the Dogs rose only 22%. Hough (2007) reported the similar

conclusion about the declining effectiveness of DoD strategy since 1996. He also suggested that the increasingly use of share repurchase as an alternative to dividend payment results in the disappearance of Dogs effect.

Domian, Louton, and Mossman (1998) examined correlation among past returns, dividend yields and future returns over the period 1964–1997. The authors compared the performance of a portfolio consist of the 10 highest dividend yield in the DJIA with the S&P 500. The study was different from previous studies because it investigated the explanations of the DoD strategy. Followed the methodologies suggested by De Bondt and Thaler (1985), Domian et al. tested whether the superior performance of DoD is actually an overreaction effect. The overreaction hypothesis states that investors tend to overreact to surprises and the stock prices systematically overshoot because individuals focus excessively on short-term events. The primary goal of the study is to determine whether high-yield stocks are losers in the pre-formation months, and whether the subsequent superior performance is "winner-loser" overreaction effect. The second objective is to test the performance of DoD portfolio over sub periods. Due to the stock market crash in 1987, the authors divide the entire sample period into two sub samples: 1964-1986 and 1989-1997. The study's results are consistent with the winner-loser overreaction hypothesis. High-yield stocks underperform the market by 3.67% in twelve months before creating portfolio, while the low-yield stocks outperform the market by 7.81%. The difference between losers and winners' returns is 11.48%. In the following twelve months, the high-yield stocks outperform the market by 4.8% and the low-yield stocks slightly underperform the market. Results from the first sub-period 1964-1986 are similar to the entire period (1964-1997). However, in the latter sub-period 1989-1997, DoD portfolio slightly outperformed the market during the first three months and then drop back. The authors conclude that the DoD strategy may result from winner-loser effect and its effectiveness disappeared when it was becoming popular (period 1989-1997)

Hirschey (2000) also tried to find explanation of the DoD phenomenon. He claimed that the phenomenon can be simply explained in term of investment period selection problems and data problems related to the accurate measurement of returns. The author pointed out that during the severe bear market of 1973-1974 and 1970s, the DoD strategy was especially effective; therefore, it causes much of false impression of DoD performance. However, the DoD performance was relatively poor during other periods. Furthermore, Hirschey (2000) argues that

data snooping and data errors also result in the outperformance results of DoD strategy. Prather and Webb (2002); however, provided a totally different view of the issue. They showed that the effectiveness of this strategy is not caused by data errors nor data mining problem. They also reject the "window dressing" of the institutional investors hypotheses suggested by O'Higgins and Downes (1991). Prather et al. (2002) re-examine the performance of DoD strategy in U.S stock market during 1961-1998. Their results suggest that the strategy outperformed DJIA by more than 4% annually on risk-adjusted basis. Although the authors did not consider the transaction costs and tax payment factors, the excess return of the DoD portfolio is high enough to beat the market even after considering these factors. Furthermore, Prather et al. used the Chow breakpoint-test to examine the "data mining" and "window dressing" theory. The Chow test was unable to reject the null hypothesis suggesting that neither data mining nor window dressing is cause of the DoD phenomenon. Furthermore, they concluded that the outperformance of the strategy probably related to many well-documented CAPM anomalies that remained unanswered.

The DoD strategy also examined in international markets outside the US stock market. Visscher and Sue (1997) examined the performance of DoD strategy in the British stock market over the period from March 1984 to February 1994. The results suggested that the strategy was not effective during the sample period. The DoD portfolio returns exceeded the market returns, on both unadjusted and risk adjusted bases, in only four years. The authors also suggested that the difference between DJIA and FTSE- 100 is the reason for the difference in strategy performance between U.S market and British market. Visscher and Filbeck (2003) studied the effectiveness of the DoD strategy in the Canadian stock market during 1988–1997. Their result indicated that the DoD investment strategy brings an average annual excess return of 6.6%. The excess return is economically significant enough to compensate for the higher risk, taxes and transaction costs.

Le Saout (2006) reexamined the effectiveness of DoD strategy in some developed European stock markets including U.K, France, Netherlands, Germany, Switzerland, Belgium and Spain. The studied period is from 1990 to 2003. The results show that the strategy is effective in all markets with the excess return of 6.3% on average compared to corresponding national indices. The excess return was highest in U.K that is totally different from the findings of Visscher and

Sue (1997). Furthermore, after considering the risk, transaction costs and tax, the strategy is still effective in all markets except German stock market.

The most recent study so far was conducted by Rinne and Vähämaa (2011) providing empirical evidence in Finnish stock market. They compared the performance of a portfolio including 10 highest-yielding stocks of the OMXH25 against the performance of the OMX Helsinki Cap total return index over the period from January 1988 to 2008. The results suggest that the DoD strategy outperforms the market index with an average annual abnormal return of 4.5%. More importantly, the superior performance was still significant after adjusting for risk and for the size and book-to-market factors of Fama and French (1993). However, the excess return is not large enough to compensate for transaction costs and tax payment, which indicates that the premium is not economically significant. In addition, the authors analyze the performance of the strategy during stock market downturns (i.e., the return on OMX Helsinki Cap total return index was negative). These periods includes the deep recession and banking crisis in the early 1990s, the technology bubble in the early 2000s and the recent global financial crisis in 2008. The empirical evidence suggests that the outperformance of the DoD strategy appears particularly pronounced during stock market downturns. Another contribution of the study is to provide possible explanation for the DoD phenomenon. The authors examine whether the outperformance of DoD strategy related to the winner-loser effect, which is firstly tested by Domian, Louton, and Mossman (1998) in U.S stock market. Their findings are consistent with Domian et al.'s findings pointing out that the high-yielding stocks are losers and the low-yielding stock are winners before creating the DoD portfolio. During the post-formation months, the high-yield "dogs" stocks outperform both the market index and the low-yield stocks portfolio. Therefore, the authors conclude that the outperformance of the DoD investment strategy is simply a manifestation of the winner-loser effect.

Although the DoD strategy has been widely discussed and examined in developed markets, there has been relatively little attention paid to its effectiveness in the emerging stock markets. In order to understand the effect of the strategy in Vietnam stock market, an emerging market, it is necessary to analyze significant findings about the strategy in some similar markets. Da Silva (2001) examined the performance of the investment strategy in Latin American stock markets

including Argentina, Chile, Colombia, Mexico, Peru, and Venezuela over the period from 1994 to 1999. He studied the strategy's performance on both absolute and risk-adjusted basis using the Sharpe Index. Moreover, the author also considered about the transaction costs and tax payment factors when calculating the real return of the portfolio. According to the results, the DoD strategy can add some value in both absolute and risk-adjusted basis in all countries except Brazil, however, the results are not statistically significant. Therefore, there is no strong statistical evidence to claim that the strategy outperform the market, which may result from the shortness of the testing period.

Brzeszczyński and Gajdka (2007) analyzed the DoD strategy in Poland stock market. The data covers the period from the opening of the Warsaw Stock Exchange in 1991 to 2004. The results suggest that although the DoD portfolios possibly beat the market index in the whole studied period, their performance are not consistent over time and the highest returns are obtained in the more recent years. One possible explanation for the phenomenon could be the increasingly important role of institutional relative to individual investors in recent years. In addition, the researchers test the size effect and the relative book value effect on the performance of high dividend yield portfolios and conclude that the dividend strategy is most successful with small companies stocks.

Wang et al (2011) tested various version of DoD portfolio in term of the number of stocks and the holding periods before rebalancing using the China stock market data from 1994 to 2009. The results show that the DoD portfolio outperforms the Chinese stock market index even after adjusting for risk, tax and transaction costs. The authors also point out that the abnormal return of the DoD portfolio is negatively significant with the number of the stocks in the portfolio and the frequency of rebalancing. Moreover, increasing number of stocks in a DoD portfolio and lowering the rebalancing frequency may improve the risk-adjusted returns of the portfolio.

7. DATA AND METHODOLOGY

7.1. Research hypotheses

The previous studies provide evidences to support for the positive abnormal return on the DoD investment strategy. However, the risk-adjusted return on the strategy has been still controversial issue. Therefore, I will firstly test the performance of the strategy against the performance of the market index on both absolute and risk-adjusted bases. The first research hypothesis can be written as follows:

H1: The DoD portfolios outperform the market return on both absolute and risk-adjusted bases.

It is supposed that the DoD strategy results in higher transaction costs (due to yearly portfolio turnover) and higher taxes payment (because majority of returns are received in form of dividends rather than capital gains). Some studies show that after taking account the transaction costs and taxes payment, the DoD strategy's outperformance is not economically significant. In order to test whether the DoD strategy is economically significant, my second hypothesis is formed:

H2: The DoD portfolios outperform the market return after considering transaction costs and taxes payment.

Although, the DoD investment strategy has been studied extensively by academic; however, there has been little convincing explanation for the phenomenon. Two following hypotheses are formed to test the possible explanations for the superior performance of the strategy.

H3: The DoD phenomenon is caused by the size effect.

H4: The DoD phenomenon is caused by the book value effect.

7.2. Data description

There are two stock exchanges in Vietnam: Ho Chi Minh stock exchange (HOSE) and Hanoi stock exchange (HASTC). HOSE was established in July 2000 while HASTC started to operate in January 2006. HOSE is the market for big enterprises, which have the capitalization greater than VND 80,000 million (USD 4.99 million). On the other hand, small and medium corporations with capitalization from VND 10,000 million (USD 0.62 million) are listed in HASTC. I focus only on the stocks in HOSE because of two reasons. First of all, the HASTC includes only small companies, which are often considered by investors to be particularly risky. The dividend policies of these companies are inconsistent. Secondly, the operation time of HASTC is too short, which may lead to unreliable results.

It is noted that the data for Vn-index, the index of HOSE, is not provided continuously in the first years of operation because at that time the market only operated three days a week. Furthermore, in 2000 and 2001, there were only several companies listed in HOSE and most of these companies are state-owned companies. Most of them were under no pressure to pay out dividends and, in fact, many of them did not do so. Therefore, the data set in my study spans from December 2002 to December 2012. The sample consists of all Vietnamese companies listed in the HOSE. The annual and monthly stock returns, market returns, book values, market capitalization and dividend payout ratios of all stocks are obtained from the database of the University of Vaasa and directly from the website of HOSE.

Vn-index is used as a market benchmark. I compare the performance of the DoD portfolio including the 10 highest-dividend-yielding stocks of Vn-index against the performance of the Vn-index. The index is a composite index calculating from prices of all common stocks traded at the HOSE. Specifically, it is a market-capitalization-weighted price index, which compares the current market value of all listed stocks to their value on the first trading day of the index, 28 July 2000.

7.3. Research methodology

7.3.1. DoD portfolio formation

I follow the standard DoD portfolio, called DoD-10, construction suggested by Slatter (1988):

(i) I calculated the dividend yields for all the stocks listed in Vn-index on the last trading day of the year over the period from 2002 to 2012. The dividend yields equal to the dividend divided by the current stock price. A portfolio is constructed by investing equally in the ten highest dividend yield stocks.

(ii) The portfolio is held in 1 year. On the anniversary date, portfolio is review by selling the stocks which have doffed off the top 10 dividend yield, and replaced with the new stocks.

(iii) The procedure is repeated on each anniversary date.

In addition, to test the DoD-5 strategy as suggested by Knowles et al. (1992), the DoD-5 also formed in the same way as the standard DoD portfolio except the number of stocks. The DoD-5 consists of the 5 highest-dividend-yielding stocks listed in the Vn-index.

Furthermore, to test if the size effect and book value effect can be explained for the DoD phenomenon, addition criteria are imposed to form three following portfolios:

- DoD1 portfolio: consisting of the 10 highest-yielding stocks excluding small companies which have the market capitalization lower than VND 1,000 billion;
- DoD2 portfolio: consisting of the 10 highest-yielding stocks excluding “value stocks” which have P/BV lower than median ratio of the market;
- DoD3 portfolio: consisting of the 10 highest-yielding stocks meeting the selection criteria for both DoD1 portfolio and DoD2 portfolio (i.e., the stocks which have the market capitalization higher than VND 1,000 billion and P/BV higher than median ratio of the market).

The time-series data used in the empirical analysis comprise the monthly closing prices of individual stocks and market index. Cash dividends are reinvested in the stock paid them at the end of the payment month in order to calculate the annual returns on the portfolios. The total value of the portfolios including all the dividends and other cash distribution is calculated on the anniversary date.

7.3.2. Portfolio performance and abnormal returns measurement

The market-adjusted model is used to measure the abnormal returns of the DoD strategies. The abnormal returns can be mathematically expressed as follows:

(19) $$AR_{MA} = R_{DoD} - R_M$$

Student t-statistics is calculated to test significance of the differences between the portfolios' returns and the market return. The levels of significance are 0.05 and 0.1

Furthermore, I will follow the measure of abnormal return proposed firstly by Modigliani and Modigliani (1997). The method is often called as the M^2 or 'Modigliani-squared' adjustment. The M^2- adjusted return is calculated as:

(20) $$AR_{M2} = (R_{DoD} - R_F)\frac{\sigma_M}{\sigma_{DoD}} - (R_M - R_F)$$

To test the risk-adjusted performance of the DoD strategy, two common risk-adjustment methods are used, Sharpe ratio and Treynor index. The Sharpe ratio measures the excess return per unit of risk (i.e., standard deviation). The Sharpe ratio formula is:

(21) $$S_p = \frac{R_p - R_f}{\sigma_p}$$

Where:

$R_p = Expected\ portfolio\ return$

$R_f = Risk\ free\ rate$

$\sigma_p = Portfolio\ standard\ deviation$

Treynor index also used to measure risk-adjusted performance of investment portfolio by calculating a portfolio's excess return per unit of risk. However, Treynor index uses the beta as the risk measure. Beta measures the systematic risk, not company-specific risk and is an appropriate measure when a portfolio is well-diversified. The Treynor index is calculated as follows:

$$T_p = \frac{R_p - R_f}{\beta_p} \quad (22)$$

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8. EMPIRICAL RESULTS

The empirical results are organized as follows. Firstly, I present the performance of the standard DoD investment strategy in both absolute and risk-adjusted basis. The transaction costs and taxes payment, then are taken into account to test the economically significance of the strategy. Secondly, the performance of the DoD-5 strategy, which is similar to the DoD-10 strategy except the number of stock (i.e., five stocks instead of ten stocks) is presented. Finally, the third sub-chapter provides possible explanations for the DoD-phenomenon by testing the size effect and book value effect.

8.1. Performance of the DoD – 10 investment strategy

Table 9 reports the annual return of the DoD-10 portfolio and the Vn-index over the period from 2003 to 2012. As the table shows, both the mean and the median return on the DoD are considerably higher than on the market index. The mean and median on the DoD-10 are 36.3% and 35.4%, while these corresponding numbers of the Vn-index are only 21% and 20.5%. The minimum annual return of the DoD-10 over the period is -62.6%, which is still higher than the minimum annual return of the index (-66%); however, the highest annual return of the market index is higher than the highest return of the DoD-10 portfolio (144.5% compared to 113.2%). The t-statistic is used to measure the difference between returns and zero. The t-test shows that although the mean of DoD-10 returns differs from zero at the 0.1 level, it is not statistically significant at the 0.05 level. The mean return of the Vn-index is statistically insignificant at both 0.05 and 0.1 level.

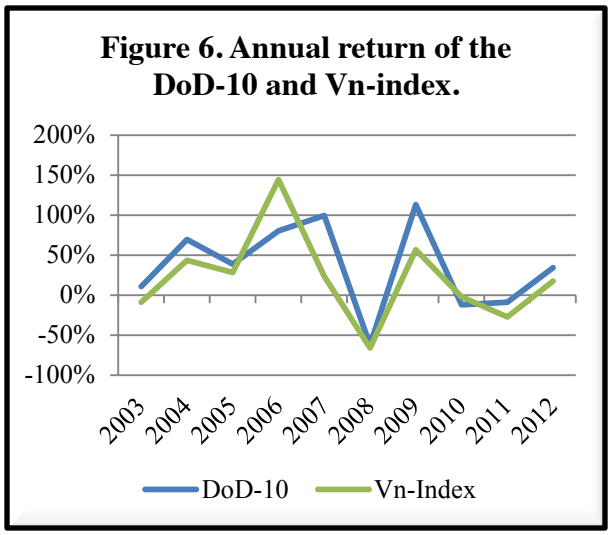
The positive abnormal returns calculated from both methods: market-adjusted (AR_{MA}) and M^2-adjusted (AR_{M2}) confirm the outperformance of the DoD-10 strategy compared to the market index. It is noted that according to the modern portfolio theory, the DoD-10 portfolio has higher systematic risk compared to the market index; therefore, the DoD-10 portfolio has a higher standard deviation. However, the empirical results suggest that the standard deviation of the market index is slightly higher than the standard deviation of the DoD-10 portfolio. The mean M^2- adjusted abnormal return is slightly higher than the mean market-adjusted abnormal return.

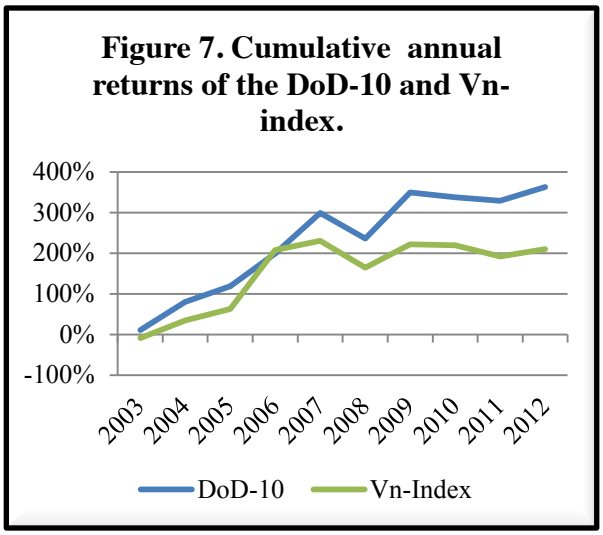
The mean (median) of abnormal returns obtaining from the two different methods are respectively 15.3% (17.6%) and 15.7% (17.8%), which are considerable impressive. However, probably due to extremely small number of observations, neither of these numbers is statistically significant.

Table 9. Annual returns of the Dow-10 investment strategy.

	DoD-10	**Vn-Index**	AR_{MA}	AR_{M2}
2003	0.107	-0.089	0.197	0.198
2004	0.696	0.433	0.262	0.271
2005	0.386	0.285	0.101	0.106
2006	0.804	1.445	-0.640	-0.631
2007	0.994	0.233	0.760	0.772
2008	-0.626	-0.660	0.033	0.025
2009	1.132	0.568	0.565	0.578
2010	-0.120	-0.020	-0.099	-0.101
2011	-0.087	-0.275	0.187	0.186
2012	0.342	0.177	0.165	0.169
Mean	0.363	0.210	0.153	0.157
t-statistic	2.066	1.180	1.292	1.320
p-value	(0.069)	(0.268)	(0.228)	(0.220)
Median	0.364	0.205	0.176	0.178
Minimum	-0.626	-0.660	-0.640	-0.631
Maximum	1.132	1.445	0.760	0.772
Standard deviation	0.555	0.562	0.375	0.377
No. of positive periods	7	7	8	8
No. of observations	10	10	10	10
Tax and transaction cost adjusted return	0.337		0.127	0.131
t-statistic	1.919		1.075	1.101
p-value	(0.087)		(0.310)	(0.299)

The number of positive abnormal returns shows that the DoD outperformed the market index in eight years over ten-year period. This can be seen more clearly in the figure 6, the annual returns of the DoD-10 portfolio are higher than the market return in the whole studied period except two years 2006 and 2010. Figure 7 represents the cumulative returns of the DoD-10 portfolio compared to cumulative returns of the Vn-index from 2003 to 2012. As showed in the figure, the ten-year cumulative return of DoD-10 clearly outperforms the market index (nearly 360% compared to 200%).





With only 10 annual observations, the results should be interpreted with some cautions. To overcome the lack of statistical power due to small number of observations, I next will focus on the monthly returns of the DoD-10 investment strategy. Table 10 reports the statistic summary about the monthly returns for the DoD-10 investment strategy and the Vn-index over the period from 2003 to 2012.

Table 10. Monthly returns of the Dow-10 investment strategy.

	DoD-10	**Vn-Index**	AR_{MA}	AR_{M2}
Mean	0.027	0.013	0.015	0.011
t-statistic	2.058	1.253	1.903	1.868
p-value	0.042	0.213	0.059	0.032
Median	-0.011	-0.002	0.002	0.005
Minimum	-0.266	-0.240	-0.172	-0.152
Maximum	0.489	0.385	0.394	0.279
Annualized standard deviation	0.145	0.111	0.084	0.066
No. of positive periods	57	56	67	69
No. of observations	120	120	120	120
Tax and transaction cost adjusted return	0.025		0.012	0.010
t-statistic	1.895		1.622	1.597
p-value	0.060		0.107	0.113

As the table shows, the mean monthly return of the DoD-10 is 2.7%, which is much higher than the corresponding return of the market index (1.3%). The mean monthly return of DoD-10 is statistically significant at 0.05 level while Vn-index's number is not significant in both 0.1 and 0.05 level. As can be seen from figure 8, the gap between the cumulative monthly returns on the DoD-10 portfolio and the market index widens significantly during the period, increasing to more than 150% in December, 2012. The median monthly return for the DoD-10 portfolio is -1.1%, while the corresponding median return for the market index is lower, being -0.2%. Moreover, the DoD's monthly return was positive in 57 months, whereas the market index's return was positive in 56 months out of 120 studied months. According to the number of positive market-adjusted returns (AR_{MA}), the DoD portfolio outperformed the market in 67 months out of 120 months, accounting for 56%. It is also noted from the Figure 9, the number of positive DoD's abnormal returns are distributed quite equally each month of a year; therefore, suggesting that the outperformance of the strategy is not attributable to any month effects.

Figure 8. Cumulative monthly returns of the DoD-10 and Vn-index.

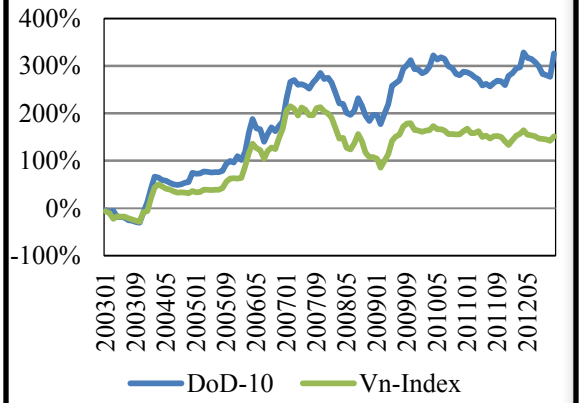
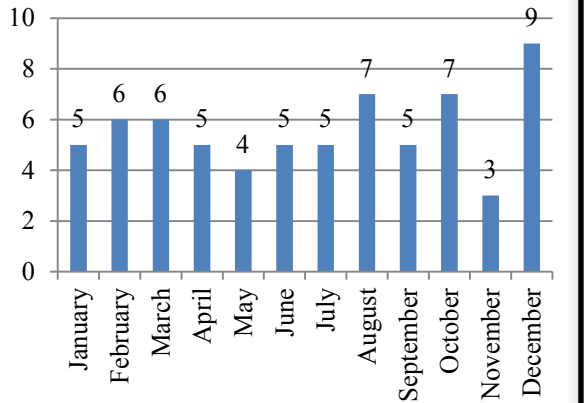


Figure 9. Number of positive DoD's abnormal returns according to month.



Furthermore, the mean market-adjusted return showed in table 10 reveals that the DoD-10 portfolio outperformed the Vn-index by 1.5% on a monthly basic. The outperformance is not statistically significant at 0.05 level; however, significant at 0.1 level (p=0.059). The median market-adjusted return is 0.2%. The mean M^2- adjusted monthly return is 1.1%, which is slightly lower than the mean market-adjusted return, suggesting that the DoD portfolio' monthly returns

have higher volatility compared to the market index over the period. However, the mean M^2-adjusted monthly return is highly statistically significant at 0.05 level (p=0.032), revealing that the DoD strategy outperforms the market index even after considering the risk adjustment.

To test intensively the effectiveness of the DoD strategy on risk-adjusted base, I follow previous DoD studies to use the Sharpe ratio and the Treynor index. Table 11 represents the Sharpe ratio and Treynor index for the DoD-10 portfolio and the Vn-index over the period from 2003 to 2012.

Table 11. Sharpe Ratio and the Treynor Index for the DoD-10 and Vn-Index.

Panel A. Sharpe Ratio				
Year	DoD-10	Vn-Index	Winner	
2003	0.175	-0.177	DoD-10	
2004	1.231	0.749	DoD-10	
2005	0.641	0.454	DoD-10	
2006	1.364	2.487	Vn-Index	
2007	1.705	0.332	DoD-10	
2008	-1.156	-1.202	DoD-10	
2009	2.036	1.007	DoD-10	
2010	-0.218	-0.039	DoD-11	
2011	-0.158	-0.489	DoD-12	
2012	0.615	0.314	DoD-13	
Panel B. Treynor Index				
Year	DoD-10	Vn-Index	Winner	Portfolio beta
2003	0.176	-0.100	DoD-10	0.550
2004	0.753	0.421	DoD-10	0.908
2005	0.544	0.255	DoD-10	0.655
2006	0.824	1.398	Vn-Index	0.920
2007	1.164	0.187	DoD-10	0.814
2008	-0.666	-0.675	DoD-10	0.964
2009	1.143	0.566	DoD-10	0.989
2010	-0.143	-0.022	Vn-Index	0.847
2011	-0.345	-0.275	Vn-Index	0.255
2012	0.455	0.176	DoD-10	0.751

According to the figures from the panel A, the DoD-10 dominates the market in the whole period, except for year 2006. It is noted that in 2006, the Vn-index has archived the highest

growth rate so far, nearly 150%. The results are consistent with the M^2- adjusted abnormal returns reported in the table 9, demonstrating the strong outperformance of the DoD strategy compare to the market index even after taking account the risk (i.e., standard deviation). The Treynor Index and the beta coefficients for DoD portfolio and market index are shown in panel B of table 11. The DoD strategy provides higher risk-adjusted return in 7 years out of 10 years, according to Treynor index. It is noted that the beta coefficients of the DoD-portfolio range from 0.255 to 0.989 and have the average of 0.765. These figures suggest that the movement of the portfolio is generally in the same direction as, however less than the movement of the market index. It means that the level of systematic risk of the DoD strategy is lower than the system risk of the market portfolio.

To sum up, the empirical results suggest that although the average annual of the DoD strategy is highly positive, it is statistically insignificant at conventional level. However, the strategy outperforms the market index on a monthly basis. More importantly, the outperformance appears to be statistically significant even after adjusting for risk. Furthermore, the risk-adjusted portfolio performance measures of Sharpe ratio and Treynor index demonstrate that the DoD-10 investment strategy is effective in the Vietnam stock market. The next part I will test if the outperformance of the DoD strategy is economically significant by considering the transaction costs and taxes payment.

The table 12 reports how to calculate the total annual transaction costs of rebalancing DoD portfolio. I follow the procedure suggested by Rinne and Vähämaa (2011). According to them, the total annual transaction costs include two parts: the transaction cost of rebalancing "new stocks" each year and the transaction cost of rebalancing "retained stocks". Over the 2003-2012 sample period, an average of 5.4 stocks out of 10 had to be replaced annually. It means that the annual portfolio turnover rate of the DoD-10 portfolio is 54%. According to Ho Chi Minh Stock Exchange, the transaction cost in Vietnam stock market ranges from 1% to 2% depending on the size of transactions. Therefore, I assume average 3% round-term transaction cost. As a result, the annual transaction cost for rebalancing "new stocks" of DoD strategy is 1.6%.

Table 12. Transaction cost calculation for the DoD-10 portfolio.

	Formula	Details	Amount
(1)		Annual portfolio turnover rate	0.540
(2)		Round-term transaction cost	0.030
(3)	(1)*(2)	Transaction cost of new stocks rebalancing	0.016
(4)		Annual return mean for DoD portfolio	0.363
(5)		Dividend yield for DoD portfolio	0.195
(6)	(3)-(4)	Capital appreciation average for DoD portfolio	0.168
(8)		Additional portfolio turnover rate for annual rebalancing of one half of the retained stocks	0.039
(9)	(2)*(5)	Transaction cost of retained stocks rebalancing	0.001
(10)	(3)+(9)	Total annual transaction costs of DoD portfolio	0.017

Furthermore, the retained stocks also are required to rebalance of their positions. Because the strategy principle is investing equally in 10 stocks; positions need to be increased in the stocks that have underperformed and decreased in outperformed stocks. With an annual return mean 36.3%, a dividend yield 19.5%, the DoD portfolio has the average of capital appreciation of 16.8%. It is acceptable to assume that one half of the retained stock need to be rebalanced annually. Therefore, additional portfolio turnover rate for annual rebalancing of one half of the retained stock is 3.9%. This results in 0.1% per year additional transaction cost due to rebalancing retained stocks. The total transaction cost of investing in DoD portfolio, therefore is 1.7% per year.

In addition to the transaction costs, investors must pay the income tax and capital gains tax. In Vietnam, before 2010 there is no tax imposed on dividends as well as capital gains. However, according to the Personal Income Tax Law, which has been effective since January, 2010, investors must pay income taxes and capital gains taxes. Specifically, dividend incomes were taxed at 5%; while capital gains were taxed at 20%. This provides advantage for the DoD investors who receive a large percentage of their income as dividend incomes. It can be calculated that dividends have been taxed at an average annual tax rate of 1.5% and capital gains at 6%. Table 13 reports details how to calculate the total taxes payment of DoD portfolio.

Table 13. Taxes payment calculation for the DoD portfolio.

	Formula	Details	Amount
(1)		Annual portfolio turnover rate	0.540
(2)		Average annual tax rate on dividend	0.015
(3)		Average annual tax rate on capital gains	0.06
(4)		Dividend yield for DoD portfolio	0.195
(5)	(2)*(4)	Capital appreciation average for DoD portfolio	0.168
(6)	(1)*(3)*(5)	Average annual tax on dividend of DoD portfolio	0.003
(7)		Average annual tax on capital gains of DoD portfolio	0.005
(8)	(6)+(7)	Total annual tax on DoD portfolio	0.008

It can be seen from the table 13, dividend yield of DoD portfolio is 19.5%, average annual tax rate on dividend is 1.5%, translating into average annual tax on dividend of DoD portfolio is 0.3%. Similarly, with the tax rate on capital gains is 6%, capital appreciation average is 16.8%, and annual portfolio turnover rate 54%, the average annual tax on capital gains of DoD portfolio is 0.5%. Overall, the total annual tax is 0.8%. Combined with the 1.7% transaction cost penalty, an investor investing in the 10 highest-yielding stocks in the Vn-index faces a penalty of 2.5% including taxes and transaction costs.

From these figure, the tax and transaction cost-adjusted average annual return of the DoD-10 can be calculated as 33.7%, which can be seen in the table 9. The number is statistically significant at 0.1 level. The average annual abnormal return for the DoD-10 portfolio after adjusting by taxes and transaction costs is 12.7% (market-adjusted method) and 13.1% (M^2- adjusted method). These figures are not statistically significant at both 0.05 and 0.1 level.

The mean taxes and transaction cost-adjusted monthly return of the DoD-10 portfolio is reported in table 10. The table shows that the mean taxes and transaction cost-adjusted monthly return is 2.5%. The average monthly taxes and transaction cost-adjusted abnormal return is 1.23% (according to market-adjusted method) and nearly 1% (according to M^2- adjusted method), both of them albeit statistically insignificant at conventional levels (p=0.107 and 0.113). In brief, the empirical results reveal that the positive DoD-10 premium is not necessarily large enough to compensate transaction costs and taxes payment; therefore, it do not have enough evidence to conclude that the DoD strategy is economically significant.

8.2. Performance of the DoD – 5 investment strategy

In this sub-chapter, I present the performance of the DoD-5 investment strategy, which is investing in the five highest-yielding stocks in the Vn-index instead of ten stocks. The DoD-5 strategy was previously studied by several researchers such as Knowles et al. (1997), Rinne and Vähämaa (2011), Wang et al. (2011). Table 14 shows the annual returns on DoD-5 portfolio and the Vn-index over the period from 2003 to 2012.

Table 14. Annual returns on the DoD-5 portfolio.

Year	DoD-5	Vn-Index	AR_{MA}	AR_{M2}
2003	0.122	-0.089	0.211	0.200
2004	0.881	0.433	0.448	0.357
2005	0.546	0.285	0.261	0.207
2006	1.108	1.445	-0.336	-0.447
2007	1.531	0.233	1.298	1.143
2008	-0.621	-0.660	0.039	0.105
2009	0.807	0.568	0.240	0.156
2010	0.070	-0.020	0.090	0.083
2011	-0.016	-0.275	0.259	0.260
2012	0.633	0.177	0.456	0.390
Mean	0.506	0.210	0.297	0.246
t-statistic	2.551	1.180	2.242	1.985
p-value	0.031	0.268	0.052	0.078
Median	0.589	0.205	0.249	0.204
Minimum	-0.621	-0.660	-0.336	-0.447
Maximum	1.531	1.445	1.298	1.143
Standard deviation	0.627	0.562	0.418	0.391
No. of positive periods	8	7	9	9
No. of observations	10	10	10	10
Tax and transaction cost adjusted return	0.464		0.254	0.208
t-statistic	2.338		1.923	1.679
p-value	0.044		0.087	0.127

According to the table 14, the average annual return of the DoD-5 (50.6%) is considerably higher than the corresponding return of the DoD-10 (36.3%). The average return is also higher than the return on market index by nearly 30%, which is really impressive result. Conventional t-test shows that the DoD-5 return differs from zero at 0.05 level; while Vn-index return is statistically insignificant. The 58.9% median return on the DoD-5 is remarkably higher than corresponding

returns on the DoD-10 (36.4%) and the Vn-index (20.5%). The -62.1% minimum annual return for the DoD-5 is nearly identical to the -62.6% minimum annual return for the Dow-10, however, the number still higher than the minimum return of the Vn-index (-66%). Additionally, the DoD-5 outperforms the market index as measured by the maximum annual return (153.1%) whereas the DoD-10's maximum annual return (113.2%) is much lower the market index (144.5%). It is also noted from the table 14, the DoD-5 portfolio has provided 8 positive annual returns, while the DoD-10 and Vn-index have got only 7 positive annual returns out of 10 years. These figures demonstrate the strong outperformance of the DoD-5 investment strategy over both the DoD-10 strategy and the Vn-index.

The outperformance can be seen more clearly in the Figure 10, which plotting the annual returns and the Figure 11, representing the cumulative annual returns of the DoD-5 and Vn-index from 2003 to 2012. The returns on DoD-5 are lower than returns on the market index only in 2006. In other years, especially in 2004, 2007 and 2012, the gap between the two returns is significantly large. As showed in the figure 11, the ten-year cumulative returns of DoD-5 strongly outperform the market index (about 500% compared to 200%).

Figure 10. Annual returns of the DoD-5 and Vn-index.

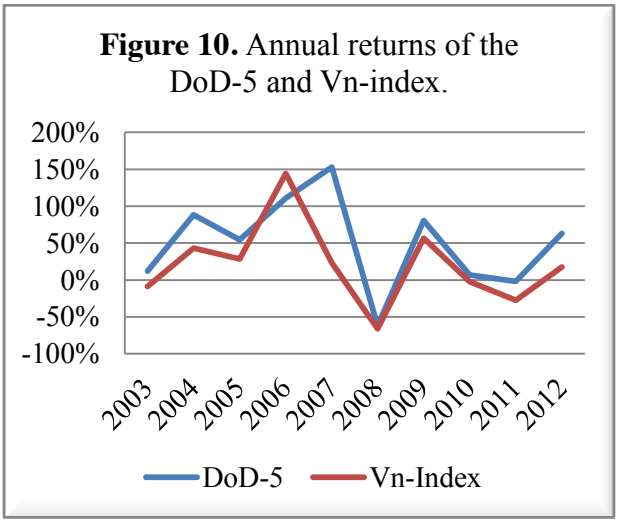
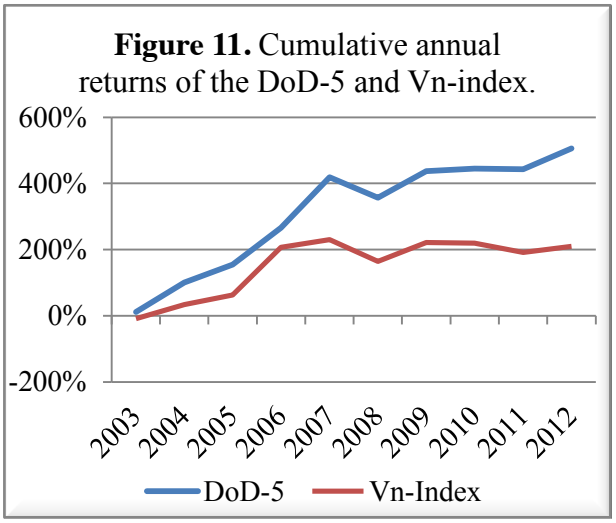


Figure 11. Cumulative annual returns of the DoD-5 and Vn-index.



The mean market adjusted return (AR_{MA}) on the DoD-5 is 29.7 %, which is statistically significant at 0.1 level (p=0.052). It is noted from the table 9, the mean market - adjusted return on the DoD-10 is insignificant. Therefore, the results are in favor of the superiority of the DoD-5

investment strategy over the DoD-10 strategy and Vn-index on an absolute basis. Moreover, the mean M^2- adjusted returns (AR_{M2}) on the DoD-5 is 24.6%, which is also statistically significant at 0.1 level. The finding provides evidence to support the outperformance of the DoD-5 portfolio on a risk-adjusted basis.

I used the same manner as represented in sub-chapter 8.1 to calculate the tax and transaction cost adjusted return for the DoD-5 portfolio. The annual portfolio turnover rate of DoD-5 strategy is 72%, which is much higher than DoD-10, resulting higher transaction cost of portfolio rebalancing 2.16%. Furthermore, with the total annual return mean of 50.6% and a dividend yield of 24%, average capital appreciation of the DoD-5 portfolio over the period is 26.6%. Annual rebalancing of one half of the retained stocks would result in a minimal additional portfolio turnover rate is 3.73%. The transaction cost of rebalancing retained stocks is 0.11%. Overall, the total transaction cost of investing in the DoD-5 strategy is 2.27% per year. Additionally, average annual tax on dividend and average annual tax on capital gains of DoD portfolio is 0.36% and 1.6%, respectively. As a result, the total taxes payment is 1.96% annually. The total annual return penalty of DoD-5 is 4.23%, which is nearly double compared to corresponding number of DoD-10. As reported in the table 14, the mean of tax and transaction cost adjusted returns on DoD-5 is 46.4%. More interestingly, the average annual abnormal return for the DoD-5 portfolio after adjusting by tax and transaction cost is 25.4% (market-adjusted method) which is statistically significant at 0.1 level (p=0.087). The result suggests that the abnormal return of DoD-5 strategy is probably high enough to compensate the taxes and transaction cost. However, the tax and transaction cost adjusted abnormal return calculating by M^2-adjusted method is 20.8 %, being not significant. To further analyses the risk-adjusted returns of the DoD-5 strategy, I calculate the Sharpe ratio and Treynor index for the DoD-5 portfolio and the Vn-index. The results are summarized in the table 15.

According to the figures from the panel A, the DoD-5 dominated the market in the whole period, except for year 2006. The results are consistent with the findings showing that the DoD-10 also outperformed the Vn-index in 9 years out of 10 years, except for year 2006. The Treynor Index and the beta coefficient for the DoD-5 portfolio and market index are shown in panel B of table

15. The DoD-5 strategy provides higher risk-adjusted return in 8 years out of 10 years, according to Treynor index. It is noted that in 2011, the beta coefficient of the DoD-5 was -0.453 suggesting that the movement of the portfolio is in the different direction as the movement of the market index.

Table 15. Sharpe Ratio and the Treynor Index for the DoD-5 and Vn-Index.

Panel A. Sharpe ratio				
Period	DoD-5	Vn-Index	Winner	
2003	0.178	-0.177	DoD-5	
2004	1.385	0.749	DoD-5	
2005	0.823	0.454	DoD-5	
2006	1.692	2.487	Vn-index	
2007	2.367	0.332	DoD-5	
2008	-1.014	-1.202	DoD-5	
2009	1.284	1.007	DoD-5	
2010	0.109	-0.039	DoD-5	
2011	-0.026	-0.489	DoD-5	
2012	1.008	0.314	DoD-5	
Panel B. Treynor Index				
Period	DoD-5	Vn-Index	Winner	Portfolio beta
2003	0.208	-0.100	DoD-5	0.537
2004	0.877	0.421	DoD-5	0.991
2005	0.782	0.255	DoD-5	0.660
2006	1.056	1.398	Vn-index	1.005
2007	1.724	0.187	DoD-5	0.861
2008	-1.604	-0.675	Vn-index	0.397
2009	3.344	0.566	DoD-5	0.241
2010	0.782	-0.022	DoD-5	0.088
2011	0.036	-0.275	DoD-5	-0.453
2012	1.132	0.176	DoD-5	0.558

In brief, the annual returns demonstrate that the DoD-5 investment strategy not only outperforms the market index but also the DoD-10 over the sample period. More importantly, the outperformance is likely statistically significant even after adjusting for risk, taxes and transaction costs. However, due to extremely small number of observations, the results could have some biases. In the next part to overcome the drawback, I will analyses the monthly returns of the DoD-5 and Vn-index. The results are summarized in the table 16.

Table 16. Monthly returns on the DoD-5 portfolio.

	DoD-5	**Vn-index**	AR_{MA}	AR_{M2}
Mean	0.037	0.013	0.025	0.017
t-statistic	2.542	1.253	1.923	2.006
p-value	0.012	0.213	0.047	0.072
Median	0.008	-0.002	0.008	0.012
Minimum	-0.281	-0.240	-0.381	-0.322
Maximum	0.733	0.385	0.433	0.333
Annualized standard deviation	0.161	0.111	0.135	0.104
No. of positive periods	65	56	63	75
No. of observations	120	120	120	120
Tax and transaction cost adjusted return	0.034		0.021	0.015
t-statistic	2.302		1.720	1.562
p-value	0.023		0.088	0.121

As the table shows, the mean (median) monthly return of the DoD-5 is 3.7% (0.8%), which is considerably higher than the corresponding returns of the DoD-10, which is 2.7%(-1.1%) and the Vn-index, being 1.3% (-0.2%). The mean monthly return of DoD-5 is statistically significant at 0.05 level while Vn-index's number is not significant in both 0.1 and 0.05 level. Furthermore, the number of positive returns on DoD-5 is 65 months (54%), while the figure on Vn-index is only 56 months (47%) out of 120 months. Figure 12 plots the cumulative monthly returns on the DoD-5 portfolio and Vn-index. The gap between two returns widens significantly during the period, increasing to about 200% in December, 2012.

The mean monthly abnormal market-adjusted return (AR_{MA}) on the DoD-5 portfolio is 2.5%, being statistically significant at 0.05 level (p=0.047). As shown in the table 10, the corresponding number of DoD-10 is only 1.5%. The number of positive abnormal returns is 63, suggesting that the DoD-5 outperformed the market in 63 months out of 120 months, accounting for 52.5%. It is noted from the Figure 13, the positive abnormal returns are distributed quite equally each month of a year; therefore, showing that the outperformance of the strategy is not attributable to any month effects. After considering the taxes and transaction cost, the mean monthly abnormal return decreased by 0.4% to 2.1%. The number is not statistically significant at 0.05 level anymore, however is significant at 0.1 level.

Figure 12. Cumulative monthly returns of the DoD-5 and Vn-index.

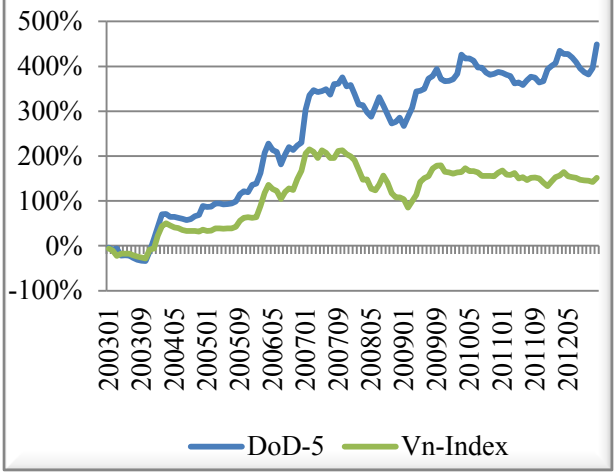
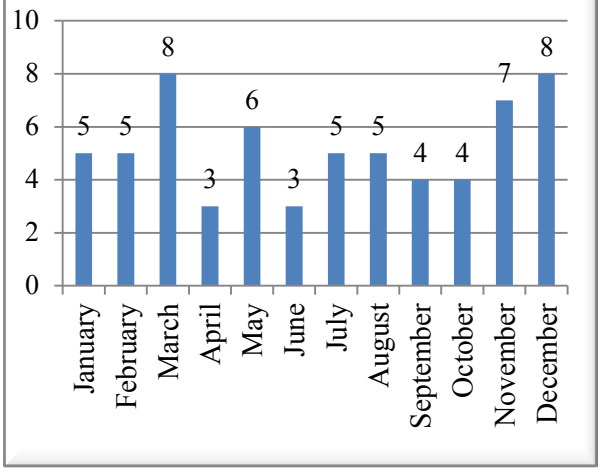


Figure 13. Number of positive abnormal returns according to month.



The mean M_2 − adjusted monthly return is 1.7%, which is 0.8% lower than the mean market-adjusted, suggesting that the DoD-5 portfolio' monthly returns have higher volatility compared to market index over the period. The number is statistically significant at 0.1 level (p=0.072). However, after adjusting for taxes and transaction cost, the mean deceased to only 1.5%, becoming albeit statistically insignificant at conventional levels (p=0.121)

To sum up, the monthly returns of DoD-5 confirmed the superiority of the DoD-5 investment strategy over the DoD-10 strategy and Vn-index on both absolute and risk-adjusted basis. However, after taking into account taxes and transaction cost, the positive abnormal return is not statistically significant.

8.3. Testing of the firm size and P/BV effects on the DoD strategy

So far there is convincing evidence to support for the superior return of the DoD investment strategy in Vietnam stock market over the period from 2003 to 2012. This sub-chapter will focus on the possible explanation for the phenomenon. I examine whether the outperformance of the DoD strategy is due to size effect or book value effect. The size anomaly is that small firms (small capitalization) tend to outperform large companies; while the idea of low book value

effect is that stocks with below-average price-to-book ratio tend to outperform the market. Therefore, to control the size effect and book value effect, I formed portfolios consisting of the ten highest-yielding stocks excluding stocks which have capitalization below to VND 1,000 billion and price-to-book ratio below median. The performance of these portfolios, then were compared to standard DoD-10 and the Vn-index's performance. Table 17 presents the annual returns of the standard DoD-10 portfolio; DoD1 portfolio consisting of the ten highest-yielding stocks excluding small companies; DoD2 portfolio consisting of the ten highest-yielding stocks excluding below median price-to-book ratio companies and DoD3 portfolio consisting of the ten highest-yielding stocks meeting the selection criteria for both DoD1 and DoD2. The market-adjusted abnormal returns on each portfolio are also given in table 17.

The results clearly indicate that over the 10 year period, all three portfolios obtained better returns than the Vn-index. The DoD2 becomes the only portfolio archiving better results than the standard DoD-10 strategy. The mean (median) annual returns of all three portfolios are higher than the market index by from 12% (16%) to nearly 21% (22%). The mean (median) of DoD1 return (excluding small companies) is 33.1% (37.1%), the lowest level, is still higher than the mean of the market return, being 21% (20.5%). The best result was achieved by the DoD2 portfolio, which excludes below average price-to-book ratio stocks. The portfolio provides the mean (median) annual return of 41.7% (42.4%) over the period, which is nearly double the number of Vn-index. The mean (median) return on the DoD3 is 34.7% (37.1%) In addition, the DoD2 is the only portfolio getting 8 positive annual returns, while other two portfolios and market index got only 7 positive annual returns out of 10 years. The DoD2 outperforms the DoD-10 by more than 5% on mean return and 6% on median return. After adjusting for the taxes and transaction costs, the mean returns on all portfolio decrease by nearly 3%; the level however still are considerably higher than the mean return on the Vn-index.

The table 17 also shows market-adjusted abnormal returns of all three investment strategies. Obviously, all of three strategies provide positive mean abnormal returns, which confirm their outperformance compared to market index. Specifically, mean abnormal return on DoD1 is 12.1% and on DoD2 is 20.7%, which are both statistically significant at 0.1 level. On the other hand, the DoD3 mean abnormal return of 13.7% is statistically insignificant. From the number of

positive abnormal returns, the DoD1 and DoD3 have higher returns than market index in 7 years, while the DoD2 outperforms the market in 9 years out of 10 years. After taking the taxes and transaction cost into account, the abnormal return of three portfolios shrinks by nearly 3%, being 9.7% for DoD1, 17.9% for DoD2 and 11.3% for DoD3. All of the numbers is not statistically significant suggesting that abnormal returns are not sufficient to compensate for the taxes and transaction cost.

Similar to the previous sub-chapter, I next focus on the monthly returns of the three portfolios to reduce small-sample biases. Table 18 reports summary statistics of the monthly returns on the investigated portfolios. Again, the table shows that the mean monthly return for all DoD1, DoD2, and DoD3 are remarkably higher than corresponding mean return for the market index. The mean monthly return for DoD1, DoD2, and DoD3 are 2.4%, 3% and 2.3%, respectively; while the Vn-index's mean return is only 1.3%. However, the DoD2 is the only portfolio outperforms the standard DoD by nearly 0.3% per month. It is noted that the mean monthly return on DoD2 portfolio is highly statistically significant at 0.05 level (p=0.017); while the mean of DoD1 and DoD3 portfolio is significant at 0.1 level. Moreover, table 17 shows that the return on the DoD2 portfolio was positive in 65 months out of 120 months, whereas the number for DoD1 is 57, DoD3 is 59 and market index is 56. The taxes and transaction cost-adjusted monthly returns of three portfolios are 2.2%, 2.8% and 2.1%, being statistically significant.

Table 17. Annual returns on standard DoD, DoD1, DoD2, DoD3 and Vn-index.

	DoD-10	DoD1	DoD2	DoD3	Vnindex	AR(10)	AR1	AR2	AR3
2003	0.107	0.063	0.107	0.063	-0.089	0.197	0.153	0.197	0.153
2004	0.696	0.646	0.696	0.646	0.433	0.262	0.213	0.262	0.213
2005	0.386	0.324	0.386	0.324	0.285	0.101	0.039	0.101	0.039
2006	0.804	1.339	0.953	1.033	1.445	-0.640	-0.106	-0.491	-0.412
2007	0.994	0.419	0.879	0.419	0.233	0.760	0.186	0.646	0.186
2008	-0.626	-0.681	-0.503	-0.689	-0.660	0.033	-0.021	0.157	-0.030
2009	1.132	1.097	1.371	1.511	0.568	0.565	0.530	0.803	0.943
2010	-0.120	-0.051	0.017	-0.047	-0.020	-0.099	-0.031	0.038	-0.027
2011	-0.087	-0.272	-0.199	-0.229	-0.275	0.187	0.002	0.076	0.045
2012	0.342	0.427	0.462	0.441	0.177	0.165	0.250	0.286	0.264
Mean	0.363	0.331	0.417	0.347	0.210	0.153	0.121	0.207	0.137
t-statistic	2.066	1.723	2.295	1.742	1.180	1.292	2.061	1.872	1.273
p-value	0.069	0.119	0.047	0.115	0.268	0.228	0.069	0.094	0.235
Median	0.364	0.371	0.424	0.371	0.205	0.176	0.096	0.177	0.099
Minimum	-0.626	-0.681	-0.503	-0.689	-0.660	-0.640	-0.106	-0.491	-0.412
Maximum	1.132	1.339	1.371	1.511	1.445	0.760	0.530	0.803	0.943
Standard deviation	0.555	0.608	0.575	0.630	0.562	0.375	0.177	0.333	0.341
No. of positive periods	7	7	8	7	7	8	7	9	7
No. of observations	10	10	10	10	10	10	10	10	10
Tax and transaction cost adjusted return	0.337	0.307	0.389	0.323		0.127	0.097	0.179	0.113
t-statistic	1.919	1.597	2.139	1.621		1.075	1.650	1.617	1.049
p-value	0.087	0.145	0.061	0.139		0.310	0.133	0.140	0.322

The mean market-adjusted returns reported in table 18 suggest that the three DoD investment strategies outperform the market index by from 1.1% to 1.7% on a monthly basis. The best performance again was achieved by the DoD2 portfolio, which having mean monthly abnormal return of 1.7%. The outperformance of DoD2 portfolio is highly statistically significant (p=0.035). The mean abnormal returns of two remaining portfolio are insignificant. It is also noted from table 18, the mean monthly abnormal return on DoD2 portfolio after adjusting for taxes and transaction cost is 1.5%, still being statistically significant at 0.1 level. The result suggests that the positive premium of the strategy is large enough to survive transaction costs and taxes, and hence the strategy may be economically significant.

Table 18. Monthly returns on standard DoD, DoD1, DoD2, DoD3 and Vn-index.

Monthly	DoD-10	DoD1	DoD2	DoD3	Vn-index	AR(10)	AR1	AR2	AR3
Mean	0.027	0.024	0.030	0.023	0.013	0.015	0.011	0.017	0.011
t-statistic	2.058	1.884	2.415	1.949	1.253	1.903	1.313	2.129	1.359
p-value	0.042	0.062	0.017	0.054	0.213	0.059	0.192	0.035	0.177
Median	-0.011	-0.007	0.004	-0.004	-0.002	0.002	0.001	0.005	0.001
Minimum	-0.266	-0.279	-0.265	-0.267	-0.240	-0.172	-0.328	-0.186	-0.353
Maximum	0.489	0.371	0.485	0.380	0.385	0.394	0.359	0.574	0.348
No. of positive periods	57	57	65	59	56	67	63	66	61
No. of observations	120	120	120	120	120	120	120	120	120
Tax and transaction cost adjusted return	0.025	0.022	0.028	0.021		0.012	0.009	0.015	0.009
t-statistic	1.895	1.723	2.227	1.780		1.622	1.070	1.842	1.102
p-value	0.060	0.087	0.028	0.078		0.107	0.287	0.068	0.273

In sum, table 17 provides evidence to suggest that the portfolio composed of the ten highest dividend yield stocks excluding small companies (DoD1) and the portfolio composed of the ten highest dividend yield stocks excluding low P/BV companies (DoD2) can beat the Vn-index annually. However, the outperformance is not economically significant after considering the taxes and transaction costs. Additionally, the portfolio composed of ten highest dividend yield stocks excluding small and low P/BV companies is not statistically better than the index even before adjusting for the taxes and transaction costs. However, due to extremely small size of the observations, the results may not have sufficient statistical power. Then, the monthly return analyses can give more reliable results. Empirical results in table 18 show that the dividend strategy is most successful when further restriction related to P/BV imposed (DoD2). Monthly average abnormal return on DoD2 is highly statistically significant. More importantly, the portfolio beats the market index even after adjusting for the taxes and transaction costs. The strong outperformance of the DoD2 reveals that the DoD phenomenon is not due to book value effect. However the slightly lower abnormal return on the DoD1 compared to the corresponding return on the standard DoD suggests that the size effect may be possible explanation for the phenomenon.

9. CONCLUSION

The "Dogs of the Dow" investment strategy was discovered more than 25 years ago by an analyst John Slatter and then re-examined in various countries. However, so far no studies have been undertaken to invest whether the strategy is effective in the Vietnam stock market. Therefore, the main purpose of this study is to examine performance of the investment strategy in the Vietnam stock market using the data over the period from 2003 to 2012. In addition to the standard version of the DoD-10 strategy, which involves investing equal amounts in the 10 highest-yielding stocks of the Vn-index, performance of the DoD-5 version was also investigated.

The first hypothesis of the study stated that "The DoD portfolios outperform the market return on both absolute and risk-adjusted bases". The empirical findings suggest that the DoD-10 strategy strongly outperforms the market index with an average annual abnormal return of 15.3%. The cumulative 10-year return for the DoD-10 investment strategy is about 360%, while the corresponding return on the market index is 200%. However, the annual abnormal return is statistically insignificant. On the other hand, the average monthly return of the DoD-10 strategy is 1.45%, which is statistically significant. It should be noted that with only ten-year period, the annual returns probably suffer from the extremely small number of observations and therefore the monthly returns can be considered more reliable in a statistical sense. Additionally, annual and monthly abnormal returns of the DoD-5 strategy are 29.7% and 2.5%, which are both highly statistically significant. Therefore, it should be determined that the DoD strategies outperform the market return on absolute base. Furthermore, to investigate the risk-adjusted performance of the DoD strategies, the 'Modigliani-squared'-adjusted model, the Sharpe ratio and the Treynor index were calculated. The results confirm the outperformance of the DoD strategies and suggest that the premium of the strategies is not merely a compensation for higher risk. Overall, the first hypothesis must be accepted.

The second hypothesis states that "The DoD portfolios outperform the market return after considering transaction costs and taxes payment." Most of previous academic studies examine portfolio performance only in statically sense. Remaining studies (e.g. McQueen et al. 1987;

Rinne and Vähämaa 2011), which investigated the economic performance, suggested that the strategies are not economically significant. The empirical results of this study confirm the conclusion of the previous researches, revealing that the positive DoD premium is not large enough to compensate transaction costs and taxes. The second hypothesis, therefore, is not accepted.

To investigate the possible explanations for the DoD anomaly, two more hypotheses of this study are formed as "The DoD phenomenon is caused by the size effect" and "the DoD phenomenon is caused by the book value effect". Several authors have explained the DoD phenomenon with value effect. According to Filbeck et al. (1997); Hirschey (2000); Rinne and Vähämaa (2011), there were not convincing evidences supporting that the anomaly can be fully explained by the value effect. Brzeszczyński and Gajdka (2007), on the other hand, stated that the size effect could be an explanation for the DoD phenomenon. The conclusion of this study is generally consistent with the previous papers. The empirical results suggest that the DoD phenomenon is not caused by the value effect. Both the annual and monthly abnormal returns of the portfolio consisting of ten stocks with highest dividend yield excluding "value stocks" are statistically significant, being 20.7% and 1.7%, respectively. Conversely, the DoD phenomenon probably could be explained with the size effect. Although the annual abnormal return of the portfolio including the 10 highest-yielding stocks of the Vn-index (excluding stocks with small market capitalization) is statistically significant, the monthly abnormal return of the portfolio is not significant. As stated earlier, the monthly returns can be considered more reliable in a statistical sense.

Generally, the findings of this study are quite consistent with the vast majority of previous papers, which favor the existence of the DoD anomaly. The DoD investment strategies have been able to provide abnormal returns for investors in the Vietnam stock market even after adjusting for risk. Interestingly, the abnormal returns of Vietnamese DoD portfolios are impressively higher than the corresponding returns in other markets. The market-adjusted returns of the DoD portfolios in several geographical regions range from -5% to 8% (see Rinne and Vähämaa 2011), while the return in Vietnam stock market is 15.3%. A possible explanation for the difference is the difference between the market indexes. The indexes were used in other studies often contain

small number of stocks (for example DJIA, Toronto-35, FT-30, OMXH25) representing performance of the most actively-traded stocks, whereas the Vn-index contains larger number of stocks, representing performance of the whole market. The Vn-index return, therefore, can be affected by returns of small and less actively-traded stocks.

In addition to provide a more clearly view and a possible explanation for the existence of the DoD anomaly. This study also contributed to re-examine efficiency of the Vietnam stock market. The market efficiency is fundamental concept in finance literature. While studies on stock markets in emerging markets are widely available, so far not many studies have been investigated the efficiency of the Vietnam stock market. Truong et al. (2010) are the first authors concerning about the issue. According to their findings, the Vietnamese stock market is inefficient in the weak form. Additionally, Nguyen, T. K. (2011) found out that in Vietnam market, the returns of Monday and Thursday had tendency to be negatively lowest and positively highest respectively. The "day of week" anomaly confirmed that the stock prices in Vietnam market did not follow random walk and the market was not efficient in weak form. The empirical tests in this study were different from the previous studies by concentrating on testing the semi-strong form of market efficiency (i.e., test if it is possible to forecast the future prices using the fundamental analysis). This study attempted to analyze the relationship between the stock returns and dividend yield. Since the empirical findings confirmed that the higher dividend yields can predict higher than average returns, it can be stated that the Vietnamese stock market is inefficient in the semi-strong form.

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