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Value and growth stocks on the Chinese stock market

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Abstract:

This thesis investigates whether an investor can get superior returns when investing in value stocks compared to investing in growth stocks on the Chinese stock exchange (2009-2017). Value and growth stocks are classified by financial ratios. In this study stocks with low price to earnings ratio(P/E), price to cash flow ratio(P/CF), market to book value ratio(MV/BV) and price earnings growth ratio(PEG) will be defined as value stocks. Conversely, stock that score high on the aforementioned ratios are defined as growth stocks.

The results of empiral analysis show that : a) value portfolios made up of low P/B ratio stocks yield significant positive return for both non risk-adjusted return and risk-adjusted return in the 3 investing horizons used in the study; b) value portfolios ranked by P/E and P/CF underperform in the comparison to growth portfolio in both 1 year horizon and 2 years horizon. In 3 years horizon the difference is however very small; c) Value portfolios consist of low PEG Ratio stocks tend to yield higher return compared to growth portfolios consist of high PEG Ratio stocks in the investing horizon of 1 year and 2 years while the return is similar in 3 year holding horizon.

Keywords: Value Investing, Growth Investing, Chinese Equities

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1.Introduction

Growth versus value investing has been one of the central debate for investors for many years. These two schools of investing are distinctive in their characteristics and attract investors with different temperaments for risks. Growth investors invest in companies that grow faster in revenue, earnings, cash flow, etc. than other companies. High expectations of the future push up the prices of growth stocks relative to sales or earnings. Value investors, on the other hand, prefer companies with stock prices lower than its intrinsic value. These stocks are considered bargains, and investors expect its prices to go up when its fundamental value will be recognized by the market over time.

Value stocks are unpopular and overlooked by the market. On the other hand, growth stocks generally have high growth prospects and thus investors are willing to pay a higher price for its stocks. They would expect the earnings of the company to grow at a high speed which leads to the appreciation of the stock in the future. These two major trends of investing have been the center topics of many investment strategies research, even though growth investing has been more widely adopted by global investors.

Value investing is most widely known because of one of the most successful investors in the world: Warren Buffet. During Buffet's 51 years investing career (1964-2016) in Berkshire Hathaway, the compounded annual return of its share has been 19.0% compared to 9.7%(with Dividends Included) of the S&P 500[1]. One dollar invested in Berkshire Hathaway in 1965 would worth 8843 dollars at the end of 2016 compared to 127 dollars in S&P 500.

Previous studies on growth and value stocks made internationally have shown that value investing generates a value premium in the US market (Lakonishok, Shleifer, & Vishny, 1994, Fama & French, 1996, and Chan & Lakonishok, 2004). Other studies have found that this premium also exists outside the North-American market (Chan, Hamao, & Lakonishok, 1991 and Fama & French, 1998).However, contrary to historical research result, US value stocks have been underperforming growth stocks since 2000; In February 2018, The MSCI All-Country World Value Index was trading at the lowest level since

[1] 2017 Letter to Shareholders, Berkshire Hathaway Inc.

2000 relative to its growth counterpart;(Costa 2018) According to S&P Dow Jones Indexes, the S&P 500 Value Index has a 10-year (2008-2017) annual average return of 7.16%, compared to 10.77% of the S&P 500 Growth Index and 9.07% of the S&P 500. (Table 1). While chasing value stocks have been a losing strategy in the US, it has been surprisingly successful in China. As of April 2018, the S&P China A 300 Value Index has outperformed S&P China A 300 Growth and S&P China A 300 Index for 10 years.

The divergence in the performances of growth and value strategies between China and USA raises the question: Will the value investing approach geneate excess risk adjusted returns in the Chinese Stock market?

Table 1: Index Return as of April 21st, 2018

Index Name	YTD	1 Year	3 Years	5 Years	10 Years
S&P 500 Growth (TR)	3.14%	20.85%	12.58%	15.79%	10.77%
S&P 500 Value (TR)	-2.39%	9.75%	8.16%	11.36%	7.16%
S&P 500 (TR)	0.44%	15.59%	10.62%	13.76%	9.07%
S&P China A 300 Value Index (CNY) TR	-7.14%	16.86%	1.14%	15.65%	6.26%
S&P China A 300 Growth Index (CNY) TR	-5.86%	6.94%	-7.54%	6.74%	0.92%
S&P China A 300 Index (CNY) TR	-6.63%	12.84%	-2.73%	11.61%	3.84%

Source: S&P Dow Jones Indices

In this study, the two investment styles are tested together. The value strategy portfolio is defined as buying stocks low in Price/Earnings, Price/Book Value, Price/Cash Flow ratios, PEG ratios and the opposite for the growth strategy. The study involves investing in publicly listed Chinese equities between 2009 and 2017. The risk adjusted results are benchmarked against the SSE50 Index.

The aim is to take the basic method from former studies and improve them by using a good risk-adjustment, flexible investment horizons, clear separation between value and growth stocks. Doing

this, the authors of this paper hopes to be able to make a more comprehensive and complete study of the existence of a value premium on the Chinese stock exchange. Hopefully, previous findings made by other papers can be confirmed in this study.

2. Theoretical Framework

Growth and value investing are the two most popular investment styles in the financial market. There are many factors that influence what style an investor will apply. Research have found that investor's style has biological basis and is partially ingrained in an investor from birth. Their life experiences also have important influences on their investment styles. Investors with adverse macroeconomic experiences (e.g. Great depression) or who grow up in lower economic status tends to favor value investing style. (Cronqvist, Siegel and Yu, 2015).

The influence of biological basis and life trajectory of investors on value and growth investing is not what this study tries to explain. Rather, in this theoretical framework section, understanding of the two investment styles as well as empirical analysis of value and growth investing will be discussed in order to provide a theoretical foundation for the empirical analysis in the following section.

The structure of this section is as follows: First, the investment logic behind the two styles are explained; Second, empirical studies on the value premium is presented; Third, academic research and explanation of the source of value premium is discussed.

2.1 Value Investing

"Value is the phenomenon in which securities that appear cheap, on average, outperform securities that appear to be expensive." (Asness et al, 2015). Benjamin Graham David Dodd laid the foundation for value investing in the 1930s with their book Security Analysis, one of the most influential book on both stock analysis and value investing. Their ideas were further elaborated in the 1949 book The Intelligent Investor. The core ideas of Graham's value strategies are (a) stock prices fluctuate around its "intrinsic value"; (b) in the long run, stocks tend to move towards its "intrinsic value"; (c) buying

securities that are significantly underpriced compared to its intrinsic value provides investors with a "margin of safety".

According to Graham, intrinsic value is an investor's perception of the inherent value of an asset based on its specific performance and financials. There is no fixed formula to calculate it, and each investor will have different opinions about this value, but on average, it should be reasonable based on its fundamentals. When stock prices fall below its intrinsic value, it presents an investment opportunity for value investors. If the discrepancy between the price and the intrinsic value is big, it provides a "margin of safety" that could protect investors against overpaying for a security while at the same time make a higher possible profit when the market price returns to its intrinsic value.

Graham (1973) explained about the margin of safety in the following context:

"The margin of safety idea becomes evident when we apply it to the field of undervalued or bargaining securities. We have here, by definition, a favorable difference between prices on the one hand and indicated or appraised value on the other. That difference is the margin of safety."

In his book *The Intelligent Investor (*1973), Graham described the mental attitude for investors towards the market. He said that investors should think of the stock market as a very accommodating fellow named "Mr. Market", who is your partner in a private business and will provide you with market quotations. These quotations are offers from "Mr. Market" that he will either sell you his part of the business or buy yours. "Mr. Market" has very serious emotional problems. Sometimes he is very euphoric about your business and sees only the bright sides of it. He is afraid that you might take away his share of this very promising business and he comes up with a very high price. Other times when he is depressed, his mind is full of bad news of the business and he is filled with fear about where the business is heading. To make it impossible for you to sell this business to him, he comes up with a very low price. It is entirely up to the intelligent investors to take up these offers or not. "Mr. Market" is very persistent, if you ignore him today, he will always come up with a new price tomorrow. It is in the intelligent investors best interests to understand the emotions of "Mr. Market" and not fall under his influences. Rather, the emotions of "Mr. Market" is what the intelligent investors could take advantage of. Most important of all, "Mr. Market" is there to serve the intelligent

investors, not guide them.

Buffet and many other loyal disciples of Benjamin Graham had earned their investors huge profits following the value approach. In a 1984 article called “The Superinvestors of Graham and Doddsville” written by Buffett, he argued that value investing was largely overseen by the market on average:

“In conclusion, some of the more commercially minded among you may wonder why I am writing this article. Adding many converts to the value approach will perforce narrow the spreads between price and value. I can only tell you that the secret has been out for 50 years, ever since Ben Graham and Dave Dodd wrote Security Analysis, yet I have seen no trend towards value investing in the 35 years I’ve practiced it. ... The academic world, if anything, has actually backed away from the teaching of value investing over the last 30 years. ... There will continue to be wide discrepancies between price and value in the market place, and those who read their Graham and Dodd will continue to prosper”.

2.2 Growth investing

Growth investing is a style of investing that favors companies with high growth. Growth stocks typically appear to be more expensive compared to value stocks due to higher Price/Earnings, Price/Book ratios. Growth investors believe that above-average growth will bring high capital appreciation in the future that will compensate for its high price today. Growth stocks are often referred to as “glamour stocks” as a lot of them are chased after by investors. Growth stocks typically carry higher risks than value stocks as they are less mature companies, margins are thinner, and some growth companies are even making loss in terms of net income. Unlike many value stocks, growth stocks don’t usually pay dividends. The earnings are usually retained in the company to finance further growth in the future.

As Benjamin Graham is referred to as the “Father of Value Investing”, Thomas Rowe Price, Jr. has been called "the father of growth investing". He founded the investment firm T. Rowe Price in 1937, which has been his vehicle to promote growth investing since. Thomas Rowe Price, Jr believed that

investors could earn superior returns by investing in well-managed companies in fertile fields whose earnings and dividends could be expected to grow faster than inflation and the overall economy.

Another influential figure in shaping this investment style was Philip Arthur Fisher. His 1958 book *Common Stocks and Uncommon Profits* is considered one of the most important books in growth investing. Fisher 's view is that stocks that seem to be overpriced by traditional metrics does not necessarily underperform. Investors should hold on to these stocks if he is certain that the peak of the stock's earning power has yet to be achieved. Fisher suggests that the selling signal for stocks should be (a) when the investor has made mistake in his assessment of the stock; (b) when the stock's earning power at its next peak, adjusted for the business cycle activity, will be lower than what it is now or has been. Overpricing doesn't particularly worry Fisher, he believes that it is unwise to sell a stock that is 30% overpriced because the risk of losing its superb future return is high.

Fisher commented on the value investing practice of "buy cheap stocks" in his book *Common Stocks and Uncommon Profits: "Even in those earlier times, finding the really outstanding companies and staying with them through all the fluctuations of a gyrating market proved far more profitable to far more people than did the more colorful practice of trying to* buy *them cheap and sell them dear."*

Fisher believes that companies with truly high growth prospects are rare since growth are hard achieve*: "what really counts is a management having both a determination to attain further growth and an ability to bring its plans to completion."* It is also hard to guess the effects of the next business cycles; therefore, investors should focus on the long-term prospects of a company rather than the short-term changes. Owners and investors of stocks with truly high growth prospects could beat the market.

Swenson (2000) argues in *Pioneering Portfolio Management* that growth investors does not look at the fundamentals of a stock, their analysis is based on market's interpretation of its future growth.

2.3 Growth at reasonable price: A bend of value and growth.

Growth at a reasonable price (GARP) is a mix of value and growth investing. Like value investors, GARP investors find stocks that are temporarily down on the market due to disappointing earnings or

bad news, but still exhibit some growth potential. GARP investor could buy these stocks at a more relatively cheap price and capture the gains from its future growth. This type of investors tries to achieve a balance between value and growth.

2.4 Summary of Value and Growth Investing

Investors continually think that they have to choose between value and growth investing as if they are on opposite sides of successful investing. There is no well-established financial theory that could end the debate between value and growth. It is ultimately a choice of the investors, who are constantly influenced by their biological basis, past experiences, investment trajectory, and constant changes in the market.

However, it is possible that the two strategies could be aligned together to capture the benefits of both, for example a "growth at a reasonable price" strategy. As Buffet wrote in his 1992 letter to investors:

"In answering this question, most analysts feel they must choose between two approaches customarily thought to be in opposition: "value" and "growth." Indeed, many investment professionals see any mixing of the two terms as a form of intellectual cross-dressing.

We view that as fuzzy thinking (in which, it must be confessed, I myself engaged some years ago). In our opinion, the two approaches are joined at the hip: Growth is always a component in the calculation of value, constituting a variable whose importance can range from negligible to enormous and whose impact can be negative as well as positive."

3. Does a Value Premium exist?

The existence of a value premium is a well-established empirical fact in both developed and emerging markets. (Fama and French 1992,1995,1997; Lakonishok, Shleifer,and Vishny,1994; Hart,Slagter and Dijk, 2001; Asness, Moskowitz, and Pedersen 2013). The central debate around value premium is the source and explanation of it's existence. One argument originates from the Effiicient Market Theory, stating that the excess return generated by value startegies is a compensation for the extra risks underlining value stocks, and these risks are not captured in the traditional capital assets pricing

model(CAPM). (Fama and French, 1993,1995,1996).The other side of the argument originated from behaivor fiannce theories, arguing that there is a value premium because investors behave irrationally. Growth stocks are overvalued and distressed stocks are undervalued. When these behavior errors are corrected, distressed(value) stocks have high returns and growth stocks have low returns which leads to a value premium. (Lakonishok, Shleifer and Vishny,1994; La Porta et al ,1997). The rest of this section will dive deeper into these two contrasting views on the explanations of value premium.

3.1 Efficient Market Hypothesis –A risk proxy story

Fama and French (1992,1995,1997, 2007) have observed a value premium over many years of in and out of sample data across different countries. Their explanation of the value premium is based on the efficient market hypothesis and they argue for rational investors behavior. They believe that value premium is a compensation for the extra risks carried by value stocks that are not captured by traditional volatility risk measures.

The Efficient Market Hypothesis (EMH) relies on the assumption that market participants are rational and therefore value assets at the fair value. Stock prices have incorporated and reflected all available information that it is impossible for investors to purchase undervalued stocks or sell overpriced stocks. As the market is efficient, the only way an investor can earn higher return is by taking on more risks. (Fama, 1970). The risks of an asset are captured by ß in a CAPM model. ß measures the systematic risk of an asset, and it is usually calculated by the correlation of an asset's return with market return. Market efficiency implies that expected returns of an asset is a linear function of its market ß, and ß is sufficient in describing the differences in returns of different assets. In a CAPM model, value premium can exist if value stocks have higher risks (higher ßs) compared to growth stocks.

*Expected return of an asset= risk free rate+ ß *(Market return-risk free rate)+e*

Equation 3.1.1: Capital Asset Pricing Model

However, the CAPM model has been widely criticized in financial literature. Empirical research had shown many deviations from the model, most notably, Fama and French found out that the relationship between ß and assets returns is weak during 50 years 1941-1990, especially in the more recent 1963-1990 period. Instead, they found factors that are better than market ßs in explaining the cross-section of stock returns: “Our bottom line results are (a) ß does not seem to help explain the cross-section of average stock returns, and (b) the combination of size and book-to-market equity seems to absorb the roles of leverage and E/P in average stocks returns, at least during our 1963-1990 sample period.” (Fama and French, 1992).

Adhering to the efficient market theories, Fama and French argues that the value premium is a compensation for risks that are not captured in the CAPM model. The conclusion is based on observations that market earnings could not explain the common variation in earnings of distressed firms, likewise, market return could not explain the common variation in the returns of distressed stocks. (Fama and French 1993, 1995, 1996). Fama and French proposed that adding a risk factor for relative stress in a multifactor model like Merton’s (1973) intertemporal capital asset pricing model (ICAPM) could explain the value premium in US stocks. They have also been able to provide out-of-sample evidence for value premium outside US markets and that it also conforms to the same factor risk model like that in the US. (Fama and French, 1998).

These findings have led them to propose a Fama and French three-factor model. The Three Factor Model expands on the capital asset pricing model (CAPM) by adding size and B/M factors to the market risk factor in CAPM. The three factors are (1) market risk, (2) the outperformance of small versus big market capitalization companies, and (3) the outperformance of high book/market versus small book/market companies.

$$\textit{Expected return of an asset} = \textit{Risk free rate} + ß\,(\textit{Market return} - \textit{risk free rate}) + b_s * SMB + b_v * HML + e$$

Equation 3.1.2: Fama and French Three Factor Model

Here the ß is different from the ß in traditional CAPM model since two more factors are added. SMB equals the return difference between small and big capitalization stocks, and HML is the return

difference between high and low book to market value stocks. Once SMB and HML are measured, the corresponding coefficients b_s and b_v can be calculated by linear regressions.

Fama and French (2007) further segregated the capital gains of stocks into three categories: (a) Book value incretion due to earnings retention;(b) Convergence of valuation rations such as P/B from mean reversion;(c) An upward shift in average P/B during 1927-2006. They found out that the major gain in value stocks come from convergence of valuation ratios like P/B as value stocks become more profitable, while the increase in book equity is a major factor contributing to the gains for growth stocks. In conclusion, growth stocks typically aren't able to keep up the high growth and profitability of investments over time, and value stocks that are overlooked by investors tend to increase profitability. This reversion to the mean of stock profitability as well as a drift in valuation ratios during the years are the major sources of value premium.

Summary of Efficient Market Hypothesis –A risk proxy story

To summaries the conclusion of the Efficient Market Hypothesis explanation of value premium: (a). Investors are rational; (b). Value premium is a compensation for risks not captured in the beta of the traditional CAPM model; (c). This premium exists largely due to convergence in the growth and profitability of value and growth stocks.

3.2 Behavior Finance-Irrational Investor Behavior

One of the basic assumption in the Efficient Market Hypothesis is that investors are rational in general. Behaviorists, however, contradicts this basic assumption, and argue that value premium is due to the irrational behaviors of investors.

Naïve investors tend to become overly optimistic about the growth in sales, earnings, profitability, as well as stock market performance of growth companies, and overly pessimistic about the poor performance of value stocks in the most recent periods. This tendency of "overconfidence" and "over pessimism" lead investors to project the most recent available growth and profitability characteristics of stocks into the future. I. M. D. Little (1962) found out that British companies that enjoyed high

growth in the most recent 5 years find it particularly hard to continue to do so in the 5 years that followed. Lintner and Glauber(1967) found similar results in US companies.

DeBondt and Thaler (1985) argued for investors overreaction to stocks' most recent performances. They composed portfolios of winners and losers, the "winners" have had good financial profitability in the recent years and their stocks prices are rising, while the "losers" had bad relatively poor profitability and were underperforming. They found out that on average "losers" outperform their "winners" counterpart by 25%.

Lakonishok, Shleifer, and Vishny (1994) posit that irrational investors do not understand convergence in growth and profitability, therefore they are constantly surprised by the decreasing growth and profitability of growth stocks and improved performance of value stocks. The result is lower average returns of growth stocks and higher average results of value stocks. They also argue that institutional investors suffer from the same behavior bias. Institutional investors, who are supposedly more rational than average investors, are fundamentally short-term oriented due to their yearly performance pressure. They would buy growth companies with a glamourous growth story that are welcomed by the market and investors in order to capture the short term good returns. Buying these popular companies would also exempt them from accusations of making bad investment decisions, should these glamourous stocks lose its glamour in the future, since they simply did what looks best at the time and it was what everyone else was doing. On the contrary, buying an undervalued stock that exhibit poor profitability and growth would take much more perseverance to stick with the stock until it comes around, and they would face much more criticism if the value stocks do not outperform others in the future.

Summary of Behavior Finance-Irrational Investor Behavior

In contrast with the Efficient Market Hypothesis, Irrational investor behavior argues that the value premium is not a compensation for extra value risk proxies like B/M or other value variable. But rather, value premium is an opportunity for truly rational investors to profit at the expense of irrational investors who naively project recent results into the future.

3.3 Summary of Theoretical Framework

Investors usually choose between value and growth investing as if they are on opposite sides of successful investing. There is no definitive financial theory that could end the debate between value and growth. It is ultimately a choice of the investors, who are constantly influenced by their biological basis, past experiences, investment trajectory, and constant changes in the market.

However, it is worth noting that, the existence of a value premium is a well-established empirical fact across time and countries represented by in and out of sample data. (Fama and French 1992,1995,1997; Lakonishok, Shleifer, and Vishny,1994; Hart, Slagter and Dijk, 2001; Asness, Moskowitz, and Pedersen 2013).

The two views in the explanations of value premium have clear differences. They are fundamentally different in the basis of financial theory: efficient market hypothesis or irrational investor behaviors. Advocates of the efficient market hypothesis claim that adding extra risk proxies to the traditional volatility based asset pricing model could account for value premium. Behaviorist, however, believe that investors' irrational nature make they more prone to unreasonably extrapolating recent results into the future. The irrational thinking results in lower average returns of growth stocks and higher average results of value stocks.

In spite of the arguments made by both sides, we think that there is no definitive answer to sort the debate. Past success of value stocks does not necessarily indicate future outperformance, nor does it suggest that investors should take a value investing approach. Even the most famous disciple of value investing Warren Buffet says that he is "85% Graham and 15% Fisher". (Graham represents value investing approach and Fisher the growth investing approach). Moreover, the "right" explanation of a statistically proven value premium could even be a blend of both efficient market hypothesis and irrational investor behaviors views that incorporate risk proxies for value and irrationality of investor behaviors proportionally.

In this study, we don't intend to come up with a hypothesis for such a purpose, as the implications for future stock market performance under both views are not clearly separable and testable. The question that we want to answer is simple and straightforward: Compared to international experience, does a value strategy outperform a growth strategy in the Chinese Stock Market?

4. The Chinese Stock Market

For decades, China's economy has been praised as a growth story. The capital markets in China are also evolving rapidly with the fast-changing economic environment. However, the Chinese stock market is still considered a speculative market which is largely dominated by retail investors. When the majority of investors in a market are speculative, market prices have a higher tendency to detach from its underlying fundamental value.

Very few similar studies have been made on the Chinese Stock Market. Possible reasons including the lack of data due to the short history of the Chinese stock market, the high percentage of retail investors and frequent government interventions. China's equity markets are the second largest in the world, yet foreigners hold less than 2 percent of it. MSCI recently announced that it will partially include China A Large Cap shares in its flagship equity indexes, beginning in June 2018. The addition of China A Large Cap shares will add 0.73% to China's existing weight of nearly 30% in the MSCI Emerging Markets Index. (MSCI, 2018).With the inclusion of China-A shares[2] in MSCI's flagship emerging markets index, an estimated $1.6tn of international investment funds that track the index will flow into Chinese stock market. Moreover, China has also started the Stock Connect programme, which links Hong Kong with Shanghai and Shenzhen without subjecting investors to the same capital restrictions they would face buying shares on the mainland using renminbi. These efforts of the Chinese government to draw international funds into China's stock market will certainly increase both international and institutional ownership in the coming years.

With these new forces driving the future of the Chinese stock market, further research on investment strategies in the Chinese Stock Market would provide investors with useful insights.

The study conducted in this paper will look at the two opposing strategies of investing in value stocks and investing in growth stocks on the Chinese stock exchange. The aim is to build on previous

[2] Mainland equities listed on the Shanghai or Shenzhen Exchange

research on value premiums in international equities market and investigates the existence of value premium in the Chinese stock market.

5. Empirical Analysis

The method used in this study will be presented and the data will be discussed to verify theoretical assumptions about value investing in this section.

5.1 Comments to the data

In this section, the origin of the data, the credibility and quality of the data, the limitations of the data and some particular considerations of the data are discussed. The purpose of this section is to provide readers a general view of the characteristics of the data used in the study and point out certain limitations.

The data used in this empirical study is sourced from WIND Financial Terminal, which is the most used and highest regarded database in Chinese Equity Market. It has top quality of data and wide coverage.

There are two stock exchanges in Chinese stock market, Shanghai Stock Exchange and Shenzhen Stock Exchange. At the beginning phase of this study, it was aimed to follow stocks from Shanghai Composite Index which includes almost all the stocks listed in Shanghai Exchange. The reason Shenzhen Stock Exchange is unfavored is that Shenzhen exchange, like Nasdaq, focuses more on high-tech companies thus has a much higher valuation level. Value shares are rare and not typical in this market. The reason why Shanghai 50 Index is used instead of Shanghai Composite Index is data quality and consistency in unrelated variables. Shanghai Composite Index contains more than 1000 stocks and many of them are small-cap stocks with low liquidity. Another important issue is about credibility of financial reports and company governance. As a relatively new capital market, the company governance of small-cap companies still requires improvement. Forging profits in financial reports, propping and tunneling between related entities and manipulating stock prices are found mostly in small-cap companies. In order to exclude the influences of these factors, Shanghai 50 Index, consists of the largest 50 companies, is chosen for this empirical study.

However, the SSE50 data still has some flaw. There are some missing data points for a few stocks in beta value. Since several of them are newly listed between 2009-2017 and shortly included in the index. Since the calculation is done with a 100-week time window, the beta value of several newly listed stocks is missing in particular years.

The stock list is based on current SSE50 Index which doesn't reflect the change of index composition during the last 9 years. The decision is made based on the fact that all data is retrieved on code level instead of entity level. Therefore, the consistency of data can be maintained in case of the merge of two SSE50 Index constituent stocks.

The selected time window of this study is between 1st Jan 2009 to 1st Jan 2018. The decision is made on purpose because the year 2008 is considered as a milestone of Chinese stock market and the years afterwards can be considered as a new cycle. Externally, the financial crisis made significant impact on international capital market and had long lasting effects. Internally, Chinese market has been bothered by the issue of non-tradable shares. Due to the special political and economic system, state-owned companies have been playing an important role in China's Economy.

Many of the listed companies are previously owned by either central government or local government. To transform the state-owned companies into stock companies and better suit the stock market, external investors are brought in. When the company is publicly listed, the external investor's shares are traded in the market but the shares owned by the government are locked. Such structure caused problems like low liquidity and low profitability in particular, since the major shareholder which is the government cannot benefit from the appreciation of stock price, they have no intention to improve efficiency. The existence of non-tradable shares also blocked the progress of merge and acquisition. In order to solve the problem, the China Securities Regulatory Commission published the notice to pilot the share-trading reform of listed companies. In the following year of 2007 and 2008, many companies had finished their reform with 100% tradable shares. Therefore, starting from 2009, Chinese stock markets can be regarded as entered a new cycle which has more common features

compared to mature markets like U.S. and Europe, which provides the basis for our empirical study on value investing strategy.

The Chinese 1 Year government bond is used in the empirical study as the proxy for risk-free rate in this country. The reason for choosing domestic government bond instead of US treasury bill is based on the fact that capital movement is under strict regulation in China, making it a separated island. Domestic sovereign bond is a better indicator of risk free rate here.

During the study, there are some stocks showing extreme volatilities in returns but due to the fact that one portfolio is made by 10 stocks thus the influence ban be set off, the extreme samples are not excluded.

5.2 Method

In this section, how the data is structured and analyzed for the study is presented along with discussion about why such method is considered beneficial for better understanding of value investing strategy in Chinese stock market.

The empirical study aims to verify whether value stock investing strategy can achieve higher return compared to growth stock investing strategy which is more favorable in Chinese market. In order to distinguish growth stocks and value stocks, criteria including Price-to-Earnings ratio(PE), Price-to-Book Value ratio(PB), Price-to-Cash flow ratio(PCF) and Price-to-Earnings ratio(PEG). The stocks with low ratios are tagged as value stocks while those with high ratios are tagged as growth ones. The approach is generally adopted from Lakonishok et al(1994) except that Growth in Sales(GS) is replaced by Price/Earning-to-Growth ratio according to Strahle(2011) since PE is a better indicator of financial performance and PEG ratio can capture the momentum status of a particular stock compared to Growth in sales.

The stocks are picked form Shanghai Stock Exchange 50 Index for the similar market cap size, high liquidity and credible governance. The stocks list is fixed according to the most recent SSE 50 Index this means there are potential possibilities that the result is influenced by survivor bias. However, the

choice is made in order to exclude the negative influence of delist and merge of companies to obtain results in longer horizon. Since the list is rather stable, the bias is considered minor.

The data including price, ratios, beta value is retrieved from Wind Financial Terminal on year basis at the first day of each year starting from 2009. The frequency is selected because the study is aimed at relative longer holding horizon. The beta value is retrieved from the database calculated on daily basis.

The yearly return is calculated according to the following formula:

$$Yearly\ Return = \frac{P_{t+1} - P_t}{P_t}$$

Where P_t is the current price and P_{t+1} is the price one year later, while all dividends are reinvested and rights offering/issuance is restored. For different time horizons, the returns are normalized into yearly Return for better comparison.

The selection of value stocks and growth stocks are conducted according to 20% segmentation. The stocks are ranked according to P/E ratio, P/B ratio, P/CF ratio and PEG ratio respectively and the highest 20% are chosen to formulate growth investing strategy portfolio while the lowest 20% are chosen to formulate value investing strategy portfolio. The ranking is done every year from 2009 to 2017 and every year the portfolio is adjusted according to the newest valuation. The 20% percent segmentation is made to enhance the contrast between value stocks and growth stocks. If the stocks are sampling divided as 50%-50%, the ones in the middle can make the difference blur and weaken the actual trend.

After picking the value stocks and growth stocks, the value investing portfolio and growth investing portfolio is constructed as equally weighted portfolios. Simply buy and hold strategy is adopted and the yearly return is calculated for different holding horizons including 1 year, 2 years and 3 years. Different investing horizons are investigated to better portrait the features of two investing strategies. Shorter holding horizons are simply do not fit in the general principal of value investing which is long-term oriented.

The portfolio annual return is averaged according to different holding horizons. Four criteria are conducted separately. Since the stock returns are related to the risk exposure which is quantified as beta value, higher return of a certain portfolio may just be the result of compensation to higher risk exposure.

In order to exclude the risk factor from the empirical study, the annual returns are further adjusted using Treynor Ratio as

$$T = \frac{R_i - R_f}{Beta_i}$$

Where T is Treynor Ratio, R_i is risk-free rate and $Beta_i$ is the portfolio beta value. The risk free rate is proxied by the yield to maturity rate of 1 year Chinese Government Bond which has a similar horizon compared to the holding horizon of the portfolio. Since the portfolio is constructed with 10 equally weighted stocks, the portfolio beta value is simply calculated as the average of each individual stocks.

5.3 Summary

In the empirical study, SSE50 Index is set as the benchmark and the constituent stocks are ranked to P/E ratio, P/B ratio, P/CF ratio and PEG ratio respectively. The 20% stocks with highest ratio is selected to make the growth stocks portfolio and the 20% stocks with lowest ratio is selected to make the value stocks portfolio. The portfolio is constructed as equally weighted and the adjustment is made at the beginning of each year. The annual return of each portfolio is calculated for different holding horizons of 1 year, 2 years and 3 years respectively. In order to exclude the influence of different risk exposure, the return is later adjusted by Treynor Ratio formula with beta value. Both risk adjusted returns and non-risk adjusted returns are presented in the next section to illustrate the actual performance of value investing strategy in Chinese stock market.

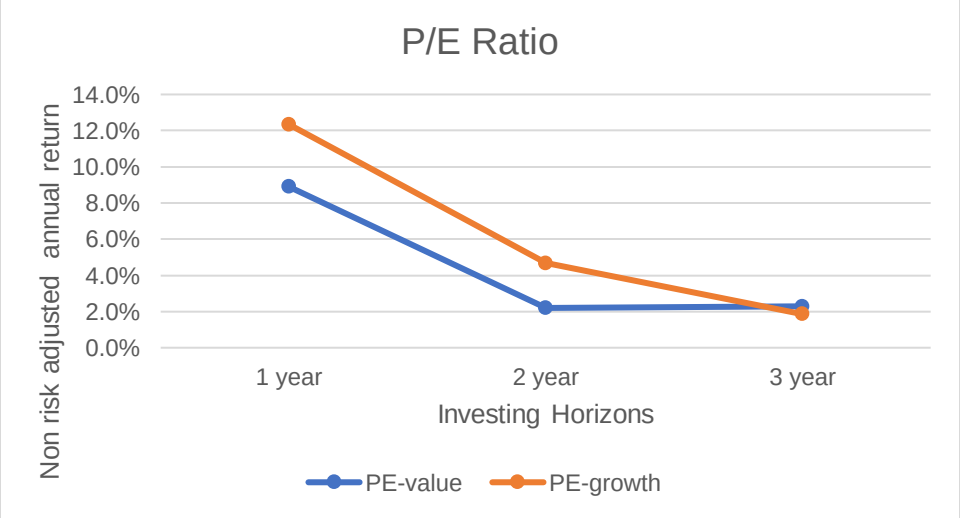
6. Presentation and Discussion of Results

The results of this empirical study is presented and discussed in this section. The data is summarized into non-risk adjusted results and risk adjusted results, each of which consists of four criteria respectively.

6.1 Non risk adjusted returns

The results will be shown followed by the order of P/E Ratio, P/B Ratio, P/CF Ratio and PEG Ratio.

6.1.1 PE Ratio



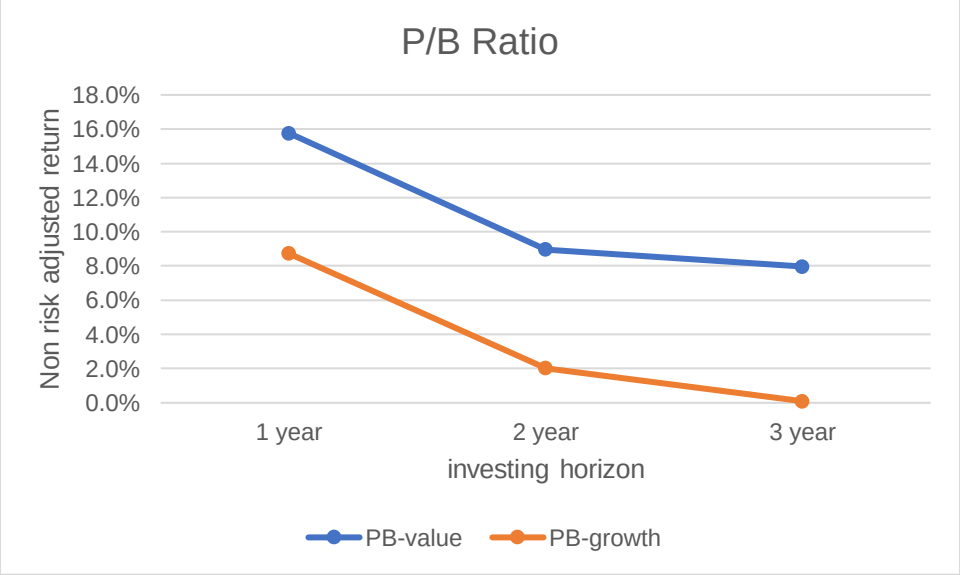
Graph 6.1.1

	1 year	2 year	3 year
PE-value	8.9%	2.2%	2.3%
PE-growth	12.3%	4.7%	1.9%

Table 6.1.1

The graph 6.1.1 and table 6.1.1 is a summary of non risk-adjusted returns of value portfolios and growth portfolios ranked by P/E Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. According to the grpah and table shown above, the growth portfolio constructed according to P/E Ratio outperforms the value portfolio in 1 year and 2 years investing horizons. The Value portfolio outperforms the growth portfolio in 3 years investing horizon. For the investing horizon of 1 year and 2 years, the difference is 3.4% and 2.5% respectively. For the investing horizon of 3 years, the value portfolio yields a higher return compared to growth portfolio at the different of 0.4%. The returns of two portfolios tend to converge with longer investing horizon.

6.1.2 P/B Ratio



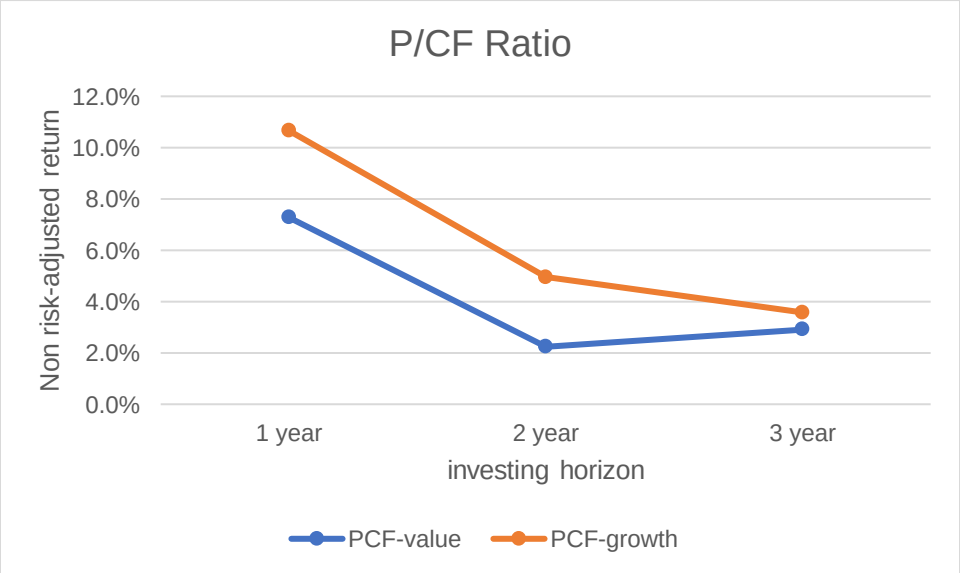
Graph 6.1.2

	1 year	2 year	3 year
PB-value	15.8%	9.0%	8.0%
PB-growth	8.7%	2.0%	0.1%

Table 6.1.2

The graph 6.1.2 and table 6.1.2 is a summary of non risk-adjusted returns of value portfolios and growth portfolios ranked by P/B Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. It is notable that according to the grpah and table shown above, the value portfolio constructed according to P/B Ratio outperforms the growth portfolio in all investing horizons. For the investing horizon of 1 year,2 years and 3 years the difference is 7.1%, 7.0% and 7.9% respectively. The difference in returns of two portfolios is significant and remains steady with longer investing horizon.

6.1.3 P/CF Ratio



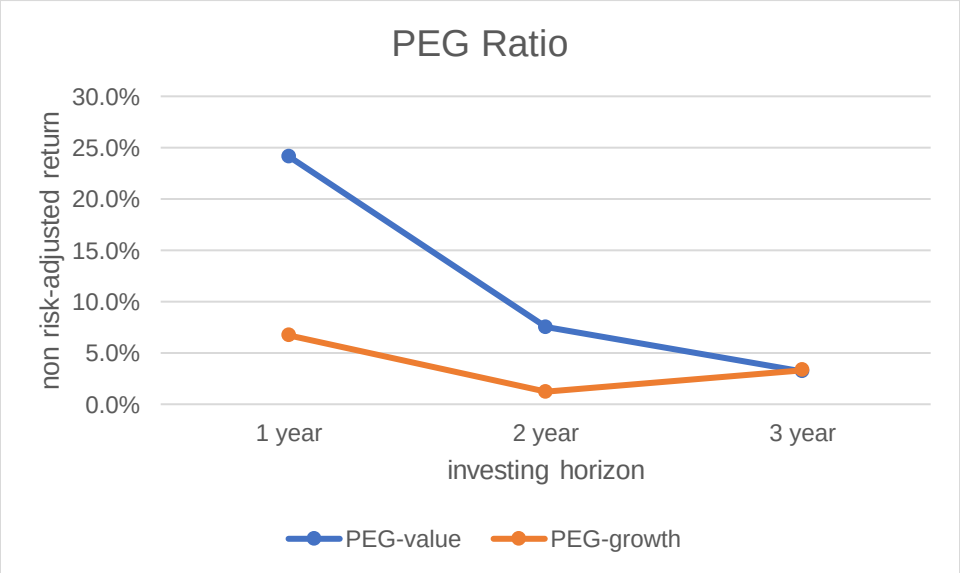
Graph 6.1.3

	1 year	2 year	3 year
PCF-value	7.3%	2.2%	2.9%
PCF-growth	10.7%	5.0%	3.6%

Table 6.1.3

The graph 5.1.3 and table 5.1.3 is a summary of non risk-adjusted returns of value portfolios and growth portfolios ranked by P/CF Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. It is notable that according to the grpah and table shown above, the growth portfolio constructed according to P/CF Ratio outperforms the value portfolio in all investing horizons. For the investing horizon of 1 year,2 years and 3 years the difference is 3.4%, 2.8% and 0.7% respectively. The difference in returns of two portfolios is significant but have the tendency to converge with longer investing horizon.

6.1.4 PEG Ratio



Graph 6.1.4

	1 year	2 year	3 year
PEG-value	24.1%	7.5%	3.2%
PEG-growth	6.7%	1.2%	3.3%

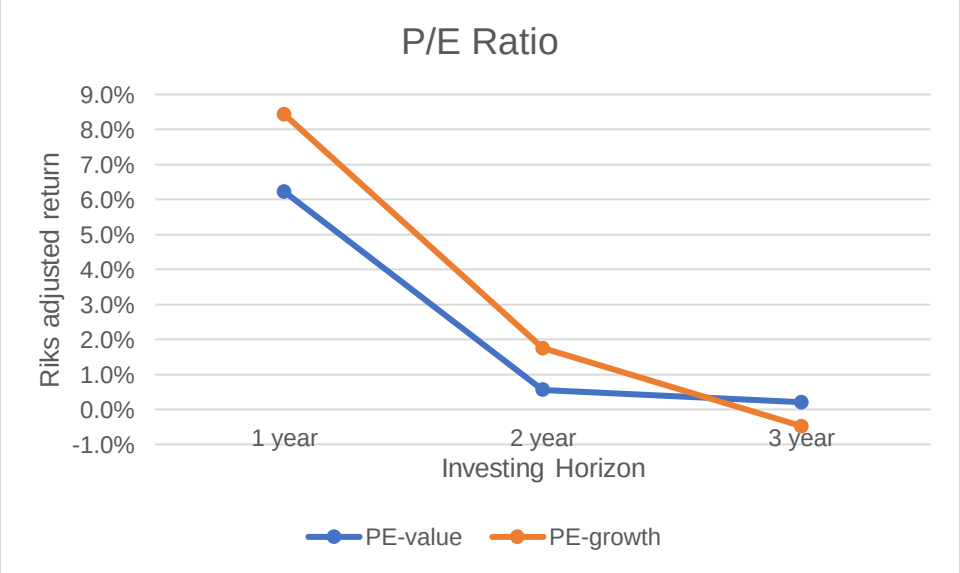
Table 6.1.4

The graph 6.1.4 and table 6.1.4 is a summary of non risk-adjusted returns of value portfolios and growth portfolios ranked by PEG Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. According to the grpah and table shown above, the value portfolio constructed according to PEG Ratio outperforms the growth portfolio in 1 year and 2 years investing horizons. The growth portfolio outperforms the value portfolio in 3 years investing horizon but with very small difference. For the investing horizon of 1 year and 2 years, the difference is 17.4% and 6.3% respectively, which is extremely significant. For the investing horizon of 3 years, the growth portfolio yields a higher return compared to growth portfolio at the different of 0.1%. The returns of two portfolios tend to converge with longer investing horizon.

6.2 Risk adjusted returns

The results will be shown followed by the order of P/E Ratio, P/B Ratio, P/CF Ratio and PEG Ratio.

6.2.1 PE Ratio



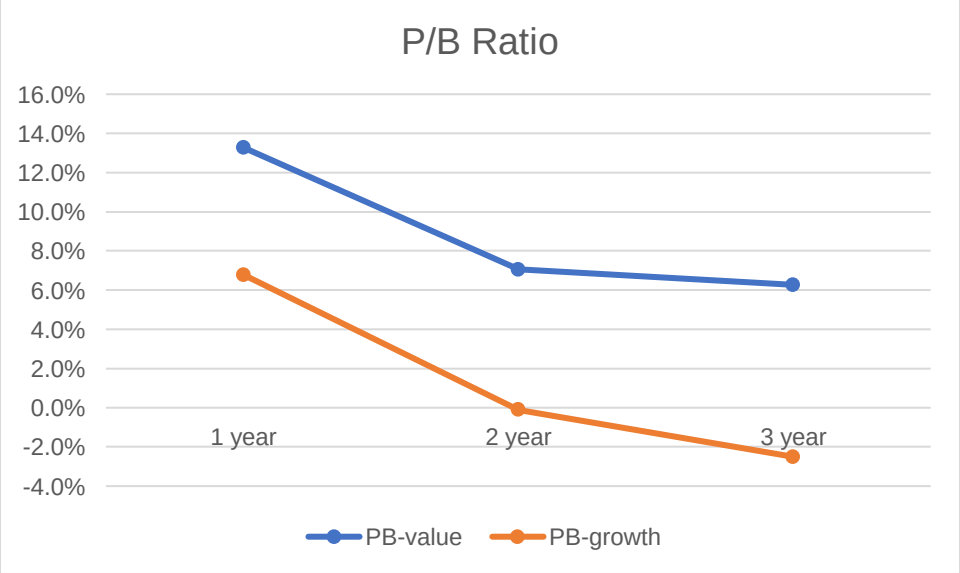
Graph 6.2.1

	1 year	2 year	3 year
PE-value	6.2%	0.6%	0.2%
PE-growth	8.4%	1.8%	-0.5%

Table 6.2.1

The graph 6.2.1 and table 6.2.1 is a summary of risk-adjusted returns of value portfolios and growth portfolios ranked by P/E Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. According to the grpah and table shown above, the growth portfolio constructed according to P/E Ratio outperforms the value portfolio in 1 year and 2 years investing horizons. The Value portfolio outperforms the growth portfolio in 3 years investing horizon. For the investing horizon of 1 year and 2 years, the difference is 2.2% and 1.2% respectively. For the investing horizon of 3 years, the value portfolio yields a higher return compared to growth portfolio at the different of 0.7%. The returns of two portfolios tend to converge with longer investing horizon.

6.2.2 P/B Ratio



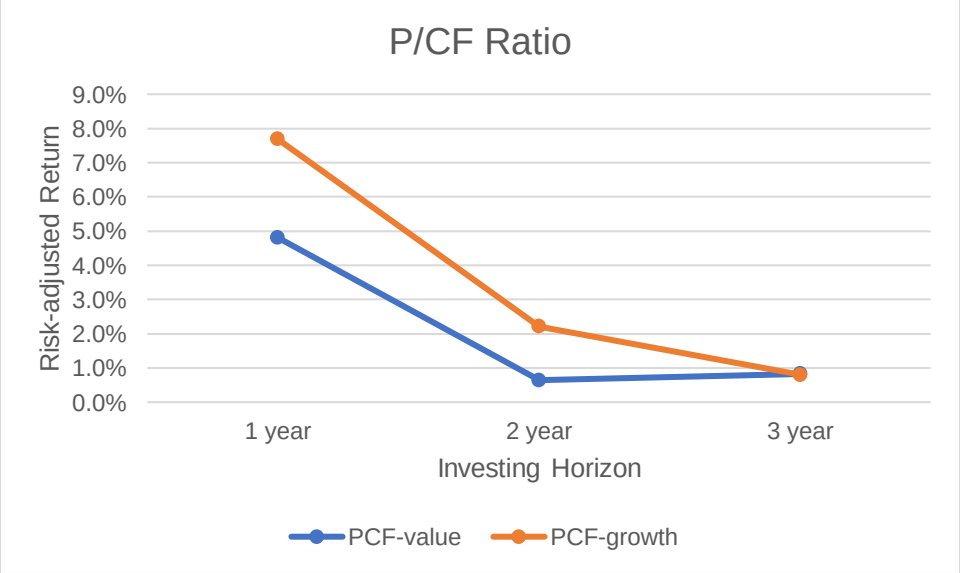
Graph 6.2.2

	1 year	2 year	3 year
PB-value	13.3%	7.1%	6.3%
PB-growth	6.8%	-0.1%	-2.5%

Table 6.2.2

The graph 6.2.2 and table 6.2.2 is a summary of risk-adjusted returns of value portfolios and growth portfolios ranked by P/B Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. It is notable that according to the grpah and table shown above, the value portfolio constructed according to P/B Ratio outperforms the growth portfolio in all investing horizons. For the investing horizon of 1 year,2 years and 3 years the difference is 6.5%, 7.2% and 8.8% respectively. The difference in returns of two portfolios is significant and even has the tendency to diverge with longer investing horizon.

6.2.3 P/CF Ratio



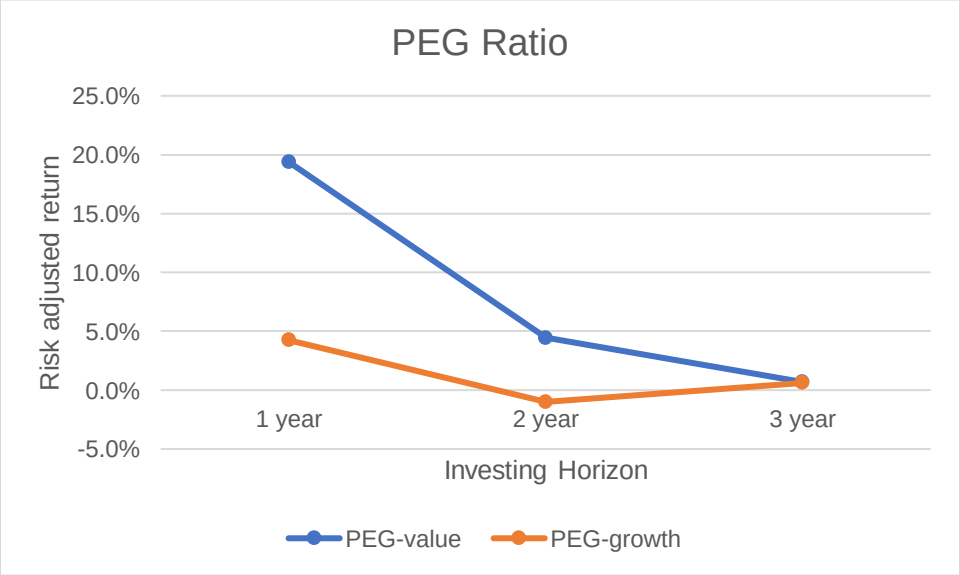
Graph 6.2.3

	1 year	2 year	3 year
PCF-value	4.8%	0.6%	0.8%
PCF-growth	7.7%	2.2%	0.8%

Table 6.2.3

The graph 6.2.3 and table 6.2.3 is a summary of risk-adjusted returns of value portfolios and growth portfolios ranked by P/CF Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. It is notable that according to the grpah and table shown above, the growth portfolio constructed according to P/CF Ratio outperforms the value portfolio in 1 year and 2 years investing horizons and the difference is 2.9%, 1.6% respectively. For the catagory of investing horizon of 3 years, the two portfolio yield almost the same return. The difference in returns of two portfolios is significant but have the tendency to converge with longer investing horizon.

6.2.4 PEG Ratio



Graph 6.2.4

	1 year	2 year	3 year
PEG-value	19.4%	4.5%	0.7%
PEG-growth	4.2%	-1.0%	0.6%

Table 6.2.4

The graph 6.2.4 and table 6.2.4 is a summary of risk-adjusted returns of value portfolios and growth portfolios ranked by PEG Ratio. The returns are take geometric means under different investing horizons to obtain the average annual return. According to the grpah and table shown above, the value portfolio constructed according to PEG Ratio outperforms the growth portfolio in 1 year and 2 years investing horizons. The growth portfolio outperforms the value portfolio in 3 years investing horizon but with very small difference. For the investing horizon of 1 year and 2 years, the difference is 15.2% and 5.5% respectively, which is extremely significant. For the investing horizon of 3 years, the growth portfolio yields a higher return compared to growth portfolio at the different of 0.1%. The returns of two portfolios tend to converge with longer investing horizon.

6.3 Discussion of data

After combining the non risk-adjusted returns and risk-adjusted returns, the criteria can be devided into two groups. Value portfolios ranked by P/E and P/CF underperform in the comparison to growth portfolio in both 1 year horizon and 2 years horizon. In 3 year horizon the difference is small making no significant impact.

The differences of PE-growth portfolio and PE-value portfolio shrink from 3.5% to 2.2% for 1 year horizon and from 1.5% to 1.2% after risk adjustment. The fact indicates that growth stocks in SSE 50 index generally have higher risk exposure and higher beta value compared to the value stocks. This is in line with the logical that PE-value stocks in SSE 50 Index are mainly banks which have stable operations.The differences of PCF-growth portfolio and PCF-value portfolio shrink form 3.4% to 2.9%

for 1 year horizon and from 2.8% to 1.6% after risk adjustment. This indicates that high P/CF ratio stocks tend to have higher risk exposure compared to low P/CF ratio stocks, which is in line with common sense.

The data suggests that high P/E stocks and high P/CF stocks tend to yield higher return than low P/E stocks and low P/CF stocks in Chinese market, which is in conflict with traditional value investing theories and similar study done in mature market. The explannation can be rooted from three different aspects including economic growth, investor preference and suvivor bias.

Unlike mature capital markets like Europe and North America, Chinese economy is still experience rapid growth in recent decades. Therefore a lot of fast growing companies become industry giants in relative short periods and investment in such companies yield lucrative returns. Since P/E ratio can only reflect the static valuation, low P/E ratios have high possibilities to be the result of low growth perspectives priced in, which explains the unsatisfying return.

The compositition of investors is also different in China compared to mature markets. Most of the market participants in Chinese stock market are indicidual investors wiouthout systematic investment methodology and adequate financial knoeledge. They also tend to focus more on potential gain instead of possible loss which leads to high risk preference. Stocks associated with hot topics are over-favored by the market although they have extremely high P/E value. Example can be found in millitary companies,natural resources companies and TMT companies.

The survivor bias may also contribute to the phenomena since the study uses current SSE 50 index to backtrack historical returns. Unsucceful growth stocks may be excluded from the index during the years. However, after manually going through the historical index, the influence is deemed as limited since the list is rather stable in the time window.

The explanation for high P/CF stocks overperform than low P/CF stocks is also in conflict with theoritical assumptions in mature market. The most possible explannation is associated with high growth rate.

Fast growing companies are commonnly bothered by cash flow since expenditures normally occur prior to revenue generation. Meanwhile, a large part of revenue goes to accounts receivable and other receivables. In free market economy, cash flow troubles of a company can result in higher financial costs, liquidity crisis and even bankruptcy which might sabotage investment return. However, in Chinese market, bankruptcy is uncommon for a publicly listed company, let alone large-cap companies in SSE50 index. Another influencial background is that most of the SSE50 index stocks have the government as major shareholder. This brings advantages in bank loans and financial supports. All these reasons make it possible that companies with high P/CF ratio can enjoy the benefit of rapid expansion while limit the negative impact of inadequate cash flow.

Unlike P/E Ratio and P/CF Ratio, value investing following P/B ratio yield significant positive return. For both non risk-adjusted return and risk-adjusted return, value portfolios outperform growth portfolios in all investing horizons.

The result is in consistent with most research in value factors. The traditional High-minus-Low(HML) factor from Famma-French model is based on the theory that stocks with high book to market value ratio, which is demonstrated as low P/B ratio in this study, can outperform stocks with low book to market value ratio, which is demonstrated as high P/B ratio in this study. Notably, low P/B ratio stocks in SSE 50 Index are mostly banks and construction companies ,whch have the government as major shareholder. It gives investors confidence that the company is undervalued and the stock price will recover. It is important to point out that the Market Value management of these companies strenthened such preference. According to the regulation in secondary offering of government owened companies, the offering price must be above book value. In order to raise capital, companies will release good news and cut costs to boost stock price if it is below book value. Therefore the listed company and investor together created the possibilities of abitrage and may contribute to the excess return.

Value portfolios consist of low PEG Ratio stocks tend to yield higher return compared to growth portfolios consist of high PEG Ratio stocks in the investing horizon of 1 year and 2 years while the return is similar in 3 year holding horizon.

The expirical find out is in line with the logic since PEG Ratio connects growth rate to valuation level. Fast growing stocks with low valuation are assumed to outperform slow growing stocks with high valuation in theory. The actual data from Chinese market has approved the assumption.

The curves are converging since the criteria is capturing the momentum status of a stock and the effect weakens as the holding horizon extends. Simillarly, the curves from P/E Ratio and P/CF ratio are also converging. The only exception is the return curve from P/B ratio and there is no persuasive explanation for it.

It is important to mention that downwarding slope of return rate is observed in the graph when the holding horizon is expanded to longer ones. This is in line with the protfolio construction since the portfolio is constructed with the top 20% and the bottom 20% of the stocks accroding to regarding ratio and for the next year, they will not necessarily remain at that range thus if the portfolio remains unchanged with longer horizons the return rate is expected to have a downwarding slope to return to the average.

Interestingly, the PEG Ratio shows as an extremely consistent and strong indicator for stock performance in 1 year holding horizon. The performance of portfolios ranked by PEG Ratio in each year is shown below.

1 year holding	PEG-value	PEG-growth
2009	116%	91%
2010	-6%	-10%
2011	-22%	-27%
2012	21%	11%
2013	-13%	-24%
2014	67%	54%
2015	-1%	-7%
2016	8%	-10%
2017	66%	5%

Geometric mean	19%	4%

Table 6.3.1

According to the table, it is clear that portfolios with low PEG Ratio outperform portfolios with high PEG Ratio in every year. In oerder to futher investigate, the performance of portfolios ranked by PEG Ratio in each year of 2 years holding horizon is shown below.

2 year holding	PEG-value	PEG-growth
2009	31%	14%
2010	-18%	-23%
2011	-3%	-13%
2012	-6%	-8%
2013	18%	15%
2014	17%	16%
2015	-9%	-6%
2016	16%	6%
Geometric mean	4%	-1%

Table 6.3.2

The strong trend continues that portfolios with low PEG Ratio outperform portfolios with high PEG Ratio in every year except the year.

According to the emprical evidence, it is possible to construct a investing strategy where investors hold long position in low PEG Ratio portfolio and keep short position in high PEG Ratio portfolio. The current interest rate to borrow stocks from Chinese securities brokers is around 8%-9% per year,

resulting in an annual return rate at around 6%-7%. Considering shorting is still a new thing in Chinese market, the borrowing rate in the future can be expected to decrease, making the expected annual return rate more lucrative. The only barries is the strict regulations of Chinese Securities Regulatory Commission on shorting of stocks. It is the consequense of the stock crisis in 2015 where unlimited shorting on stocks and index is blamed. There are limited stocks can be shorted in the market and the stocks are oftenly borrowed out. However, the situation cannot be long lasting and once the option is available in the future, excess return can be generated with market risks hedged.

7. Conclusion

This thesis is aimed to investigate whether traditional value investing approach can yield excess return in Chinese equity market (2009-2017). The empirical study is done by constructing value investing portfolios and growth investing portfolios with stocks chosen from Shanghai Stock Exchange 50. Value and growth stocks are classified by financial ratios. In this study stocks with low price to earnings ratio(P/E), price to cash flow ratio(P/CF), market to book value ratio(MV/BV) and price earnings growth ratio(PEG) will be defined as value stocks. Conversely, stock that score high on the aforementioned ratios are defined as growth stocks.

Real market historical data is used to retrieve the annual return under 1 year, 2 years and 3 years holding horizon. Each year the new value investing portfolios and growth investing portfolios are adjusted with last year's financial ratios and the returns of all the portfolios are analysed under different investing horizons.

The results of empirical analysis show that: a). value portfolios made up of low P/B ratio stocks yield significant positive return for both non-risk-adjusted return and risk-adjusted return in the 3 investing horizons used in the study; b) value portfolios ranked by P/E and P/CF underperform in the comparison to growth portfolio in both 1 year horizon and 2 years horizon. In 3 years horizon the difference is however very small; c). Value portfolios consist of low PEG Ratio stocks tend to yield higher return compared to growth portfolios consist of high PEG Ratio stocks in the investing horizon of 1 year and 2 years while the return is similar in 3 year holding horizon

According to the empirical analysis result, we can make the conclusion that traditional value indicators including P/E ratio, P/B ratio and P/CF ratio in general do not qualify as a good guidance for excessive return in Chinese stock market according to real market data. Unlike theoretical research done in Europe or North America, the evidence of that value premium exists in Chinese stock market is weak and unsolid. The possible reasons of such phenomenon might be inferred as the still fast expanding economy, the retail investor dominated market and survivor bias.

PEG ratio, on the other hand, has demonstrated outstanding capability in constructing well performing portfolios in relatively short investing horizons.

Unlike P/E ratio, P/B ratio and P/CF ratio, which describe the static valuation level of a company, PEG ratio connects the valuation level and growth rate. The characteristic that it combines the well established value investing framework and growth prospects makes it a well suited instrument in constructing portfolios in Chinese stock market where growth acts as an decisive factor in investing returns.

The portfolios constructed with low PEG ratio stocks yield satisfying return according to Chinese stock market historical data and further implementations can be grounded on the empirical finding.

Under long only investing strategy, investors in Chinese stock market should assign higher weight to PEG ratio when selecting target stocks. The buy-in decision solely based on low valuation or high growing prospect should be avoided. Since the indicator captures the momentum feature of a stock, the premium vanishes as time past. Therefore, the portfolio should be frequently revised.

Under long and short investing strategy, a potential hedging portfolio can be constructed with long position in low PEG ratio stocks and short position in high PEG ratio stocks. The market risk can be hedged and neutralized. According to the historical data, around 17% return can be achieved annually, deducting 8% borrowing rate, and 9% absolute return is pocketed.

The main obstructs of such strategy is that Chinese Securities Regulatory Commission has very strict rule regarding shorting after the stock crisis in 2015. The range of stocks can be borrowed from brokerages is regulated and the amount is limited. However, since the stocks in this thesis are all

selected from Shanghai Stock Exchange 50 Index, they are all available for short, making such strategy possible in actual world.

There are limitations regarding this thesis, mainly the survivor bias. Stocks can be delisted excluded from SSE 50 Index during revision. However, the bias is dual edged and have influences on both growth factor and value factor in this empirical study.

The investigated time window is also restricted. Longer time window can generate higher stability and credibility of data; however, the SSE 50 Index has a relatively short history and limits the scope of this research.

For future study, the extension can be made horizontally and vertically.

Horizontally, more research in Emerging markets can be conducted to verify whether value premium appears to be weakened or even non-existent in rapid growing economy and growth plays an more significant role in indicating future return. Potential findings of such research can act as beneficial guidance of excess investment returns in developing countries as capital flows globally nowadays.

Vertically, more research can be conducted in Chinese stock market to further verify the indicating effect of PEG ratio with larger time windows and further differentiated investing horizons. The long-short strategy can be enhanced with sophisticated in investing horizon and the return might be improved.

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Appendix

Portfolio composition from 2009-2017

PE-Value portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
600019.SH	600050.SH	601166.SH	601166.SH	601818.SH	601328.SH	601398.SH	601288.SH	601288.SH
601166.SH	600000.SH	601328.SH	601328.SH	601166.SH	600000.SH	600000.SH	601398.SH	601398.SH
600000.SH	601398.SH	600019.SH	600016.SH	600000.SH	601166.SH	601288.SH	601166.SH	601166.SH
600016.SH	601328.SH	600016.SH	601186.SH	601988.SH	601818.SH	601166.SH	601818.SH	601988.SH
600036.SH	601988.SH	601988.SH	600000.SH	601398.SH	601988.SH	601988.SH	600000.SH	601818.SH
601328.SH	601166.SH	601398.SH	601169.SH	600016.SH	601398.SH	600036.SH	601988.SH	601328.SH
600309.SH	600016.SH	601169.SH	601988.SH	601288.SH	601288.SH	601169.SH	601328.SH	600000.SH

601169.SH	600028.SH	600000.SH	601288.SH	601328.SH	601800.SH	601328.SH	600016.SH	600016.SH
601398.SH	601169.SH	600028.SH	601818.SH	600036.SH	601668.SH	601818.SH	601668.SH	600036.SH
601988.SH	600036.SH	601288.SH	600029.SH	600019.SH	601169.SH	600016.SH	600036.SH	600104.SH

PE-Growth portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
600029.SH	600111.SH	600309.SH	601989.SH	600606.SH	600518.SH	600606.SH	601989.SH	601989.SH
600887.SH	600019.SH	601766.SH	600837.SH	601688.SH	601688.SH	601628.SH	600019.SH	600518.SH
600340.SH	600340.SH	600519.SH	601688.SH	601336.SH	600837.SH	600837.SH	601985.SH	601336.SH
600547.SH	600887.SH	600887.SH	601628.SH	600837.SH	600887.SH	601688.SH	601857.SH	600958.SH
600518.SH	600029.SH	601989.SH	600887.SH	600999.SH	600030.SH	600030.SH	601766.SH	601628.SH
601390.SH	601766.SH	600518.SH	600547.SH	603993.SH	600999.SH	600547.SH	600050.SH	600547.SH
601628.SH	601628.SH	600340.SH	601336.SH	600050.SH	603993.SH	600999.SH	600606.SH	603993.SH
601186.SH	600104.SH	600547.SH	600519.SH	600111.SH	601989.SH	601989.SH	600547.SH	600050.SH
601766.SH	600547.SH	600111.SH	600518.SH	601601.SH	600606.SH	600029.SH	603993.SH	601857.SH
601318.SH	601601.SH	600050.SH	600050.SH	601628.SH	600111.SH	600111.SH	600111.SH	600111.SH

PB-Value portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
600019.SH	600019.SH	600019.SH	601186.SH	600019.SH	600019.SH	600019.SH	600019.SH	601328.SH
600104.SH	601668.SH	600016.SH	601390.SH	601390.SH	601390.SH	601328.SH	600028.SH	601988.SH
600606.SH	600050.SH	601668.SH	600019.SH	601328.SH	601328.SH	601988.SH	601328.SH	601288.SH
600016.SH	601390.SH	601390.SH	601669.SH	601988.SH	601800.SH	601398.SH	601288.SH	601818.SH
600887.SH	601988.SH	601328.SH	601668.SH	600050.SH	601186.SH	601169.SH	601398.SH	601398.SH
601166.SH	601186.SH	601988.SH	601328.SH	601186.SH	600029.SH	601288.SH	601088.SH	600019.SH
601988.SH	600606.SH	600000.SH	600606.SH	601800.SH	601818.SH	600000.SH	601818.SH	600028.SH
601328.SH	601989.SH	601186.SH	600000.SH	600000.SH	601988.SH	600028.SH	601988.SH	601166.SH
600029.SH	601398.SH	600050.SH	601988.SH	601818.SH	601668.SH	601818.SH	601166.SH	600016.SH

601601.SH	600016.SH	601166.SH	601169.SH	601169.SH	601169.SH	601166.SH	600016.SH	601088.SH

PB-Growth portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
601006.SH	601318.SH	600029.SH	601766.SH	601336.SH	601766.SH	600837.SH	601766.SH	601766.SH
601318.SH	600029.SH	601318.SH	601336.SH	600518.SH	600999.SH	601688.SH	600606.SH	601985.SH
601186.SH	600999.SH	600340.SH	600518.SH	601628.SH	603993.SH	601628.SH	600958.SH	600340.SH
600048.SH	601628.SH	601766.SH	601628.SH	603993.SH	600547.SH	600030.SH	601985.SH	600309.SH
600111.SH	600887.SH	600309.SH	600340.SH	600309.SH	600518.SH	600999.SH	603993.SH	600518.SH
601766.SH	600340.SH	600518.SH	600309.SH	600887.SH	600519.SH	600519.SH	600519.SH	603993.SH
600309.SH	600309.SH	600887.SH	600887.SH	600340.SH	600340.SH	600309.SH	600518.SH	600547.SH
601628.SH	600519.SH	600519.SH	600547.SH	600519.SH	600309.SH	600887.SH	600887.SH	600887.SH
600547.SH	600111.SH	600547.SH	600111.SH	600547.SH	600887.SH	600340.SH	600111.SH	600111.SH
600519.SH	600547.SH	600111.SH	600519.SH	600111.SH	600111.SH	600111.SH	600340.SH	600519.SH

PCF-Value portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
601169.SH	601668.SH	601166.SH	601288.SH	600000.SH	601169.SH	601988.SH	601688.SH	601166.SH
601390.SH	600016.SH	600016.SH	601988.SH	601398.SH	600036.SH	601166.SH	601169.SH	601668.SH
601166.SH	600030.SH	601169.SH	601669.SH	601166.SH	600340.SH	601688.SH	600837.SH	600606.SH
600887.SH	600048.SH	601288.SH	601328.SH	600016.SH	601390.SH	600036.SH	601211.SH	601169.SH
601186.SH	600000.SH	600000.SH	601318.SH	601390.SH	601318.SH	601669.SH	600030.SH	601398.SH
601988.SH	600887.SH	601398.SH	600000.SH	601186.SH	601186.SH	601818.SH	600999.SH	600518.SH
600837.SH	601398.SH	601988.SH	600518.SH	601668.SH	601328.SH	600837.SH	600000.SH	601818.SH
601398.SH	600837.SH	601989.SH	600606.SH	601800.SH	600050.SH	600340.SH	600958.SH	600340.SH
600036.SH	600104.SH	601186.SH	600048.SH	600048.SH	601668.SH	601989.SH	601318.SH	601229.SH
600000.SH	601318.SH	601088.SH	600029.SH	601336.SH	600999.SH	600030.SH	601668.SH	603993.SH

PCF-Growth portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
600016.SH	600019.SH	600048.SH	601766.SH	601088.SH	603993.SH	601318.SH	601006.SH	600000.SH
600309.SH	601601.SH	601688.SH	601601.SH	600104.SH	600837.SH	601328.SH	600547.SH	601328.SH
601628.SH	601088.SH	600606.SH	601989.SH	600050.SH	600016.SH	601169.SH	601088.SH	601989.SH
600048.SH	600029.SH	601328.SH	601398.SH	601669.SH	601336.SH	601390.SH	600019.SH	601318.SH
601088.SH	601169.SH	600837.SH	600999.SH	600887.SH	601988.SH	600111.SH	601336.SH	600919.SH
601601.SH	601766.SH	601318.SH	600837.SH	600606.SH	601818.SH	601857.SH	600104.SH	600999.SH
600104.SH	600036.SH	601668.SH	600016.SH	601989.SH	601288.SH	601288.SH	601288.SH	600030.SH
601318.SH	601988.SH	601818.SH	601688.SH	600999.SH	601398.SH	600000.SH	600029.SH	600837.SH
601328.SH	601166.SH	600999.SH	600030.SH	601688.SH	601166.SH	601398.SH	601166.SH	601688.SH
600030.SH	600999.SH	600030.SH	601166.SH	601169.SH	600000.SH	600016.SH	601988.SH	601211.SH

PEG-Value portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
600104.SH	600029.SH	600340.SH	601166.SH	600887.SH	600606.SH	600606.SH	600019.SH	601169.SH
601318.SH	600111.SH	600111.SH	600016.SH	600340.SH	600030.SH	601766.SH	600309.SH	600887.SH
601601.SH	600019.SH	600016.SH	601818.SH	601668.SH	601688.SH	600999.SH	600547.SH	600309.SH
601390.SH	600104.SH	601989.SH	601169.SH	601628.SH	600837.SH	601688.SH	600028.SH	600019.SH
601628.SH	601006.SH	601186.SH	600340.SH	600000.SH	600999.SH	600029.SH	601088.SH	601088.SH
600887.SH	600016.SH	600887.SH	600000.SH	601166.SH	601318.SH	600837.SH	600340.SH	603993.SH
600028.SH	600000.SH	600104.SH	600019.SH	601390.SH	601336.SH	600030.SH	601668.SH	601318.SH
600016.SH	601668.SH	601166.SH	600036.SH	601601.SH	600340.SH	601601.SH	600029.SH	600340.SH
600048.SH	601166.SH	600000.SH	600048.SH	601318.SH	600000.SH	601989.SH	601669.SH	600519.SH
600518.SH	600036.SH	601668.SH	600519.SH	600048.SH	601169.SH	601318.SH	601318.SH	600048.SH

PEG-Growth portfolio

2009	2010	2011	2012	2013	2014	2015	2016	2017
601398.SH	601169.SH	601766.SH	601186.SH	601006.SH	600887.SH	600036.SH	600016.SH	601669.SH

600030.SH	601318.SH	601088.SH	600050.SH	601328.SH	601006.SH	600016.SH	600519.SH	600016.SH
600340.SH	600028.SH	600547.SH	601669.SH	601857.SH	601328.SH	601818.SH	601818.SH	600030.SH
601088.SH	600887.SH	601006.SH	601390.SH	600519.SH	601601.SH	601628.SH	603993.SH	601398.SH
600000.SH	601601.SH	600309.SH	600547.SH	600030.SH	600518.SH	601328.SH	601288.SH	600050.SH
601328.SH	600606.SH	600518.SH	601088.SH	600028.SH	601398.SH	600048.SH	600606.SH	600999.SH
600547.SH	600519.SH	600030.SH	600104.SH	603993.SH	600016.SH	601988.SH	601328.SH	601336.SH
601766.SH	601390.SH	601318.SH	601766.SH	601800.SH	600050.SH	601288.SH	601390.SH	600837.SH
600519.SH	601989.SH	600050.SH	601318.SH	601766.SH	601669.SH	601398.SH	601398.SH	601211.SH
601169.SH	601628.SH	600028.SH	601336.SH	600111.SH	600519.SH	600519.SH	600048.SH	601985.SH