A Test of CAPM in China's Stock Market

by

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Abstract

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Capital Asset Pricing Model (CAPM) developed by Sharpe, Linter and Mossin is an important milestone in the development of modern finance theory. For China's stock market, an emerging capital market, whether Capital Asset Pricing Model is valid or not needs to conduct further empirical research and testing.

This dissertation selects 90 stocks from the Hushen 300 Index as the study samples, and the sample periods being from January 2010 to December 2010. With corresponding daily yield data, the CAPM model is estimated and tested, by using time series test and cross-sectional regression.

This dissertation has found that CAPM model is not entirely applicable in China's stock market and the impact of systemic of stock returns is weak. Because of the relatively short running time of the stock market and stock market is not mature, the market has been speculative and the stock prices were easily controlled. Overall, the CAPM is not valid in China's stock market.

Keywords: Capital Asset Pricing Model; Stock market; Empirical Study

Chapter 1. Introduction

1.1 Introduction of CAPM

1.1.1 A brief introduction of CAPM

William Sharpe and Linter develop Capital Asset Pricing Model (CAPM) based on the

Capital Asset Theory in 1964. CAPM is a pricing theory that applies to a financial market

under the condition of single period, perfect competition, and no conflict. The model

itself is applied to obtain the linear relationship between risk and return of a financial

asset based on numerous restricted assumptions, which are stated as followings:

1. All investors focus on a single holding period, and they seek to maximize the expected

utility of their terminal wealth by choosing among alternative portfolios on the basis of

each portfolio's expected return and standard deviation.

2. All investors can borrow or lend an unlimited amount at a given risk-free rate of

interest and there are no restrictions on short sales of any assets.

3. All investors have identical estimated of the expected returns, variances, and

covariance among all assets (that is, investors have homogeneous expectations).

4. All assets are perfectly divisible and perfectly liquid (that is, marketable at the going

price).

5. There are no transaction costs.

6. There are no taxes.

7. All investors are price takers (that is, all investors assume that their own buying and selling activity will not affect stock prices).

The purpose of the assumptions related to financial asset market is to obtain a clear representing of the relationship between the expected return and the risk in the market, so that the inefficiency due to transaction costs, taxes, and the delay of information is avoided in the application of the model.

Although the assumptions do not perfectly match the realistic situation, they simplified the issues to generate the pricing model of the financial asset. Under the restricted assumptions, William Sharpe and Linter obtained the linear relationship between the expected return and the risk of the asset.

The model of CAPM can be presented as:

$$E(R_i) = R_f + \beta_i E[(R_m) - R_f] \qquad (1\text{-}1)$$

R_i: The expected return of the stock i.

R_f: Risk free rate normally is the national bond rate with 1-year maturity.
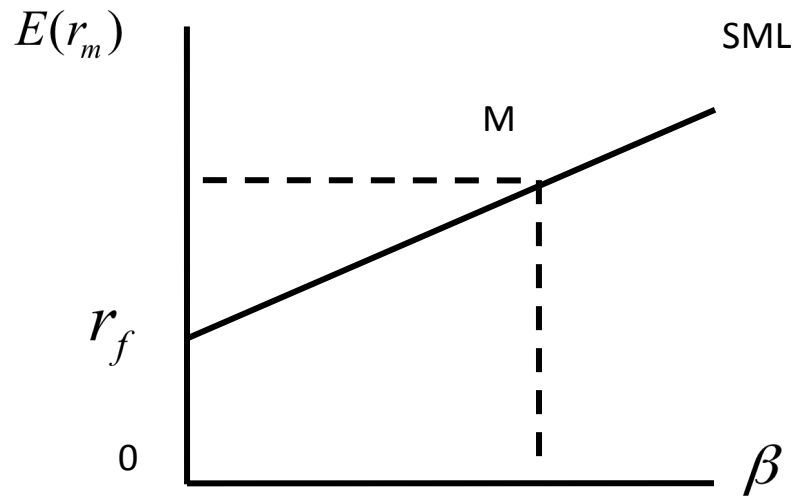
R_m: The expected return of the market portfolio.

β_i: β measures of the systematic risk of stock i, or, it represents the reaction level of a financial asset's expected return towards the risk of it. Generally, it is defined as the

volatility of an asset in relation to the volatility of the benchmark that said asset is being compared to.

The model of CAPM presents: (1) the return of a risky assets consists two parts, one is the return of risk free assets, represented by R_f; and the other part of the return of risky assets is the return of risky market, represented by $(R_m) - R_f$. β represents the level of the risk of the financial market, which indicates that a higher risk is always accompanied with a higher return. (2) Not all the risk of the assets would need a remedy of the risk; the one with a remedy is systematic risk. Due to the reason that systematic risk cannot be reduced and eliminated through diversification, an accompanying return with the risk can attract investors; in contrast, unsystematic risks can be diversified; therefore, a remedy in order to attract investors is not needed. (3) CAPM also indicates that the best portfolio is market portfolio due to the smallest risk it has among all, all the risky asset investors would prefer market portfolio.

The approach of defining the risk-return relationship of a single financial asset leads to the development of SML (stock market line). As stated in Graph 2, Stock Market Line indicates the risk-return relationship of a single stock under the condition of an efficient market. When efficient market applies, the relationship formula of a single stock risk and its return, the SML, can be obtained.

Graph 2: Stock Market Line

It is obvious that, based on the model of CAPM, for any single stocks, the expected return increases with an increase of β, therefore, it is a positive relation between the value of β and the expected return of any single stocks.

1.1.2 The Use of CAPM

The model of CAPM has been widely applied in Chinese stock markets since the early development of the Chinese stock markets. The computation of the expected return of a financial asset is the most essential application among all the discovered applications; furthermore, this critical application of CAPM has been developing many other applications in even other areas. The major use of CAPM can be concluded as follows:

1. **The use of classification of assets**

According to the model of CAPM, an effective classification of assets can be done through the result of CAPM application. By using the risk factor βin CAPM to classify stocks, the classification of stocks can avoid risks and realize the returns for investors. As an example, when β>1, for instance, β=2, when the market portfolio return increased by 1%, such stocks would have an expected return increase 2%; when the market portfolio return decreased by 1, however, such stocks would have an expected return decrease 2%. Therefore, it is obvious that the stocks in this category carries a relatively higher risk than that with a β=1. When β=1, such stocks will have a volatility same to the market volatility, and also they accurately reflect the market portfolio price change; when β<1, such stocks are more defensive compared to those discussed above. Apparently, different stocks carry different characteristics of return, based on which, an efficient financial asset management can be conducted according to the investors risk preference and their investment profile.

2. Pricing financial assets, providing investment guidance to investors

CAPM is a forecasting model for expected return of risky financial assets based on a balanced risk-return relationship; however, in the real life markets, returns of stocks are not balanced. Assuming that the calculated expected return is balanced, and a comparison can be conducted, so that the underpriced and overpriced financial assets can be easily explored. Furthermore, based on the rule of investing in low, shorting in high, such an application is guiding the investment behavior of investors.

1.2 Purpose of study

The purpose of this study is to apply CAPM in Chinese stock market to obtain the predicted return of the sample stocks; based on the results, comparing the predicted returns with the realistic returns of the stocks, in order to examine the compatibility of CAPM in Chinese stock market. The whole examination of CAPM is to test whether CAPM can be the right pricing model in Chinese stock market.

Also, after the examination of the model application in Chinese stock market, an analysis of the result will be conducted in this study as well.

1.3 Objective of study

The sample data of this study are gathered through Guangfa Stocks (premium version), which randomly selected 300 stocks to be the samples of the analysis in Shanghai Exchange and Shenzhen Exchange. The time period is set from January 4, 2010 to December 31, 2010.

In the examination part of this study, as the necessity of obtain the model of CAPM and its factors, a two-step regression will be applied to actualize the whole examination.

In the first step, a calculation will be conducted to obtain the beta of the 90 stocks of the sample. This step is a time series analysis, which conducted a regression between the return of the stocks and the return of the market index in order to obtain the beta.

The second step is a cross-section regression, which targeted every stock in the sample. In this step, the regression will be conducted between the beta obtained in the first step and the average return of the market, in order to obtain the SML of the studied market.

This study attempts to identify whether the result of the second step is the same as the predicted result of CAPM.

1.4 Chapter organization

This study conducts the application and analysis of CAPM in Chinese stock market in the year of 2010. This study contains 5 chapters altogether.

Chapter 1 mainly provides the background and the introduction of the objective of the study. Basically, the model of CAPM is introduced in this chapter.

Chapter 2 mainly discusses the previous literature of the related studies and researches. Based on the discussion, this study respects the accomplishment and the achievement of the related researchers; this study will analyze the accomplishment of the studies.

Chapter 3 mainly stated the data source characteristics and the methodology of this study.

Chapter 4 provides the test result and the analysis of the result, so that the readers will have a clear idea towards the discussed topic.

Chapter 5 will mainly provide the conclusion of the study and related recommendations of the topic.

Chapter 2. Literature Review:

The CAPM (Capital Asset Pricing Model) has been discovered and discussed since early 1960's through both theoretical and empirical aspects. Due to the long history of CAPM, the authors and researchers conducted numerical accomplishments related to the model itself and empirical cases, which is the main reason why CAPM has been developed into many directions as it is various depending on the application circumstances. Several authors have contributed to development of a model describing the pricing of capital assets under condition of market equilibrium including Eugene Fama, Michael Jensen, John Lintner, John Long, Robert Merton, Myron Scholes, William Shaepe, Jack Treynor and Fischer Black, whose findings will be discussed in this chapter of literature review. (Attiya Y. Javed, Alternative Capital Asset Pricing Models: A Review of Theory and Evidence)

2.1 Model discussions

2.1.1 Capital Asset Pricing Model: Sharpe-Lintner Version

Markowitz (1959) and Tobin (1958) announced one period mean-variance model, which was extended into Sharpe-Lintner model, which in turn are built on the expected utility model of Von Nuemann and Morgenstern (1953). With this extension, Sharpe-Lintner asset pricing model built the relationship between risk and expected return of financial assets based on the investors risk profile for the first time in the finance history.

With this development, the accompanying assumptions of CAPM were stated as: (a) all investors are risk-averse individuals, who maximise the expected utility of their end of period wealth, (b) the investors are price takers and have homogenous expectations about asset returns that have joint normal distribution, (c) there exist a risk-free asset such that investor may borrow or lend unlimited amounts at the risk-free rate, (d) the quantities of asset are fixed, also all assets are marketable and perfectly divisible, (e) asset markets are frictionless and information is costless and simultaneously available to all investors, and (f) there are no market imperfections such as taxes, regulations, or restrictions on other selling (Attiya Y. Javed, Alternative Capital Asset Pricing Models: A Review of Theory and Evidence).

Concluding the Sharpe-Lintner model, the CAPM model can be written as:

$$E(Ri) = Rf + \beta i\ ((E(Rm) - Rf)$$

Where E (Ri) is expected return on i security, Rf is risk-free rate, E(Rm.) is expected return on market portfolio and βi is the measure of risk.

Also, the definition of risk premium has been announced with the development of Capital Asset Pricing Model, which was derived from the equation of CAPM based on mathematical concepts. The Equation of risk premium can be written as:

$$E\ (Ri) - Rf = \beta i\ ((E(Rm) - Rf)$$

$$\text{Or } E\ (ri) = \beta i E(rm)$$

The version of CAPM by Sharpe and Linter has discovered a new field of finance study, which is the reason why the model has been widely used and tested based on both theoretical cases and empirical cases (Attiya Y. Javed, Alternative Capital Asset Pricing Models: A Review of Theory and Evidence).

2.1.2 Capital Asset Pricing Model: Black Version

Black (1972) announced the use of Zero-beta portfolio Rz as the absence of riskless asset, which developed CAPM into a two-factor model that can be presented as:

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

Or $E(R_i) - E(R_z) = \beta_i[E(R_m) - E(R_z)]$ as the excess return form.

In Black version of CAPM, zero-beta portfolio replaces the risk-free asset in Sharpe-Lintner version.

After the announcement of Black version of CAPM model, in 1982, Stambaugh applied Langrange multiplier in the examination of the model, which provided the evidence to support the version of CAPM. Similarly, Gibbons (1982), in the mean time, employed likelihood ratio test (LRT) in the test of the model, which proved the validity of CAPM. (Attiya Y. Javed, Alternative Capital Asset Pricing Models: A Review of Theory and Evidence)

2.1.3 Capital Asset Pricing Model: Conditional Version

Engle (1982) and Bollerslev (1986) suggested that the return distribution varied over the time by testing the realistic samples from the traded stocks in the market. Therefore, the statement that stock returns are solely on beta measure in traditional CAPM model became a false statement due to the result of the test. This new finding brought the model of CAPM into a new development stage, where it implies that the investors' expectation follows a random walk as the instable investors behaviour found during the test.

According to the suggestion of Engle (1982) and Bollerslev (1986), the new model considered investors' expectation of the moment as a random variable, which mainly defined by the time period indicator t. As suggested, the model of CAPM may be presented as:

$E(Rit \mid \psi t{-}1) = E(Rft \mid \psi t{-}1) + \beta imt [E(Rmt \mid \psi tt{-}1) - E(Rft \mid \psi t{-}1)]$

Or $E(Rit \mid \psi t{-}1) - E(Rft \mid \psi t{-}1) = \beta imt [E(Rmt \mid \psi t{-}1) - E(Rft \mid \psi t{-}1)]$ as excess return form

Where E(Rit) is expected return on asset i on time t, Rft return on riskless asset, $\psi t{-}1$ is the information set available at time t–1 and βimt is the beta measure which is defined as βimt = cov(Rit , Rmt!ψt−1) / var(Rmt !ψt −1). (Attiya Y. Javed, Alternative Capital Asset Pricing Models: A Review of Theory and Evidence)

According to the literatures discussed above, it is obvious that CAPM has gone through many development processes with the time passing since Sharpe and Linter first announced it. With the development, the researches conducted related to CAPM has been

reducing and eliminating the limitations of CAPM along with the application of CAPM, which brought CAPM from a theoretical model into a realistic model in finance industry.

2.2 Empirical studies related to CAPM

2.2.1 Estimation of expected return: CAPM vs Fama and French:

Estimation of expected return or cost of equity for individual stocks is central to many financial decisions such as those relating to portfolio management, capital budgeting, and performance evaluation. The two main alternatives available for this purpose are a single factor model (or Capital Asset Pricing Model (CAPM)) and the three-factor model suggested by Fama and French [1992, for example]1. Despite a large body of evidence in the academic literature in favour of the Fama and French model, for estimation of portfolio returns, practitioners seem to prefer CAPM for estimating cost of equity (Bruner et al [1998] and Graham and Harvey [2001]). Considering the number of years it took for Net Present Value to become accepted as the primary decision tool in capital budgeting this lack of acceptance could be due to "natural resistance". On the other hand it could also be because the Fama French model does not perform significantly better than CAPM, when applied to individual stocks, and is therefore not cost effective. The main objective of Bartholdy and Peare's paper is to compare the performance of the Fama-French model with that of CAPM, for individual stocks.

The data they used for their analysis is daily adjusted prices were extracted from the CRSP tapes from 1970 to 1996. Daily returns were calculated as simple holding period rates of return between days. Weekly returns were calculated from Wednesday to

Wednesday to avoid any contaminating effects from weekends and Mondays and end of month prices were used for calculating monthly returns. Daily, weekly and monthly yields on 3 month T-bills were used for the risk-free rate for the time series regression and the yield on 12 month T-bills for the dependent variable in the cross-section regressions. T-Bill yields were calculated at the beginning of the period; for example, for the risk-free rate on Thursday the closing price/yield on the T-bill on Wednesday was used.

Most practitioners favour a one-factor model (CAPM) when estimating expected return for an individual stock. For estimation of portfolio returns academics recommend the Fama and French three-factor model. The main objective of Bartholdy and Peare's paper is to compare the performance of these two models for individual stocks. First, they estimates for individual stock returns based on CAPM are obtained using different time frames, data frequencies, and indexes. They found that five years of monthly data and an equal-weighted index, as opposed to the commonly recommended value-weighted index, provide the best estimate. However performance of the model is very poor; it explains on average three percent of differences in returns. Then they estimates for individual stock returns are obtained based on the Fama and French model using five years of monthly data. This model, however, does not do much better; independent of the index used it explains on average five percent of differences in returns. These results provide a possible explanation for why CAPM is used so extensively by practitioners; the additional cost associated with Fama and French is not justified.

2.2.2 The application in Turkish stock market

The research "Test of the capital asset pricing model and the efficient market hypothesis in turkey's security markets" conducted by Kurt Dew (2001), studied the joint test of the Efficient Market Hypothesis and a Multifactor Capital Asset Pricing Model. They find that they cannot reject the null hypothesis that the CAPM applies and Turkish securities markets are efficient. The first test analysis also provides an estimate of the cost of capital in Turkey and gives them an estimated value of the beta of Turkey's common stocks with the World stock portfolio of about one. The second test develops a forecasting model for returns to a specific portfolio, long the ISE Dollar Index and short the S&P 500 composite. They sought once again evidence of market inefficiency by asking whether returns to this portfolio were greater than or were commensurate with its systematic risks. They find that simply buying and holding the portfolio produced a low ratio of return to risk, suggesting that the portfolio is not on the efficient frontier of the Capital Market line. However, they found that an active trading rule generates very high returns. Normally this is evidence of weak form inefficiency. But because portfolio risks also vary over time they still cannot reject the efficient market hypothesis. To test their result Data used in this study are end-of-month closing prices. Exchange rates used in this paper are end-of-month bid prices for US Dollars supplied by the Central Bank of Turkey. All returns data in this article are supplied by Global Financial Data, Inc. Non-US returns are Istanbul Stock Exchange Dollar Composite Index Total Returns, and ISE 90-day Treasury Bill Performance Index. S&P Composite Total Returns Index represented World stocks. The risk-free investment was US Total Return Commercial/T-bill Index. The Turkish Treasury bill returns are measured in Turkish Lira. They changed The Turkish Treasury-Bill Index to a dollar index by dividing it by end-of-month buying

prices for US$ in lira terms provided by the Central Bank of Turkey. Then they computed returns from the result. They used the total returns to the S&P 500 Composite Index for the proxy of world returns. The analysis in this section was based on excess returns to each variable, excess return meaning the natural log of the difference between the return to the analyzed security and the return to the US Commercial Paper/Treasury Bill series. The software package used in the analysis was RATS from Estima, Inc.

The analysis suggests, however that either the long ISE/short S&P position is an inefficient portfolio rewarding unsystematic risk-taking, or there a reason to buy and sell this portfolio based on comparisons of their expected return/expected risk forecasts for the ISE compared to the same forecasts from the EMH-based random walk forecasts. It is possible that these changes cause the efficient portfolio to change its composition over time.

Finally they believed that the identification of a market that may be both efficient in the EMH sense and characterized by frequent changes in efficient portfolio in the CAPM sense is an interesting development.

2.2.3 The application of CAPM in Athens stock market

(a) Daily data examination

Theriou. N., Aggelidis. V., and Spiridis. T(2001) conducted an examination of CAPM application in data collected from Athens Stock Exchange (ASE). The data set studied has a time period from the 1st of July 1992 and the 30th of June 2001, which is considered relatively new. Rather than applying the traditional CAPM model announced by Sharpte

and Lintner (1965), this research conducted an empirical study based on the model suggested by Black, Jensen and Scholes, which is named BSJ-approach.

The data collection of this study is based on traded stocks in Athens Stock Exchange, which contains both daily open and close price of every stock. For the market return, the authors obtained the data based on ASE Composite (General) Share Price Index; time-series of excess returns on the market and individual securities are taken over the three-month Government Treasury Bill rate, which is considered to be the short-term interest rate (risk-free interest rate). The Government Treasury bills were taken from the Central Bank of Greece. (Theriou. N., Aggelidis. V., and Spiridis. T., 2001, EMPIRICAL TESTING OF CAPITAL ASSET PRICING MODEL)

Based the detailed methodology, which contains both time-series and cross-section tests, the research presented a conclusion that the standard CAPM was not verified in the ASE during the period between the 1st of July 1987 and the 30th of June 2001, also, In the case of the two-factor model, by releasing the assumption that all investors can borrow and lend at a given riskless rate of interest, the model appears to have some explanatory power but not a valid effect on stocks' returns. However, the authors also concluded that the model of CAPM was only a theoretical model since the required market portfolio could never be conducted, which became a significant limitation of the test.

(b) Monthly data examination

However, another study of CAPM was conducted by Messis, Iatridis, and Blanas (2007) named "CAPM and the Efficacy of Higher Moment CAPM in the Athens Stock Market:

An Empirical Approach" (International Journal of Applied Economics, 4(1), March 2007, 60-75), which aimed to the examination of CAPM in Athens Stock Exchange as well.

In data collection section, a significant different exists between the two papers: Messis, Iatridis, and Blanas (2007) used monthly data from the year of 2001 to 2005 collected in Athens Stock Exchange rather than daily open and close prices that used by Theriou. N., Aggelidis. V., and Spiridis. T.(2001). Furthermore, this study tested two models in order to obtain the result presenting the comparison conclusion of Capital Asset Pricing Model (CAPM) and the higher moment CAPM.

The conclusion of the study shows that the higher moment CAPM is more efficient than the other, while the differences between the models are statistically significant. Therefore, the result presented that the traditional CAPM has a lower value of application in Athens stock market due to the lack of considerable factors, which are considered in the other model.

2.3 Summary

The studies listed and discussed above presented that researchers have continued the development of CAPM since it was first announced, and it is still in the on-going process. According to the discussions related to the model itself, apparently, the researchers have been increasing the considered factors to establish a stable model in order to show the real relationship between the expected return and the risk of risky financial assets, mainly stocks; however, it has been proved that the use of CAPM must be based on the assumptions of the model, otherwise it does not hold the hypothesis. Accordingly, with

the increasing number of considered factors, the model has been becoming more accurate than the previous ones, which is the fact that motivates researcher to continue the studies.

The empirical studies are more related to this study than the theoretical ones. The researches discussed above have accomplished great examples of this study. Some of the empirical studies have shown that the traditional CAPM is not valid in certain countries stock markets due to various reasons, which are mainly the lack of considerable factors in the traditional model; however, some of them have approved that traditional CAPM has a good validity in certain country's stock exchange, so that it even proves the market efficiency hypothesis.

Due to the various results and the conclusion conducted by previously mentioned authors, this study will still focus on the examination of CAPM in China's Stock Market, mainly in Shanghai Exchange and Shenzhen Exchange.

Chapter 3 Research Methodology

3.1 Sample selection:

Since CAPM has been discovered and developed, many researchers with numerous empirical cases, which concluded both positive and negative results, have tested the effectiveness of the model. Therefore, with the uncertain results of previous studies conducted by the researchers, whether or not CAPM is the correct model in the newly found China's stock market has become a question. Being along with this question, this study will focus on the test of CAPM on China's stock market, which mainly contains the stocks listed in Shanghai Stock exchange and Shenzhan Stock exchange by using supportive statistical software (SPSS, Stata, and Eview).

The sample data set is gathered from Shanghai stock exchange and Shenzhen stock exchange dated from Jan 4th, 2010 to Dec 31st, 2010, which indicated that the data set contains 1-year data of the listed stocks.

3.2 Data description:

3.2.1 Stock index data determination

The data set obtained and used for this study is obtained from one of the most popular Chinese stock trading software named "Guangfa pro edition". The data set contains the Shanghai & Shenzhen 300 Index related to 90 listed stocks of various industries applied as the sample of this study. The listed data is marked from Jan 4th, 2010 to Dec 31st, 2010.

The industries and number of stocks are presented in the following table:

Industry	#	Industry	#	Industry	#	Industry	#	Industry	#
Finance	3	Cement	3	International Trading	3	Chemical Industry	3	Diversified	3
Mining	3	Architecture	3	Oil & Gas	3	Real assets	3	Road and bridges	3
Alcohol	2	Shopping Mall	3	Hotel	1	Clothing trading	1	Fishing industry	3
Automobile	2	Power	2	Media Entertainment	1	Agricultural chemistry	2	Electronic devices	3
Transportation	3	Electronic Device	2	Developing	2	Device supply	2	Paper manufacture	1

IT	3	Food	2	Enviro nment	1	Clothi ng	1	Water supply	2
Iron & Steel	2	Shippi ng Equip ment	1	Printin g	1	Glasse s	2	Aircraf t manufa cture	3
Mecha nics	3	Power Supply	3	Plastic	1	Metal	2	Bioche mistry	3

In order to maintain the completeness of the sample data set, due to the loss of trade suspensions, the data in all the suspension days will be deleted, so that the trading volume of stocks will still match with the related trading time.

Despite the existence of numerous indexes in current Shanghai stock exchange, this study will focus on shanghai & Shenzhen 300 Index used as the market index, since the index reflects the market trend of both of the stock exchanges. Shanghai & Shenzhen 300 index was first announced and reported by Shanghai Stock Exchange and Shenzhen Stock Exchange in April 8th, 2005, targeting to present the trend of the class "A" stocks listed on their boards. According to the announcement by the Exchanges (2005), the purpose of conducting Shanghai & Shenzhen 300 index is to reflect the price volatility of China's stock exchange and the basic status of stocks' operation; therefore, the index can be

viewed as a standard of investment, which provides a basic condition to investment behaviours and investment related derivatives.

Shanghai & Shenzhen 300 index targets 31st December 2004 as its base day with a base point set as 1000. Within the index calculation, the adjusted capital is obtained based on the grade of the market capital. The detailed calculation is: reporting index=(reporting day adjusted market capital/ base day adjusted market capital) ×1000, where adjusted market capital=∑ (market price× adjusted capital). The detailed calculation is based on the following table. As an example, a stock has a current issue/total issue ratio as 7%, which is less than 20%, the current issue ratio is applied as the factor in the calculation; a stock as a current issue ratio as 35%, which is in between (30, 40), the according weight is 40%, which implies that 40% of total issue is the factor.

Current (%)	≤10	(10 , 20)	(20 , 30)	(30 , 40)	(40 , 50)	(50 , 60)	(60 , 70)	(70 , 80)	≥80
Factor (%)	20	30	40	50	60	70	80	90	100

Shanghai & Shenzhen index adjusts the listed stocks based on the stability and dynamicity of the market every half year, where the adjustments normally less than 10%. Therefore, in most aspects, Shanghai & Shenzhen index reflects the total level of the

market without the volatility due to the adjustments conducted. Based on the formation of the calculation of this index, this index is selected as a significant data source.

3.2.2 Risk-free rate determination

Risk-free interest rate is the theoretical rate of return of an investment with no risk of financial loss. One interpretation is that the risk-free rate represents the interest that an investor would expect from an absolutely risk-free investment over a given period of time. Another interpretation is that the risk free rate is the compensation that would be demanded by a representative investor holding a representative market portfolio, comprising all the assets in the economy, (i.e. the risk free rate is the compensation for systemic risk which cannot be eliminated by holding a diversified portfolio.) It is the second interpretation, which is applied in the Capital Asset Pricing Model (Refer to The Econometrics of Financial Markets, by Campbell, Lo and MacKinlay).

In most countries, many researchers use short-term national bond rate or bank loan rate as risk-free rate. However, the national bond rate of China is not marketed yet with a relatively long maturity period compared with many western developed countries. Also, institutional investors occupy the most market in national bond trades. Therefore, applying the national bond rate of China as risk-free rate does not reflect the real risk-free rate in China. As an alternative, bank loan rate of Shanghai Banks is chosen in this case.

The detailed rates of the year of 2010 are presented in the following table:

2010	Monthly rate
Jan	1.1151
Feb	1.5558
March	1.3475
April	1.3044
May	1.6817
June	2.2193
July	1.6771
Aug	1.5778
Sep	1.7985
Oct	1.6072
Nov	1.7145
Dec	2.8031

3.3 Methodology

3.3.1 Market return calculation

For Shanghai & Shenzhen 300 Index, the daily rate of return formula is presented as:

Rm= (closing price –opening price/ opening price) *100

3.3.2 Single security rate of return calculation

For a single security, the daily rate of return is presented as:

Ri= (closing price –opening price/ opening price)*100

3.3.3 Calculation on β for a single stock

The determination of β can be conducted by executing an OLS regression with the daily returns of Shanghai & Shenzhen 300 index and every single stock gathered. The regression model is, based on CAPM model, presented as:

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{it}) + \varepsilon_{it}$$

Where:

R_{it}: The rate of return of stock i at time t

R_{mt}: The rate of return of the market at time t

R_{ft}: The risk-free rate at time t

ε_{it}: The residual value of the regression

α_i、 β_i: The estimated parameters

3.3.4 Examination on the relationship between risk and return

During the examination procedure, the methodology of inputting the βvalue of each stock with that of the rate of return will be applied. Therefore, the average rate of return for each stock will be calculated. The formula applied is presented as:

$$R_p = r_0 + r_1 \beta_p + \varepsilon_p$$

Where:

R_p: The average rate of return of the stock

β_p: The β of the stock

ε_p: The residual value

r_0、r_1: The estimated parameters

Chapter 4 Results and findings

Based on the methodology stated in the previous chapter, the model has been conducted and executed on SPSS and Microsoft Excel with the following result, presented in the table:

Stock code	α_i	β_i	βsig. (within 95% confident interval)	$\overline{R}^2$	F	D-W
601857	-0.044	0.693	0.000	0.538	280.041	1.825
600028	-0.241	0.896	0.000	0.663	472.208	1.881
601808	1.781	1.167	0.000	0.432	181.656	1.718
601398	0.188	0.561	0.000	0.372	138.257	1.615
601988	0.037	0.554	0.000	0.547	281.223	1.704
601628	-0.096	0.950	0.000	0.620	392.338	1.731
601088	-0.273	1.086	0.000	0.741	689.360	1.949
600348	1.204	1.561	0.000	0.502	241.252	1.988
601699	0.771	1.456	0.000	0.556	298.533	2.191
600519	0.092	0.568	0.000	0.201	60.942	1.912
000858	0.159	0.922	0.000	0.429	181.318	1.771
600104	-0.178	1.052	0.000	0.428	176.557	2.000
000800	-0.116	1.238	0.000	0.507	246.684	1.874
601006	-0.187	0.708	0.000	0.539	274.874	1.886

601111	1.510	1.314	0.000	0.421	161.702	1.827
600018	-0.322	0.726	0.000	0.422	171.827	1.943
600050	-0.103	0.748	0.000	0.450	185.078	2.022
000063	0.144	0.972	0.000	0.339	122.501	1.668
600100	1.174	1.052	0.000	0.260	82.947	1.942
600031	1.207	1.341	0.000	0.529	265.266	1.949
000157	0.532	1.436	0.000	0.542	282.293	1.980
000338	1.233	1.045	0.000	0.296	101.277	2.021
002202	0.310	1.165	0.000	0.394	154.474	1.987
600089	-0.317	1.126	0.000	0.545	282.260	1.928
600857	0.714	1.116	0.000	0.446	193.293	1.823
000002	0.258	0.982	0.000	0.450	196.344	1.970
600048	0.831	1.296	0.000	0.509	248.384	1.687
600208	0.284	1.203	0.000	0.476	213.744	2.172
600585	0.428	1.063	0.000	0.406	165.360	1.904
000401	0.287	1.182	0.000	0.385	131.920	1.880
600881	-0.176	1.096	0.000	0.612	374.475	1.900
601390	-0.155	0.759	0.000	0.525	263.017	1.879
600068	0.656	0.971	0.000	0.308	106.257	1.962
600583	0.298	1.198	0.000	0.460	201.343	2.013
002024	0.039	0.950	0.000	0.449	194.296	1.986
600415	0.504	0.856	0.000	0.295	99.925	1.616
600655	-0.193	0.950	0.000	0.416	170.602	1.898

601991	-0.246	0.639	0.000	0.385	149.195	2.340
600795	-0.054	0.566	0.000	0.293	98.140	2.088
000527	0.262	1.128	0.000	0.456	195.826	1.895
600690	0.564	0.875	0.000	0.273	89.814	2.020
000876	0.126	1.211	0.000	0.422	149.104	2.139
600737	0.118	1.219	0.000	0.360	135.303	1.624
600150	0.240	0.882	0.000	0.421	174.676	1.960
600058	2.239	1.241	0.000	0.305	106.023	1.882
600739	-0.191	1.417	0.000	0.536	267.723	2.123
600500	0.366	1.128	0.000	0.540	282.045	1.973
600309	0.142	1.211	0.000	0.472	214.638	1.948
002001	0.254	1.077	0.000	0.352	129.082	1.669
600352	0.422	1.139	0.000	0.415	167.799	1.835
600256	1.205	1.008	0.000	0.232	72.063	1.833
600832	-0.097	1.039	0.000	0.401	159.482	1.941
000839	0.398	1.236	0.000	0.431	176.380	2.108
600019	-0.117	0.899	0.000	0.547	291.290	1.859
600808	0.007	0.841	0.000	0.536	278.151	2.119
000900	-0.104	1.135	0.000	0.606	370.163	1.821
600033	0.019	0.744	0.000	0.391	154.335	2.154
600269	-0.366	0.848	0.000	0.494	234.398	1.960
000069	0.352	1.140	0.000	0.476	217.324	1.809
600220	0.742	0.987	0.000	0.299	102.428	1.984

600598	-0.069	0.873	0.000	0.384	146.882	2.048
000061	0.714	1.013	0.000	0.274	91.682	1.991
600108	0.447	0.944	0.000	0.270	87.969	2.226
000100	-0.103	0.881	0.000	0.469	209.861	1.841
600601	0.341	0.919	0.000	0.337	117.711	1.959
600835	0.087	1.113	0.000	0.546	289.815	2.051
000897	0.204	1.161	0.000	0.409	164.099	1.924
600895	-0.216	1.042	0.000	0.538	279.520	2.099
000725	0.167	0.919	0.000	0.361	134.805	2.008
600183	0.648	1.234	0.000	0.402	158.137	1.699
000488	-0.003	1.071	0.000	0.610	373.990	2.069
600008	0.176	0.910	0.000	0.368	138.775	2.070
600177	-0.975	0.547	0.000	0.364	138.586	1.758
600635	-0.211	1.037	0.000	0.509	249.881	1.864
600649	-0.307	0.998	0.000	0.526	267.624	2.134
000768	-0.237	1.071	0.000	0.426	177.808	2.172
600316	1.951	0.709	0.000	0.129	36.290	2.016
600879	0.767	1.188	0.000	0.324	116.116	1.977
000012	1.383	1.310	0.000	0.340	124.191	2.033
600660	-0.062	1.255	0.000	0.592	350.158	1.860
000059	0.530	1.049	0.000	0.310	97.113	1.688
000422	0.118	1.318	0.000	0.413	163.132	1.983
000538	1.046	0.520	0.000	0.120	33.812	1.892

600518	1.233	0.710	0.000	0.171	48.934	1.670
000423	2.591	0.613	0.000	0.127	35.336	1.766
600362	0.333	1.363	0.000	0.539	281.945	1.822
601168	0.659	1.470	0.000	0.567	311.153	1.919
600037	0.134	0.885	0.000	0.261	85.766	1.777
600143	1.385	1.065	0.000	0.370	140.708	1.814
600210	-0.139	1.014	0.000	0.614	378.801	1.988

4.1 Analysis of the model elements

Based on the regression results, the analysis can be conducted to each element of the regression model.

4.1.1 The analysis to the β value

Theoretically, β represents the systematic risk of a stock. The β value of the single stocks listed ranged from the minimum 0.52 to the maximum 1.561. Stock code 600348 with the largest β value represents a company engaging in the development of plastic manufacture with a chain of design, manufacture, and sales. Stock code 000538 with the smallest β value represents a medical company engaging in the manufacture and sale of a certain kind of Chinese traditional medicine. In reality, the risk that 600348 faces, as a high-tech

company, is greater than that of 000538 as a mature stage medicine manufacture, which matches the result of the β values that calculated.

The average β value of all the stocks gathered is calculated to be 1.0287, where 50 high-tech stocks all have β values greater than 1, while mature companies have β values less than 1 in all circumstances within the data gathered.

4.1.2 The analysis to the α value

The estimation result presents that the maximum value of annual rate of return of a single stock is 2.591, where the minimum value of that of single stock is -0.975. As the conducted calculation shows, the average α value among all the 90 stocks is 0.3457, where 59 stocks have positive α values and the rest of the stocks presented negative values. The 59 stocks with positive α values all have a higher expected rate of return than their actual rate of return, which states that they are over-valued by the market and investors. On the other hand, the other 31 stocks with negative α values all have a lower expected rate of return than their actual rate of return; therefore, they are undervalued in the market by investors. The stated fact states that the stocks with negative α values have growth potential during investment considerations.

4.1.3 The analysis to $\mathbb{R}^2$ value

R^2 Values present the part of the parameters that can be explained by the regression estimators. In fact, R^2 shows the ratio of systematic risk taking part in total risk. As presented in the table above, the adjusted R^2 values all have a relatively small value, where the average adjusted R^2 is 0.4258, which contains a maximum value of 0.741 and a minimum value of 0.12. Also, as shown in the regression result, the significant value of F value is 0, and endogenous issue does not exist in the example since D-W has a trend of 2. Therefore, we can draw a result that the explaining ability of systematic risk to the rate of return is relatively low, systematic risk takes a small part in total risk, which claims that the rate of return does not pay off systematic risk.

4.2 Test of risk-return relation

4.2.1 Security Market Line (SML)

In order to clarify the positive linear relationship between β value and risky assets, the regression has been conducted to obtain the SML line of the listed 90 stocks. The SML line is presented as following:
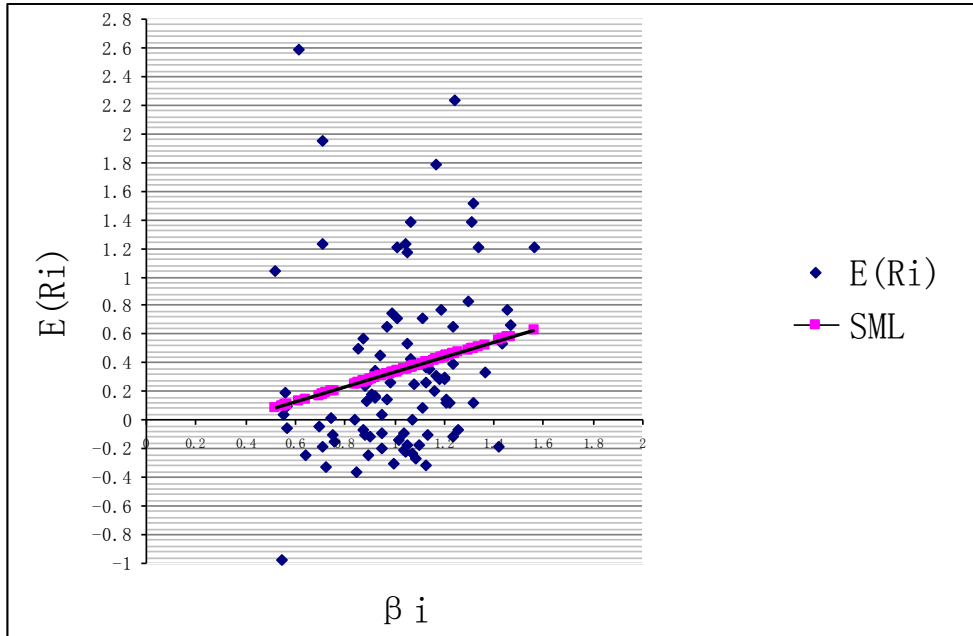
Based on the graph above, all the stocks above SML line are underpriced, while all the

stocks below SML line are over-priced. Within the range of β>1, all the stocks are highly

risky, where all the stocks in the range of β<1 have relatively low risks.

4.2.2 Test of risk-return relation

Based on the β values and rate of returns obtained, the result of the regression on SPSS

presents the following table:

Model	R	R Sqr	Adj R Sqr	Residual	Durbin-Watson
	0.199[a]	0.040	0.029	0.60831	2.136

Model	Sum Sqr	Df	Average Sqr	F	Sig.
Regression	1.348	1	1.348	3.644	0.060[a]
Residual	32.564	88	0.370		
Total	33.913	89			

Model	B	Residual		T	Sig.
Cons	-0.192	0.289		-0.665	0.508
X	0.528	0.276	0.199	1.909	0.060

The estimation result shows that the explaining ability of systematic risk to sample rate of return is relatively low, while systematic risk is only taking 29%, and the payoff of sample rate of return to systematic risk is relatively low. Constant value is -0.1923, and

risk free value is negative both present that investors in the market have a low attention to the time value of asset, but persuades a high risk and a high return. Investors tend to be irrational rather than evaluating their own risk profiles. Such an irrational investors behavior presents that security market in China is still on an immature stage.

A βvalue of 0.528 presents that a positive linear relationship exists between systematic risk and rate of return, so systematic risk has effects on asset pricing process. However, a T-value of 1.909 shows an insignificant result, which states that the expected significant linear relationship between systematic risk and rate of return does not exist in the sample.

Chapter 5 Conclusions and Recommendations

This study, conducted based on a sample of 90 stocks in Shanghai &Shenzhen 300, has achieved the following conclusion: since the parameters of the estimation model presented to be insignificant, the correlation and the covariance between the rate of return of the stocks and the estimated systematic risk are relatively weak, and similarly, the explaining ability of systematic risk in terms of total risk and the rate of return is relatively weak. Therefore, the linear relationship between the rate of return and the systematic risk is insignificant, that is, a high risk does not always imply a high return. The conclusion states that the stock market in china is still in an immature stage, which does not fully obey the theory and assumptions CAPM contains; thus, the market is inefficient.

CAPM contains a series of ideal theories and assumptions, with which a mature stock market in western world cannot perfect match according to several empirical analysis studies. Therefore, it is an understanding situation that China's stock market cannot fully match the theories and assumptions. Since this study was conducted based on the data set gathered in China's stock market, the sample also determines the significance of the differences from the theoretical conclusions. Therefore, βvalue can not be applied in any long-term forecasting, the result of which may not present the expected accuracy.

With the empirical research conducted above, CAPM is not yet the right model in China's stock market. Despite that, due to the fact that Markowitz's portfolio theory is

included in the model, CAPM is still a significant model to risk analysis, portfolio

analysis, and also the risk-return relation of China's stock market.

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Appendix A

2010 China's stock market rate of return

Date	Opening	Closing	R_m
2010/1/4	3592.47	3535.23	-0.01593
2010/1/5	3545.19	3564.04	0.005317
2010/1/6	3558.7	3541.73	-0.00477
2010/1/7	3543.16	3471.46	-0.02024
2010/1/8	3456.91	3480.13	0.006717
2010/1/11	3593.11	3482.05	-0.03091
2010/1/12	3477.84	3534.92	0.016412
2010/1/13	3448.29	3421.14	-0.00787
2010/1/14	3433.47	3469.051	0.010363
2010/1/15	3472.521	3482.74	0.002943
2010/1/18	3471.781	3500.68	0.008324
2010/1/19	3506.81	3507.48	0.000191
2010/1/20	3512.25	3394.43	-0.03355
2010/1/21	3397.04	3408.57	0.003394
2010/1/22	3364.45	3366.2	0.00052
2010/1/25	3340.01	3328.01	-0.00359
2010/1/26	3328.11	3242.8	-0.02563
2010/1/27	3243.04	3198.57	-0.01371
2010/1/28	3195.29	3206.57	0.00353
2010/1/29	3190.31	3204.16	0.004341
2010/2/1	3198.23	3152.71	-0.01423
2010/2/2	3170.781	3146.19	-0.00776
2010/2/3	3160.71	3230.72	0.02215
2010/2/4	3206.43	3218.801	0.003858
2010/2/5	3147.72	3153.091	0.001706
2010/2/8	3152.25	3150.99	-0.0004
2010/2/9	3147.76	3169.19	0.006808
2010/2/10	3195.14	3214.13	0.005943
2010/2/11	3216.69	3220.4	0.001153
2010/2/12	3232.88	3251.28	0.005692
2010/2/22	3248.95	3233.34	-0.0048
2010/2/23	3225.39	3198.63	-0.0083
2010/2/24	3177.08	3244.48	0.021214
2010/2/25	3252.15	3292.13	0.012293
2010/2/26	3286.09	3281.67	-0.00135
2010/3/1	3290.01	3324.42	0.010459
2010/3/2	3327.1	3311.24	-0.00477
2010/3/3	3313.02	3335.08	0.006659

Date	Opening	Closing	R_m
2010/3/4	3338.67	3250.57	-0.02639
2010/3/5	3253.16	3259.76	0.002029
2010/3/8	3268.4	3286.18	0.00544
2010/3/9	3285.62	3305.86	0.00616
2010/3/10	3304.04	3279.69	-0.00737
2010/3/11	3282.2	3276.71	-0.00167
2010/3/12	3277.31	3233.13	-0.01348
2010/3/15	3231.22	3183.18	-0.01487
2010/3/16	3183.77	3203.97	0.006345
2010/3/17	3214.22	3273.92	0.018574
2010/3/18	3277.88	3267.55	-0.00315
2010/3/19	3270.98	3293.87	0.006998
2010/3/22	3297.82	3302.63	0.001459
2010/3/23	3305.55	3275.57	-0.00907
2010/3/24	3282.05	3276.67	-0.00164
2010/3/25	3270.39	3229.13	-0.01262
2010/3/26	3226.8	3275	0.014937
2010/3/29	3295.76	3358.54	0.019049
2010/3/30	3361.35	3366.71	0.001595
2010/3/31	3369.19	3345.61	-0.007
2010/4/1	3349.88	3391.94	0.012556
2010/4/2	3400.14	3407.35	0.002121
2010/4/6	3422.85	3405.15	-0.00517
2010/4/7	3403.09	3386.95	-0.00474
2010/4/8	3381.31	3346.74	-0.01022
2010/4/9	3348.77	3379.17	0.009078
2010/4/12	3388.35	3351.479	-0.01088
2010/4/13	3350.729	3391.719	0.012233
2010/4/14	3394.639	3403.709	0.002672
2010/4/15	3407.02	3394.57	-0.00365
2010/4/16	3388.29	3356.33	-0.00943
2010/4/19	3313.5	3176.419	-0.04137
2010/4/20	3176.409	3173.369	-0.00096
2010/4/21	3178.879	3236.679	0.018183
2010/4/22	3222.679	3201.54	-0.00656
2010/4/23	3198.78	3190	-0.00274
2010/4/26	3195.459	3172	-0.00734
2010/4/27	3163.1	3108.41	-0.01729
2010/4/28	3080.32	3097.35	0.005529
2010/4/29	3114.94	3060.06	-0.01762
2010/4/30	3060.12	3067.36	0.002366
2010/5/4	3005.49	3019.45	0.004645

2010/5/5	2981.78	3036.39	0.018315
2010/5/6	3014.91	2896.86	-0.03916
2010/5/7	2835.88	2836.79	0.000321
2010/5/10	2842.37	2858.23	0.00558
2010/5/11	2916.33	2800.82	-0.03961
2010/5/12	2781.71	2818.16	0.013103
2010/5/13	2818.58	2886.91	0.024243
2010/5/14	2865.58	2868.02	0.000851
2010/5/17	2828.88	2714.72	-0.04036
2010/5/18	2711.41	2771.35	0.022107
2010/5/19	2748.95	2762.17	0.004809
2010/5/21	2656.42	2768.79	0.042301
2010/5/24	2787.75	2873.47	0.030749
2010/5/25	2851.26	2813.94	-0.01309
2010/5/26	2814.44	2813.94	-0.00018
2010/5/27	2808.05	2859.98	0.018493
2010/5/28	2885.86	2850.3	-0.01232
2010/5/31	2835.33	2773.26	-0.02189
2010/6/1	2755.28	2744.16	-0.00404
2010/6/2	2729.33	2757.53	0.010332
2010/6/3	2769.1	2736.08	-0.01192
2010/6/4	2721.36	2744.39	0.008463
2010/6/7	2692.83	2695.719	0.001073
2010/6/8	2694.109	2699.339	0.001941
2010/6/9	2711.639	2782.129	0.025995
2010/6/10	2755.939	2750.02	-0.00215
2010/6/11	2766.199	2758.869	-0.00265
2010/6/17	2778.529	2742.729	-0.01288
2010/6/18	2739.029	2696.169	-0.01565
2010/6/21	2698.979	2780.659	0.030263
2010/6/22	2772.889	2783.719	0.003906
2010/6/23	2768.699	2758.499	-0.00368
2010/6/24	2753.709	2757.499	0.001376
2010/6/25	2744.119	2736.289	-0.00285
2010/6/28	2734.509	2716.779	-0.00648
2010/6/29	2717.469	2592.019	-0.04616
2010/6/30	2572.909	2563.069	-0.00382
2010/7/1	2557.919	2526.069	-0.01245
2010/7/2	2523.029	2534.099	0.004388
2010/7/5	2507.349	2512.649	0.002114
2010/7/6	2504.869	2562.899	0.023167
2010/7/7	2561.109	2580.479	0.007563
2010/7/8	2591.509	2575.919	-0.00602

2010/7/9	2578.549	2647.099	0.026585
2010/7/12	2647.419	2676.219	0.010879
2010/7/13	2649.659	2634.589	-0.00569
2010/7/14	2640.929	2653.609	0.004801
2010/7/15	2650.329	2608.519	-0.01578
2010/7/16	2596.999	2616.129	0.007366
2010/7/19	2592.089	2682.469	0.034868
2010/7/20	2685.459	2741.499	0.020868
2010/7/21	2744.699	2747.329	0.000958
2010/7/22	2738.029	2781.289	0.0158
2010/7/23	2787.519	2793.079	0.001995
2010/7/26	2798.759	2811.049	0.004391
2010/7/27	2803.749	2795.719	-0.00286
2010/7/28	2796.479	2863.719	0.024045
2010/7/29	2866.769	2877.979	0.00391
2010/7/30	2871.479	2868.849	-0.00092
2010/8/2	2868.279	2917.269	0.01708
2010/8/3	2925.249	2865.969	-0.02026
2010/8/4	2858.348	2876.428	0.006325
2010/8/5	2874.658	2850.828	-0.00829
2010/8/6	2848.158	2897.658	0.01738
2010/8/9	2894.098	2918.238	0.008341
2010/8/10	2920.398	2832.638	-0.03005
2010/8/11	2823.148	2850.208	0.009585
2010/8/12	2822.788	2816.388	-0.00227
2010/8/13	2818.408	2855.548	0.013178
2010/8/16	2851.218	2922.078	0.024853
2010/8/17	2927.258	2942.288	0.005134
2010/8/18	2945.978	2937.358	-0.00293
2010/8/19	2940.768	2955.398	0.004975
2010/8/20	2943.328	2898.328	-0.01529
2010/8/23	2895.708	2896.188	0.000166
2010/8/24	2892.128	2911.828	0.006812
2010/8/25	2893.988	2843.018	-0.01761
2010/8/26	2853.098	2850.088	-0.00105
2010/8/27	2847.448	2858.568	0.003905
2010/8/30	2874.248	2915.008	0.014181
2010/8/31	2905.148	2903.188	-0.00067
2010/9/1	2907.658	2884.038	-0.00812
2010/9/2	2917.738	2921.387	0.001251
2010/9/3	2926.938	2920.208	-0.0023
2010/9/6	2935.887	2975.087	0.013352
2010/9/7	2979.297	2983.107	0.001279

2010/9/8	2969.997	2980.967	0.003694
2010/9/9	2986.867	2926.457	-0.02023
2010/9/10	2927.997	2932.547	0.001554
2010/9/13	2933.587	2962.317	0.009793
2010/9/14	2971.547	2965.007	-0.0022
2010/9/15	2965.537	2913.187	-0.01765
2010/9/16	2908.317	2857.787	-0.01737
2010/9/17	2864.717	2861.367	-0.00117
2010/9/20	2865.037	2849.827	-0.00531
2010/9/21	2859.427	2857.477	-0.00068
2010/9/27	2869.927	2905.027	0.01223
2010/9/28	2900.537	2880.907	-0.00677
2010/9/29	2877.267	2874.807	-0.00085
2010/9/30	2859.057	2935.567	0.026761
2010/10/8	2965.647	3044.228	0.026497
2010/10/11	3069.188	3132.897	0.020758
2010/10/12	3121.637	3172.728	0.016367
2010/10/13	3176.887	3217.577	0.012808
2010/10/14	3245.127	3224.137	-0.00647
2010/10/15	3204.718	3327.677	0.038368
2010/10/18	3345.798	3306.158	-0.01185
2010/10/19	3300.518	3375.668	0.022769
2010/10/20	3304.218	3396.878	0.028043
2010/10/21	3404.718	3374.688	-0.00882
2010/10/22	3365.598	3378.658	0.00388
2010/10/25	3386.848	3481.078	0.027822
2010/10/26	3491.468	3466.078	-0.00727
2010/10/27	3451.428	3403.868	-0.01378
2010/10/28	3390.428	3397.688	0.002141
2010/10/29	3400.258	3379.978	-0.00596
2010/11/1	3390.408	3472.998	0.02436
2010/11/2	3484.228	3463.128	-0.00606
2010/11/3	3462.738	3420.338	-0.01224
2010/11/4	3426.458	3480.498	0.015771
2010/11/5	3538.988	3520.798	-0.00514
2010/11/8	3534.188	3548.568	0.004069
2010/11/9	3547.438	3523.948	-0.00662
2010/11/10	3507.198	3499.108	-0.00231
2010/11/11	3490.738	3509.978	0.005512
2010/11/12	3484.608	3291.828	-0.05532
2010/11/15	3298.738	3314.887	0.004896
2010/11/16	3311.617	3169.537	-0.0429
2010/11/17	3124.107	3103.907	-0.00647

2010/11/18	3134.938	3147.958	0.004153
2010/11/19	3168.167	3178.847	0.003371
2010/11/22	3148.218	3171.938	0.007534
2010/11/23	3156.478	3107.177	-0.01562
2010/11/24	3088.988	3177.038	0.028504
2010/11/25	3197.968	3223.478	0.007977
2010/11/26	3214.127	3194.847	-0.006
2010/11/29	3183.537	3190.047	0.002045
2010/11/30	3187.527	3136.987	-0.01586
2010/12/1	3127.257	3136.017	0.002801
2010/12/2	3185.757	3155.057	-0.00964
2010/12/3	3161.927	3158.157	-0.00119
2010/12/6	3168.877	3165.567	-0.00104
2010/12/7	3152.727	3200.337	0.015101
2010/12/8	3194.897	3171.877	-0.00721
2010/12/9	3155.998	3123.368	-0.01034
2010/12/10	3107.378	3161.978	0.017571
2010/12/13	3176.328	3261.058	0.026675
2010/12/14	3270.198	3269.468	-0.00022
2010/12/15	3270.778	3247.638	-0.00707
2010/12/16	3246.008	3230.668	-0.00473
2010/12/17	3229.298	3225.658	-0.00113
2010/12/20	3239.018	3178.658	-0.01864
2010/12/21	3184.698	3249.508	0.02035
2010/12/22	3253.818	3215.448	-0.01179
2010/12/23	3210.668	3188.608	-0.00687
2010/12/24	3170.638	3162.958	-0.00242
2010/12/27	3176.108	3099.708	-0.02405
2010/12/28	3084.818	3044.928	-0.01293
2010/12/29	3049.928	3061.828	0.003902
2010/12/30	3063.048	3064.098	0.000343
2010/12/31	3069.048	3128.258	0.019293

Appendix B

Stock historical prices and related information

CNPC

Time	Opening	Closing	Ri	Rf	Rm-Rf	Ri-Rf
2010/1/4	13.85	13.63	-0.0159	0.000030975	-0.0160	-0.0159
2010/1/5	13.69	13.89	0.0146	0.000030975	0.0053	0.0146
2010/1/6	13.87	13.7	-0.0123	0.000030975	-0.0048	-0.0123
2010/1/7	13.73	13.61	-0.0087	0.000030975	-0.0203	-0.0088
2010/1/8	13.5	13.45	-0.0037	0.000030975	0.0067	-0.0037
2010/1/11	14	13.72	-0.0200	0.000030975	-0.0309	-0.0200
2010/1/12	13.65	14.28	0.0462	0.000030975	0.0164	0.0461
2010/1/13	14.1	13.83	-0.0191	0.000030975	-0.0079	-0.0192
2010/1/14	13.84	13.88	0.0029	0.000030975	0.0103	0.0029
2010/1/15	13.9	13.78	-0.0086	0.000030975	0.0029	-0.0087
2010/1/18	13.7	13.72	0.0015	0.000030975	0.0083	0.0014
2010/1/19	13.75	13.85	0.0073	0.000030975	0.0002	0.0072
2010/1/20	13.88	13.67	-0.0151	0.000030975	-0.0336	-0.0152
2010/1/21	13.63	13.51	-0.0088	0.000030975	0.0034	-0.0088
2010/1/22	13.31	13.53	0.0165	0.000030975	0.0005	0.0165
2010/1/25	13.4	13.39	-0.0007	0.000030975	-0.0036	-0.0008
2010/1/26	13.39	13.15	-0.0179	0.000030975	-0.0257	-0.0180
2010/1/27	13.17	13.14	-0.0023	0.000030975	-0.0137	-0.0023
2010/1/28	13.17	13.12	-0.0038	0.000030975	0.0035	-0.0038
2010/1/29	13.1	13.08	-0.0015	0.000030975	0.0043	-0.0016
2010/2/1	13.03	12.83	-0.0153	4.32167E-05	-0.0143	-0.0154
2010/2/2	12.9	12.82	-0.0062	4.32167E-05	-0.0078	-0.0062
2010/2/3	12.87	13.04	0.0132	4.32167E-05	0.0221	0.0132
2010/2/4	12.99	12.91	-0.0062	4.32167E-05	0.0038	-0.0062
2010/2/5	12.74	12.71	-0.0024	4.32167E-05	0.0017	-0.0024
2010/2/8	12.73	12.7	-0.0024	4.32167E-05	-0.0004	-0.0024
2010/2/9	12.7	12.76	0.0047	4.32167E-05	0.0068	0.0047
2010/2/10	12.81	12.84	0.0023	4.32167E-05	0.0059	0.0023
2010/2/11	12.85	12.87	0.0016	4.32167E-05	0.0011	0.0015
2010/2/12	12.91	13.01	0.0077	4.32167E-05	0.0056	0.0077
2010/2/22	13.05	12.92	-0.0100	4.32167E-05	-0.0048	-0.0100
2010/2/23	12.92	12.84	-0.0062	4.32167E-05	-0.0083	-0.0062
2010/2/24	12.78	12.96	0.0141	4.32167E-05	0.0212	0.0140
2010/2/25	12.95	13.05	0.0077	4.32167E-05	0.0123	0.0077
2010/2/26	13.02	13	-0.0015	4.32167E-05	-0.0014	-0.0016
2010/3/1	12.99	13.06	0.0054	3.74306E-05	0.0104	0.0054

2010/3/2	13.06	12.95	-0.0084	3.74306E-05	-0.0048	-0.0085
2010/3/3	12.95	12.99	0.0031	3.74306E-05	0.0066	0.0031
2010/3/4	12.99	12.78	-0.0162	3.74306E-05	-0.0264	-0.0162
2010/3/5	12.8	12.8	0.0000	3.74306E-05	0.0020	0.0000
2010/3/8	12.74	12.85	0.0086	3.74306E-05	0.0054	0.0086
2010/3/9	12.85	12.88	0.0023	3.74306E-05	0.0061	0.0023
2010/3/10	12.87	12.85	-0.0016	3.74306E-05	-0.0074	-0.0016
2010/3/11	12.87	12.94	0.0054	3.74306E-05	-0.0017	0.0054
2010/3/12	12.95	12.82	-0.0100	3.74306E-05	-0.0135	-0.0101
2010/3/15	12.8	12.66	-0.0109	3.74306E-05	-0.0149	-0.0110
2010/3/16	12.65	12.66	0.0008	3.74306E-05	0.0063	0.0008
2010/3/17	12.69	12.82	0.0102	3.74306E-05	0.0185	0.0102
2010/3/18	12.83	12.8	-0.0023	3.74306E-05	-0.0032	-0.0024
2010/3/19	12.79	12.86	0.0055	3.74306E-05	0.0070	0.0054
2010/3/22	12.84	12.85	0.0008	3.74306E-05	0.0014	0.0007
2010/3/23	12.86	12.81	-0.0039	3.74306E-05	-0.0091	-0.0039
2010/3/24	12.83	12.77	-0.0047	3.74306E-05	-0.0017	-0.0047
2010/3/25	12.78	12.65	-0.0102	3.74306E-05	-0.0127	-0.0102
2010/3/26	12.65	12.77	0.0095	3.74306E-05	0.0149	0.0094
2010/3/29	12.81	12.93	0.0094	3.74306E-05	0.0190	0.0093
2010/3/30	12.95	12.92	-0.0023	3.74306E-05	0.0016	-0.0024
2010/3/31	12.92	12.84	-0.0062	3.74306E-05	-0.0070	-0.0062
2010/4/1	12.85	12.91	0.0047	3.62333E-05	0.0125	0.0046
2010/4/2	13	12.98	-0.0015	3.62333E-05	0.0021	-0.0016
2010/4/6	13.06	12.98	-0.0061	3.62333E-05	-0.0052	-0.0062
2010/4/7	12.96	12.91	-0.0039	3.62333E-05	-0.0048	-0.0039
2010/4/8	12.89	12.76	-0.0101	3.62333E-05	-0.0103	-0.0101
2010/4/9	12.75	12.81	0.0047	3.62333E-05	0.0090	0.0047
2010/4/12	12.85	12.76	-0.0070	3.62333E-05	-0.0109	-0.0070
2010/4/13	12.77	13.05	0.0219	3.62333E-05	0.0122	0.0219
2010/4/14	13.08	12.97	-0.0084	3.62333E-05	0.0026	-0.0084
2010/4/15	12.97	13.23	0.0200	3.62333E-05	-0.0037	0.0200
2010/4/16	13.23	13.04	-0.0144	3.62333E-05	-0.0095	-0.0144
2010/4/19	12.96	12.49	-0.0363	3.62333E-05	-0.0414	-0.0363
2010/4/20	12.53	12.42	-0.0088	3.62333E-05	-0.0010	-0.0088
2010/4/21	12.44	12.56	0.0096	3.62333E-05	0.0181	0.0096
2010/4/22	12.52	12.34	-0.0144	3.62333E-05	-0.0066	-0.0144
2010/4/23	12.35	12.25	-0.0081	3.62333E-05	-0.0028	-0.0081
2010/4/26	12.28	12.2	-0.0065	3.62333E-05	-0.0074	-0.0066
2010/4/27	12.18	11.92	-0.0213	3.62333E-05	-0.0173	-0.0214
2010/4/28	11.92	11.99	0.0059	3.62333E-05	0.0055	0.0058
2010/4/29	12.03	11.95	-0.0067	3.62333E-05	-0.0177	-0.0067
2010/4/30	11.96	12.1	0.0117	3.62333E-05	0.0023	0.0117

2010/5/4	11.97	11.97	0.0000	4.67139E-05	0.0046	0.0000
2010/5/5	11.84	11.92	0.0068	4.67139E-05	0.0183	0.0067
2010/5/6	11.84	11.31	-0.0448	4.67139E-05	-0.0392	-0.0448
2010/5/7	11.1	11.04	-0.0054	4.67139E-05	0.0003	-0.0055
2010/5/10	11.06	11.08	0.0018	4.67139E-05	0.0055	0.0018
2010/5/11	11.26	10.98	-0.0249	4.67139E-05	-0.0397	-0.0249
2010/5/12	10.9	11.11	0.0193	4.67139E-05	0.0131	0.0192
2010/5/13	11.09	11.22	0.0117	4.67139E-05	0.0242	0.0117
2010/5/14	11.16	11.15	-0.0009	4.67139E-05	0.0008	-0.0009
2010/5/17	11.08	10.73	-0.0316	4.67139E-05	-0.0404	-0.0316
2010/5/18	10.73	10.89	0.0149	4.67139E-05	0.0221	0.0149
2010/5/19	10.86	10.87	0.0009	4.67139E-05	0.0048	0.0009
2010/5/21	10.6	10.84	0.0226	4.67139E-05	0.0423	0.0226
2010/5/24	10.84	11.1	0.0240	4.67139E-05	0.0307	0.0239
2010/5/25	11.03	10.85	-0.0163	4.67139E-05	-0.0131	-0.0164
2010/5/26	10.84	10.81	-0.0028	4.67139E-05	-0.0002	-0.0028
2010/5/27	10.83	10.92	0.0083	4.67139E-05	0.0184	0.0083
2010/5/28	11.03	10.96	-0.0063	4.67139E-05	-0.0124	-0.0064
2010/5/31	11.05	10.85	-0.0181	4.67139E-05	-0.0219	-0.0181
2010/6/1	10.9	10.86	-0.0037	6.16472E-05	-0.0041	-0.0037
2010/6/2	10.81	10.77	-0.0037	6.16472E-05	0.0103	-0.0038
2010/6/3	10.64	10.62	-0.0019	6.16472E-05	-0.0120	-0.0019
2010/6/4	10.62	10.61	-0.0009	6.16472E-05	0.0084	-0.0010
2010/6/7	10.46	10.38	-0.0076	6.16472E-05	0.0010	-0.0077
2010/6/8	10.38	10.38	0.0000	6.16472E-05	0.0019	-0.0001
2010/6/9	10.4	10.6	0.0192	6.16472E-05	0.0259	0.0192
2010/6/10	10.55	10.63	0.0076	6.16472E-05	-0.0022	0.0075
2010/6/11	10.68	10.69	0.0009	6.16472E-05	-0.0027	0.0009
2010/6/17	10.85	10.68	-0.0157	6.16472E-05	-0.0129	-0.0157
2010/6/18	10.68	10.58	-0.0094	6.16472E-05	-0.0157	-0.0094
2010/6/21	10.59	10.79	0.0189	6.16472E-05	0.0302	0.0188
2010/6/22	10.77	10.76	-0.0009	6.16472E-05	0.0038	-0.0010
2010/6/23	10.75	10.77	0.0019	6.16472E-05	-0.0037	0.0018
2010/6/24	10.77	10.76	-0.0009	6.16472E-05	0.0013	-0.0010
2010/6/25	10.73	10.71	-0.0019	6.16472E-05	-0.0029	-0.0019
2010/6/28	10.7	10.67	-0.0028	6.16472E-05	-0.0065	-0.0029
2010/6/29	10.67	10.29	-0.0356	6.16472E-05	-0.0462	-0.0357
2010/6/30	10.26	10.25	-0.0010	6.16472E-05	-0.0039	-0.0010
2010/7/1	10.27	10.19	-0.0078	4.65861E-05	-0.0125	-0.0078
2010/7/2	10.18	10.33	0.0147	4.65861E-05	0.0043	0.0147
2010/7/5	10.27	10.34	0.0068	4.65861E-05	0.0021	0.0068
2010/7/6	10.34	10.43	0.0087	4.65861E-05	0.0231	0.0087
2010/7/7	10.43	10.41	-0.0019	4.65861E-05	0.0075	-0.0020

2010/7/8	10.45	10.38	-0.0067	4.65861E-05	-0.0061	-0.0067
2010/7/9	10.39	10.53	0.0135	4.65861E-05	0.0265	0.0134
2010/7/12	10.52	10.52	0.0000	4.65861E-05	0.0108	0.0000
2010/7/13	10.45	10.36	-0.0086	4.65861E-05	-0.0057	-0.0087
2010/7/14	10.39	10.41	0.0019	4.65861E-05	0.0048	0.0019
2010/7/15	10.41	10.28	-0.0125	4.65861E-05	-0.0158	-0.0125
2010/7/16	10.27	10.21	-0.0058	4.65861E-05	0.0073	-0.0059
2010/7/19	10	10.28	0.0280	4.65861E-05	0.0348	0.0280
2010/7/20	10.25	10.44	0.0185	4.65861E-05	0.0208	0.0185
2010/7/21	10.4	10.44	0.0038	4.65861E-05	0.0009	0.0038
2010/7/22	10.4	10.49	0.0087	4.65861E-05	0.0158	0.0086
2010/7/23	10.52	10.55	0.0029	4.65861E-05	0.0019	0.0028
2010/7/26	10.55	10.56	0.0009	4.65861E-05	0.0043	0.0009
2010/7/27	10.53	10.48	-0.0047	4.65861E-05	-0.0029	-0.0048
2010/7/28	10.48	10.66	0.0172	4.65861E-05	0.0240	0.0171
2010/7/29	10.66	10.75	0.0084	4.65861E-05	0.0039	0.0084
2010/7/30	10.73	10.71	-0.0019	4.65861E-05	-0.0010	-0.0019
2010/8/2	10.71	10.76	0.0047	4.38278E-05	0.0170	0.0046
2010/8/3	10.82	10.62	-0.0185	4.38278E-05	-0.0203	-0.0185
2010/8/4	10.6	10.68	0.0075	4.38278E-05	0.0063	0.0075
2010/8/5	10.67	10.55	-0.0112	4.38278E-05	-0.0083	-0.0113
2010/8/6	10.55	10.67	0.0114	4.38278E-05	0.0173	0.0113
2010/8/9	10.65	10.69	0.0038	4.38278E-05	0.0083	0.0037
2010/8/10	10.68	10.41	-0.0253	4.38278E-05	-0.0301	-0.0253
2010/8/11	10.38	10.39	0.0010	4.38278E-05	0.0095	0.0009
2010/8/12	10.34	10.26	-0.0077	4.38278E-05	-0.0023	-0.0078
2010/8/13	10.27	10.32	0.0049	4.38278E-05	0.0131	0.0048
2010/8/16	10.31	10.46	0.0145	4.38278E-05	0.0248	0.0145
2010/8/17	10.46	10.43	-0.0029	4.38278E-05	0.0051	-0.0029
2010/8/18	10.44	10.39	-0.0048	4.38278E-05	-0.0030	-0.0048
2010/8/19	10.4	10.58	0.0173	4.38278E-05	0.0049	0.0173
2010/8/20	10.55	10.42	-0.0123	4.38278E-05	-0.0153	-0.0124
2010/8/23	10.4	10.35	-0.0048	4.38278E-05	0.0001	-0.0049
2010/8/24	10.35	10.37	0.0019	4.38278E-05	0.0068	0.0019
2010/8/25	10.3	10.23	-0.0068	4.38278E-05	-0.0177	-0.0068
2010/8/26	10.26	10.24	-0.0019	4.38278E-05	-0.0011	-0.0020
2010/8/27	10.25	10.31	0.0059	4.38278E-05	0.0039	0.0058
2010/8/30	10.33	10.35	0.0019	4.38278E-05	0.0141	0.0019
2010/8/31	10.35	10.28	-0.0068	4.38278E-05	-0.0007	-0.0068
2010/9/1	10.28	10.23	-0.0049	4.99583E-05	-0.0082	-0.0049
2010/9/2	10.31	10.31	0.0000	4.99583E-05	0.0012	0.0000
2010/9/3	10.31	10.24	-0.0068	4.99583E-05	-0.0023	-0.0068
2010/9/6	10.3	10.39	0.0087	4.99583E-05	0.0133	0.0087

2010/9/7	10.39	10.35	-0.0038	4.99583E-05	0.0012	-0.0039
2010/9/8	10.34	10.29	-0.0048	4.99583E-05	0.0036	-0.0049
2010/9/9	10.29	10.19	-0.0097	4.99583E-05	-0.0203	-0.0098
2010/9/10	10.21	10.18	-0.0029	4.99583E-05	0.0015	-0.0030
2010/9/13	10.21	10.27	0.0059	4.99583E-05	0.0097	0.0058
2010/9/14	10.28	10.25	-0.0029	4.99583E-05	-0.0023	-0.0030
2010/9/15	10.26	10.2	-0.0058	4.99583E-05	-0.0177	-0.0059
2010/9/16	10.1	10	-0.0099	4.99583E-05	-0.0174	-0.0100
2010/9/17	10.02	9.98	-0.0040	4.99583E-05	-0.0012	-0.0040
2010/9/20	9.99	9.98	-0.0010	4.99583E-05	-0.0054	-0.0011
2010/9/21	9.97	9.99	0.0020	4.99583E-05	-0.0007	0.0020
2010/9/27	9.99	9.99	0.0000	4.99583E-05	0.0122	0.0000
2010/9/28	10	9.94	-0.0060	4.99583E-05	-0.0068	-0.0060
2010/9/29	9.94	10.05	0.0111	4.99583E-05	-0.0009	0.0110
2010/9/30	10.06	10.18	0.0119	4.99583E-05	0.0267	0.0119
2010/10/8	10.26	10.47	0.0205	4.46444E-05	0.0265	0.0204
2010/10/11	10.51	10.78	0.0257	4.46444E-05	0.0207	0.0256
2010/10/12	10.79	11.15	0.0334	4.46444E-05	0.0163	0.0333
2010/10/13	11.14	11.02	-0.0108	4.46444E-05	0.0128	-0.0108
2010/10/14	11.16	11.34	0.0161	4.46444E-05	-0.0065	0.0161
2010/10/15	11.25	11.55	0.0267	4.46444E-05	0.0383	0.0266
2010/10/18	11.52	11.4	-0.0104	4.46444E-05	-0.0119	-0.0105
2010/10/19	11.4	11.44	0.0035	4.46444E-05	0.0227	0.0035
2010/10/20	11.2	11.26	0.0054	4.46444E-05	0.0280	0.0053
2010/10/21	11.31	11.26	-0.0044	4.46444E-05	-0.0089	-0.0045
2010/10/22	11.22	11.12	-0.0089	4.46444E-05	0.0038	-0.0090
2010/10/25	11.12	11.45	0.0297	4.46444E-05	0.0278	0.0296
2010/10/26	11.74	11.56	-0.0153	4.46444E-05	-0.0073	-0.0154
2010/10/27	11.53	11.32	-0.0182	4.46444E-05	-0.0138	-0.0183
2010/10/28	11.32	11.29	-0.0027	4.46444E-05	0.0021	-0.0027
2010/10/29	11.29	11.19	-0.0089	4.46444E-05	-0.0060	-0.0089
2010/11/1	11.22	11.39	0.0152	0.000047625	0.0243	0.0151
2010/11/2	11.42	11.4	-0.0018	0.000047625	-0.0061	-0.0018
2010/11/3	11.4	11.47	0.0061	0.000047625	-0.0123	0.0061
2010/11/4	11.48	11.89	0.0357	0.000047625	0.0157	0.0357
2010/11/5	12.15	11.99	-0.0132	0.000047625	-0.0052	-0.0132
2010/11/8	12.06	12.14	0.0066	0.000047625	0.0040	0.0066
2010/11/9	12.17	11.82	-0.0288	0.000047625	-0.0067	-0.0288
2010/11/10	11.73	11.83	0.0085	0.000047625	-0.0024	0.0085
2010/11/11	11.87	12.74	0.0733	0.000047625	0.0055	0.0732
2010/11/12	12.51	12.54	0.0024	0.000047625	-0.0554	0.0024
2010/11/15	12.54	12.38	-0.0128	0.000047625	0.0048	-0.0128
2010/11/16	12.28	11.57	-0.0578	0.000047625	-0.0430	-0.0579

2010/11/17	11.2	11.35	0.0134	0.000047625	-0.0065	0.0133
2010/11/18	11.34	11.39	0.0044	0.000047625	0.0041	0.0044
2010/11/19	11.46	11.28	-0.0157	0.000047625	0.0033	-0.0158
2010/11/22	11.15	11.18	0.0027	0.000047625	0.0075	0.0026
2010/11/23	11.11	10.86	-0.0225	0.000047625	-0.0157	-0.0225
2010/11/24	10.8	10.95	0.0139	0.000047625	0.0285	0.0138
2010/11/25	11.08	11.18	0.0090	0.000047625	0.0079	0.0090
2010/11/26	11.14	10.98	-0.0144	0.000047625	-0.0060	-0.0144
2010/11/29	10.94	10.97	0.0027	0.000047625	0.0020	0.0027
2010/11/30	10.99	11.07	0.0073	0.000047625	-0.0159	0.0072
2010/12/1	10.98	10.97	-0.0009	7.78639E-05	0.0027	-0.0010
2010/12/2	11.12	11.1	-0.0018	7.78639E-05	-0.0097	-0.0019
2010/12/3	11.13	11.24	0.0099	7.78639E-05	-0.0013	0.0098
2010/12/6	11.33	11.77	0.0388	7.78639E-05	-0.0011	0.0388
2010/12/7	11.64	11.78	0.0120	7.78639E-05	0.0150	0.0119
2010/12/8	11.68	11.56	-0.0103	7.78639E-05	-0.0073	-0.0104
2010/12/9	11.54	11.38	-0.0139	7.78639E-05	-0.0104	-0.0139
2010/12/10	11.31	11.45	0.0124	7.78639E-05	0.0175	0.0123
2010/12/13	11.52	11.95	0.0373	7.78639E-05	0.0266	0.0372
2010/12/14	11.93	11.82	-0.0092	7.78639E-05	-0.0003	-0.0093
2010/12/15	11.79	11.71	-0.0068	7.78639E-05	-0.0072	-0.0069
2010/12/16	11.7	11.69	-0.0009	7.78639E-05	-0.0048	-0.0009
2010/12/17	11.67	11.56	-0.0094	7.78639E-05	-0.0012	-0.0095
2010/12/20	11.55	11.31	-0.0208	7.78639E-05	-0.0187	-0.0209
2010/12/21	11.38	11.52	0.0123	7.78639E-05	0.0203	0.0122
2010/12/22	11.66	11.44	-0.0189	7.78639E-05	-0.0119	-0.0189
2010/12/23	11.44	11.4	-0.0035	7.78639E-05	-0.0069	-0.0036
2010/12/24	11.38	11.42	0.0035	7.78639E-05	-0.0025	0.0034
2010/12/27	11.41	11.16	-0.0219	7.78639E-05	-0.0241	-0.0220
2010/12/28	11.12	11.07	-0.0045	7.78639E-05	-0.0130	-0.0046
2010/12/29	11.08	11.07	-0.0009	7.78639E-05	0.0038	-0.0010
2010/12/30	11.08	11.15	0.0063	7.78639E-05	0.0003	0.0062
2010/12/31	11.06	11.22	0.0145	7.78639E-05	0.0192	0.0144

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Time	Opening	Closing	Ri	Rf	Rm-Rf	Ri-Rf
2010/1/4	13.85	13.63	-0.0159	0.000030975	-0.0160	-0.0159
2010/1/5	13.69	13.89	0.0146	0.000030975	0.0053	0.0146
2010/1/6	13.87	13.7	-0.0123	0.000030975	-0.0048	-0.0123
2010/1/7	13.73	13.61	-0.0087	0.000030975	-0.0203	-0.0088
2010/1/8	13.5	13.45	-0.0037	0.000030975	0.0067	-0.0037

2010/1/11	14	13.72	-0.0200	0.000030975	-0.0309	-0.0200
2010/1/12	13.65	14.28	0.0462	0.000030975	0.0164	0.0461
2010/1/13	14.1	13.83	-0.0191	0.000030975	-0.0079	-0.0192
2010/1/14	13.84	13.88	0.0029	0.000030975	0.0103	0.0029
2010/1/15	13.9	13.78	-0.0086	0.000030975	0.0029	-0.0087
2010/1/18	13.7	13.72	0.0015	0.000030975	0.0083	0.0014
2010/1/19	13.75	13.85	0.0073	0.000030975	0.0002	0.0072
2010/1/20	13.88	13.67	-0.0151	0.000030975	-0.0336	-0.0152
2010/1/21	13.63	13.51	-0.0088	0.000030975	0.0034	-0.0088
2010/1/22	13.31	13.53	0.0165	0.000030975	0.0005	0.0165
2010/1/25	13.4	13.39	-0.0007	0.000030975	-0.0036	-0.0008
2010/1/26	13.39	13.15	-0.0179	0.000030975	-0.0257	-0.0180
2010/1/27	13.17	13.14	-0.0023	0.000030975	-0.0137	-0.0023
2010/1/28	13.17	13.12	-0.0038	0.000030975	0.0035	-0.0038
2010/1/29	13.1	13.08	-0.0015	0.000030975	0.0043	-0.0016
2010/2/1	13.03	12.83	-0.0153	4.32167E-05	-0.0143	-0.0154
2010/2/2	12.9	12.82	-0.0062	4.32167E-05	-0.0078	-0.0062
2010/2/3	12.87	13.04	0.0132	4.32167E-05	0.0221	0.0132
2010/2/4	12.99	12.91	-0.0062	4.32167E-05	0.0038	-0.0062
2010/2/5	12.74	12.71	-0.0024	4.32167E-05	0.0017	-0.0024
2010/2/8	12.73	12.7	-0.0024	4.32167E-05	-0.0004	-0.0024
2010/2/9	12.7	12.76	0.0047	4.32167E-05	0.0068	0.0047
2010/2/10	12.81	12.84	0.0023	4.32167E-05	0.0059	0.0023
2010/2/11	12.85	12.87	0.0016	4.32167E-05	0.0011	0.0015
2010/2/12	12.91	13.01	0.0077	4.32167E-05	0.0056	0.0077
2010/2/22	13.05	12.92	-0.0100	4.32167E-05	-0.0048	-0.0100
2010/2/23	12.92	12.84	-0.0062	4.32167E-05	-0.0083	-0.0062
2010/2/24	12.78	12.96	0.0141	4.32167E-05	0.0212	0.0140
2010/2/25	12.95	13.05	0.0077	4.32167E-05	0.0123	0.0077
2010/2/26	13.02	13	-0.0015	4.32167E-05	-0.0014	-0.0016
2010/3/1	12.99	13.06	0.0054	3.74306E-05	0.0104	0.0054
2010/3/2	13.06	12.95	-0.0084	3.74306E-05	-0.0048	-0.0085
2010/3/3	12.95	12.99	0.0031	3.74306E-05	0.0066	0.0031
2010/3/4	12.99	12.78	-0.0162	3.74306E-05	-0.0264	-0.0162
2010/3/5	12.8	12.8	0.0000	3.74306E-05	0.0020	0.0000
2010/3/8	12.74	12.85	0.0086	3.74306E-05	0.0054	0.0086
2010/3/9	12.85	12.88	0.0023	3.74306E-05	0.0061	0.0023
2010/3/10	12.87	12.85	-0.0016	3.74306E-05	-0.0074	-0.0016
2010/3/11	12.87	12.94	0.0054	3.74306E-05	-0.0017	0.0054
2010/3/12	12.95	12.82	-0.0100	3.74306E-05	-0.0135	-0.0101
2010/3/15	12.8	12.66	-0.0109	3.74306E-05	-0.0149	-0.0110
2010/3/16	12.65	12.66	0.0008	3.74306E-05	0.0063	0.0008
2010/3/17	12.69	12.82	0.0102	3.74306E-05	0.0185	0.0102

2010/3/18	12.83	12.8	-0.0023	3.74306E-05	-0.0032	-0.0024
2010/3/19	12.79	12.86	0.0055	3.74306E-05	0.0070	0.0054
2010/3/22	12.84	12.85	0.0008	3.74306E-05	0.0014	0.0007
2010/3/23	12.86	12.81	-0.0039	3.74306E-05	-0.0091	-0.0039
2010/3/24	12.83	12.77	-0.0047	3.74306E-05	-0.0017	-0.0047
2010/3/25	12.78	12.65	-0.0102	3.74306E-05	-0.0127	-0.0102
2010/3/26	12.65	12.77	0.0095	3.74306E-05	0.0149	0.0094
2010/3/29	12.81	12.93	0.0094	3.74306E-05	0.0190	0.0093
2010/3/30	12.95	12.92	-0.0023	3.74306E-05	0.0016	-0.0024
2010/3/31	12.92	12.84	-0.0062	3.74306E-05	-0.0070	-0.0062
2010/4/1	12.85	12.91	0.0047	3.62333E-05	0.0125	0.0046
2010/4/2	13	12.98	-0.0015	3.62333E-05	0.0021	-0.0016
2010/4/6	13.06	12.98	-0.0061	3.62333E-05	-0.0052	-0.0062
2010/4/7	12.96	12.91	-0.0039	3.62333E-05	-0.0048	-0.0039
2010/4/8	12.89	12.76	-0.0101	3.62333E-05	-0.0103	-0.0101
2010/4/9	12.75	12.81	0.0047	3.62333E-05	0.0090	0.0047
2010/4/12	12.85	12.76	-0.0070	3.62333E-05	-0.0109	-0.0070
2010/4/13	12.77	13.05	0.0219	3.62333E-05	0.0122	0.0219
2010/4/14	13.08	12.97	-0.0084	3.62333E-05	0.0026	-0.0084
2010/4/15	12.97	13.23	0.0200	3.62333E-05	-0.0037	0.0200
2010/4/16	13.23	13.04	-0.0144	3.62333E-05	-0.0095	-0.0144
2010/4/19	12.96	12.49	-0.0363	3.62333E-05	-0.0414	-0.0363
2010/4/20	12.53	12.42	-0.0088	3.62333E-05	-0.0010	-0.0088
2010/4/21	12.44	12.56	0.0096	3.62333E-05	0.0181	0.0096
2010/4/22	12.52	12.34	-0.0144	3.62333E-05	-0.0066	-0.0144
2010/4/23	12.35	12.25	-0.0081	3.62333E-05	-0.0028	-0.0081
2010/4/26	12.28	12.2	-0.0065	3.62333E-05	-0.0074	-0.0066
2010/4/27	12.18	11.92	-0.0213	3.62333E-05	-0.0173	-0.0214
2010/4/28	11.92	11.99	0.0059	3.62333E-05	0.0055	0.0058
2010/4/29	12.03	11.95	-0.0067	3.62333E-05	-0.0177	-0.0067
2010/4/30	11.96	12.1	0.0117	3.62333E-05	0.0023	0.0117
2010/5/4	11.97	11.97	0.0000	4.67139E-05	0.0046	0.0000
2010/5/5	11.84	11.92	0.0068	4.67139E-05	0.0183	0.0067
2010/5/6	11.84	11.31	-0.0448	4.67139E-05	-0.0392	-0.0448
2010/5/7	11.1	11.04	-0.0054	4.67139E-05	0.0003	-0.0055
2010/5/10	11.06	11.08	0.0018	4.67139E-05	0.0055	0.0018
2010/5/11	11.26	10.98	-0.0249	4.67139E-05	-0.0397	-0.0249
2010/5/12	10.9	11.11	0.0193	4.67139E-05	0.0131	0.0192
2010/5/13	11.09	11.22	0.0117	4.67139E-05	0.0242	0.0117
2010/5/14	11.16	11.15	-0.0009	4.67139E-05	0.0008	-0.0009
2010/5/17	11.08	10.73	-0.0316	4.67139E-05	-0.0404	-0.0316
2010/5/18	10.73	10.89	0.0149	4.67139E-05	0.0221	0.0149
2010/5/19	10.86	10.87	0.0009	4.67139E-05	0.0048	0.0009

2010/5/21	10.6	10.84	0.0226	4.67139E-05	0.0423	0.0226
2010/5/24	10.84	11.1	0.0240	4.67139E-05	0.0307	0.0239
2010/5/25	11.03	10.85	-0.0163	4.67139E-05	-0.0131	-0.0164
2010/5/26	10.84	10.81	-0.0028	4.67139E-05	-0.0002	-0.0028
2010/5/27	10.83	10.92	0.0083	4.67139E-05	0.0184	0.0083
2010/5/28	11.03	10.96	-0.0063	4.67139E-05	-0.0124	-0.0064
2010/5/31	11.05	10.85	-0.0181	4.67139E-05	-0.0219	-0.0181
2010/6/1	10.9	10.86	-0.0037	6.16472E-05	-0.0041	-0.0037
2010/6/2	10.81	10.77	-0.0037	6.16472E-05	0.0103	-0.0038
2010/6/3	10.64	10.62	-0.0019	6.16472E-05	-0.0120	-0.0019
2010/6/4	10.62	10.61	-0.0009	6.16472E-05	0.0084	-0.0010
2010/6/7	10.46	10.38	-0.0076	6.16472E-05	0.0010	-0.0077
2010/6/8	10.38	10.38	0.0000	6.16472E-05	0.0019	-0.0001
2010/6/9	10.4	10.6	0.0192	6.16472E-05	0.0259	0.0192
2010/6/10	10.55	10.63	0.0076	6.16472E-05	-0.0022	0.0075
2010/6/11	10.68	10.69	0.0009	6.16472E-05	-0.0027	0.0009
2010/6/17	10.85	10.68	-0.0157	6.16472E-05	-0.0129	-0.0157
2010/6/18	10.68	10.58	-0.0094	6.16472E-05	-0.0157	-0.0094
2010/6/21	10.59	10.79	0.0189	6.16472E-05	0.0302	0.0188
2010/6/22	10.77	10.76	-0.0009	6.16472E-05	0.0038	-0.0010
2010/6/23	10.75	10.77	0.0019	6.16472E-05	-0.0037	0.0018
2010/6/24	10.77	10.76	-0.0009	6.16472E-05	0.0013	-0.0010
2010/6/25	10.73	10.71	-0.0019	6.16472E-05	-0.0029	-0.0019
2010/6/28	10.7	10.67	-0.0028	6.16472E-05	-0.0065	-0.0029
2010/6/29	10.67	10.29	-0.0356	6.16472E-05	-0.0462	-0.0357
2010/6/30	10.26	10.25	-0.0010	6.16472E-05	-0.0039	-0.0010
2010/7/1	10.27	10.19	-0.0078	4.65861E-05	-0.0125	-0.0078
2010/7/2	10.18	10.33	0.0147	4.65861E-05	0.0043	0.0147
2010/7/5	10.27	10.34	0.0068	4.65861E-05	0.0021	0.0068
2010/7/6	10.34	10.43	0.0087	4.65861E-05	0.0231	0.0087
2010/7/7	10.43	10.41	-0.0019	4.65861E-05	0.0075	-0.0020
2010/7/8	10.45	10.38	-0.0067	4.65861E-05	-0.0061	-0.0067
2010/7/9	10.39	10.53	0.0135	4.65861E-05	0.0265	0.0134
2010/7/12	10.52	10.52	0.0000	4.65861E-05	0.0108	0.0000
2010/7/13	10.45	10.36	-0.0086	4.65861E-05	-0.0057	-0.0087
2010/7/14	10.39	10.41	0.0019	4.65861E-05	0.0048	0.0019
2010/7/15	10.41	10.28	-0.0125	4.65861E-05	-0.0158	-0.0125
2010/7/16	10.27	10.21	-0.0058	4.65861E-05	0.0073	-0.0059
2010/7/19	10	10.28	0.0280	4.65861E-05	0.0348	0.0280
2010/7/20	10.25	10.44	0.0185	4.65861E-05	0.0208	0.0185
2010/7/21	10.4	10.44	0.0038	4.65861E-05	0.0009	0.0038
2010/7/22	10.4	10.49	0.0087	4.65861E-05	0.0158	0.0086
2010/7/23	10.52	10.55	0.0029	4.65861E-05	0.0019	0.0028

2010/7/26	10.55	10.56	0.0009	4.65861E-05	0.0043	0.0009
2010/7/27	10.53	10.48	-0.0047	4.65861E-05	-0.0029	-0.0048
2010/7/28	10.48	10.66	0.0172	4.65861E-05	0.0240	0.0171
2010/7/29	10.66	10.75	0.0084	4.65861E-05	0.0039	0.0084
2010/7/30	10.73	10.71	-0.0019	4.65861E-05	-0.0010	-0.0019
2010/8/2	10.71	10.76	0.0047	4.38278E-05	0.0170	0.0046
2010/8/3	10.82	10.62	-0.0185	4.38278E-05	-0.0203	-0.0185
2010/8/4	10.6	10.68	0.0075	4.38278E-05	0.0063	0.0075
2010/8/5	10.67	10.55	-0.0112	4.38278E-05	-0.0083	-0.0113
2010/8/6	10.55	10.67	0.0114	4.38278E-05	0.0173	0.0113
2010/8/9	10.65	10.69	0.0038	4.38278E-05	0.0083	0.0037
2010/8/10	10.68	10.41	-0.0253	4.38278E-05	-0.0301	-0.0253
2010/8/11	10.38	10.39	0.0010	4.38278E-05	0.0095	0.0009
2010/8/12	10.34	10.26	-0.0077	4.38278E-05	-0.0023	-0.0078
2010/8/13	10.27	10.32	0.0049	4.38278E-05	0.0131	0.0048
2010/8/16	10.31	10.46	0.0145	4.38278E-05	0.0248	0.0145
2010/8/17	10.46	10.43	-0.0029	4.38278E-05	0.0051	-0.0029
2010/8/18	10.44	10.39	-0.0048	4.38278E-05	-0.0030	-0.0048
2010/8/19	10.4	10.58	0.0173	4.38278E-05	0.0049	0.0173
2010/8/20	10.55	10.42	-0.0123	4.38278E-05	-0.0153	-0.0124
2010/8/23	10.4	10.35	-0.0048	4.38278E-05	0.0001	-0.0049
2010/8/24	10.35	10.37	0.0019	4.38278E-05	0.0068	0.0019
2010/8/25	10.3	10.23	-0.0068	4.38278E-05	-0.0177	-0.0068
2010/8/26	10.26	10.24	-0.0019	4.38278E-05	-0.0011	-0.0020
2010/8/27	10.25	10.31	0.0059	4.38278E-05	0.0039	0.0058
2010/8/30	10.33	10.35	0.0019	4.38278E-05	0.0141	0.0019
2010/8/31	10.35	10.28	-0.0068	4.38278E-05	-0.0007	-0.0068
2010/9/1	10.28	10.23	-0.0049	4.99583E-05	-0.0082	-0.0049
2010/9/2	10.31	10.31	0.0000	4.99583E-05	0.0012	0.0000
2010/9/3	10.31	10.24	-0.0068	4.99583E-05	-0.0023	-0.0068
2010/9/6	10.3	10.39	0.0087	4.99583E-05	0.0133	0.0087
2010/9/7	10.39	10.35	-0.0038	4.99583E-05	0.0012	-0.0039
2010/9/8	10.34	10.29	-0.0048	4.99583E-05	0.0036	-0.0049
2010/9/9	10.29	10.19	-0.0097	4.99583E-05	-0.0203	-0.0098
2010/9/10	10.21	10.18	-0.0029	4.99583E-05	0.0015	-0.0030
2010/9/13	10.21	10.27	0.0059	4.99583E-05	0.0097	0.0058
2010/9/14	10.28	10.25	-0.0029	4.99583E-05	-0.0023	-0.0030
2010/9/15	10.26	10.2	-0.0058	4.99583E-05	-0.0177	-0.0059
2010/9/16	10.1	10	-0.0099	4.99583E-05	-0.0174	-0.0100
2010/9/17	10.02	9.98	-0.0040	4.99583E-05	-0.0012	-0.0040
2010/9/20	9.99	9.98	-0.0010	4.99583E-05	-0.0054	-0.0011
2010/9/21	9.97	9.99	0.0020	4.99583E-05	-0.0007	0.0020
2010/9/27	9.99	9.99	0.0000	4.99583E-05	0.0122	0.0000

2010/9/28	10	9.94	-0.0060	4.99583E-05	-0.0068	-0.0060
2010/9/29	9.94	10.05	0.0111	4.99583E-05	-0.0009	0.0110
2010/9/30	10.06	10.18	0.0119	4.99583E-05	0.0267	0.0119
2010/10/8	10.26	10.47	0.0205	4.46444E-05	0.0265	0.0204
2010/10/11	10.51	10.78	0.0257	4.46444E-05	0.0207	0.0256
2010/10/12	10.79	11.15	0.0334	4.46444E-05	0.0163	0.0333
2010/10/13	11.14	11.02	-0.0108	4.46444E-05	0.0128	-0.0108
2010/10/14	11.16	11.34	0.0161	4.46444E-05	-0.0065	0.0161
2010/10/15	11.25	11.55	0.0267	4.46444E-05	0.0383	0.0266
2010/10/18	11.52	11.4	-0.0104	4.46444E-05	-0.0119	-0.0105
2010/10/19	11.4	11.44	0.0035	4.46444E-05	0.0227	0.0035
2010/10/20	11.2	11.26	0.0054	4.46444E-05	0.0280	0.0053
2010/10/21	11.31	11.26	-0.0044	4.46444E-05	-0.0089	-0.0045
2010/10/22	11.22	11.12	-0.0089	4.46444E-05	0.0038	-0.0090
2010/10/25	11.12	11.45	0.0297	4.46444E-05	0.0278	0.0296
2010/10/26	11.74	11.56	-0.0153	4.46444E-05	-0.0073	-0.0154
2010/10/27	11.53	11.32	-0.0182	4.46444E-05	-0.0138	-0.0183
2010/10/28	11.32	11.29	-0.0027	4.46444E-05	0.0021	-0.0027
2010/10/29	11.29	11.19	-0.0089	4.46444E-05	-0.0060	-0.0089
2010/11/1	11.22	11.39	0.0152	0.000047625	0.0243	0.0151
2010/11/2	11.42	11.4	-0.0018	0.000047625	-0.0061	-0.0018
2010/11/3	11.4	11.47	0.0061	0.000047625	-0.0123	0.0061
2010/11/4	11.48	11.89	0.0357	0.000047625	0.0157	0.0357
2010/11/5	12.15	11.99	-0.0132	0.000047625	-0.0052	-0.0132
2010/11/8	12.06	12.14	0.0066	0.000047625	0.0040	0.0066
2010/11/9	12.17	11.82	-0.0288	0.000047625	-0.0067	-0.0288
2010/11/10	11.73	11.83	0.0085	0.000047625	-0.0024	0.0085
2010/11/11	11.87	12.74	0.0733	0.000047625	0.0055	0.0732
2010/11/12	12.51	12.54	0.0024	0.000047625	-0.0554	0.0024
2010/11/15	12.54	12.38	-0.0128	0.000047625	0.0048	-0.0128
2010/11/16	12.28	11.57	-0.0578	0.000047625	-0.0430	-0.0579
2010/11/17	11.2	11.35	0.0134	0.000047625	-0.0065	0.0133
2010/11/18	11.34	11.39	0.0044	0.000047625	0.0041	0.0044
2010/11/19	11.46	11.28	-0.0157	0.000047625	0.0033	-0.0158
2010/11/22	11.15	11.18	0.0027	0.000047625	0.0075	0.0026
2010/11/23	11.11	10.86	-0.0225	0.000047625	-0.0157	-0.0225
2010/11/24	10.8	10.95	0.0139	0.000047625	0.0285	0.0138
2010/11/25	11.08	11.18	0.0090	0.000047625	0.0079	0.0090
2010/11/26	11.14	10.98	-0.0144	0.000047625	-0.0060	-0.0144
2010/11/29	10.94	10.97	0.0027	0.000047625	0.0020	0.0027
2010/11/30	10.99	11.07	0.0073	0.000047625	-0.0159	0.0072
2010/12/1	10.98	10.97	-0.0009	7.78639E-05	0.0027	-0.0010
2010/12/2	11.12	11.1	-0.0018	7.78639E-05	-0.0097	-0.0019

2010/12/3	11.13	11.24	0.0099	7.78639E-05	-0.0013	0.0098
2010/12/6	11.33	11.77	0.0388	7.78639E-05	-0.0011	0.0388
2010/12/7	11.64	11.78	0.0120	7.78639E-05	0.0150	0.0119
2010/12/8	11.68	11.56	-0.0103	7.78639E-05	-0.0073	-0.0104
2010/12/9	11.54	11.38	-0.0139	7.78639E-05	-0.0104	-0.0139
2010/12/10	11.31	11.45	0.0124	7.78639E-05	0.0175	0.0123
2010/12/13	11.52	11.95	0.0373	7.78639E-05	0.0266	0.0372
2010/12/14	11.93	11.82	-0.0092	7.78639E-05	-0.0003	-0.0093
2010/12/15	11.79	11.71	-0.0068	7.78639E-05	-0.0072	-0.0069
2010/12/16	11.7	11.69	-0.0009	7.78639E-05	-0.0048	-0.0009
2010/12/17	11.67	11.56	-0.0094	7.78639E-05	-0.0012	-0.0095
2010/12/20	11.55	11.31	-0.0208	7.78639E-05	-0.0187	-0.0209
2010/12/21	11.38	11.52	0.0123	7.78639E-05	0.0203	0.0122
2010/12/22	11.66	11.44	-0.0189	7.78639E-05	-0.0119	-0.0189
2010/12/23	11.44	11.4	-0.0035	7.78639E-05	-0.0069	-0.0036
2010/12/24	11.38	11.42	0.0035	7.78639E-05	-0.0025	0.0034
2010/12/27	11.41	11.16	-0.0219	7.78639E-05	-0.0241	-0.0220
2010/12/28	11.12	11.07	-0.0045	7.78639E-05	-0.0130	-0.0046
2010/12/29	11.08	11.07	-0.0009	7.78639E-05	0.0038	-0.0010
2010/12/30	11.08	11.15	0.0063	7.78639E-05	0.0003	0.0062
2010/12/31	11.06	11.22	0.0145	7.78639E-05	0.0192	0.0144

CHINA OILFIELD SERVICES LIMITED

Time	Opening	Closing	Ri	Rf	Rm-Rf	Ri-Rf
2010/01/04	16.31	15.91	-0.02452	3.1E-05	-0.01596	-0.02456
2010/01/05	15.99	16.33	0.021263	3.1E-05	0.005286	0.021232
2010/01/06	16.32	16.33	0.000613	3.1E-05	-0.0048	0.000582
2010/01/07	16.4	16.11	-0.01768	3.1E-05	-0.02027	-0.01771
2010/01/08	15.98	16.01	0.001877	3.1E-05	0.006686	0.001846
2010/01/11	16.5	16.34	-0.0097	3.1E-05	-0.03094	-0.00973
2010/01/12	16.39	17.02	0.038438	3.1E-05	0.016382	0.038407
2010/01/13	16.75	16.57	-0.01075	3.1E-05	-0.0079	-0.01078
2010/01/14	16.62	17.04	0.025271	3.1E-05	0.010332	0.02524
2010/01/15	17.02	16.81	-0.01234	3.1E-05	0.002912	-0.01237
2010/01/18	16.7	16.96	0.015569	3.1E-05	0.008293	0.015538
2010/01/19	16.9	16.88	-0.00118	3.1E-05	0.00016	-0.00121
2010/01/20	16.91	16.15	-0.04494	3.1E-05	-0.03358	-0.04497
2010/01/21	16.18	16.18	0	3.1E-05	0.003363	-3.1E-05
2010/01/22	15.9	15.8	-0.00629	3.1E-05	0.000489	-0.00632
2010/01/25	15.64	15.65	0.000639	3.1E-05	-0.00362	0.000608

2010/01/26	15.6	15.18	-0.02692	3.1E-05	-0.02566	-0.02695
2010/01/27	15.21	15.11	-0.00657	3.1E-05	-0.01374	-0.00661
2010/01/28	15.12	15.17	0.003307	3.1E-05	0.003499	0.003276
2010/01/29	15.08	14.94	-0.00928	3.1E-05	0.00431	-0.00931
2010/02/01	14.8	14.53	-0.01824	4.32E-05	-0.01428	-0.01829
2010/02/02	14.65	14.47	-0.01229	4.32E-05	-0.0078	-0.01233
2010/02/03	14.61	15.31	0.047912	4.32E-05	0.022107	0.047869
2010/02/04	15.15	15.13	-0.00132	4.32E-05	0.003815	-0.00136
2010/02/05	14.73	15.17	0.029871	4.32E-05	0.001663	0.029828
2010/02/08	15.09	15.28	0.012591	4.32E-05	-0.00044	0.012548
2010/02/09	15.2	15.17	-0.00197	4.32E-05	0.006765	-0.00202
2010/02/10	15.31	15.21	-0.00653	4.32E-05	0.0059	-0.00657
2010/02/11	15.34	15.39	0.003259	4.32E-05	0.00111	0.003216
2010/02/12	15.45	15.4	-0.00324	4.32E-05	0.005648	-0.00328
2010/02/22	15.45	15.33	-0.00777	4.32E-05	-0.00485	-0.00781
2010/02/23	15.33	15.07	-0.01696	4.32E-05	-0.00834	-0.017
2010/02/24	15	15.31	0.020667	4.32E-05	0.021171	0.020623
2010/02/25	15.3	15.44	0.00915	4.32E-05	0.01225	0.009107
2010/02/26	15.39	15.43	0.002599	4.32E-05	-0.00139	0.002556
2010/03/01	15.43	15.74	0.020091	3.74E-05	0.010422	0.020053
2010/03/02	15.8	15.89	0.005696	3.74E-05	-0.0048	0.005659
2010/03/03	15.91	15.92	0.000629	3.74E-05	0.006621	0.000591
2010/03/04	15.91	15.39	-0.03268	3.74E-05	-0.02643	-0.03272
2010/03/05	15.33	15.49	0.010437	3.74E-05	0.001991	0.0104
2010/03/08	15.51	15.6	0.005803	3.74E-05	0.005403	0.005765
2010/03/09	15.59	15.65	0.003849	3.74E-05	0.006123	0.003811
2010/03/10	15.65	15.41	-0.01534	3.74E-05	-0.00741	-0.01537
2010/03/11	15.48	15.95	0.030362	3.74E-05	-0.00171	0.030324
2010/03/12	15.9	15.55	-0.02201	3.74E-05	-0.01352	-0.02205
2010/03/15	15.48	15.17	-0.02003	3.74E-05	-0.0149	-0.02006
2010/03/16	15.07	15.2	0.008626	3.74E-05	0.006307	0.008589
2010/03/17	15.26	15.49	0.015072	3.74E-05	0.018536	0.015035
2010/03/18	15.49	15.55	0.003873	3.74E-05	-0.00319	0.003836
2010/03/19	15.46	15.76	0.019405	3.74E-05	0.00696	0.019367
2010/03/22	15.8	15.71	-0.0057	3.74E-05	0.001421	-0.00573
2010/03/23	15.68	15.64	-0.00255	3.74E-05	-0.00911	-0.00259
2010/03/24	15.68	15.52	-0.0102	3.74E-05	-0.00168	-0.01024
2010/03/25	15.68	15.71	0.001913	3.74E-05	-0.01265	0.001876
2010/03/26	15.65	15.89	0.015335	3.74E-05	0.0149	0.015298
2010/03/29	15.9	16.18	0.01761	3.74E-05	0.019011	0.017573
2010/03/30	16.19	16.17	-0.00124	3.74E-05	0.001557	-0.00127
2010/03/31	16	15.88	-0.0075	3.74E-05	-0.00704	-0.00754
2010/04/01	15.86	15.96	0.006305	3.62E-05	0.012519	0.006269

2010/04/02	16.01	16.12	0.006871	3.62E-05	0.002084	0.006834
2010/04/06	16.23	16.48	0.015404	3.62E-05	-0.00521	0.015367
2010/04/07	16.48	16.33	-0.0091	3.62E-05	-0.00478	-0.00914
2010/04/08	16.28	16.18	-0.00614	3.62E-05	-0.01026	-0.00618
2010/04/09	16.2	16.4	0.012346	3.62E-05	0.009042	0.012309
2010/04/12	16.4	16.24	-0.00976	3.62E-05	-0.01092	-0.00979
2010/04/13	16.2	16.48	0.017284	3.62E-05	0.012197	0.017248
2010/04/14	16.55	16.67	0.007251	3.62E-05	0.002636	0.007215
2010/04/15	16.67	16.54	-0.0078	3.62E-05	-0.00369	-0.00783
2010/04/16	16.4	16.16	-0.01463	3.62E-05	-0.00947	-0.01467
2010/04/19	16.05	15.25	-0.04984	3.62E-05	-0.04141	-0.04988
2010/04/20	15.25	15.15	-0.00656	3.62E-05	-0.00099	-0.00659
2010/04/21	15.26	15.38	0.007864	3.62E-05	0.018146	0.007827
2010/04/22	15.37	15.06	-0.02017	3.62E-05	-0.0066	-0.02021
2010/04/23	15.05	15.09	0.002658	3.62E-05	-0.00278	0.002622
2010/04/26	15.16	15.15	-0.00066	3.62E-05	-0.00738	-0.0007
2010/04/27	15.1	14.66	-0.02914	3.62E-05	-0.01733	-0.02918
2010/04/28	14.5	14.62	0.008276	3.62E-05	0.005492	0.00824
2010/04/29	14.64	14.52	-0.0082	3.62E-05	-0.01765	-0.00823
2010/04/30	14.58	14.77	0.013032	3.62E-05	0.00233	0.012995
2010/05/04	14.62	14.44	-0.01231	4.67E-05	0.004598	-0.01236
2010/05/05	14.25	14.53	0.019649	4.67E-05	0.018268	0.019602
2010/05/06	14.4	13.88	-0.03611	4.67E-05	-0.0392	-0.03616
2010/05/07	13.62	13.38	-0.01762	4.67E-05	0.000274	-0.01767
2010/05/10	13.51	13.5	-0.00074	4.67E-05	0.005533	-0.00079
2010/05/11	13.76	13.09	-0.04869	4.67E-05	-0.03965	-0.04874
2010/05/12	13	13.14	0.010769	4.67E-05	0.013057	0.010723
2010/05/13	13.18	13.33	0.011381	4.67E-05	0.024196	0.011334
2010/05/14	13.15	13.12	-0.00228	4.67E-05	0.000805	-0.00233
2010/05/17	12.9	12.08	-0.06357	4.67E-05	-0.0404	-0.06361
2010/05/18	12.1	12.27	0.01405	4.67E-05	0.02206	0.014003
2010/05/19	12.2	12.05	-0.0123	4.67E-05	0.004762	-0.01234
2010/05/20	11.93	11.92	-0.00084	4.67E-05	-0.00487	-0.00088
2010/05/21	11.68	12.02	0.02911	4.67E-05	0.042255	0.029063
2010/05/24	12.03	12.46	0.035744	4.67E-05	0.030702	0.035697
2010/05/25	12.35	12.25	-0.0081	4.67E-05	-0.01314	-0.00814
2010/05/26	12.12	12.33	0.017327	4.67E-05	-0.00022	0.01728
2010/05/27	12.34	12.56	0.017828	4.67E-05	0.018447	0.017781
2010/05/31	12.48	12	-0.03846	4.67E-05	-0.02194	-0.03851
2010/06/01	11.99	11.83	-0.01334	6.16E-05	-0.0041	-0.01341
2010/06/02	11.74	12.04	0.025554	6.16E-05	0.010271	0.025492
2010/06/03	12.1	11.83	-0.02231	6.16E-05	-0.01199	-0.02238
2010/06/04	11.8	11.96	0.013559	6.16E-05	0.008401	0.013498

2010/06/07	11.7	11.8	0.008547	6.16E-05	0.001011	0.008485
2010/06/08	11.7	11.74	0.003419	6.16E-05	0.00188	0.003357
2010/06/09	11.77	12.17	0.033985	6.16E-05	0.025934	0.033923
2010/06/10	12.1	12.12	0.001653	6.16E-05	-0.00221	0.001591
2010/06/11	12.11	12.22	0.009083	6.16E-05	-0.00271	0.009022
2010/06/17	12.38	12.1	-0.02262	6.16E-05	-0.01295	-0.02268
2010/06/18	12.05	11.84	-0.01743	6.16E-05	-0.01571	-0.01749
2010/06/21	11.85	12.31	0.038819	6.16E-05	0.030202	0.038757
2010/06/22	12.3	12.38	0.006504	6.16E-05	0.003844	0.006442
2010/06/23	12.32	12.26	-0.00487	6.16E-05	-0.00375	-0.00493
2010/06/24	12.26	12.19	-0.00571	6.16E-05	0.001315	-0.00577
2010/06/25	12.18	12	-0.01478	6.16E-05	-0.00292	-0.01484
2010/06/29	11.88	11.31	-0.04798	6.16E-05	-0.04623	-0.04804
2010/06/30	11.09	11.06	-0.00271	6.16E-05	-0.00389	-0.00277
2010/07/01	11.02	10.89	-0.0118	4.66E-05	-0.0125	-0.01184
2010/07/02	10.89	10.79	-0.00918	4.66E-05	0.004341	-0.00923
2010/07/05	10.68	10.6	-0.00749	4.66E-05	0.002067	-0.00754
2010/07/06	10.58	10.77	0.017958	4.66E-05	0.02312	0.017912
2010/07/07	10.77	10.85	0.007428	4.66E-05	0.007517	0.007381
2010/07/08	10.87	10.74	-0.01196	4.66E-05	-0.00606	-0.01201
2010/07/09	10.77	11.1	0.030641	4.66E-05	0.026538	0.030594
2010/07/12	11.09	11.23	0.012624	4.66E-05	0.010832	0.012577
2010/07/13	11.11	11.03	-0.0072	4.66E-05	-0.00573	-0.00725
2010/07/14	11.08	11.12	0.00361	4.66E-05	0.004755	0.003564
2010/07/15	11.09	10.91	-0.01623	4.66E-05	-0.01582	-0.01628
2010/07/16	10.86	10.86	0	4.66E-05	0.00732	-4.7E-05
2010/07/19	10.69	11.14	0.042095	4.66E-05	0.034821	0.042049
2010/07/20	11.21	11.54	0.029438	4.66E-05	0.020821	0.029391
2010/07/21	11.53	11.82	0.025152	4.66E-05	0.000912	0.025105
2010/07/22	11.75	11.92	0.014468	4.66E-05	0.015753	0.014421
2010/07/23	11.93	11.91	-0.00168	4.66E-05	0.001948	-0.00172
2010/07/26	11.9	11.89	-0.00084	4.66E-05	0.004345	-0.00089
2010/07/27	11.89	11.88	-0.00084	4.66E-05	-0.00291	-0.00089
2010/07/28	11.87	12.61	0.062342	4.66E-05	0.023998	0.062295
2010/07/29	12.51	12.5	-0.0008	4.66E-05	0.003864	-0.00085
2010/07/30	12.57	12.91	0.027049	4.66E-05	-0.00096	0.027002
2010/08/02	12.8	13.33	0.041406	4.38E-05	0.017036	0.041362
2010/08/03	13.28	12.94	-0.0256	4.38E-05	-0.02031	-0.02565
2010/08/04	12.92	13.25	0.025542	4.38E-05	0.006282	0.025498
2010/08/05	13.18	13.2	0.001517	4.38E-05	-0.00833	0.001474
2010/08/06	13.2	13.39	0.014394	4.38E-05	0.017336	0.01435
2010/08/09	13.38	13.33	-0.00374	4.38E-05	0.008297	-0.00378
2010/08/10	13.33	12.67	-0.04951	4.38E-05	-0.03009	-0.04956

2010/08/11	12.48	12.68	0.016026	4.38E-05	0.009541	0.015982
2010/08/12	12.49	12.34	-0.01201	4.38E-05	-0.00231	-0.01205
2010/08/13	12.34	12.67	0.026742	4.38E-05	0.013134	0.026698
2010/08/16	12.6	12.96	0.028571	4.38E-05	0.024809	0.028528
2010/08/17	13	13.08	0.006154	4.38E-05	0.005091	0.00611
2010/08/18	13.08	12.98	-0.00765	4.38E-05	-0.00297	-0.00769
2010/08/19	12.98	13.22	0.01849	4.38E-05	0.004931	0.018446
2010/08/20	13.18	12.73	-0.03414	4.38E-05	-0.01533	-0.03419
2010/08/23	12.61	13.09	0.038065	4.38E-05	0.000122	0.038021
2010/08/24	12.9	13.17	0.02093	4.38E-05	0.006768	0.020886
2010/08/25	13.1	12.85	-0.01908	4.38E-05	-0.01766	-0.01913
2010/08/26	12.81	12.79	-0.00156	4.38E-05	-0.0011	-0.00161
2010/08/27	12.85	13.58	0.056809	4.38E-05	0.003861	0.056766
2010/08/30	13.71	14.16	0.032823	4.38E-05	0.014137	0.032779
2010/08/31	14.02	14.14	0.008559	4.38E-05	-0.00072	0.008515
2010/09/01	14.07	14.51	0.031272	5E-05	-0.00817	0.031222
2010/09/02	14.75	14.57	-0.0122	5E-05	0.001201	-0.01225
2010/09/03	14.7	14.49	-0.01429	5E-05	-0.00235	-0.01434
2010/09/06	14.41	14.49	0.005552	5E-05	0.013302	0.005502
2010/09/07	14.48	14.69	0.014503	5E-05	0.001229	0.014453
2010/09/08	14.66	14.73	0.004775	5E-05	0.003644	0.004725
2010/09/09	14.73	14.31	-0.02851	5E-05	-0.02028	-0.02856
2010/09/10	14.31	14.05	-0.01817	5E-05	0.001504	-0.01822
2010/09/13	14.06	14.28	0.015647	5E-05	0.009744	0.015597
2010/09/14	14.35	14.47	0.008362	5E-05	-0.00225	0.008312
2010/09/15	14.47	13.98	-0.03386	5E-05	-0.0177	-0.03391
2010/09/16	13.98	14	0.001431	5E-05	-0.01742	0.001381
2010/09/17	13.99	13.8	-0.01358	5E-05	-0.00122	-0.01363
2010/09/20	13.84	13.82	-0.00145	5E-05	-0.00536	-0.0015
2010/09/21	13.92	13.86	-0.00431	5E-05	-0.00073	-0.00436
2010/09/27	13.9	14.2	0.021583	5E-05	0.01218	0.021533
2010/09/28	14.22	14.21	-0.0007	5E-05	-0.00682	-0.00075
2010/09/29	14.18	14.44	0.018336	5E-05	-0.0009	0.018286
2010/09/30	14.35	14.42	0.004878	5E-05	0.026711	0.004828
2010/10/08	14.63	15.13	0.034176	4.46E-05	0.026452	0.034132
2010/10/11	15.12	16.08	0.063492	4.46E-05	0.020713	0.063447
2010/10/12	16.1	16.29	0.011801	4.46E-05	0.016322	0.011757
2010/10/13	16.28	16.19	-0.00553	4.46E-05	0.012763	-0.00557
2010/10/14	16.21	16.28	0.004318	4.46E-05	-0.00651	0.004274
2010/10/15	16.19	16.58	0.024089	4.46E-05	0.038323	0.024044
2010/10/18	16.55	16.37	-0.01088	4.46E-05	-0.01189	-0.01092
2010/10/19	16.35	16.69	0.020795	4.46E-05	0.022725	0.02075
2010/10/20	16.05	16.52	0.029283	4.46E-05	0.027998	0.029239

2010/10/21	16.61	16.49	-0.00722	4.46E-05	-0.00886	-0.00727
2010/10/22	16.53	16.22	-0.01875	4.46E-05	0.003836	-0.0188
2010/10/25	16.16	16.95	0.048886	4.46E-05	0.027778	0.048841
2010/10/26	17.31	17.33	0.001155	4.46E-05	-0.00732	0.001111
2010/10/27	17.08	16.54	-0.03162	4.46E-05	-0.01382	-0.03166
2010/10/28	16.58	16.31	-0.01628	4.46E-05	0.002097	-0.01633
2010/10/29	16.29	16.46	0.010436	4.46E-05	-0.00601	0.010391
2010/11/01	16.62	17.42	0.048135	4.76E-05	0.024312	0.048087
2010/11/02	17.7	17.92	0.012429	4.76E-05	-0.0061	0.012382
2010/11/03	17.94	17.4	-0.0301	4.76E-05	-0.01229	-0.03015
2010/11/04	17.6	18.09	0.027841	4.76E-05	0.015724	0.027793
2010/11/05	18.69	19.63	0.050294	4.76E-05	-0.00519	0.050247
2010/11/08	19.63	19.89	0.013245	4.76E-05	0.004021	0.013197
2010/11/09	19.95	20.22	0.013534	4.76E-05	-0.00667	0.013486
2010/11/10	20	21.44	0.072	4.76E-05	-0.00235	0.071952
2010/11/11	21.08	22.57	0.070683	4.76E-05	0.005464	0.070635
2010/11/12	22.52	21.12	-0.06217	4.76E-05	-0.05537	-0.06221
2010/11/15	21.04	23.02	0.094106	4.76E-05	0.004848	0.094059
2010/11/16	22.9	23.3	0.017467	4.76E-05	-0.04295	0.01742
2010/11/17	22	20.98	-0.04636	4.76E-05	-0.00651	-0.04641
2010/11/18	20.94	20.57	-0.01767	4.76E-05	0.004106	-0.01772
2010/11/19	20.65	21.99	0.064891	4.76E-05	0.003323	0.064843
2010/11/22	21.7	22.64	0.043318	4.76E-05	0.007487	0.04327
2010/11/23	22.65	21.15	-0.06623	4.76E-05	-0.01567	-0.06627
2010/11/24	20.91	21.77	0.041129	4.76E-05	0.028457	0.041081
2010/11/25	22.02	22.52	0.022707	4.76E-05	0.007929	0.022659
2010/11/26	22.35	22.05	-0.01342	4.76E-05	-0.00605	-0.01347
2010/11/29	21.8	21.65	-0.00688	4.76E-05	0.001997	-0.00693
2010/11/30	21.3	21.98	0.031925	4.76E-05	-0.0159	0.031877
2010/12/01	21.6	20.95	-0.03009	7.79E-05	0.002723	-0.03017
2010/12/02	21.45	20.11	-0.06247	7.79E-05	-0.00971	-0.06255
2010/12/03	20.11	19.4	-0.03531	7.79E-05	-0.00127	-0.03538
2010/12/06	19.43	20.11	0.034997	7.79E-05	-0.00112	0.03492
2010/12/07	19.88	20.66	0.039235	7.79E-05	0.015023	0.039158
2010/12/08	20.45	21.44	0.048411	7.79E-05	-0.00728	0.048333
2010/12/09	21.48	21.31	-0.00791	7.79E-05	-0.01042	-0.00799
2010/12/10	21.3	22.49	0.055869	7.79E-05	0.017493	0.055791
2010/12/13	22.6	24.74	0.09469	7.79E-05	0.026598	0.094612
2010/12/14	25	24.85	-0.006	7.79E-05	-0.0003	-0.00608
2010/12/15	24.7	24.41	-0.01174	7.79E-05	-0.00715	-0.01182
2010/12/16	24.38	24.23	-0.00615	7.79E-05	-0.0048	-0.00623
2010/12/17	24.18	23.7	-0.01985	7.79E-05	-0.00121	-0.01993
2010/12/20	23.66	23.96	0.01268	7.79E-05	-0.01871	0.012602

2010/12/21	24.02	26.21	0.091174	7.79E-05	0.020273	0.091096
2010/12/23	25.56	24.41	-0.04499	7.79E-05	-0.00695	-0.04507
2010/12/24	24.01	22.98	-0.0429	7.79E-05	-0.0025	-0.04298
2010/12/27	23.11	23.14	0.001298	7.79E-05	-0.02413	0.00122
2010/12/28	23.09	23.04	-0.00217	7.79E-05	-0.01301	-0.00224
2010/12/29	23.06	24	0.040763	7.79E-05	0.003824	0.040685
2010/12/30	23.9	25.24	0.056067	7.79E-05	0.000265	0.055989
2010/12/31	25.09	25.54	0.017935	7.79E-05	0.019215	0.017858

All the data sets gathered for this study are listed in the format above. Due to the complication and un-necessity of repeating, the more detailed information will not be provided. However, the data is available also in China's stock market.