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Development of global stock markets: case of 2015 China's crisis.

Dissertation

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Lyon 31.08.2016

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Statement of originality

To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

In Lyon: 31. 08. 2016

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Abstract

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The world has been globalized. Free movement of goods, services and capital has caused a time of prosperity and peace. Yet it might seem, as people are afraid. Large investments, incentives and mutual aid are standing on the scale pan against growing nationalism, protectionism and a fear from unknown. Once strong national states wanting to influence developing economies are now under a pressure from those developing countries and trying to manage themselves in the global world. The year of 2015 showed that what appeared to be Chinese crisis only, has far bigger consequences than everyone expected and that education, critical thinking and realization that everything is interconnected has become more important than ever before. Theoretical part of the literature overview focused on stock markets and business cycles. The empirical evidence of connection among world financial markets and business cycles is provided.

Analytical part aims to determine whether and if so, then how big of an impact the crisis had on selected stock markets and commodities. Data were precisely selected, and compared in statistical and econometrics calculations with additional valuables as exchange rate of USD and CNY. Hypotheses were selected and thus that the Chinese crisis had significant impact on selected markets and commodities. Concerning the conclusion, Chinese crisis did meet the assumptions and had a significant impact on Dow Jones Industrial Average, Standard & Poor's 500 and NYSE Oil & Gas index. However, the impact on NYSE Gold index was not proven.

Keywords

Stock markets, subjects of trading, stock market indexes, business cycles, China, Shanghai stock exchange, 2015 Chinese crisis.

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1 Introduction

1.1 Introduction

Financial markets, stocks, bonds and commodities are no longer vocabulary reserved only for the Wall Street elite bankers, but rather, they are a set of terms that most people in 21st century encounter on a daily basis. Financial markets are systems, which assure large amounts of options for investors to increase their financial wealth by redistributing their available funds among those who can use them to achieve their business objectives. Personal finance and investment portfolios have therefore become a part of everyday life. New trading methods, trends and strategies, combined with high-speed online accessibility, are often focused on the promises of minimal risk and maximal profit for some individual investors who do not want to hold their disposable funds. However, investors must not forget that markets hold great threats and risks. Volatility of bonds and stocks as well as interest rates, or fast changes on the political scene affect financial markets indeed. Twists on financial markets impacts currency markets, currency markets influence fiscal and monetary decisions, in turn, shifting entire government agendas. The opportunity to increase profits significantly includes a great responsibility and urgency for financial literacy and risk management, and as could be observed during 2015 Chinese crisis, not everybody is ready.

Investments have inevitable consequences on the growth, decline, or stagnation of the gross domestic products of individual countries. The buying decisions of households – investments and possible failure as redistribution of money by final consumers are related to expected revenues, uncertainty of the future and economic crises. The development of the information technology field augments the globalization of financial markets and thus, expands the amount of participants. When people without financial literacy partake in these markets, they are more likely to forfeit and be sceptic during recessions and fluctuations. Shareholders will sell their shares due to paranoia evoked by media outlets. This in turn

leads to deeper fiscal issues in households, while professional traders and investors are able to make profits at the same time. This trend is intertwined with individual indebtedness, which is one of the most important factors of development in the current global financial system.

The highest increase of individual investors can be seen in China, to the dismay of many countries, is a global superpower. According to Goldman Sachs, the Chinese economy has the potential to be three-times bigger than the economy of the United States (Goldman Sachs, 2003). Even nowadays, there is perhaps no major country that does not manufacture or trade with China. China has a long reputation and even Napoleon Bonaparte once remarked, “China is a sleeping giant. Let her sleep, for when she wakes she will move the world” (The British Gazette, 2014). The awakening of the giant happened in the late of 80s of the last century. The Chinese economy has been growing rapidly for the past 25 years since its opening in 1979 and its GDP per capita growth rate increased from an average 0.4% per annum in the 1960s to an average of 8.4% in 1990s. It then reached its maximum of 13.6% in 2007. As a result, Chinese citizens in 2000 enjoyed an average income close to \$900 USD per capita, which lifted millions of Chinese above the poverty benchmark of \$2 USD per day. Additionally, in just one decade, the average income has doubled more than five times to \$4,755 USD in 2012 (Groenewold, et al., 2004).

If China had maintained its growth rate at the 8% level, its per capita income would have doubled in less than 9 years and in 2030, it would have reached \$7,200 USD. This number is higher than any Latin American or African country today; however, this did not happen (Groenewold, et al., 2004). Chinese growth has slowed in response to a capital flow reversal and an overvalued currency. In June 2015, Shanghai’s stock exchange experiences the biggest downfall in its history. During the first 3 weeks, the market fell by 30% and was labelled the next financial crisis by IMF (International Business Times, 2016). The crisis had a W-shaped form and another drop between 17th and 26th August cut another almost 30% from the cake. China however, was able to recover by the end of December 2015 and had outperformed S&P for 2015, though still well below the June 12

highs. Near to the end of 2015, the Shanghai Composite Index performance was again up to 12.6%. Nonetheless in January 2016 the Chinese stock market experienced yet another downfall when the market fell 7% and later 5%. The situation by February 2016 caused a loss of more than 3 trillion dollars in value and attention of all world leading financial experts expecting large consequences on western economies. The thesis proves that the consequences came.

China's spectacular growth over the last 25 years is linked to its market-oriented reforms. Despite the success of these reforms, the Chinese government faces continuing challenges in its efforts to sustain its current high level of growth. The overall Chinese society, however, is believed to have an inadequate financial knowledge and most people's savings are in current accounts with low interest rates, passbooks, term deposits or some are still holding large amount of cash. As Chinese progress has carried on, people invested money into housing. New government policies, however, pushed millions of ordinary people to stock markets as an attempt to prevent another housing crisis after 2008. This and other unacquainted behaviour lead to the market fail, the question thus emerges: how bad is the situation?

This dissertation was chosen to examine how China's growing influence alters global markets. Despite the fact that China still belongs among the list of developing countries in the world, this dissertation disputes the claim and tries to prove China as one of the most important global players in the stock market world that affects global markets and traditional commodities. The significance of this dissertation lies in financial market field. Therefore, this topic also carries personal interest due to the fact that the author would like to deepen his knowledge about stock exchanges and expand his investment options leading to a future portfolio.

1.2 Aim

First aim of this thesis is to analyse the basic principles of the stock markets¹ and trading on the stock exchange that every individual investor should know. This serves as a contribution to financial literacy aforementioned in the introduction. Afterwards, the thesis aims to describe and analyse influences that have an impact on stock trading and market fluctuations. The thesis grapples with modern trends in trading and building a portfolio. Financial leverage is explained.

The main goal is to characterize the impact of 2015 Chinese stock market crisis on particular indexes and commodity market. The dissertation elaborates a dependence of the Dow Jones Industrial index and S&P 500 index on Shanghai SHCOMP index. Later the Dow Jones indexes for gold and oil and SHCOMP commodity index. The DJ and S&P were chosen deliberately as representatives of the western financial sector as changes in those markets have direct impact on other American and European markets. Eventually, the author summarizes and comment on all measured and discovered results.

The assumptions are that:

- 1) The events in China had a significant impact on global market indexes
- 2) The events had a significant impact on the commodities

The term significant impact is then defined subjectively by the author to the extent that all forecasted parameters will be significant by statistical rules and the level of influence of the Shanghai index will be equal or greater than 25% on examined indexes.

¹ The stock markets are also known as the Equity markets. The dissertation keeps the first term for clarity.

1.3 Methodology

The dissertation is divided into two parts, theoretical literature review and practical empirical part.

The theoretical part is written as a descriptive literature review using different professional literature and academic articles, which contain secondary data already published in various resources. Using the descriptive method, the basic characteristics of stock markets, trading systems, indexes and business cycles are introduced. Their classification and factors influencing their development.

The practical part firstly describes Chinese economy as the author finds necessary to present data in political and economic context, later computations are done using the author's own analysis of the stock market and commodity market data by using their indexes. Data are organized and analytically analysed using deduction and comparison method with the Gretl software, which with the author is accustomed to use.

Working hypothesis are that:

- Events had a significant impact on global market indexes
- Events had a significant impact on the commodities

The analysis is made by indicators which influence the rise and thus profitability of commodities and shares. As a representative of the stock markets were elected Dow Jones Industrial and S&P 500 indexes for their volume and best description of the situation on markets throughout history. These indexes are compared with Shanghai's SHCOMP index representing fluctuation on Chinese market. The commodities are analysed through supply and demand on particular charts. The data are compared on a daily basis during 1 year period from 1st January 2015 to 31st December 2015.

The analysis are completed using statistical and econometric methods, precisely the Correlation analysis and Ordinary Least Square method in Gretl software, which is used for econometric analysis and can be freely downloaded.

Correlation analysis is a method used to discover statistical dependence between two economic variables. The subject of the analysis is not a prediction of future values but identification of dependence between two variables. The pre-condition is a two-dimensional normal distribution of continuous variables. To analyse dissertation's time series, the Pearson correlation coefficient is used, which reflects the degree of stochastic dependence of the variables and is expressed as a proportion of mutual variance and sample variance of selected variables.

$$r_{xy} = r_{yx} = \frac{S_{xy}}{S_x * S_y}$$

Where:

X = different stock and commodities indexes in time

Y = SHCOMP index

The result are interpreted as following:

Power of correlation	Value of coefficient
Little	0.1 – 0.3
Medium	0.3 – 0.7
High	0.7 - 1

Table 1: Correlation power

Regression analysis is used as a next method to identify and prove dependence between variables. The best possible equations are identified to assume relationship between the variables. General regression equation has following form:

$$\gamma = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where:

γ = dependant variable, SHCOMP index

$X_{1,2}$ = explanatory variables, Dow Jones Industrial and S&P 500

ε = stochastic variable

The positive correlation is expected as author assumes that with positive change of SHCOMP, Dow Jones Industrial and S&P 500 will move the same direction. For dependence of the relationship Ordinary Least Square method is used.

LITERATURE REVIEW

Literature review debates published information in a particular subject area in summery and composite pattern. A summary gives a recapitulation of the important information of the sources and synthesis is their re-organization in order to introduce and educate readers about a problem which are elaborated in later parts.

In literature review of this thesis the author writes about introduction to stock markets trading. One of the aims of the thesis is to educate readers and potential investors with practical knowledge of how stock markets work. This education includes historical moments, general and specific market characteristics, subjects of trading, stock market indexes overview and introduction to world crises. It is a source ground after which the readers will be able to understand and critically evaluate following parts.

2 Stock markets

“Stock market is a market in which shares of publicly held companies are issued and traded” (Investopedia, 2016). The stock markets are said to be one of the main components of free-market economy as it is a place through which private saving finances meet potentially profitable investments when investors allocate their limited funds via buying enlisted companies’ stocks.

As any other market in free-market economy, a stock market works on the supply and demand base, results base and the trust base. If for example there is a limited number of shares to buy, their price increases provided that there is a demand, or if a company is having a successful year, and is coming out with a new products or its results are skyrocketing, the investors will automatically want to be part of the company with investment of profit-oriented expectations. Thereby the stock markets make possible to expand a small initial sum of money into successful high profit investment.

Financial markets have developed rapidly over the last century. The first chapter therefore analyse and summarize critical points of their structure.

2.1 Historical milestones

A well-known fact is that the banking business started in Italy in the 12th Century in the cities of Florence and Venice. In this time merchants who had ran maritime trade first concluded securities transactions in the Italian consular houses called Loggias in order to raise money for the trade and fleet. The subjects of trade were bills of exchange, which represented safe and inexpensive means of money transfer between different places and different entities (Müller, 2010).

A less known fact is, that the original place was called bursa² which in Latin means a leather sack, and started to being used in the 14th century when a Belgian

² In some countries this name for a stock exchange prevailed as for example in Italy Borsa, Czech Burza, French Bourse or Russian Birza.

family Van der Buerse, which had three leather sack as their coat of arms, allowed merchants from Florence, Venice or Norway to make business deals in front of their house in Bruges. The basic function used to lie in transformation of savings into investments, meaning allocation of the surplus units to the deficit ones (RM-SYSTÉM Czech Stock Exchange, 2008).

The first modern stock exchange was established in 1531 in Antwerp. Brokers met moneylenders to deal business when the government and individuals issued promissory notes and bonds and offered them to moneylenders who could choose in which person or institution they want to invest. Even though there were still no official shares, this is the place of birth of modern stock exchange structure.

The modern-like stocks with dividends and official requisites started in 1600s during the trades with Asia respectively East India trading company. Sea voyages coming back and forth heavy loaded with Asian treasures often struggled with pirates, weather and poor navigation. Ship owners thus sought investors who would finance the voyage in return for a percentage of their cargo if the voyage was successful. When the East India companies were established, they put out their stocks that would pay out dividends on all the treasure from all the voyages the companies had made. This allowed the companies to demand more money and build larger fleets and eventually pay out more for their investors. Newly formulated pack resembled what could be called joint stock companies of old days. (Investopedia, 2015)

This started an organized secondary securities market and more stock exchanges were established afterwards as the London stock exchange in 1773 and New York in 1792 (Beattie, 2015). The difference lied in the law restrictions as the New York had dealt in the trading of stocks for better or worse, however London with law restricting shares only. Even though the NYSE was not the first stock exchange in the United States, that was actually Philadelphia, NYSE had built its reputation and thanked to its strategical position on Wall Street took over the American trade. Later on in 1971, the NASDAQ entered the market with a very different style of the exchange when it does not inhabit any physical space but it is a network of computers that execute trades electronically (Investopedia, 2015).

Liberalization and integration, which were mottos of capital markets in the end of 20th century, were possible to observe on stock markets as well. Liberalization facilitated admission to the markets that resulted in better competition and easier access to capital. The financial activity on the markets was boosted also by the fact that the number of people on earth doubled and most of them in Asia (Rády, 2011). Since that time, Asia has been conjugated as the biggest financial threat for Europe and North America, especially in context of so-called Asian tigers. Due to this events new markets has emerged and gained importance as those in Japan, South Korea and China, which is the point of our interest.

The Chinese stock exchanges might seem to be very young as it dates only back to 1990 when it took the western-standard layout after being interrupted for many years by the Communist revolution. At the end of 20th century China was transformed from a poorly, centrally planned economy into the world's fastest-growing major economy and taken together China's two stock markets, it ranks second in the world as far as market capitalization is concerned just behind the NYSE. More details about the Chinese stock markets lies in chapter 6.

2.2 General market characteristic

Most stock trades on market exchanges, which are physical or electronical places, where buyers and sellers meet and decide on price. Also, the markets usually have two different structures, first are the call markets and others the continuous markets, depending on time when their stocks can be traded. Call market collects bids over a period of time and then traded at a specific time and more importantly at one price. More commonly used variant is the continuous version when buyers and sellers bid on continuous basis and the price is constantly moving, biggest international markets are using this variant. But whether a market is international or local, call or continuous trading can be divided into two main sections: the primary market and the secondary market.

2.2.1 Primary and Secondary market

The primary market is a place where new issues of corporations or governments are first sold through initial public offerings and it is the investors' first chance to purchase a new security. The primary markets are facilitated by underwriting groups, which are temporary associations of investment banks who wish to purchase a new issue of securities directly from an issuer³. By doing that, they set the beginning price to the security. The investment banks are making profit on the difference between the purchase price and the resale price to the secondary market. This is known as the underwriting spread (Investopedia, 2015).

Once the securities are sold to the public through the primary market any subsequent sales of the stocks or bonds takes place at the secondary markets such as the NYSE, NASDAQ or SSE. Although the price on the primary market is set by the banks and is the result of complex calculations, the prices on the secondary markets are determined by the supply and demand of investors who trade among themselves, not directly with the issuing company that is not involved in any transactions at all. The secondary market can be further divided into auction market and dealer market (Investopedia, 2015).

An auction market as the NYSE is a market in which traders are in one area and announce the prices at which they are willing to buy (bid) or sell (ask). "Thus, the best price of a good need not be sought out because the convergence of buyers and sellers will cause mutually-agreeable prices to emerge" (Investopedia, 2015). On the other hand, a dealer market as NASDAQ connect investors through electronic network with dealers. Dealers hold an inventory of particular market stocks and buy or sell with market participants. The competition between dealers should provide the price for investors (Investopedia, 2015).

³ A company who wants to issue their shares.

2.2.2 Over-The-Counter Market

The Over-The-Counter Market otherwise known as the OTC is a dealer network used by non-listed, usually small companies, which do not meet the requirements to be enlisted on exchanges such as NYSE. Thereby are considered riskier and less transparent but possibly more profitable.

OTC is a decentralized market for example OTCBB or PK in which unlisted securities are being trade. The OTC market does not have a physical location, the prices are negotiated and trades can be made just between two parties without others knowing the price while trades are made by using computers or telephone networks. Dealers act as market makers and quote prices in which they want to buy and sell. In the markets dealers trade with corporations as well as within each other (Investopedia, 2015).

2.2.3 Capital Gain

A capital gain refers to the increase in value of hold capital assets or an investment security upon its sale. In common world if investors sell their stocks for higher price than they had paid for them, they realise a capital gain. Capital gains are usually reported in tax return on income tax (Investopedia, 2015).

The income tax brackets are usually dependable on the length for which the stock were hold prior to their sale. If the period is less than one year, the common practice is to tax this capital gain on the level of usual income. If it is hold for more than one year prior to sale, the tax burden usually diminishes or becomes zero. This should discourage investors to realize short-term speculative trades and conversely promote entrepreneurship and investment (KELLER, 2012). As an example in the Czech Republic, the capital gains are taxed by 15% but if the period between buying and selling exceed 6 months, capital gain is free of tax by §4 income tax law.

2.2.4 Dividends

An investor can make profit via selling his stock for higher price than he bought them or via holding them over the Day D, which is a day when a company decides whether, and if so then how much it would pay out on dividends. A dividend is a distribution of a portion of a company's earning in form of cash, stocks or other property. If a company is doing well and operates with positive retained earnings, the surplus can be invested or distributed in the form of dividends to company's shareholders. The more shares an investor owns, the larger the proportion of the profits he gets. If a company is struggling or not making profit at all, the board of directors may not pay out dividends at all or in lower amount. In case of a bankrupt, an investor will receive what is left after all company's creditors have been paid (Investopedia, 2015).

2.3 Speculation

Actors are entering the market with the aim to make a profit. Two basic types of speculation are one bidding for an increase (buy or bull) and the other one bidding for decrease of market prices (sell or bear).

A bull market or a bull stock is one, which is naturally increasing as the economy is in a good shape. If the GDP is glowing, the market is growing. Picking stocks during the bull period is easier as everything is increasing. Unfortunately, the bull state cannot last forever and as the business cycle pass its peak the stocks are going down.

A bear market happens when the economy is performing badly generally in the recession and slump part of the cycle. The investors then can perform two types of speculations, stabilizing and destabilizing. If an investor is buying declining commodity with the expectation of future incline, we talk about stabilizing. If an investor is selling with the expectation that the commodity is going to further decline, we talk about a destabilizing investment.

2.4 Financial leverage

Leverage is a ratio of the amount which was needed to implement a trade in relation to the size the transaction. This allows for each unit of assets trade many more units depending on the size of one's leverage (Hartman, et al., 2009 p. 19).

In the reality a bank or a broker lend money in a certain ration for a margin. Investor who cannot enter a market because of his limited assets is then allowed to realize the investment. Alternatively, can reach a bigger deal. For example, if the leverage is 1:100 and the value of a contract is \$100 000 a client needs only \$100 to seize the contract. An investor then can reach much higher profit for lower risk.

2.5 Contracts for difference

The Contracts for difference, in other term CFDs are deposit investment instruments traded on the London interbank market listed on leading European, American and Asian shares and indexes. It allows traders to participate in price movements of securities or commodities without taking full ownership of the underlying asset.

CFD thus enable investors to realise profit from a falling or rising market due to the ability to trade both sides of the market based on equities and share indices. With the CFD an investor is trading at the underlying market prices and has an ability to trade the market from the long or short side, capitalizing from falling prices. "A CFD is a contract then, not a tradable instrument. It is an agreement between a buyer and a CFD provider (who acts as the counterparty seller) to exchange the difference between the purchase price of the CFD and the price at which it is sold. The buyer of a CFD will profit if the underlying instrument on which the CFD is based rises on price and a seller will profit if the price falls. Buying or selling a CFD is a proxy for buying or selling the underlying instrument. For the buyer, the benefits of a price in the underlying instrument will be passed on directly by the CFD provider " (Norman, 2009 p. 3).

In practical terms investing via the CFDs creates similar profit and loss opportunity as trading stocks in traditional way but thank to using leverage, short selling (benefits from falling stock prices) and no interest paid for intra-day trading the CFDs are generally safer and quicker. In the other hand a CFD trader has no shareholder rights, he is not buying shares of a particular company, and he is bidding on the difference of the CFD of the company. CFDs position must be closed with the same broker they were opened with and if an investor decides to carry on in more days and interests are introduced (Makod, 2014).

For example, if an investor thinks a given company will rise from its current share price \$6, buys 1000 CFDs at the price assuming rising to \$7 where he will sell his 1000 CFDs purchased earlier. Profit makes \$1000 excluding any commissions. If the investor thinks the share price will fall to \$5, he will close his CFD position by buying back the 1000 CFDs, the profit is the difference between where he sold it short and where he bought it back. In this case, it is again \$1000 excluding any commissions due.

2.6 Brokers

Brokers are specialist market makers for stocks, they post bid and ask price and trade with shares. There are several types of brokers as for example a commission broker who works for a company that is a member of the exchange and sell or buy for clients or floor brokers who are independent and buy or sell for their own account.

There are also several orders that brokers can make. Apart from the market order which is simply to buy or sell for the best price, there are several others as limit order, short sale or stop loss order. For example, the limit order are pre-set orders in attempt to maximize investors' profits by buying or selling stocks at a specific price e.g. if the sell limit order is \$20 and a stock price is \$15, once the stock reaches the border a broker will automatically sell. Same with the low range as if the minimum is 13, once is reached the broker sells. This can prevent loss in case of absence or data shortage (Profits Run, 2014).

Short selling is characterized with gaining profit by selling not-owned shares betting on expectation of stock decline. For instance, an investor expects a certain stock to go down, but he does not own the share. Broker then sells the share from his inventory or from someone else who owns the share. Afterwards broker buys the share back for moved (presumably lower) price (Wall Street Survivor, 2011).

2.7 Other important terms

Beta – term Beta symbolize a measurement of the relationship between the movement of a whole market and the price of a stock of that market. If stock A has a beta 5, it means that for every 1 point move in the market, the stock A moves 5 points and vice versa (Sykes, 2013).

Blue chip stock – A blue chip is the nickname for a stock that is thought to be safe and entrenched as a leader in its field. Blue chips generally have very consistent uphill performance, are well established with good reputation or pay large amount of dividends. Examples can be Coca Cola, Procter and Gamble or Walmart. Sometimes Dow Jones index is marked as a blue chip index as it follows 30 most established, trusted and industry leader stocks (Sykes, 2013). Even though the blue chip is marked as the safest investment it does not meant that their companies couldn't have problems or even bankrupt. General Motors or Lehman Brothers are examples.

Execution – if an order of buy or sell has been completed. If someone orders 50 shares and all of them have been bought it means that the order was executed.

Rally – a rapid increase or decrease in price of certain stocks or a whole market.

Hedge - to Hedge means to attempt to insure yourself against a negative event happening. If an investor owns an ABC fund in hi portfolio, he can insure himself against its crash by investing in XYZ, which is negatively correlated with ABC. If one goes up, the other goes down. Other option is to buy a Put option, which protect investor against a short-term loss by allowing the buyer to sell his stocks by a set price in the future.

3 Subjects of trading

The previous paragraphs outlined the development and characteristics of the stock markets. Very important thing, however is to say, what kind of subjects are being trades on the markets. It is the subjects of trading which represent the markets and the markets' condition is going to be analysed right through the subjects in the analytical part.

3.1 Common Shares

As it has been described, that there are two ways how a company can raise capital, it can do it by borrowing money, which is debt, or by selling shares of itself and allow investors to become partial owners. Stock are the very first subject of trading in the history of markets. Stocks of a company are sold in units called shares.⁴ A firm that decided to be a joint-stock company enlist its shares onto a market. One who buys a share of stocks becomes a part owner in the company with a claim on every asset in earnings. As company's earnings improve, investors are willing to pay more for the stock (CNNMoney (New York), 2015).

Among features that stock proved belong a claim for dividends and limited liability. Limited liability of stocks means that owners of a company's stocks do not personally liable for company's debt respectively its pay-out. The maximum value an investor can lose is the value of his investment.

As there are thousands of different stocks to choose from, investors usually divide into three main categories, shares linked to company's size, style or sector.

⁴ However the difference between stocks and shares has become almost non-existing and the difference does not have any legal or tax impact (Tradimo, 2016), (Investopedia, 2016).

3.1.1 Size

A company's size refers to its market capitalization, meaning product of the current share price and the total number of shares outstanding. This number gives a hind of how much is the whole company is worth. "Companies with large market capitalizations, or "large-cap" companies tend to be established and stable, but because of their size, they have lower growth potential than small caps" (CNNMoney (New York), 2015).

In the long run companies with smaller capitalisation tend to rise at a faster pace as they usually promise new investment over their special product or service (ŽÁK, 2002).

3.1.2 Style

Style refers to stocks' potential which is lined to company's feasibility. The stocks themselves doesn't say if the company is growth company or not, but the circumstances around, as for example technological companies in the 1990s. Growth stocks race higher when times are favourable, tend to drop faster if the circumstances change, which was given by reason, that modern technologies tend to expand more during economic growth rather than recession (CNNMoney (New York), 2015).

Another type is a cyclical company, makes something that isn't in constant demand throughout the business cycle. For example, steel makers usually rise when the economy goes through expansion expecting builders to put up new offices, halls, skyscrapers and consumers to buy new material goods as cars or kitchens. However, during a recession their sales lag too. Cyclical stocks tend to change their value more often as investors are trying to foresee next upturn or downturn (CNNMoney (New York), 2015).

3.1.3 Sector

Standard & Poor's breaks stocks into 10 sectors and dozens of industries. Different things, not only a business cycles but also natural catastrophes or new discovery in the medical field, affect different sectors. Some therefore can be doing well at a certain moment while others are not. "In most cases, finance, healthcare and technology tend to be the fastest growing sectors, while consumer staples and utilities offer stability with moderate growth. The other sectors tend to be cyclical, expanding quickly in good times and contracting during recessions." (CNNMoney (New York), 2015).

3.2 Preferred Stocks

As it has been described one of the main differences between debt financing which is represented by loans and bonds and equity financing represented by shares is the risk. The bonds, which are described later on, are a low risk tool while the common shares are the highest risk tool. The Preferred Stocks are in the middle of the risk. Preferred Shares pay dividends, they represent a proportional piece of equity in a business but by issuing this type of shares, company's equity remains the same and is effected only if the company fails. Preferred Shares' market prices are therefore derived from their interest rate. Preferred Shares also receive their fixed dividend payments before the common shareholders but after the bondholders receive their coupons (Investopedia, 2015).

Preferred Shares have a Certificate of Designation where the specific condition of a particular Preferred Share are written, such as it may have a fixed term and they are terminated by act of buying it back, and for example fixed or adjustable dividend rate. Therefore, the purpose of Preferred Stocks is to raise money for the company with the flexibility of not to make or delay payments to the end of the term, and to retain equity of the business for common shareholders in the long run because by issuing Preferred Shares equity of a business remains the same (Pysh, 2012).

3.3 Bonds

A security in the debt world is a bond and even though bonds are not being traded in Stock Exchanges, the author decided to describe them shortly for better understanding of shares. Issuing stock is equity financing and does not require to pay back the money or interest payments. Bonds however guarantee the return of your money with promised interest payment. Bonds are therefore less risky with their return guaranteed. Low risk is then reflected in low, fixed earning.

3.4 Reading a stock table

As one of the main goals of the dissertation lies in education and knowledge flow, the author finds important to explain the stock table, as proper reading of the table could have avoided the Chinese crash, which is described later on.

Figure 1: Stock table Chegg, Inc.



(Yahoo Finance, 2016)

Chegg, Inc. Refers to the name of the stock

CHGG Is a ticker symbol. Each company has its own unique symbol and the symbol is assigned to by the stock exchange on which the stock is traded.

NYSE The symbol right after the ticker refers to the stock exchange that this company is traded on.

-
- 4.67 Represents the current price with the current gains or losses on the stock during the latest trading session.
- Prev. Close: Indicates the closing price of the stock during the last trading session.⁵
- Open: Refers to the stock's opening price at the current session. The opening price and previous close may not be the same that is given by possible events that occurred between the sessions as positive earnings announcement and the after-hours trading which are reserved for special investors.
- Bid: The offering price at which buyers are willing to pay for the stock. This may indicate that if a seller wants to sell his stock immediately, this might be the price he gets.
- Ask: The price at which current stockholders are willing to sell their shares.
- 1y Target E.: This indicates to median target price forecast by analyst. If the stock is currently trading on its target, it is unlikely to increase much in value in the future.
- Beta: A historical measurement of volatility of a stock as compared to the stock market as a whole. The higher is the number, the more volatile is the stock. The range is between 0-1, 1 is as volatile as the market.
- Next Earning Date: Next day the company reports their earnings. Is said before, the report disclosure may positively or negatively affect the buyers.
- Day's Range: Shows the highest and lowest price during the current, or last if the market is closed, trading session.
- 52wk Range: The highest and lowest price over the last 52 weeks.
- Volume: The number of shares traded in the market during the current, or last if closed, session.

⁵ Trading sessions are usually days or specific hours.

Market Cap: Market capitalization is the total value of the company. The total number of shares outstanding * last price of the stock.

P/E: Price to earnings. The higher the ratio, the more valuable the stock is to investors.

EPS: Earnings per share is the amount of earnings per outstanding share of a company's stock. Higher number is more favourable.

Div. & Yield: If a company pays out dividends, it shows here. The Yield is then the dividend in percentage terms. Raising the dividends may attract investors but can be also an indicator of financial problems.

4 Stock market indexes

Index is a quick and easy way to understand how a general market is performing. An index is a sample of stocks that provides an idea of the broader market. It is a measurement of the value of a section of the stock market computed from the prices of selected stocks. The index is used by investors to describe the market, as for example if the market is up by 100 points, it is a reference to its index. There are three major indexes the Dow Jones Industrial Average, Standard & Poor's 500 and the NASDAQ composite index.

The dissertation provides overview of the Dow Jones and S&P indexes as they better represent stock markets' overview, their changes represent changes in investors' expectations of the earnings and risks and are more suitable in terms of further comparison with the Shanghai market index.

4.1 Dow Jones Industrial Average

Dow Jones Industrial Average is the oldest and most famous index, which takes a weighted average of the thirty largest companies on the NYSE. These thirty stocks are so heavily traded that they represent the majority of the market volume (Wall Street Survivor, 2012). The index was originally computed by adding up prices per share of each company's stocks in the index and dividing this sum by the number of companies, results into the average, from what it has its name.

$$\text{Price weighted series} = \frac{\text{Sum of stock prices}}{\text{Number of stocks}}$$

Even though the DJIA represents more than a quarter of the entire U.S. stock market its movement is not a definite indication of the entire market performance. As the Investopedia says: "Dow should not be interpreted as a definite indication that the entire market has dropped by the same percent. This is because of the Dow's price-weighted function. The basic problem is that a \$1 change in the price of a \$120 stock in the index will have the same effect on the DJIA as

a \$1 change in the price of a \$20 stock, even though one stock may have changed by 0.8% and the other by 5%” (Investopedia, 2015). As the index includes the most well-known companies, it’s been chosen for the comparisons in the analytical part especially because large swings in this index generally correspond to the movement of the entire market.

The next table shows example of companies incorporated in the DJIA.

Table 2: Dow Jones Industrial Average

Name	Volume
Apple Inc.	68 531 478
American Express Company	5 051 200
Caterpillar Inc.	7 702 702
Chevron Corporation	8 826 940
Intel Corporation	36 443 747
The Coca-Cola Company	11 716 045
McDonald's Corp.	6 276 920
NIKE, Inc.	8 178 658
The Procter & Gamble Company	9 390 964
Visa Inc.	8 092 698

(Yahoo Finance, 2016)

4.2 Standard & Poor's 500

S&P's initial function is the same. S&P takes weighted average of 500 most widely held stocks on the market that held for approximately 70% of the entire market (Wall Street Survivor, 2012). The S&P is market weighted and every stock in the index is represented in proportion to its total market capitalization, which is an advantage comparing to the DJIA as here 10% change in the companies is reflected on 10% change in the index while this is not necessarily correct for the DJIA for the different system of computation. The S&P was also chosen for its variability as it includes companies from varieties of sectors as consumer, healthcare, technology or finance.

$$\text{Market weight} = \frac{\text{Sum of current market values}}{\text{Sum of base market values}} \times \text{Beginning value}$$

The problem is the effect of large market capitalization stocks, when their change have large effect on the series than companies with small market capitalization. The next table shows several examples of companies included in the S&P.

Table 3: Standard & Poor's 500

Name	Volume
Apple Inc.	68 516 305
Microsoft Corporation	48 408 898
Johnson & Johnson	7 774 400
Berkshire Hathaway Inc.	3 895 500
Facebook Inc. Class A	37 131 000
Amazon.com Inc.	10 309 600
Procter & Gamble Company	9 390 899
Philip Morris International Inc.	4 268 300
Honeywell International Inc.	2 719 400
Starbucks Corporation	12 133 199

(Barchart, 2016)

4.3 SHCOMP

SHCOMP or SSE Composite Index is a stock market index of all stocks that are traded on the Shanghai Stock Exchange. Despite that, there are still many state-owned companies. The SSE represents the best view over the overall Chinese economy (Investopedia, 2015). The index is based on a base period of 100 on a specific day, which is July 15, 1990, and the base period is the total market capitalization of all stocks of that day. Which means that:

$$\text{Current index} = \frac{\text{Current total market capitalization}}{\text{Base period}} \times \text{Base value}$$

The next table shows several examples of companies included in the S&P.

Table 4: SSE Composite Index

Name
Air China
Bank of China
Beijing North Star
China Merchants Bank
China Unicom
Industrial Bank
Jiangxi Copper

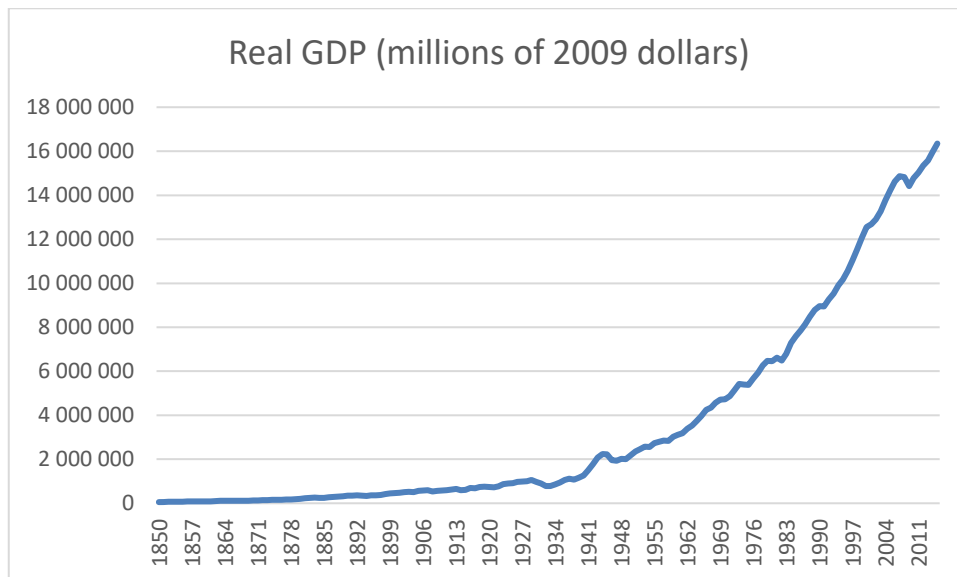
(Topforeignstocks.com, 2016)

As the aim of the dissertation and especially the practical part is to compare and evaluate the impact of the 2015 Chinese crisis on the Western world, stock indexes are the core. The indexes represent enlisted corporations which in a nutshell creates the economy of a country (KOUBA, 2007). By comparing the indexes author presumes to conclude how different economies are dependable on each other. Author has decided to choose the aforementioned indexes as they best represent investigated economies. The SSE is the best representation of China and S&P with DJIA the Western world.

5 Business cycles and world crises

If we could observe the progress of the real GDP in market economies, we would see that this basic macroeconomic aggregate is constantly increasing in time. This means that market economies are gradually rising their efficiency and people have gradually more funds to exchange for goods and services. However, as the following chart shows in some periods the aggregate output increases quicker than in the other parts, and sometimes even falls. This short-term fluctuation of aggregate output around its long-term trend can be called the business cycle (Jurečka, et al., 2010).

Figure 2: Real GDP trend in the United States (1850-2015)



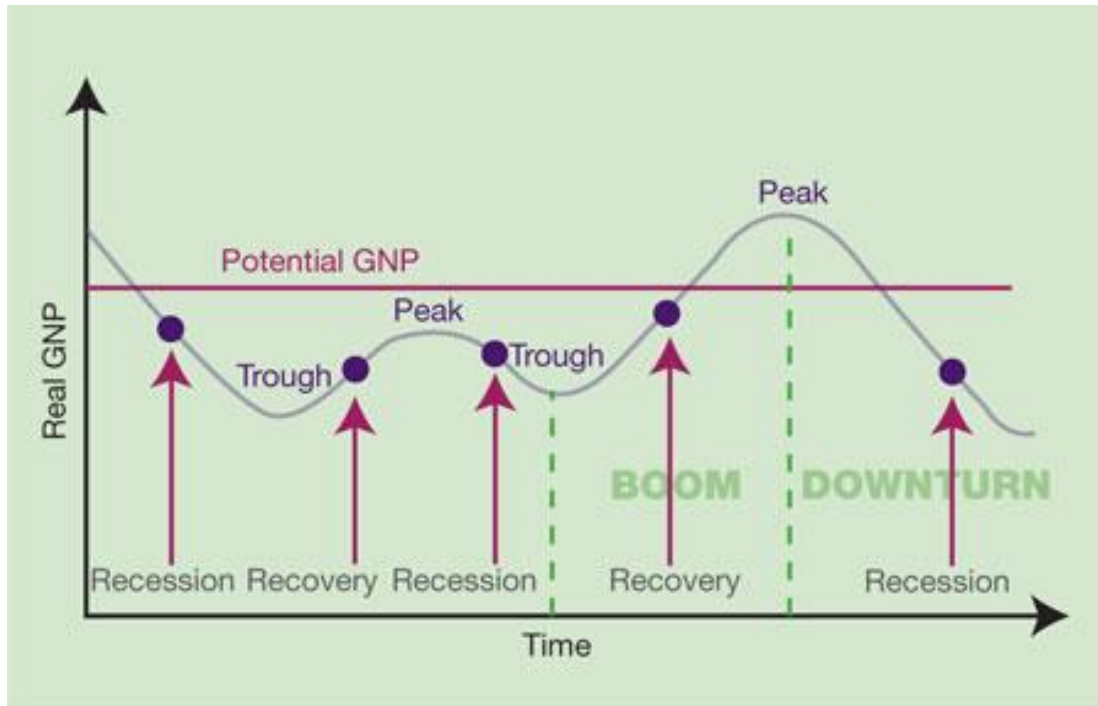
(Measuringworth, 2016)

5.1 Business cycles and economic recessions

Financial crises as well as growth are natural parts of a business cycle. Business cycle can be characterized as a change in macroeconomic equilibrium. They are caused by changes in aggregate supply or demand, which leads to the change in macroeconomic equilibrium by changes of actual products with regards to potential product. Aggregate supply is the total supply of goods and services in an economy and aggregate demand are total planned expenditures in the economy,

meaning expenditures of all economic subjects. Potential product is the level of GDP in full sustainable use of factors of production (Jurečka, et al., 2010).

Figure 3: The business cycle



(businesscasestudies.co.uk, 2015)

During expansion or sometimes called boom the economy is growing, macroeconomic indicators are changing e.g. unemployment is shortening, production is growing and the stock market is in the bull mode. Maximum appears in the Peak where the market is saturated and aggregate supply becomes greater than aggregate demand.

During recession or downturn, the economy is contracting. The macroeconomic indicators are moving in the opposite direction towards a bottom. The bottom is a situation when market managed to get rid of insufficient producers, heal itself and only those who can produce with equilibrium costs and price survives. At this point demand takes over supply and next expansion is started (Jurečka, et al., 2010).

According to the NBER, there have been 11 business cycles between 1945 and 2009 with the average length about 69 months, which is around 5.75 years. While

the average expansion period has lasted 58.4 and contraction 11.1 months (Investopedia, 2016).

The reasons for business cycles vary. The literature differs reasons in two categories, internal and external. External comes from outside of the economic system as wars, revolutions, embargos, inventions or weather. Other in the other hand underline inner causes as decrease of demand or outflow of investments. Other reason coming from within of an economy is the political cycle. Political business cycle is a “concept that politicians manipulate an economy (usually by increasing or decreasing money supply) to achieve personal ends, especially during an election period” (Business Dictionary, 2016). In practical terms this means that politicians tend to increase spending before elections to get people’s vote and tighten it right after.

5.2 Global economy

The world has been globalized. Not only we can buy Asian or African food in our local shop in Europe but more importantly people can freely study, work and travel all around the globe with just one mouse click. Opportunity for everybody, chances for everyone, best job for the best man. Global markets, global profits, global corporations. The idea comes from an assumption that free market is better in allocation of resources and thus better evaluate financial instruments. On the other hand, global interconnectivity has proven that the markets can decline much faster than grow. Over a couple weeks the 2008 crisis transform itself to Europe and then further on to every continent and state. The most important is the technological progress and the IT factor. Thank to this, the financial and market unity becoming interdependent (Rejnus, 2014).

Interdependent markets lead to mutual equilibrium as can be seen in interest rate parity, however it means that a local financial market has become sensitive to other markets which are not necessary correlated as well. The market then appears to shift without any obvious reason which is connected also with trading psychology and inadequate reaction of traders. Financial markets are thus no

longer single units independent on each-other but rather one interdependent body (Rejnus, 2014 pp. 249-250).

Another trend is connected with indebtedness. Households as well as firms and countries are becoming more indebted. This leads to growing number of loan providers and amount of securities traded on secondary markets. And due to the increasing number of receivables and payables financial operations are becoming riskier which leads to bankruptcy, over indebtedness, insolvency and greater need of governmental and international help (as in case of Greece) (Rejnus, 2014 p. 250). As WB, MMF, local government and central banks are more involved, more they are distorting the rules of the free market which leads to uncertainty and investors anxiety (Rejnus, 2014). Because besides Lehman Brothers every major bank had been saved investors tend to increase speculation and trading with innovative of financial derivatives. Extreme fluctuation in market prices then leads to the fact that investment in these instruments is highly risky. Additionally, due to the fact that the prices of derivatives e.g. options are a fraction of the underlying assets and individuals thus control large volume with minimal capital (leverage). This increases the possibility of bankrupt of these entities.

5.3 Financial crisis

Financial crises are inevitable part of business cycles and lead to stock market crashes. These crises are typically accompanied by stagnating economic growth, ramping inflation and high unemployment, more precisely substantial credit volume and asset prices, severe disruptions in financial intermediation and the supply of external financing to various actors in the economy. These symptoms eventually lead to large-scale balance sheet problems and government support in the form of liquidity support and recapitalization (International Monetary Funds, 2013).

There are several types of financial crisis, and are typically interconnected:

- Currency Crises
- Sudden Stops
- Foreign and Domestic Debt Crises
- Banking Crises

As such, financial crises are typically multidimensional and can be hard to characterize using a single indicator. While rational factors as macroeconomic imbalances, internal or external shocks can be mathematically described, financial crises sometimes appear to be fuelled by irrational factors as runs on banks, stress, mistrust and anticipations (International Monetary Funds, 2013).

A currency crisis involves speculative attacks on a particular currency resulting in a devaluation or depreciation of that currency. This often leads to the authorities to defend the currency using international reserves, raising interest rates, or imposing capital control. Currency crisis is usually accompanied with bank and debt issues and their result are not as dramatic as for example banking crises. As an example can be used the disintegration of the European Monetary System in 1992.

A sudden stop, also known as balance of payments crisis can be defined as a large fall in international capital inflows or a sharp reversal in aggregate capital flows to a country. Likely taking place in conjunction with a sharp rise in its credit spreads.

A foreign debt crisis takes place when a country cannot service its foreign debt. It can take the form of a sovereign or private debt crisis. A domestic public debt crisis takes place when a country does not honour its domestic fiscal obligations in real terms, either by defaulting explicitly, or by inflating or otherwise debasing its currency, or by employing some other forms of financial repression. The internal form of debt crisis is very dangerous and manifest itself in households' indebtedness, insolvency or chronic internal indebtedness.

In a systemic banking crisis, actual or potential bank runs and failures can induce banks to suspend the convertibility of their liabilities or compel the government to intervene to prevent this by extending liquidity and capital assistance on a large scale. Banking crisis can emerge from neglected debt crisis and inability of borrowers to repay loans. As an example can be taken Spanish or Scandinavian bank crises in the early 1990. Since these are not so easily measurable variables, they lend themselves more to the use of qualitative methodologies (International Monetary Funds, 2013).

5.4 Stock markets

The business cycle and its fluctuation have a big impact on exchange trade for both large financial institutions and banks as well as small investors. These fluctuations primarily during a contraction or decline phase have a negative impact on the indexes value, share prices and other instruments which can drop by number tens of per cents in couple days. Only forex market seems not to be affected because of high volatility of exchange rates independent on the business cycle.

There are two major types of stock market failures. First benign, which is usually dismissed by renewed market growth in no time without any macroeconomic consequences. Investors can easily overcome these crashes by trusting his market. The second type called malign is much dangerous with consequences in banking sector and real economy with long lasting period. For example, the American stocks which lost their value in 1930 gained their previous numbers in 1950s. Malign crashes are accompanied with vast macro and microeconomic problems as unemployment, credit crunch, bank problems and stagnation (Kohout, 2011 p. 161).

Nevertheless, every position in the business cycle can be used to place one's investment portfolio. "For instance, the early expansion phase, cyclical stocks in sectors such as commodities and technology tend to outperform. In the recession

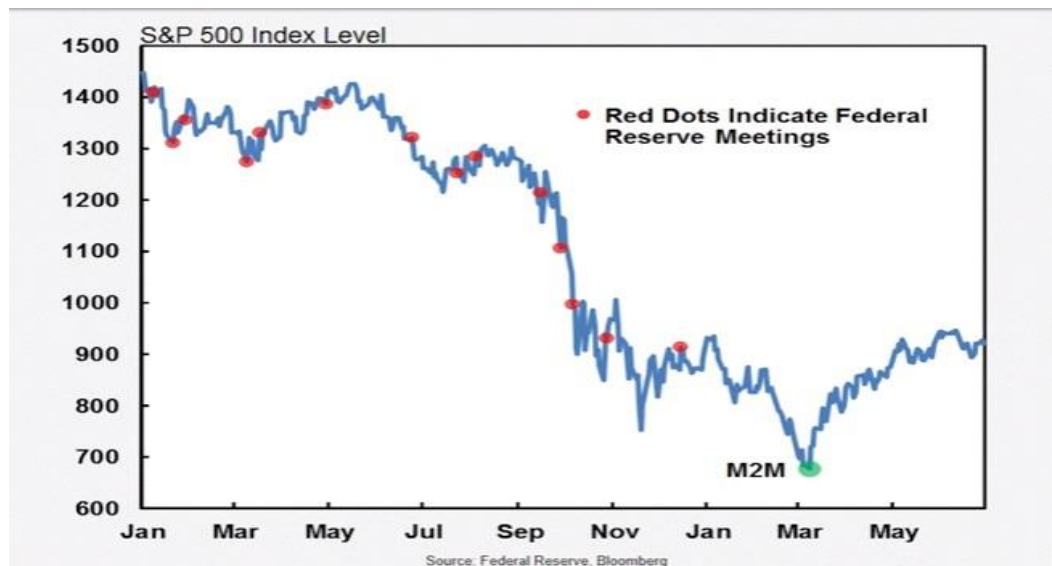
period, the defensive group like health care, consumer staples and utilities outperform because of their stable cash flow and dividend yields” (Investopedia, 2016).

5.5 Unconventional 2008

Many people nowadays believe that what caused the 2008 crisis was irresponsible behaviour of bankers, excess speculations of brokers combined with unmanageable free market system.

The fact is that the central banks, in this case the Federal Reserve (FED) control the level of short term interest rate, which are then transferred into economy through transmission mechanisms. When a central bank lower the short-term interest rate, commercial banks should be less motivated to save money in the central bank and lend more which should start economy moving. Between the years 2001-2003, the Federal Reserve dropped the interest rate to 1% that was below that time inflation. Because of the lower interest rate more people could afford to borrow more money and buy bigger houses, interestingly even prices of the houses were appreciating around 8-14%.

Figure 4: S&P and FED meetings



(Wesbury, 2014)

In September and October 2008 decline in the market index and red dots representing FED meetings. During these months, FED started program Quantitative Easing (QE) program. QE program consists of buying bonds and financial aid for the economy in an attempt to change direction of the crisis. On October 8th 2008 President Bush's administration passed Trouble Asset Relief Program (TARP) meaning 700 billion dollars' government spending in order to save the banking system. From the chart can be observed that QE, TARP and later introduced stress testing did not have positive effect on the crisis, in fact the worst part of the crisis took place after their introduction as the S&P fell 40%. Ben Bernanke that time chairman of the Federal Reserve disclosure that the United States faced \$228 billion loss which is relatively small in \$15 trillion economy.

Mark to market accounting (M2M) was re-introduced in 2007 and means that assets are not valued based on their historical value but on present market value. Thus, the book value of an asset will be different at majority of times from its market value since it would be a function of demand-supply mismatch and other macroeconomic factors (Patil, 2010). In the situation when assets' (houses) value was certain number but because of the economy crisis, the M2M accounting made the value drop to demand for houses value, nobody wanted to buy or sell the acid assets. On March 9 2009 the accounting rule was changed and from the point the economy is growing (Wesbury, 2014).

From the observation, the author concluded that the crisis was not generated from over-speculation but was caused by the FED's inappropriate decisions. Government restrictions and measures did not save the economy, changing the accounting rules closed to the free market appeared to save the economy. Buying bonds and injecting cash therefore should not be a tool of any central bank.

LITERATURE REVIEW OVERLOOK

This part of the thesis successfully met its aim and thus to analyse the basic principles of the stock markets and trading on the stock exchange. Trading methods, strategies and risks were described along with overview of primary and secondary market, which completes the stock market basics. Further, subjects of trading, capital gain, dividends and financial leverage were covered to elucidate what investors can do and what kind of outcome they can expect.

Next step was to cover stock market indexes, their value and formulation of their computation, and understand that investments and movement of one of the commodity have inevitable consequences on the whole growth and structure of an index. Further business cycles and world crises were elaborated with an example of 2008 crisis, which then adds to understand the broad view and connections between a stock market and an economy. The buying decisions of households – investments and possible failure as redistribution of money by final consumers are related to expected revenues, loss or uncertainty of the future and economic crises.

PRACTICAL PART

Practical part of the thesis is a quantitative research. The quantitative research of the thesis investigates the phenomena of 2015 Chinese stock market crash via statistical and econometric techniques.

The assumptions are that:

- 1) The events in China had a significant impact on global market indexes represented by Americans' Dow Jones Industrial Average Index and Standard & Poor's 500
- 2) The events had a significant impact on the commodities of Gold and Oil

The author then defines the term significant impact subjectively to the extent that all forecasted parameters are significant by statistical rules and the level of influence of the Shanghai index is equal or greater than 25% on examined indexes.

The database consists of seven components namely indexes: Shanghai Stock index, S&P 500 index, Dow Jones Industrial Average index, NYSE index for gold, NYSE index for Oil and Gas. Furthermore, exchange rates of USD/CNY and EUR/CNY. The data set consists of 225 observations from 1st January 2015 to 31st December 2015.

6 Chinese stock exchange

China was always considered as the biggest economy in the world. As early as in 221 BC the ruling dynasty Qin connected agriculture and army thus created a momentum that gave China the ruling position in Asia. Despite Mongolian occupation and later inner power struggle, China managed to persuade its position until the 19th century when due to an insurrection and strife within the country and later on the lost war over Japan in Korea in 1894 to 1895 gave out its position to the United States (Maddison, 1998).

Increasing globalization, free markets and advanced technology surprised traditional China which couldn't keep up with the new conditions and opponents. Lack of interest in foreign trade and almost non existing knowledge of Western countries technology or language brought China on the edge of poverty and rank of developing countries. Economic instability of the empire was also supported by a coup of emperor's widow Cixi who in 1900 declared war on foreign merchants and landholders in China, which led into the subsequent political struggle, and the fall of the monarchy in 1911. One year later on 1st January 1912 the republic of China was officially proclaimed (Chowdhury, et al., 2008 p. 206).

China had been torn in many civil wars and turmoil before the Second World War when the country managed to unite in order to defend itself against Japan. After the war, inner conflicts went on until 1949 when People's Republic of China was announced and the communist party took over (Liu, 2008 p. 21). The communistic regime under Mao Zedong changed property rights, nationalized assets, invested in heavy industry and set the planned economy. The poorly managed agriculture with focus only on the heavy industry led into famine and between 1958 and 1960, over 20 million people died (Liu, 2008 p. 23) (Bakešová, 2003 pp. 62-70).

The big transformation ended with Mao's death in 1976 and left China yet again in political and economic chaos. However, in 1978 Deng Xiaoping took power and instituted significant economic reforms as one child policy, focus on

agriculture and because China had entered the OSN in 1971 diplomacy with Japan, USA and Europe started. Special economic zones in Shenzhen, Shantou and Xian were established with a special condition as incentives or tax holidays for foreign investors (Maddison, 1998) (Bakešová, 2003 pp. 162-164).

Eventually in 1992 the officials decided to move towards the market economy, joined WTO, persuade the foreign trade and created the modern version of stock markets (Maddison, 1998). The People's Republic of China, similarly to other world leading economies has several stock markets. The three biggest financial markets are The Shanghai, Shenzhen and Hong Kong stock exchanges.

6.1 Shanghai Stock Exchange

The Shanghai stock exchange, listed under the acronym SSE was re-opened on November 26th 1990 directly governed by the China Securities Regulatory (CSRC)⁶ (Shanghai Stock Exchange, 2015). It started operating a few weeks later on 19th December 1990 but only from November 2014 the shares became available for foreigner ownership. Before, foreigner investors could only invest in countries' stocks listed in Hong Kong and New York (McCafferty, 2014). Despite foreigner allowance a listed company can't have more than 30% foreign ownership and no more than 10% of a firm's shares can be owned by one person (Borzykowski, 2015).

Its main principles are: "legitimacy, regulation, self-discipline, and compliance in order to create a transparent, open, reliable and efficient marketplace" (Shanghai Stock Exchange, 2015). Four major securities categories are equities, funds, derivatives and bonds.

The major statistical results are displayed for the year of 2014, as the year 2015 is the major year of research affected by the crisis. By the end of 2014, SSE listed 995 companies with the total market capitalization nearly 24.4 trillion RMB

⁶ The CSRC is a state controlled organization conducting surveillance over Chinese stock markets

(€3.36 trillion) (Shanghai Stock Exchange, 2015) which makes the exchange 5th largest stock market in the world.

Table 5: Shanghai 2014 results

Results of 2014 in Billions	¥	€
Total annual turnover	37560	5160
Average daily turnover	153.3	21.08
Total capital raised	396.259	54.49
The bond market value	2290	310
The fund market value	208.4	28.66
The registered account of investors	0.12317	0.01694

(Shanghai Stock Exchange, 2015)

6.2 Shenzhen

From a small village of ancient times to a modern city and China's first special economic zone established in 1980. Shenzhen city has grown rapidly with more than 10 million inhabitants and more than \$230 billion share in GDP. Shenzhen stock exchange (SZSE) established on 1st December 1990 is another of China's stock exchange and it has become world's best performing stock market by the end of 2014. A self-regulatory legal entity under the supervision of CSRC. Its main functions are providing the venue and facilities for securities trading, formulating operational rules, receiving listing applications and arranging securities listing (Shenzhen stock exchange, 2013).

By May 2015 SZSE 1 768 companies are listed with a total market capitalization 3.5 trillion USD. Shares on this exchange have surged 55 per cent this year and are mainly composed of technology, innovation and growth companies as Shenzhen is a leading business centre in China. Shipping, logistics, high technology and financial services businesses are concentrated here and Shenzhen is world leader in shipping and supply chain with the world's third busiest container port.

Table 6: Shenzhen stock exchange results

Results of 2014 in Billions	¥	€
Stock market value	19158.85	2580
Stock trading value	311.84	42
Average P/E ratio	36.57	
Average turnover rate	2.23	

(Shenzhen stock exchange, 2013)

6.3 Hong Kong

The communist takeover in 1949 caused many people to leave mainland China and move to Hong Kong. Political and environmental nature of the peninsula was that different⁷ that allowed people to set up businesses without the government interference. This evolvement enabled HK to become one of so called Asian tigers along with Taiwan, South Korea and Singapore and gradually become premier financial and business centre with, opposed to the mainland China, service oriented economy.

Regarding the aforementioned historical points Hong Kong has become Asia's third largest stock exchange in terms of market capitalization after Tokyo and Shanghai and the sixth largest in the world. (HSBC, 2016) Even though the exchange is significant the author has decided not to use SEHK index in the practical part as Hong Kong exchange is partially international and enlisting only about 50% purely mainland-china stocks. Other half is foreigner or Hong Kong stocks which are not under Chinese regulation and are using HKD, CNY and USD and therefore are not under the Chinese economy policy which is in our focus in the practical part.

⁷ As a part of British colony from 1842 to 1997.

7 Chinese economy before the crash

The Chinese economy might well be the topic of the decade. From one of the highest GDP growth of almost 15% in 2006 to the lowest in 2015 when China reached its 25 years minimum of 6.9%. Chinese GDP Per Capita was skyrocketing since 1992, real GDP was stabilized and stock market⁸ showed sustain growth. However, in June 2015, Shanghai's stock exchange experiences the biggest downfall in its history. During the first 3 weeks, the market fell down by 30% and was labelled as the next financial crisis. Chinese officials took unprecedented actions to prevent its total collapse and the market closed for several days.

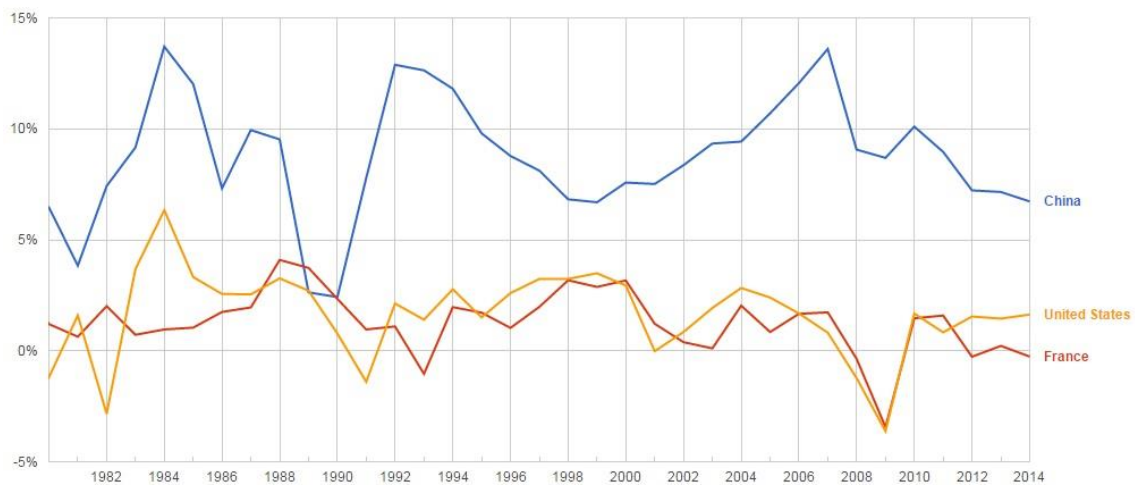
This part of the thesis covers the situation before the downfall and gives overall view on Chinese economy. An economy can be evaluated by basic economic indicators, which are Gross Domestic Product, Inflation, Balance of payments and Unemployment rate (Jurečka, et al., 2010).

7.1 Economic growth

As explained in Chapter 6 significant economic reforms were introduced after Mao's death in 1976. Privatization of agriculture, more individual rights, agricultural and heavy industry incentives and mass manufacturing led China on modern economy trail.

From the graph of GDP below can be conclude that China has grown rapidly averaging 10% before 2008 and between the years 2008 and 2014 8.8%. This ranks China as one of the highest growing countries among India, Dominican Republic or Ethiopia. 10% growth per year means that the living standards can possibly double in every 10 years. China during those years spent about 50% of its GDP on investments. For example, places as Shanghai or Shenzhen completely changed its infrastructure.

⁸ Shanghai Composite Index

Figure 5: GDP per capita growth rate

(The World Bank, 2016)

The curve of GDP growth rate shows similarities to the curve of the United States. Especially in the 80s and 20s. An interesting point can be seen along 2008 when Chinese drop was not as dramatic as in the United States or Europe but continues to affect the economy ever since. Borrowing and flowingly injecting money to the economy, which is shown in figure 6, can explain this smaller drop. In addition, 2008 crisis caused import attenuation and many countries has structuralized their import policy that affected China, as it is an economy primarily focused on export. The United States curve then appears almost identical progress as the French curve, these phenomena can be seen among other indicators, and France thus had been distracted from other figures.

Despite an enormous economic growth, the government debt to GDP is growing rapidly. China had 43.9% government debt to GDP by December 2015 with inclining tendency. Countries with similar numbers are Mexico (43.2%) or the Netherlands (65%) (Trading Economics, 2016). To total debt as a share of GDP reached at the end of 2014 286% of GDP in particularly \$199 trillion is the biggest in the world. As the underlying economic growth has declining trend it is harder to be sustain and pay out the debt (McKinsley&Company, 2015).

Figure 6: China Government Debt to GDP

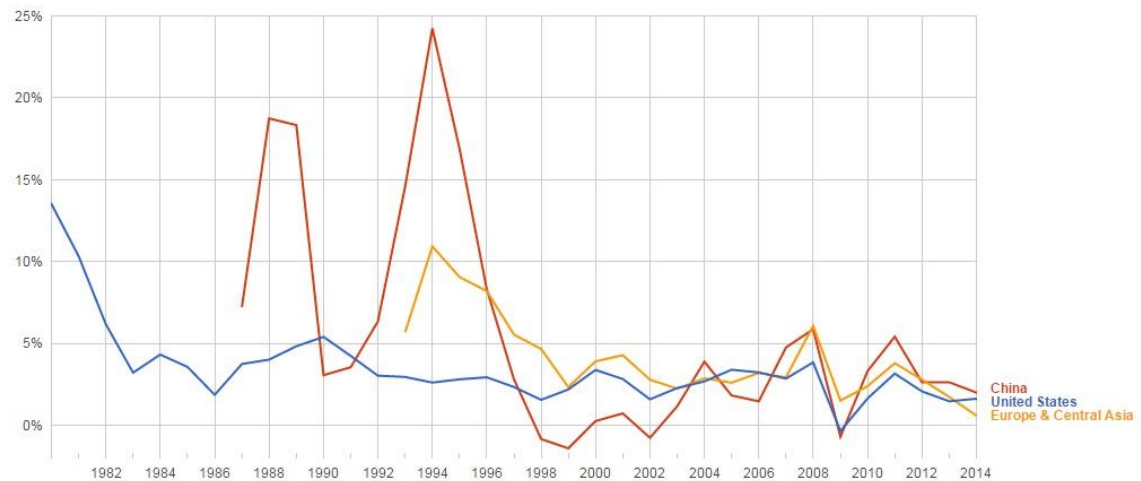


(Trading Economics, 2016)

7.2 Inflation

Consumer Price Index (CPI) uses a basket of goods that contains every-day products and services, which can be compared throughout periods. By comparing prices of the basket, changes in price level are observed (Jurečka, et al., 2010). After dramatic jump between 1986 and 1998 when China suffered from galloping inflation almost 25%. In the modern history, China meets its target of 2.7 reasonable inflation.

Figure 7: Inflation, CPI



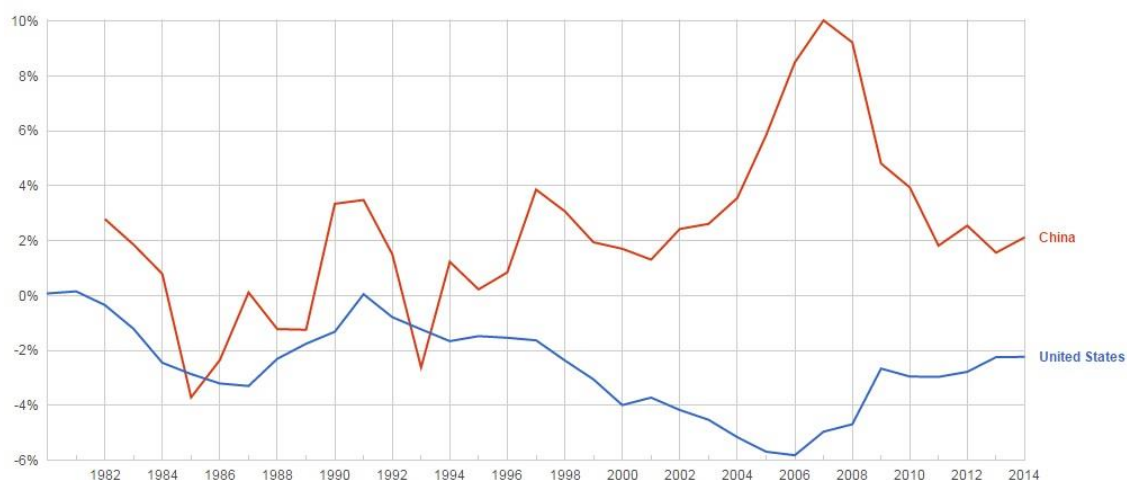
(The World Bank, 2016)

This might be a signal of continuing economic growth and live economy. Inflation can be the product of spending and employment. China has low level of unemployment, which is shown on the figure 9, the economy is still in growth mode and government borrows and injects money, China meets its inflation target. Europe on the other hand has been struggling with very low inflation and cannot meet the target of 3%. European Central Bank has recently announced cutting short-time interest rate from -0.3% to -0.4% that can indicate mistrust in the European economy and anticipated recession.

7.3 Balance of payments

Balance of payments (BOP) is the amount of foreign currency taken in minus the amount of domestic currency paid out. It represents how a country accounts for the different ways that money is flowing into the country or payments are happening inside or outside the country.

Figure 8: Balance of Payments to GDP (current accounts)



(The World Bank, 2016)

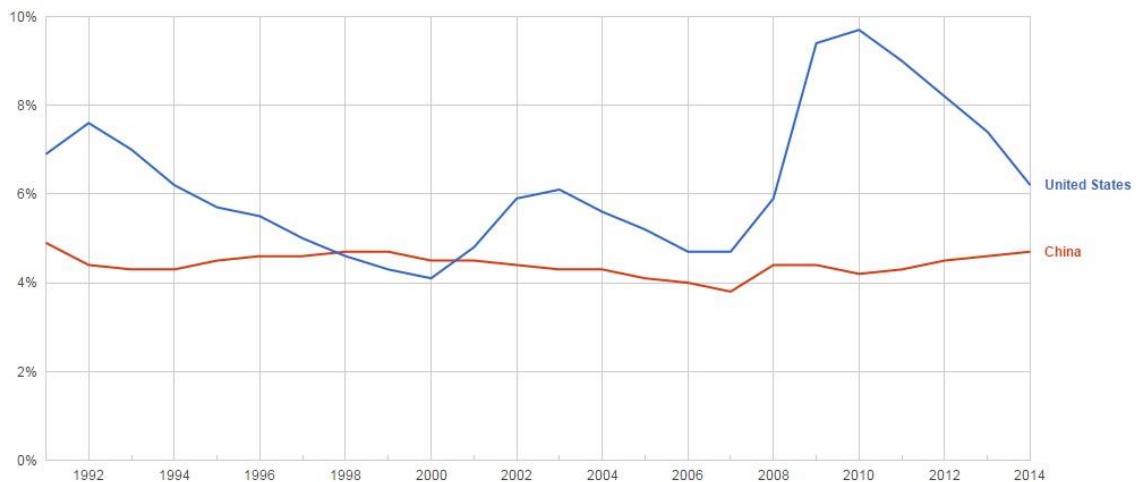
China is having positive Balance of Payments since 1994 with maximum of 10% in 2007. In 2014 while the ratio was 2.1%, current account surplus accounted for \$219.7 billion. This means that the trade in goods grew by 32% and trade in services 54%. China exported \$2.37 trillion and imported \$1.53 trillion. The exports are led by computer technologies, clothing and raw materials, imports are led

mostly by crude petroleum, integrated circuits and cars (U.S. International Trade Commission K.C. Fung, 2009).

7.4 Unemployment rate

People who are currently actively searching for a job and are unable to find one are called unemployed. The rate of unemployment is then number of unemployed people divided by the number of people currently employed and part of the labour force (Investopedia, 2016). Despite very accurate statistics in the OECD countries, communist countries such as former Soviet Union, Cuba or North Korea has so called no unemployment policy and thus very inaccurate statistics. The Chinese government officially takes employment as: “the first priority of people’s livelihood and as the top strategy for ensuring the stability of its society” (Ministry of Labour and Social Security, 2015).

Figure 9: Unemployment rate



(The World Bank, 2016)

This means that the statistics may not be entirely accurate (Jun, 2016). According to the official statistics, unemployment rate in China is remarkably steady, by the end of 2014 accounts for 4.09%. Despite big unemployment swing after 2008 in the USA, Chinese unemployment shows constant tendency between 4% and 5%. As far as job vacancies are concerned, there is declining tendency since 2013 when there were 6 000 000 open positions to 4 500 000 in January 2016. The low rate

of unemployment can be explained by Chinese shift from a manufacturing-driven economy to a service oriented model which leads to continuous job creations in service sector, one child policy, implementation of massive stimulus packages focused on investment in infrastructure and real-estate development (Jun, 2016), (BBC, 2014).

From the indicators above can be conclude that China still grows around 8% in average but with dwindling tendency finishing just below 7% in 2015. Chinese debt is on increase, 43.9% government debt to GDP with increasing tendency as well as total debt to GDP 286% which is currently the highest in the world. Inflation is stable and below 5% after 2011 with declining tendency. Balance of payments are positive and stable on 2% and unemployment steady around 4%.

Despite successes in market restructuring which have taken place so far in China, the Chinese economy still faces difficulties, especially how to reform the huge, state sector which is in many cases inefficient and making losses. Since the state sector remains a major player in the Chinese economy, how to increase the efficiency of these uncompetitive state-owned enterprises (SOEs) has become a pressing issue for the government (Groenewold, et al., 2004).

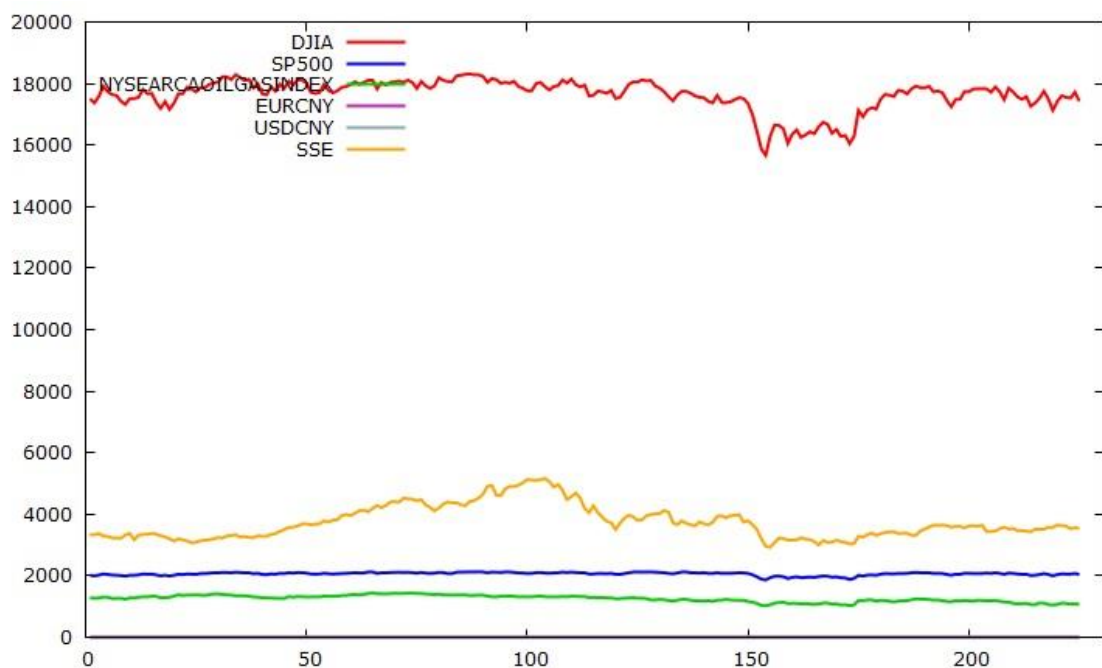
8 Impacts of the crisis on stock indexes

Main goal of the thesis is to consider the impact of the crisis, respectively changes in SSE, on world stock and commodity indexes. Due to the different calendar and trading days, the observation contains 225 observations. For better transparency and further possible explanations exchange rates of USD/CNY and EUR/CNY were added.

The assumptions are that:

- 1) The events in China had a significant impact on global market indexes represented by Americans' Dow Jones Industrial Average Index and Standard & Poor's 500
- 2) The events had a significant impact on the commodities of Gold and Oil

Figure 10: Indexes, commodities, rates



(Novák, 2016)

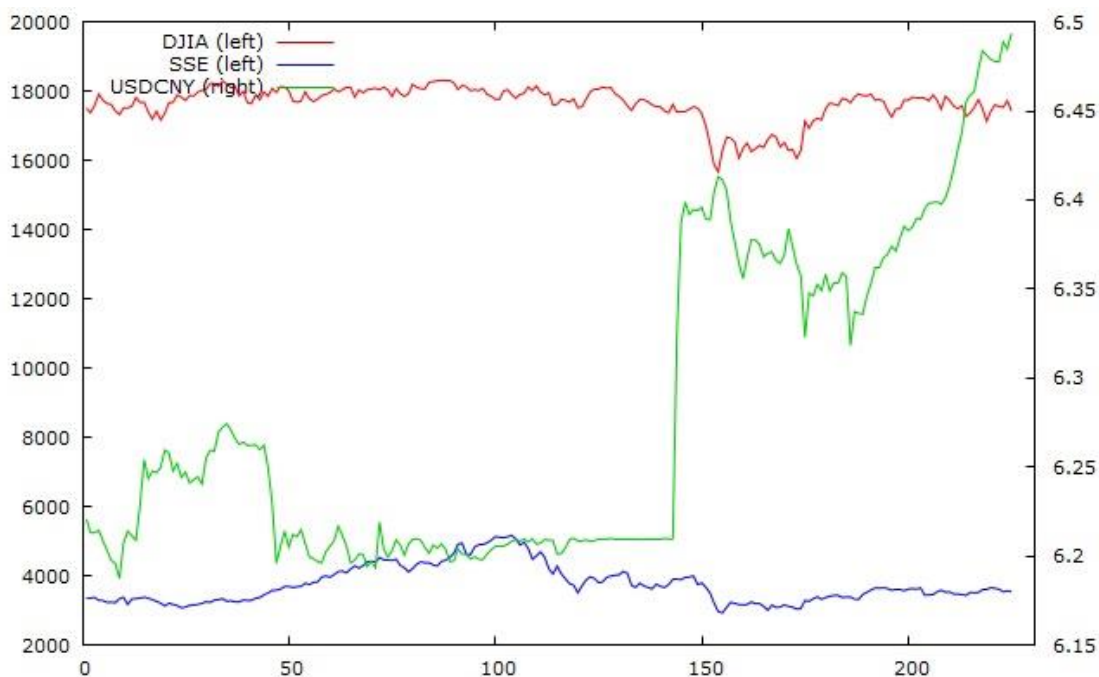
The basic graph overview can indicate that stock markets are connected indeed. The Chinese talked about crisis is around observation number 100, which is the beginning of June. Other significant observation is in no. 150 which is middle August and no. 195 in November where took place the second part of the w-shape crisis.

8.1 Dow Jones index analysis

For the thesis, therefore, time series analysis, author decided to analyse the impact on Dow Jones Industrial Average Index (INDEXDJX) in relation to Shanghai Stock Exchange Composite Index (SHCOMP) for the daily period from 1st January 2015 to 31st December 2015.

8.1.1 Observation

Figure 11: DJIA analysis



(Novák, 2016)

The visual observation can help us to predict results of an econometric analysis. The red curve represents development of INDEXDJX, the blue curve SHCOMP index and the green USD/CNY exchange rate.

From the start can be observed increasing tendency in both indexes, the Chinese crisis started in June which can be seen after 100th observation in the SHCOMP curve but not very much in the INDEXDJX. Right after the 150th observation which is end of August and the Shanghai index felt again, there is a similar trend. The author thus concludes that the crisis seems having an effect on the INDEXDJX. The exchange rate changed little after popping of bubble in June but rather rapidly in August 14 and August 24 within the 3 weeks' collapse. Future examination is necessary to provide.

8.1.2 Equation model

Author models a relationship $Y = f(X_1)$

$$Y_i = \text{INDEXDJX}$$

$$X_{1,i} = \text{SCHCOMP}$$

Assumption:

Author assumes that changes in SCHCOMP has significant impact on changes in INDEXDJX and thus SCHOMP is dependable variable of INDEXDJX.

8.1.3 Econometric model

The model is linear and therefore has the functional form:

$$Y_{1t} = \gamma_{10}X_{0t} + \gamma_{11}X_{1t} + u_{1t}$$

$$X_{0,t} = \text{unit vector}$$

$$X_{1,t} = \text{SCHOMP index in time}$$

$$U_{1,t} = \text{random variable}$$

Figure 12: OLS DJIA

Model 3: OLS, using observations 1-225
 Dependent variable: DJIA

	coefficient	std. error	t-ratio	p-value
const	15709.1	204.017	77.00	1.25e-162 ***
SSE	0.513463	0.0539444	9.518	3.04e-018 ***
Mean dependent var	17631.38	S.D. dependent var	514.1512	
Sum squared resid	42107476	S.E. of regression	434.5374	
R-squared	0.288902	Adjusted R-squared	0.285713	
F(1, 223)	90.59957	P-value (F)	3.04e-18	
Log-likelihood	-1684.970	Akaike criterion	3373.940	
Schwarz criterion	3380.773	Hannan-Quinn	3376.698	
rho	0.917670	Durbin-Watson	0.164740	

(Novák, 2016)

Variable		Parameters
const	γ_{0t}	15709.1
X1	γ_{1t}	0.5134

$$Y_{1t} = 15709.1 + 0.5134X_{1t} + u_t$$

By creating an econometric equation can be said that the unit change in SCHCOMP index has the impact of 0.5134 unit change to INDEXDJX. The p-value shows that the parameters are significant.

R-squared

Because $R^2 = 0.2889$, our estimated linear model explained 29% function. F-statistic is equal to 90.5995 and the model is so statistically conclusive, because is true that $90.5995 > (1, 223) = 5.024$.

T-test

T-test checks whether the individual parameters are conclusive. The Test statistic is calculated on the level of significance 5%:

t-value	t-critical; $\alpha=0,05$	Significant/Not Significant
$t_{X_0} = 77.00$	1.66	S
$t_{X_1} = 9.518$	1.66	S

Critical quantile for the hypothesis H_1 is = 1.66. The coefficients γ_0 and γ_1 are statistically significant at the 5% significance level, because is true that $|77.00| > 1.66$ as well as $|9.518| > 1.66$.

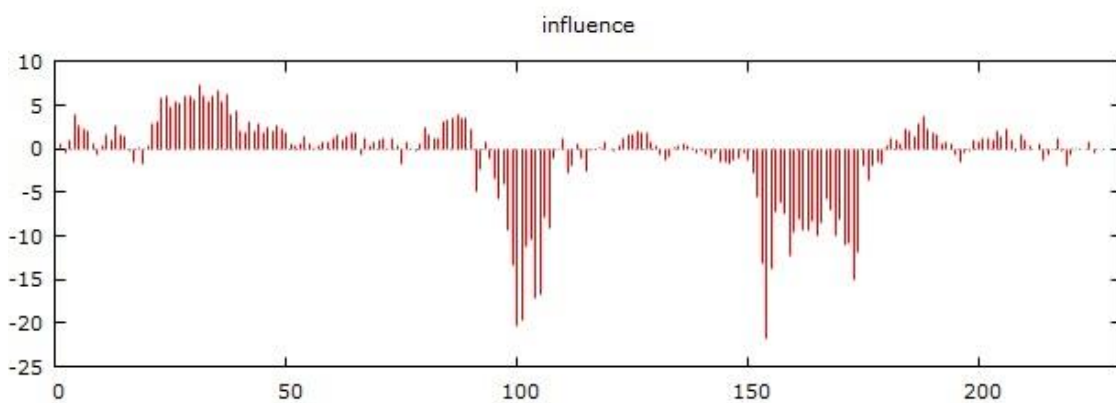
The model proved that changes in Shanghai Stock Exchange Composite Index do have impact on changes in Dow Jones Industrial Average Index.

By comparing the calculated parameter estimates with our theoretical expectations, author concluded that the parameter of the directive:

γ_1 : does meet theoretical assumptions. Because of increased investment in the environment of 1%, we can expect an increase in INEXDZX 0.5134%

This is supported by the following graph:

Figure 13: Influence on INEXDZX



(Novák, 2016)

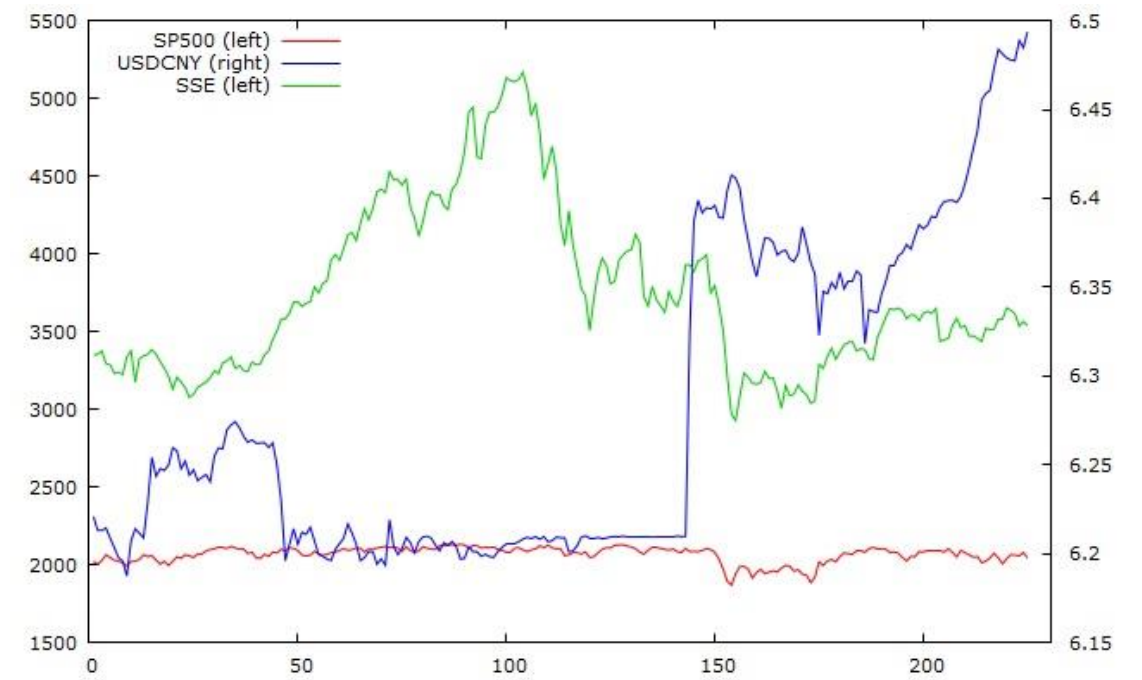
Conclusion is that development on Shanghai Stock Exchange Composite Index at the moment of the crisis as well as during the second downfall has a significant impact on the Dow Jones Industrial Average Index.

8.2 SP500

The second analysis consider the impact on Standard & Poor's 500 (INDEXSP) in relation to Shanghai Stock Exchange Composite Index (SHCOMP) for the daily period from 1st January 2015 to 31st December 2015.

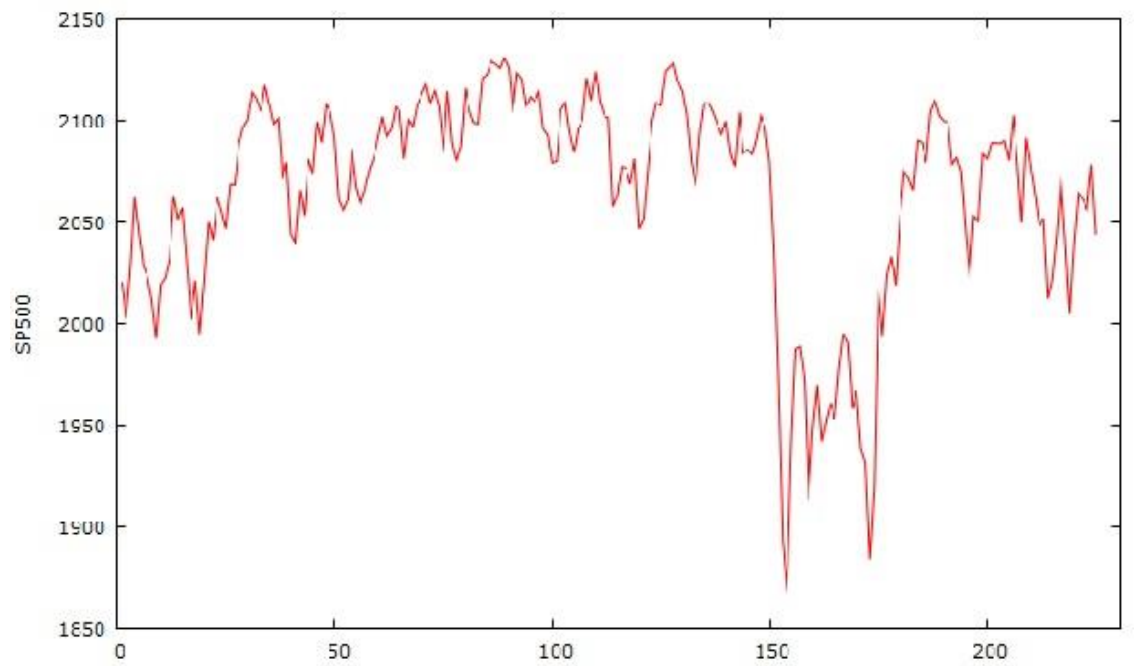
8.2.1 Observation

Figure 14: SP500 analysis



(Novák, 2016)

The red curve represents development of INDEXSP and the blue curve SHCOMP. In this graph can be clearly seen the drop around 100th and 150th observations taking place during the crisis. However, during this period of time and later on, cannot be seen very significant changes on the red curve.

Figure 15: SP500

(Novák, 2016)

The INDEXSP curve however shows significant change during 150th observations thus further econometric model is needed.

8.2.2 Equation model

We model a relationship $Y = f(X_1)$

$$Y_i = \text{INDEXSP}$$

$$X_{1,i} = \text{SCHCOMP}$$

Assumption:

Author assumes that changes in SCHCOMP has significant impact on changes in INDEXSP and thus SCHOMP is dependable variable of INDEXSP.

8.2.3 Econometric model

The model is linear and therefore has the functional form:

$$Y_{1t} = \gamma_{10}X_{0t} + \gamma_{11}X_{1t} + u_{1t}$$

$X_{0,t}$ = unit vector

$X_{1,t}$ = SCHOMP index in time

$U_{1,t}$ = random variable

Figure 16: OLS SP500

Model 4: OLS, using observations 1-225
Dependent variable: SP500

	coefficient	std. error	t-ratio	p-value	
const	1848.46	18.9466	97.56	6.88e-185	***
SSE	0.0579933	0.00500968	11.58	1.41e-024	***
Mean dependent var	2065.564	S.D. dependent var	50.94567		
Sum squared resid	363151.5	S.E. of regression	40.35446		
R-squared	0.375367	Adjusted R-squared	0.372566		
F(1, 223)	134.0094	P-value (F)	1.41e-24		
Log-likelihood	-1150.240	Akaike criterion	2304.479		
Schwarz criterion	2311.311	Hannan-Quinn	2307.237		
rho	0.868872	Durbin-Watson	0.261094		

(Novák, 2016)

Variable		Parameters
const	γ_{0t}	1848.46
X1	γ_{1t}	0.0579

$$Y_{1t} = 1848.46 + 0.0579X_{1t} + u_t$$

By creating an econometric equation, can be said that the unit change in SCHCOMP index has the impact of 0.0579 unit change to INDEXSP.

R-squared

Because $R^2 = 0.3753$ our estimated linear model explained 37% of INDEXSP function. F-statistic is equal to 134 and the model is so statistically conclusive, because is true that $134 > (1, 223) = 5.024$.

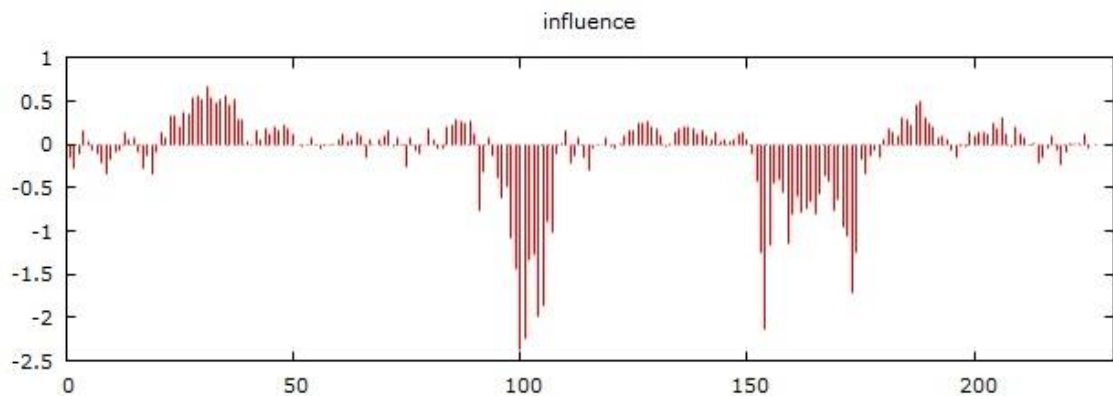
T-test

T-test checks whether the individual parameters are conclusive. The Test statistic is calculated on the level of significance 5%:

t-value	t-critical; $\alpha=0,05$	Significant/Not Significant
$t_{X_0} = 97.56$	1.66	S
$t_{X_1} = 11.58$	1.66	S

Critical quantile for the hypothesis H_1 is = 1.66. Tus the coefficients γ_0 and γ_1 are statistically significant at the 5% significance level, because is true that $|97.56| > 1.66$ as well as $|11.58| > 1.66$.

Figure 17: Influence on INDEXSP



(Novák, 2016)

As can be seen on figure 17, development of the SCHCOMP index does have influence on INDEXSP. The influence is only in maximum of 2.5 points deviation. By comparing the calculated parameter estimates with our theoretical expectations, author concluded that the parameter of the directive:

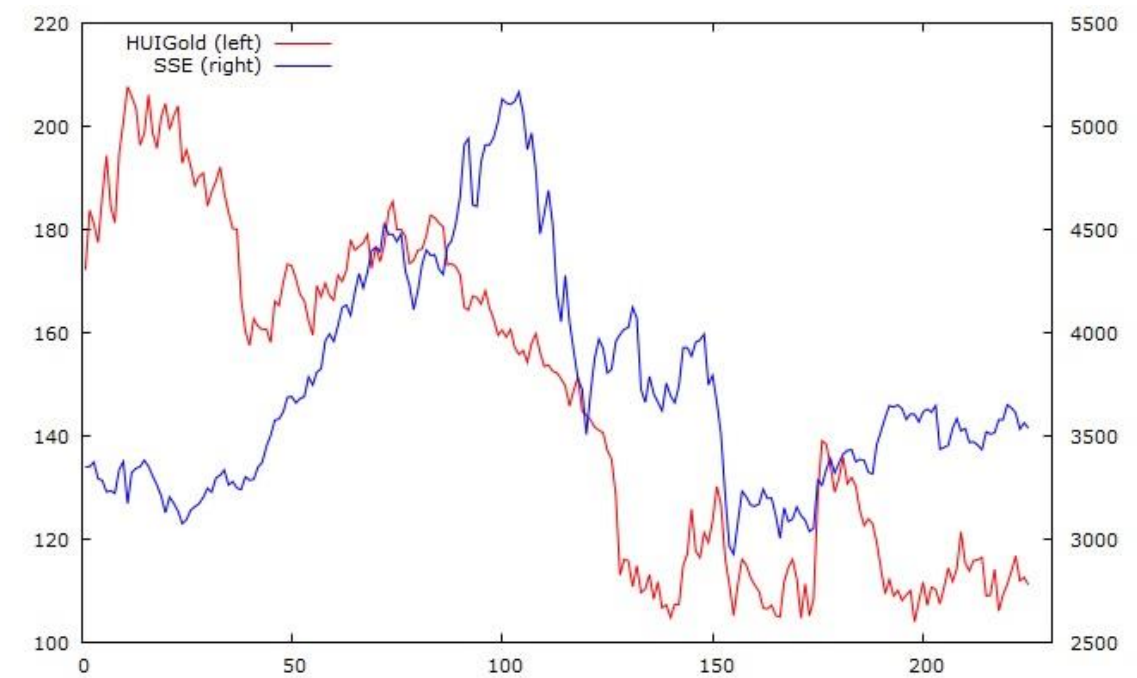
γ_1 : does meet theoretical assumptions. INDEXSP does have influence on SCHCOMP, explains 37% of the value and is statistically significant.

9 Impact on commodities

For the second part, commodities, author decided to reflect impact of the crisis on indexes of gold and oil particularly NYSE ARCA GOLD INDEX (HUI) and NYSE ARCA OIL & GAS INDEX (XOI) for the daily period from 1st January 2015 to 31st December 2015.

9.1 Gold

Figure 18: HUI analysis



(Novák, 2016)

Visual analysis can be interpreted in favour of argument of significant impact. Along the SCHCOMP drop can be seen significant but delayed drop in HUI as well as during the second slump in August.

9.1.1 Equation model

We model a relationship $Y = f(X_1)$

$$Y_i = \text{HUI}$$

$$X_{1,i} = \text{SCHCOMP}$$

Assumption:

The author assumes that changes in SCHCOMP has significant impact on changes in HUI and thus SCHOMP is dependable variable of HUI.

9.1.2 Econometric model

The model is linear and therefore has the functional form:

$$Y_{1t} = \gamma_{10}X_{0t} + \gamma_{11}X_{1t} + u_{1t}$$

$$X_{0,t} = \text{unit vector}$$

$$X_{1,t} = \text{SCHOMP index in time}$$

$$U_{1,t} = \text{random variable}$$

Figure 19: OLS HUI

Model 5: OLS, using observations 1-225
Dependent variable: HUIGold

	coefficient	std. error	t-ratio	p-value	
const	103.365	14.6763	7.043	2.31e-011	***
SSE	0.0117523	0.00388059	3.028	0.0027	***
Mean dependent var	147.3621	S.D. dependent var	31.82435		
Sum squared resid	217902.6	S.E. of regression	31.25927		
R-squared	0.039504	Adjusted R-squared	0.035197		
F(1, 223)	9.171739	P-value(F)	0.002747		
Log-likelihood	-1092.778	Akaike criterion	2189.556		
Schwarz criterion	2196.388	Hannan-Quinn	2192.313		
rho	0.989735	Durbin-Watson	0.021677		

(Novák, 2016)

By creating an econometric equation can be said that the unit change in SCHCOMP index has the impact of 0.011 unit change to HUI.

$$Y_{1t} = 103.365 + 0.01175X_{1t} + u_t$$

R-squared

Because $R^2 = 0.039$ our estimated linear model explained 4% of INDEXSP function. F-statistic is equal to 9.17 and the model is so statistically conclusive, because is true that $9.17 > (1, 223) = 5.024$.

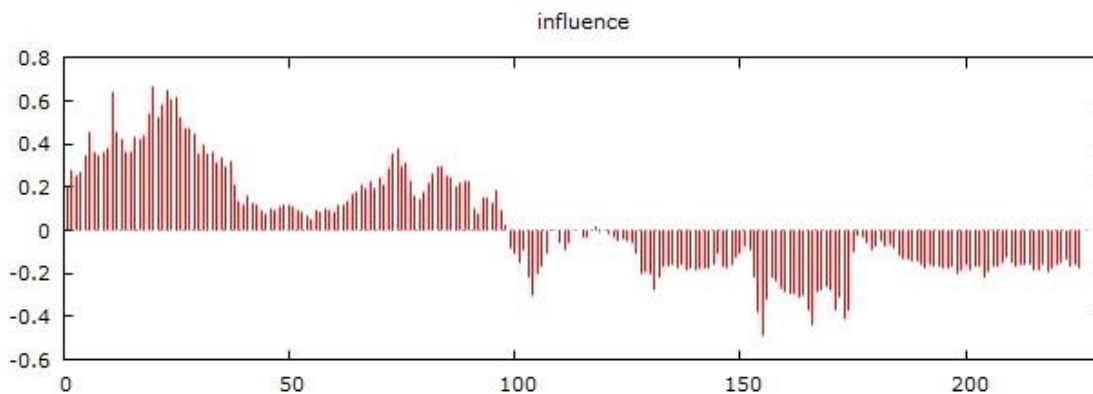
T-test

The t-test, checks whether the individual parameters are conclusive. We calculate the Test statistic, on the level of significance 5%:

t-value	t-critical; $\alpha=0,05$	Significant/Not Significant
$t_{x_0} = 7.043$	1.66	S
$t_{x_1} = 3.028$	1.66	S

Critical quantile for the hypothesis H_1 is = 1.66. The coefficients γ_0 and γ_1 are statistically significant at the 5% significance level, because is true that $|7.043| > 1.66$ as well as $|3.028| > 1.66$.

Figure 20: Influence on HUI



(Novák, 2016)

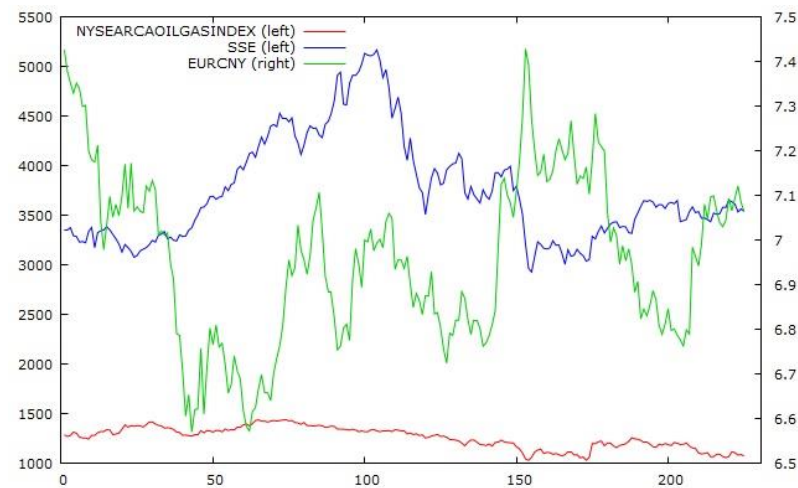
As can be seen on figure 20, development of the SCHCOMP index does have influence on HUI, however the influence is only in maximum of 0.5 points deviation. By comparing the calculated parameter estimates with our theoretical expectations, author concluded that the parameter of the directive:

γ_1 : does not meet theoretical assumptions. INDEXSP does have influence on SCHCOMP, but explains only 4% of the value and influences only to 0.5 percentwise change extend thus is by the author insignificant.

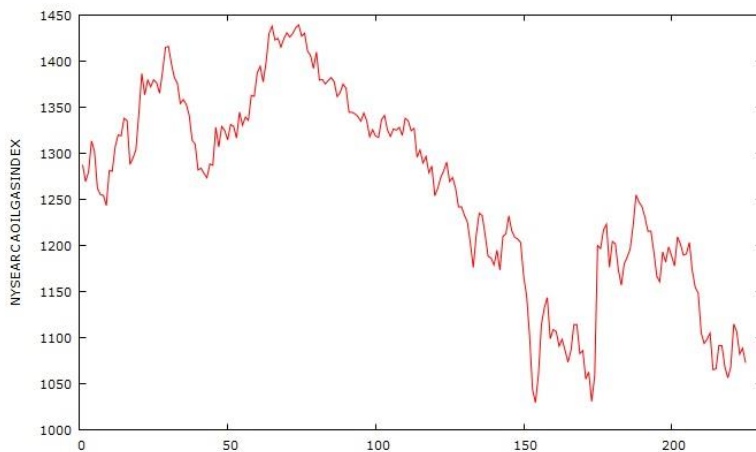
9.2 Oil

Visual assessment can predict positive result of econometric analysis therefore influence of SCHCOMP on XOI but not significant. From the visual point of view index of oil is rather stable in 2015 with very little fluctuation comparing to SCHOMP perhaps only after 150th observation can be seen significant change accompanied with changes in exchange rating.

Figure 21: XOI analysis



Only looking closer can be concluded that changes have effect on XOI index but not large as far as 100th observation is concerned. Aforementioned significant change is confirmed around the 150th when index XOI dropped about 150 points as can be seen in following picture.



(Novák, 2016)

9.2.1 Equation model

We model a relationship $Y = f(X_1)$

$$Y_i = \text{XOI}$$

$$X_{1,i} = \text{SCHCOMP}$$

Assumption:

Author assumes that changes in SCHCOMP has significant impact on changes in XOI and thus SCHOMP is dependable variable of XOI.

9.2.2 Econometric model

The model is linear and therefore has the functional form:

$$Y_{1t} = \gamma_{10}X_{0t} + \gamma_{11}X_{1t} + u_{1t}$$

$X_{0,t}$ = unit vector

$X_{1,t}$ = SCHOMP index in time

$U_{1,t}$ = random variable

Figure 22: OLS XOI

Model 3: OLS, using observations 1-225
 Dependent variable: NYSEARCAOILGASINDEX

	coefficient	std. error	t-ratio	p-value
const	885.795	43.9333	20.16	3.70e-052 ***
SSE	0.0999093	0.0116165	8.601	1.42e-015 ***
Mean dependent var	1259.822	S.D. dependent var	107.7428	
Sum squared resid	1952606	S.E. of regression	93.57394	
R-squared	0.249086	Adjusted R-squared	0.245719	
F(1, 223)	73.97149	P-value (F)	1.42e-15	
Log-likelihood	-1339.476	Akaike criterion	2682.952	
Schwarz criterion	2689.784	Hannan-Quinn	2685.709	
rho	0.980848	Durbin-Watson	0.049681	

(Novák, 2016)

By creating an econometric equation can be said that the unit change in SCHCOMP index has the impact of 0.09 unit change to HUI.

$$Y_{1t} = 885.795 + 0.0999X_{1t} + u_t$$

R-squared

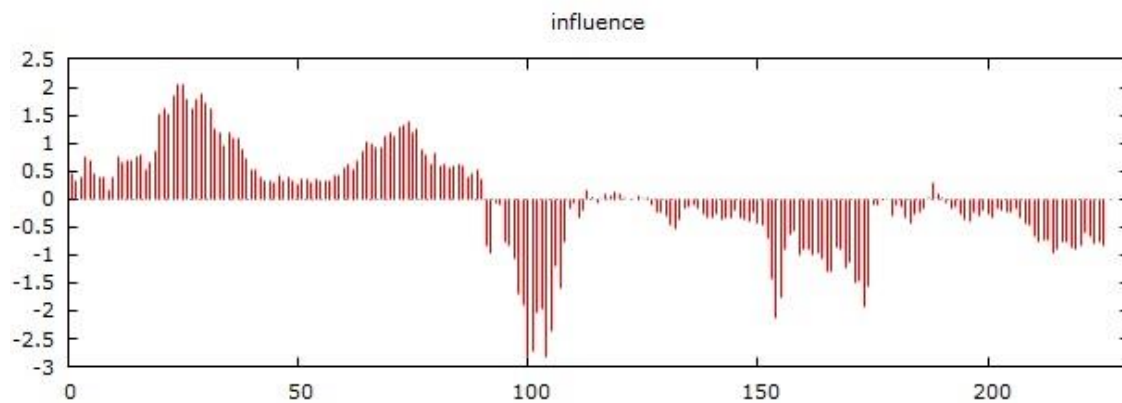
Because $R^2 = 0.249$ our estimated linear model explained 25% of HUI function. F-statistic is equal to 73.97 and the model is so statistically conclusive, because is true that $73.87 > (1, 223) = 5.024$.

T-test

Using the t-test, we check whether the individual parameters are conclusive. We calculate the Test statistic, on the level of significance 5%:

t-value	t-critical; $\alpha=0,05$	Significant/Not Significant
$t_{X_0} = 20.16$	1.66	S
$t_{X_1} = 8.601$	1.66	S

Critical quantile for the hypothesis H_1 is = 1.66. We can say that the coefficients γ_0 and γ_1 are statistically significant at the 5% significance level.

Figure 23: Influence on XOI

(Novák, 2016)

Even though the actual level of influence might seem low, the estimated model explained 25% of HUI function and as can be seen in the influence graph there is an impact. The level of an impact along with the fact that the Oil index curve is rather flat in 2015 and does not deviate really apart from 150th observation leads to the conclusion that the impact was significant.

PRACTICAL PART OVERVIEW

As the literature overview described, relationship between a stock exchange and an economic situation of a particular country is closely related thus the first what was written is a short historical overview to China. Chinese political and economic development was explained alongside with the economic situation, which preceded the key year of 2015 so the computed result could be seen in context. Author concludes that China still grows around 8% in average but with dwindling tendency finishing just below 7% in 2015. Chinese debt is on increase, 43.9% government debt to GDP with increasing tendency as well as total debt to GDP 286% which is currently the highest in the world. Inflation is stable, 5% with declining tendency. Balance of payments are positive stable on 2% and unemployment fluctuating around 4%.

Then the actual econometric analysis was calculated. Dow Jones Industrial Average does meet theoretical assumptions. A unit change in Chinese SCHOMP index has 0.5134 united impact on INDEXDJX. SCHOMP model explained 29% of the function and graph of influence was also conclusive.

Standard & Poor's 500 (INDEXSP) by comparing the calculated parameter estimates with our theoretical expectations has been affected by SCHOMP as well. The influence is in maximum of 2.5 points deviation. SCHCOMP does have influence on INDEXSP, explains 37% of the value and being statistically significant.

SCHCOMP does have influence on NYSE ARCA GOLD INDEX (HUI), however the influence is only in maximum of 0.5 points deviation. The author concluded that the parameter of the directive does not meet theoretical assumptions. INDEXSP explains only 4% of the value and influences only to 0.5 percentwise change extend thus is by the author insignificant.

Even though the actual level of influence might seem low, the estimated model explained 25% of XOJ function, the graph of influence proves an impact and leads to the conclusion that the impact was in case of NYSE ARCA OIL & GAS INDEX significant.

10 Conclusion and recommendation

China, one of the world's fast growing countries, most populated country, fourth largest country with endless traditions and a country that everybody talks about is still being recognized as a developing country. In 2016, Chinese President Xi Jinping asked the world to recognize China as a market economy⁹ and the world said no. The no sets China back among countries in South America or Africa but is it really the case? The arguments of government-regulated economy, strict rules and questionable human right are clear but as far as the economy is concerned, is it "enough"?

In June 2015 Chinese economy experienced its biggest downfall, a W-shape crisis which reached the world. Unprecedented actions had to be taken to prevent collapse of the whole economy. Yet most public media such as World Economic Forum, China Uncensored and even The Wall Street Journal¹⁰ marked this downfall as insignificant for the Western world and lost their attention soon. The popular view is that China is undergoing a transformation to a knowledge-based economy focused on services and thus is having slower GDP growth underpinned by domestic consumption.

Others, rather independent economists for example Professor Kenneth Rogoff, Professor Hammad Siddiqi, Professor Keyu Jin and others¹¹ argued that 2015 events had a significant effect of the Western economy and that China is a global player that can't be neglected any more. This thesis eventually agrees with these conclusions and shows practical data and statistical proved information on its behalf.

⁹ (Financial Times, 2016)

¹⁰ (World Economic Forum, 2016), (China Uncensored, 2015), (The Wall Street Journal, 2015)

¹¹ (Rogoff, 2016), (Siddiqi, 2016), (Jin, 2016)

10.1 Evaluation of aims and hypothesis

First aim of the thesis was to analyse the basic principles of the stock markets and trading on the stock exchange, which every individual investor should know. This educational summary includes historical moments, general and specific market characteristics, subjects of trading, stock market indexes overview and introduction to the world crises. It is a source ground after which the readers will be able to understand and critically evaluate following part.

This aim of the thesis successfully met its aim. Trading methods, strategies and risks were described along with overview of primary and secondary market which completes the stock market basics. Further, subjects of trading, capital gain, dividends and financial leverage were covered to elucidate what investors can do and what kind of outcome they can expect. Flowingly the thesis covered stock market indexes, what are they good for, how are they computed and understand that investments and movement of one of the commodity have inevitable consequences on the whole growth and structure of an index. Further business cycles and world crises were elaborated with an example of 2008 crisis which then again helps to understand the broad view and connections between a stock market and an economy.

This part served as a contribution to financial literacy aforementioned above. Afterwards, the thesis aimed to describe and analyse influences that have an impact on stock trading and market fluctuations in China. The main goal was to characterize the impact of 2015 Chinese stock market crisis on particular indexes and commodity market. Particularly on the Dow Jones Industrial index and S&P 500 index. Later the Dow Jones indexes for gold and oil. The indexes and commodities were compared with Chinese Shanghai's index SCHOMP which represents Chinese market the most.

The assumptions were that:

- 1) The events in China had a significant impact on global market indexes
- 2) The events had a significant impact on the commodities

Practical part of the thesis was compounded as a quantitative research, investigated 7 different variables each consisting of more than 225 observations from 1st January 2015 to 31st December of the same year. Statistical and econometric techniques were used.

The first written was a short historical overview to China. Chinese political and economic development was explained alongside with the economic situation, which preceded the key year of 2015 so the computed result could be seen in context. China still keeps growing at around 8% in average but with dwindling tendency finishing just below 7% in 2015. Chinese debt is on increase, 43.9% government debt to GDP with increasing tendency as well as total debt to GDP 286%, which is currently the highest in the world. Inflation is stable, 5% with declining tendency. Balance of payments are positive and stable on 2% and unemployment fluctuating around 4%.

Then the actual econometric analysis was calculated. Dow Jones Industrial Average does meet theoretical assumptions. A unit change in Chinese SCHOMP index has 0.5134 united impact on INDEXDJX. SCHOMP model explained 29% of the function and graph of influence was conclusive. Standard & Poor's 500 (INDEXSP) by comparing the calculated parameter estimates with our theoretical expectations has been affected by SCHOMP as well. The influence is in maximum of 2.5 points deviation. SCHCOMP does have influence on INDEXSP, explains 37% of the value and is statistically significant. SCHCOMP does have influence on NYSE ARCA GOLD INDEX (HUI), however the influence is only in maximum of 0.5 points deviation. The author concluded that the parameter of the directive does not meet theoretical assumptions. INDEXSP explains only 4% of the value and influences only to 0.5 percentwise change extend thus is by the author insignificant. Even though the actual level of influence might seem low, the estimated model explained 25% of XOI function, the graph of influence proves an impact and leads to the conclusion that the impact was in case of NYSE ARCA OIL & GAS INDEX significant.

The author defines the term significant impact subjectively to the extent that all forecasted parameters are significant by statistical rules and the level of influence of the Shanghai index is equal or greater than 25% on examined indexes.

Given how much is heard about China and Chinese economic importance the author assumed that the stock market crisis would have had much bigger impact on the United States economy, but it did not. Indeed, it has been proved, that the stock markets influence each-other and what happened in 2015 does have an impact on the USA economy, but in fact the total shares owned by foreigners in the Shanghai market is only 2% and Chinese market thus can be considered protective and isolated not mentioning high fees for foreigner traders. Total U.S. export to China are 9.2% or \$134 billion, which is less than 1% of GDP. Thus, the author concludes the impact is not too significant. There are certainly firms for which China is a huge market, such as commodity producers, technology dealers or even food companies, but for most firms selling billions of products to China is less than a reality.

10.2 Conclusion

Chinese president Xi Jinping has promised its people a Chinese dream of increasing wealth, power and wellbeing. In the last couple years in attempt to stimulate growth, bring money to the economy and prevent another housing crisis, which was a threat as people in China were moving from countryside to urban areas, Xi's government opened the domestic stock market to its citizens. Many citizens reached out for the opportunity and almost 9 million new accounts were opened. Tempting promise of fast and easy money along with decreasing amount of regulation caused that many Chinese stocks were purchased inadequately, unprofessionally and with borrowed money.

The overall Chinese society is believed to have an inadequate financial knowledge and 67% of investors are holding less than a high school education. Most people's savings are in current accounts with low interest rates, passbooks, term deposits or some are still holding large amount of cash.

Due to the massive inflow of fresh and uneducated investors, a new bubble emerged. Investing without tactics, order or plan and evaluating companies inadequately, encouraged enlisted companies and banks to attract investors unprofessionally and promised impracticable profits. The government using the state owned media deliberately cheered investors and described situation improperly pushed Shanghai market to become second most valuable market in the world.

This and other unacquainted behaviour led the market fail, the question thus emerges: how bad is the situation? In a matter of days Shanghai index dropped from a high of 5,100 points to 3,700 points and more than \$3 trillion were lost. Chinese government suspended trading for couple of days and pumped millions of dollars into the economy as the result. Chinese economy has emerged into a crisis, first in its modern history. The impact on the other market however was not as significant as some people predicted. Majority of enlisted companies are state-owned and foreigner investors hold only about 2% of total shares. This secured low damage and prevented another global crisis. However, with the deeper globalization and growing interconnection the next downfall is going to be much worse.

10.3 Recommendation

Author's recommendations aim to several kinds of audience. First to investors, author recommends to carefully analyse and review available materials about selected investment. It is important and profitable to invest, but is more important to invest properly and diversify a risk.

Secondly, China has to continue with its structural changes, particularly the changes in the field of property rights. China has to allow more individual to gain rights and allow more private possession. State owned enterprises should be privatised which would, through market mechanism, allow the strong ones to profit and focus on shareholders' values rather than satisfaction of state party values. More importantly, they would become subjects of financial disciplines and hard constrains and gain much needed transparency and accountability.

Thirdly, the author would like to recommend how the study could continue in the future. The obvious limitation throughout the entire writing was the lack of data from China, which is caused due to Chinese restricted data publicity, possible falsification of the data, language and the fact that the topic is still very recent. The future writers should therefore concern this limitation and possibly reach out for a translator who would transparently and objectively interpret market news and recent posts from China.

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Attachments

A Real GDP 1850-2015 in the USA.

Year	Real GDP (millions of 2009 dollars)		
1850	53,575	1887	288,837
1851	57,887	1888	305,444
1852	64,572	1889	314,221
1853	69,852	1890	344,747
1854	72,264	1891	348,823
1855	75,277	1892	366,598
1856	78,300	1893	345,318
1857	78,701	1894	328,952
1858	81,886	1895	366,539
1859	87,815	1896	360,483
1860	88,713	1897	376,021
1861	90,293	1898	417,134
1862	101,513	1899	445,659
1863	109,319	1900	456,861
1864	110,559	1901	481,111
1865	113,725	1902	505,823
1866	108,507	1903	520,584
1867	110,368	1904	502,152
1868	114,673	1905	558,810
1869	117,793	1906	581,661
1870	121,309	1907	596,607
1871	127,080	1908	532,105
1872	137,714	1909	570,565
1873	149,462	1910	576,709
1874	152,180	1911	595,394
1875	151,909	1912	623,289
1876	158,198	1913	647,893
1877	166,069	1914	598,287
1878	171,405	1915	614,598
1879	191,383	1916	699,822
1880	207,245	1917	682,512
1881	233,159	1918	744,069
1882	245,533	1919	750,039
1883	252,323	1920	743,030
1884	248,163	1921	725,995
1885	249,022	1922	766,310
1886	269,276	1923	867,213
		1924	893,916

1925	914,914	1965	3,976,700
1926	974,698	1966	4,238,900
1927	984,111	1967	4,355,200
1928	995,390	1968	4,569,000
1929	1,056,600	1969	4,712,500
1930	966,700	1970	4,722,000
1931	904,800	1971	4,877,600
1932	788,200	1972	5,134,300
1933	778,300	1973	5,424,100
1934	862,200	1974	5,396,000
1935	939,000	1975	5,385,400
1936	1,060,500	1976	5,675,400
1937	1,114,600	1977	5,937,000
1938	1,077,700	1978	6,267,200
1939	1,163,600	1979	6,466,200
1940	1,266,100	1980	6,450,400
1941	1,490,300	1981	6,617,700
1942	1,771,800	1982	6,491,300
1943	2,073,700	1983	6,792,000
1944	2,239,400	1984	7,285,000
1945	2,217,800	1985	7,593,800
1946	1,960,900	1986	7,860,500
1947	1,939,400	1987	8,132,600
1948	2,020,000	1988	8,474,500
1949	2,008,900	1989	8,786,400
1950	2,184,000	1990	8,955,000
1951	2,360,000	1991	8,948,400
1952	2,456,100	1992	9,266,600
1953	2,571,400	1993	9,521,000
1954	2,556,900	1994	9,905,400
1955	2,739,000	1995	10,174,800
1956	2,797,400	1996	10,561,000
1957	2,856,300	1997	11,034,900
1958	2,835,300	1998	11,525,900
1959	3,031,000	1999	12,065,900
1960	3,108,700	2000	12,559,700
1961	3,188,100	2001	12,682,200
1962	3,383,100	2002	12,908,800
1963	3,530,400	2003	13,271,100
1964	3,734,000	2004	13,773,500

2005	14,234,200
2006	14,613,800
2007	14,873,700
2008	14,830,400
2009	14,418,700
2010	14,783,800
2011	15,020,600
2012	15,354,600
2013	15,583,300
2014	15,961,700
2015	16,348,900

B Stock markets' indexes

	Y	X1	X2	X3	X4
Date	SSE	DJIA	SP500	HUI Gold	NYSE ARCA OIL & GAS INDEX
Jan 2, 2015		17832.99	2058.2	167.81	1349.84
Jan 5, 2015	3350.52	17501.65	2020.58	172.2	1287.66
Jan 6, 2015	3351.45	17371.64	2002.61	183.78	1269.4
Jan 7, 2015	3373.95	17584.52	2025.9	181.15	1279.85
Jan 8, 2015	3293.46	17907.87	2062.14	177.48	1313.55
Jan 9, 2015	3285.41	17737.37	2044.81	186.3	1302.37
Jan 12, 2015	3229.32	17640.84	2028.26	194.33	1261.99
Jan 13, 2015	3235.3	17613.68	2023.03	184.52	1255.47
Jan 14, 2015	3222.44	17427.09	2011.27	181.32	1254.44
Jan 15, 2015	3336.46	17320.71	1992.67	194.59	1243.39
Jan 16, 2015	3376.5	17511.57	2019.42	200.87	1281.48
Jan 20, 2015	3173.05	17515.23	2022.55	207.69	1280.6
Jan 21, 2015	3323.61	17554.28	2032.12	205.77	1307.34
Jan 22, 2015	3343.34	17813.98	2063.15	203.65	1320.06
Jan 23, 2015	3351.76	17672.6	2051.82	196.37	1319.03
Jan 26, 2015	3383.18	17678.7	2057.09	198.61	1338.09
Jan 27, 2015	3352.96	17387.21	2029.55	206.09	1335.51
Jan 28, 2015	3305.74	17191.37	2002.16	198.66	1288.04
Jan 29, 2015	3262.3	17416.85	2021.25	195.72	1294.93
Jan 30, 2015	3210.36	17164.95	1994.99	201.82	1303.99
Feb 2, 2015	3128.3	17361.04	2020.85	204.38	1342.98
Feb 3, 2015	3204.91	17666.4	2050.03	199.35	1386.6
Feb 4, 2015	3174.13	17673.02	2041.51	202.03	1363.6
Feb 5, 2015	3136.53	17884.88	2062.52	203.93	1379.5
Feb 6, 2015	3075.91	17824.29	2055.47	192.86	1372.32
Feb 9, 2015	3095.12	17729.21	2046.74	195.45	1379.88
Feb 10, 2015	3141.59	17868.76	2068.59	192.3	1376.63
Feb 11, 2015	3157.7	17862.14	2068.53	188.51	1365.2
Feb 12, 2015	3173.42	17972.38	2088.48	190.35	1388.51
Feb 13, 2015	3203.83	18019.35	2096.99	190.94	1415.14
Feb 17, 2015	3246.91	18047.58	2100.34	184.6	1416.12
Feb 18, 2015		18029.85	2099.68	188.33	1404.62
Feb 19, 2015		17985.77	2097.45	183.89	1391.41
Feb 20, 2015		18140.44	2110.3	184.35	1388.96

Feb 23, 2015		18116.84	2109.66	185.09	1387.82
Feb 24, 2015		18209.19	2115.48	184.06	1393.89
Feb 25, 2015	3228.84	18224.57	2113.86	187.32	1397.13
Feb 26, 2015	3298.36	18214.42	2110.74	189.39	1382.09
Feb 27, 2015	3310.3	18132.7	2104.5	192.14	1376.31
Mar 2, 2015	3336.28	18288.63	2117.39	187.11	1354.15
Mar 3, 2015	3263.05	18203.37	2107.78	183.35	1358.42
Mar 4, 2015	3279.53	18096.9	2098.53	180.22	1353.35
Mar 5, 2015	3248.48	18135.72	2101.04	180.05	1341.34
Mar 6, 2015	3241.19	17856.78	2071.26	166.6	1314.36
Mar 9, 2015	3302.41	17995.72	2079.43	160.37	1310.04
Mar 10, 2015	3286.07	17662.94	2044.16	157.56	1282.04
Mar 11, 2015	3290.9	17635.39	2040.24	162.73	1283.97
Mar 12, 2015	3349.32	17895.22	2065.95	161.28	1278.34
Mar 13, 2015	3372.91	17749.31	2053.4	160.65	1273.58
Mar 16, 2015	3449.3	17977.42	2081.19	160.75	1288.52
Mar 17, 2015	3502.85	17849.08	2074.28	158.12	1287.12
Mar 18, 2015	3577.3	18076.19	2099.5	166.12	1328.36
Mar 19, 2015	3582.27	17959.03	2089.27	165.3	1306.87
Mar 20, 2015	3617.32	18127.65	2108.1	169.82	1329.17
Mar 23, 2015	3687.73	18116.04	2104.42	173.29	1324.93
Mar 24, 2015	3691.41	18011.14	2091.5	173.01	1314.63
Mar 25, 2015	3660.73	17718.54	2061.05	170.47	1331.38
Mar 26, 2015	3682.09	17678.23	2056.15	167.42	1329.42
Mar 27, 2015	3691.1	17712.66	2061.02	166.22	1316.77
Mar 30, 2015	3786.57	17976.31	2086.24	162.32	1344.76
Mar 31, 2015	3747.9	17776.12	2067.89	159.6	1330.63
Apr 1, 2015	3810.29	17698.18	2059.69	169.14	1339.38
Apr 2, 2015	3825.78	17763.24	2066.96	167.03	1335.9
Apr 6, 2015		17880.85	2080.62	173.27	1361.26
Apr 7, 2015	3961.38	17875.42	2076.33	169.6	1363.08
Apr 8, 2015	3994.81	17902.51	2081.9	167.24	1362.06
Apr 9, 2015	3957.53	17958.73	2091.18	166.32	1387.43
Apr 10, 2015	4034.31	18057.65	2102.06	171.18	1394.47
Apr 13, 2015	4121.71	17977.04	2092.43	169.95	1377.42
Apr 14, 2015	4135.56	18036.7	2095.84	172.14	1399.3
Apr 15, 2015	4084.16	18112.61	2106.63	178.03	1430.28
Apr 16, 2015	4194.82	18105.77	2104.99	176.04	1438.09
Apr 17, 2015	4287.3	17826.3	2081.18	176.71	1423
Apr 20, 2015	4217.08	18034.93	2100.4	177.46	1424.81
Apr 21, 2015	4293.62	17949.59	2097.29	179.02	1415.27

Apr 22, 2015	4398.49	18038.27	2107.96	172.51	1424.41
Apr 23, 2015	4414.51	18058.69	2112.93	176.69	1430.85
Apr 24, 2015	4393.69	18080.14	2117.69	173.79	1426.18
Apr 27, 2015	4527.4	18037.97	2108.92	177.09	1430.13
Apr 28, 2015	4476.21	18110.14	2114.76	183.59	1436.37
Apr 29, 2015	4476.62	18035.53	2106.85	185.43	1439.35
Apr 30, 2015	4441.65	17840.52	2085.51	179.98	1427.15
May 1, 2015		18024.06	2108.29	179.9	1433.41
May 4, 2015	4480.46	18070.4	2114.49	180.02	1430.36
May 5, 2015	4298.71	17928.2	2089.46	178.71	1410.75
May 6, 2015	4229.27	17841.98	2080.15	173.43	1406.31
May 7, 2015	4112.21	17924.06	2088	174.02	1392.19
May 8, 2015	4205.92	18191.11	2116.1	175.99	1409.92
May 11, 2015	4333.58	18105.17	2105.33	176.29	1379.54
May 12, 2015	4401.22	18068.23	2099.12	178.83	1380.06
May 13, 2015	4375.76	18060.49	2098.48	182.81	1375.27
May 14, 2015	4378.31	18252.24	2121.1	182.29	1379.16
May 15, 2015	4308.69	18272.56	2122.73	181.26	1382.23
May 18, 2015	4283.49	18298.88	2129.2	180.54	1377.65
May 19, 2015	4417.55	18312.39	2127.83	173.17	1361.7
May 20, 2015	4446.29	18285.4	2125.85	173.4	1366.06
May 21, 2015	4529.42	18285.74	2130.82	172.77	1375.18
May 22, 2015	4657.6	18232.02	2126.06	171.28	1370.55
May 26, 2015	4910.9	18041.54	2104.2	164.93	1344.72
May 27, 2015	4941.71	18162.99	2123.48	164.41	1344.5
May 28, 2015	4620.27	18126.12	2120.79	167.11	1342.98
May 29, 2015	4611.74	18010.68	2107.39	166.82	1340.01
Jun 1, 2015	4828.74	18040.37	2111.73	165.55	1335.04
Jun 2, 2015	4910.53	18011.94	2109.6	168.16	1343.74
Jun 3, 2015	4909.98	18076.27	2114.07	164.8	1335.22
Jun 4, 2015	4947.1	17905.58	2095.84	162.57	1318.14
Jun 5, 2015	5023.1	17849.46	2092.83	159.54	1325.73
Jun 8, 2015	5131.88	17766.55	2079.28	160.53	1318.67
Jun 9, 2015	5113.53	17764.04	2080.15	159.16	1317.48
Jun 10, 2015	5106.04	18000.4	2105.2	160.67	1336.51
Jun 11, 2015	5121.59	18039.37	2108.86	157.18	1341.2
Jun 12, 2015	5166.35	17898.84	2094.11	155.84	1325.41
Jun 15, 2015	5062.99	17791.17	2084.43	156.57	1318.38
Jun 16, 2015	4887.43	17904.48	2096.29	154.29	1326.45
Jun 17, 2015	4967.9	17935.74	2100.44	157.98	1325.36
Jun 18, 2015	4785.36	18115.84	2121.24	159.83	1328.33

Jun 19, 2015	4478.36	18015.95	2109.99	156.3	1319.51
Jun 22, 2015		18119.78	2122.85	153.98	1327.44
Jun 23, 2015	4576.49	18144.07	2124.2	153.51	1338.17
Jun 24, 2015	4690.15	17966.07	2108.58	153.76	1335.21
Jun 25, 2015	4527.78	17890.36	2102.31	152.58	1324.61
Jun 26, 2015	4192.87	17946.68	2101.49	152.24	1327.06
Jun 29, 2015	4053.03	17596.35	2057.64	151.07	1295.87
Jun 30, 2015	4277.22	17619.51	2063.11	149.74	1303.71
Jul 1, 2015	4053.7	17757.91	2077.42	145.81	1289.54
Jul 2, 2015	3912.77	17730.11	2076.78	148.89	1296.64
Jul 6, 2015	3775.91	17683.58	2068.76	151.41	1279.04
Jul 7, 2015	3727.12	17776.91	2081.34	144.85	1286.25
Jul 8, 2015	3507.19	17515.42	2046.68	144.06	1254.01
Jul 9, 2015	3709.33	17548.62	2051.31	143.11	1262.02
Jul 10, 2015	3877.8	17760.41	2076.62	141.69	1273.88
Jul 13, 2015	3970.39	17977.68	2099.6	141.15	1280.94
Jul 14, 2015	3924.49	18053.58	2108.95	140.62	1290.46
Jul 15, 2015	3805.7	18050.17	2107.4	137.2	1269.55
Jul 16, 2015	3823.18	18120.25	2124.29	135.56	1273.77
Jul 17, 2015	3957.35	18086.45	2126.64	128.56	1262.58
Jul 20, 2015	3992.11	18100.41	2128.28	113.07	1241.84
Jul 21, 2015	4017.68	17919.29	2119.21	116.12	1242.13
Jul 22, 2015	4026.04	17851.04	2114.15	115.79	1232.82
Jul 23, 2015	4123.92	17731.92	2102.15	110.81	1225.68
Jul 24, 2015	4070.91	17568.53	2079.65	114.89	1202.68
Jul 27, 2015	3725.56	17440.59	2067.64	109.67	1176.18
Jul 28, 2015	3663	17630.27	2093.25	110.38	1211.8
Jul 29, 2015	3789.17	17751.39	2108.57	113.14	1235.12
Jul 30, 2015	3705.77	17745.98	2108.63	108.42	1232.57
Jul 31, 2015	3663.73	17689.86	2103.84	111.73	1211.56
Aug 3, 2015	3622.91	17598.2	2098.04	106.73	1188.42
Aug 4, 2015	3756.54	17550.69	2093.32	107.31	1186.49
Aug 5, 2015	3694.57	17540.47	2099.84	104.85	1178.89
Aug 6, 2015	3661.54	17419.75	2083.56	107.44	1194.89
Aug 7, 2015	3744.21	17373.38	2077.57	107.38	1173.4
Aug 10, 2015	3928.42	17615.17	2104.18	114.94	1209.9
Aug 11, 2015	3927.91	17402.84	2084.07	117.28	1212.59
Aug 12, 2015	3886.32	17402.51	2086.05	125.83	1232.2
Aug 13, 2015	3954.56	17408.25	2083.39	117.77	1215.97
Aug 14, 2015	3965.33	17477.4	2091.54	116.47	1209.04
Aug 17, 2015	3993.67	17545.18	2102.44	121.3	1207.06

Aug 18, 2015	3748.16	17511.34	2096.92	119.38	1203.26
Aug 19, 2015	3794.11	17348.73	2079.61	123.54	1166.94
Aug 20, 2015	3664.29	16990.69	2035.73	130.26	1145.81
Aug 21, 2015	3507.74	16459.75	1970.89	126.72	1103.18
Aug 24, 2015	3209.91	15871.35	1893.21	116.21	1043.92
Aug 25, 2015	2964.97	15666.44	1867.61	111.17	1029.64
Aug 26, 2015	2927.29	16285.51	1940.51	105.23	1059.89
Aug 27, 2015	3083.59	16654.77	1987.66	111.32	1113.78
Aug 28, 2015	3232.35	16643.01	1988.87	116.12	1132.22
Aug 31, 2015	3205.99	16528.03	1972.18	115.03	1143.6
Sep 1, 2015	3166.62	16058.35	1913.85	112.61	1098.85
Sep 2, 2015	3160.17	16351.38	1948.86	111.14	1108.85
Sep 3, 2015		16374.76	1951.13	109.16	1110.22
Sep 4, 2015		16102.38	1921.22	108.66	1085.81
Sep 8, 2015	3170.45	16492.68	1969.41	109.96	1106.92
Sep 9, 2015	3243.09	16253.57	1942.04	106.68	1090.87
Sep 10, 2015	3197.89	16330.4	1952.29	106.52	1098.29
Sep 11, 2015	3200.23	16433.09	1961.05	107.24	1086.35
Sep 14, 2015	3114.8	16370.96	1953.03	105.22	1073.47
Sep 15, 2015	3005.17	16599.85	1978.09	104.97	1086.22
Sep 16, 2015	3152.26	16739.95	1995.31	111.76	1114.29
Sep 17, 2015	3086.06	16674.74	1990.2	114.55	1114.19
Sep 18, 2015	3097.92	16384.58	1958.03	116.1	1082.75
Sep 21, 2015	3156.54	16510.19	1966.97	112.37	1086.05
Sep 22, 2015		16330.47	1942.74	106.19	1070.69
Sep 23, 2015	3115.89	16279.89	1938.76	104.74	1055.19
Sep 24, 2015		16201.32	1932.24	112.92	1059.48
Sep 25, 2015	3092.35	16314.67	1931.34	111.37	1062.69
Sep 28, 2015		16001.89	1881.77	105.28	1023.5
Sep 29, 2015	3038.14	16049.13	1884.09	105.22	1030.85
Sep 30, 2015	3052.78	16284.7	1920.03	108.42	1058.36
Oct 1, 2015		16272.01	1923.82	105.88	1067.6
Oct 2, 2015		16472.37	1951.36	114.69	1108.67
Oct 5, 2015		16776.43	1987.05	120.66	1141.95
Oct 6, 2015		16790.19	1979.92	125.84	1170.21
Oct 7, 2015		16912.29	1995.83	126.24	1190.08
Oct 8, 2015		17050.75	2013.43	125.55	1220.59
Oct 9, 2015		17084.49	2014.89	133.36	1209.94
Oct 12, 2015	3287.66	17131.86	2017.46	128.59	1200.01
Oct 13, 2015		17081.89	2003.69	129.08	1184.96
Oct 14, 2015	3262.44	16924.75	1994.24	139.08	1196.72

Oct 15, 2015	3338.07	17141.75	2023.86	138.44	1216.93
Oct 16, 2015	3391.35	17215.97	2033.11	134.12	1223.16
Oct 19, 2015		17230.54	2033.66	128.61	1193.15
Oct 20, 2015		17217.11	2030.77	134.31	1190.81
Oct 21, 2015	3320.68	17168.61	2018.94	129.13	1176.37
Oct 22, 2015	3368.74	17489.16	2052.51	131.83	1204.34
Oct 23, 2015	3412.43	17646.7	2075.15	135.95	1201.93
Oct 26, 2015	3429.58	17623.05	2071.18	130.76	1174.04
Oct 27, 2015	3434.34	17581.43	2065.89	131.98	1156.95
Oct 28, 2015	3375.2	17779.52	2090.35	130.31	1180.27
Oct 29, 2015	3387.32	17755.8	2089.41	125.5	1187.4
Oct 30, 2015	3382.56	17663.54	2079.36	122.7	1196.1
Nov 2, 2015	3325.08	17828.76	2104.05	123.97	1221.92
Nov 3, 2015	3316.7	17918.15	2109.79	123.03	1254.98
Nov 4, 2015	3459.64	17867.58	2102.31	119.38	1246.99
Nov 5, 2015	3522.82	17863.43	2099.93	114.24	1242.15
Nov 6, 2015	3590.03	17910.33	2099.2	109.45	1230.74
Nov 9, 2015	3646.88	17730.48	2078.58	112.21	1215.44
Nov 10, 2015	3640.49	17758.21	2081.72	109.05	1215.77
Nov 11, 2015	3650.25	17702.22	2075	110.12	1193.14
Nov 12, 2015	3632.9	17448.07	2045.97	108.19	1166.6
Nov 13, 2015	3580.84	17245.24	2023.04	109.2	1160.7
Nov 16, 2015	3606.96	17483.01	2053.19	110.09	1193.08
Nov 17, 2015	3604.8	17489.5	2050.44	104.04	1182.02
Nov 18, 2015	3568.47	17737.16	2083.58	108.05	1198.59
Nov 19, 2015	3617.06	17732.75	2081.24	111.69	1188.59
Nov 20, 2015	3630.5	17823.81	2089.17	107.21	1177.87
Nov 23, 2015		17792.68	2086.59	106.09	1183.56
Nov 24, 2015	3616.11	17812.19	2089.14	110.71	1209.49
Nov 25, 2015	3647.93	17813.39	2088.87	110.3	1201.66
Nov 27, 2015	3436.3	17813.39	2090.11	107.48	1189.61
Nov 30, 2015	3445.4	17719.92	2080.41	110.79	1190.99
Dec 1, 2015	3456.31	17888.35	2102.63	114.45	1203.49
Dec 2, 2015	3536.91	17729.68	2079.51	111.82	1172.44
Dec 3, 2015	3584.82	17477.67	2049.62	114.32	1154.26
Dec 4, 2015	3524.99	17847.63	2091.69	121.44	1148.53
Dec 7, 2015	3536.93	17730.51	2077.07	115.45	1105.26
Dec 8, 2015	3470.07	17568	2063.59	113.89	1093.65
Dec 9, 2015	3472.44	17492.3	2047.62	115.89	1098.57
Dec 10, 2015	3455.5	17574.75	2052.23	115.99	1104.99
Dec 11, 2015	3434.58	17265.21	2012.37	116.49	1065.32

Dec 14, 2015	3520.67	17368.5	2021.94	109.01	1066.39
Dec 15, 2015	3510.35	17524.91	2043.41	109.19	1091.61
Dec 16, 2015	3516.19	17749.09	2073.07	114.18	1091.37
Dec 17, 2015	3580	17495.84	2041.89	106.11	1068.41
Dec 18, 2015	3578.96	17128.55	2005.55	109.25	1056.5
Dec 21, 2015		17251.62	2021.15	111.88	1056.04
Dec 22, 2015	3651.77	17417.27	2038.97	111.27	1068.15
Dec 23, 2015	3636.09	17602.61	2064.29	113.81	1114.87
Dec 24, 2015	3612.49	17552.17	2060.99	116.74	1106.58
Dec 28, 2015	3533.78	17528.27	2056.5	111.96	1082.12
Dec 29, 2015	3563.74	17720.98	2078.36	112.64	1088.57
Dec 30, 2015		17603.87	2063.36	110.76	1072.51
Dec 31, 2015	3539.18	17425.03	2043.94	111.18	1072.71

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