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Diploma Thesis

China-US Trade Relations

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Thesis title

China-US Trade Relations

Objectives of thesis

The overall objective of this study will be to evaluate the developments of China-US trade relations and its future prospects. Economic and political factors that impact these trade relations and the trade issues arising in the process will be determined and evaluated.

Methodology

A review of the relevant available literature and its subsequent analysis will constitute a foundation to the methodology of the study. Economic and political comparison will be used, as well as analysis and description of secondary data.

The proposed extent of the thesis

65 pages

Keywords

the US, China, trade, China-US trade relations, the WTO, exports, imports, Rembinbi, IPR, economic growth, trade deficit, FDI

Recommended information sources

- China's growing role in world trade (2010). Ed: Feenstra, R.C. & Wei, S. National Bureau of Economic Research Conference Report. The University of Chicago Press. Retrieved from http://lutung.library.ums.ac.id/dokumen/ebooks/Ekonomi/2011/09/micro%20economicChina__039_s_Grading_Role_in_World_Trade__National_Bureau_of_Economic_Research_Conference_Report_.pdf
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Declaration of integrity

I hereby declare that I have worked on my Diploma thesis titled "China-US Trade Relations" solely and completely on my own and that I have marked all quotations in the text. The literature and other material I have used are mentioned in the References section of the Thesis.

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Signature 

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China-US Trade Relations

Čínsko-americké obchodní vztahy

Summary

This thesis deals with the trade relations of the two largest trading economies the US and China. The theoretical background presents an overview of modern trade theory and will acquaint us with the two studied countries by giving an overview of their export and imports by countries and the commodity structure. The differing political and economic background of the US and China are analyzed with special importance given to the sources and consequences of China's economic rise. The thesis aims to shed light on the complexity of China-US trade relations and evaluate their past developments from rivals to strategic partners, their trade issues that arise during trading, and the future prospects of relations. The aim of the quantitative section of the thesis is to identify the main its determinants that influence US-Chinese trade balance in merchandise products, which is done by constructing a linear regression econometric model.

Keywords: the US, China, trade, China-US trade relations, the WTO, exports, imports, Renminbi, IPR, economic growth, trade deficit, FDI

Souhrn

Tato práce se zabývá obchodními vztahy mezi Spojenými státy americkými a Čínou - dvou největších a nejvýznamnějších světových ekonomik. Teoretická část práce představuje souhrn novodobé teorie obchodu a obě země jsou nám přiblíženy přehledem vývozu i dovozu a komoditní struktury. Rozdílné politické a ekonomické prostředí USA a Číny je rozebráno do detailu se zvláštním zaměřením na příčiny a důsledky čínského ekonomického růstu. Práce si klade za cíl objasnit složitosti obchodních vztahů mezi Čínou a USA, zhodnotit jejich vývoj (který z nich učinil nerozlučné strategické partnery), obchodní problémy (které v průběhu obchodování vznikají) a výhledy do budoucnosti. Cílem kvantitativní části práce je určit hlavní determinanty ovlivňující americko-čínskou obchodní bilanci se zbožím pomocí lineárně regresního ekonometrického modelu.

Klíčová slova: Spojené státy Americké, Čínská lidová republika, obchod, Čínsko-americké obchodní vztahy, WTO, vývoz, dovoz, Renminbi, práva duševního vlastnictví, ekonomický růst, obchodní deficit, přímé zahraniční investice

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1 Introduction

China and the US are two important global leaders in today's world and their role in international relations cannot be overlooked. The focus of this study is the dramatic development in trade between United States of America (US) and the People's Republic of China. Their first official diplomatic relations were being established in 1979¹ which contributed to the further development of this relationship and more importantly to China stepping out of isolation and towards mutual cooperation with the world.

Studying the US-Chinese trade relationship is extremely valuable, which we can be shown by the degree of importance of each power holds in the world. The US is has been the dominant and leading economic and political power ever since we can remember. On the contrary, China is an emerging power whose potential has only been uncovered in the last decades, now a leading exporter and the largest contributor to US growth. This is what makes the study of the nation's trade relations so interesting. Both the US and China are countries with growing power and influence on international affairs, each with a different starting point.

The developments of international trade are important factors that lead to economic development. Countries which have been able to internationalize their production through increasing their exports have been rewarded with growth of their GDP as well as their economies, as is the case of China in particular. This combined with the liberalization of international trade and the globalization of production proved to be beneficial for its development. This thesis will discuss the developments of both countries, the rise of China, and in particularly the rise of this important trading relationship, from two countries which were hostile to becoming strategic partners, who are now more interdependent than ever.

¹ Deng Xiaoping visited the United States and later a trade deal was made granting Chinese goods "most favored nation (MFN) tariff status" Chronology of U.S.-China Relations, 1784-2000. Retrieved from <https://history.state.gov/countries/issues/china-us-relations>

2 Aims and Methodology

This thesis aims to shed light on the complexity of China-US trade relations and evaluate their past developments from rivals to strategic partners and their future prospects. It aims to provide a detailed picture of the two studied countries, in terms of their economic developments, differences in their starting points, and political systems. Moreover, this thesis will give a picture of the developments of the US-Chinese trade balance, by constructing a linear regression econometric model to quantify its determinants. A review of relevant available literature and its subsequent analysis will constitute a foundation of the methodology of the study. Economic and political comparison will be used, as well as data interpretation, economic and statistical analysis.

The theoretical part of the thesis provides an overview of modern trade theorist thinking to answer the questions under what conditions is it beneficial for countries to trade? This is based on a literature review of modern trade theory, starting with David Richardo to Michael Porter. The next part of the theoretical section shall acquaint us with the two studied countries by giving a picture of their export and imports by countries, which shall be carried out by data evaluation of especially trade balance figures, and also the commodity structure of export and imports will be given.

The differing background of the US and China will be presented by using economic and political comparison. The sources and consequences of Chinese growth will be discussed and the stages of development of both countries will be identified using the framework of the World Economic Forum's Global Competitiveness Report.

The rise and continuation of the valuable US-Chinese trade relationship, which now constitutes the most important relations in the modern day world, will be explained in depth. With benefits of any relationships come drawbacks, therefore this thesis will include an overview of the trade issues and topics of disputes that result as a natural part of trading where both parties want to secure their interests. This review is based upon publications written by American and Chinese authors, which are from a range of institutions including the

Congressional Research Service, National Bureau of Economic Research, United States Institute of Peace, World Bank, US-China Business Council, university reports, and media coverage such as the Wall Street Journal. In order to provide another impartial perspective on the issue, discussion papers and reports were also taken from the Bank of Finland and the Finnish Ministry of Employment and Economy.

The aim of the quantitative section of the thesis is to construct a one equation econometric model based on collected data - 20 observations between the years 1994 and 2013 to model the total bilateral trade balance between the USA and China in merchandise goods with respect to other variables. The most significant determinants of the US-Chinese trade balance will be chosen to form the final model based on economical and statistical and analysis. Economic and econometric model is created with subsequent explanation of the model, data set is submitted, and parameters estimated using the OLSM in SW Gretl. Data analysis and description will be used to carry out the economic verification, statistical verification, econometric verification and model application. In model application the most explanatory determinant of the US-Chinese trade balance will be selected as well as modelling the possible effects of variable increases on the trade balance. These scenarios reflect the forecasted predictions of American GDP by the World Economic Outlook report “Uneven Growth: Short- and Long-Term Factors” and the Chinese inflation forecast by the People’s Bank of China.

3 Literature review

This chapter focuses on providing a solid informative base to aid in the understanding of the rest of the thesis. A summary of international trade and the reasons and benefits that arise with it will be discussed, an overview of modern trade theory will be given, which will make us comprehend the thinking of trade theorist up to present in answering why trade exchanges take place and which ones are beneficial. Next the focus will be on the countries of analysis - the US and China, an overview of their export and imports by countries and the commodity structure will be given.

3.1 Theoretical base of International trade

Trade involves transferring or exchanging goods or services for money or other means, this is most commonly referred to as buying and selling. The goods are transferred from producer, to wholesaler, retailer and finally to the end customer. Trade enhances the standard of living by providing us with an endless array of goods to satisfy our never ending human wants and provides opportunities to make profit. Trade enables optimum resource allocation thanks to division of labor and specialization and promotes economic development through employment opportunities and facilitating technology transfers. Trade is internal (Retail and Wholesale trade) and external. The latter is also known as international or foreign trade and involves two or more countries being involved in Import or Export trade (Akrani, 2011).

The trade relations have a key role in the world and the have originated in connection with economic growth and the development of civilization. Globalization has come to bring about an increased role of foreign trade in national economies. International economic cooperation makes countries interconnected and interdependent on the mutual exchange of goods and services. Countries that are able to produce high quality products have a primary role on the international market. The largest countries (or group of countries) such as the EU, US, Russia, China are the most important world importers and exporters by both volume and value. The

more open the economy is to trade - the more it depends on turnover and demand of goods abroad. This is even more so the case with agricultural products for example.

Competing on an international level is of paramount importance if a country or firm wishes to be successful in the era of globalization. The advantages that are connected with international expansion are very numerous indeed. Today's global business climate presents many opportunities to improve upon quality and efficiency, but also innovate and implement cutting edge information technology. Barriers to entry have been to a greater sense eliminated and therefore it is more accessible than ever for companies to compete abroad. This however brings increase competition in all aspects however, firms compete for customer their customer base, but also natural resources, raw materials and technology (Beneš, Maitah, Smutka, Tanner, 2008). That is why international trade is a subfield of international economics, assessing the implications of international trade in not only goods and services, but also money and securities and portfolio and foreign direct investment (FDI). International trade analyses the effects that changes in trade policy bring and deal with promoting free trade and in some cases protectionism, this is done with microeconomic tools. However, we use macroeconomic tools to define international finance questions when for example assessing the relationships of main economic variables, such as GDP, the level of inflation, the interest rate, the exchange rate (Beneš, Maitah, Smutka, Tanner, 2008).

A concept connected to trade is so called liberalism, which is the call for taking down barriers to trade, which will result in overall economic benefit; this is the principle the World Trade Organization is built upon. The opposite is protectionism, which is an economic policy that protects domestic industries against competition and therefore restricts trade and acts against the forces of globalization.

Expansion into international markets becomes a logical consequence at a certain stage of a firm's lifecycle. At a certain point in time domestic opportunities are exploited and all the market is penetrated. Growth of global operations happens when a similar target market of consumers is found abroad, combined with liberalized trade and distribution channels make it possible for these global trade exchanges. Another factor which calls for the necessity of

international trade is the extremely high set-up cost involved with some products – for example launching a new pharmaceutical product or brand. It is necessary to split costs between a large sale volumes, which international trade enables. With this, international trade brings about economies of scale trade on the domestic market could not have secured.

Advanced communication and information technology of our time enable us to engage in international trade operations more effectively, presenting a viable means of development for emerging markets.

3.2 International trade theory

Now let us proceed to examine the evolution of trade theory until now, and let us help us clarify answers to questions such as: What is a beneficial trade exchange? What conditions need to be met for a beneficial trade exchange? What makes one country more capable at producing cars and the other to specialize in wine and how is this related to trading? Why does most trade happen between countries which have relatively similar levels of technology and resources?

Up to present trade theorist have tried to answer these questions in attempt to rationalize and explain how and why trade exchanges take place. The first theory was of Comparative advantage by David Richardo which was built on Adam Smith's theory, and it discussed concepts such as opportunity cost, specialization and comparative and absolute advantage. The second theory of Factor Proportions was proposed by two Swedish economists Eli Heckscher and Bertil Ohlin and dealt with the importance of primary factor endowments. The next theory was that of Strategic Trade by Paul Krugman, which explains international trade using concepts such as economies of scale or increasing returns. Lastly Michael Porter's theory of Competitive advantage has shed light on what makes a country achieve great competitiveness and become a leader in an industry. Let us examine these theories in detail. This section of the thesis will be based on my Bachelor's thesis: Analysis of Trade Relations between US-China written in 2012 for the University of New York in Prague, which can be found in the references section under Klucká, 2012.

3.2.1 Comparative advantage, David Ricardo

David Ricardo, author of the Comparative advantage theory, built on Adam Smith's theory of Absolute Advantage, and thus at the beginning of the 19th Century gave rise to a new and broader trade theory. In Ricardo's theory he believed that an advantageous trade exchange was not bound by both countries having an "absolute cost advantage". So why according to Ricardo is it then sometimes of benefit to import goods from less efficient and cost-effective countries?

In the Comparative advantage theory, Ricardo puts forth the argument that even in a trade exchange where one side is more capable and resourceful at producing all goods – which in essence means that it has an absolute cost advantage in these goods – is of advantage to both parties.

This will prove right as long as the second party possesses an ability to produce one of the goods *relatively more efficiently* in comparison to its trading partner. Therefore, the condition for a beneficial trade exchange is when one of the trading partners has absolute advantage in both goods, while the other side possess a comparative advantage in one of the goods. In Ricardo's model, labor is the only factor of production. If a country is to have a comparative advantage in a product, its labor has to be comparatively more productive at making it (Krugman & Obstfeld, 2003, p.34).

In today's world we cannot pinpoint to a single country that is self-sufficient. This would not only be virtually impossible, but more importantly it wouldn't make economic sense. However, it is not difficult to imagine a country that produces multiple goods. In this case, it would be facing trade-offs between them. For every extra product produced, it would have to give up a decreased volume of production of its other products, as resources in an economy are not infinite. This demonstrates the economic concept of *opportunity cost*. The differing opportunity costs between countries provide the possibility of a "mutually beneficial rearrangement of world production" (Krugman & Obstfeld, 2003, p.11). Therefore, if we are to define this in another way, a country possess a comparative advantage in a good when it has

a lower opportunity cost of producing it *in terms of the other goods*, and this is in terms of the other countries (Krugman & Obstfeld, 2003, p.12).

However, solely having a superior level of productivity compared to other countries as discussed above is not the only necessary factor to having a comparative advantage. What likewise plays an important role is the level of the *domestic wage rate relative to the foreign wage rate*. When relative domestic productivity is lower in comparison to other countries, wages will be lower at home, subsequently making the final cost of the produce also *lower*, in comparison with a country with higher levels of productivity that pays out wages that are higher (Krugman & Obstfeld, 2003, p.24). When our productivity is relatively higher than the relative wage we have achieved a comparative cost advantage in terms of the wage rate.

Richardo advocated for “specialiaztion” of countries. As was stated by Ricardo, every nation should focus on the production of goods for which they have this comparative advantage and export and trade these goods with other states. (Carbaugh, 2006, p.32). States should therefore “shrink their least valuable industries and expand their most valuable ones” (Fletcher, 2010), when this this applied, the result is that everyone is better off, achieving more world output (Why trade is good for you, 1998). Every country can then consume varied assortments of products. This increased range of choice for consumers, makes the population better off. Carbaugh (2006) puts it like this; prices will be lower and there will be “higher levels of output, income, and consumption than could be achieved in isolation” (p.53).

3.2.2 Factor Proportions, Heckscher-Ohlin

The first assumption of Ricardo in his model was, that labor is the only factor of production, this implied comparative advantage arose only thanks to the differing levels of labor productivity. However, in the real world we cannot explain trade solely through differences in labor productivity. To portray trade realistically, other factors of production, such as land, capital, and mineral resources must be taken into account (Krugman & Obstfeld, 2003, p.67).

What is lacking in Ricardo's theory is for example the answers to questions such as "What is the source of comparative advantage?", "How is the distribution of income affected by trade?". Eli Heckscher and Bertil Ohlin, two economists from Sweden addressed these in the Factor Proportions theory (Carbaugh, 2006, p.66), which later became the most influential theory in the realm of international economics.

According to the Factor Proportions theory, different primary factor endowments i.e. countries' resources, determine the patterns of international trade. (Krugman & Obstfeld, 2003, p.67). If a country possess a handful of one resource, we can say it is abundant in it. Goods can be classified under several categories: they can either be labor intensive (e.g. clothing), capital intensive (e.g. technology), or land intensive (e.g. food). Usually, an economy is effective at the production of a good, for which it consumes the resource it is well endowed with, the more intensively, the better (Krugman & Obstfeld, 2003, p. 75). The underlying assumption of this model is that technology used for production is identical everywhere, so the sole difference between countries lies in the "relative endowments of factors of production" (Suranovic, 1997-2004).

Heckscher and Ohlin identified a relationship between the wage and rental rate², and the ratio of the prices of the two goods (Krugman & Obstfeld, 2003, p. 69). This signifies that if the relative price of labor rises, it will be complemented by a growth of the relative price of the labor intensive good (Krugman & Obstfeld, 2003, p. 70). Heckscher and Ohlin noticed that an surge in the price of good A, will raise the income of workers who work on A, in comparison to who work on B. Furthermore, they recognized that a change in relative price of a good will have a direct effect on the purchasing power of the employees and the general income distribution (Krugman & Obstfeld, 2003, p. 71-72). Employees manufacturing product A, whose price has increased, will see their purchasing power grow as their *real wage increases*, as opposed to those producing B, who will see it fall, due to "*lowering real rents*" (Krugman & Obstfeld, 2003, p. 71). Thus, the effect of this relative change in price is an economy that is faced with quite a fundamental change of income distribution, making the party that owns a

² The *rental rate* is the income that an owner of capital earns. (Suranovic, 1997-2004)

resource much better off, while the other is left worse off than before (Krugman & Obstfeld, 2003, p. 72).

With trade exchanges, those who are employed in factors abundantly accessible in a country, profit from trade, whereas those who have ownership of or work in scarce factors lose out (Krugman & Obstfeld, 2003, p. 77). To demonstrate this, the example of low-skilled workers in the US can be used, who become worse off as a result of international trade (Krugman & Obstfeld, 2003, p. 78). Nevertheless, generally the H-O theory suggests that trade increases the efficiency of both trading states, without necessarily concentrating on the production of the product it exports (Suranovic, 1997-2004), as Ricardo's theory recommends.

The basic conclusion that can be drawn from the Heckscher-Ohlin's theory is that nations will export goods that involve the intensive usage of their abundantly supplied factors (Krugman & Obstfeld, 2003, p. 86). The H-O theorem therefore predicts that a capital abundant state will export capital intensive products and a labor abundant state will export labor-intensive products. Nevertheless, there has been a study published that challenges this view, known as the *Leontief paradox*, which found that there is in fact no evidence to confirm this interpretation. Regardless of the Heckscher-Ohlin's predictions, from trade data it was seen that US exports use "more labor-intensive production than its imports" (Wild, Wild & Han, 2003, p. 152).

To sum up these two theories, both advocate free trade, but the H-O theory believes that trade should be governed by differences in factor endowments, rather than differences in labor productivity (Beneš, Maitah, Smutka, Tanner, 2008, p.9)

3.2.3 Strategic Trade, Paul Krugman

The afore-mentioned theoretical models that were discussed above both maintained that the sole reason and incentive to trade were country differences in technology or in resources.

Thanks to this belief, countries focused on activities they did fairly well, and imported goods for which they had a comparative disadvantage (Krugman & Obstfeld, 2003, p.120). Nonetheless, there are additional reasons, beyond that of comparative advantage, which can explain the reason for trade exchanges occurring. In the 1970's Paul Krugman (2003) recognized these as *economies of scale* (or *increasing returns*). Krugman (1992) made use of a basic monopolistic competition trade model³ from which he recognized that “economies of scale could be an independent cause of international trade, even in the absence of comparative advantage”.

The role of growing returns in international trade had failed to be recognized by trade theorists before 1980. Literature that criticized conventional trade theory had already been published, it believed that trade happens between states with similar factor endowments, and that the majority of intra-industry exchanges takes place with nearly identical products (Krugman, 1992). Some literature even emphasized the importance of economies of scale and imperfect competition in international markets (Krugman, 1992). No one had nonetheless, constructed an economic model to clarify this, since it was believed it was “too hard to model”. This led to mainstream trade theorists managing to overlook the evidence in front of them and later Krugman showing them it was actually “childishly simple” (Krugman, 1992). By 1987 standard trade theory came to include the role of increasing returns thanks to Krugman and Elhanan Helpman (Krugman, n.d).

Criticisms of conventional trade theory had been taken to the next step by Krugman, as he expressed it in a simple model, making it impossible to ignore by mainstream trade theorists for any longer. Krugman (1992), already a graduate from MIT at the time, came up with his model after a visit to his old mentor, because he was feeling “somewhat directionless”. There he stated that the monopolistic competition models (especially the Dixit and Stiglitz model) might be connected to international trade. After a few days of studying and reflection, Krugman (1992) came to recognize this would form “the core of my [his] professional life”.

³ Monopolistic Competition is a type of competition within an industry where firms are “profit maximizers” and make “similar, yet not perfectly substitutable products”. (Monopolistic Competition, 2012)

Krugman approached economic models from a different perspective; his contribution was very straightforward, by using the existing trade model of monopolistic competition, he noticed that the connection between increasing returns and product differentiation could help explain “puzzles about international trade” (Krugman, 1999). With the aid of his New trade theory Krugman (1992) explained the reason why most trade happens between relatively similar countries and so he finally came up with an answer to the question why countries who have comparable products trade. When talking about his accomplishment he remarks he looked at things from a “slightly different angle” and in doing so, “reveal[ed] the obvious, things that had been right under our noses all the time”.

The trademark of Krugman (1992) is that he used unfamiliar assumptions, in a very straightforward way. Krugman’s assumptions were:

- “Countries of identical economic size, with mirror-image factor endowments”
- “A continuum of goods all with identical production functions, entering symmetrically into utility”.

Hence, trade that takes place among countries with similar levels of technology and resources, even when comparative advantage has practically zero importance, can be explained by increasing returns which are a reason for specialization (Krugman, n.d.). When a country specializes in the production of a good, the result is that the output rises due to improved efficiency. This continues on to economies of scale, which in turn makes the unit cost of production lower (Krugman & Obstfeld, 2003, p.155). The reason for this is the *fixed cost* is now spread out over more units of production, making each final unit of production cheaper, giving an incentive for specialization and international trade. Thanks to international trade countries can make only a restricted range of products and reap the benefits from economies of scale, without having to give up the diversity of consumption (Krugman & Obstfeld, 2003, p.122). To recapitulate, then, Krugman (n.d.) sums up his contribution to economics in two points, by providing both “substance – the integration of increasing returns into economics – and style – radical simplification as a modeling strategy”.

In order for countries to be able to reap the benefits of economies of scale, they must first attempt to raise their competitiveness by *targeting specific industries* to mature, this is known as a strategic trade policy (Daniels & Radebaugh, 2001, p.189). It is not an easy job to recognize and target the right industries, but if selected well, this can lead to great success. Otherwise, countries can *target the whole industry* to adjust its “factor proportions, efficiency and innovation” (Daniels & Radebaugh, 2001, p.182). This can be attained through education of the population to increase their skills, advancement in infrastructure, and encouraging a highly competitive business environment to encourage the efficiency of companies and to make customer’s demand for high quality products increase (Daniels & Radebaugh, 2001, p.182). Using these strategically tailored policies country can achieve competitiveness in their desired area.

Moreover, Economic Diplomacy⁴ can act as a large facilitator in the pursuit of each country’s strategic goals. It is carried out using various activities such a promotion of trade and investment opportunities, and multilateral economic diplomacy. Economic diplomacy manages all these interactions by arranging and transmitting them, which largely simplifies them. Nations interact and negotiate their interests in a variety of settings. Trade delegations are hosted by Embassies, and trade fairs that promote investment opportunities in home countries are organized (Trade, investments, aid and technology, 2011).

FDI is encouraged by countries, whether from the side of a donors or receiver, their aim is to encourage their goods being exported, and foreign goods to be imported. Thus through these exchanges, positive relationships and business ties are created between foreign parties and this allows networking possibilities with professionals in a given field (Trade, investments, aid and technology, 2011). Also, when the situation demands, trade disputes are mediated on a multilateral level in organizations such as the WTO.

⁴ *Economic diplomacy* is defined as advocating a state’s economic and business interest, the aim of which is to promote international trade and investments, achieve internationally accepted standards, managing economic aid, reduce the cost and risks of cross-border transactions and achieve a right political climate to facilitate and institute all of these objectives. (Economics and Diplomacy, n.d.)

3.2.4 Competitive advantage, Michael Porter

A study was undertaken by economist and a Harvard business professor Michael Porter, to find out whether other variables exert influence of a country becoming and attaining a leadership position in a particular industry (Ball & McCulloch, 1999, p.93). Porter was aiming to discover what makes a nation become competitive in an industry, not to explain a country's export and import patterns (Wild, et al., 2003, p.156).

The other trade theories of Comparative Advantage and Factor Endowments recognized the fundamental importance of factors of production in determining the success of an industry. Porter however believed there exist four elements that govern whether firms in a country will be able to make use of their resources to obtain a competitive advantage (Ball & McCulloch, 1999, p.93). Porter identified four factors that exist, to a differing extent, in every country. He believed, these form the "basis of national competitiveness" (Wild, et al., 2003, p. 156). The four factors can be seen in graphical representation in the Porter diamond, which is made up of: 1) Factor conditions; 2) Demand conditions; 3) Related and supporting industries and 4) Firm strategy, structure, and rivalry (Wild, et. al., 2003, p.156). Each element of the diamond supports national competitiveness.

Factor conditions is the first element that affects national competitiveness. Porter further broke these down into *basic factors* (i.e. natural resources), which had been already mentioned in the Heckscher-Ohlin's model, and *advanced factors* (Wild, et al., 2003, p.156). Advanced factors are considered by Porter to be more important since they comprise of skills of the workforce and technological infrastructure, all of which must be acquired through education, innovation, and research & development. Porter puts forward that these advanced factors are detrimental in determining whether a country will have a "sustained competitive advantage" since he is of the belief that the basic factors can only cause a country to initiate production, with no future guarantees of what will follow (Wild, et al., 2003, p. 156). This can be justified and demonstrated on an example from Japan.

Japan is nowadays very well known for its highly reliable and well-engineered cars. This

cannot be explained through the H-O model logic, because it is not thanks to being naturally abundant in raw materials needed for car production, on the contrary – Japan has to rely on imports for the majority of its iron ore. Hence, Japan’s rise to become a leader of the automotive industry was not as a result of its *basic factors*, but rather thanks to its *advanced ones*. Japan’s development didn’t happen by accident; it was a result of deliberate action and targeted improvements with the aim of becoming productive. Through its efforts, Japan *acquired* its status of a top automotive producer. The same success story is that of South Korea, Taiwan and China. Later, a parallel will be drawn on China’s and Japan’s development.

Demand Conditions are the second factor affecting national competitiveness. Demanding customers ensure that the firm maintains its product quality, ensuring customer loyalty and retention through constant innovation. These actions of course are simultaneously beneficial for the firm as they make it achieve a “global competitive advantage” (Ball & McCulloch, 1999, p.93).

The third element of competitiveness is **Related and Supporting industries**. This involves firms grouped together in a so called “*exporting cluster*” which means they are located in geographical proximity and provide inputs to an exporting company (Wild, et al., 2003, p. 157). All companies within the cluster benefit as this will increase their productivity and competitiveness. Savings on transport costs are a positive aspect, but more importantly, exporting clusters are the “primary source of an area’s long term-prosperity” (Wild, et al., 2003, p. 157). Companies are not limited by domestic demand and can therefore expand beyond it, which is another advantage of this type of operations (Wild, et al., 2003, p. 157). As Wild (2003) comments “a nation’s internationally competitive industries do not exist in isolation” (p. 157).

The last factor Porter identified in his diamond is **Firm strategy, structure, and rivalry**. The reasoning is comparable as in the second factor. Porter argues that increased rivalry between domestic firms in turn will make them become more competitive, which will help them compete abroad as well. Additionally, Porter identified government actions and also an

element of chance as a separate and last potential influence on the competitiveness of national industries (Wild, et al., 2003, p. 158).

Porter added valuable insights to classical trade theory. In 1990 he presented his theory a book called *National Comparative Advantage* and using it, he explained “why certain countries are leaders in the production of certain products” (as cited in Wild, et al., 2003, p. 155) and what is the determinant of national competitiveness. According to the theory, if governments wish to increase competitiveness, they should not design policies to protect its domestic industries, but to develop components of the diamond –i.e. the internal structures of an economy (Wild, et al., 2003, p. 159).

3.3 China and US: country profiles and trade structure

Let us know familiarize ourselves with the two countries this thesis will examine, the US and China by giving an overview of their export and imports by countries and the commodity structure.

3.3.1 China: Export and import

International trade has played a key role in China’s process of reform over the past 30 years. During the start of its reforms, trade formed only 10% of GDP, we can contrast this to the year 2006, where trade took up the highest proportion of GDP at 65%. In recent years the percentage has stabilized at 45-50%. China's foreign trade turnover increased in dollar terms by 3.4% in 2014 (in RMB only 2.3%), exports by 6.1% to 4.3 trillion USD and imports by 0.4% to 1.96 trillion USD. If we were to take the year 2013 and compare, we see a downward sloping trend, in 2013 exports grew by 7.9% and imports by 7.3%. The growth of trade has been significantly slower than in previous years: 2013 - 7.6%, 2012 - 6.2%. Before 2008, China's foreign trade grew by an average of 23% per annum. This slowing down is mainly due

to lower demand in the EU and the US and rising labor costs in the PRC. With decreasing competitiveness and increasing domestic demand, this trend will continue.

China is the world's largest trader since 2013 and it has consolidated this position in 2014. World trade in 2014 grew by only 2% and Chinese exports accounted for an estimated 12.2% of world exports, which is 0.5 percentage point more than in 2013. Foreign trade contributed to the growth of Chinese GDP in 2014 by about 10.5%. The Chinese trade surplus has increased dramatically and has more than doubled its value from 2010, making it now account for 382.5 billion USD. This has surpassed the record from 2008 by 100 billion (the figure for 2008 was 298 billion USD). In 2013 the Chinese trade surplus also increased by 48 % compared to the previous year (Čína – zahraniční obchod země, 2015).

What is important to note when analyzing Chinese statistics is that statistics of China, and business partners are very different, especially given that in some exports through Hong Kong is counted, whereas it isn't in some. According to Chinese customs statistics, Hong Kong is the second largest export market for the US. Another important aspect is the fact that according to the OECD, only 67% of gross exports has added value in China. In other cases, China has only finalized the product. Value added, mostly in the form of labor costs, amounts to less than ¼ or even 10% of the export value of the final product.

	Export	Import	Balance
2010	1.58	1.4	181.51
2011	1.9	1.74	154.9
2012	2.05	1.82	230.31
2013	2.21	1.95	259.01
2014	2.34	1.96	382.46

Table 1 Chinese trade balance for the last 5 years - exports, imports, balance (in billion USD)

Source: China Hand 2015 a China Statistical Yearbook 2014; taken from: (Čína – zahraniční obchod země, 2015)

Let's proceed with the export and import of Asian tiger. China's largest trading partner is the EU (13.4%), followed by the US (12.4%), ASEAN, neighboring Hong Kong and Japan.

While China is cooperating with both neighboring countries and the key economic players in the world, we can observe the trend that the share of classical trade partners is decreasing, in favor of so-called “Emerging markets” - this proportion increased by 0.4 percentage points - especially ASEAN, India, the Russian Federation and the countries of Central and Eastern Europe.

When talking about imports however, the situation is different - the main partners are neighboring countries such as South Korea, Japan, Taiwan, etc. Moreover, it should be noted that Taiwan, from where China is importing over 13%, is not officially recognized by China. The proportion of goods exported to the United States are higher (24%) than the ones imported which are 13% (Čína – zahraniční obchod země, 2015).

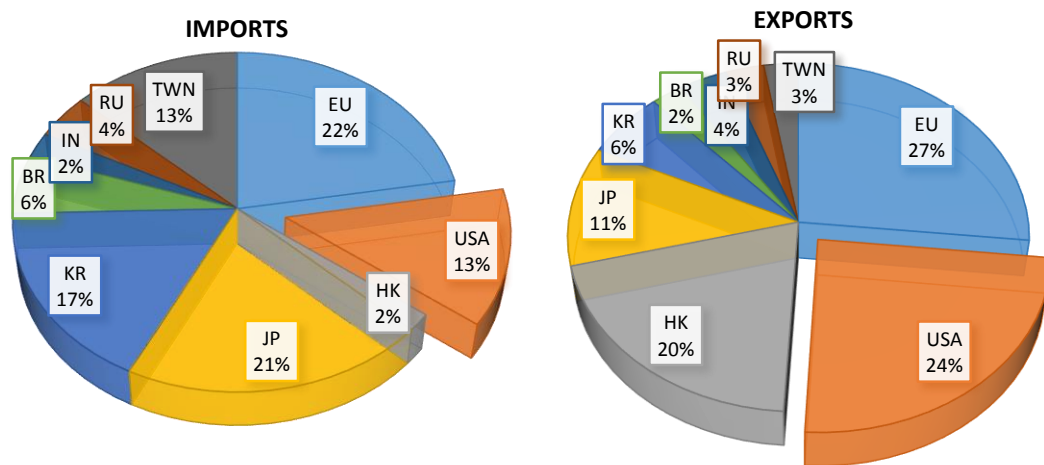


Figure 1 Chinese Export and import – by countries

Source: own processing, Čína – zahraniční obchod země, 2015

When talking about the commodity structure of Chinese exports, we must mention industrial products accounted for 95.2% in 2014, namely in one of these three categories; 1) *telecommunication equipment and parts*, 2) office machinery and equipment and 3) *electrical and household appliances*. China has become an integral part of the production chain of these goods, however the value added and technology still remains abroad as these products are mostly produced by foreign companies or joint ventures. A trend of increasing exports of locomotives and communications equipment can be noticed, the latter having an increase of 8.8% from 2013 to 2014 (Čína – zahraniční obchod země, 2015). The two largest local telecom giants are Huawei and ZTE but they contribute only minimally to the total exports, even though Huawei sells two thirds of its products abroad and ZTE and more than half, since the total value of their export do not exceed 45 billion USD. The largest share of exports are taken Apple and Hewlett-Packard and the domestic computer company Lenovo has a relatively strong position also at home.

It would be very difficult to find someone who does not own a piece of clothing that has a label that says “Made in China”. Indeed, *clothing and textiles* is the fourth strongest export category for China, followed by the related category of *textile yarn, fabrics and haberdashery*. The sixth largest category of exports that is also steadily growing is *industrial machinery and equipment*, from companies like Sany and Zoomlion that has seen a big increase of 8.7%, similar to communications equipment. Exports of Chinese road vehicles have also been on the rise – 10.4% increase from the previous year 2013. What is interesting to note, the biggest increase in category – 32.2% has been in *scientific instruments and equipment*, the second to last category, before *furniture*. An essential trend of Chinese exports that can't be failed to be mentioned is the decreasing share manufactured exports, indicating a shift towards the exports of products with higher added value. Their share in 2012 amounted to 34.8%, and 32.6% in 2013 (Čína – zahraniční obchod země, 2015).

Although there has been discussion in recent years about the increasing of Chinese private consumption, nevertheless the majority of imports are raw materials or capital goods. In 2014 raw materials amounted to 31% of all imports. The goods which have an absolutely main role

in Chinese import are iron and oil. The reason being quite simple – these are the main commodities for production, as they cannot be replaced by anything. China is in a lack of these natural resources that is why they are imported from abroad. In 2014, oil imports amounted to 228.3 billion USD, iron ore was at 93.6 billion USD, soybeans were at 40.3 billion USD and coal imports were worth 22.2 billion USD, making the total of primary materials account for 406 billion USD from the 1.96 trillion USD.

These large quantities of soybeans hint at the fact that China is in fact, the world's largest importer of soybeans and also the second largest importer of rice and barley. Wheat, rice and maize are imported since they are an indispensable part of human population nutrition, while maize is used mainly for the production of compound feed and further processing in the food industry. Rice is the primary staple food for half of the world's population and Asia is the largest producer and consumer. China, together with India and Indonesia are among the top 3 rice cultivating territories, in China the value of rice production was 50.4 Billion USD worth and 204 billion tonnes (FAO Statistical Yearbook, 2013).

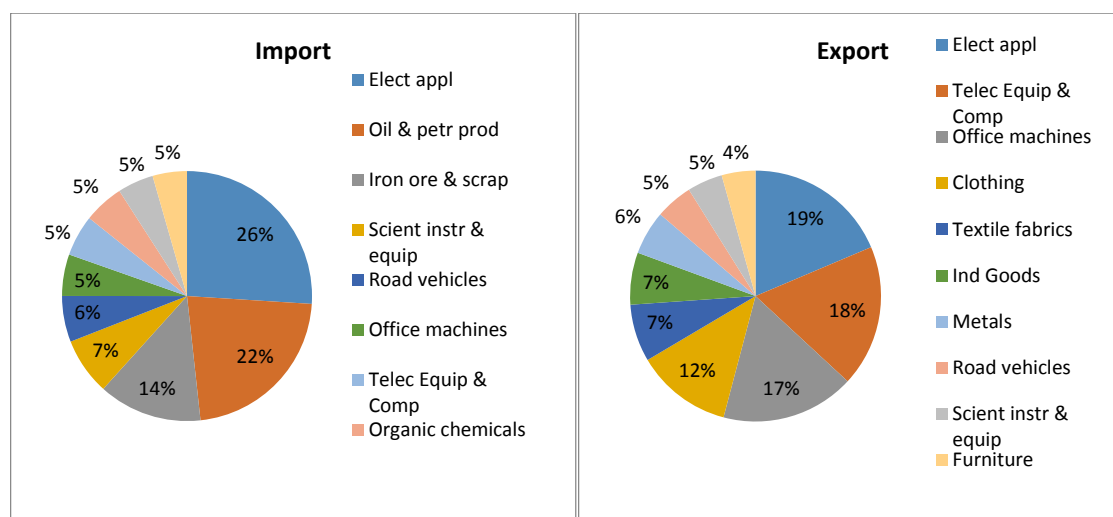


Figure 2 Chinese Export and import – by commodities

Source: own processing, (Čína – zahraniční obchod země, 2015)

3.3.2 USA: Export and import

One of the fundamental characteristics of the foreign trade of the United States is the persistent deficit in merchandise trade and a steady (and growing) trade surplus in services. Another permanent feature is the surplus in agricultural trade, because the US is the largest exporter of agricultural commodities in the world. In 2012, the USA was the third top producer of wheat with 8.66 billion USD worth and a total volume of 61.6 billion tonnes. Percentage wise, the US takes up 26% of wheat exports, followed by France (17%), Canada (14%), Australia (14%) and the Russian Federation (9%). The USA also leads the list of top coarse grain exporters, together with Brazil, Argentina and Ukraine (FAO Cereal Supply, 2015). US is highly specialized in maize production, the top 3 maize cultivating territories are USA, China, Brazil. In the USA the value of production in 2012 was 22.2 billion USD and 273 billion tonnes. The number two producer in the same year was China with 10.1 billion USD worth and a total volume of 205.6 billion tonnes (FAOstat, 2015).

Naturally, the USA holds the biggest deficit in merchandise trade with China, over 300 billion USD annually. The United States also hold a significant merchandise trade deficit with the European Union, which is around 140 billion dollar/year. Almost half of the deficit with the EU is made up of trade exchanges with Germany, but permanent deficits are also with other big EU countries like France, Italy and the United Kingdom (Spojené státy americké: Zahraniční obchod a investice, 2015). Both the figures for deficits with the EU and China are constantly growing.

The US has a strong export sector in services, mainly related to the use of *intellectual property*, amounting to a value of about 130 billion USD annually. This is thanks to the strong prevalence of creativity in US companies and therefore a push for the observance and enforcement of intellectual property rights. After *travel services*, which account for over 170 billion USD, exports of intellectual property are the second largest export item among services. Other important export item in the service category are *transportation services and financial services* (both around 90 billion USD annually). 40% of US spending is on foreign

services, which is 200 billion goes to transport and traveling abroad. 50 billion USD annually is paid out as insurance to foreign entities.

		2010	2011	2012	2013	2014
	Export	1.29	1.499	1.561	1.592	1.635
	Import	1.938	2.239	2.303	2.294	2.37
Goods	Balance	-0.648	-0.74	-0.742	-0.701	-0.735
	Export	0.563	0.627	0.654	0.687	0.709
	Import	0.409	0.435	0.45	0.462	0.478
Services	Balance	0.154	0.192	0.204	0.225	0.231

Table 2 US trade balance for the last 5 years - exports, imports, balance (in billion USD)

Source: own processing, Spojené státy americké: (Zahraniční obchod a investice, 2015)

The United States is mainly exporting to its neighboring countries, Canada (26%) and Mexico (19%). The third biggest export market for the US one the list is the European Union, where Germany plays the key role. The share of goods exported to China is only 10% in comparison (United States Census Bureau, 2015). Meanwhile, the quantity of goods imported from China is double the import figure - 24%, making China the largest source of imports for the United States.

Trade with neighboring Canada and Mexico faithfully replicates the economic situation in the USA. Growth or decline of trade is derived from the investment activities of US companies in both countries, where a large portion of the goods produced in their foreign branches, heads back to the US in the context of intra-firm trade. Both countries also record a steady surplus with the United States, which is about 45-60 billion annually for Mexico and about 30-50 billion USD annually for Canada (Spojené státy americké: Zahraniční obchod a investice, 2015).

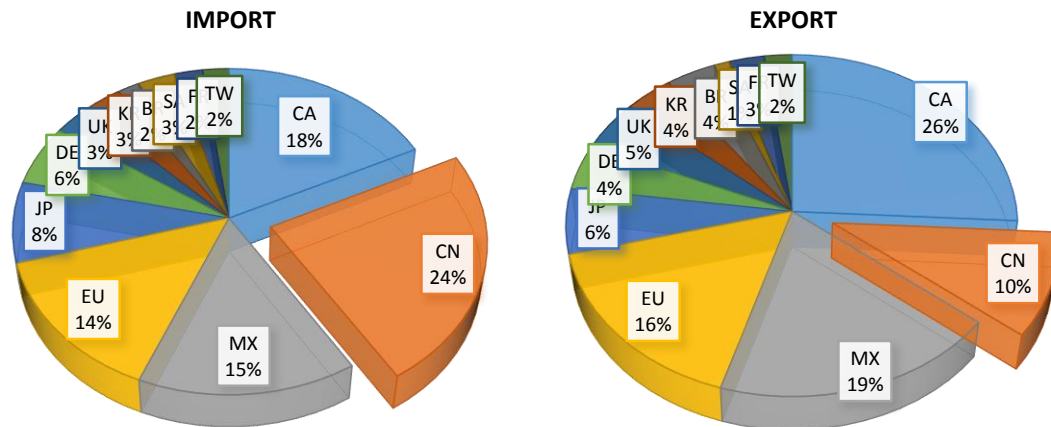


Figure 3 American Export and import – by countries

Source: United States Census Bureau, 2015

The exported products of the US represent primarily high-tech goods - such as civilian aircraft, engines, equipment and parts for transport vehicles, cars, industrial machinery, chemical products, pharmaceutical preparations and also petroleum products and heating oil. The main imported goods by the USA is crude oil from Arab countries, which takes up a third of imports. Other major categories of US import are cars, parts of equipment for transport vehicles, mobile phones and appliances, pharmaceutical preparations, telecommunications equipment, computers and computer accessories (Spojené státy americké: Zahraniční obchod a investice, 2015).

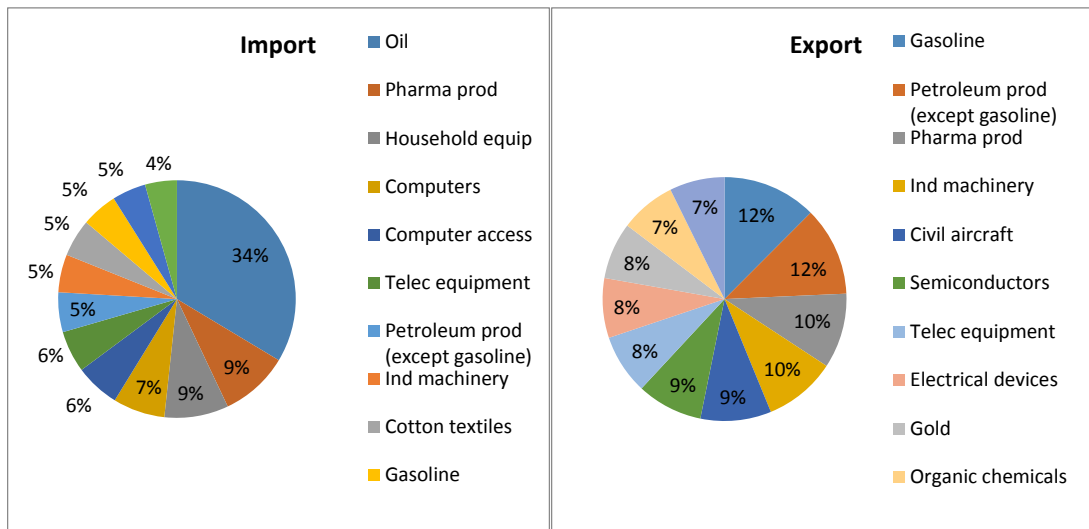


Figure 4 American Export and import – by commodities

Source: Spojené státy americké: (Zahraniční obchod a investice, 2015)

4 China-US Trade Relations Analysis

This section will present the differing background of the US and China – as the political and economic differences characteristic of each country are not similar. Their development will be explained and the stage of development will be identified using the framework of the World Economic Forum's Global Competitiveness Report. Particularly the sources and consequences of Chinese growth will be discussed as well as the prevailing trends of both countries development.

How did two such differing economies get friendly and subsequently over the years how did China become the second largest US trading partner? The route from hostile relations to strategic partners will be explained. The ways in which both countries possess complementary of economies which gives rise to beneficial trade exchanges will be discussed. Another, more problematic aspect of the relationship will be evaluated; that are the specifics of Chinese US trade and the trade issues and points of tensions that present themselves as a natural outcome of the large bilateral trade relationship, which are largely the rising trade US trade deficit with China, the great investment ties between the two nations and some trade frictions relating to Intellectual Property Rights (IPR), government subsidies and lastly not adhering to World Trade Organization (WTO) obligations. The valuation of the renminbi will be analyzed carefully, as it has been a hot topic which analysts. How does it affect bilateral trade and the complaints from the American side arguments for it from the Chinese side will be discussed and evaluated. The last part will highlight the necessity of mutual cooperation despite the differences present as both countries relationship presents the most important relations in modern world.

4.1 Comparison of Economic background

The US is has been the dominant and leading economic and political power ever since we can remember. On the contrary, China is an emerging power whose potential has only been uncovered in the last decades. This is what makes the study of the nation's trade relations so

interesting. Both the US and China are countries with growing power and influence on international affairs, each with a different starting point.

The US can be classified as a highly developed and industrialized state, and China as a rapidly-growing developing country with enormous potential, who has achieved a significant global strategic position in the world economy. Its economy has grown at such a fast rate that it is now holds the second place in the world for its size, with the United States having the number one largest economy (Lawrence, 2013). Some analysts speculate even further by suggesting that it could take over America's first place in about five years. China however holds first place in being the world's largest trading economy.

As we have mentioned, China can now be regarded as a major player in the international trade playing field. After the Maoist era, China has opened itself up to trade with the outside world. It implemented domestic reforms, which integrated it into the global market and in two decades later, it become a major center of global trade and manufacturing activities (Zeng & Mertha, 2007, p.1). China has grown exceptionally both in terms of its economic GDP growth, making it at present the "world's second largest economy and premier creditor" (China 2030, 2012), but also in terms of what kinds of goods it exports. Its growth can be associated not only with domestic activity, but also heavy foreign investment. In 2002 China surpassed the United States as the leading recipient of foreign direct investment in the world, of which the US is the largest originator (Lum & Nanto, 2006, p.38). Complementing China's development and rise into the fastest-growing economy, has been a substantial increase in its economic ties with the United States during the last three decades (Morrison, 2011). Between the years 1979 – 2010, US-China trade had grown from \$2 billion to \$457 billion, which illustrates the sheer magnitude of this increase.

4.2 Nature of Chinese economy compared to the US

China and the United States possess the two largest economies in the world. Nevertheless, there remain differences between them. On the one hand China has undergone rapid economic

expansion; besides being a global economic power, China is now also the “world’s largest manufacturer, merchandise exporter, and holder of foreign exchange reserves” (Morrison, 2014a). Chinese GDP is the second largest in the world after the US, also Chinese GDP forms 14.9% of world GDP, making it the second largest share after the US which form 18.87% of world GDP. But on the other hand, it still lacks development in many areas. Despite the fact that Chinese GDP may be very high and growing, which is largely the result of the combination of cheap labor and large volumes it exports, at the same time Chinese GDP per capita is very low. Chinese GDP/capita however is ranked on the 77th place in the world according to the Global Competitiveness Report 2013–2014, being in a worse position than countries like Kazakhstan, Mexico, Costa Rica, South Africa, and Iran (World Economic Forum, 2013). The world leaders of GDP per capita are the European countries (such as Luxemburg, Holland, Switzerland, Germany, etc.) and it is interesting to notice that their total GDP is lower than the Chinese one, which grows primarily through volume and cheap labor.

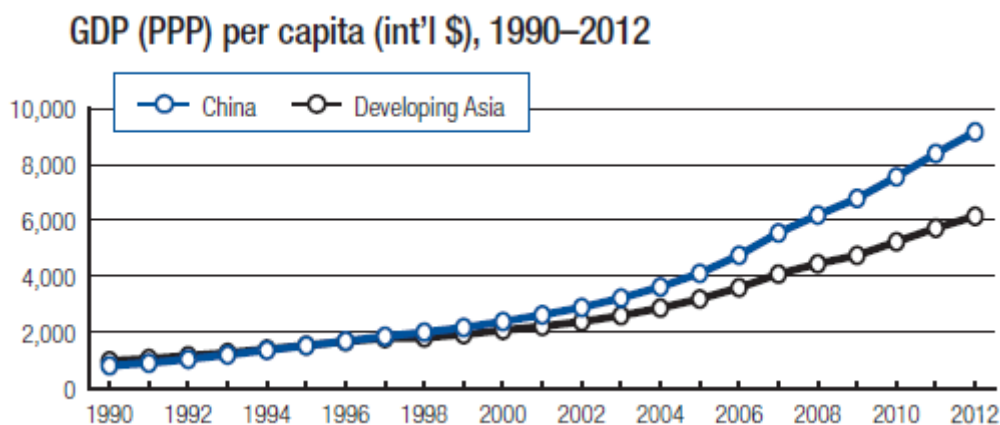


Figure 5 Chinese GDP (PPP) per capita, 1990 – 2012

Source: World Economic Forum (2013)

4.2.1 Chinese transformation

The Peoples Republic of China is a country with one of the world's oldest cultures, which it is very proud of. China is the most populous country and is the fourth largest country in the world in terms of area size. Population density is 145 people/km² and the annual population

growth is a steady 0.5% for the last few years (World Bank, 2015). China has undergone major changes in the economy over the last 40 years, in terms of economic growth and changes in the political approach which now supports the pro-export economy and creating an environment friendly towards foreign investment. Its economic development cannot be replicated at this scale around the world, so can be judged as an almost unique phenomenon. The main factors that led and helped give pace to this massive development is a combination of historical, political, as well as demographic, sociological and economic developments.

In the past, China had a very closed economy for a very long time. Until the seventies, China was a closed country due to the so-called Maoism, which was a cause of the country hardly developing in economic terms. The economy was centrally planned, which meant that resources were allocated and production goals and prices were set. This resulted in almost three quarters of industrial production to be produced by centrally controlled in 1978, state-owned enterprises (SOEs). Foreign investment and companies were not allowed and trade was only limited to some items which were not possible to get in China, the aim of which was to make Chinese economy self-sufficient (Morrison, 2014a).

The Chinese economy was stagnant and inefficient, competition was nonexistent and the living standards of the Chinese population were substantially lower than in other developing countries (Morrison, 2014a). Families which at that time owned a TV or mobile phone were perceived as being very rich. Luckily, all that changed with the death of Mao Zedong and the transformation of the country was about to begin. In 1978, two years after the death of Chairman Mao Zedong, the Chinese government started to progressively reform their economy by getting rid of the Soviet-style economic policies and adhering to free market principles by opening to trade and investment. Gradually reforming and opening to the outside world has proved to be extremely successful in supporting economic growth and rising living standards. Rising levels of production were tied to great FDI inflows, both continuing to increase on a large scale after China's accession to the WTO (China's Growing Role in World Trade, 2010, p.513). On average it had sustained an annual growth rate of 9.8% (Yongding, 2010, p. 39).

A pertinent quote to this situation would be from the Chinese leader Deng Xiaoping, who put in place Chinese economic reforms and compared the type of economic system to the colour of a cat's fur: "*Black cat, white cat, what does it matter what color the cat is as long as it catches mice?*" (Morrison, 2014a). In 2012, thirty four years after the transformation, China currently accounted for 10.4% of global world trade, which is 143 times more than when Den Xiaoping opened its market in 1978 (Li, 2012). Many analyst content that the rise of China during about three decades is the "greatest economic success stories in modern times" (Morrison, 2014a).

The Chinese political arrangement is referred to as an authoritarian regime under the leadership of the Communist Party of China, where, from 1949 to the present four generations of leaders have taken power in succession. According to the Constitution from 1982 however, the PRC is a "socialist state under the people's democratic dictatorship led by the working class and based on the alliance of workers and peasants" (Xingxing, 2004). The PRC's state power is separated from the Communist Party, the country has its own president and government with a prime minister. In reality, the legislative power at the central executive level is concentrated in the hands of a relatively small group of senior representatives of the Communist Party, whose membership in high party politics is usually also accompanied by a high state functions. Provinces are led by governors and provincial secretaries of the Communist Party, who have significant autonomous powers in decision making and in the implementation of directives from headquarters.

Apart from the strong position of the Communist Party of China an important function is that of the Central Military Commission, which is directly subordinate to the President who holds the power over the armed forces of the entire country. Referendum committees controlling the National People's Congress, a sort of parliament, and the military commission chaired by the current President of the PRC Xi Jinping.

4.2.2 Sources and consequences of Chinese growth

The exceptional growth of the Chinese economy has brought substantial benefits to itself; reduction in poverty, job creation, and imported foreign practices, resulting in higher competitiveness. The government relies now on this growing economy as means to achieve social stability. However, Chinese future economic growth could be threatened by several issues and economic challenges that China is faced with.

Despite the global financial and economic crisis the major political trends remained intact in the country. The Communist Party has everything firmly under control, including both domestic political events, but also international trade. In everything it does it adheres to the national interest with the goal of to maintain economic and social stability, which would ultimately maintain the exclusive leading role of the Communist Party. How else would the government be legitimate to the majority of the population, without good economic results? Trust in its politician is as high as 26 out of 148, which is quite remarkable, given that the Czech Republic is the 146th place. A prosperous economy is one of the crucial factors that are holding together this regime. Domestic interest is always on mind, efficiency of government spending of public revenue is very high in China – 29th most efficient country, which proves again that the government strategically targets its policies, including spending.

The financial crisis and fall in global demand has however exposed China's reliance on exports; its "export dependency is the highest among the major world economies" (Yongding, 2009, p.1). This is because of its "export promotion policy" and the overcapacity as a result of excess investment, as already discussed (Yongding, 2009, p.2). The Congressional Research Service Publication from August 2014 identifies these economic challenges to be mostly related with China's great reliance, or over-reliance we can say on "fixed investment and exports for economic growth rather than on consumer demand, government support for state-owned firms, a weak banking system, widening income gaps, growing pollution, and the relative lack of the rule of law in China" (Morrison, 2014a). These problems are quite

significant and reflect the fact that maybe amidst the quick growth solid foundations of an economy were not properly laid out.

Now that the technological development of China is beginning to catch up with developed countries, the gains from productivity achieved through technology transfers under FDI could be leveled, in turn causing real GDP growth to slow down. To prevent this from happening, specialist in Asian trade and commerce from the Congressional Research Service Wayne Morrison points out that China will have to become itself a major center for new technology and innovation or also likewise implement new comprehensive economic reforms (2014a, p.5). Morrison warns that in the past other countries had a problem of economic stagnation that prevented them from transitioning from middle-income to high income countries. According to the prediction of The Economist Intelligence Unit (EIU) real GDP growth in China will slow considerably in the years ahead, averaging at around 6.1% in 2014 to 2020, and 2.3% from 2021 to 2030 (Morrison, 2014a).

The Chinese government is aware of these issues and has promised to address them by employing policies which will encourage consumer spending, increase the coverage of social safety measures, and boost the expansion of less-polluting industries. It is aware that it needs to decrease its dependence on industries consuming high amounts of energy and which pollute and that it need to move towards green energy, to attain a more balanced “smart” economic growth, as opposed to just “fast” growth at whatever means. Problems such as energy shortages, uncontrolled environmental degradation, inconsistent legal system and violations of labor, civil and human rights are also the reality in China.

Other serious issues are rising inflation, unemployment, real estate prices, and also growing inequalities between the Chinese population; that are some of the underlying reasons why the Communist Party of China detected the need to focus on strengthening social management and begin producing measures to eliminate the negative trends of economic growth. Because in the case that these were not addressed, social unrest could logically follow.

Figure 6 below taken from the Global Competitiveness Report shows a general overview of the socio-economic situation and points out positions in the world ranking and their development. According to it, China is in the efficiency driven stage of development, mirroring the spider web of efficiency driven economies, with the difference that it has an even larger market size at the highest level 7, and better macroeconomic environment and health and primary education.

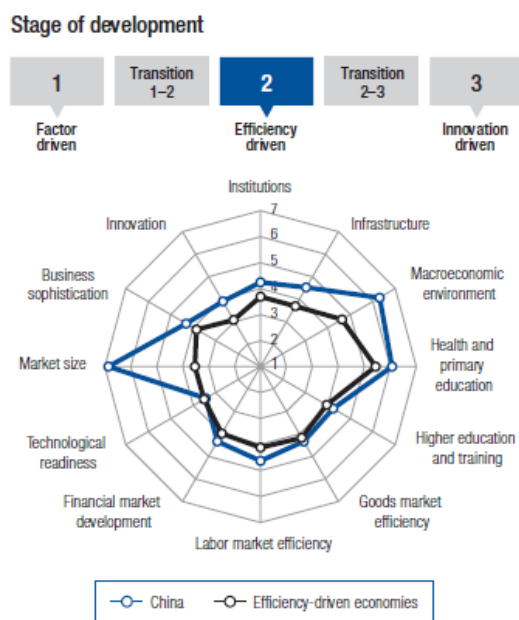


Figure 6 China's Stage of development

Source: The Global Competitiveness Report 2013–2014. World Economic Forum (2013).

China is developing its labor market efficiency and higher education and training, which is a positive sign. China has infrastructure is developing in the right direction and it has rising business sophistication and institutions. It needs to further work on innovation, technological readiness and financial market development (World Economic Forum, 2013). The most problematic factors for doing business as cited by entrepreneurs are access to financing, inefficient government bureaucracy, and corruption, which can be seen on Figure 7. These are significant obstacles which can hinder the business deal negotiation process. Other hindrances

include tax rates, inflation, and lack of innovation and infrastructure (China which is a very large country and infrastructure is well developed in some places, but this is not true of the entire country of course). Inadequately educated workforce and their poor work ethic is a much smaller scale problem, nevertheless the lack of complex education might be a concern when talking about more skilled jobs, as the majority of the Chinese population maybe not yet be prepared and capable to easily switch from labor intensive tasks to more technological ones. The issues when doing in business in China that cause the least problems are public health, which was mentioned is at a slightly higher rate compared to the other efficiency driven economies. Next, crime and political instability are not a big problem in China, as the Communist regime ensures a stable political environment in the country.

The most problematic factors for doing business

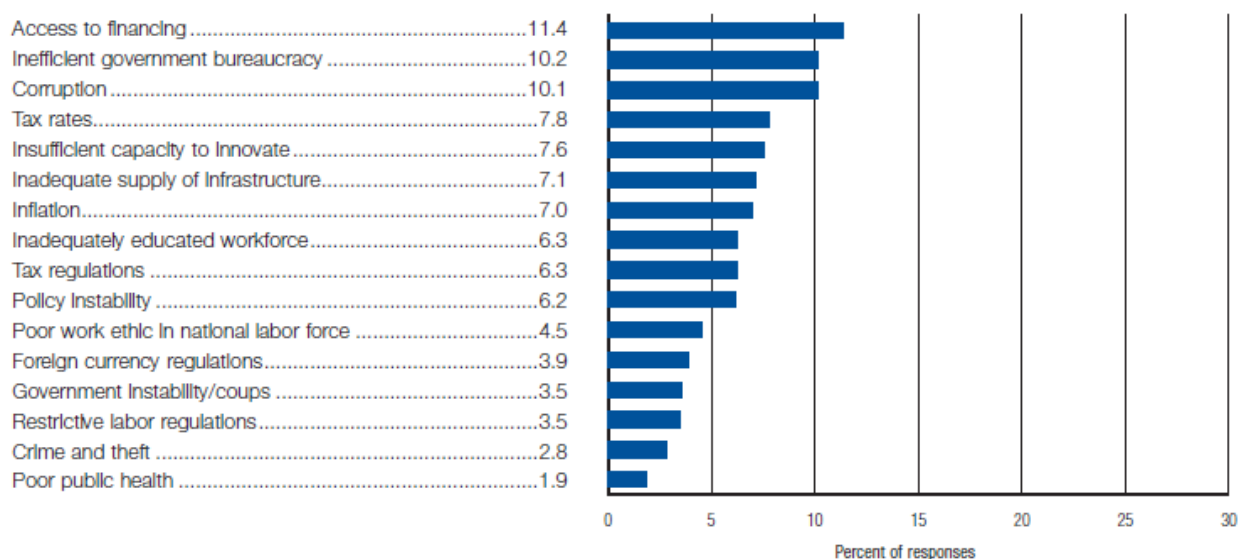


Figure 7 The most problematic factors for doing business in China

Source: The Global Competitiveness Report 2013–2014. World Economic Forum (2013).

Economists generally come to agree upon the major part of China’s rapid economic growth can be attributable to two basic factors: *Large-scale capital investment*, which had been paid

by huge domestic savings, and *foreign investment and rapid productivity growth*. China has an extremely high level of savings - it has the highest level of gross savings as a percentage of GDP among major economies. While it also enjoys the benefits of boosting its economy with domestic investment, it still remains a net global lender as its domestic investment doesn't exceed its saving rate (Morrison, 2014a). Gains from increase productivity also played a role in China's growth as resources were transferred to more economically efficient sectors. The noticeable dynamic development has been also happening thanks to the openness to the global economy, including the membership in the World Trade Organization, but also the restructuring of the private sector, which moreover benefits from low labor costs; these are however currently rising.

From the Chinese perspective, China's growth strategy stems from two sources: 1) Investment growth and 2) Export-driven growth (Yongding, 2010, p. 22). We can characterize Chinese growth by having extremely high ratios between both Investment/GDP and Exports/GDP (Yongding, 2009, p.2). There is no doubt that FDI in China brought with it new technology and processes that boosted efficiency. However, being reliant on external demand is very unstable and Yongding (2009) argues that China will not be able to sustain its investment-driven and export-led growth (p.8).

4.3 Economic and political nature of the US economy

In the long journey in human history the United States of America have played a central role. The Soviet Union collapse at the end of the Cold War marked an important point in history. This was the start of the rapid ascendance of power in the Western hemisphere, with the US being the "sole, and indeed, the first truly global power" (Myllylä, 2015). It not only became a globally leading superpower, but also the first non-Eurasian superpower.

America's evolution was a long one, but successful one. After having achieved independence, it pursued expansionist policies, not only in the political meaning, but also in the economical. Each administration of the US has had different strategies they pursue during their political mandate. However, if we look carefully at history we can witness a continuity of wider policy

goals, which are manifested through the American core national interests, which in turn are shaped by values, geopolitics and economy. Dr. Richard Hooker identifies what constitutes the core of a national strategy – the preservation of core strategic (national) interests. And this has remained consistent throughout American history.

The US has to put it simply, created and continually creates global order. As the Senior Adviser at Ministry of Employment and the Economy in Finland puts “U.S. global primacy is heavily linked to its capability to secure the undisturbed functioning of the world economy” (Myllylä, 2015, p.15). The importance of the economic aspect in today’s world is already known and the US achieves its grand strategy precisely through these means. Building up a powerful economy with advanced technology, industrial base, military reserves, together with possessing an educated and technologically skilled population in a liberal democratic political system capable of making sustainable decisions, remains of the core strength of America. The US has brought about a rules-based international and economic order, which has unmistakably benefited much of the world.

Based on its core values the US took an active role in building an institutionalized world order, by assisting post-war reconstruction, which was in fact financed by America. Militarily-wise is built the North Atlantic Treaty Organization (NATO). Economy-wise it has built the Bretton Woods system, which was the first to govern monetary relations, later giving rise to International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD), which is nowadays part today of the World Bank Group. The US opened up its market to exports of participating states and thus helped regenerate the European economies after the war. Through this, it becoming the basis of the global trading network, which began with the General agreement on Tariffs and Trade (GATT), later transforming into the World Trade Organization (WTO). The US Dollar became the world reserve currency and the US acts as a lender of last resort, thus establishing American dominance in the global economic system. As the Senior Adviser Myllylä puts it, only a “powerful economy enables the realization of long-term strategy” (2015).

The core interest from a US geopolitical perspective was the prevention of the emergence of a rivaling and hostile Eurasian state and containment of Soviet communism and rather promoting stability and democracy in the region. Therefore, we can see European integration as a European peace project, but at the same time it has to be acknowledged as part of a wider trans-Eurasian integration project, which is ultimately connected to the long-term grand strategy of the US (Myllylä, 2015).

Today the world is no longer bipolar, but the end of the Cold War has brought about a multipolar system which features apart from the militarily and economically dominant US, also a rising China and India, growing Russia, and economically wealthy but militarily declining Europe. It also includes the unstable Middle East, failed states and empowered non-state actors and organizations. In this new world order we have witnessed the gradual decline of the share of US GDP in the global GDP figure. After WWII the US formed as much as 50% of world GDP, now it is about half of that, the Global Competitiveness report cites the exact figure at 18.87%. American GDP is still significantly higher than other advanced economies, nevertheless is expected to gradually decline to reflect the share of its population. The US GDP per capita remains the top 11 in the world at 49,922 billion USD in 2013 (World Economic Forum, 2013).

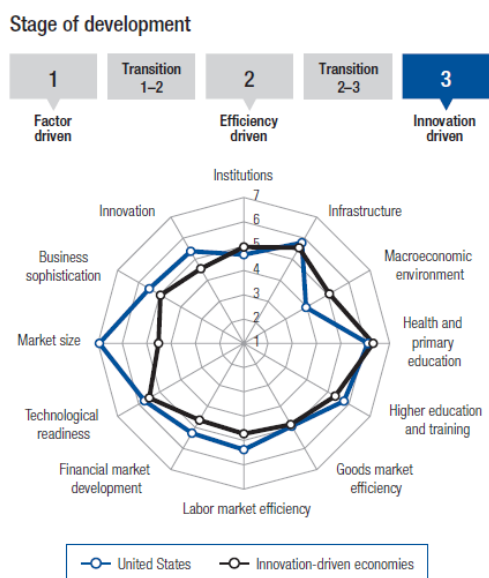


Figure 8 Stage of development of the United States

Source: The Global Competitiveness Report 2013–2014. World Economic Forum (2013).

In terms of stages of development it is not surprising to note that the US has reached the final Innovation driven phase, which China has yet to attain. As we see on Figure 8, America is slightly ahead of other economies in its category, with room for improvement especially in its macroeconomic environment, institutions and slightly in health and primary education. The most cited problematic factors for doing business are related to these areas; they are tax regulations and rates and inefficient government bureaucracy, but also access to financing, labor regulations, inflation, inadequately educated workforce and poor work ethic (World Economic Forum, 2013).

Innovation has always played an integral part in the success of the United States. It's core comparative advantage lies in its ability to manage well, with is further promoted by a regulatory framework that puts emphasis on the aspects of consumer welfare and open competition. Moreover the US is one of the countries that builds its “macroeconomic stability on monetary policy instead of fiscal policy” (Myllylä, 2015).

Thus we can sum up, that from the Declaration of Independence in 1776, up-until the end of the Cold War in 1991 the principal strong foundation of US economic strength lay in the techno-industrial base which had been extensively promoted by public research funding. Nowadays, this aspect still remains strong, but the core of the American economic strategy lies in the financial sector. The strategic goal in mind is being able to promote not only free world trade, but likewise a global dollar-based financial market (Myllylä, 2015).

4.4 Outcome of previous sections

Now we have compared economic and political systems in the US and China, acquainted ourselves with the country profiles, detailed trade structure, and familiarized ourselves with what determines the level of trade according to the theory. The theoretical predictions that have been outlined thus far, serve to illustrate us the important aspects of trade that have been recognized over the last two centuries by theorists.

They identify exactly the aspects of trade that have been recognized as re-occurring over the years and serve as explanatory of the trade exchanges carried out between nations. Each theory brings its own insightful ideas to predict and logically explain the flows of trade, from which we are able to witness the development of trade theorists' thinking. The models may not necessarily be capable of explaining reality and today's trade flows entirely and with infallible accuracy, but they represent the best explanations for the theorists at that time. We can find some very limiting assumptions (especially in reference to the theory of Comparative advantage) and some aspects of trade development may even be left unaddressed, leaving us with unanswered questions. Nonetheless, each theory brings us its learning points and brings something some aspect that is essentially true and can be applied to certain situations we face today.

Nevertheless, no matter how accurate trade theories are, they is no guarantee they will be able to predict future trade patterns. The forecast of the future trade flows is done based on analysis and the finding of patterns in *past* trade flows, to which there is no guarantee that what has happened will go on to follow a related trend in following years. This is especially true in today's rapidly changing and innovative world where we are constantly moving forward at astonishing speed. Some years ago, we were not even able to imagine the sheer impact and progress that the technology revolution of the Internet which has happened over the last 25 years has brought us. Hence one limiting factor of the application of theory into the future is the speed of progress, but this is certainly not the only one. What is also important to consider is that the actions of political representatives in public institutions, regional trade agreements, such as the European Union, and even multilateral organizations, like the World Trade Organization, can certainly influence the way a country economically operates at home and abroad. We have discussed the economic and political systems of our two studies countries as it is evident that the policies of the ruling government, including its foreign policy, and its use of economic diplomacy will change the way it behaves on the international scene and affect its economy.

Standard political economy studies of trade policy have confirmed this, which point out the "influence of interests and political institutions, among other variables, on trade policy" (Zeng,

2007, p.170). The type of regime as well as the electoral and party system can all shape trade policy, where political institutions can favor interests of one group over another, as a result of interest group lobbying (Zeng & Mertha, 2007, p.3)

4.5 US-Chinese trade relations in perspective

The world is increasingly economically interdependent and has shared security issues. This growing economic interdependence has quickly presented new large-scale global challenges and opportunities that the international community is confronted with. In this present organization of the world it would be unwise for the two countries with the greatest contribution to world GDP (over 33%) to not have friendly relations.

It is vital that the relationship of genuine partnership continues between the China and the United States. The reason for this does not have to a shared ideology, or similar geopolitical interests, but it should primarily rest on the common need of global governance, says Wu Xinbo, senior fellow at the United States Institute of Peace (2011). A pre-requisite for this to happen is that both countries have to respect the other's legitimate core interests, because a lack of thereof would result in distrust and misunderstanding of intentions, which would ultimately make cooperation less probable. Differences arising between US and China are inevitable, the development of the relationship between the US and China is of course limited by certain factors such as differences in opinion on global strategic issues. In order for them to not prevent economic ties they should be addressed in order to build up mutual trust. Successful economic cooperation will not only bring economic benefits to the two countries but it will also serve the development of mutual trust.

Not only are China and the US are two important global leaders in today's world and their role in international relations cannot be overlooked, but they also share together one of the most important relations in modern world. This relationship developed over the past decades from virtually nonexistent to being the most important in the world. The importance of the relationship can be illustrated on the large volumes of goods traded, the largely integrated

supply chains, an increasing volume of trade in services, extensive direct investment from America into China and an even greater Chinese investment in US Treasury securities.

As we can see from Table 3, the US and China belong among the **Top 3 exporters**, their economic ties have expanded, and are strategic partners. According to specialist in Asian Trade and Finance Wayne M. Morrison, China is the 2nd largest US trading partner, 3rd largest export market and biggest source of imports (2014b). The US with the population of 318,8 million has the GDP 15,684.8 billion USD. China's GDP is 8,227 billion USD with 1,355 billion inhabitants. If we look at the GDP/capita, the US's figure is significantly higher at 49,922 USD, compared to 6,076 USD for China (Morrison, 2014b).

RANK	COUNTRY	EXPORTS
1	<u>China</u>	\$ 2,210,000,000,000
2	<u>European Union</u>	\$ 2,173,000,000,000
3	<u>United States</u>	\$ 1,575,000,000,000
4	<u>Germany</u>	\$ 1,493,000,000,000
5	<u>United Kingdom</u>	\$ 813,200,000,000
6	<u>Japan</u>	\$ 697,000,000,000
7	<u>France</u>	\$ 578,600,000,000
8	<u>Netherlands</u>	\$ 576,900,000,000
9	<u>Korea, South</u>	\$ 557,300,000,000
10	<u>Russia</u>	\$ 515,000,000,000

Table 3 Country Comparison of Exports

Source: CIA World Factbook, 2013

4.5.1 From enemies to strategic partners

Both are **important strategic partners**, thanks to the benefit they both provide for one another. This sheer strength of their cooperation, brings together a **necessity for mutual cooperation** among them. China needs the US to support her in integration into the global economy and the US needs China in order to retain cheap and easy access to products and

credit (as China keeps US interest rates down by buying its debt). In other words, both sides have a significant stake in one other's development.

Relations had been hostile before American President Richard Nixon met Chairman Mao Zedong of the People's Republic of China in 1972. The two countries had been top enemies as the US was radically against communist governance. "Nixon to China" broke this, the Shanghai Communiqué was negotiated and thus the visit marked the beginning of a thaw in Sino-American relations after many years of hostility (US Department of State, 2013).

The two countries recognized the strategic importance of mutual collaboration against Soviet hegemony. Formal diplomatic relations were established on 15 December 1978 and Chinese economic reforms and opening of its economy proceeded three days after (China-United States Exchange Foundation, 2013). Since this time, four decades later, there have been four generations of Chinese leaders and six US presidents who have tried to form a solid and durable US-China relationship. Although there have been ups and downs along the road, what is important that overall the relationship has endured.

Mutual economic relations have given rise to great economic benefits to both countries. The US innovation ecosystem has opened the possibility of innovation and market opportunities for Chinese firms, from which China has benefited immensely.

China entered the WTO in 2000, combined with most-favored nation treatment it was granted by the US in the 1990's, this provided ideal grounding for its further development. The tremendous progress in its economic development can be seen on its GDP development. Between 1978 and 2012 we have seen Chinese real GDP grew from \$341 billion US dollars to \$8.262 trillion US dollars (measured at 2012 prices), which officially made China to become the second largest economy in the world, after the US.

Trade flows between the two countries has increased exponentially from \$2 billion in 1979 to \$562 billion in 2013 (Morrison, 2014b). Data about trade flows differ whether they comes from the Chinese or American side. Let's have a look at data of Chinese and American exports of goods and services. Chinese exports of goods and services to the US increased from \$9.65

billion USD in 1992 to \$364 billion USD in 2012, this is according official data from China. The equivalent numbers for the same period according to official US data are \$27 billion USD and \$446 billion USD. In the same way, Chinese official data state that US exports of goods and services to China developed from \$10.5 billion USD in 1992 to \$163 billion USD in 2012, while official US data cite the development to be from \$9 billion USD to \$14 billion USD. From both data set it is evident that there has been a very quick growth in in bilateral trade and we can notice also a more rapid rise in US exports to China than China's exports to America, a trend which is estimated to continue as China will inevitably work on changing its growth structure.

Both countries now face different situations in their economic development. For China, the next ten years will be a decade of change. China must change its growth strategy it used in the past three decades – that of export led growth, its economy has to start relying on internal demand as well as consumption led growth. The Chinese economy has to shift from being input driven to innovation driven, which poses enormous challenges to China. Even though the US is the most innovative and technologically advanced country, its economy is on the other hand dealing with the recovery from the most severe financial crisis that we have witnessed in recent years. This is all meanwhile its economy is in need of structural adjustments, due to an ever rising budget deficit, trade deficit as well as high unemployment rate. Moreover, as Wu Xinbo, author, professor and senior fellow at the United States Institute of Peace says what the Obama administration has realized is that the US economy has to reduce its reliance on the so called “virtual economy” which is represented by sectors such as finance and sectors dealing with nonmaterial products and has to also focus on the real economy, with sectors such as manufacturing industry (2011).

4.5.2 Complementarity of economies

The last 35 years of prosperity are a result of multiple factors, the world has been at peace and we have witnessed a revolution in information and communication technology, which was largely led by the United States. This has reduced the transaction cost of doing business abroad and the world has become one global market. In this case America was responsible for

the technological innovations and China was the place with a comparative advantage in labor cost and therefore became the point of final assembly due to its low wage rate. This current world order also means that moving jobs to cheaper locations is easier than ever, resulting in fragmentation of production, global supply chains and ultimately in a more interdependent and more integrated global economy than ever before. There are some negative consequences as well such as unequal distribution of the benefits of economic growth, rising income disparity, and a downward pressure on wages in developed countries, due to low wage rates in developing economies.

From this it is apparent that China's and US economy are greatly different, but also complementary and that is precisely the reason why trade exchanges are beneficial between them. The greatest benefits from exchanges occur when cooperation happens between economies that are the most different, i.e. when their comparative advantages practically do not overlap. If two countries have similar natural resource endowments and also wage rates and cost of capital, trading would not bring much benefit, as the final cost structure would be basically the same (China-United States Exchange Foundation, 2013).

However in US and China there are vast differences between the availability of the tangible primary inputs of production, which are capital, labor and land. In terms of capital, US workers are better off than the Chinese workers, as they have more than six times more equipment to work with, making them much more productive. Secondly, in terms of **labor**, China is a labor abundant country, having 5 times more working-age people than the US (in 2012), making its economy have a labor-surplus. The weighted average of minimum wages range from \$1.85 USD in Chinese provinces and the highest minimum wage per hour can be found in Beijing at \$2.43 USD, compared to the US federal minimum wage of \$7.25 USD. This clearly shows that the cost of Chinese labor is less than a third of the cost in the US. Thirdly, in terms of arable land the US has a third more (163 million hectares compared to 122 million hectares in China), however we must take into account that China's population is as much as six times higher than the US. China is the largest importer of agricultural products in the world, the US supplies the largest quantity of them, while China is the largest market for US agricultural products. This dependence is likely to continue in the years to come as China

will not likely meet additional demand due to the growing population, middle class and trends of urbanization (China-United States Exchange Foundation, 2013).

	China			U.S.		
	2010	2011	2012	2010	2011	2012
Tangible capital per working-age population (2011 US\$ thousands)	14.27	16.09	18.02	113.41	112.32	111.43
Arable land per working-age population (Hectares)	0.12	0.12	0.12	0.79	0.78	0.78
R&D capital stock per working-age population (2010 US\$)	382	449		15,731	16,058	
U.S. Patents granted annually per thousand working-age population	0.003	0.003	0.004	0.522	0.523	0.580

Sources: China census data, Chinese Statistical Year Book 2012, International Financial Statistics (IFS), National Bureau of Statistics of China (NBSC), OECD Statistics, U.S. Patent and Trademark Office, World Development Indicator

Table 4 A Comparison of Factor Proportions between the U.S. and China, 2010-12

Source: China-United States Exchange Foundation, 2013

There are areas where China is lacking and where US has been and still is ahead of China; these are tangible capital per person, arable land per person, and R&D capital per person, which are many times higher in the US as can be seen in Table 4. The implication from this is that China is likely to have a substantial comparative advantage over the U.S. in labor-intensive industries. Whereas the US has a higher chance of having a big comparative advantage in comparison with China in industries which are intensive in the factors it is abundant in; i.e. industries which use tangible capital-intensive inputs, land-intensive inputs (such as agriculture) and human and R&D capital-intensive inputs (as needed for example in high-technology industries).

Complementarity of economies is also achieved in another which is the huge difference in the savings rates. China saves too much, with a saving rate close to 50% and the US savings are negative (gross saving are about 12%, with 8% being net depreciation and we also have to take in to account the high rate of borrowing). China has to try to lower the domestic saving rate, to a more reasonable level (30%) but the boosting of domestic personal consumption takes time to show up in a lower savings rate, so in the meantime it should focus on public or government consumption in providing public goods such as clean air and water and also invest in the spheres of education and healthcare services.

The economies of China and US have great interdependence and deep integration with the world economy and it is in both countries interest to cooperate and help secure strong, sustainable, and balanced global growth. Cooperation between two countries that are different in many different aspects, may seem challenging, but if both parties respect each other's legitimate core interests, and find common goals it is not that difficult. As former President Hu Jintao rightly emphasized: "China and the United States differ in national conditions, and it is only natural that the two sides may disagree on some issues. What is important is to respect and accommodate each other's core interests and major concerns, appropriately handle the sensitive issues and strengthen the foundation of mutual trust." (Xinbo, 2011, p.9)

4.6 Trade deficit and other issues

As was said by 6th President Chinese president it is likely that good trade partners will disagree on some issues. Trade issues between partners are a natural result of trading. We can say they are to a certain extent a logical consequence of trade relations. This is so because each trading partner is separate entity, with different priorities and interests that they would like to secure in the trading process. Ultimately, each party wants to secure its national interests. In the case of the US – Chinese trade relationship this phenomenon is even stronger, as both countries are extremely powerful in the economic sphere, making relations even more complex.

There are specific factors that define and form the essence of the US-Chinese trade relationship that should be mentioned. In this section the specifics of Chinese US trade will be identified to give the reader a solid understanding into the trade relations between these two countries and next the complex issues that arise as a result of this large bilateral trade relationship will be evaluated.

Specific factors that govern the Chinese US trade relationship is the big and rising trade US trade deficit with China, the great investment ties between the two nations and some trade

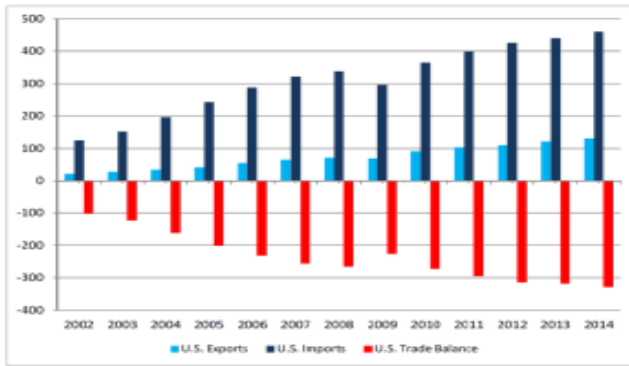
frictions relating to Intellectual Property Rights (IPR), government subsidies and lastly not fulfilling obligations under the World Trade Organization (WTO).

4.6.1 Negative trade balance

The US trade deficit with China is a major concern US policy makers. Figure 5, shows the trend of US Merchandise Trade with China over the last 11 years. US exports, shown in light blue are increasing, but this small increase, is not enough to offset the enormous volume of Chinese imports that enter the US market every year, making the trend of the US trade deficit rise exponentially. Over the years the deficit has risen from \$10 billion in 1990 to \$273 billion in 2010. The projections for 2014 plunge the trade deficit even lower to -329 billion US \$ (Morrison, 2014b). In this respect we can conclude that Chinese trade is in fact misbalanced, as the US is experiencing a negative trade balance with China, i.e. a trade deficit.

The sustainability of these large imbalances is debated among analysts. Some are of the opinion that they can be sustained in the foreseeable future and that the Asian periphery will be characterized by large current account surpluses, large capital outflows in the form of “accumulated reserve asset claims on the United States” (Aizenman, 2015). At a certain point in time, the Asian “periphery” will achieve a level of development for it to become part of the “central” countries and in the meantime a new periphery will be created by another country which will again use the same strategy for development as China – export led growth. In this view of the world it is inevitable for central countries to maintain current-account deficits in the international monetary system (Dooley et al., 2003).

Figure 1. U.S. Merchandise Trade with China: 2002-2013 and Projections for 2014
(\$ billions)



Source: U.S. International Trade Commission DataWeb.

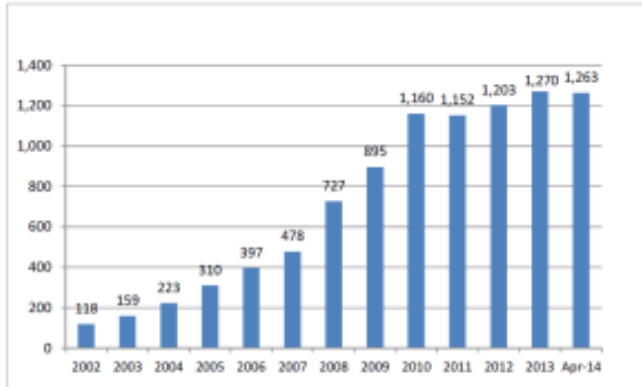
Figure 9 Merchandise trade with China

Source: Morisson, 2014b, p. 4.

4.6.2 Investment Ties

Secondly, Investment Ties constitute an important issue. The US and China likewise have significant investment ties, this plays a growing role in their relationship. China invests in the US in several forms. Firstly, through holdings of US securities, which in June 2013 was \$1.7 trillion. China’s holdings of US securities are following an upward trend as can be seen on the graph on Figure 10. Securities constitute the bulk of Chinese investment in the US. In April 2014 China owned nearly a quarter - 21.2% of the share of total foreign holdings of US treasury securities, making it the largest foreign holder (Morisson, 2014b, p. 13). This brings both advantages to the US, Chinese buying its debt helps keep the US interest rates low, and also “fund the its budget deficit” but on the other hand there is the controversy that this gives China leverage over the US (Morrison & Labonte, 2013).

Figure 5. China's Holdings of U.S. Treasury Securities: 2002-April 2014
(\$ billions)



Source: U.S. Department of the Treasury.
Note: Data for 2002-2013 are year-end.

Figure 10 US Treasury securities holding by China

Source: Morisson, 2014, p. 14.

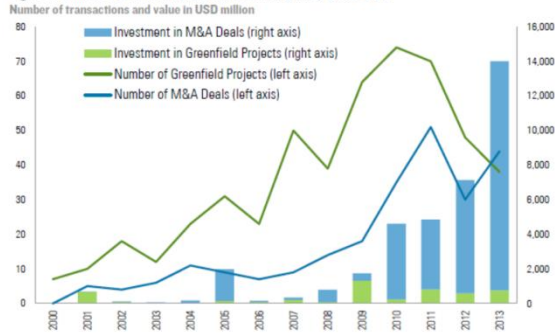
4.6.3 Foreign Direct Investment

Thirdly, we must mention the Foreign Direct Investment (FDI) between these two countries. The flows are not that large, but what should be mentioned is the much larger portion that the US invests in China through FDI than vice versa. FDI forms the bulk of US investment in China, which can be linked to the rise of Chinese technological industries. Thirdly, there is the category of other non-bond investments, but this is of not much significance in the topic of our concern.

The largest FDI investor in the US in the European Union, especially the UK, however, China was the largest BRIC investor in the US. What is interesting to note is that the fastest growth in FDI has been achieved in professional, scientific and technical service, which are areas especially crucial for economic growth. From Figure 11 we can see rising Chinese FDI in the US and we see the categories which formed the bulk in 2013 were Food, Real estate and Energy, strategic sectors. Furthermore, the Chinese government is constantly seeking FDI in areas such as Manufacturing, Real estate, Retail, Transportation and Scientific research (Hastings, 2014). This is very smart move as these sectors generate economic growth and will drive Chinese competitiveness in the future. FDI have been more than welcome in China, but it has been “subject to China’s rules of the game” (Aizenman, 2015). The outcome of which

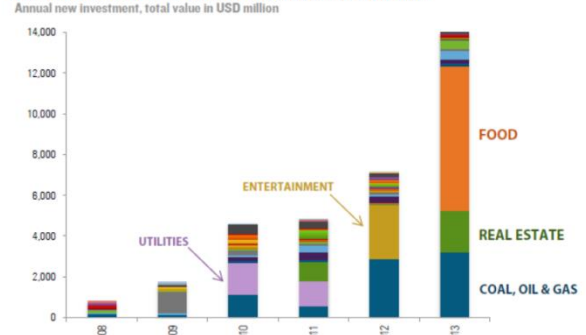
was “rapid learning by doing and transfer of know-how and the rapid climb of China on the ladder of industrial sophistication” (Holmes et al., 2013). Technology transfers being a precondition of investment have given rise to welfare gains for China (around 4.5% / annum of annual consumption) but gave rise to welfare losses for the US and the EU.

Figure 1: Chinese FDI Transactions in the United States, 2000-2013



Source: Rhodium Group. *Numbers are constantly updated and therefore subject to adjustment. A detailed explanation of sources and methodology can be found at: <http://rhg.com/interactive/china-investment-monitor>

Figure 2: Chinese FDI Transactions in the US by Industry, 2008-2013



Source: Rhodium Group. *Numbers are constantly updated and therefore subject to adjustment. A detailed explanation of sources and methodology can be found at: <http://rhg.com/interactive/china-investment-monitor>

Figure 11 Chinese FDI in the US by Year & Industry

Source: Hanemann & Gao 2014

4.6.4 Intellectual Property Rights

Thus far, we have outlined the factors that inevitably accompany US-Chinese trade relations. Now let us move on to the most significant problem US firms face while doing business in China, which is the poor record on protecting IPR. The losses of US intellectual property-intensive firms are certainly not minor. US firms have already lost 150 billion USD while doing business in China and they say it is their “top concern”; this is 50% of the total amount counted from over the whole world (Morrison, 2014b).

Another factor why this constitutes a big problem is that government policy is ineffective to stop piracy. China prevents legitimate products from entering the market; therefore this policy creates a huge demand for low-cost pirated products, making efforts to control IPR to meaningless. The concept of IPR is unfamiliar for most people in China and most importantly is advantageous for them to engage in it. Piracy generates jobs and tax revenue and helps China to become more technologically advanced and competitive in the global economy, at

expense of other players of course. Therefore, there exists no incentive to stop it. Moreover, IPR violations are tolerated by leaders if it helps their firms become more skilled and technologically developed, as the major goal of China is to become a capital intensive and technology exporter (Morrison, 2011, p.30). This mirrors Porter's Competitive advantage theory; China is promoting and developing in the industry it has targeted, even though in this case using illegal means. Let's take an example, imported works, like films, have no protection under China's laws on copyright; therefore distributing them does not violate any copyright laws (Morrison, 2011, p.31). Even though China has made substantial improvements in its IPR enforcement rates, IPR piracy is still "unacceptably high" (Morrison, 2011, p.31) and enforcement by the Chinese government is not helping as fines and punishments are not high enough to prevent further IPR violations.

4.6.5 Government subsidies

In addition to IPR issues, many of the trade tensions that occur between the US and China can be linked to China's incomplete transition to a free market economy. China has in the last 30 years undergone a significant liberalization of its economy and trade, but there still remain some state policies that distort trade and investment flows. China is protected from foreign competition in several ways. Numerous barriers exist, these include restrictions, administrative barriers, product standards, difficult licensing. Also policies to promote the development of industries favored by the government. Protection at expense of foreign firms is done, making it virtually impossible for any non – Chinese companies to participate and compete in the market.

This can be illustrated on the case of Huawei for example. Huawei is a telecommunications company, and it was said to have strong links with the government. At the start of their operations they were given large loans by state owned banks to help their development and to become competitive on the domestic market compared to foreign firms. This can be said to be a protectionism measure undertaken by the Chinese government as it stops fair competition.

This also works the other way as well, Chinese firms have been accused of cyber economic espionage against U.S. firms. Taking the case of Lenovo in 2004, where Lenovo, which is predominantly owned by the Chinese government, wanted to buy the personal computer division of IBM for \$1.75 billion. This was deemed a security risk by some American policymakers and but after further negotiations the deal went through in 2005 (Morrisson, 2014, p. 24)

One other interesting case was the case of Chinese export restrictions on raw materials such as magnesium, silicon metal and others in 2009. US charged that this policy was put in place to give an “unfair competitive advantage” to Chinese exporting firms, by lowering the prices of their inputs (Morrison, 2011, p.25). This can definitely be interpreted as *strategic thinking* on the part of the Chinese government, who wanted to lower the price of their capital-intensive exports to make them *even more* competitive. Moreover, this can be directly linked to Krugman’s theory, as it helps China achieve further economies of scale. This is of course done at the expense of others, therefore making the price of such materials outside of China increase. Another similar case happened a year later, when China announced it would cut exports of “rare earth elements” by 40% compared to 2009 levels (Morrison, 2011, p.25). Estimates say China produces 97% of the world’s rare earth metals, which are used in electronics and other technological products, therefore this was done for the same strategic reason as the year before, with further arguments presented, that using this China wants to lure foreign technology firms to produce in China (Morrison, 2011, p.28).⁵

4.6.6 World Trade Organization negotiations

After complex negotiations lasting 15 years, China entered the WTO organization on the 11th December 2001 (Morrison, 2014b, p. 39). China had entered as a developing country, before completely liberalizing its trade regime, with a compromise being reached that it can keep protection for its sensitive sectors (Morrison, 2011, p.24). Part of the deal was it would make numerous reforms in the area of reducing trade and investment barriers in industrial and

⁵ Adapted from Klucká, 2012.

agricultural goods and opening its market to foreign competition by granting equal treatment to foreign companies in China, limiting subsidies for agricultural production, respecting the TRIPS agreement and others. Since then however time has passed and China has evolved into acquiring a dominant position in the global economy. In the first years after entry, China made significant progress in opening up to trade and FDI, however since 2006 it has come to a standstill and even trends of a “more restrictive trade regime” seemed to become apparent (Morrison, 2011, p.25) as the US believes that China is upholding more protectionist measures. Despite a lot of progress made by China, As a consequence, the US has brought 15 cases against China through the WTO settlement mechanism due to China’s lack of enforcement of WTO obligations; mostly regarding issues of illegal Chinese government subsidies in given sectors, or discriminatory treatment of foreign products, firms, or investment.

The problem can be summed up as follows; the Chinese government seeks to promote the development of industries it believes are going to be vital for its future economic growth at whatever cost – whether it is giving illegal subsidies, cutting exports in strategic products, violating IPR, and restricting FDI in targeted sectors, which all makes it harder for foreigner to do business in these sectors.

These are some of the concerns the American side has acted upon in trade disputes. The result was that the US applied protective duties on products such as furniture, semiconductors and automotive parts, accusing the Chinese of dumping, and Washington putting pressure on the Chinese side to revalue the Chinese currency (Zeng, 2007).

4.7 Analysis of the Chinese currency – undervalued?

In addition to these issues, there is another significant topic in US-China trade tensions and that is the Chinese currency. This has been a hot topic which analysts as well, and the debate is concerning the valuation of the renminbi (RMB) against other currencies, namely in this case against the US dollar. Certain sections of this chapter have been adapted based on my

Bachelor's thesis: Analysis of Trade Relations between US-China written in 2012 for the University of New York in Prague.

For background, the renminbi (RMB) is the official name of the Chinese currency, but also the name yuan can be used to refer to it. Yuan is however the basic unit of the renminbi, similar to the British currency where we have sterling and its unit the pound. Renminbi is the name used for trading. It is traded however at two different exchange rates as it is traded on two separate markets; the onshore CNY (traded in mainland China), and the offshore CNH (mainly in Hong Kong) (ECR Research, 2011a).

The Chinese central bank fixes the exchange rate of CNY with the dollar, this is carried out by fixing the USD/CNY-rate each trading day. The exchange rate is controlled by exchanging the dollars received in exchange for renminbi and using them to buy US Treasuries, which leads to an accumulation of low yield foreign reserves (ECR Research, 2011b). This enables the exchange rate appreciating, and therefore keeps the value of its exports low.

Until 2005, the Chinese currency was fixed versus the value of the US dollar. From 1994 to 2005 its currency, the renminbi (RMB) /yuan/, was pegged to the dollar, until 2005 when it shifted to a "managed float", which is based on a basket of foreign currencies, including the dollar. For China to be able to maintain this exchange rate with the dollar, it has to impose limitations on capital transactions and buy US dollars in bulk and as a result, "the exchange rate between the RMB and the dollar basically stayed the same, despite changing economic factors which could have otherwise caused the yuan to appreciate (or depreciate) relative to the dollar" (Morrison & Labonte, 2013).

From 2005 the currency system was a managed float of USD/CNY, this means their exchange rate isn't controlled by the market but by its Central bank. This allowed the renminbi to slowly increase value compared to the dollar, as much as 21%, making the USD/CNY exchange rate decline. This enables it to keeping value of its currency artificially low, at an undervalued rate, which is beneficial for making their exports comparatively cheaper for importers. This in turn strengthens the demand for low cost Chinese products. That is why China resisted adopting a market-based floating exchange rate; its currency would appreciate, making its exports

comparatively more expensive. From August 2008 till June 2010 China was forced to re-evaluate its currency policy due to the financial crisis and pegged its currency to the dollar. The decline in world trade put significant pressure on the Chinese export sector and it wanted to avoid additional competitive pressures.

The yuan then appreciated by 21% by 2009, but further appreciation was stopped by the government as to prevent the negative impact of the financial crisis to be reflected on the demand for Chinese goods. This move was strongly criticized by its trading partners including the United States and the European Union. China labeled this increasing global pressure it was put under to appreciate its currency as “protectionism” (Morrison & Labonte, 2013). In 2010 China did announce it will reform the RMB to increase its “exchange rate flexibility”, however despite these minor reforms, whose speed is very slow, the government continuously engages in manipulation of its currency to keep it “artificially low against the dollar” (Morrison, 2011, p.21).⁶

At this point the Chinese currency was the first and maybe the greatest concern of the US is because it is undervalued by at least 40% against the dollar and 25% on a trade weighted basis (Morrison & Labonte, 2010, p.6), also the reluctance of the Chinese government to value it at the market rate, which gave it an unfair trade advantage over others didn't help the situation either. This is connected to the fact that China hasn't fully converted into a free market economy, which is also why China is not entirely implementing its duties under the WTO.⁷

Why did this constitute as a problem for the United States? First of all, the effect of this policy is as though Chinese exports were given a subsidy; making their products cheaper, more competitive in international markets, and therefore resulting in unfair competition for US and other foreign producers. President Obama stated that as a result of the Chinese undervalued currency US producers are put under a “huge competitive disadvantage” (Morrison & Labonte, 2013), which makes US imports to China more expensive, as if they were given an import tariff. Tariffs are of course banned under international trading rules of the WTO, which China is a member since 2002, therefore it can be said that China doesn't abide by them, but

⁶ Adapted from Klucká, 2012.

⁷ Adapted from Klucká, 2012.

moreover; this causes the loss of US jobs, which even further widens the growing US trade deficit with China. This is supported, as a direct correlation was found between US trade deficits and US job losses, particularly in the manufacturing sector (Morrison & Labonte, 2010, p.6). More is being imported at a low cost from China, at the expense of a low level of domestic production. This causes rising unemployment at home, which further deepens the concerns over the supposed economic effect of China's currency policy.⁸

The Congress note that while this policy may have been justified during the beginnings of China's economic development, it is no longer appropriate now, when China's economic policies have a huge impact on the world economy, not only due to its large trade flows (Morrison & Labonte, 2013). The global effect is that the low value of the Yuan provokes other East Asian countries to do the same and keep their currencies weak against the dollar, to be able to compete with Chinese goods, which widens the US deficit with countries other than China as well. Moreover, economist Paul Krugman, author of our Strategic trade theory, comments that this currency intervention causes among the other things already mentioned a "significant drag on the global economic recovery", calculating it approximately to lower global GDP by 1.4% (Morrison & Labonte, 2013).

The US Treasury is required by Congress to issue a report every other year about the valuation of currencies compared to the US dollar, but it hasn't quoted China as a currency manipulator since 1994. The thing is, it cannot prove that the purpose of Chinese currency policy is to give it a trade advantage (Morrison & Labonte, 2013, p.13).

According to the IMF the RMB was substantially undervalued in 2011, but in 2012 and 2013 the IMF deemed it to be only moderately undervalued. William R. Cline an economist at the Peterson Institute for International economics undertook a study – he estimated equilibrium exchange rates for a number of countries including China for the years 2008 to 2013. China ranked ninth out of ten in the ranking of estimates of currency misalignment against the Dollar in April 2013, which illustrates that the situation isn't too bad.

⁸ Adapted from Klucká, 2012.

In 2014, the great yuan debate continued in a controversial tone at the leading economic think tank Peterson Institute for International economics. For some years already, several scholars of the institute have been arguing that the yuan is undervalued and have even urged the US use the platform of the WTO to sue China. When economist Arvind Submanian analyzed new data on global pricing from the World Bank he concluded the opposite – that the Yuan is no longer undervalued. However this was contested by Fred Bergsten, the founding director of the institute, who quoted his analysis as “hopelessly simplistic” (Davis, 2014). The main argument of director Bergsten was that purchasing power parity data are not a constructive way to analyze developing countries as it makes them appear richer, due to comparatively low cost of goods. Other scholars supported his point of view by saying that an indication of an undervalued yuan is that China “keeps intervening to keep it from rising”, purchasing large quantities of FOREX to hold the currency down (Davis, 2014). More specifically, in 2013 this amount was \$500 billion USD, which makes it approximately \$2 billion USD every working day to ensure the price of the dollar to remain up while the price of the RMB down. The last word can be given to previously cited economist Cline, who believes that the RMB is undervalued, but by only 3% which is not that dramatic (Davis, 2014).

The issue of the Chinese currency has somewhat faded in recent years, which can be attributable to the fact that compared to a basket of currencies the yuan did appreciate by 30%, as well as a rise in Chinese labor costs can be noticed. The average annual wage of an urban Chinese worker rose 9% last year to the equivalent of \$7,900, employees of private companies saw an increase of 11.3% in nominal terms compared to last year (Spegele, 2015).

These measures made the IMF declare in May 2015 that the Chinese yuan is no longer undervalued (Mauldin & Magnier, 2015). However in August 2015, China made the largest yuan devaluation in one day against the dollar in more than two decades, making the currency in one day decline by 1.9%. The result of which was heavy complaints from American industry as Chinese goods became instantly more competitive. What the People’s Bank did had a double effect, weaker yuan could help the struggling export sector during the period of weak global demand and help make the yuan exchange rate more market determined, a significant factor which could assist China at the Special Drawing Rights review November.

In contrast to the point of view of US politicians and US industries, the IMF however welcomed this step, as it views it as a stepping stone to the currency becoming more determined by market forces, which is exactly the same argument of the Chinese government. However, this is also a counter intuitive statement from the Chinese government, as it is known to value stability among everything else and committing the RMB to market forces would be extremely destabilizing (Mauldin & Magnier, 2015). Kick starting the economy had already been attempted throughout the year by four interest cuts in 12 months (Hilsenrath & Blackstone, 2015), but from this devaluation move we can nonetheless clearly see that the Chinese government is increasingly concerned about their economy losing competitiveness as the yuan rose against other currencies such as the Euro and the Yen (Kazer, 2015).

What rests an indisputable fact is that the global financial crisis has highlighted the need to refocus attention on the reduction of “global imbalances in savings, investment, and trade, especially with regard to China and the United States, in order to avoid future crisis” (Morrison & Labonte, 2013). Both China and analysts have agreed that China should rely on other sources of growth other than exports and investment and ad boost its domestic consumption and incidentally a key factor to achieve this is a market based currency, which from an economic perspective would be a win-win situation for both countries.

The slight RMB undervaluation produces “winners and losers” in the economic sense in both countries. If the currency were to appreciate, it would result in a mere change in the groups of winners and losers. Now US consumers benefit from being able to consume more for less and also costs are lowered for US firms manufacturing products using Chinese raw materials. In the case of an appreciation of the RMB US consumers’ purchasing power would deteriorate, reducing their economic welfare and firms using Chinese parts would become less competitive with rising costs.

A study from Yale University concluded that the “benefits to the US economy would be offset by lower Chinese economic growth (because of falling exports) which would diminish its demand for imports, including those from the United States” (Morrison & Labonte, 2013, p.31). Therefore, an appreciation of the Chinese currency would do little to help boost the US

economy. It is unlikely that this will result in having a dramatic effect of US employment says Derek Scissors from the Heritage Foundation (Morrison & Labonte, 2013, p.28). Neither will this close the gap between the US and Chinese saving rate, or decrease the value of the trade deficit. The US-China Business Council (USCBC), concludes that the only effect would be job creation in Vietnam or similar countries, as a result of the relocation to other low cost production facilities (US-China Trade Policy, 2011, p.7). Moreover, analysts argue that an appreciation of the RMB would limit China's need to buy US Treasury securities, which would rapidly start to put upward pressure on interest rates in the US. Regardless of the current economic conditions it is probable that the RMB will be considered undervalued by analysts if the Chinese government will maintain it in a managed currency peg. Free trading of it would however lead it to be viewed as determined by market forces.

China acknowledges that its "increasing economic openness" had been the major reason behind its unprecedented growth in the last three decades and is aware that it cannot become high-income country by isolating itself from the world economy, but it must have an open trading system that welcomes investment (China 2030, p. 394-395). Of course, China admits the clear benefits of its present currency arrangement; linking the renminbi to the dollar, managing its exchange rate policy with a closed capital account. It has supported the rapid Chinese growth through its export industries and has limited financial instability. However, once the RMB becomes a global currency and it can denominate its goods in it, domestic stability could be achieved even with a fluctuating exchange rate (China 2030, p. 396).⁹

However, the official Chinese view, supported by the World Bank, is that this "does not mean that the government should move rapidly to dismantle all its controls on transactions with the global economy, which would be excessively risky" (China 2030, p. 395). It argues the shift into an open financial system and a flexible exchange rate will take time, in order for its institutions to be fully prepared to be able to uphold stability when faced with market shocks. If China were to open its capital account and adopt a floating exchange rate, the government would have to control inflation with monetary policy, and China argues this would prove excessively risky before it puts in place an adequate regulatory framework to take care of the

⁹ Adapted from Klucká, 2012.

supervision of financial institutions. To the dismay of many Americans, Chinese officials conclude that China shall pursue a “relatively conservative approach” to building a more open and efficient financial and exchange rate system “stretching over many years”. Moreover, among those who favor the Chinese currency policy are Nobel Prize Laureate Robert A. Mundell and Joseph Stiglitz, who think excessive appreciation would be counterproductive for China and the US’s insistence on it is a “manifestation of protectionism” (Baker Hostetler, 2010).¹⁰

Chinese officials insist that their currency management is not a currency manipulation for the gains of its export industry, as the Americans insist, but rather a cautious policy of liberalizing markets. They state they are not promoting exports over imports, but they are doing it to “foster domestic economic stability” (Morrison, 2011, p.21). They worry that leaving the currency policy would cause a decline in their export industry and large scale unemployment, which would topple economic stability which the Chinese regard as a precondition for upholding political stability (Morrison, 2011, p.21). Nevertheless, in the report “China 2030”, co-written by the World Bank, we can find a reference where China admits that its present management of the renminbi has allowed it to retain a “highly competitive exchange rate to support exports” and attain rapid growth (China 2030, p. 425).¹¹

Nonetheless, if we are to forget all these official government statements, arguments of analysts being for or against, if we do not try to find who is right or wrong, and whether the Yuan is really undervalued, we come to what is important. At the end of the day, in this case at the end of the debate, what is important is that as China is a global player (one which we cannot imagine our world without now) all its decisions affect the other players of the game, whether its neighboring Asian partners, or its largest trade partner the US, and this is indisputable. The world economy is shaped by China, as is by other countries, and the decision of China’s Central bank ultimately puts pressure on other Central Banks around the world to push down their currencies to help their own exports and avoid destabilizing capital flows.

¹⁰ Adapted from Klucká, 2012.

¹¹ Adapted from Klucká, 2012.

If the Chinese devaluation were to continue, Asian nations that export significant amounts to China or compete in Beijing could feel intense pressure to weaken their currencies. For example South Korea's Bank of Korea announced this would likely put increased downward pressure on the won as South Korea competes with China in cheap mobile phone devices and other goods. Other affected currencies are the Australian dollar and the Thai baht (Hilsenrath & Blackstone, 2015). Therefore, China needs to take its actions wisely, as they have a huge global impact.

4.8 Reasons to cooperate: benefits of the relationship

There exist some issues as mentioned earlier that have sparked and intensified trade frictions and in some cases even provoked confrontations and trade disputes between the two parties. As these scenarios take place, this brings up important questions about the cause and basis of these conflicts and how they will affect the future direction of US-China trade relations.

As the Former Deputy Secretary of State Robert Zoellick mentioned, the challenge for US-China relations is that they are threatened by China's unfair trade practices. More specifically the failure at stopping the theft of U.S. intellectual property (which cost a US firms around \$200-250 billion year globally, the largest portion attributable to Chinese piracy) and also the undervaluation of China's currency, contributing to the US trade deficit with China. It is frustrating when the US, the primary driver of economic globalization, comes to perceive other players breaking the rules of the game, especially when it is in its disadvantage. The result of this is that it weakens support in American for not only specifically US-Chinese relations, but for economic globalization in general (Council on Foreign Relations, 2007).

Hopefully, in the long run China will be more willing to work on these issues, as for example the issue of the intellectual property will become also a subject of concern for their own firms, who will want to keep their IP protected. China should be integrated into the global system, to build on its integration, but also to strengthen its accountability to common trade rules and practices so it can move on the path to further becoming a responsible player in the global trading system.

Not all US problems can of course be blamed on China, however. As mentioned in the report *US China Relations: An Affirmative Agenda, A Responsible Course*, overall, the “trade deficit with China is part of global trend” and is not only present because of Chinese arguably distorted trade practices (Council on Foreign Relations, 2007). Also, the structure of US employment is shifting from manufacturing to services and therefore China is not the cause of the problem. The US should address this issue by ensuring that the American workforce is highly educated and trained and work on the providing a solid social welfare system which can aid workers that lose their jobs. Information about China should be more in depth to avoid the only black and white portrayal of it. However, it still remains an undisputable fact that China still hasn't been compliant to all WTO obligations and so actions brought up against China can be viewed as the legitimate, as they protect the not only the US and their workers, but also the lawful upholding of the rules of the global trading system.

It is no doubt that mutual economic relations have given both parties immense economic benefits. Chinese society has become much more open, and this made it possible to enjoy the benefits of investment, innovation and market opportunities thanks to the valuable presence of US firms. The standard of living is now far superior to that of previous generations, yet China has still immense growth challenges that lie ahead.

Despite the fact that we can observe both benefits and drawbacks in the US-Chinese relationship, it is still considered by most analysts to be “mutually beneficial overall” (Morrison, 2011, p.20). With certainty, we can prediction that China will remain the central concern of US trade policy in the years to come (Zeng & Mertha, 2007). The central challenge will be however for both parties to maintain a solid level of trust and dialogue to avoid potential sparks of conflict between the dominant and rising power. The cost of such conflict could be detrimental and this can be prevented through open and transparent discussions. As the Foreign Affairs article “*Keep Hope Alive: How to Prevent U.S.-Chinese Relations From Blowing Up*” states “The key to stable U.S.-Chinese relations over the long term is for each side to be clear about its true redlines and the price, at least in general terms, it is willing to pay to defend them.” (Steinberg & O'Hanlon, 2014). Once Beijing and Washington are capable of this dialogue, all should remain well.

5 China-US Trade Relations determinants evaluation

Now let us move on to the quantitative section of the thesis which will present American export and import data to give us a picture of the developments of the US-Chinese trade balance from 1994 up to the year 2013. A linear regression econometric model will be constructed, with carefully chosen variables, which will attempt to explain the tendencies of the US- Chinese trade balance. The endogenous variable is the American Merchandise Trade balance with China, otherwise referred to in as the US-China Trade balance, and its selected determinants it will be identified and presented.

Let us present the form of the economic and econometric model and then proceed to the explanation of why these particular variables had been chosen and the estimated relations among them.

5.1 Economic model and econometric model

The topic of this econometric model is modeling the total bilateral trade balance between the USA and China in merchandise goods. The model is based on annual data with 20 observations between the years 1994 and 2013. This econometric model has the character of stochastic regression model and focuses on monitoring the dependence of the US-Chinese trade balance with regard to other variables. The aim of this quantitative analysis is to create one-equation model from collected data.

In the econometric model the dependency of the US-Chinese trade balance on the total US imports, total US exports, total US trade balance, GDP of the US, the GDP of the China, the exchange rate of CNY in comparison to the USD, as well as the interest rate in the US, the interest rate in China, the rate of inflation in the US and the rate of inflation in China, the unemployment rate in the US and the rate of unemployment in China will be examined.

Firstly, an economic and econometric model is created with subsequent explanation of the model, data set is submitted, and parameters are estimated using OLSM in Gretl. Then the

economic verification, statistical verification, econometric verification and model application are done.

Economic model:

$$y = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}, x_{11}, x_{12})$$

Econometric model:

$$y_t = \gamma_1 x_{1t} + \gamma_2 x_{2t} + \gamma_3 x_{3t} + \gamma_4 x_{4t} + \gamma_5 x_{5t} + \gamma_6 x_{6t} + \gamma_7 x_{7t} + \gamma_8 x_{8t} + \gamma_9 x_{9t} + \gamma_{10} x_{10t} + \gamma_{11} x_{11t} + \gamma_{12} x_{12t} + u_t$$

Where:

Endogenous variable is:

$$Y = \text{US-Chinese trade balance (billion USD)}$$

Exogenous variables are:

x_0 = unit vector, constant, intercept term

x_1 = Total US Imports (billion USD)

x_2 = Total US Exports (billion USD)

x_3 = Total US Trade balance (billion USD)

x_4 = GDP US (billion USD)

x_5 = GDP China (billion USD)

x_6 = Exchange rate of CNY (LCU per US\$, period average)

x_7 = Interest rate US (%)

x_8 = Interest rate China (%)

x_9 = Inflation US (%)

x_{10} = Inflation China (% point)

x_{11} = Unemployment US (%)

x_{12} = Unemployment China (%)

The starting assumption is that the US-Chinese trade balance is dependent on the total US Trade balance (the total imports and exports of the USA), the GDP of the US, the GDP of the China, the exchange rate of CNY in comparison to the USD, the interest rate in the US, the interest rate in China, the rate of inflation in the US and the rate of inflation in China, as well as the unemployment in the US and the rate of unemployment in China.

5.2 Chosen determinants of the US-Chinese trade balance

The trade balance can be defined as the difference between imports of a country (including foreign aid, domestic spending and investments abroad) and domestic abroad and its exports (and also foreign sources of spending and investments in the domestic economy. It is the major component of a country's balance of payments (Investopedia, 2015). The US is known to be the one with a large trade deficit in this relationship and China conversely a trade surplus. The paper written for the National Bureau of Economic Research identified the main determinants of the bilateral trade deficit and assessed their relative importance. Broadly speaking, the trade balance is determined by macroeconomic and structural determinants, which influence the levels of saving and investment in an economy. The paper cites opposite macroeconomic movements in the US and China, demographic trends and Chinese reforms have influenced the US-Chinese trade balance in the 1990's. More specifically the slowing tendency of the American savings rate and the rise in (particularly investment-led) saving in China (Feenstra et al, 1998).

The US-Chinese trade balance is determined by a wide range of factors. Our econometric model will uncover the determinants of the US-Chinese trade balance in the following period, ie: from 1994 to 2013. In this model we assume that the most important indicators of a stable economic environment are going to be the most crucial ones in influencing the bilateral trade balance between the two countries. That is why the GDP, as the most important indicator of

wealth of an economy, is used, followed by the interest rate, a tool of monetary policy influencing money supply in an economy and the main determinant of the financial account.

Next the rates of inflation and unemployment in the US and China were taken. Their relevance can be illustrated on the fact that they constitute two of the three internal economic targets any government want to achieve – low rate of unemployment (around 5%) and a low level of inflation (2%), with the third one being a stable economic growth around 3%, which can be measured using the already mentioned indicator GDP. Lastly, the exchange rate of Chinese Yuan was used as the level of currency influences the level of competitiveness of goods, therefore affecting our endogenous variable – the US-Chinese trade balance.

5.3 Estimated relations

The bilateral trade balance of the US and China is related to the both countries GDP, the interest rate, the levels of inflation, unemployment and the price of the Chinese Yuan in terms of the US Dollar.

The following assumptions can be made, assuming that all conditions remain constant:

Assumptions:

- Increase in the total US imports will cause decrease in the US-Chinese trade balance
- Increase in the total US exports will cause an increase in US-Chinese trade balance
- The total US trade balance will model the behavior of the US-Chinese trade balance
- Increase in US GDP will cause increase or decrease in US-Chinese trade balance
- Increase in Chinese GDP will increase or decrease the US-Chinese trade balance
- An increase in the CNY exchange rate will decrease the US-Chinese trade balance
- An increase in US interest rates will increase the US-Chinese trade balance

- An increase in interest rates in China will decrease the US-Chinese trade balance
- Increase in US inflation will decrease the US-Chinese trade balance
- Increase in Chinese inflation will increase or decrease the US-Chinese trade balance
- Increase in US unemployment will increase or decrease the US-Chinese trade balance
- Increase in unemployment in China will increase or decrease the US-Chinese trade balance

Let us now begin to explain the reasoning behind these assumptions. First of all, it should be mentioned that when we talk about trade balance in this model, we mean only the trade balance in merchandise products, excluding services. When in the assumptions we say an increase in one variable will cause an increase in the trade balance, we mean that the gap between the US imports from China and US exports to China is getting smaller. As was mentioned earlier, the US has a big trade deficit with China, and so when the trade balance increases the gap is closing. On the other hand, when the trade balance decreases, this means that the gap between imports to and exports from China is widening, the difference between these two figures is getting bigger.

Let us illustrate this on an example on our variable x_1 - Total US Imports. If total US imports increase, the trade balance will increase, but into negative values, which means it is an overall negative decrease. We see that an increase in imports results in a more negative figure of the trade balance.

$$\text{If } TB = (X-M)$$

$$= (10-15) = -5$$

$$= (10-20) = -10$$

On the contrary, if we take the variable x_2 - Total US Exports, we see that with an increase of exports, the trade balance will increase overall, which decreased the difference between

exports and imports. In absolute terms the figures are actually increasing and going towards positive values, as we see from the example.

$$TB = (X-M)$$

$$= (10-15) = -5$$

$$= (20-15) = +5$$

The variable x_4 – the GDP of the US follows the behavior pattern of x_2 - Total US Exports as it also results in the overall increase of the trade balance. Variable x_5 the GDP of China however has the same relation like x_1 – Total US Imports and follows the same pattern. An increase in the Chinese GDP, causes the trade balance to decrease overall. The effect of an increase in x_4 American GDP would cause the trade balance to increase. While a decrease in the GDP of US causes a decrease in the trade balance, a decrease in Chinese GDP will increase the trade balance.

It is moreover possible, that these two variables will cause the trade balance to shift in the opposite direction than was just mentioned, as it depends on the magnitude of the resulting increase or decrease of imports/exports, which determines in what direction the trade balance will move. In other words, it depends if the GDP change will have a greater influence on the export strength of the market or the purchasing power of the market (ie: demand for imports). In the event of a decrease of American GDP, it is possible that both the exports to China as well as the imports from China will decrease and if this shift will be larger like in our model example, then the trade balance effect will be an increase.

$$TB = (X-M) = (10-15) = -5$$

$$TB = (X-M) = (9-11) = -2$$

The variable x_6 represents the Exchange rate of CNY. If this increases, by which we mean that for 1 USD we will get not 6.3 CNY but 7 CNY. We get more for one dollar, which means we can buy more. Our purchasing power increases and trade increases, due to the Chinese currency depreciation, the result of which is a plunge in the trade balance.

On the other hand, when the Yuan is appreciating, which means its value is strengthened, as it drops in terms of the Dollar and other currencies from for example 6.3 CNY to 5 CNY, it becomes instantly more expensive for Americans to buy from China. This causes their purchasing power to decrease, causing a fall in trade and an increasing tendency in the American trade balance

We assume that all conditions remaining constant an increase in x7 the US interest rate, will mean that people will save more and spend less, as it will be favorable to keep money in account. This will cause less demand for imports from China, closing the gap between Chinese exports to US and US exports to China, increasing the trade balance, as is the case with x2 Total US Exports.

While an increase in x8 the Chinese interest rates will decrease the trade balance, a decrease in interest rates will cause the trade balance to increase. An increasing of the Chinese interest rate, will encourage Chinese people to save, they will keep their money in the bank, will not spend so much on US goods. Therefore, US exports to China will decrease, making the trade balance plummet further. As can be illustrated on this example:

$$\begin{aligned} \text{TB} &= (X-M) \\ &= (10-15) = -5 \\ &= (8-15) = -7 \end{aligned}$$

The same can be said about an increase in the inflation rate in US - x9 which will stimulate the US trade balance to take a downward direction. Increase of Inflation in the US, will make goods in the US more expensive, therefore people will buy more Chinese goods, increasing imports from China.

An increase in x10, will make Chinese goods more expensive, therefore there will be less demand from the people in US – therefore less US imports from China, which would likely increase the trade balance. However, it depends on the magnitude of the shift and whether the

US consumers will be responsive enough to a price increase so as to completely change their consumption patterns.

The effect of an increase in $\times 10$ the Inflation in China, can have a 2 way effect on the American Trade Balance. Either an increase in Chinese inflation will causes an increase in the American Trade Balance. This is a consequence of the rising cost of Chinese goods, which will lead to less demand for Chinese imports from the US.

Or the effect on the trade balance can be negative – a decrease, meaning it is increasing into negative numbers. This can be the case if the cost increase will not prevent Americans buying Chinese goods. The price increase can for example be only temporary and the transaction cost of changing supplier in the short term are high. Contracts could be already agreed upon with little possibility to change. Or even where there is possibility to terminate the contract, it is likely that other competitors do not offer lower prices and so the Americans would still chose to opt for Chinese products in spite of the slight inflation price rise.

Short term price increases in price (due to an increase in inflation) doesn't have to necessarily mean an outflow of customers. US consumers will be paying a bit more dollars for the same products, but not so much more for them to have an incentive to buy somewhere else, or for the relocation of production facilities to a cheaper location to make sense.

$\times 11$ the unemployment in the US has likewise two effects on the trade balance. Either a decrease in imports, would mean the trade balance would increase. This would be as a result of increased unemployment, which makes it more likely for the purchasing power to deteriorate, which in turn decreases demand, causing less US imports from China.

The second effect that can happen is a decrease of exports to China as a result of decreased production. Both these effects can happen and can cause both effects on the trade balance, depending on which effect is stronger.

$\times 12$ the unemployment in China can also result in both effects on the trade balance. If there is an increase of Unemployment in China, Chinese people will have less money, eroding the

purchasing power, which dampens down demand for American imports, making US Exports to China to decrease, causing the trade balance to decrease.

Another option is that increased unemployment will lead to a fall in production in China, making US imports drop. As less is being imported from China to US, the trade balance increases.

5.4 Parameters' estimation using OLSM

The aforementioned determinants of US-Chinese trade balance were entered into the regression model as exogenous variable.

Parameters of variables were estimated by the OLSM (Ordinary Least Square Method). The main point of OLS is to minimize the sum of random errors: $\min \sum u^2$. Matrix form: $\beta = (X^T X)^{-1} X^T Y$. Two methods can be used for estimation of parameters by the OLSM. The first and faster method is with the use of software. This software in our case is Gretl. The second way is using MS Excel and the procedure would be: Matrix X \rightarrow X transpose = $X^T \rightarrow X^T X = XTX \rightarrow XTX$ inversed matrix = $(XTX)^{-1} \rightarrow X^T * Y = XTY \rightarrow (XTX)^{-1} * XTY = \gamma$ gamma matrix (parameters)

Vector Y: Matrix X:

Constant	489.7
Y₁	-0.133
Y₂	-0.022
Y₃	0
Y₄	-0.017
Y₅	0.002
Y₆	-22.38
Y₇	-0.252
Y₈	-9.214
Y₉	8.611
Y₁₀	-7.77
Y₁₁	-8.042
Y₁₂	5.447

Table 5 Linear Regression model - Parameter estimation

Source: own calculation in MS Excel and Gretl

The estimated econometric model form is as follows:

$$Y = 489.73 - 0.133x_{1t} - 0.021x_{2t} - 0.016x_{4t} + 0.0024x_{5t} - 22.38x_{6t} - 0.252x_{7t} - 9.214x_{8t} + 8.611x_{9t} - 7.77x_{10t} - 8.042x_{11t} + 5.44x_{12t} + u_t$$

The value of these parameters is identical to the values found in SW GRETL:

Model 1: OLS, za použití pozorování 1994–2013 (T = 20)
 Závisle proměnná: Y1
 Vynecháno z důvodu přesné kolinearity: X3

	koeficient	směr. chyba	t-podíl	p-hodnota	
const	489,738	232,890	2,103	0,0686	*
X1	-0,133221	0,0632687	-2,106	0,0683	*
X2	-0,0217601	0,117201	-0,1857	0,8573	
X4	-0,0167961	0,00650361	-2,583	0,0325	**
X5	0,00244934	0,00599349	0,4087	0,6935	
X6	-22,3807	22,8977	-0,9774	0,3570	
X7	-0,251685	2,58992	-0,09718	0,9250	
X8	-9,21400	2,74986	-3,351	0,0101	**
X9	8,61065	5,70243	1,510	0,1695	
X10	-7,76964	2,09462	-3,709	0,0060	***
X11	-8,04220	4,20715	-1,912	0,0923	*
X12	5,44706	2,80801	1,940	0,0884	*

Střední hodnota závisle proměnné -161,6696
 Sm. odchylka závisle proměnné 104,4315
 Součet čtverců reziduí 257,1207
 Sm. chyba regrese 5,669223
 Koeficient determinace 0,998759
 Adjustovaný koeficient determinace 0,997053
 F(11, 8) 585,3794
 P-hodnota(F) 2,24e-10
 Logaritmus věrohodnosti -53,91691
 Akaikovo kritérium 131,8338
 Schwarzovo kritérium 143,7826
 Hannan-Quinnovo kritérium 134,1663
 rho (koeficient autokorelace) -0,002279
 Durbin-Watsonova statistika 1,994348

zde je poznámka o zkratkách statistik modelu

Pomine-li se konstanta, p-hodnota byla nejvyšší pro proměnnou 8 (X7)

Figure 12 Econometric model 1

Source: SW Gretl

This is the first version of the econometric model which underwent many changes before the final model was obtained. From the first output of regression estimation we can conclude that with a few exceptions, the majority of exogenous variables are statistically significant at the significance level $\alpha = 0.1$ (10%), which we can see based on looking at the p-values of the constants, which is case of significance should be less than 0.1. This is a positive sign and

further a high value of R^2 (0.9987) and Adjusted R^2 (0.9970) tell us that the choice of variables for the model has been a successful one, as they by 99% explain our exogenous variable.

Nevertheless, the model contains some variables with a high p-value, indicating statistical insignificance, variable x_3 has been omitted due to exact multicollinearity, it will be excluded from model in further trials and so therefore there are still improvements which can be enhanced upon. X_{10} – the inflation of China shows up as highly significant, and x_8 and x_{10} are as significant as well. X_2 – US exports and x_5 , x_6 , x_7 , and x_9 do not appear to be significant at the present moment. If we have a look at the correlation matrix for the model, we see that a correlation exists mostly between variables x_1 and x_2 , as well as x_4 , x_5 , and x_8 the latter of which have a negative multicollinearity. There is a clear correlation between x_1 and x_2 which represent the total US Imports and total US Exports for obvious reasons, as these are the direct determinants of the US-Chinese trade balance.

	Y1	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
Y1	1												
X1	-0.98767	1											
X2	-0.96086	0.959591	1										
X3	0.898499	-0.92736	-0.78459	1									
X4	-0.98848	0.98121	0.943338	-0.90757	1								
X5	-0.90487	0.878588	0.965115	-0.6525	0.89128	1							
X6	0.884727	-0.85194	-0.95289	0.610061	-0.86907	-0.97916	1						
X7	0.751129	-0.71614	-0.66927	0.687967	-0.7709	-0.71546	0.660074	1					
X8	0.102322	-0.08667	-0.03712	0.141617	-0.00526	-0.01142	-0.013	0.226273	1				
X9	-0.07052	0.14037	-0.05775	-0.38606	0.037545	-0.2112	0.311532	-0.01033	-0.44275	1			
X10	0.12702	-0.1613	-0.14562	0.161753	-0.24337	-0.12916	0.140947	0.021292	-0.93364	0.32323	1		
X11	-0.60509	0.509287	0.622914	-0.29384	0.586399	0.748037	-0.78019	-0.72063	-0.13001	-0.45977	0.073251	1	
X12	-0.54843	0.537136	0.661559	-0.30381	0.543464	0.707764	-0.71564	-0.46373	0.16752	-0.37803	-0.20726	0.696486	1

Table 6 Econometric model 1 - Correlation matrix

Source: own processing in Microsoft Excel

5.5 Progression towards final model

Steps towards finding the final model will be shown and commented in this section, including a reasoning behind each change that took place.

5.5.1 Model 2

Model 2: OLS, za použití pozorování 1994–2013 (T = 20)
 Závisle proměnná: Y1

	koeficient	směr. chyba	t-podíl	p-hodnota	
const	305,547	86,5616	3,530	0,0047	***
X1	-0,112035	0,0268911	-4,166	0,0016	***
X4	-0,0188630	0,00502121	-3,757	0,0032	***
X5	0,00359317	0,00268526	1,338	0,2079	
X6	-1,52826	9,32928	-0,1638	0,8728	
X8	-8,61566	1,76758	-4,874	0,0005	***
X10	-7,23593	1,31470	-5,504	0,0002	***
X11	-6,29400	2,80428	-2,244	0,0463	**
X12	4,03625	2,32965	1,733	0,1111	

Střední hodnota závisle proměnné	-161,6696
Sm. odchylka závisle proměnné	104,4315
Součet čtverců reziduí	333,8862
Sm. chyba regrese	5,509382
Koeficient determinace	0,998389
Adjustovaný koeficient determinace	0,997217
F(8, 11)	851,9622
P-hodnota (F)	3,00e-14
Logaritmus věrohodnosti	-56,52945
Akaikovo kritérium	131,0589
Schwarzovo kritérium	140,0205
Hannan-Quinnovo kritérium	132,8083
rho (koeficient autokorelace)	0,033460
Durbin-Watsonova statistika	1,888011

zde je poznámka o zkratkách statistik modelu

Pomíne-li se konstanta, p-hodnota byla nejvyšší pro proměnnou 7 (X6)

Figure 13 Econometric model 2

Source: SW Gretl

	Y1	X1	X4	X5	X6	X8	X10	X11	X12
Y1	1								
X1	-0.98767	1							
X4	-0.98848	0.98121	1						
X5	-0.90487	0.878588	0.89128	1					
X6	0.884727	-0.85194	-0.86907	-0.97916	1				
X8	0.102322	-0.08667	-0.00526	-0.01142	-0.013	1			
X10	0.12702	-0.1613	-0.24337	-0.12916	0.140947	-0.93364	1		
X11	-0.60509	0.509287	0.586399	0.748037	-0.78019	-0.13001	0.073251	1	
X12	-0.54843	0.537136	0.543464	0.707764	-0.71564	0.16752	-0.20726	0.696486	1

Table 7 Econometric model 2 - Correlation matrix

Source: own processing in Microsoft Excel

In the second version of the model x_2 , x_3 , x_7 , and x_9 were eliminated from the model. X_2 has a very high p-value (0.857) which means it is not very significant and explanatory in the model. X_7 has the highest p-value of 0.925 in the model, meaning it is the least significant variable in model and it is redundant to keep it. X_3 has been excluded as already mentioned for perfect multicollinearity. The Inflation of the US - X_9 's p-value is 0.169, but it doesn't show signs of statistical significance and is also slightly problematic due to the fact that it doesn't comply with the economic verification test, as it goes in the opposite direction that the assumptions made at the beginning and so was eliminated from the model.

X_5 was kept in model 2, due to the fact that GDP China is still nevertheless a significant variable and the economic verification is correct, as the variable has two effects of the trade balance. We can conclude that x_1 , x_4 , and x_8 are very significant variables in explaining the US trade balance with China! They are compliant as well as with the economic verification and likewise the statistical verification, where they have received three stars of significance, as their p-values are lower than 0.05.

Adjusted R squared has stayed at the same value of 0.997 as in the first model, but what is important is that our parameters are improving in significance as we have begun to eliminate the redundant ones.

The correlation matrix shows us whether multicollinearity occurs, or does not occur, in the model. Multicollinearity is high if any of the pairwise correlation coefficients greater than 0.8. This represents an unwanted dependence of two independent variables. We can remove it by removing variable, inserting a vector variable in successive differentiation, replacing variable by inserting a dummy variable or inserting a vector variable in relative and standard deviations.

In the second econometric model, we see that there exists a correlation between the variables x_1 Total US Imports and x_4 the GDP of the US. This is natural as ultimately how much will be spent of importing will affect the US GDP. Similarly so we have a correlation between x_1 Total US imports and x_5 – naturally as the Chinese GDP will determined by US imports – as the more the US will import the more Chinese GDP will grow (as a significant amount of US imports come from China), and this correlation can be witnessed on the correlation matrix. We also notice multicollinearity between x_4 GDP of the US and x_5 the GDP of China – this is a natural inescapable consequence of the global village phenomenon, which is particularly strong in the case of the US and China due to the close economic and trade relations these two economies share. A negative correlation is present between x_5 the GDP of China and x_6 the Exchange rate of the Chinese Yuan illustrates a natural economic phenomenon – that which a falling value of the exchange rate makes Chinese goods cheaper and so the demand for them will rise. This will make Chinese exports rise and the GDP in turn also following the same direction.

5.5.2 Model 3

Model 3: OLS, za použití pozorování 1995–2013 (T = 19)

Závisle proměnná: Y1

	koeficient	směr. chyba	t-podíl	p-hodnota	
const	340,066	89,8010	3,787	0,0023	***
X4	-0,0373813	0,00235556	-15,87	6,88e-010	***
X6	-0,188611	6,67527	-0,02826	0,9779	
X8	-7,08922	2,61613	-2,710	0,0179	**
X10	-7,15167	1,92350	-3,718	0,0026	***
d_X1	-0,0227129	0,0121430	-1,870	0,0841	*
Střední hodnota závisle proměnné		-168,6257			
Sm. odchylka závisle proměnné		102,4223			
Součet čtverců reziduí		912,4280			
Sm. chyba regrese		8,377754			
Koeficient determinace		0,995168			
Adjustovaný koeficient determinace		0,993309			
F(5, 13)		535,4669			
P-hodnota(F)		1,43e-14			
Logaritmus věrohodnosti		-63,74070			
Akaikovo kritérium		139,4814			
Schwarzovo kritérium		145,1480			
Hannan-Quinnovo kritérium		140,4404			
rho (koeficient autokorelace)		0,270824			
Durbin-Watsonova statistika		1,381416			

zde je poznámka o zkratkách statistik modelu

Pomine-li se konstanta, p-hodnota byla nejvyšší pro proměnnou 7 (X6)

Figure 14 Econometric model 3

Source: SW Gretl

In deciding what variables to exclude from the third model the discussed variables for elimination were x_5 , x_6 , x_{11} , and x_{12} . The highest p-values were among x_5 (0.2) and x_6 (0.87), with x_6 having a significantly larger p-value. However, even though the economic verification is compliant, after analysis the decision was made to only exclude x_5 model as the GDP of China would be less useful for predicting the trends of the US-Chinese trade balance. Variable x_6 , the exchange rate of the Chinese Yuan has decided to be kept and it passes the test of economic verification.

The significance of the variables x_1 , x_4 , x_8 , and x_{10} have been highlighted in this third model. They remain the highly significant ones of the model – this is both statistically and economically. X_{10} , the Inflation in China has a very low p-value – indicating high statistical significance in our model, which we can clearly graphically see represented by three stars in the output from Gretl software, which the other variables have as well.

The last variables to negotiate their position in the model are x_{11} and x_{12} , both remain compliant with economic theory, but if we were to compare them in terms of parameter significance x_{11} would qualify as being more useful, in terms of a having a lower p-value – 0.046 compared to 0.111 (p-value of x_{12}). X_{11} therefore does merit one extra star, in total it was attributed two by Gretl software. X_{12} – a superfluous variable was therefore removed in the third model due to reasons of insignificance.

After careful consideration variable x_{11} – unemployment in the US, was also eliminated as in subsequent trials (which are not shown here) it had lost its statistical significance, going from two stars to none, which gave a clear and valid reason to likewise eliminate it from the model.

As we see on the correlation matrix for the third model, data of x_1 has been converted to first differences, which eliminated the multicollinearity that was present beforehand. A correlation between x_6 and the endogenous Y_1 is not a problem, but a natural phenomenon arising out of the relationship between the two variables. Now the correlation matrix shows only negative multicollinearity between exogenous variables of the model: between x_4 & x_6 and x_8 & x_{10} , which will be eliminated in further steps.

	Y1	X1 FD	X4	X6	X8	X10
Y1	1					
X1 FD	-0.08847	1				
X4	-0.99	0.029257	1			
X6	0.876219	0.088052	-0.86215	1		
X8	0.389303	-0.48212	-0.32471	0.195122	1	
X10	-0.1231	0.436768	0.023064	-0.05671	-0.88966	1

Table 8 Econometric model 3 - Correlation matrix

Source: own processing in Microsoft Excel

5.5.3 Model 4 and Model 5

The fourth model saw the removal of x_1 transformed through first differences, and the fifth model saw the removal of x_6 , which continued to have an extremely high p-value of 0.74. X_6 remained the only statistically insignificant variable of the model, despite what economic theory says about how the value of the currency strangely affects trade and therefore the trade balance. With the removal of x_6 , the variable x_8 the Interest rate of China gained statistical significance as its p-value moved from 0.0261 to 0.0065 and it gained one more star, having a total of 3 stars from Gretl.

All exogenous variables are statistically significant at the significance level $\alpha = 0.975$ (97.5%), which we can see based on looking at the p-values of the constants, which is case of significance should be less than 0.025.

Model 5: OLS, za použití pozorování 1994-2013 (T = 20)
Závisle proměnná: Y1

	koeficient	směr. chyba	t-podíl	p-hodnota	
const	329,318	20,2118	16,29	2,20e-011	***
X4	-0,0371335	0,000906859	-40,95	1,26e-017	***
X8	-6,06110	1,93768	-3,128	0,0065	***
X10	-6,73732	1,44405	-4,666	0,0003	***
Střední hodnota závisle proměnné			-161,6696		
Sm. odchylka závisle proměnné			104,4315		
Součet čtverců reziduí			1182,109		
Sm. chyba regrese			8,595453		
Koeficient determinace			0,994295		
Adjustovaný koeficient determinace			0,993226		
F(3, 16)			929,5505		
P-hodnota(F)			3,74e-18		
Logaritmus věrohodnosti			-69,17200		
Akaikovo kritérium			146,3440		
Schwarzovo kritérium			150,3269		
Hannan-Quinnovo kritérium			147,1215		
rho (koeficient autokorelace)			0,230049		
Durbin-Watsonova statistika			1,472085		

zde je poznámka o zkratkách statistik modelu

Figure 15 Econometric model 5

Source: SW Gretl

	Y1	X4	X8	X10
Y1	1			
X4	-0.98848	1		
X8	0.102322	-0.00526	1	
X10	0.12702	-0.24337	-0.93364	1

Table 7 Econometric model 5 - Correlation matrix

Source: own processing in Microsoft Excel

One thing that is noticeable is the negative correlation between x_8 the interest rate in China and x_{10} the inflation rate in China. The Quantity theory of money can help us explain this phenomenon. The increase in money supply, will increase the price level; in other words inflation arises. If there is higher inflation, this means that money supply is high, and it is extremely likely this is a result of a low interest rate. Low interest rate promotes transactions and leads to higher inflation. In turn, high interest rate will dampen down the spending and investing and results in lower inflation; this effect manifests more visibly in the second year after increasing of the interest rate, where inflation falls sharply (Anderton, 2006). *Interest rates* are therefore related to the demand and supply of money and they are in turn inversely correlated to *inflation* as we can witness in the correlation matrix for model 5.

5.5.4 Final model 6

Before proceeding to the final model, one last thing would be suitable to correct and that of the negative multicollinearity present between x_8 and x_{10} , which makes the data appear to take on similar form, which could negatively impact further analysis. That is why first differences of variable x_{10} were carried out and now in the correlation matrix for model see that no multicollinearity is present. In choosing whether to carry out the first differences of variable x_8 or x_{10} , the latter was chosen as it has a higher p-value of 0.733 as can be seen in Gretl output for model 6, compared to the value 0.1491 for FD of x_8 .

The final model – model 6 can be seen below. All variables (with the exception of x_{10} which has been transformed through first differences) are statistically significant at the significance level $\alpha = 0.975$ (97.5%).

Model 6: OLS, za použití pozorování 1995–2013 (T = 19)
Závisle proměnná: Y1

	koeficient	směr. chyba	t-podíl	p-hodnota	
const	249,812	14,5820	17,13	2,93e-011	***
X4	-0,0347418	0,00108090	-32,14	3,00e-015	***
X8	3,15344	1,04435	3,020	0,0086	***
d_X10	1,43372	0,744508	1,926	0,0733	*

Střední hodnota závisle proměnné -168,6257
 Sm. odchylka závisle proměnné 102,4223
 Součet čtverců reziduí 2233,868
 Sm. chyba regrese 12,20346
 Koeficient determinace 0,988170
 Adjustovaný koeficient determinace 0,985804
 F(3, 15) 417,6434
 P-hodnota (F) 1,14e-14
 Logaritmus věrohodnosti -72,24682
 Akaikovo kritérium 152,4936
 Schwarzovo kritérium 156,2714
 Hannan-Quinnovo kritérium 153,1330
 rho (koeficient autokorelace) 0,470125
 Durbin-Watsonova statistika 1,056416

zde je poznámka o zkratkách statistik modelu

Figure 16 Econometric model 6

Source: SW Gretl

	Y1	X4	X8	X10
Y1	1			
X4	-0.99	1		
X8	0.389303	-0.32471	1	
X10	-0.06316	0.099528	0.143175	1

Table 8 Econometric model 6 - Correlation matrix

Source: own processing in Microsoft Excel

The model doesn't have to undergo further amendments, no multicollinearity is present and we can thus continue with further analysis using this Model 6 as the final version of the model.

The final model is thus in the following form:

$$Y = 249.812 - 0.0347 x_{4t} + 3.1534 x_{8t} + 1.4337x_{10t} + u_t$$

Where:

Endogenous variable is:

$$Y = \text{US-Chinese trade balance (billion USD)}$$

Exogenous variables are:

$$x_4 = \text{GDP US (billion USD)}$$

$$x_8 = \text{Interest rate China (\%)}$$

$$x_9 = \text{Inflation US (\%)}$$

$$x_{10} = \text{Inflation China (\%)}$$

The **Adjusted R squared value** of the model is now 0.985 compared to 0.997 in the first model with 12 variables. This means that the 12 variable model 1, was able to explain the US trade balance with China by 99.7%, and our Final model with only 3 variables is able to this at a almost identical level – at 98.5%, only 1.2% less. This demonstrates that the choice as to which variables to keep in the model was not haphazard, but was based on solid economic and econometric analysis.

We can say that the US trade balance with China is by 98.5% influenced by the level of GDP of the US, the Interest rate in China and the Inflation rate in China. These variables were proved to be the most instructive in explaining the US trade balance with China. Other influences account for only 1.5% of developments of the US trade balance with China.

5.6 Economic verification

In our model, US-Chinese trade balance depends on the US GDP, the interest rate in China, and also the level of inflation in China. The parameters of the econometric model have already been estimated using coefficients (which are the least squares estimates) generated by the OLS method through SW Gretl and Microsoft Excel.

Vector Y: Matrix X:

Constant	249.812
Y₄	-0.0347
Y₈	3.1534
Y₁₀	1.4337

Table 9 Final Linear Regression model - Parameter estimation

Source: own calculation in MS Excel and Gretl

The econometric model is now in the following form:

$$Y = 249.812 - 0.0347 x_{4t} + 3.1534 x_{8t} + 1.4337x_{10t} + u_t$$

This result is consistent with the assumptions of the model.

Using calculated parameters it was found that:

Constant

The constant shows all other influences on the trade balance. This means, that the constant shows us what is the value of Y (US-Chinese trade balance) if all other exogenous variables are equal to 0, and in this case the US-Chinese trade balance would be 329.3 billion USD.

X₄

X₄ is -0.037 and stands for the GDP of the US. X₄ tells us that if the GDP of the US will increase by 1 unit (billion USD/year) the US-Chinese trade balance will decrease by 0.037 billion/year.

Economic theory would primarily assume that an increase in GDP would promote trade in general, so rather it would predict an increasing the trade balance. But it is likely that with an increased GDP, any of its components (consumption, investment, public expenditure and next exports) can increase. Increased GDP doesn't have to only mean more purchasing power for foreign goods. It can also result in more investment, leading to exports, or exporting using foreign inputs and raw materials. Both Imports and Exports can increase as result of an increased GDP, and it depends on the magnitude of the resulting increase or decrease of imports / exports, which determines in what direction the trade balance will move. Therefore a decrease in the trade balance is one of the realistic outcomes under economic theory.

X₈

X₈ shows the Interest rate of China. If the interest rate increases by 1%, trade balance decreases by 6.06 billion.

This finding corresponds to economic theory. An increasing of the Chinese interest rate will encourage Chinese people to save, they will keep their money in the bank, will not spend so much on US goods. Therefore, US exports to China will decrease, making the trade balance further decrease. This result is consistent with economic theory.

X₁₀

X₁₀ shows the Inflation rate of the China. If the inflation rate increases by 1 percentage point, the trade balance will decrease by 6.73 billion.

The first economic theory explanation that comes to mind is that an increase in x₁₀, will make Chinese goods more expensive, therefore there will be less demand from the people in US which should mean less US imports from China and an increase in the trade balance.

Here we have a drop in the trade balance, and this as well can be backed up by economic theory. It can be the case that an increase in price of Chinese goods might not lead to a change in consumption patterns of consumers, one reason being, that the Chinese goods could still represent the most value for money. US consumers will therefore not be responsive enough to a price increase so as to completely change their consumption patterns and search for comparable goods on other Asian markets. Contracts done by American firms with Chinese ones for goods will have already been negotiated and signed. Therefore, in the short run there is no room for cancelation or for Americans to look for a cheaper supplier, neither will the Chinese relocate their production to a cheaper location. These changes can be done at earliest in the medium or long term. If US consumers and firms will not be responsive to a price increase so as to completely change their consumption patterns, it is consistent with economic theory that the trade balance will decrease.

5.7 Statistical verification

The main aim of the statistical verification is to determine if our parameters are statistically significant or not and how the estimated model fits the data. For the verification we can use wide range of tests. The process was carried out in MS Excel and SW Gretl.

5.7.1 T-TEST

One of the test we use in statistical verification is the T-test. This tests the hypothesis whether the parameters are significant and whether we can reject or accept null hypothesis. The t-value, which we get from the t-test, is then compared with the t-table $(1-\alpha/2)^{(T-K)}$. If t-value is higher or equal to with t-table $(1-\alpha/2)^{(T-K)}$, it means we reject H_0 and the parameters are significant. For the T-test we set significance level $\alpha = 0.1$. For counting the t-value, we used Gretl software.

We set hypotheses and in the end of the test we will reject or accept the null hypothesis.

$H_0: Y_i = 0$... parameter is not significant

$H_1: Y_i \neq 0$... parameter is significant

Level of significance: $\alpha = 0,01$

Parameters	Constant	X_4	X_8	X_{10}
t-value	17.13	32.14	3.020	1.926
t-tab. ($\alpha=0,1$)	1.341	1.341	1.341	1.341
S / N *	S	S	S	S

* S = parameter is significant, N = parameter is not significant

Table 10 Comparing t-values with t-table $(1-\alpha/2)^{(T-K)}$

Source: own calculation in MS Excel and Gretl

In Table 3, we can see that all our parameters are statistically significant on the level $\alpha = 0.1$ and so we reject the null hypothesis. The constant, x_4 and x_8 are also significant on the level $\alpha = 0.025$, as the T-table value for this level of significance is 2.13, and the significance of these parameters is shown by three stars in Gretl output.

P-value

We can also have a look at the p-value of our parameters, which tells us the probability that H_0 is true. Using P values we can identify significant parameters that are present in our model. The smaller the P-values, the higher the probability that output was not obtained by chance. A hypotheses was put forward and at the end of the test the null hypothesis will be rejected or accepted. We compare the P value to the T table value. If the latter is larger, than the Null Hypothesis is rejected, which is favorable and we can declare our parameter significant. P value has to be smaller than 0.025 on significance level $\alpha = 0.025$. According to the output table from Gretl we observe that all our parameters are statistically significant, except the parameter x_{10} who's significance has dropped to the level of $\alpha = 0.1$ (10%) due to the transformation into first differences.

5.7.2 Coefficient of determination - R²

Let us start with evaluating the overall regression accuracy which can be determined by R squared and adjusted R squared.

Multiple R, otherwise known as the Correlation coefficient, shows us how strong the linear relationship is. In graphic representation, the R^2 would show how many points fall on the regression line, i.e. how well the regression line approximates the real data. Maximum $R^2 = 1$ (100%) and it indicates the perfect fit. R^2 lays in interval $<0;1>$ and in our model R^2 is 0.9881, which is a very high number. If we multiply this by 100 we will get a percentage figure, ie: 98.8%. This suggests that 98.8% of the US-Chinese trade balance is explained by the exogenous variables in the model. 98.8 percent of variance of the output variable (the US-Chinese trade balance) is explained by the input variables (the total level of US GDP, the

Chinese interest and inflation rate). From this we can assert that it was a good choice that these exogenous variables were chosen into the model, as 98.8% of the bilateral US-Chinese trade balance can be explained by them and other influences account for only 1.2%.

The value of adjusted R-squared can be more revealing, as its value is stricter, because its value does not increase automatically when a new variable is added, as is the case with R^2 . When a new input variable is added, adjusted R^2 only increases if the variable increases the predictive power of the studied equation. Adjusted R^2 would have been even more important in the earlier stages of the model when we have twelve x variables. In our model now, adjusted R-squared is equal to 0.9858, therefore in this case this means that 98.5% of bilateral trade balance is explained by exogenous variables. In comparison with the R^2 value of 0.988 the difference is insignificant and we can regard the model highly accurate based on both values.

5.8 Econometric verification

Econometric verification involves three tests (which were carried out in SW Gretl) and is a crucial part of the model testing as it tells us if the model meets all the conditions necessary for the econometric model application.

5.8.1 Heteroscedasticity

H_0 : no heteroscedasticity = homoscedasticity, H_A : there is heteroscedasticity
 $p\text{-value} > \alpha$ do not reject H_0 , $p\text{-value} < \alpha$: reject H_0

Through the White test we found there is no heteroscedasticity as the P-value is 0.1888, which is bigger than $\alpha - 0.05$. The variance of U_t in this model is constant, hence homoscedasticity exists in the model. The error term between the independent variables and the dependent variable is identical across all values of the independent variables (Homoscedasticity, 2015).

Whiteův test heteroskedasticity
 OLS, za použití pozorování 1995–2013 (T = 19)
 Závisle proměnná: uhat²

	koeficient	směr. chyba	t-podíl	p-hodnota
const	-938,825	1007,08	-0,9322	0,3756
X4	0,192988	0,152971	1,262	0,2388
X8	-60,3643	64,0288	-0,9428	0,3704
d_X10	-24,4430	46,2765	-0,5282	0,6101
sq_X4	-8,62910e-06	5,79126e-06	-1,490	0,1704
X2_X3	0,00616838	0,00472595	1,305	0,2242
X2_X4	0,00344452	0,00339939	1,013	0,3374
sq_X8	-0,528071	3,27927	-0,1610	0,8756
X3_X4	-5,93010	3,87479	-1,530	0,1603
sq_d_X10	0,0186380	1,83049	0,01018	0,9921

Neadjustovaný koeficient determinace = 0,655534

Testovací statistika: $TR^2 = 12,455148$,
 s p-hodnotou = $P(\text{Chí-kvadrát}(9) > 12,455148) = 0,188849$

Figure 17 Test for Heteroscedascity

Source: SW Gretl

5.8.2 Autocorrelation

H_0 : no autocorrelation, H_A : there is autocorrelation

p-value > α do not reject H_0 , p-value < α : reject H_0

There is no autocorrelation in the series of data. The p-value is 0.0549 which is bigger than $\alpha = 0.05$ therefore we do not reject H_0 .

Breusch-Godfreyův test pro autokorelaci prvního řádu
 OLS, za použití pozorování 1995–2013 (T = 19)
 Závisle proměnná: uhat

	koeficient	směr. chyba	t-podíl	p-hodnota
const	-3,56432	13,2796	-0,2684	0,7923
X4	0,000222395	0,000981999	0,2265	0,8241
X8	0,206949	0,948396	0,2182	0,8304
d_X10	-0,308627	0,688374	-0,4483	0,6608
uhat_1	0,507968	0,242485	2,095	0,0549 *

Neadjustovaný koeficient determinace = 0,238650

Testovací statistika: LMF = 4,388390,
 s p-hodnotou = $P(F(1,14) > 4,38839) = 0,0549$

Alternativní statistika: $TR^2 = 4,534351$,
 s p-hodnotou = $P(\text{Chí-kvadrát}(1) > 4,53435) = 0,0332$

Ljung-Box $Q' = 4,89271$,
 s p-hodnotou = $P(\text{Chí-kvadrát}(1) > 4,89271) = 0,027$

Figure 18 Test for Autocorrelation

Source: SW Gretl

5.8.3 Normality

H_0 : normal distribution of error term U_t , H_A : uneven distribution of error term U_t

p-value > α : do not reject H_0 , p-value < α : reject H_0

The output for p-value is higher than α , the p-value is 0.2275. We do not reject H_0 and we can say that model has a normal distribution of error term U_t which can be further illustrated on the graph.

Frekvenční rozdělení pro uhat1, poz. 2-20
 počet tříd = 7, střední hodnota = 7,14282e-014, so = 12,2035

interval	střed	frequence	rel.	kum.	
< -13,043	-15,807	2	10,53%	10,53%	***
-13,043 - -7,5138	-10,278	4	21,05%	31,58%	*****
-7,5138 - -1,9849	-4,7494	4	21,05%	52,63%	*****
-1,9849 - 3,5440	0,77956	3	15,79%	68,42%	*****
3,5440 - 9,0729	6,3085	1	5,26%	73,68%	*
9,0729 - 14,602	11,837	1	5,26%	78,95%	*
>= 14,602	17,366	4	21,05%	100,00%	*****

Test nulové hypotézy normálního rozdělení:
 Chí-kvadrát (2) = 2,961 s p-hodnotou 0,22756

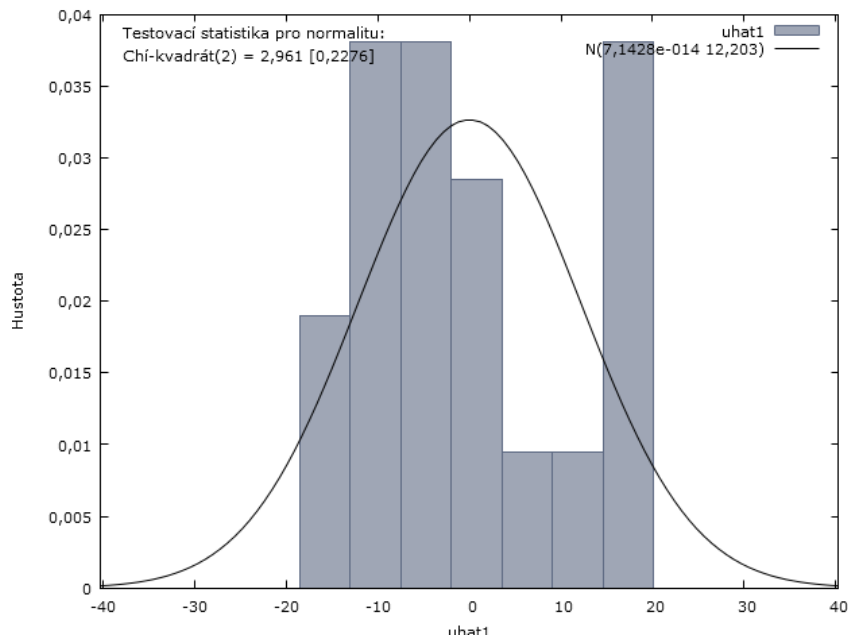


Figure 19 Test for Normality

Source: SW Gretl

The result of the econometric verification of the model is that we can conclude it fulfills all criteria to be labelled a BLUE model and can be used for future econometric model application.

5.9 Model application

GDP elasticity

$$Y = 249.812 - 0.0347 x_{4t} + 3.1534 x_{8t} + 1.4337x_{10t} + u_t$$

$$Y = 329.318 - 0.0371 x_{4t} - 6.0611 x_{8t} - 6.7373 x_{10t} + u_t$$

Firstly, we calculate the theoretical value of y for the last period (2013).

$$\begin{aligned}\hat{y} &= 249.812 - 0.0347 x_{4t} + 3.1534 x_{8t} + 1.4337x_{10t} \\ &= 249.812 + (-0.0347 * 16768.10) + (3.1534 * 4.20) + (1.4337 * 58.8) \\ &= 249.812 + (-581.85) + (13.24428) + (84.30156) \\ &= -234.49523\end{aligned}$$

$$\begin{aligned}e_{ii} &= \frac{\delta y}{\delta x_4} \times \frac{x_4}{|\hat{y}|} \\ &= -0.0347 * (16768.10 / 234.49523) \\ &= \underline{\underline{-2.4813\%}}\end{aligned}$$

This means, that if the GDP of the US increases by 1%, the US-Chinese trade balance decreases by 2.48%.

The reaction is inelastic, since $|e_{ii}| < 0$.

Interest rate elasticity

$$\begin{aligned}e_{ii} &= \frac{\delta y}{\delta x_8} \times \frac{x_8}{|\hat{y}|} \\ &= 3.1534 * (4.20 / 234.49523) \\ &= \underline{\underline{0.056479\%}}\end{aligned}$$

This means, that if the interest rate in China increases by 1%, the US-Chinese trade balance increases by 0.056%.

Inflation rate elasticity

$$e_{ii} = \frac{\delta y}{\delta x_{10}} \times \frac{x_{10}}{|y|}$$

$$= 1.4337 * (58.8/234.49523)$$

$$= \underline{\underline{0.3595\%}}$$

This means, that if the inflation rate in China increases by 1%, the US-Chinese trade balance increases by 0.35%.

According to elasticities, the GDP of the US has the biggest effect on the trade balance.

5.10 Scenario simulation & Prognosis

Let us now have a look at three scenarios and their effect on the American trade balance with China. The first will be a 10% increase in US GDP, the second will be an increase of GDP using the IMF predicted figure of 3.1%. And lastly the third scenario will have a look at the trade balance consequences of a predicted low 1.4% rate of inflation in China.

1. How will the US-Chinese trade balance change if the GDP of the US increases by 10% compared to the last period, ceteris paribus?

If the GDP of the US increases by 1%decrease in the US-Chinese trade balance by 2.48%

If the GDP of the US increases by 10%.....decrease in the US-Chinese trade balance by 24.8%

a) for the 1% increase in GDP:

According to elasticity, if US GDP increases by 1 percent, the US-Chinese trade balance will decrease by -2.48%

$$-2.48 * -318.711/100 = 7.904 \text{ billion USD}$$

$$-318.711 - (7.904) = -326.62 \text{ billion USD}$$

b) for the 10% increase in GDP:

$$-2.48 * (-318.711 * 10/100) = 79.0403 \text{ billion USD}$$

$$-318.711 - (79.0403) = -397.751 \text{ billion USD}$$

When the GDP of the US increases by 10% the US-Chinese trade balance decreases by 79.04 billion USD (from -318.711 billion USD) to -397.751 billion USD compared to the last period (2013).

Now we see how than an increasing US GDP has increasing effect on the US-Chinese trade balance, as it reduces the absolute value of the trade balance towards positive values. Let us now model the situation using real figures issued by the IMF. In the World Economic Outlook (WEO) report “Uneven Growth: Short- and Long-Term Factors” the IMF evaluates that conditions remain favorable for robust U.S. economic performance in 2015; these include lower energy prices, moderate inflation, favorable monetary policy and financial conditions and a recovering housing market. These factors could enable the US to maintain solid growth momentum and reach 3.1 % in 2015 and the projection is the same as for 2016 as well (WEO, 2015). Let us see therefore what effect on the trade balance a 3.1% increase in US GDP would have.

2. How will the US-Chinese trade balance change if the GDP of the US increases as forecasted by 3.1% compared to the last period, ceteris paribus?

If the GDP of the US increases by 1%decrease in the US-Chinese trade balance by 2.48%

If the GDP of the US increases by 3.1%.....decrease in the US-Chinese trade balance by 7.688%

a) for the 1% increase in GDP:

$$-2.48 * (-318.711/100) = 7.904 \text{ billion USD}$$

$$-318.711 - (7.904) = -326.62 \text{ billion USD}$$

b) for the 3.1% increase in GDP:

$$-2.48 * (-318.711 * 3.1 / 100) = 24.5025 \text{ billion USD}$$

$$-318.711 - (24.5025) = -343.2135 \text{ billion USD}$$

When the GDP of the US increases by 3.1% as predicted for 2015 we can expect the US-Chinese trade balance to decrease by 24.5 billion USD (from -318.711 billion USD) to -343.2135 billion USD compared to the previous period.

3. **How will the US-Chinese trade balance change if inflation rate in China increases by 1.4% compared to the last period, ceteris paribus?**

The People's Bank of China forecasts China's economy will grow by 7% and the forecast for consumer inflation has been lowered from 2.2% to 1.4% which sparks concern over possible deflation in the second biggest economy. Demand has been stimulated by three interest rate cuts in 6 months, and infrastructure spending has been increased by the government as well as the implementation of tax breaks and cutting of red tape has been done to promote growth (China's Central Bank, 2015). Let us have a look at the effect of the inflation rate prognosis on US-Chinese trade balance.

If the inflation rate in China increases by 1% ...increase in US-Chinese trade balance by 0.3595 %

If the inflation rate in China increases by 1.4%... increase in US-Chinese TB by 0.5033%

$$(0.5033/100) * -318.711 = -1.6041$$

$$\rightarrow -1.6041\% \text{ from } -318.711 \text{ is } 5.11244$$

$$= (-1.6041/100) * -318.711 = 5.11244$$

$$-318.711 + 5.11244 = -313.59856 \text{ billion USD}$$

If inflation rate in China increases by 1.4% as the People's Bank of China forecasts, the US-Chinese trade balance will increase by 5.11244 billion USD to -313.59856 billion USD compared to the last period.

5.11 Summary of China-US Trade Relations determinants evaluation

In this section an econometric model quantifying the determinants of the US-Chinese trade balance from the American perspective was constructed in SW Gretl using data up to the year 2013. Parameters were estimated through regression by the Ordinary Least Square Method. A 12 variable model was started off with and was modified step-by-step and adjusted based on the statistical and economic significance of the parameters. The criteria use to remove the variables from the model included high p-value (statistical insignificance), exact multicollinearity with the endogenous studied variable. Compliance with economic theory was also a crucial factor in determining the quality of the model. If a variable couldn't be excluded from the model and it had the problem of multicollinearity, this was then counter acted by changing the variable (x_1, x_{10}) into First differences.

$$Y = 249.812 - 0.0347 x_4t + 3.1534 x_8t + 1.4337x_{10}t + u_t$$

The final model appears in the following form and includes exogenous variables such as the GDP of the US, the Interest rate of China and the Interest rate of China. Exogenous variables behave consistently with economic theory. The model fulfills criteria to be labelled a BLUE model and can be used for future econometric model application. There is no autocorrelation and heteroscedasticity present in the model and the error term U_t is normally distributed. The adjusted R squared value of the model is 0.9881, which means it can explain the US trade balance with China by 98.8% accuracy, demonstrating that the choice of variables in the model was not haphazard, but was based on solid economic and econometric analysis.

Our calculated constant is 249.81 and tell us the US-Chinese trade balance in billion USD per year if all other exogenous variables were equal to zero. It was found that if the GDP of the US will increase by 1 unit (billion USD/year) the US-Chinese trade balance will decrease by 0.034 billion/year. If we increase the interest rate by 1%, the trade balance increases by 3.15 billion. Likewise, if the inflation rate increases by 1 percentage point, the US-Chinese trade balance will increase by 1.433 billion.

In the model application it was found that according to elasticities, the GDP of the US has the biggest effect on the trade balance out of the three variables. The effect of a 1% increase of the US GDP would cause the US-Chinese trade balance to decrease by 2.48%.

In Scenario simulation & Prognosis three scenarios were constructed to model the possible effects of variable increases on the trade balance. It was found that if the American GDP were to increase by 3.1 % for 2015 as predicted in the World Economic Outlook (WEO) report “Uneven Growth: Short- and Long-Term Factors” the US-Chinese trade balance would decrease by 24.5 billion USD to -343.2135 billion USD compared to the previous period.

Moreover, if inflation rate in China increases by 1.4% as the People’s Bank of China forecasts, the US-Chinese trade balance will increase by 5.11244 billion USD to 323.822 billion USD compared to the last period.

6 Conclusion and Recommendations

The US and China are two very different countries, both having different starting points of development, but now are the top two economies in the world. The US has been the dominant and leading economic and political power ever since we can remember, however China is an emerging power whose potential has only been uncovered in the last decades.

The US has created and continually creates global order. As part of the post-war reconstruction it created numerous institutions that form the basis of the modern day rules-based international and economic order and have benefited the world immensely - NATO, the Bretton Woods system, later transforming into the IMF and IBRD, which is now part of the World Bank Group. It also gave rise to the GATT, now the WTO. The US Dollar became the world reserve currency and the US acts as a lender of last resort, which has firmly established American dominance in the global economic system financial sector. Using these means, America is not only promoting free world trade, but likewise a global dollar-based financial market.

China has made immense progress since the end of the Cultural Revolution. China's economic expansion has wooed the major part of the world, western countries admiring its high growth rates, it has shifted towards exporting products of higher value. Nevertheless, this expansion is steadily slowing down as China moves to a different stage of economic development. Even though China forms 14.9% of world GDP, it still lacks development in many areas. Big challenges now lie ahead of it. China's reliance on exports has been uncovered in light of the financial crisis. This means of growth is very unstable.

If it wants its growth to continue then it must transition towards a sustainable form of growth stimulated by internal demand as it will not be able to sustain its investment-driven and export-led growth. Gains from FDI transfers have been leveled and it will have to become itself a major center for new technology and innovation. Plus, it needs to undergo many internal structural reforms and invest heavily in social systems to have better structures in place for its citizens.

In light of its rapid growth it has been reproached its many unfair practices that have seemingly distorted trade flows to their trade partners' disadvantage. As China is the US's second largest trade partner, it has in this sense suffered a lot. It holds a large and exponentially rising trade deficit with China, US firms incur great losses due to the unacceptably high levels of IPR piracy, which fines and punishments haven't been able to stop as they are too low. The liberalization of its economy still are not complete as numerous barriers to entry exist, subsidies to domestic firms are given, all of which is linked to the lack of enforcement of WTO obligations. Basically, the Chinese government seeks to promote the development of industries it believes are going to be vital for its future economic growth at the cost of breaching WTO rules.

Another point of contempt for some is the Chinese currency, which was considered for many years to be undervalued, which acted as a "subsidy" making their products cheaper. This causes it to have an unfair trade advantage over others, become more competitive in international markets, and therefore resulting in unfair competition for US and other foreign producers. As China has reached a certain level of development and its economic policies and currency management have a huge impact on the world economy and other Central Banks, these measures are no longer appropriate now, but China justifies them rather as a cautious policy of liberalizing markets. Moreover, the slight RMB undervaluation produces "winners and losers" in the economic sense in both countries, so if the currency were to appreciate, it would result in a mere change in the groups of winners and losers.

Apart from the immense benefit US-Chinese relations bring, there exist many differences between the US and Beijing government that are rooted deeply in their political systems – we could argue that they will impede the development of a close relationship and impose real limits, as the government restricts for example the freedom of religion, speech, and political competition. Nevertheless, democracy and other values cannot be imposed on a country, but have to be gradually progress towards, so in this sense Beijing is going in the right direction, but encouraging political reform especially in the area of human rights should continue to remain a priority.

Moreover, we have noticed a trend of deepening of relations between these two countries, which is largely due to a mutual convergence of interests and that they are complementary to each other making relations beneficial. Whether these interests will continue to coverage in the future is uncertain, but if they do cooperation is likely, and it is improbable that it will cease in the coming future. US should seek to follow a consistent policy that's aims to integrate China into the global community, to be able to further build on areas with overlapping interests and make their differences narrow down. Nevertheless it is appropriate for the US to be ready to challenge China if its conduct doesn't lie within the boundaries of US vital interests. Both countries are interdependent thanks to the great ties of their economies.

On the other hand, China's rise does bring with it also a threat of rivalry in some form or another with the United States, as it is rising economically and militarily, and if it coupled with other Asian countries together they could pose a threat. This however is only another aspect of the extremely complex and mixed relationship of the United States and China that doesn't show signs of materializing yet. Engaging and integrating China in the global economic system to make it a responsible player in all aspects, would be ideal, while also at the same time balancing its growing power, which does not prove to be an easy task. Lastly if we are to truly address the challenges and opportunity faced with in light of this relationship, it is necessary to deepen our understanding of China, to be well informed and not only adopt a black and white view.

It is essential that Beijing and Washington continue to uphold an open and transparent dialogue to fully comprehend each other's intentions on important issues. Taking steps to increasing trust is essential to reducing the risk of conflict between the dominant and rising power. They have to realize that while they may disagree at times their differences shouldn't let their relationship be torn apart as the potential costs of such conflict could be extensive.

Understanding each other's issues and handling them is key as this intensifying economic partnership has the potential to both create disputes and solid ground for cooperation – let us hope that through diplomatic dialogue the later will hold true and the positions of these two major economic power remain steady in the international trading arena and global economic system.

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10 Appendix

Table A: Trade balance structure US-China

Total US Merchandise exports and imports to China and the Total Trade Balance between the US and China

	US Exports	US Imports	TOTAL - Trade Balance
1994			-29.505
1995	11.753	45.543	-33.789
1996	11.992	51.512	-39.52
1997	12.862	62.557	-49.695
1998	14.241	71.168	-56.927
1999	13.111	81.788	-68.677
2000	16.185	100.018	-83.833
2001	19.234	109.38	-90.15
2002	22.12	125.192	-103.064
2003	28.36	152.436	-124.068
2004	34.42	196.682	-162.254
2005	41.1	243.47	-202.278
2006	53.67	28.774	-234.101
2007	62.9	321.442	-258.505
2008	69.7	337.772	-268.039
2009	69.4	296.373	-226.877
2010	91.9	364.952	-273.041
2011	104.1	399.371	-295.249
2012	110.5	425.626	-315.11
2013	121.7	440.447	-318.711
2014	124.02	466.656	-342.632

Source: own processing based on TradeStats Express and Census.gov

Table B: Data set for Econometric model

	Y1	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	
	TOTAL - Trade Balance	Total US imports	Total US EXPORTS	Total US Trade balance	GDP US	GDP China	Exchange rate of CNY	Interest rate US	Interest rate China	Inflation US	Inflation China	Unemployment US	Unemployment China	Trend line	Total Chinese export	
Year 1	1994	-29.505	668.69	502.859	-165.831	7308.8	559.224	8.62	4.9	-8	2.1	20.6	6.1	2.8	1	120.822
Year 2	1995	-33.789	770.852	584.743	-186.109	5	6	8.35	6.6	-1.5	2.1	13.7	5.7	4.5	2	148.892
Year 3	1996	-39.52	803.113	612.113	-191	5	6	8.31	6.3	3.4	1.8	6.4	5.5	4.6	3	151.093
Year 4	1997	-49.695	899.019	689.182	-209.837	5	6	8.29	6.6	7	1.7	1.5	5	4.6	4	182.917
Year 5	1998	-56.927	944.353	682.138	-262.215	5	6	8.28	7.2	7.3	1.1	-0.9	4.6	4.7	5	183.744
Year 6	1999	-68.677	1059.44	695.797	-363.643	5	6	8.28	6.5	7.2	1.4	-1.3	4.3	4.7	6	194.932
Year 7	2000	-83.833	1259.3	781.918	-477.382	5	6	8.28	6.8	3.7	2.3	2	4.1	4.5	7	249.212
Year 8	2001	-90.15	1179.18	729.1	-450.08	5	6	8.28	4.5	3.7	2.3	2.1	4.8	4.5	8	266.2
Year 9	2002	-103.064	1200.23	693.103	-507.127	5	6	8.28	3.1	4.7	1.5	0.6	5.9	4.4	9	325.642
Year 10	2003	-124.068	1303.05	724.771	-578.279	5	6	8.28	2.1	2.7	2	2.6	6.1	4.3	10	438.472
Year 11	2004	-162.254	1525.37	818.52	-706.85	5	6	8.28	1.5	-1.3	2.7	6.9	5.6	4.3	11	593.647
Year 12	2005	-202.278	1735.06	907.158	-827.902	5	6	8.19	2.9	1.6	3.2	3.9	5.2	4.1	12	762.326
Year 13	2006	-234.101	1918.08	1038.27	-879.81	5	6	7.97	4.7	2.2	3.1	3.8	4.7	4	13	968.98
Year 14	2007	-258.505	2020.4	1162.98	-857.42	5	6	7.61	5.2	-0.2	2.7	7.6	4.7	3.8	14	1220.46
Year 15	2008	-268.039	2169.49	1301.11	-868.38	5	6	6.95	3.1	-2.3	1.9	7.8	5.9	4.4	15	1438.69
Year 16	2009	-226.877	1605.3	1056.04	-549.26	5	6	6.83	2.4	6	0.8	-0.6	9.4	4.4	16	1201.61
Year 17	2010	-273.041	1969.18	1278.49	-690.69	5	6	6.77	2	0.8	1.2	6.6	9.7	8.1	17	1577.76
Year 18	2011	-295.249	2265.89	1480.29	-785.6	5	6	6.46	1.2	-1.2	2.1	7.8	9	7.1	18	1898.38
Year 19	2012	-315.11	2336.52	1545.71	-790.81	5	6	6.31	1.4	3.9	1.8	2	8.2	6.4	19	2048.71
Year 20	2013	-318.711	2329.06	1579.05	-750.01	5	6	6.2	1.7	4.2	1.5	1.7	7.4	6	20	2209.63

Source: own processing based on TradeStats Express, Census.gov, Commtrade, World Bank