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The Chinese Financial Market: Development, Features and Performance Analysis

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Firma dello studente

Simone Tovo

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Introduction

Over the last century, China is without a doubt one of the countries that went through the largest amount of change. From being an underdeveloped country to the world's second largest economy, the country's growth has been impressive, leading China to become, as by today, the world's largest investor. From an economic point of view, China is often labelled as an emerging market. Whilst this can be correct from a certain point of view as it shares some of the characteristics of emerging economies, from another, this connotation is not anymore valid: in terms of size, the Chinese economy is certainly a world class competitor, with a Gross Domestic Product value equal to US$ 14,4 trillion in 2019.[1] The spectacular growth is evident from the fact that the Chinese GDP tripled over the last 10 years, for the third decade in a row. In order to understand what China is today in terms of economic power and characteristics, it is important to understand its evolution over the years, focusing in particular on those key aspects that affected the economy.

The first chapter aims to provide this historical overview, starting from the origins of China's economy and economic thinking. Throughout its long history, China has been marked by a series of ups and downs that hindered its development. Up to the middle of the 20th Century, the Chinese economy was still essentially be based on the agriculture. It is only from the second half of the 20th Century that starts to rise, due to a series of economic and political upheavals. After a brief analysis of the key elements of today's Chinese economic implant, with the additional help of macroeconomics indicators, the focus will move on the near-future implications and relevant elements to take in consideration in order to have a picture of what China might be in the years to come. The ongoing transition from production-based to service-based economy and the recent conflicts with the United States are just two elements that are essential to consider as they can potentially affect the overall global economy, due to the deep interconnections that characterise our present system.

For every country, the financial system is fundamental to the economic growth and to provide credit to the market. China is no exception, with the financial system playing a critical role in fuelling the country expansion, despite being difficult to efficiently analyse due to the fact that is in fast and constant evolution.

The second chapter is entirely dedicated to the Chinese financial system and its relation with

[1] Data from the World Bank database

the overall economy. Many evolutions throughout the time have shaped the current financial system of China, from the first Western influences during the 19th Century to the heavy centralisation process that took part with the Communist Party at the power. During this period (1950-1978) the Chinese financial system consisted of a single bank, the People's Bank of China (PBOC), that functioned as both the central and only commercial bank of China. The trading in the Stock Exchange was also stopped up to 1990, when the two mainland markets, the Shanghai Stock Exchange and the Shenzhen Stock Exchange, were officially established. Today, China's financial system is composed by a highly dominant banking sector, characterised by a group of big and partially state-owned banks, the "Big Four" and a numerous number of small/medium banks of different types. The many reforms and institutions that were raised in China especially during the last two decades will be presented and discussed in order to highlight the main characterizing factors regarding the organisation of the system and its main sectors. The Chinese financial system has been a historical pledge by a high amount of non-performing loans, that heavily affected the market environment and banks' health. It is relevant to analyse the past and current situation regarding NPLs not only to understand the current stability of the system, but also to have an idea of future possible developments.

Through the help of data from the World Bank database, different aspects of the Chinese and United States' financial system will be compared to identify possible differences and similarities in terms of size, development, etc. More space is dedicated to the Chinese stock market, composed by the two mainland stock exchanges (the Shanghai Stock Exchange and the Shenzhen Stock Exchange) and by the Hong Kong Stock Exchange. To understand their characteristics and functioning, it is important to analyse factors such as the composition, the market exposure and the types of share traded. It is also important to take into account the government influence for a country like China, as it showed during the years to be highly impactful on the performance and organisation of the stock market. Differently from the Western countries, China has adopted a more controlled approach on the trading system, shaping the market and its participation through series of different reforms. More generally, China has often been criticised for the heavy and sometimes obscure interventions into the financial system, making also use of the banking system for government purposes. Lastly, the residual sectors that composed of the financial system of China will be analysed. The great importance of the banking system is flanked by other standard sectors like the insurance market, the bond market, etc. The no-standard financial sector, composed by informal financial channels, had also an important role in the country's development.

In particular, it has revealed to be one of the fastest growing sectors, essential for the growth of the Hybrid Sector and for all those companies not targeted or covered by the banking funds. Only a few decades ago, China was characterised by a virtually non-existing private financial sector and all banking was done through branches of the People's Bank of China; it becomes evident why other types of financing have grown in popularity and relevance.

The third and last chapter is dedicated to the performance analysis of the stock market's returns. Through a series of data collected from Thomson Reuters Eikon, the two Chinese mainland stock indexes will be compared to three of the most widely used benchmarks in the trading industry: the S&P 500, the Dow Jones Industrial and the NASDAQ Index. The analysis aims to provide a direct comparison of the performance of the Chinese markets against the overall market behaviour, tracked by the benchmarks. Three types of indexes will be taken into account regarding the Chinese exchanges: Composite, A Share and B Share. The aim is once again to highlight possible differences between shares marketed towards domestic or foreign investors.

Besides some basic metrics such as average returns, volatility and correlation, the analysis will focus on risk-adjusted measures, to better understand the performance over time. These measures will be divided in three main groups, depending on the assumption regarding the return distribution. The first group of measures will be based on the normal distribution of returns, the second type of measures will drop this assumption by taking into account higher moments of a distribution. Instead, the third measurements group will not assume any kind of distribution.

The results will be then compared in order to have an empirical picture of the evolution and relative performance of the indexes, in order to understand the role of the Chinese stock within the widest economical system. Almost every functioning financial system includes financial markets and intermediaries, but how these two sectors contribute to the entire financial system and economy differs significantly across different countries. It is therefore important to understand which sector was the main engine for China's outstanding growth.

There is evidence from the past to show that financial markets have not been effective in allocating resources in the Chinese economy, often hindered by high levels of speculation. However, the situation is recently improving and these improvements will be essential going forward as financial markets are likely to play an increasingly important role in the economy. Throughout the comprehensive examination of China's financial and economic system and comparison with a developed and more mature country from the financial organization point

of view, like the United States, it can also be discussed what has worked and what remains to be done so that the Chinese financial system can better serve its entire economy.

Chapter 1

The historical background and evolution of the Chinese economic system

1.1 The Chinese economy from the origins to the 20th Century

1.1.1 Confucianism's influence

In order to accurately analyse the Chinese economical system, it is necessary that we look back and evaluate its origins. We cannot talk about the Chinese economy without talking about the school of thought, the milestone from which the culture originates: the Confucianism.

The Confucian values have influenced both the past and present culture, facilitating formal education and knowledge-based learning. "Confucianism can provide the fuel to make the engines of industry work. It provides a work ethic which is characterised by diligence, responsibility, thrift, promptness, co-operation, and learning".[2] Without getting too much into the details of the origin of this philosophy, it is enough to know that it was first adopted by the fifth Han Emperor, Wu (147 BC), who found that Confucianism was well suited to the conditions of ancient China. Confucianism held a dominant position in China from the Han era (206 BC-AD 220) and onward.

The ideology is based on five main virtues: benevolence, righteousness, propriety, wisdom, and fidelity. Nevertheless, the ideology is strongly based on social rankings and ethics and acts as a reinforcement to the central monarchy. Even if it is not officially in vogue as of today, the 2000 years of its influence cannot be ignored. To this day, a strong hierarchical system presides over China and has been furthermore strengthened with the introduction of the Marxism ideology. The strong social order is reflected in the fact that everyone has a fixed position in society, in which they need to relate and behave in accordance with. The effects of the ideology are very visible not only strictly from a social point of view, but also through everyday business and economy. The high number of state-owned enterprises is just an example of the influence as described above.

[2] Confucian roots in China: a force for today's business, Laurence Jacobs, Gao Guopei and Paul Herbig, 1995

An interesting peculiarity of the Chinese "ideology" is the heavy reliance on ethics rather than on the law as a source of commitment. However, in Europe the law has been the main source of commitment since the earliest source of civil law, such as the *Corpus Iuris Civilis*.
If laws are explicitly stipulated, ethics are rather established through use and based on morals. In some cases, it could be argued that moral principles are stronger than legal principles. We can refer to a more recent example by looking at the legislations of certain countries in regards to abortion and/or same-sex marriage. It is evident that these legislations have been enacted as a consequence of moral and ethical issues, rather than a legal principle.
Examples of the strong ethics reliance can be seen in the fact that Chinese people are quite reluctant about going to court to settle a dispute. Where possible, especially in business, Chinese people may not recourse to the civil law but rather hope to settle problems through a "friendly consultation", in order to avoid the break of a relationship.

There are definitely some features of the Confucian ideology that positively affected the Chinese economy over the decades. Besides the strong hierarchy and the importance of relationships when dealing with disputes, factors such as the respect for authority, the conformation to a prescribed pattern of interpersonal relations and the importance given to the education were relevant in the creation of a strong work ethic, which are favourable conditions for the development of economic growth. Furthermore, the conception of leadership is central to the ideology. It is not primarily focused on personal profit but instead on inner personal growth and development. The figure of 'the leader' was very important and coincided with virtues such as kindness and justice: a value-based figure of the leader is fundamental in the development of business relationships.[3]
Similarly, there are some aspects of Confucianism that acted as an anchor to economic development rather than a promoter of it. The main aspect being the aversion to trading and profit motive. If agricultural activity was encouraged, commerce was instead restrained, especially during the Han Dynasty. The figure of the merchant was not well seen, both from a social point of view and from a fiscal point of view. For example, in the Han Dynasty merchants were made to pay a poll tax that was double the amount that other workers paid. Succeeding the Confucian belief of "righteousness before profits", we did not see that the development and efficiency of the trade economy were advanced or benefitted.

[3] Pi-Chi Han (2013) Confucian Leadership and the Rising Chinese Economy, Chinese Economy, 46:2, 114-117

1.1.2 From the early ages to the “Century of Humiliation"

Historically, the Chinese economy has been strongly based on agriculture, in fact, during the Han era, 80% of the whole population was composed by peasants. This data has been relatively steady up until 1950-1960. From a government point of view, the main source of revenue was given by the taxation, especially given the fact that the state was able to tax peasant’s revenue. The source of the growth was sustained by the constant surplus given by the farming activities and consequentially a constant stream of revenues, in the form of taxes, for the government to reinvest.[4]

Internally, the agricultural system was organised in families, each one forming a basic production unit. The main difference that characterised the feudal China to the ancient Europe is the fact that land rent in ancient Europe was payable in either labour or in service, whereby a worker had to provide a certain amount of work in order to fulfil his rental obligations. Alternatively in China, everything that a farmer produced after the rent payment would have been entirely his/hers. This difference provides higher motivation to the Chinese peasant to produce more, creating higher value for the whole economy.
Another aspect able to affect the economy was the right to inherit property. Contrary to Europe, where the entire property was given to the eldest son, in China every child had the same rights to the property, therefore making it necessary for them to collaborate and strengthen the family unit in order to prosper.[5]

As previously stated, the agricultural sector was by far the single most important source of employment for the majority of the Chinese population, whilst instead the merchant class tradition was somewhat weak. The equation of more land = more endowments = more tax revenues, was the main motive that lead to a consistent expansion of the Empire and consequently of the farmable lands. In particular during the Qing era (1644–1911) China doubled its territories, at the same time the labour force was never a problem thanks to China’s large population. The geographic expansion of the empire stopped only when the physical limits for farming were reached.
High yield agriculture was not all that China had to offer. From approximately the 10th to the 15th century China led the world in the fields of science and technology. From material production to transport, weaponry to medicine, China was far ahead of Europe during those

[4] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[5] Confucian roots in China: a force for today’s business, Laurence Jacobs, Gao Guopei and Paul Herbig, 1995

periods.[6] For example, if we look at textile manufacturing, China launched a revolution in the 14th century while Europe had to wait until the Industrial Revolution started to take place in Britain in the 18th century. The difference in timing was due to the fact that China was ahead in the production of both steel and iron. Overall, China was a dominant country until the 19th century.[7]

Another interesting aspect to discuss is the fact that China persistently imported silver from the 15th to the 19th centuries during the Ming-Qing Period. It has been estimated that as a response to the supply of many different products, specifically ceramics, silk and paper, one-third of silver output from the New World ended up in China. The imported silver consequently made China a silver-standard economy.

All aforementioned factors contribute to the explanation of China's success during the so called 'premodern era'.

From the beginning of the 19th century China faced a downfall that coincided with the Opium War (1839-42).[8] At the beginning of the 19th century, England decided to impose an illegal importation of Opium in China. The aim was to repay the considerable amount of debt accumulated till that point, that is estimated to be in the order of 28 million pounds through the use of a triangular market established with China and India. The Chinese reserves of silver were quickly depleted due to the fact that the silver was used to pay for the Opium importation. England was able to refill its reserves whilst the Chinese government had to raise the taxation on peasants to face the decrease of reserves (and consequentially the increase in price of the silver).[9]

From this point onwards, the war was inevitable, regardless of whether or not the British officials tried to play down the illicit origins of the conflict. The war began what in China is known as the "Century of Humiliation", during which, foreign powers forced weak Chinese governments to cede territory and sign unequal treaties. A second Opium War against China took place from 1856 to 1860 and involved both France and Britain. Even if the Chinese empire could have counted on a huge number of people, its military capabilities and armaments were far from that of the foreign invaders, and consequentially, China was defeated in both wars. It was forced to sign unfavourable trading concordats and lost the control of Hong Kong in favour of Britain.[10]

[6] Economic History of Premodern China (from 221 BC to c. 1800 AD), Kent Deng, EH.Net Encyclopaedia
[7] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[8] Economic History of Premodern China (from 221 BC to c. 1800 AD), Kent Deng, EH.Net Encyclopaedia
[9] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[10] How Britain Went to War with China Over Opium, by Austin Ramzy, The New York Times, July 3, 2018

The period commonly referred as the "Century of Humiliation" dates from 1839 to around 1949. During this period, China lost control of many of its territories. Till this day, the effects of what happened during the Century of Humiliation are still tangible and are reflected even from a business point of view. It is common opinion among the Chinese as a historical lesson as to how strong Western powers tend (or might tend) to behave toward China, therefore it cannot be overlooked.

The Opium war somewhat marked China's first sustained exposure to the West, and essentially highlighted its military and diplomatic weaknesses in the face of Western power. During this chaotic period, China was crossed by different waves of rebellions and civil wars. The long list of political, military, and cultural indignities further weakened the economic system. This period ended only when the Chinese Communist Party (CCP) and the Red Army won the Chinese civil war, drove the Nationalist Party (KMT) off the mainland and officially established the People's Republic of China on October 1, 1949.[11]

1.1.3 The rebirth of the 20th Century

With the establishment of the Communist regime and after a long period of darkness, the Chinese economy started to flourish once again. Under the lead of Mao Zedong, the country was unified and many of the plagues that affected China up to that point (such as illegal treaties and trafficking of women and drugs) finally came to an end. Consistent investments of public money were made and especially favoured the education and health system's that became free.

The economic policies put in place by Mao have been clearly influenced by the ideologies of Karl Marx. Following Marxism's theory, he put an emphasis on the centralisation of the economy and on the strengthening of the domestic market. These choices revealed to be important to overcome the situation of stress and instability that the country experienced during the previous century. All efforts were concentrated towards the development of the agriculture sector which, as previously mentioned, was the life-line of the Chinese economy. In this matter, many reforms were made, mainly aiming to boost the output and eradicate some remnants of feudalism. China opted for agrarian polices that were very similar to the reforms that had contributed to the development of the Soviet agriculture sector, with which

[11] The "Century of Humiliation" and China's National Narratives, March 10, 2011, Alison A. Kaufman, China Analyst CNA

China shared the basis of common ideology. To summarise, Mao believed that the two main factors, centralised economy and agricultural development, were the main sources to aid in achieving economic development and eventually bring positive changes to the lifestyle of the people. However, as it occurred, not all the policies put in place had only positive effects. One counter effect of the agrarian policies aimed to maximise the output was the shortage of food and consequently, initiated the death of many people. On the other hand the literacy rate of China during Mao's government increased consistently and worked to create a solid base for future economic and cultural development.

A pivotal change of events started in the 1980's, whereby, following the death of Mao Zedong in 1976, Deng Xiaoping became *de facto* leader of China from 1978, bringing a paradigm shift in Chinese economic policies. The economic system changed form, from socialism to capitalism. Considerable efforts were made to develop the Chinese industrial sector and quickly became the main focus. For the first time in China's history the agriculture field was not the first one in the line of priority. The results of Deng's policies included rapid economic growth that was attained at an average pace of a real national output that reached 9.5% in its first decade. The ideas of Deng are highly influenced by Adam Smith, the pioneer of the free market. Ideas such as free trade and foreign investments became central in his economic policy and were often defined as the "Open Door Policy". It is not by chance that Deng Xiaoping is primarily associated with the liberalisation of the Chinese economy.
In particular, one of the policies that revealed to be most effective was the institution of Exclusive Economic Zones (EEZ) having the main objective of developing trading ties with foreign states. Tax revenue remained an important source for revenues and, thanks to the opening up of the economy and the rising foreign investment it is estimated that in 1997 the total tax revenue reached approximately 8.2 billion Yuan, 16 times greater than what was previously registered in 1979. Decentralisation and privatisation of services such as education and healthcare and the establishment of new EEZ completed the shift to a capitalist economical structure. The transition didn't come without shocks: if from one side the rate of employment increased, from the other a wave of unskilled migrants got incorporated into the Chinese open market system, only later proving to be compatible with the system itself.

Overall, China had a positive economic transformation under both leaders, Mao and Deng. This can be seen by the uplift of a large portion of the Chinese population from the lowest economic ties to the middle tier.[12]

1.2 Chinas most recent history from an economic point of view

1.2.1 Key elements of the economy

China represents a successful example of a gradual transition through different reforms, from a planned economy to a market economy. To cite some data, the real per capita GNP grew by 7.2% annually from 1978 to 1990. In the 80's the growth was particularly fast, averaging at 9.8% capita from 1982 to 1988. The export grew at over 10% per year from 1978 to 1990 in real terms. The growth of national income is definitely a good indicator of the economic success of the country during those years. The most dynamic sector was the one of non-state-owned industrial firms that again grew from 1978 to 1990 at an annual growth rate of 17.6%. The non-state sector grew even in terms of output, reaching 45% of the total industrial output in 1990, therefore, reaching almost half of the total industrial production.[13]
In 2010, following three decades of substantial growth, China surpassed Japan and following the United States, it became the world's second-largest economy. By this time China's economy was valued just below $1.33 trillion. Throughout the years, China has become a major driver of global growth and began to assert a greater influence in Asia, Africa and Latin America through the use of special trade agreements and multibillion dollar resource deals.[14]

Today, China is the biggest manufacturer and exporter in the world. This came to be through its productive capacity and position as a major importer of raw materials, predominantly with Africa and Latin America. If we look at the most recent data, we find that the GDP growth in 2018 is equal to 6.6%, showing a decrease in the last few years from 7.3% in 2014. It is essentially a consequence of the uncertain environment that surrounds China today, however, this will be better discussed at a later point of this paper.

[12] Chinese Economy under Mao Zedong and Deng Xiaoping, Prof. Dr. Khalid Manzoor Butt and Sarah Sajid, Journal of Political Studies, Vol. 25, Issue - 1, 2018
[13] How to reform a Planned Economy: lesson from China, John McMillan and Barry Naughton, Oxford Review of Economic Policy, 1992
[14] China Passes Japan as Second-Largest Economy, David Barboza, New York Times, 2010

In the figure below we can see the Balance of Payment of China from 2014 to 2018. The figure also shows some projections though for now we will focus only on real data.

China: Selected Economic Indicators											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
								Projections			
	(Annual percentage change, unless otherwise indicated)										
BALANCE OF PAYMENTS (Percent of GDP)											
Current account balance	2.2	2.7	1.8	1.6	0.4	0.5	0.4	0.2	0.1	0.0	-0.1
Trade balance	4.1	5.1	4.4	3.9	2.9	3.1	2.9	2.7	2.5	2.5	2.4
Services balance	-2.0	-1.9	-2.1	-2.1	-2.2	-2.2	-2.2	-2.2	-2.1	-2.1	-2.1
Net international investment position	15.2	14.9	17.4	17.4	15.9	15.6	14.8	13.9	12.9	12.0	11.0
Gross official reserves (bn US$)	3,899	3,406	3,098	3,236	3,168	3,167	3,174	3,177	3,179	3,182	3,189

Figure 1: BOP China, Sources: Bloomberg, CEIC, IMF Financial Statistics database, staff estimates and projections

By looking at the current account balance, we can see that it has fallen considerably and steadily in the last few years, dropping from a +2.2% in 2014 to a +0.4% in 2018. The trade balance remains on surplus, even if it has decrease of over 1 percentage point, falling to +2.9% in 2018. Thanks to its highly positive trading surplus, especially during the past years, China was able to reinvest the resources into various economic sectors and simultaneously build up its foreign currency reserves that amounts to US$ 3'168 billion in 2018. Furthermore, the trading surplus allowed China to limit the external debt which was estimated to be approximately US$ 2 billion in 2018, an amount that may seem low when compared to other countries.[15] Europe and the United States had respectively and external exposure of over US$ 29 billion and US$ 17 billion back in 2016.[16]

China holds a considerable amount of the foreign-owned US debt, holding just over US$ 1 trillion (June 2020). In this special rank, China is categorised at second place, just below Japan that is the main US debt holder, holding over US$ 1.2 trillion.[17] The amount of US debt held by China has however fallen consistently since 2010 and comprises of only the 5 to 7 percent of the total US debt. As of today, most of the sovereign debt is still held domestically. It is often debated that the large quantity, at least in nominal value, of US debt held by China could be a risk for the United States, as it would open the country to possible manipulation. In actual fact, the purchasing of sovereign debt by foreign countries is a normal transaction. Sovereign debt is often bought by central banks as part of a monetary policy, done in order to maintain stability of the exchange rate. It helps to build up foreign exchange reserves (cash/other liquid assets denominated in foreign currency). For example, foreign exchange

[15] The time-series data of China's Gross External Debt Position, safe.gov.cn
[16] Country Comparison: Debt – External, cia.gov
[17] Major Foreign Holders of Treasury Securities, ticdata.treasury.gov

reserves are particularly important for countries as they can be used to pay interest on external debt and are additionally useful to stabilise/maintain stability of the foreign exchange rate. In the case of China, if the Renminbi (local currency) depreciates against the US dollar, the Chinese CB can sell the US dollar through foreign exchange reserves in its possession in order to buy Renminbi in attempt to counteract the depreciation and stabilise the prices. China CB also tends to buy foreign assets in order to prevent the high and consistent inflows as a consequence of the positive current account surplus, from causing extreme high inflation, a processed often referred to as "sterilisation". It is evident that the value of foreign exchange reserves is used as a safety net and for this purpose, the US dollar is highly appealing and is in high demand due whilst also being widely used in international transactions. This is mainly thanks to the fact that the United States government has never defaulted on its debt.

To summarise, China specifically holds large exchange reserves that have been built up over time, mainly due to persistent surpluses in the current account. The United States debt held by China should not constitute a problem of economic influence per se as even in case in which China would suddenly decide to sell the US debt, this would be simply purchased by another country because of its high appeal. For example, in August 2015 China decided to reduce its holdings of the United States treasuries by approximately $180 billion. Despite the scale, this sell-off did not significantly impact the United States economy.[18]
Between the other factors that significantly contributed to China's economic success, the low cost of the work force was fundamental, even though wages and public services have been progressively increased during the past few years in order to reduce the social differences.[19]

1.2.2 Present tasks and issues

A lot of progress has been made in China from a reformed point of view in the most recent past, with many already planned for the future. The main structural change that China has recently been going through is the shift from a high-speed to high-quality growth, therefore there is the need to support this shift with proper macro policies. To achieve high-quality growth, the deleveraging and financial de-risking is fundamental, together with balance strengthening. China has been the fastest growing country for the recent decades, being able to grow even during the recession period, however, the high-speed growth was characterised

[18] Is it a or America that China Holds over $1 Trillion in U.S. Debt?, chinapower.csis.org
[19] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis

at the same time by an increasing debt. The aim of the deleveraging policy is in fact the reduction of this fast growth in debt. It was particularly aimed towards state-owned enterprises, by adjusting their balance through risk reduction. A greater effort was also put into fighting the shadow banking system that notoriously makes use of high financial leverage, whilst also improving the general health of the banking system through the take-over of "zombie" banks with solvency and liquidity problems.

More recently we have seen a reversal of the trend. As we can see in the figure below, the economic activity slowed down in the second half of 2018 in response to a weakened demand from advanced economies.

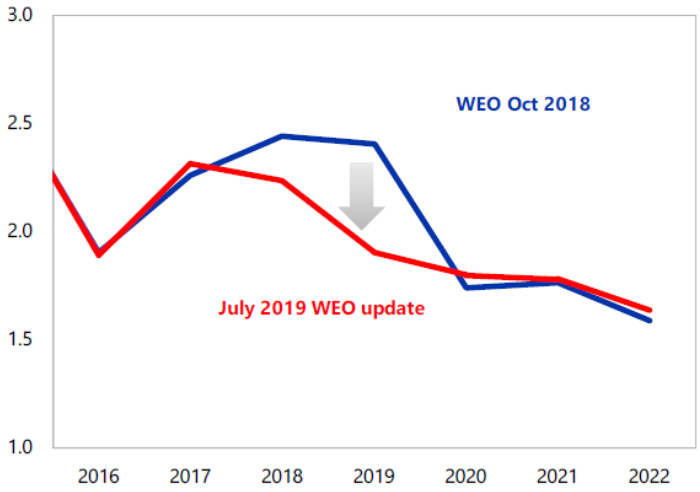

Figure 2: Weaker domestic demand in advanced economies, IMF WEO database

The Chinese government decided then to shift the emphasis from deleveraging back to supporting growth. The range of policy measures adopted includes import tariff cuts, tax cuts, monetary easing, and a marginal relaxation of the pace of regulatory strengthening.
The recent trade conflicts with the United States that started in spring of 2018 have largely contributed to create an uncertain environment and a weaker global demand. It has to be pointed out that the conflict between China and the United States goes beyond bilateral trade and extends to structural issues related to a wide variety of fields such as: China's foreign investment regime, intellectual property (IP) protection, technology transfer policies, etc. Overall, it is a very complex situation that will keep developing in the near future and will shape the whole global trading system.[20]

For the last few decades China's economic growth has been heavily reliant on export, especially from Europe and the United States. It has been estimated that one-third of growth

[20] People's Republic of China, IMF Report No. 19/266

of income in China during the years before the outbreak of the global crisis was due to exports, which grew by 25% per year. This high degree of dependence on growth of exports was the outcome of underconsumption (the share of private consumption in GDP fell since the late 1990s) combined with a constant raise of investments that increased faster than the GDP. In this situation, to fully utilise the production capacity it is necessary to have a rapid expansion in foreign markets. This can clearly be an issue in the moment where the external demand starts to lack.[21] Most recently we have been seeing a decline in China's export dependency, precisely since 2006, whereby the ratio fell below the world's average after 2011. In 2017 China's exports accounted for less than 19% of its GDP, below a global average of 22%. Therefore we can conclude that China's effort to stimulate the domestic demand in order to avoid being hit by possible contraction of external demand is quite evident.[22]

Another aspect in which China has to concentrate on, as previously mentioned, is the necessity to boost its internal consumption. This is connected with the high amount of precautionary savings by Chinese households. The high amount of savings is a consequence of a lack of security and inadequate public provision of basic needs, such as health care, education and housing. With the introduction of a capitalism in China, free education and free health care systems were abolished. Since the late 1990s the shares of wages and household income in GDP have been falling, thus creating an imbalance and further decline in private consumption.[23] Some of the challenges that China is facing today is the necessity of reforms to enhance the social safety net and make the tax system more progressive. Household savings as a percentage of GDP is still over 30%. Adequate fiscal reforms could boost consumption and simultaneously reduce inequality, ensuring a minimum level of service and reducing the large disparity between urban and rural public service provision.
Social inequality is also a relevant problem in China and is amplified by the fact that it is the country with the largest population. The rapid economic growth together with social and cultural changes contributed to the sharp rise of income inequality that has been registered from the 1980s. One of the most used metrics for income inequality is the Gini coefficient, that simply measures the inequality among values of a frequency distribution. A Gini coefficient of 100% express maximal inequality between values.
In the figure below we can clearly see how the Gini coefficient started to increase from 1980.

[21] Export Dependence and Sustainability of Growth in China, Yılmaz Akyüz, China & World Economy / 1 – 23, Vol. 19, No. 1, 2011
[22] China export dependency below world average: expert, Xinhua, Editor: Li Xia
[23] Export Dependence and Sustainability of Growth in China, Yılmaz Akyüz, China & World Economy / 1 – 23, Vol. 19, No. 1, 2011

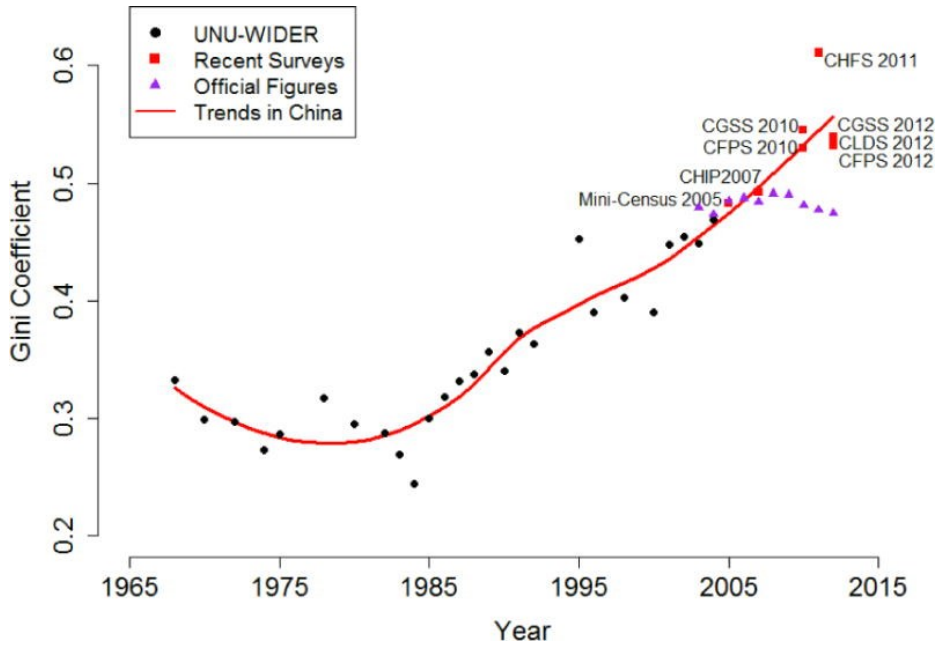

Figure 3: Trends in China's Family Income Gini Coefficients, Xie and Zhou

Inequality in China is a consequence of different factors and it is rather complex to analyse. It is a consequence of a traditional political ideology that endorses merit-based inequality (leaders in Chinese society are often rewarded with various benefits and privileges for providing the public good), of a recent political propaganda that views inequality as a necessary cost of economic development. It cannot be ignored that the geographical complexity makes it harder to achieve a plain field.[24] Whilst absolute poverty has fallen to less than 3% of the population, still-high spatial and rural-urban inequality remains to be a challenge.

From a fiscal point of view however, there are solutions that could be adopted in order to reduce the phenomenon. As for example, reducing the personal income tax threshold, widening the tax base and/or removing minimum social security contributions for low income households. [25]

[24] Understanding Inequality in China, ncbi.nlm.nih.gov
[25] People's Republic of China, IMF Report No. 19/266

1.3 Future implications

1.3.1 The growth of service sectors

The Chinese economy has recently been going through many changes and transformations. With the recent transition from being a developing country to becoming a developed country, the exports are supposed to lower and in favour of the tertiary sector and services.

The first big shift on the Chinese economy happened in the 1990s, with a rapid transition from an agriculture based economy to a manufacture based economy. The employment share of agriculture fell steadily from 60% to below 30%, while the share of industry and services rose to 28% and 46% respectively. The industrial productivity has rapidly raised from 15% (end of the 1990s) to about 35%, driven by the upgrade from low-tech to high-tech sectors and productivity increases in each industry. In today's day, China has a very advanced industrial structure with a high share of high-tech industries over the total. The service sector's productivity has also grown considerably from the 1990s, but at a slower pace than that compared to the industrial sector: it has converged from 10% to approximately 26%. It has to be mentioned that some of the service sectors have greatly outperformed the average of 26%. Due to heavy investments, the transportation and ICT services have greatly improved their productivity rate, settling respectively at around 40% and 28%, as seen from the figure below.

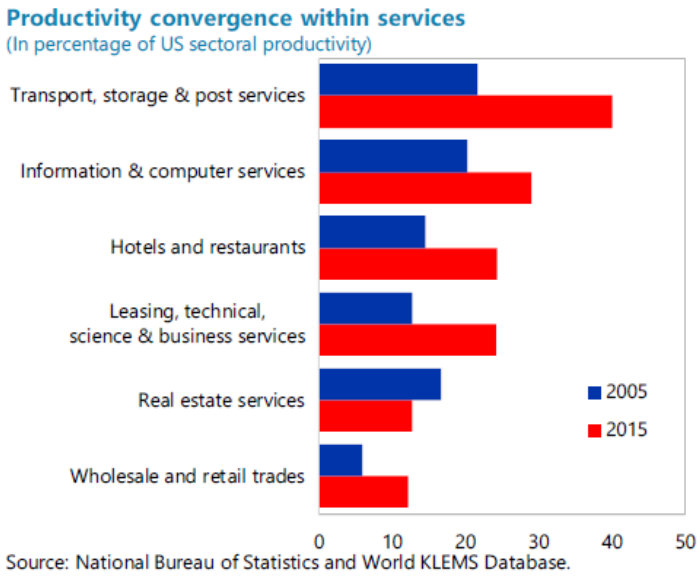

Figure 4: Productivity rates

From circa 2012, China has started a second phase of transition, this time from industry to services: the so called "deindustrialisation". The labour focus is progressively shifting from industry to services, but because the industrial productivity is approximately 1.3 times higher than that of services productivity, deindustrialisation will likely put a sustained downward pressure on aggregate growth. Since productivity growth is generally lower in service related sectors, the economy will gradually slow down as it shifts further away from the industrial sector to lower productivity service sectors. Following the projections, the service share is predicted to raise to 65% by 2030.

There are several institutional barriers that have hindered and complicated the transitional process. For example, the presence of low productivity State Owned Enterprises (SOE) has constrained the growth of services in China. Due to the excessive entry barriers, it is hard and in some cases impossible for privates to obtain the necessary permits to operate in the service sector, weighting on the efficiency of the whole sector. The lack of public information is another issue that prevents the growth of the service sector: without an institution style system able to efficiently collect information at a local level, it is hard to improve service delivery and meet the wide needs of the population. Stimulus programs have been put in action by the government, however, the resources that should have been devoted to service-related sectors have instead been directed to industrial sectors, prioritising the revenues given by the higher productivity but at the same time causing problems due to overcapacity.[26]

In the coming decade, the challenge will be to maintain a robust growth. Due to the fact that China is still in the early stages of sectoral convergence, it has the potential to maintain a substantial growth. In this sense, it appears of fundamental importance to ensure the opening up of the economy. Particularly in the service sector, despite having a gradual opening to foreign trade and investment, China remains less open than other G20 emerging market economies. By further opening up its service sector and simplifying the approval of inward investments, China could further boost the productivity and therefore avoid a potentially dangerous drop in the GDP growth.

It is estimated that the unilateral elimination of tariffs on goods imports could increase China's real GDP level by approximately 3% in the long term, while liberalising foreign direct investments could increase GDP by a further 6%.[27]

[26] Easing China's Transition to a Services Economy, Zhang Bin, April 2016
[27] People's Republic of China, IMF Report No. 19/266

1.3.2 Trade tensions with the United States

As previously stated, the trade conflict that escalated between China and the United States is far from being solved. Two rounds of U.S. tariffs and counter-tariffs were implemented before a 'truce' and negotiations began in December 2018, which broke down in May and led to another round of tariff increases in order to try to reduce its trade deficit. A total of four rounds of tariffs were implemented, with the fourth one being introduced in September last year. If from one side the United States accused China of unfair trade practises, from the other China answered back accusing the United States government of protectionism. To present some data, the United States has imposed tariffs on more than $360billion of Chinese goods, and China has retaliated with tariffs on more than $110billion of US products.[28]
A first signing of the agreement, the so called "phase one" deal, was signed in Washington on January 15th, 2020, by the United States President Donald Trump and China's Vice Premier Liu He. The aim of this agreement was to ease the trade war that affected the global economy since its exploit. To keep it simple, China has pledged to boost US imports by $200billion above 2017 levels and to strengthen intellectual property rules whilst in exchange, the United States has agreed to halve some of the tariffs it has imposed on Chinese products. It does not represent a complete truce, but rather an armistice as the majority of the tariffs remain in place, such as border taxes. A phase two deal is supposed to follow but there is still nothing concrete scheduled.[29]

The trade tensions have stressed the financial markets and weakened the global demand. There has been a recovery since the announcement of the "phase one", but it is still evident from the picture below how impactful this conflict has been on the major market indexes of both China and the United States.[30]

[28] A quick guide to the US-China trade war, BBC, 16th January 2020
[29] US and China sign deal to ease trade war, BBC, 15th January 2020
[30] Trade war: US-China trade battle in charts, Daniele Palumbo & Ana Nicolaci da Costa, BBC News

Figure 5: Markets performance

Many countries have been indirectly impacted, in particular those that are important trading partners for the United States or China and those that play key roles in their supply chains, however here we are going to focus mainly on the consequences from the Chinese point of view.

The main consequences for China have been a weak domestic demand and a deceleration of the nominal GDP growth, as well as the impact on financial markets. Trades have been volatile in 2019, driven by changing expectations in regards to the outcome of trade negotiations, with nominal export growth near zero and imports contracting. The impact on the current account has been important as we saw in earlier data, with a surplus far from the peak of the 10% registered in 2007. It has to be stated that strong increase of investments could be at least partially responsible of this drop. Furthermore, the bilateral RMB/USD rate depreciated relatively quickly from mid-June to early August 2018, but measures to counter depreciation pressure were taken quickly. Thanks to its high amount of foreign currency reserves, China is able to adequately react to events of this sort.

As part of the Phase 1 Agreement China committed to raise its imports from the United States by 200 billion over 2020 and 2021, a sizeable amount (almost a 50% increase compared to the pre-trade conflict imports) that can have a negative impact on Chinese farmers and manufacturers. In exchange, the United States reduced the tariffs on the Chinese import. The figure below represents the evolution of the average tariff rates on US imports from China (blue) and Chinese imports from the United States (red). The former was effectively reduced

to 16%. China instead has not committed officially to a reduction of its additional tariffs on imports from the United States, but as we can see from the chart it has reduced its tariffs as well, even if in a smaller amount compared to United States.

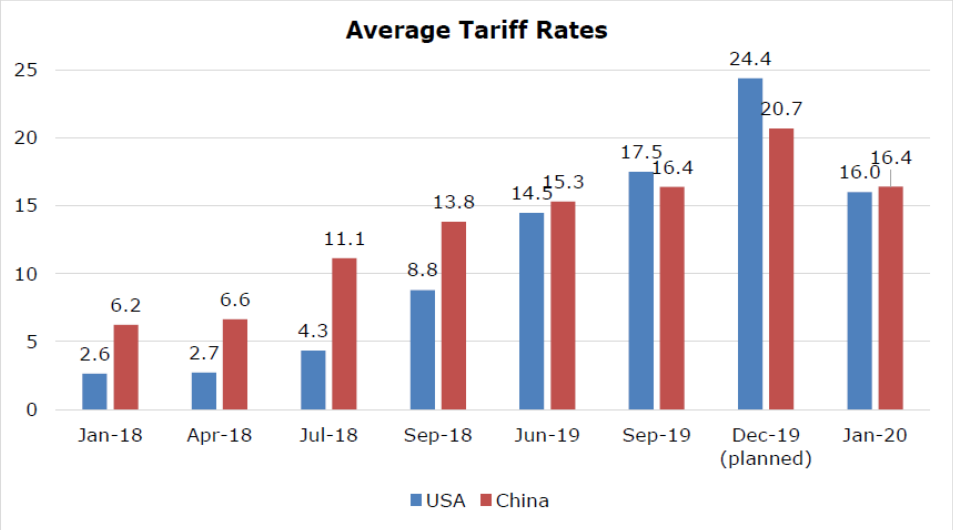

Figure 6: average tariff rates on US imports from China and Chinese imports from the US, Source: Trade Data Monitor and tariff data collected by the WTO secretariat

We can also see how steep the increase in tariffs imposed by the US has been since the start of the trade conflicts, precisely from 2.6% to 17.5% in just a couple of years. In 2018, imports from China still increased in relation to 2017, for both tariffed as well as non-tariffed products, a clear indication that anticipation effects of higher tariffs played a role. However, in 2019 trade between the United States and China has fallen substantially. In particular US imports of products that were affected by tariff measures decreased by up to 13.5%. Overall there has been a slowdown of the whole Chinese economy in 2019, but in particular a big drop has been registered in the sectors of petroleum, coal products, machinery, electrical equipment and agricultural products, that were heavily targeted by the US import tariffs. It is estimated that a total decrease in imports from China to the United States of 35 billion dollars, comparing the first two quarters of 2019 to the first two quarters of 2018.

As another important consequence of the trade wars, there has been a reorganisation on the value chains in East Asia: four East-Asian economies, Vietnam, Taiwan, Korea, and Japan are exporting substantially less to China and exporting more directly to the United States. This indirect effect on the trade conflicts adds weight to the impact on the Chinese current account balance.

The commitment of a 200 billion dollar increase in imports from the United States will require some type of intervention by the Chinese government in order to somehow absorb it.

The Chinese government has already decided to lower some tariffs on American imports in order to try to stimulate the import from the United States, nevertheless, it will be required to continue to do so and/or to force Chinese importers to buy more American goods. The danger of such a policy would be that by requesting its companies to buy more American goods than what is economically optimal, this may lead to an increase in average prices of Chinese imports and consequentially to a negative impact on the Current Account.[31] On the other side, a further escalation in tension could result in higher tariffs, disrupting supply chains and depressing confidence and investments. The road to a truce seems to be the safest option.

The Current Account Balance, whose strength was the fuel of the impressive fast growth in the recent years, now is becoming an issue or at least a matter of concern for China. Accurate policies will have to be introduced to avoid the negative consequences that a negative CA could have, given even the heavy import commitment.
China is trying to increasingly open up its economy, showing efforts from 2018 when tariffs were cut twice, a new foreign investment law was passed including provisions on equal treatment of foreign and domestic firms, and the negative list for foreign investment was revised. In this respect, the trade war with China has definitely been a big obstacle, however, China has to continue moving forward in this direction. "Opening up" has to involve even the financial market, but more attention to this topic will be dedicated later on.[32]

1.3.3 Belt and Road Initiative

Another important topic to take into account when analysing the future of China, especially in relation to the other countries, is the so called 'Belt and Road Initiative' (BRI). It is a cooperation framework firstly articulated by President Xi Jinping during his visits to Kazakhstan and Indonesia in September and October of 2013. The aim of this policy is to promote connectivity, coordination and development on a transcontinental scale. The formulation and the substance of this framework has considerably evolved during the years.[33] At its birth, it was known as "One Belt, One Road", calling for the building of a Silk Road

[31] AN ECONOMIC ANALYSIS OF THE US-CHINA TRADE CONFLICT, Eddy Bekkers and Sofia Schroeter, Economic Research and Statistics Division, WTO
[32] People's Republic of China, IMF Report No. 19/266
[33] European versus American Perspectives on the Belt and Road Initiative, Madi Sarsenbayev, Nicolas Véron, China & World Economy / 84–112, Vol. 28, No. 2, 2020

Economic Belt and a 21st Century Maritime Silk Road. In the figure below we can see a graphical representation of what China aims to build with it.

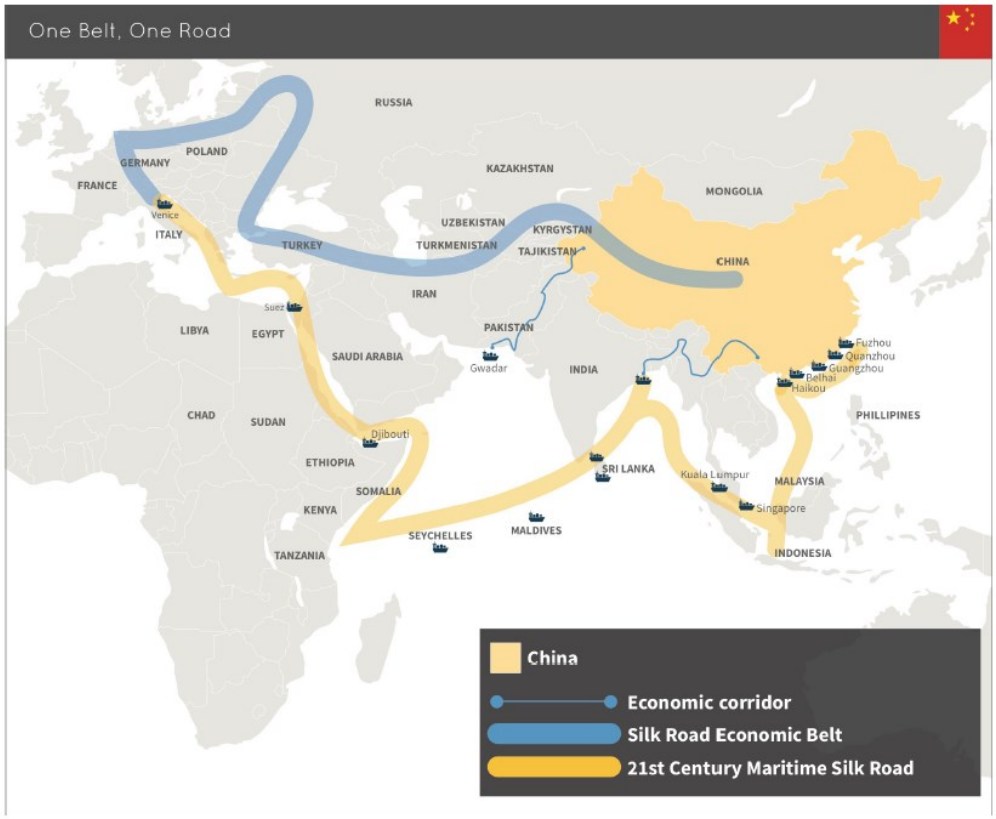

Figure 7: OBOR graph, Understanding China's Belt and Road Initiative

It is definitely one of China's most ambitious foreign policies and economic initiatives. The initiative started as a program of infrastructure building to connect China's lesser developed border regions with neighbouring countries in order to address China's regional disparities. As previously discussed, inequality within China has always been a problem. For example, the coastal mega-metropolis of Shanghai is five times wealthier than the inland province of Gansu (2017 data). Other attempts were made in the past (since 1999) whereby, the Chinese Government pursued the so-called 'western development strategy' to revitalise chronically underperforming provinces, yet the results were underwhelming. Even the large-scale fiscal injections through heavy state subsidies showed little results. Where the money injections fails, the government hopes to integrate the underperforming provinces into regional economies.

The high degree and complexity of the framework comes also from the fact that there are political reasons involved in the plan, as it is aimed to strengthen Beijing's economic leadership building throughout China's neighbouring regions. For the president Xi, the OBOR

was also a way to promote China as the new global champion of free trade through a vast program of economic integration. The scope of the OBOR was later broadened, with less specific emphasis on one belt or road and the corresponding rebranding (in English) as 'BRI' from 2015. The development and upgrade of various industries to facilitate financial integration, promoting people-to-people exchanges and addressing excess capacity are just some of the many objective that the BRI aims to achieve.

In terms of the industry, the growth was led by low labour costs advantages that are recently disappearing. As such, China is now trying to update its production in order to capture the higher ends of the value chain. The BRI is an integral part of this transformation, together with the so-called Made in China 2025 strategy. The strategy was inspired by Germany's "Industry 4.0" plan and has the primary goal of making the country's manufacturing industry more innovative-driven and emphasise quality over quantity. Beijing expects the BRI to play an important role in boosting high quality export, believing that the emerging markets targeted will be more than willing to accept higher-end Chinese industrial goods. There is definitely the ambition in this sense to become in the near future an innovation-based economy and a leader in research and development. The Chinese Government's campaign to market its high-speed railway technology is a good example of how it intends to use the BRI to upgrade China's industry. Other sectors such as energy and telecommunications will be also particularly targeted.

Dealing with excess capacity is another target of the framework. Excess capacity in China is a direct consequence of stimulus packages delivered during the recent financial crisis. This policy was effectively able to carry China through the crisis but has its downsides: if not addressed, in the moment that the economy slows down, it will squeeze corporate profits, increase debt levels, and make the country's financial system more vulnerable. This is especially relevant in this period where the international demand is contracting. The aim of the BRI in this sense is not much about boosting exports of products such as steel but more about moving the excess production capacity out of China, hoping that countries who need to build their infrastructure will take the excess production facilities. Therefore domestic economic liabilities become foreign economic and diplomatic assets. This is even more coherent with the intent of moving away from a cheap manufacturing model to focus more on high value production.[34]

[34] Understanding China's Belt and Road Initiative, Lowy Institute for International Policy, Peter Cai, March 2017

In regards to the content, the BRI is quite elastic. Any country in the world is potentially a BRI country as the project does not have any intrinsic restrictions in terms of its potential geographical scope. It currently involves 138 countries and investments are planned in nearly 70 countries. The World Bank (2019) estimated that the total BRI investments already executed, in the implementation phase or planned in 70 corridor economies amount to US$575billion. Analysis' estimated that the increase in trade, following the implementation of the BRI, will raise the global real income by 0.7–2.9 percent. Transport projects could lift 7.6 million people from extreme poverty and 32 million from moderate poverty.

The road to implement the BRI is not free from challenges. Firstly, there is often a lack of political trust between China and some of the countries involved. BRI projects have sometimes been denounced as Chinese "debt-trap diplomacy" that seeks to take control of BRI countries' critical infrastructure by driving up their debts to unstainable levels.
To counter these critics and increase the trust, the Chinese government will have to take particular caution to focus on aspects such as debt sustainability, transparency and corruption, whilst also understanding that quickly delivering some positive results is key in this case. The initiative has also generated domestic criticism in China, for example, being described as a waste of Chinese wealth. Even in this case, it is important to bring successful results early on in order to be able to justify such a heavy investment to the public.

If we look at the BRI from a European point of view, 17 countries out of 27 European countries, predominantly located in South and Central Europe, have formally joined. Chinese investments in Europe so far include a broad range of industries and focus particularly on transportation and energy infrastructure. From an Italian point of view investments are mainly focused on the ports of Genoa, Palermo and Trieste. There has not been a clear and unified response to China's BRI from Europe, at least until now. From the responses given until this point, it seems that Europe is asking for higher standards than the BRI, which has been criticised because it could potentially lead to sovereign over-indebtedness. What cannot be denied is that investments in infrastructure in Europe has declined significantly in the past decade due to financial and economic crisis. In 2016, overall infrastructure investment stood at 1.7% of GDP, down 0.5 percentage points from its peak of 2.2% in 2009. Even if many infrastructures already exist in Europe, it is necessary to take into account the depreciation of the existing infrastructure and, as a result, the need to maintain and replace worn-down structures and facilities. The largest investment gap have been identified in the information and communication technology (ICT), transportation/mobility sectors and in health and

energy generation.

Therefore, there is definitely space for the Chinese investments. The potential value added from BRI projects in the EU reside in whether Chinese entities are willing to take equity risk, as opposed to purely debt-financed projects, as it is doubtful that Chinese entities would be able to offer better credit conditions without potentially harmful covenants. Thus, as long as the investments comply with the EU standards, there is no reason to block the participation of Chinese companies from projects. In order to assess the concerns often raised about national and European security in critical infrastructure areas, it is essential to have an effective screening of the projects. This screening has to follow the principles of non-discrimination and reliance on a sufficiently narrow definition of national/European security. Without this, the screening mechanism could easily be used as a cover for protectionism. Overall in 2019 report, China's company ownership has continuously risen in key EU sectors.

When it comes to China's relation with foreign countries, it appears unlikely that the United States–China relationship will improve any time soon. The European road appears to be much more straight forward when compared to the United States for different reasons; firstly, the EU does not act consistently as a global power and does not display the ambition to behave as such. In this regard, it does not see China as a clear threat as the United States could. The history of the relations with Europe (and its member states) with China are also very different from that of the United States. If only considering recent events: the United States also fought directly against China during the Korean War (1950-53), maintaining a significant military presence in Japan and Republic of Korea, and has continued to sell military equipment to Chinese Taipei to this day. Even if the recent trend is of a hardening of attitudes, following a sort of parallelism with the United States, it is because of the very different starting points that there is certainly space for a profitable collaboration for both sides of European member states and China.[35]

[35] European versus American Perspectives on the Belt and Road Initiative, Madi Sarsenbayev, Nicolas Véron, China & World Economy / 84–112, Vol. 28, No. 2, 2020

Chapter 2

In depth examination of the Chinese financial system

2.1 Review of the historical evolution of China's financial system

2.1.1 The early stages

Despite the variations across countries, all financial systems need to effectively perform some basic key functions. They optimise the allocation of funds to projects which are proising and allow both savers and investors to maximise their returns for a given level of risk. They also allow risk diversification across a wide pool of instruments and are essential in order to transform shorter-term assets into funds that can support longer-term projects.
Almost every financial system includes predominantly financial markets and intermediaries that constitute the banking sectors and China is no exception. How these two sectors work and interact with each other determines the characteristics of that specific system.[36]

Early traces of a financial system in China can be dated back to the 17th century, firstly under the late Ming Dynasty. A further development saw the light during the Qing Dynasty (17th century to the early 20th century). Late Qing China had a highly commercialised society with a high number of guilds (merchant coalitions) being perfect field for the development of a trade and financial system. As briefly discussed in the first chapter, China's commerce and financial system as a whole largely developed outside the formal legal system. Due to the reluctancy held by the Chinese society in regards to going to court, most business related disputes were resolved through mechanisms outside of courts, typically involving the guilds internally.
The influence of the Western financial system is without doubt present in today's Chinese system. The first real contact not only with the Western from a social point of view, but also in regards to its legal and capital system happened during the Opium War (1839-42). As a consequence of the forced foreign trade liberalisation, British and other European banks

[36] The Chinese Financial System, An Introduction and Overview, Douglas J. Elliott and Kai Yan

entered China around the middle of the 19th century and they were able to enjoy extraterritorial rights whilst at the same time being unregulated by the Chinese government.

From the late 19th century to the early 20th century Shanghai emerged as the financial sector of China. In fact, during this period Shanghai completed a transition from an agricultural based trading hub for the surrounding areas to becoming a highly industrialised centre linked to international financial markets. At the end of the 19th century, the first share trading associations were established in Shanghai and Hong Kong.
The first Chinese stock market was created in 1891, during the boom in mining shares by foreign businessmen with the foundation of the "Shanghai Sharebrokers Association". The market got renamed in 1929 and till this day is operative under the name of the "Shanghai Stock Exchange" (SSE). It is one of the two stock exchanges that operate independently in mainland China.

By the end of the 19th century the number of Chinese lending institutions grew considerably, exceeding 100 in the year 1875. Five of China's first modern banks were founded between 1897 and 1908, and by 1936, there were 28 major foreign banks that had set up branches in Shanghai, only confirming the fact that Shanghai was quickly able to acquire an international position in the financial world. Many different currencies were used during the transactions between merchants, creating an environment characterised by high risks and lack of security.

2.1.2 Financial development through the 20th century

As we have seen, at the start of the 20th century China already had a pre-existing financial system characterised by a good level of development: stocks, government bonds and futures were already among the traded on the Shanghai Stock Exchange. Before the Japanese invasion, the Shanghai Stock Exchange was considered amongst the largest and most advanced in terms of trade mechanisms and financial instruments offered.

With the Communist Revolution and subsequent Civil War ended in 1949, the People's Republic of China was founded. The Exchange and the general financial system came to an abrupt halt. All of the pre-1949 capitalist companies and institutions were completely nationalised by 1950 and between 1950 and 1978, the Chinese financial system consisted of a single bank, the People's Bank of China (PBOC), that functioned as both the central and only commercial bank of China.

With the Communist Party at the power, China went through a severe centralisation process that included even the financial and economic system. The central government owned and controlled he PBOC under the Ministry of Finance. As a result, it controlled about 93% of the total financial assets of the country and was in charge of almost all financial transactions. Whilst maintaining strict control on the cash flows in consumer markets, the primary function of the PBOC was to finance the physical production plans.

After the Cultural Revolution (1966-1976) that ended with Deng Xiaoping raising to power, China began to re-open to the outside world from 1978. Many structural changes started exactly that year. By the end of 1979, the PBOC dissociated itself from the Ministry of Finance and became its own separate entity. At the time, three state-owned banks took over some of the commercial banking businesses of the Ministry: the Bank of China (BOC), the People's Construction Bank of China (PCBC) and the Agricultural Bank of China (ABC). These are three of the four big state-owned banks that still as by today dominate and act as the main players in the Chinese banking business, also known as the "Big Four".

The BOC was firstly established in 1905 during the Qing dynasty under the name *Da Qing.* It performed the role of Central Bank, first in China's history, under the Qing dynasty and was renamed Bank of China in 1912. Under Deng Xiaoping the BOC was given the mandate to specialize in transactions related to foreign trade and investment.
The PCBC instead, originally formed in 1954, was set up in order to handle transactions related to fixed investments, especially related to manufacturing.
The ABC was firstly created in 1951 as a merger of two other individual banks, but only officially founded in 1979, taking the current denomination. It was specifically set up with the aim of dealing with banking business in rural areas.
By the end of the same year the PBOC was formally established as China's Central Bank. This step completed the transition from a mono-bank system to a two-tier system, with a Central Bank that serve as a regulatory body for the banking sector and three state-owned commercial banks, each one specialised in its own designated area of business.

The fourth state-owned commercial banks that completes the "Big Four" group is the Industrial and Commercial Bank of China (ICBC), formed in 1984. It took over the rest of the commercial transactions of the PBOC.[37] In this period, the main investment channel for firms

[37] China's Financial System: Past, Present, and Future, Franklin Allen, Jun Qian, Meijun Qian, SSRN Electronic Journal, March 2007

were the loans from state-owned banks, however, the "Big Four" had almost no discretion in making loan-related decisions which were instead based on quotas allocated by the PBOC.

What really characterised the development of the Chinese financial system in the 1980's was the fast growth of financial intermediaries outside the group of the "Big Four". Particularly in rural and coastal areas, the government formed regional banks that were partially owned by the local government. The introduction of regional banks paired up with the creation of Special Economic Zones (SEZ) introduced in the early 1980's. SEZ's can be defined as designated geographical spaces where special policies and measures support specific economic functions and stimulate economic growth. SEZ's will significantly contribute to China's development in the following years, allowing for experimentation with market-oriented reforms.[38]

Non-bank financial intermediaries, such as the Trust and Investment Corporations emerged considerably in this period. The non-standard financial sector, operational outside the markets and banking sectors and consisting of alternative financing channels has historically been significant and relevant in supporting the growth of the overall Chinese economy. The new financial intermediaries began to take deposits and make loans, resulting in an increase of the competition but even in higher levels of inflation. In regards to foreign banking institutions, a slow process of "opening up" of the economy was starting. It was only from 1985 that foreign banks were permitted to set up branch offices (for currency exchange operations) in China's Special Economy Zones, legalising their status.[39]

In terms of the stock market, Deng Xiaoping started a process of restoration through different reforms, consequently seeing trading started to re-open. In 1984, the Chinese government approved the first public issue of shares for decades. Initially, trading was carried out without the intermediation of financial institutions and without the state control over the capital flows, in order to try to finance the inefficient SOE's. As most of the capital was raised by private or partially private companies, the control on the stock market was rapidly tightened. Twenty-four regional stock exchanges were established in 1990 and the issuance of shares were limited to SOE's only. Due to the inefficiency of the aforementioned system the smaller exchanges ended up closing soon after.

In the 1990's the growth of the stock market was what significantly drove the development of

[38] China's Special Economic Zones, Experience Gained in the Development of China's Special Economic Zones, China Development Bank

[39] China's Financial System: Past, Present, and Future, Franklin Allen, Jun Qian, Meijun Qian, SSRN Electronic Journal, March 2007

the financial system. From 1981 the trading in treasury bonds was resumed however soon after, all trading became concentrated on stock exchanges in Shanghai and Shenzhen.
In 1990, two domestic stock exchanges (the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE)), were officially established after the long interruption caused the Communist Revolution. The stock markets were essentially in the process of transformation from a centrally planned economy into an export-oriented economy. From the 1990's they both rapidly grew, both in terms of capitalisation and trading volume. Over the following years (starting from 1992) supervisory authorities were created together with new trading regulations. Some mentionable elements were the shares classification system, the control of the maximum investments in securities allowed and funds raised by the issuance of shares.

The first separate stock supervisory body, the China Securities Regulatory Commission (CSRC), was also formally formed in 1992 and shared control tasks with the Central Bank. The functions of the CSRC are comparable to those performed by the Security and Exchange Commission (SEC) in the United States.
However, in general there has been a lack of supportive legal framework in addition to a lack of institutions behind the markets. China's first bankruptcy law (governing SOEs) was passed in 1986, but the formal Company Law did not become effective until the end of 1999. In the 1980's and 1990's the lack of a proper effective framework contributed to increased volatility and speculative short-term behaviours by investors.
In parallel with the development of the stock market, the real estate market also considerably grew. It went from inexistent in the early 1990's to one that is currently comparable in size with the stock market.[40]

The influence of foreign institutions progressively increased during the years. Foreign direct investments sharply increased and in 1997, nine foreign banks were allowed to enter the RMB markets and operations in the Pudong Special Zone in Shanghai, reaffirming itself as the main financial centre of China.
In July 1997, a severe financial crisis hit China the general Southeast Asia. It started from Thailand as a currency crisis and it quickly spread towards the surrounding economies,, due to the high degree of financial contagion. Even if the crisis impacted China only to a lower degree, it highlighted structural problems regarding its economy.
As a consequence, many reforms have been issued targeting the financial sector reform-

[40] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

specifically the state-owned banks and the problem of NPLs. By the late 1990's the large state-owned banks' aggregated NPLs ratio exceeding 30 percent.[41]

As the banking reforms took hold, many small and inefficient SOE's were forced to shut down. Since the state-owned commercial banks were the main providers of credit to the SOE's, they had to recognise the previous loans. They were consequentially left with serious issues in regards to credit quality resulting in a quick growth of NPLs. Responding to the banking crisis, in 1998 the four state-owned commercial banks were restructured and received direct capital contributions for RMB 270 billion or US$ 33 billion, through the use of foreign reserves held by the PBOC and bonds issued by the Ministry of Finance.
Four asset management companies (AMCs) were also established in 1999 in order to take care of the banks' NPLs. The four AMCs purchased RMB 1.4 trillion of NPLs from 1999 to 2000, and another 1 trillion from 2003 to 2004. After acquiring them from the banks, the AMCs slowly sold them off to recover part of the losses. The restructuring seemed to work, investments enhanced the capital adequacy ratio of these banks and allowed them to write off some of the NPLs on their balance sheets without going bankrupt. More groups of reforms were also made in the following years with the aim of improving the banks' balance sheet.[42]
Despite the Asian crisis, the government decided to support its development by easing restrictions on the purchase of shares and public offerings. The main aim of these actions was to accelerate the process of partial privatisation. In July 1999 the first securities law entered into force, signing the end of the stock market formation stage and its full formalisation.[43]

The institutional investors that play an important role in every developed financial system began to really emerge in China only from the end of the 20th century. For example, the first closed-ended fund was established in 1997 whilst for an open-ended, it was necessary to wait up until 2001.[44]
A brief note also has to be made regarding the exchange rate policies adopted by China during the 20th century. From 1949 to 1978, the official rates were strictly fixed by the PBOC and all demand and supply of RMB was centrally administrated. Between 1978 and 1994, with the reopening of the economy and financial markets, the "dual exchange system" was introduced to make it possible for the official exchange rate and market exchange rate to coexist.

[41] An Overview of the Chinese Banking System: Its History, Challenges and Risks, Lili Chen, Stan Vinson, Lander University, USA
[42] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings
[43] The transformation of the Chinese stock market between 1990 and 2012, Adam Marszk, International Business and Global Economy 2014, no. 33, pp. 340–351
[44] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

Nevertheless, the market exchange rate was not freely floatable but retained a degree of control. A real market-based system was then introduced from 1994. The exchange rate has been exclusively pegged to the US Dollar and can fluctuate in a small range under state regulation and monitoring. Interbank foreign exchange trading has also been allowed.[45]

2.1.3 The new millennium

On December 11th 2001 China entered into the World Trade Organisation (WTO), marking the beginning of a new era.
China had the intention to take part to this organisation till the late 1980s, when the opening up of the economy just started. Many steps were taken toward this objective through trade agreements and reforms. In 1997, just after the Asian Crisis, China merged many unprofitable SOEs, however the road to take part to the WTO was not easy. The market access commitments required were much more far-reaching than for other developing countries. Some of these commitments included a significant reduction in tariffs, a gradual elimination of quotas and a license that restricted the import flow, the opening of the capital account and critical service sectors such as telecommunications, insurance and asset management. The authorities committed to open up the banking system to foreign bank branches by the end of 2006. Furthermore, China had to conform to higher standards regarding transparency and intellectual property.

Despite the explosive growth of trade and its ability to attract high amounts of direct foreign investments, the Chinese government decided to accept the harsh conditions in order to grant itself the participation to the WTO. Why?
The main trade-off for China has been the increased competition brought to the domestic market. It is essential for the development and particularly pushed the inefficient state-owned banks and enterprises to reform in order to survive. The SOEs in particular have steadily become a burden for China during the years. The other important factor is the increase in capital flows through the globalisation of the production. With the gradual relaxation of rules driven to a large extent by China's accession to the WTO, foreign banks have increasingly been entering the Chinese market hoping to realise significant profits.
These factors alone were strong enough for the government to offset the risk of high short-

[45] The transformation of the Chinese stock market between 1990 and 2012, Adam Marszk, International Business and Global Economy 2014, no. 33, pp. 340–351

term economic costs due to a possible increase of unemployment as a consequence of the renewed international competition in many sectors.[46]

If the opening up of the economy and the high potential increase in capital flows can exponentially increase the economic and financial growth, it can also expose the country to a higher risk of a harmful financial crisis.
From the early 2000's the Chinese financial system started to progressively acquire those features that typically characterise a well-established system of a developed country.
The institutional investors sector, fundamental in order to finance enterprises and in particular IPOs, grew from a Net Asset Value (NAV) of RMB 11 billion (or US $1.3 billion) in 1998 to RMB 2.58 trillion (US $322 billion) in May 2008. Even if the figure seems to be significant, it is still not comparable to the assets value managed by the banking sector in that period. Qualified Foreign Institutional Investors (QFII) were allowed to enter the asset management industry in 2002, where they started to operate through joint ventures. Qualified Domestic Institutional Investors (QDII) were instead allowed to invest in overseas markets only from 2006. The Chinese investors were rapidly able to penetrate different markets, and by 2008 the Assets Under Management (AUM) amounted to a total of US$ 109.4 billion. [47]
In September 2007, the government decided to institute the Chinese Investment Corporation (CIC). It is a sovereign wealth fund established on order to efficiently utilise the foreign reserves accumulated, amounting to US$ 1.4 trillion in 2007. At its foundation, it already had US$ 200 billion in AUM. The disadvantage is that the overall transparency of its operation and investment strategy was not very high. Only on occasions are announcements made regarding its investments. To be fair, this argument could be raised to the overall system, even if improvements have and are being made over the years.

Concerning the banking sector, a new regulatory body was established in 2003 in order to oversee the banking activity: the China Banking Regulation Commission (CBRC). In particular, one of the main objectives was to attract foreign investors for the IPOs.
The regulatory bodies were still far from being properly adequate. In particular, the SOEs still received a more than proportional share of the total credits. As it can be seen from the figure below, the loans to the SOEs still made up the major part of all loans handed out. There is

[46] Issues in China's WTO Accession, Nicholas R. Lardy, May 9 2001, brookings.edu
[47] China's Financial System: Past, Present, and Future , Franklin Allen, Jun Qian, Meijun Qian, SSRN Electronic Journal, March 2007

evidence that show that the state-owned banks lending overwhelmingly to the state-owned enterprises was one of the direct causes of the problematic situation with related to NPLs. [48]

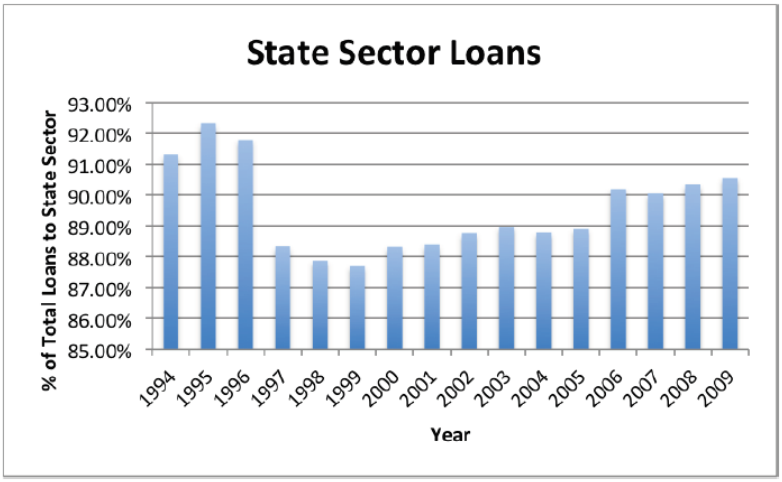

Figure 8: The Share of Loans directed to the State Sector (Sources: CSY 1995-2010)

On the other end, pension funds did not play a significant role in development during the early 2000's, blocked by limited capital and the several problems affecting the pension system.[49] In the year 2000, China decided to establish a National Security Social Fund (NSSF) and at the same time set up the National Council for Social Security Fund (SSF) in order to manage and operate the NSSF's assets. It was aimed to be the answer to the aging problems, working as a reserve fund to support the future social security expenditures where the pension funds failed. The fund is mainly financed by capital and equity assets derived from the listing of SOEs and fiscal allocations from the central government. The fund was allowed to invest in either domestic or foreign markets, thus, through a diversified basket of instruments the fund grew in 10 years to a total of RMB 856.7 billion (US$ 142.8 billion) according to the NSSF annual reports.

The amount of hedge funds were instead small and the few existing were implementing only the "long strategy" as short-selling was prohibited up until recent times.[50]

Thanks to the introduction of automated trading systems and electronic communication network, major changes and developments took place on the stock exchanges across the years. As the markets continued to shape, the large corporations tended to be listed mostly in Shanghai, while the small and medium ones mostly in Shenzhen.

[48] Banking Reforms in China and Their Macroeconomic Implications: Three Decades of Reform Revisited, Tobias Kurer, Department of Economics at the University of Zurich
[49] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian
[50] Essays on Chinese Financial Market, Chenying Zhang, University of Pennsylvania, 2012

Overall, the first decade of the new millennium was dominated by the banking system. Banks provided the private sector with credit amounting to approximately 128% of GDP in 2012, compared to 48% for the United States. The bond market has still been highly under-developed, providing credit equivalent to approximately 41% of China's GDP, compared to 240% in the United States. By comparison, the aggregate market capitalisation of the Chinese stock market accounted for a value equivalent to 44% of its GDP, therefore, slightly superior than the bond market. This is in contrast with the Western economies where the bond market is typically bigger than the stock market.
Furthermore, over 35% of corporate bonds in China are owned by banks, making them the largest holders by far. The development of the bond market has been hindered in the past by complicated regulatory arrangements that often prevented firms from issuing corporate bonds. From 2010, the situation saw some improvements with the PBOC that established a medium-term bond market with a registration issuance system. This meant that firms could issue bonds as long as they achieved certain requirements. Between 2008 and 2012, the total corporate issuance more than doubled. Even with the rapid speed of growth, it is still considered to be relatively small compared to central and local government bonds.

In regards to government debt, in the 2008-2009 financial crisis, the central government launched a RMB 4 trillion stimulus package which required that the local governments were to be responsible for identifying valuable projects. In March of 2009, the Ministry of Finance issued RMB 200 billion of local government bonds. According to public data at the end of 2010, the total amount of debt issued by the local governments exceeded the 10 trillion. Many arguments could be made concerning the reliability of the Chinese public data, but they still remain speculations in this case.

Sector	Bank Credit	Stock	Fixed Income	Insurance	Asset Management Companies
Size (China):	10.7	3.7	3.4	1.2	0.4
Size (US):	7.6	18.7	38	4.8	36
% GDP (China):	128%	44%	41%	14%	5%
% GDP (US):	48%	118%	240%	32%	230%

Figure 9: Markets weight comparison, The Chinese Financial System: An Introduction and Overview

From the figure above, with data computed in the end of 2012, we can see the weight of the different market sectors in relation to the GDP. The banking system is by far the more impactful in China. It is highly concentrated, with the five largest commercial banks (the fifth being the Communication Bank of China), all owned predominantly by the government,

controlling about half of the total assets of the whole banking industry.
The return on assets for the major commercial banks grew from approximately 0.6% to roughly 1.4% from 2006 to 2010. Regarding NPLs, the situation slowly improved from the access to the WTO. From 2006 to 2013 there was a drop in the non-performing loan rate from 9% (on the total loans) to around 1%. Particularly important in this sense were the foreign investment banks/companies. They injected their money into the commercial banks as equity, allowing them to write off more on their non-performing loans.

In general, the government effort aimed to strengthen the banking sector was evident after the financial crisis of 1997 and started to show good results. A partial privatisation of the four biggest banks started in 2003 improved their efficiency, however, the corporate governance problems are not completely resolved as there are issues related in particular to NPLs that were not completely dealt with. As long as the economy can keep a certain pace of growth, the NPLs will not be a huge problem as the government can always write off a large fraction of them. The moment that the growth slows down, if the accumulation of NPLs continues the related banking sector problems could lead to a financial crisis.

Lastly, we can see from Figure 8 that the asset management industry, even if it has grown exponentially since the 1990's, accounts only for 5% of the GDP, compared to the United States where it accounts for 230%. The domestic, open-end mutual fund industry (since its establishment in 2001) has been the fastest growing sector in the asset management industry. This data clearly shows a country in transition and that has a financial system typical of a developing country, not yet comparable to the financial system of a highly developed country as the United States.[51]

2.1.4 Characteristics of the current financial system through data

In this section, we will analyse some relevant data from the Global Financial Development Database provided by the World Bank in order to draw some conclusions regarding the current situation of China's financial system and its development (particularly during the last decade). Note that the data analysed dates only up to 2017.

[51] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

The Chinese financial system has essentially remained bank dominated. Banks have continued to be the main sources of financing for the private sector, and in the figure below we see the behaviour of the ratio between the private credit by deposit money banks to the GDP. The private credit by deposit money banks represent the financial resources provided to the private sector by domestic banks as a share of GDP.

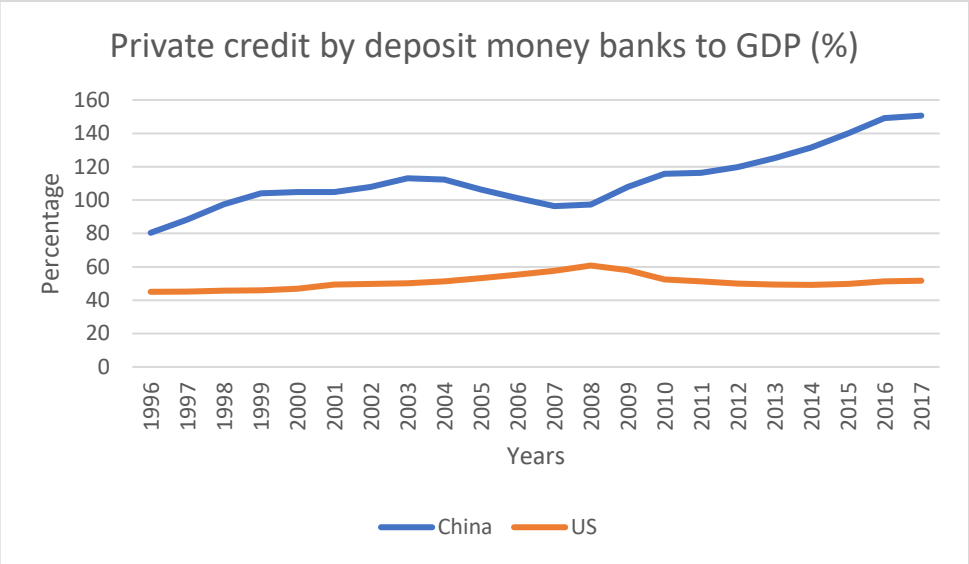

Figure 10, own elaboration

As we can see, the trend (blue) is positive in the last decade after a flexion due to the global financial crisis. By 2017, the credit given by domestic banks has been over 1.5 times the Chinese GDP. In comparison, the United States (orange) value of this ratio hardly exceed the 50%, as testimony to the fact that China's financial system is more similar to that of one that characterises most emerging economies.

In terms of total assets as a share of GDP, the ratio grew substantially for commercial banks (from 105% in 2007 to almost 175% in 2017) while it decreased for the Central Bank, going from 3.5% to 1.9%.

Regarding the efficiency of the banking sector, we can take into account the cost to income ratio, measuring the operating expenses of a bank as a share of the sum of net interest revenue and other operative income.

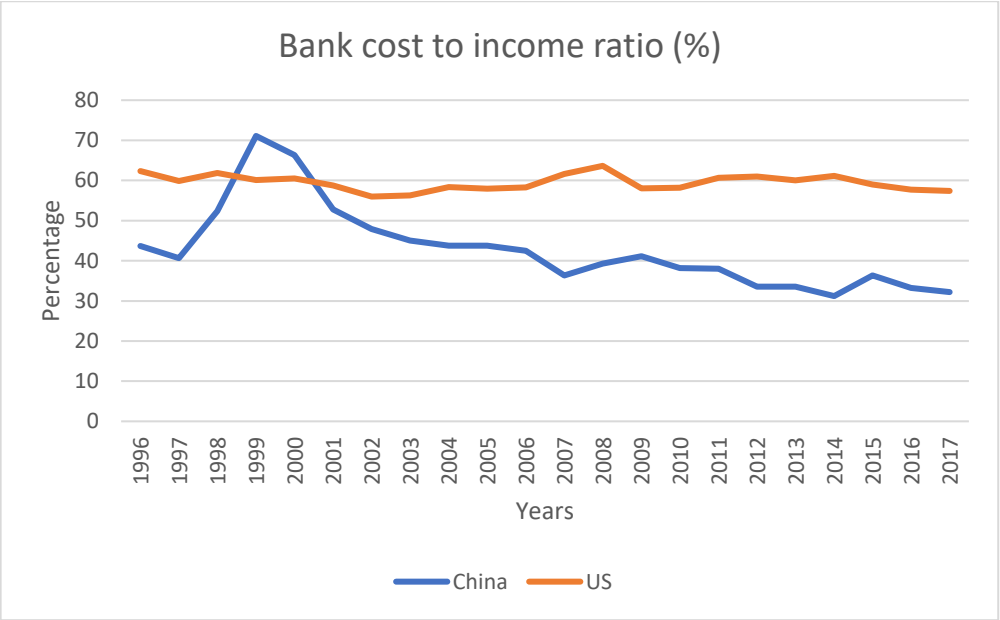

Figure 11, own elaboration

In this case, we can see how the sets of reforms and also strict conditions in order to take part to the WTO have worked to increase the efficiency of the banks, at least in terms of the balance sheet. The cost-income ratio is in fact almost half compared to the United States banks.

If we instead look in terms of return on assets (ROA) and return on equity (ROE) both before and after tax, we arrive at different conclusions. The return on assets has in fact decreased from 1.7% to 1.2% in the last decade (2007-2017) whilst the return on equity decreased from 24% to less than 17%, with latter in particular having suffered the higher loss. Consequently, we cannot accurately state that the banking system has suddenly become efficient, particularly as these last two quantities are quite low in value. The low ROE could be an indirect consequence of the tighter restrictions applied to commercial banks in the last years.

Relevant in this sense is also the fact that the credit to government and SOEs to GDP has steeply increased in the last couple of years, after a period of stall. In 2017, the ratio had reached 26.29% yet the majority of the bank credit still goes to state-owned firms in China. In terms of loan quality, the ratio between NPLs and total gross loans has decreased from 7% of 2006 to 1.7% in 2016, bringing it to the level of the most developed economies. A lot of work was done in this matter, as in just 2001 the NPLs ration was almost hitting 30%. It has to be noted that the most recent trend in terms of NPL ratio is increasing, even if just slightly. It is definitely a situation that the Chinese government cannot overlook.

Overall, in relation to non-performing loans the Chinese banking sector still has the scope to improve its efficiency.

The last two quantities taken in consideration for the banking sectors were the bank concentration (measuring the assets of three largest commercial banks as a share of total commercial banking assets) and the percentage of foreign owned banks to the total number of banks. The bank concentration ratio has decreased from almost 55% to 37% in the last decade. This shows that the competition in the Chinese banking industry has increased and the overall business is less focused on just a few very big banks but rather more spread among the players. As the privatisation of SOEs progressed, not only did it improved the efficiency of the banking sector but it also boosted the growth of the Listed Sector.

Notably, the percentage of foreign banks has increased. Even as the most recent data was not available, there were 20 foreign banks operating in China in 2013, however, the amount of assets they held were still very low compared to the overall industry (2%). The increased number is due to the progressive opening of the economy and financial system, but the low amount of assets held reflects an industry are still dominated by local players.
In terms of Assets Management, the industry has been steadily growing in the last few years. In 2017, the mutual fund assets value corresponded to almost 14% of the GDP. Even the pension fund industry has grown, however, less powerfully and it still accounts for a very small fraction of the financial system as a whole. The pension fund assets as a share of the GDP raised to only 1.5% of the total gross domestic product in 2017.
Focusing instead on the financial markets, the bond market has been slowly growing as well. The corporate bond issuance volume by private entities has grown to approximately 6.5% of the GDP in 2016, only dropping to 4% in 2017- the last year for which the data taken in consideration is available. Nevertheless, a small fraction compared to the flow of finances coming from the banking industry.

To understand the size of the Chinese equity market and its development over the years, we can look at the stock market capitalisation as a share of the GDP. This ratio is calculated by taking into account the total value of all listed shares in a stock market as a percentage of the GDP.

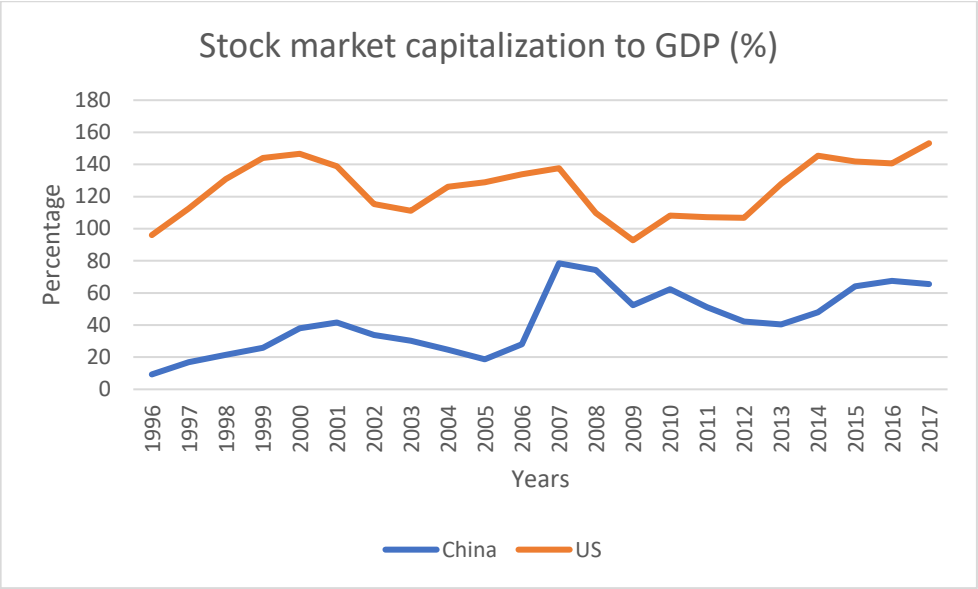

Figure 12, own elaboration

As we can see from the graph above, China's stock market has grown in terms of capitalisation to GDP, especially in the first years of the new millennium when China started to considerably open up the economy and its financial system, therefore attracting significant investments that helped the growth of the market. After the 2008 financial crisis the market had shrunk in terms of capitalisation over GDP, although this trend is common for most of the countries, particularly for the most developed. The value of this ratio for China remains still very far compared to that of the United States, at confirmation of the fact that the size of the Chinese stock market, be sides the growth, it is still very limited. The market capitalisation as a share of GDP was in fact only slightly over 65% in 2017 for China and in line with pre-crisis level, against the 150% for the United States that is also further trending up.

To estimate the actual size of the market the "value traded" indicator can also be used. Whilst the market capitalisation takes into account the value of all listed shares, even non-tradable or rarely traded shares, the total stock market value traded is calculated as the total number of shares traded (both domestic and foreign) multiplied by their respective prices. For this reason it could arguably be considered as a more accurate indicator of the market size. The total value traded as a share of the GDP sat at 144% in 2017. For China there is higher volatility regarding this ratio compared to the market capitalisation. There has been a considerable drop in total value traded in the last year of data, as in 2016 the value of the ratio was up to almost 250%. By looking at this indicator for the United States, the value is still higher at 211%. However without considering the year 2017, the values were not too far from China. Overall, we can conclude that the size of China's stock market, even if not on par with the United States, is definitely bigger than what is considered standard for an emerging

country and has the possibility to become one of the leading markets in the near future. The high difference between the market capitalisation and the total value traded tells us that there has been a lot of interest in the market (high number of trades) compared to its relative small size.

Finally, we can look at two main indicators: volatility and returns.
In terms of stability of the stock market, the average volatility of prices assumed different patterns during the years and show some interesting results when compared to the United States' market.
In this case, the stock price volatility has been computed as the average of the 360-day volatility of the national stock market index. China's stock market became less volatile and slightly more stable after the 1997 financial crisis, despite being constantly higher than the volatility registered in the United States' markets. The same behaviour was maintained during the 2008 global financial crisis. A big peak in volatility has been registered for China in 2015-2016, with the situation re-entering the following year. The causes of this peak will be analysed more in depth in the following sections, meanwhile, we can notice that the Chinese stock market still remains more volatile that the American counterpart.

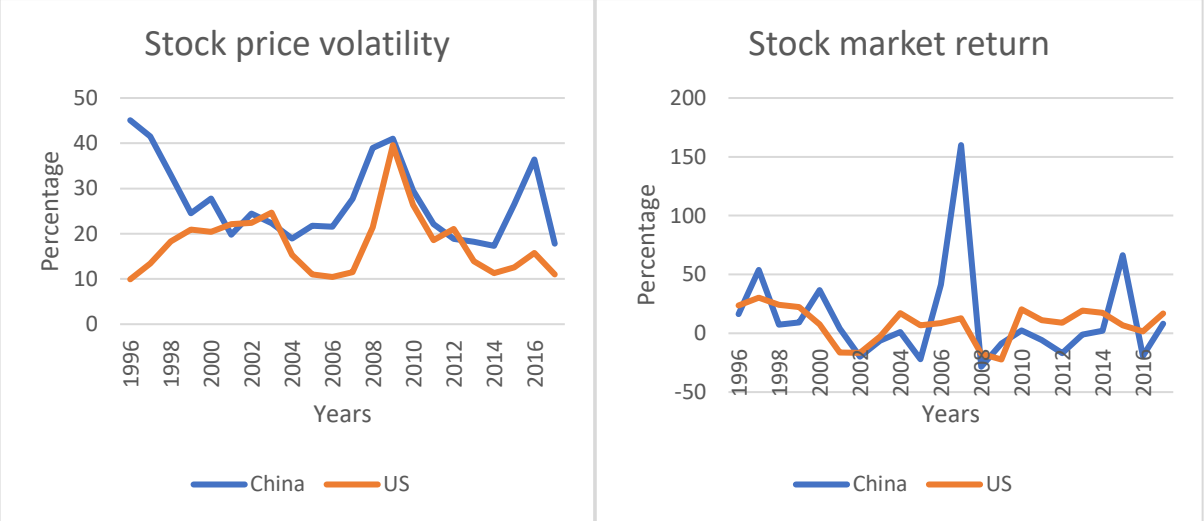

Figure 13, own elaboration

In terms of stock market return, computed as the growth rate of the annual average stock market index, two big peaks are evident: 2007-08 and 2015-06. The figure gives a picture of a market characterised by moments of high instability, with the potential to deliver very high returns yet also very high losses. Especially post crisis, the average returns have been negative for several years, showing a slower recovery compared to the United States.

In the following chapter, the Chinese stock market will be analysed in greater depth in order to better understand the reasons behind these numbers and their evolution.[52]

2.2 Financial market system

2.2.1 Stock markets organization

There are essentially two stock exchanges in China's mainland: the Shanghai Stock Exchange and the Shenzhen Stock Exchange, each with their own characteristics. They were officially re-established in 1990 after a long interruption due to the Communist Revolution.
Additionally, there is also a third stock exchange, the Hong Kong Stock Exchange, although it is more independent by nature due to the countries' history. The Hong Kong Stock Exchange was only implemented into the Chinese system in 1997 due to the fact that it was under the British Protectorate for a long time.
The two domestic stock exchanges, the SSE and the SZSE, are both supervised by the same institution that was established just a few years after the markets re-opened, the Chinese Securities Regulatory Commission. Among its duties, there is the supervision of new stock listing and daily trading activities as well as assuring an efficient centralised security supervisory system.

During the years, other smaller markets were established with the aim to complement the main exchanges.
A second-tier and fully electronic operated market, "*Er Ban Shi Chang*", was opened in 2004. It was designed specifically for small and medium enterprises, in order to lower the entry barriers. In 2007 the market counted already 119 firms listed, mostly coming from the high-tech sector. A third-tier market, "*San Ban Shi Chang"*, was established targeting primarily de-listing firms and dealing with over-the-counter transactions. It was particularly noted that throughout the years some publicly listed firms on the main exchanges that were not anymore able to meet the listing standard requirements have been shifted to this market.
In 2009, China also launched the Growth Enterprises Market (GEM), similar to the NASDAQ, in order to provide financing for small and medium sized private enterprises. The

[52] Data from The World Bank Database

first firms listed were mainly categorised from the hi-tech, electronic, and pharmaceutical industries. The index for the GEM started to be released from 2010 by the SZSE. [53]

The Shanghai Stock Exchange, as it states by its name, operates in the city of Shanghai and it is the largest exchange in mainland China. It is the fifth largest stock market in terms of capitalisation at over US$ 6 trillion and with almost 1800 listed shares. Supervised by the CRSC, it has many different functions: providing marketplace and facilities for the securities trading, formulating business rules, accepting and arranging listings, organising and monitoring securities trading, regulating members and listed companies and managing and disseminating market information.
The SSE is still not completely opened to foreign investors and there are still forms of capital control by the Chinese mainland authorities. Clearing and settlements are provided by a central counterparty, the Shanghai Clearing House, that among its many tasks, also provides security for the financial market participants through margin and collateral management. Three main types of securities are listed on this exchange: bonds, stocks and funds. A fourth category, the derivatives, are also traded. Among the bonds traded on SSE there are treasury bonds, corporate bonds and convertible corporate bonds. In terms of stocks, there are two types: the A-shares priced in the local currency, the Renminbi (RMB), and mainly restricted to domestic investors and the B-shares quoted instead in US dollars, as they are to be subscribed in foreign currencies and therefore designed for foreign investors. Initially, trading in A shares was completely restricted to domestic investors only whilst B shares were the ones available to both domestic and foreign investors and often denominated in foreign currencies. After the reforms implemented in 2002, foreign investors were allowed to trade A shares, although many limitations were imposed. The A shares are only open to some foreign investors under Qualified Foreign Institutional Investors (QFII) program that launched in 2002. There are around 100 institutional investors that have been approved as QFII and therefore are qualified to buy/sell A shares. As this is the largest Chinese stock exchange in terms of market capitalisation, the medium and large sized firms usually choose to be listed in the SSE main board with a high percentage of formerly state-run companies. There is nevertheless a minimum share capital requirement for every company so to apply for the listing of shares. This minimum is a total of RMB 30 million.

The Shenzhen Stock Exchange operates instead in the Futian district of Shenzhen. It is 8th in the list of major stock exchanges by capitalisation at US$ 4.5 trillion. Just like the SSE, the

[53] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

SZSE is also regulated by the Chinese Securities Regulatory Committee and has roughly the same functions. It is still not completely open to foreign investment and trades equity (A and B-shares), funds, bonds and asset-backed securities.[54]

Beside the Main Board designed for medium and large sized companies, the SZSE also runs the Small & Medium Size Enterprise Board (SME) and the ChiNext Board. The SME, created in 2004, adopts the same listing requirements as the Main Board yet targets companies of a smaller scale, those smaller firms that satisfy the listing conditions of the main board. The ChiNext Board, created instead later in 2009, provides an important platform with less stringent listing criteria for those enterprises engaged in independent innovation businesses and other growing venture enterprises.[55] It operates independently from the main board, acting as China's Nasdaq.

Although the SZSE is smaller compared to the SSE in terms of market capitalisation, it is larger in terms of companies listed (that are more than 2300) as well as by volume traded. The main difference between the two exchanges is that the Shenzhen Stock Exchange focuses more on smaller and more entrepreneurial companies that are highly innovative and potentially more profitable than the larger state-owned companies listed in the Shanghai Stock Exchange.

Sector	Shanghai	Shenzhen
Manufacturing	28%	60%
Financial	32%	7.2%
Mining	Less than 3%	15%
Transportation	5.1%	Less than 3%
Real Estate	Less than 3%	4.9%
Utilities	4.5%	Less than 3%
Retail and Wholesale	Less than 3%	3.3%

Figure 14: Comparison of the SSE and the SZSE by sector

In the figure above the distribution by sector of the two Chinese main exchanges are represented. The two exchanges differ quite significantly in terms of the types of companies whose shares are traded. In the SSE the first sector by representation is the financial sector, with many large financial companies and banks' shares traded. Conversely, about 60% of

[54] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[55] The China Stock Exchange – IPO Overview

companies traded in the SZSE are manufacturers, with many entrepreneurial and technology-focused companies. Additionally, the majority of institutional investors tend to trade in Shanghai, whilst the Shenzhen exchange is greatly dominated by individual investors.[56]

The third big exchange is the Stock Exchange of Hong Kong, the world's 6th largest stock exchange in terms of market capitalisation, just behind the SSE. It too has over 2300 listed companies and is reported to be the fastest growing market in Asia. The SEHK is different from the previous two exchanges, by characteristics and by history. In terms of trading volumes, it is believed that the Hong Kong Stock Exchange plays a marginal role when compared to the main marketplaces of Mainland China and Western countries.
It has a long history as it was founded back in 1891 when it was established in Hong Kong by the Association of Stockbrokers, however, the market was formally renamed as the Stock Exchange of Hong Kong only in 1914. Hong Kong became a British colony at the end of the first Opium War in 1842 and the territory was transferred again to China only in 1997, more than 150 years after. Hong Kong works as special administrative region similar to Macau, maintaining separate governing and economic system from that of mainland China. It benefits of the principle of "One country, two systems" allowing the city to keep its own legal system, its money and political regime, including trade relations with foreign countries.
The SEHK is completely open to foreign investors and the exchange has been historically preferred by institutional investors and large companies.[57]
The Hong Kong Stock Exchange previously focused on equities of locally based firms when it was first established, although since then it has expanded considerably. It trades high volumes of the so called "H shares", which are shares of Chinese firms, usually majority owned by the government that have gained permission to sell stock in Hong Kong. Furthermore, these companies' accounting statements are in accordance with the international accounting standards. H-shares cannot generally be traded on the mainland or be converted into shares that can be traded there. Listing in Hong Kong has historically been the main route through which Chinese firms have accessed foreign equity capital, since Hong Kong has been during the years a major world financial centre with investors from all around the globe participating in its market.[58] There are also different clearing houses that provide services for trading in securities, options and futures.
In addition to the main board, there is the Growth Enterprise Market (GEM). As its name

[56] Why China's Stock Market Is Like a Casino, Kimberly Amadeo, the balance
[57] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[58] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

states, it is dedicated to growth enterprises, in particular the emerging ones, with good business ideas and growth potential, but that do not fulfil the requirements needed to be listed on the main board. It acts as an alternative stock market operated by the Hong Kong Exchange. As the GEM listing does not require companies to have achieved a specific profitability level as a listing precondition, special arrangements are required in terms of transparency and disclosure of relevant information, including companies' business plan. Very recently, the minimum requirements in terms of market capitalisation and public float for both the SEHK Main Board and the GEM have been raised.[59]

In early 2015 the Shanghai-Hong Kong Stock Connect was opened acting as a cross-boundary investment channel that connects the stock exchanges of Shanghai and Hong Kong and was established in order to enable both foreign and domestic investors to trade shares coming from the two different markets. The possibility of direct investments between the SSE and the SEHK caused a huge flood of money in the latter, that consequentially suffered a shock similar to the Chinese stock market crash that happened in late 2015.
A second investment channel, the Shenzhen-Hong Kong Stock Connect, was launched in late 2016 in order to fulfil a similar role by connecting the SZSE with the SEHK.

2.2.2 Stock markets features

In order to better understand the characteristics and specific features of the Chinese financial market, the main focus will be on the two mainland stocks, the SSE and SZSE.
In China, the stock market is a pure order driven market and is as an example, different from the United States, which adopt a hybrid market, that is a mix of order and quoted driven market. Quoted driven markets are commonly found in markets for bonds, currencies, and commodities. It can be argued that a pure order driven market has the advantage of improving transparency.
By characteristics and development, the Chinese stock exchanges are quite different from the others. They are relatively new given their history of only 30 years; enough to be still considered as emerging markets under this point of view. However, in terms of capitalisation and number of companies listed, China's stock market is already among the leaders.
Both the Shanghai and Shenzhen market had high growth rate since the establishment and

[59] Stock Exchange Markets in Hong Kong: Structure and Main Problems, Rubens Pauluzzo & Enrico Geretto, Transition Studies Review, (2013)

reached a peak around the end of the previous millennium. A major correction in the first years of the new millennium caused a loss of half the capitalisation. The Chinese stock markets also suffered important losses during the recent global financial crisis and by the end of 2008 the markets lost three quarters of their value. However a sudden loss in the value of stocks had much less dramatic consequences for companies in China than it had for companies in the United States. The reason for this, is that the majority of Chinese companies finance themselves through bank credit and continued to do so throughout the stock market crash. The recovery since 2008 has been rather slow, besides the use of stimulus packages issued by the government. [60]

China's stock markets are characterised by different classes of shares, restricted completely or in part to either domestic or foreign investors. The three main classes are A, B and H-shares, but there is also a group of less common types.

The A shares, also known as domestic shares, are the shares of companies traded on the domestic Shanghai and Shenzhen stock markets and are denominated in Renminbi (RMB). They are mainly available to domestic investors and have been accessible since 2002 to a limited extent by foreign investors who have been approved as a Qualified Foreign Institutional Investor (QFII).

In contrast, the B shares, officially known as Domestically Listed Foreign Investment Shares, are designed for foreign investors and are traded in foreign currency. They are also traded on the SSE and SZSE, however, they represent a smaller part of the outstanding shares. In Shanghai, they are traded in US dollars whilst in Shenzhen they are traded in Hong Kong dollars. Until 2001 they were limited to foreign investors and later on the CSRC began to permit the exchange of B shares via the secondary market also to domestic citizens.

H-shares are the stocks of Chinese companies that are listed on the Hong Kong Stock Exchange. Many of these shares represent some of the largest Chinese companies and are also simultaneously listed on the two mainland exchanges. They are denominated in Hong Kong dollars and are open for all investors to trade, there are no restrictions in this sense. Since foreign investors can also trade H shares, these are generally more liquid than A shares.[61]

In an ideal environment where capital flows are not restricted and information is symmetric, the A share and the H share markets should be integrated and a single price should prevail in both markets. However, there is evidence that price differences can occur between these two stock markets. It has been found that a large time-varying H share price discount relative to A

[60] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[61] H-Shares vs A-Shares: What's the Difference?, Investopedia

shares exists and it is correlated with domestic and foreign market factors and relative market illiquidity. The A to H share price premiums are higher for firms in which the controlling shareholders have greater potential to expropriate wealth from outside investors. In the graph below the price premium is represented, showing that it can sometimes get to a negative, meaning that the A shares are traded at discount respect to H shares.[62]

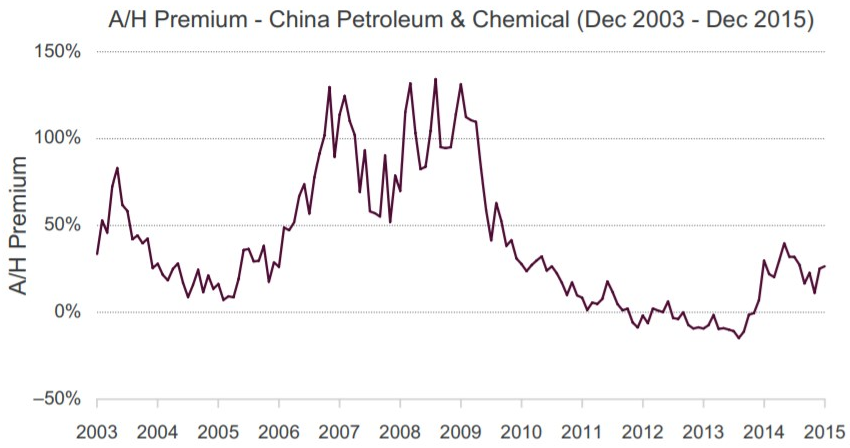

Figure 15: A to H premium, FTSE Russel, 2016

The more marginal group is composed by N and L shares, Red, P and S chips.

The N shares are shares of Chinese companies that have their main business operations in the mainland. These are listed on the NYSE or NASDAQ. L shares refers instead to Chinese companies listed on the London Stock Exchange and as such, they are denominated in Pounds. Both are available to global investors.

Red Chips are shares of a company incorporated outside the People's Republic of China (PRC) that trades on the Hong Kong Stock Exchange and is substantially owned, directly or indirectly, by mainland China state entities. The majority of its revenue or assets have to derive from mainland China. There are certain criteria to fulfil for a company in order to be able to issue these shares.

P Chips are shares of a company, controlled by mainland Chinese companies or individuals, that has the establishment and origin in mainland China. It must be incorporated outside the PRC and traded on the Hong Kong Stock Exchange with a majority of its revenue or assets derived from mainland China. Other criteria are also present.

Lastly, S Chips are shares of a company controlled by mainland Chinese companies or individuals, established or originated in mainland China. It must also be traded on the Singapore Stock Exchange with a majority of its revenue or assets derived from the mainland.

[62] Capturing the Chinese A-shares and H-shares Anomaly, FTSE Russel, 2017

Chinese investors, in order to trade classes of shares different from A and B, have to invest via fund management or asset management institutions that have been approved as Qualified Domestic Institutional Investors (QDII), approved by the CSRC. These are able to access overseas markets from 2007. In the table below we can see all the key information about these share classes summarised.[63]

Share Class	Country of Incorporation	Country of Listing	Trading Currency	Other Requirements	Available to mainland Chinese investors	Available to other investors
A Share	People's Republic of China (PRC)	China	CNY	None as they are specific share classes issued by the company	Yes	Yes under QFII/RQFII/ Stock Connect programs
B Share	People's Republic of China (PRC)	China	USD (Shanghai) HKD (Shenzhen)		Yes (if they have appropriate currency accounts)	Yes
H Share	People's Republic of China (PRC)	Hong Kong	HKD		Yes if QDII approved or under Stock Connect programs	Yes
Red Chip	Non-PRC	Hong Kong	HKD	See notes below	Yes if QDII approved or under Stock Connect programs	Yes
P Chip	Non-PRC	Hong Kong	HKD		Yes if QDII approved or under Stock Connect programs	Yes
S Chip	Non-PRC	Singapore	SGD		Yes if QDII approved	Yes
N Share	Non-PRC	United States	USD		Yes if QDII approved	Yes

Figure 16: Share classes table

One of the main peculiarities of China's stock markets, differently from the HKSE and the stock markets in the West, is the composition: smaller investors rather than big institutional investors. It can be seen as a direct consequence of the lack of investments solutions for many households and companies, as Chinese banks have proposed very low interest rates during the years. This also acted as a trigger for speculation, keeping the stock demand always high.[64] In contrast to institutional investors, small investors often suffer from an asymmetry of information. Instead of evaluating the fundamentals underlying the value of the companies

[63] Guide to Chinese Shares Classes, FTSE Russel, 2019
[64] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis

they invest in, they follow rumours and market waves, thus tend to panic more easily. Perfect and full information is one of the key assumptions of the Efficient Market Theory, developed from rational expectations, which asserts the financial market to be informationally efficient. The hypothesis was developed by Eugene Fama in 1970. In his article, he believes that the stock market is extremely efficient in reflecting information, that when released, spreads fast enough to be incorporated into stock prices without significant delay. The hypothesis is associated with the idea that prices follow a random walk: tomorrow's stock price will only reflect tomorrow's news and it is independent from the price changes occurring today. This assumption however does not comply with many stock price movements in China. Without it, we cannot have a perfectly efficient market and therefore, the market is open to possible manipulations.[65]

The investor composition is the result of different factors strictly connected with the Chinese government policies. Firstly, China's laws give shareholders considerably less influence over the management of companies than in other countries. The weakness of shareholder rights discourages fundamental investment approaches, as the risk that management or well-connected individuals will find a way to siphon off value from the firm is simply too high.[66] It disincentives larger institutional investors yet at the same time it does not prevent the individual investors from participating in the market looking for potential gains. Moreover, many public companies are state-owned or partially state-owned, consequentially the influence coming from minor shareholders is greatly reduced. The government will often make the ultimate determination on any key actions, such a change in the dividends policy for example. With many individual investors participating in trading, every move of the market, more or less driven by changes of the fundamental values, has a great impact, causing the volatility to drive up.

The government, in order to promote financial innovation and accelerate the growth of the country's two stock markets, legalised and promoted margin financing in the previous years. Margin financing essentially allowed investors to buy shares listed on the markets on credit. Through an active use of the margin account, clients are allowed to carry out margin trading and are therefore able to tak bigger positions by paying only a fraction of the cost. The fast pace growth of the margin trading created very high levels of leverage in just a short period of time, attracting to the markets a majority of small investors rather than institutional investors, whose decisions are driven in speculative manners. This was one of the factors that

[65] The Effect of Government Policy on China's Stock Market, Liya Wang
[66] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

caused the burst of the price bubble in 2015.[67] Across the years and since the establishment of the stock markets, China has been particularly prone to stock market bubbles and crashes that will be analysed in specific detail later on in this document.

There is evidence showing that China's stock markets have not being efficient, meaning that prices and investor behaviour are not necessarily driven by fundamental values. There has been evidence in this sense that in emerging countries like China, stock prices tend to move up and down together more than in developed countries. The exact cause of this phenomenon is unsure, but it has been attributed to poor minority investor protection and to an imperfect regulation of markets that often characterise emerging countries.[68]
Since 1990, the growth appeared to rely on singular day trading sessions rather than on more gradual trends, with some day percentage gain going over 20% gain. This was until 1996, when a threshold of daily price limits of 10% was introduced in order to reduce price volatility and the possibility of extreme manipulations.
Moreover, the growth has not been equally dependent on the index on which investments have been made but instead dependent on the segment of the market. Overall, the returns have been high on China's market, but not without a considerably high value of volatility. Volatility affects compound earnings and enhances the creation of market speculation, so it greatly contributed to the making of short-term bets rather than long term investments.[69] High volatility often comes together with high abnormal returns, fuelling the fast growth of the markets (as we were able to see from the previous chart). The Chinese stock market also shows a low correlation with the other world's stock markets, making it an interesting investment for foreign investors willing to diversify their portfolio. The stock market was closed to foreign investors for the majority of its life, in fact only from 2014 was it given the possibility to open up to foreign investors, allowing them to trade in it.[70]

Both the SSE and the SEHK are characterised by a relatively high "turnover velocity", meaning that the total turnover for the domestic shares is high in relation to the market capitalisation. Even if most of the trading is still concentrated on high capitalisation stocks, there is a large amount of speculative trading stocks in the Chinese markets, particularly among small and medium capitalisation stocks as they are easier to manipulate.[71]

[67] The possibilities of investing in Chinese Stock Market with a small budget, Ekaterina Panchenko, Saimaa University of Applied Sciences
[68] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian
[69] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[70] The possibilities of investing in Chinese Stock Market with a small budget, Ekaterina Panchenko, Saimaa University of Applied Sciences
[71] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

The speculation on China's market is reinforced not only by high volatility but even by the particular market structure. With a high concentration of small capitalisation stocks, individual speculators are incited to speculate in order to exploit the short term opportunity of profit. There is evidence that the number of individual retail investors on the Chinese market is raising, and states currently around 80% of the total trading.

In a normal structure market with a high concentration of blue chip companies, companies with high market capitalisation and a lead in the market, speculation would be discouraged as it would be next to impossible to manipulate them. Blue chip firms typically have a large market value, low volatility and high liquidity. Because of these characteristics they are often able to operate profitably, even in adverse market conditions. In the Chinese markets there is a general lack of blue chip companies, mainly due to the short economic history and to the fact that most of the largest Chinese companies, in regards to capitalisation, are listed on the overseas exchanges and/or on the Hong Kong Stock Exchange.

In China, the large presence of small capitalisation stocks means that speculation can impact not only the return of the stock, but even the index return and potentially influence the overall market trends. In fact, once the investors have made their short-term profit, they tend to sell the stocks. Returns will then decrease, preventing those companies from becoming large capitalisation companies and creating an endless cycle. In this environment, it is really hard for a company to emerge and develop as a large and dominant blue chip company.[72]

In this sense, the stock market turnover ratio is a good metric in order to measure the degree of speculation. It is measured as the total value of shares traded during a certain period, generally one year, divided by the average market capitalisation for the period. It is also a liquidity indicator: the higher the turnover rate, the higher the liquidity, the shorter is the average holding period of a share. If a turnover of 100% means that the average holding period of the stock is one year, China's turnover ratio has consistently been touching peaks of over 500% as it can be seen by the graph below. This means that on average stocks were held for around two months. [73] This high turnover rate is particularly relevant given that large portions of Chinese shares are still non-tradable, generally because they are owned by government entities. If we would take into account only negotiable shares, the average

[72] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[73] Data from The World Bank Database

turnover rate would be even higher. As a comparison, in China institutional investors have a turnover rate that is about 40% lower than individual investors, suggesting that a higher presence of institutional investors would definitely lead to less speculation.

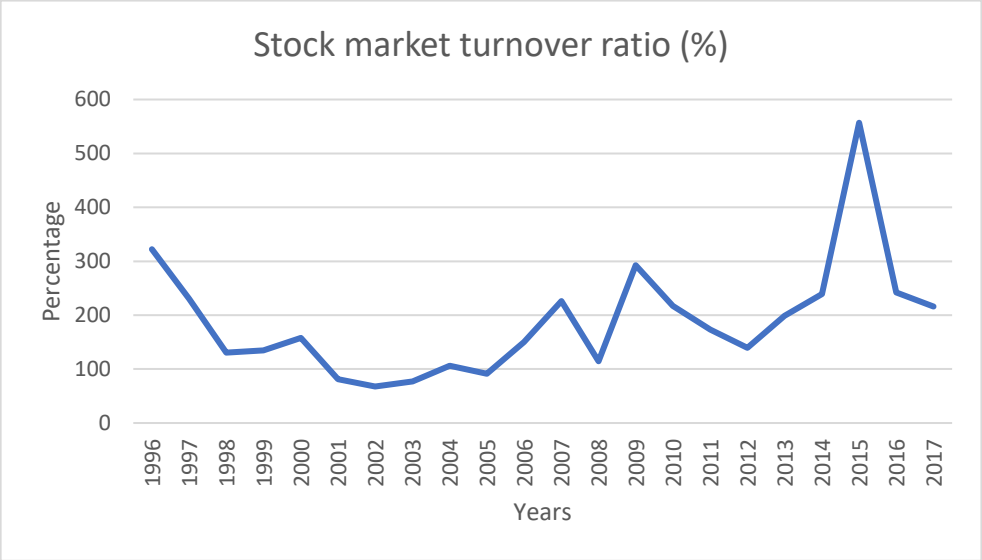

Figure 17, own elaboration

Speculation is still strongly present today in the Chinese stock markets, especially in the Shenzhen Stock Exchange, as it is mainly composed of small capitalisation stocks and smaller domestic retail investors.

In addition to speculation, there have been numerous lawsuits alleging insider trading and manipulation that further caused imbalances on the Chinese stock markets. In many cases it was quite evident as managers and other insiders from Chinese companies did not use any sophisticated accounting and financial manoeuvres to hide their losses. These cases reveal that the inefficiencies in the stock markets can be partially attributed to poor and ineffective regulation.[74]

2.2.3 Government influence

Another important characteristic is the heavy involvement of the government, in contrast to the western theories regarding free stock markets. China's stock market is highly insulated with foreign investors only owning 1.5% of the total shares on both the Shanghai and Shenzhen stock markets. This situation is in contrast with the rest of the world, where the government ownership of public companies is decreasing. In China, many of the shares issued

[74] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

on the stock markets are called “non-tradable shares” because they are the possession of either the government or the business itself and as such they are not allowed to be traded. The free-float ratio, that is the proportion of shares available for public trading, has historically been under the world’s firsts market.

Besides the heavy presence, the government has not always been able to efficiently stabilise the markets as showed by the high volatility, mainly due to an incomplete corporate government structure and inadequate regulatory capacity. The regulations in this sense are still reasonably fresh, China had no laws to govern corporations until 1994 and no laws to regulate securities until 1999, a time when the stock markets had already been working at full regime for nine years. The severe growth since the opening of the share markets, was primarily the result of the lack of policies and regulation governing the corporations and individual investors willing to enter the market.

The government’s manipulation over the stock markets, through the China Securities Regulatory Commission (CSRC) that is in charge of the new listing and of selecting qualified companies, led often to criticism. It has been argued multiple times that stock markets have been favouring state-owned firms over entrepreneurial ventures, for example, acting as an obstacle to the healthy development of China’s stock market system.[75] Moreover, the government’s dual roles, as a regulator and shareholder of many listed firms (SOEs), can lead to conflicting goals: maximising profits as shareholder from one side versus maximising social welfare as the regulator on the other. These contrasts can in turn weaken the efficiency of both of its roles.[76]

The government and authorities have different tools in order to affect and manipulate the stock market, and more in general the overall economy. There are essentially two main tools that can be used: the monetary policy and the fiscal policy.

Regarding the monetary policy, in specific money supply, there is evidence regarding China of a positive correlation between M1 and the stock market growth. M1 measures the currency in circulation plus the checkable deposits and is the highest liquid money in the economy. Stock markets are capital-fuelled markets, therefore, a capital inflow promotes the stock market and an outflow of capital leads to the market drop. In this sense, there is evidence that the stock market follows bottoms and peaks of M1, making it an effective tool of market control. For example, the sharp decrease in stock markets from 2008 was also associated with

[75] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis
[76] China’s Financial System and the Law, Franklin Allen & Jun “QJ” Qian

the tight monetary policy implemented by the government. The correlation between M1 and yearly stock market growth cannot be identified in the case of the United States. During the long bear market caused by the global financial crisis, Chinese investors were heavily suffering from the so called “disposition effect”, being reluctant to realise their losses while selling winners too quickly and holding losers for too long. To counteract this phenomenon and help to tackle the economic slowdown, the government loosened the credit policy. As result, the Shanghai Composite Index picked up almost simultaneously with the increase of money supply.
The relation between the interest rate and the stock market is inverse, as a general rule of thumb; when the Central Bank cuts interest rates, it causes the stock market to go up. The stock market in the Chinese case however, till 2005, did not react positively to the multiple stimulus packages issued by the government, including a sharp decrease in the interest rate. It is easier to identify patterns when looking at more recent data. In 2007, the authorities, aware of the overheated stock markets, aggressively lifted the interest rate causing the market to drop. It has to be stated that there is evidence of a significant implementation delay between this type of monetary policy and the realisation of the effects on the Chinese stock market.
In terms of required reserve ratios set by the PBC and open market operations that were aimed to control the money supply by either buying or selling government bonds and other financial instruments, evidence show a less significant effect on the stock market behaviour.

Instead, observing the fiscal policy, a tight policy is usually implemented in order to stabilise the prices when inflation is high. A contractionary fiscal policy occurs when public expenditure is lower than tax revenues, thus resulting in a budget surplus. A tight fiscal policy is usually implemented by raising taxes or cutting the government expenditure. However, cutting spending is often very difficult, as spending benefits politically influential interest groups. China has an advantage under this point, due to its political organisation and its single-party dominance makes it easier to implement a contractionary fiscal policy.
Concerning the stock market, the Chinese government adopted an expansionary fiscal policy from the late 1990s, when the burst of the Asian financial crisis considerably slowed the economic growth and led to a drop of prices of goods, higher unemployment and lower investment. In 2005, the government switched to a steady fiscal policy.
Government spending, that represents the main tool of an expansionary fiscal policy, can be financed through tax or bonds issuing and generally results in a stock price appreciation. There is generally a certain time lag between the increase of government spending and the lift of stock prices, similarly to what was described before in regards to interest rate changes.

There is evidence that the impact of government spending on domestic economic growth in China is stronger than the impact of monetary policy. Therefore, the benefit on stock markets is higher, as in absence of market bubbles the economic fundamentals should be the essential prerequisite to the stock market development. After the slowdown of 2008, the government started a pro-growth fiscal policy through stimulus packages of over RMB 4 trillion and particularly targeting infrastructure investments and SOEs.

The issuing of bonds can help to relieve the costs of infrastructure construction and economic stimulus plan, without running the risk of the inflation that printing more money could impose. There is generally evidence of a certain rate of substitution between stocks and bonds, as the risk increases, investors tend to move from riskier assets (stocks) to safer fixed income securities. Therefore, a negative correlation between bond and share prices can be assumed but cannot be taken for granted.

Cutting tax intuitively benefits stock prices, as a tax reduction can increase income and encourage consumption as well as investments. Higher investments will often result in higher share purchases. Among all kinds of taxes, stamp duty on share transaction showed to be the most closely related to trading cost. Stamp duty is charged once per transaction and is usually payed as a percentage on the transaction. There are findings that higher stamp duty tax has imposed negative effects on turnover. Stamp duty is generally raised by the government in order to cool down an overheated market. In China, the first stamp duty on stock was established in June of 1990 on the Shenzhen Stock Exchange as 0.6% of the total transaction turnover. The rate of stamp duty has changed over the years, however, after 2008 it was lowered to 0.1% in order to tackle the consequences of the financial crisis. The influence of the stamp duty on the stock market is observable in the very short term but not consistent in longer terms when put in contrast to other types of tax that need a certain time in order to be "digested" by the market.[77]

An example of a suboptimal government intervention can be seen in the IPOs policy implementation. In contrast to almost all regulatory frameworks in the developed economies where IPO procedures are based on registration, the Chinese regulatory framework is still based on approval. Applications for IPOs must go through CSRC's Public Offering Review Committee for approval. This can result in a massive backlog of firms awaiting approval, considerably slowing down the whole process. Furthermore, the administrative control over the approval procedure feels excessive. It is beneficial to those SOEs with close connections

[77] The Effect of Government Policy on China's Stock Market, Liya Wang

to the government and those who are more likely to obtain IPO approval and limit the supply of new issues, increasing speculative interest in the market.[78] The Chinese government often managed the IPO activity as a tool to manipulate the stock market. The issuance of IPO can be allowed in order to cool down the market: issuing new shares should release the pressure on the old ones and therefore should help to stabilise the market. There is evidence, even in markets without strong regulatory intervention, that IPO activity is positively correlated with stock market returns: the IPOs pattern increases in periods of high market returns and declines when markets go cold. The main motivation for the Chinese Securities Regulatory Commission to regulate the IPO activity appears to be the reduction of market volatility. However, IPO activity in China is quite small in relation to the overall capitalisation of China's stock markets. If there is evidence in some other markets suggesting that IPOs can affect asset prices, this is not the case of China, where the IPO issuance is still relatively limited. As such, a considerable impact from IPOs management on Chinese equity values cannot be expected, making its management a suboptimal regulatory tool. In order to stabilise the Chinese markets, new policy reforms regarding IPOs should be issued to assist and to improve market efficiency and stability.[79]

Beside the many flaws highlighted and connected with an incomplete corporate governance and regulatory structure of the market, the government has recently made numerous attempts and put great effort into open up the Chinese stock market.

The first step started with the creation of the CSRC: in order to start to open up the economy (also through its financial markets), it was essential for the Chinese government to establish a regulatory institution for the supervision and daily control of the stock markets and their participants.

The two main programs that have been issued by the government that marked an important step towards the liberalisation of capital flows have been the QFII and the QDII.

The Qualified Foreign Institutional Investor scheme was the first one to be launched back in 2001. It came as a natural consequence of the entrance to the WTO at the end of the previous year and as a statement from the Chinese government for the willingness to improve the regulatory environment and trading mechanisms. The Qualified Domestic Institutional Investor scheme followed in 2006, allowed domestic financial institutions to invest in offshore markets.

[78] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

[79] China's IPO Activity and Equity Market Volatility, Packer & Spiegel, FRBSF ECONOMIC LETTER, 2016

During the years these two programs have somewhat evolved into two successors: the Renminbi Qualified Foreign Institutional Investor (RQFII) and the Qualified Domestic Individual Investor (QDII2).

The RQFII was launched in 2011 and allows institutional investors that received the RDFII qualification to use offshore RMB funds to invest in RMB denominated financial instruments. The program represents a continued loosening of China's capital controls. Differently from its predecessor, it relaxes existing restrictions on currency settlement, adds permissible asset classes, and expands investor eligibility, aiming in particular to attract long term foreign funds.

The second scheme regarding domestic investors was firstly proposed in 2013. It is focused on individual investors rather than institutional and allows them to invest on the overseas markets. It has not yet been officially implemented.

Another important addition in this regard has been the investment channels, implemented to improve both the capital inflows and outflows. Before the channels connecting Hong Kong with the two mainland markets previously cited, the first one was launched in 2013, when the government established the Free Trade Zone of Shanghai. In this zone, cross-border capital transactions and financial institutions have been liberalised. Other free trade zones followed years later.

Following the most recent efforts toward the capital account liberalisation, The Shanghai-London Stock Connect was officially launched in June 2019, which allows listed companies to issue global depository receipts on the other exchange based on local rules and regulations. Not only can global investors benefit from China's growth through London, but also LSE listed companies can access Chinese investors directly. For Chinese investors it means that they can access international stocks within China without being subject to domestic capitals control.[80]

Overall, opening up capital flows should reduce systematic risk and the cost of equity capital whilst boosting investment growth and wages in China. In a contest of insulated markets, it represents the opportunity for foreign investors to diversify their portfolio and mitigate their risk, as China's stock market appeared to have low correlation with other world's stock markets. However, it is reasonable to think that as the liberalisation of the Chinese economy further develops, it will probably lead to an increase of this correlation.[81]

[80] Shanghai London Stock Connect, londonstockexchange.com
[81] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis

2.3 Intermediation sector and other financial markets

2.3.1 Banking system and its features

Despite the rapid growth and development of the stock market system, the Chinese financial system remains heavily focused on the bank system: the banking sector remains today the biggest sector of the Chinese economy. It was previously showed how banks still provide most of the credit to private sector and remain to be one of the main sources of financing. The banking sector is regulated by the Chinese Banking Regulatory Commission (CBRC), set up as an independent banking regulator in 2003. It was established to assume responsibility for banking sector regulation and supervision, separating this from the functions of monetary policy and financial system stability that continued to be carried out to the PBOC. The CBRC requires banks to satisfy a number of quantitative controls on their balance sheets, in addition to imposing minimum capital requirements. It has also been active in strengthening prudential standards and oversight over recent years, contributing to improvements in governance, risk management practices and transparency among Chinese banks.[82]

In 2018, the CBRC and the Chinese Insurance Regulatory Commission (CIRC), in charge of the regulation of insurance products and services market were merged into a unique agency denominated 'China Banking and Insurance Regulatory Commission' (CBIRC), officially in order to assess responsibility and cross-regulation problems.
The nation's central bank, the People's Bank of China (PBOC), not only is responsible for the planning and implementation of the monetary policy, but also establishes the foreign exchange policies. In order to set the monetary policy and control the money supply in the Chinese banking system the PBOC has many tools such as reserve requirement ratios (RRRs). It also set benchmark interest rates on banks' deposits and loans at various maturities, constituting respective cap and floor rates in order to ensure a certain profitability level. Banks are allowed to set their own deposit and lending rates, nonetheless, they have to stay within strict limits set by the PBOC, which ultimately determine the base, the upper and lower limits of these rates. By fixing the base rates along with the range of the deposit and lending rates, the PBOC has a high level of control and numerous ways to affect rates.[83]

The "Big Four", state owned commercial banks, are not only the largest banks by total assets in China, but also in the world. These four, namely the Industrial & Commercial Bank of

[82] The Chinese Banking System, Grant Turner and Nicholas Tan and Dena Sadeghian
[83] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

China (ICBC), the Chinese Construction Bank, the Bank of China and the Agricultural Bank of China (ABC), individually have more than US$ 3 trillion in assets. This acts as confirmation to the fact that the banking sector in China is not only big compared to the overall economy, but is also highly concentrated, with the five largest commercial banks (the fifth largest being the Communication Bank of China) controlling about half of the total assets in the banking industry.

In particular, the ICBC is the largest multinational banking company in the world with over US$ 4 trillion in total assets. In 2006 it had what at the time was the world's largest IPO with a value of over US$ 21 billion. At the same time, it was the first company ever to be simultaneously listed on both the SSE and the SEHK.

The partial privatisation process involved all of the "big Four". The process started in 2003 when the Chinese government started to inject a large amount of foreign currency reserves into these banks to improve their balance sheets in preparation for going public, even if at different times they all have private sector shareholders. The most recent state owned bank to go public was the ABC in 2010. It was listed on both the SEHK and the SSE, therefore issuing respectively H and A shares. On completion it became the world's biggest IPO, surpassing the one set by Industrial and Commercial Bank of China in 2006. The ABC was in fact able to raise a total of US$ 22.1 billion. All of these large banks have multiple numbers of subsidiaries and branches all over the world.

Despite the recent and major changes that have brought the Chinese banks closer to their Western counterparties, the financial operations are still tightly controlled by the government and the largest banks remain predominantly owned by the government, keeping their headquarters in Beijing.[84] The Chinese Government has a majority ownership of banks that account for more than half of Chinese banking system assets, mainly through the five largest commercial banks. The government's equity shareholdings are owned by Central Huijin, that is a subsidiary of the sovereign wealth fund, the Chinese Investment Corporation, which invests in financial institutions by the Ministry of Finance and, to a lesser extent, by some SOEs.

After the six state owned banks, the second largest category of commercial banks are the "joint-equity banks", twelve smaller, domestically owned banks which make up over 15% of total banking assets.

There are also the three policy banks, the Agricultural Development Bank of China, the

[84] The 4 Biggest Chinese Banks, Investopedia

Export-Import Bank of China, and the China Development Bank. These are entirely owned by the government and are responsible for funding state led development projects and aim to implement economic policies of the government. The rest of the banking sector consists of city and regional banks, small credit cooperatives and rural financial institutions and additional branches and subsidiaries of foreign banks. The banks set in the special administrative zones of Hong Kong and Macau do not answer to the CBRC for their operations.

It has to be stated that following the recent trend of growth of other institutions, the five largest banks' position in the sector has shrunk, both in terms of the number of banks and in relative share of total assets.[85]

During the late 1980's and 1990's, much of the Chinese banks' lending was to state-owned enterprises, many of which were loss-making and heavily reliant on bank credit to continue financing their activities. The situation was not sustainable as ultimately the SOEs did not repay these loans. As a result, banks' NPLs increased so significantly that by the late 1990's the large state-owned banks' aggregate NPL ratio exceeded the 30%. It is a matter of fact that these banks, severely undercapitalised, were not efficient or profitable. In order to assess the situation the government had to start an extended process of restructuring of the "Big Four" in 1998, injecting a total of US$33 billion of capital into them.

Regarding NPLs, in China there is also a problem of recognition. If in the United States a loan is classified as "doubtful" or "bad" when any interest payment is overdue by 90 days, in China instead this step is often not taken until the principal payment is delayed beyond the loan maturity date or an extended due date, and in many cases, until the borrower has declared bankruptcy and/or has gone through liquidation.[86]

In terms of profitability, it started to slowly rise in the banking sector over the past decade for almost all banks, not just the largest. As it can be seen below, the ROA the major commercial banks grew from about 0.6% to about 1.4% from 2006 to 2010. It is compared on the chart with the ROA of the major United States banks, as we can see the pattern for the first decade of the new millennium was inverse, with Chinese banking developing and growing under the efficiency point of view, whilst banking system of the United States suffered a severe hit with the 2008 crisis.

[85] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

[86] Essays on Chinese Financial Market, Chenying Zhang, University of Pennsylvania, 2012

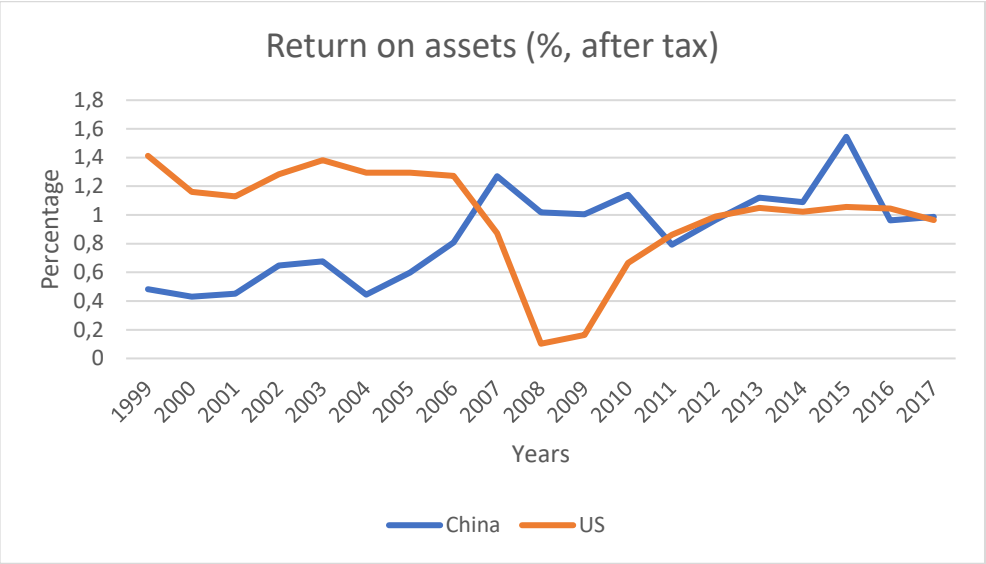

Figure 18, own elaboration

For China's banking sector, the main driver of the rise in profits was the increased net interest margin, calculated as the difference between the interest rate earned on loans and the cost of funding the loans, mostly determined by the deposit interest rate.

Profit levels were also significantly aided by a drop in the non-performing loan rate, also universal among the types of banks. The performance of the banking sector during the 2008 financial crisis was remarkable compared to that of other countries, as noted by the return on assets. The Chinese banking system was resilient to the direct financial effects of the global financial crisis, mostly because it was focused on a strongly growing domestic market and had little exposure to overseas wholesale funding markets. In response to the sharp downturn in external demand, the Chinese government implemented substantial economic stimulus through a rapid expansion in bank credit, largely directed to government infrastructure projects. The increase in the banks' credit in 2009 was equivalent to about 30% of China's GDP. [87]

Overall, across the last two decades China has undertaken a number of banking system reforms in addition to restructuring its largest banks. These were strictly connected upon China joining the World Trade Organisation in 2001, as it agreed to a five-year timetable of changes aimed towards opening up its banking system to foreign competition. The privatisation was the main tool used by the government in order to improve the banking sector profitability. Together with the reform of the banking structure, it should enhance competition and improve the efficiency. Beside the partial privatisation of four biggest banks, the

[87] The Chinese Banking System, Grant Turner and Nicholas Tan and Dena Sadeghian

government also worked in order to address a number of different issues as part of the process, including corporate governance, NPLs, risk management structures and accounting standards.

In terms of risk management, some of the biggest banks were able to offer multi-million dollar salaries to hire top risk managers from Wall Street. Regarding the accounting standards employed by the banks, they significantly improved over time, approaching those employed by international banks.
A lot has still to be done, as recognised by the same Chinese government. For example, state-owned banks still lend overwhelmingly to the SOEs, which was one of the main culprits responsible for the situation with the NPLs.[88] While there has been a shift from short-term to long-term loans, the fact that the majority of loans goes to SOEs in manufacturing industries will have to be address.

Another critical issue for the Chinese government has to do with shadow banking. Shadow banking involves non-bank financial intermediaries that do not have banking licenses and therefore are not subjected to the banking regulation, providing services similar to traditional commercial banks but outside normal banking regulations. They provide credit and therefore increase liquidity, but due to high leverage levels they are also significantly risky and can treat the financial stability.
As a consequence of the strong demand of capital by the real economy in China, shadow banking, which includes trust and entrusted loans, loans by small-scale lending companies and informal finances, has been growing rapidly. [89] There are several advantages of shadow banking in comparison to conventional banking and they determine a high growth of credit through it.
Shadow banks are not subject to bank limits on loan or deposit rates set by the regulatory requirements and also avoid costly PBOC reserve requirements. This resulted in a credit funding demand much higher than the supply of bank loans.[90]
It is only very recently that the shadow banking phenomenon has started to retract, thanks to the efforts made by the government in order to alleviate the issue. As visible from the figure below, only from 2018 did the growth of shadow banking credit stop and start its regression.

[88] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings
[89] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian
[90] Shadow banking in China: A primer, Douglas Elliott, Arthur Kroeber, Yu Qiao

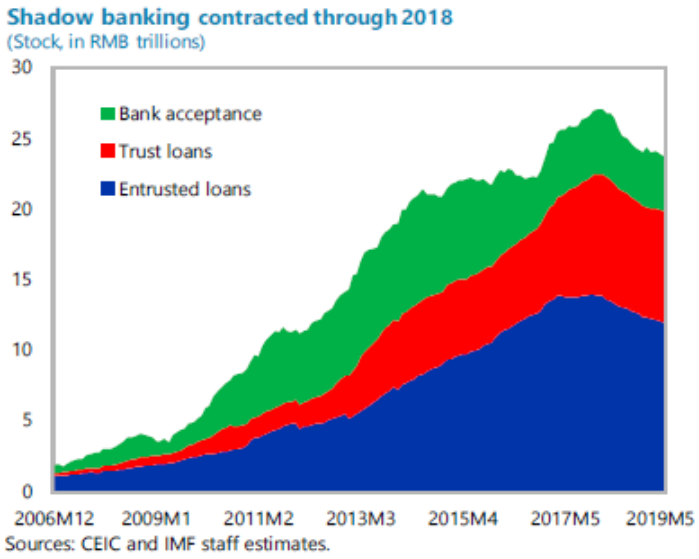

Figure 19, Shadow banking

In particular, the most recent fiscal policies have been issued to target shadow banking, effectively reducing the leverage in the financial market. Additional efforts were made to strengthen financial regulation, reduce regulatory arbitrage and improve the institutional framework for financial supervision.

On the negative side, the recent deleveraging and tighter financial conditions have put profitability under pressure, particularly for small and medium sized banks, together with curtailed access to credit for private firms. Downsizing shadow banking is particularly relevant as it encourages migration of assets onto bank balance sheets, and at the same time, improves the transmission of the monetary policy.

From the IMF China's Monetary Survey below the transition from shadow banking towards bank loans is evident, as a share of GDP.[91]

	2014	2015	2016	2017	2018
			(In percent of GDP)		
TSF 1/	189.8	202.2	227.1	227.6	227.5
Bank loans	131.2	137.0	144.6	149.0	154.3
Shadow banking	33.1	31.7	31.4	33.0	27.1
Net corporate bond financing	18.1	20.9	24.0	22.5	22.7
Non-financial enterprise equity	5.9	6.5	7.7	8.2	7.9
Others	1.6	1.5	8.5	1.5	1.3

Figure 20, China: Monetary and Credit Developments, IMF

[91] People's Republic of China, IMF Report No. 19/266

Together with the state owned banks, the development of both non-state banks and other (state and non-state) financial institutions is just as important in allowing China to have a stable and functioning banking system. Since China's entrance into the WTO, there has been a boom in the entry and growth of non-state financial intermediaries; this trend is expected to continue with more foreign banks entering the domestic credit markets.

Even if the five largest state-owned banks dominate the banking business, the contribution given by the other banks in the sector cannot be ignored. There is evidence that shows that these banks and institutions appear to be more efficient, having less NPLs than the largest state-owned banks. Particularly among commercial banks, Rural Credit Cooperative (RCC) has showed one of the highest growth rates since late 1990's, holding the largest amount of assets.[92]

2.3.2 Insurance market

China's insurance market is significantly smaller than that of other Asian economies, however, in the recent years it is slowly catching up.
The growth was fuelled by capital injection made by the PBOC to insurance companies during the first decade of the new millennium. From 2004, insurance companies have been allowed to invest in the international capital market, thus starting that process of opening up that is still going forward today. In regards to total assets over GDP, there is a growth in the ratio from 7% in 2004 to 20% in 2017. This ratio is still far from the other three Asian economies, South Korea, Taiwan, and Singapore, for which the total assets managed by the insurance companies sum up to over 30% of their GDP, and generally from the most advanced economies (the insurance company assets to GDP for the United States in 2017 is around 30% as well). It is clear that the insurance industry is also significantly smaller when compared to China's banking industry.
Recently, after a year of slow growth in 2018, experiencing a year-on-year growth rate of 3.9% for gross written premium, China's insurance market bounced back in 2019. During the first half of 2019, the overall gross written premium grew by 13.9%, with the life market leading the growth with a +15.9%. In particular, the life insurance market is shifting from business volume and asset-driven growth to value-driven growth. In a context of falling interest rates, it is more difficult for insurers to maintain attractive benefit levels. The main

[92] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

challenge of the future that insurance companies will have to face moving forward, regards digitalisation, essential in order to boost efficiency.

To have an idea about the size of the insurance sector, the growth of insurance company assets as a share of GDP is represented in the figure below. The chart displays a slow but steady growth during the last fifteen years, with neither excessive bumps nor drops.[93]

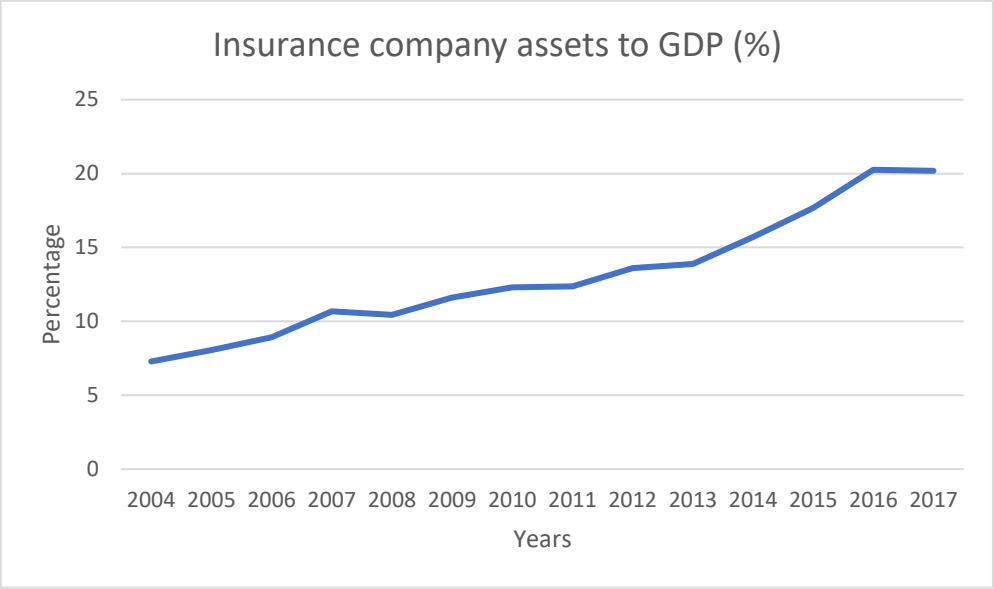

Figure 21, own elaboration

Consequently to the development of the market and continuous regulatory improvements, China's life insurance industry had to actively adjust its business structure in order to adapt. Short-term products are progressively being phased out as long-term products are now being favoured, enabling a gradual transformation from high speed growth to high quality growth. The China Banking and Insurance Regulatory Commission (CBIRC), that from 2018 supervises the insurance institutions activity, has stated that it will continue to promote the opening of the insurance sectors through different measures. It will continue the process of removing foreign ownership caps in foreign-invested life insurance companies during 2020, easing the entry conditions for foreign insurance companies by removing the requirement of having at least 30 years of operation before entering the Chinese market and allowing foreign insurance group companies to invest and set up insurance institutions in China.

Persistent, low interest rates can be a major threat for life insurance companies due to their rate sensitive products and investments, therefore, the CBIRC is recently pushing to improve the supervisory system of insurance asset and liability management and to establish

[93] Data from the World Bank Database

constraint-based asset and liability management.

In terms of market structure, the market is still dominated by the largest players, with the top ten non-life insurers representing approximately 85% of China's market share and capturing 104% of the non-life market's underwriting profit in 2018. For medium and smaller non-life insurers to survive, it is important that they differentiate themselves by further exploiting their competitive advantages (such as shareholder synergy and specialised expertise) and by concentrating in selected niche markets.[94]

2.3.3 Bond market

The development of the bond market has not been very strong. Until 2010, the corporate bond issuance volume to GDP was only 1%. It grew quite considerably and consistently until 2017 when it dropped back to 7% of the GDP.

Most of the corporate bonds in China are owned by banks, making them the largest holders by far. Banks also dominate secondary trading in the relatively inactive corporate bond market. Regarding the corporate bond sector, the slowed growth especially in the early 2000's was a consequence of the complicated regulatory arrangements that often prevented firms from issuing corporate bonds. The strict regulatory framework was simultaneously one of the main drivers of the dominance of bank loans as source of financing for firms. The growth, in terms of bond issuance volume, started in 2010 and was a direct consequence of various steps that were taken to reduce the difficulties deterring bond issuance. The first step was taken by the PBOC, establishing a medium-term bond market with a registration issuance system. This means that firms can issue bonds prior compliance to certain requirements and as long as they make certain information public.[95]

After the measures taken, the total corporate issuance more than doubled, even if it remains a small portion of the total bond supply which is dominated by central and local government bonds. As an example, the government bond market had an annual growth rate of over 25% during the period 1990-2009 in terms of newly issued bonds, with total outstanding bonds reaching RMB 4,976.8 billion (or US$ 721.3 billion) at the end of 2008. After the government bonds, the second largest component of the bond market is represented by the "policy financial bonds." These bonds are issued by policy banks, which operate under the

[94] 2020 China Insurance Outlook, Rick Huang, EY

[95] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

supervision of the Ministry of Finance. The proceeds of bond issuance are invested in government-run projects and industries, such as infrastructure construction.
The small size of the bond market, especially the corporate bond market, relative to the stock market, seems to be a common feature among Asian countries, even in Japan the size of the corporate bond market is much smaller compared to its government bond market.[96]

There are few reasons for the underdevelopment in bond markets in China and other parts of Asia. The lack of an efficient accounting system inherently held back the development of the market, as well as a low creditor protection and court inefficiency that lead to low recovery rates for bondholders during default.
Further development of China's bond markets, specifically concerning its legal system and related institutions, is of particular importance as it can help the advancement of other markets and the overall financial system.[97]
Recently the foreign participation in China's stock and bond markets has been rising, even whilst it remains comparatively low with international peers. Foreign participation in the Chinese bond market is estimated to be at only 1.6% of the total value of bond outstanding, with most of the foreign holdings concentrated in government instruments. A further liberalisation of the bond market could help the private sector diversifying funding, improve liquidity and lengthen borrowing maturities.[98]

2.3.4 Asset management industry

The history of the asset management industry started back in 1992 when the first closed-end mutual fund was established. Till 1997, the fast growth was characterised by a lack of regulation and frequent frauds that led to social instability. Only in 1997 did the CSRC issue the first set of regulations for the asset management industry in aim to regularise and stabilise the market. A wave of more rapid development followed from 2001, when the first open-end mutual fund was established. Whilst in open-end funds investors can pull/add money in any working day and the fund managers adjust their holdings accordingly, closed-end funds maintain their size, only allowing investors to buy/sell their shares on the market.

[96] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian
[97] Essays on Chinese Financial Market, Chenying Zhang, *University of Pennsylvania*, 2012
[98] The Future of China's Bond Market, Alfred Schipke, Markus Rodlauer, and Longmei Zhang, IMF, March 2019

A stronger development took place from 2002, whereby, the Chinese government agreed to allow several Qualified Foreign Institutional Investors (QFII) to enter and invest in the Chinese market, as a consequence of the agreements signed whilst joining the World Trade Organisation. During the years there has been a growth in the number of QFII, thanks to the relaxation of the qualification requirements, in specific regarding the AUM for QFIIS.

From 2006, the Chinese government started to allow a limited number of domestic asset management companies to invest abroad, as long as they comply with the Qualified Domestic Institutional Investors (QDII) requirements. The QDII funds invest in stocks, bonds, real estate investment trusts and other mainstream financial products listed on the major financial markets such as NYSE and the SEHK.

Most of the growth of the asset management industry has however been focused on open-end funds. The mutual fund companies, which main source of income is represented by management fees, are owned by financial services companies.

Associated to the asset management industry are the trust companies, asset managers for high net worth individuals and at the same time sources of credit for firms in need, recently undergoing a rapid growth that made it one of the largest financial services sectors. Today there are 68 trust companies in China, and unlike most financial sectors in China, this industry is not dominated by a small number of large firms.

Trust companies are very valuable as asset management companies due to their ability to provide alternative investments. The products offered by trust companies greatly differ from those provided by mutual funds and banks. The investments cover a wide variety of fields, from investment in firms to real estate and infrastructure. These various products are a direct consequence of the need to satisfy high net worth individuals and company expectations, specifically regarding portfolio diversification. Nevertheless, the principal service provided by the trust companies is credit, through making loans to other firms. They also importantly provide finance for local government's investment in infrastructure. [99]

As aforementioned, the financial sector opening has accelerated recently, including removal of the foreign ownership limit for Chinese banks and asset management companies. In 2017, China relaxed its restrictions on foreign ownership; foreign companies can now own up to 51% of a company, up from 49%. If the trend of opening up domestic markets to foreign

[99] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

investors continues, demand and supply of capital will increase and a greater inflow of QFIIs is to be expected.[100]

2.3.5 Private equity and venture capital

The private equity and venture capital sectors are of particular importance when raising large amounts of funds. In market-based economies such as the United States and the United Kingdom, with well-developed systems for the acquisition and distribution of information, the cost of information to investors is low. In such environments, investors have the possibility to anticipate high profits, providing the finance to the firms operating in the new industries. Together with the existence of an active IPO market, it creates the conditions for a prolific private equity/venture capital sector, able to increase the financing for new industries. Whilst banks are better than financial markets for funding mature industries due to the fact that there is a wide agreement on how they are best managed, markets are better for funding new industries, as evaluation of these industries based on experience is difficult and there is wide diversity of opinions.[101]

In China, there is not a clear distinction between private equity firms and venture capital firms like in the United States for example, but they are rather similar. Both types of firms focus on investing in those companies that are not yet listed and almost the only way for them to exit is to get listed in either the Chinese or the foreign stock markets. The sector has grown a lot in the past few years and its impact on the capital market can be considered significant. The market is at the same time not very concentrated but rather packed by small firms.

The private equity in China is the third-largest market in the world, with approximately $60 billion in additional capital deployed in 2019. The growth has however been hindered by SOEs that have historically crowded the market by competing for assets. Corporate buyers have also been powerful competitors when it comes to acquisitions, limiting the number of attractive deals. As a result, private equity as a share of GDP in China was just 0.5% in 2019. There is a significant lag compared to more developed PE markets, such as the United Kingdom, where PE made up 2.6% of GDP, and the United States, where PE comprised 2.2% of GDP in 2019. The gap is also a sign that the Chinese PE market has room to grow in the

[100] Asset Management in China, KPMG, 2018
[101] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

near future. However, the higher levels of uncertainty and risk due to ongoing trade and geopolitical tensions, represent an additional challenge for the private equity firms that, in order to continue to grow and thrive, will need to acquire new capabilities and adjust their strategies to create value in their portfolio companies.

Currently, private equity funds have started a shift from buying minority stakes in companies toward deals that would give funds more influence over portfolio companies' operations, deals that would give investors the direct management control of capital allocation, talent, and exits. As investments in China have grown, so have the size of PE deals. The average size deal rose to US$75 million in 2019 from UD$36 million in 2009. The market is currently not very concentrated but rather filled with small firms with limited assets under management. Going forward, the industry is expected to become further concentrated as it will expand. Sales to a strategic corporate player, or trade sales, have been the predominant exit route for private equities in China. Since 2016, corporate buyers have accounted for 80/90% of exit value and 70/90% of the number of deals, the trend over the last five years has led towards fewer and larger exits. This reliance on corporate buyers poses a risk for the overall Chinese PE market.[102]

As previously stated, the investment strategies used by venture capital and private equity firms are often overlapping, making the boundary blurry. Differently from North America, where venture capital commonly means early stage equity investments in small firms with high growth potential and the predominant format for venture capital is limited partnerships. In China, venture capital can also be used for buyouts and turnaround investments, typically proper of the private equity, and consisting of funds that are more typically corporate funds associated with banks or corporations. However, the venture capital in China is progressively shaping to better reflect the United States or European systems. Due diligence is already starting to look more like the Western template as the information is becoming much more focused on sophisticated data, with most private equity investors taking advantage of this information. Additionally, investigation of the investment opportunity now goes much deeper than it did in the past, when it was often just about getting to know the promoter presenting the business concept.[103]

Today, China's Venture Capital market is the second in the world in terms of deal value. Innovation is one of the main focuses of the venture capital firms, with state-sponsored VC funds becoming a popular way for local authorities to finance projects. Furthermore, due to

[102] In search of alpha: Updating the playbook for private equity in China, Wouter Baan, Nick Leung, Ivo Naumann, Vivek Pandit, and Oliver Ramsbottom, mckinsey.com

[103] Venture capital in China: Past, present, and future, David Ahlstrom, Garry D. Bruton, Kuang S. Yeh

the progressive opening of the economy, foreign VC funds are contributing considerably to most of the start-up investments in China, often by using directly USD to raise funds.
The recent government efforts in order to create favourable conditions for the development of micro-companies and to support the development of innovative start-ups, mainly through tax incentives, are raising the private equity firms importance as source of funds, otherwise difficult to raise from more conventional credit sources. Nonetheless, the trade war and the general slowdown in the Chinese economy in 2019 also affected start-up investments in China, especially among the telecommunication and tech industries. With the solution of contrast and recent turbulence, the start-up investments, and therefore the strictly linked venture capital business, are supposed to bounce back.

2.3.6 Non-standard financial sector

China's economic system is characterised by a very sizeable informal financial sector, which refers to financial intermediaries that are not registered with any regulatory agencies and therefore are not regulated. This performs an important role in helping the Hybrid Sector to raise funds and to grow from start-ups to successful industry leaders.
The Hybrid Sector can be defined as the sector that includes all non-state, non-listed firms, including privately or individually owned firms, and firms that are partially owned by local governments. Compared to the State Sector, including SOEs and all firms where the central government has ultimate control, and the Listed Sector, made of publicly listed and traded firms, the Hybrid Sector has been the one with the highest growth and major labour force employment. Together with banks, the alternative financial sector acts as the main fuel to its growth. In fact, even if in China the banking system remains the main source of credit, it has been shown that the majority of the bank credit goes to state-owned firms and only a small fraction goes to firms in the Hybrid Sector. Furthermore, firms from the Hybrid Sector can become listed and publicly traded, but especially in the past the accessibility of equity markets for these firms has been much lower than for former SOEs, mainly due to strict listing standards. Accordingly, China's SOEs have had much easier access to the debt market, due to government protection that lowers the costs for bankruptcy and financial distress.
Recently the government has progressively relaxed the listing criteria and regulations, allowing firms from the Hybrid sector to easily enter the market through IPOs.
The evidence of the Hybrid Sector growth comes from data: the sector grew at an annual rate of over 30% between 1998 and 2011, while the State and Listed sectors combined grew at

around 20% during the same period. In addition, the growth rates for investment in fixed assets of these sectors have followed the same trend during the period, implying that the Hybrid Sector is also more productive than the State and Listed Sectors. In the same way, the returns to capital has shown to be much higher.

Once a firm is established, a big source of funds comes from internal finance, predominantly through retain earnings. During the initial life cycle of a firm however, external financing is fundamental. External financing in China through alternative and informal channels, included funds from family and friends and loans from private (unofficial) credit agencies. The mechanism of trust is relevant in an environment such as the non-standard financial sector, that is not strictly regulated. Reputation and relationships acquire much more importance in raising funds and contracting with investors and business partners. These are also additional factors in line with the ideology and beliefs behind the Chinese country, as explained in the first chapter.

In emerging economies, family-run firms often emerge as the dominant form of ownership structure where there are weak minority shareholder protections. It is even more relevant among firms in the Hybrid Sector, where legal protection is weaker compared to firms in the State and Listed sectors. Generally, the non-standard financial sector was one of the main reasons for the good economic performance despite the lack of institutions compared to Western countries, especially for the Hybrid Sector.
It can be argued that conducting business outside the legal system in fast-growing economies such as China can actually be superior to using a more conventional law-based channel as the source of finances. Alternative institutions can adapt and change more rapidly than when the law is involved. Competition will then ensure that the most efficient mechanism prevails and this process does not require persuading the legislature and the electorate to revise the law when circumstances change. Ultimately, this is the reason why the development of alternative dispute resolution and contract enforcement mechanisms alongside the development of legal and other formal institutions can promote a broader base of economic growth that is also more sustainable in emerging economies. The coexistence of alternative and legal mechanisms can also exert positive impact on the development of legal institutions, acting as a competitor that forces an improvement of efficiency. In democracies there can sometimes be a lengthy

political process before significant changes can be approved, slowing down the system as a whole.[104]

Of course, there are also many downsides connected with the proliferation of informal financial institutions. These intermediaries are not often registered with any regulatory agencies and therefore are not regulated. This sector is often negatively connoted as "shadow banking" sector as they accept deposit-like funding and provide credit outside the traditional and higher regulated banking model. Technically, these financial intermediaries are often in violation of Chinese law, however, local governments, despite knowing the existence of these financial intermediaries, usually allow them to operate unless there is evidence that they may have done harm to the local economy.

They can and have been, a great source of credit, particularly for the smaller firms that are often not targeted by the largest banks that dominate the market and mainly lend to the bigger firms. Especially in a context of underdeveloped bond markets such as that of the Chinese case, where it is made even more difficult for local private firms to issue corporate bonds to raise money.

It is complicated to study the size and features of the informal financial sector due to the lack of official data or studies on a national level. A considerable amount of the information regarding this topic often comes from surveys of doubtful reliability.[105]

[104] China's Financial System and the Law, Franklin Allen & Jun "QJ" Qian

[105] The Chinese Financial System: An Introduction and Overview, Douglas J. Elliott and Kai Yan, The John L. Thornton China Center at Brookings

Chapter 3

Performance Analysis

3.1 Background

3.1.1 Data

In this section the aim will be to analyse how the Chinese stock market has behaved and is behaving in relation to the overall economy, that, as we have seen, has been the fastest growing global economy for the past three decades. The market performance will also be compared to the ones of the United States market as to utilise a developed country as a benchmark.
Once established if the market has under or overperformed in relation to the benchmarks and the overall economy's rate of growth, we will look for the main factors that can possibly explain the reasons behind certain performances.
The analysis can also be useful from the point of view of an American investor aimed at determining the advantages of investing in the Chinese stock markets compared to that of other world markets for the past twenty years, given certain limitations connected to the type of data analysed, as it will be pointed out in the next section.

In order to compute the different ratios and metrics necessary to realise the performance analysis, monthly data has been collected from Thomson Reuters Eikon. The analysis is focused on a twenty-year period, analysing from the year 2000 to 2020. The two mainland stock exchanges were only re-established in 1990 after a long period of inactivity due to the Communist Revolution and there was no law regulating securities up until 1999. I decided to focus only on the two recent decades as China and in particular its market, went through a great transformation just after the opening. Focusing solely on the new millennium should give more meaningful data that could otherwise be biased by the extreme volatility and speculation prior to the year 2000.

Three stock indexes have been selected in order to act as a benchmark to the performance of the Chinese indexes taken into consideration for this analysis.

The first one is represented by the American index S&P 500. It was created in the year 1957 and measures the stock performance of 500 large scale companies listed on stock exchanges in the United States. It is one of the most commonly followed equity indexes and it is tracked by many passive equity funds therefore, it can be chosen as a reliable benchmark. Not only is it the most representative index of the American stock market, but is even largely used as a measure of the global level of stock prices and therefore, as a global benchmark. This is due to the fact that it gathers the most valued stocks. It is a capitalisation-weighted index, meaning that its components are weighted according to the total market value of their outstanding shares: the impact that individual stock's price change has on the index is proportional to the company's overall market value.

The second benchmark used is the Dow Jones Industrial Average that measures the stock performance of 30 large publicly-owned companies listed on stock exchanges in the United States, thus making it a small-cap index compared to the previous S&P 500 and arguably not as complete. Additionally, it is not weighted by market capitalisation, but it figures as a price weighted index: the price of each component stock is the only factor taken into consideration when determining the value of the index. The difference is that a price movement of a single security can heavily influence the value of the index, differently from a capitalisation-weighted index whereby the impact of individual stock's price change is proportional to the company's overall market value. Stocks with higher share prices are given greater weight in the index.

The NASDAQ Composite is the third index taken as a benchmark and includes almost all stocks listed on the Nasdaq stock market, taking into account more than 2500 equities. Established in 1971, it was the first electronic exchange, where stocks are traded through an automated network. It is heavily weighted towards companies from the information technology field, in fact, nearly 50% of the composition is made up by the technology sector whilst consumer services, health care and financials are the next most prominent industries. It is a capitalisation-weighted index as is the S&P 500. Something that differentiates the Nasdaq from a number of other indexes is the fact that it is not limited to companies that have their headquarters in the United States.[106]

In order to calculate some ratios, an additional element is necessary: the risk free rate. As proxy for the free risk rate, I decided to use the United States 3-Month Treasury Bill. Even

[106] Investopedia

though in practice a truly risk-free rate does not exist (as even the safest investments carry a very small amount of risk), the interest rate on a three-month United States Treasury bill is often used as the risk-free rate for US based investors. It is a useful proxy because the market considers there to be virtually no chance of the government defaulting on its obligations. The frequency of observations is monthly in order to match the rest of the data.

Concerning the Chinese stock markets, the focus will be on the two mainland markets: the Shanghai Stock Exchange and the Shenzhen Stock Exchange. For each of the markets, three indexes are considered: the A Share, the B Share and the Composite that tracks the performance of both the A and B share classes.
The Shanghai Stock Exchange Composite (SSE Composite Index) is a capitalisation-weighted index that tracks the performance of all the A and B shares listed on the SSE. In the same way, the Shenzhen Stock Exchange Composite (SZSE Composite Index) includes all companies listed on the exchange. They are both large-cap indexes.
The A and B share classes performance are also analysed individually through the SSE A and SSE B Share Index and the SZSE A and B Share Index respectively, for comparison purposes. It is important to take into account that in regards to the Chinese stock markets, the B share markets are much smaller than the A share markets with less than 10% of the total outstanding shares.
Whilst the United States benchmark refers to the US Dollar for its currency, the Chinese indexes have the Renminbi as the reference currency. There are two exceptions, namely for the Shanghai SE B Share Index and Shenzhen SE B Share Index, because the B shares are traded in foreign currencies. The former's reference currency is the United States dollar whilst the latter's reference currency is instead the Hong Kong dollar.

3.1.2 Inflation and exchange rate

The analysis will be based upon nominal returns calculated from the end of month values of the respective Price Index. In order to think in terms of real returns, it is necessary to take into account the inflation of the respective countries, China and the United States, over the sample. From the data made available by the World Bank Database, the average annual inflation calculated over the last 20 years is similar: 2,23% for China against 2,17% for the United States. Therefore, in average terms the analysis should not be significantly affected, however,

if we plot the two inflation rates (measured in terms of consumer prices variation) a few noticeable differences appear.

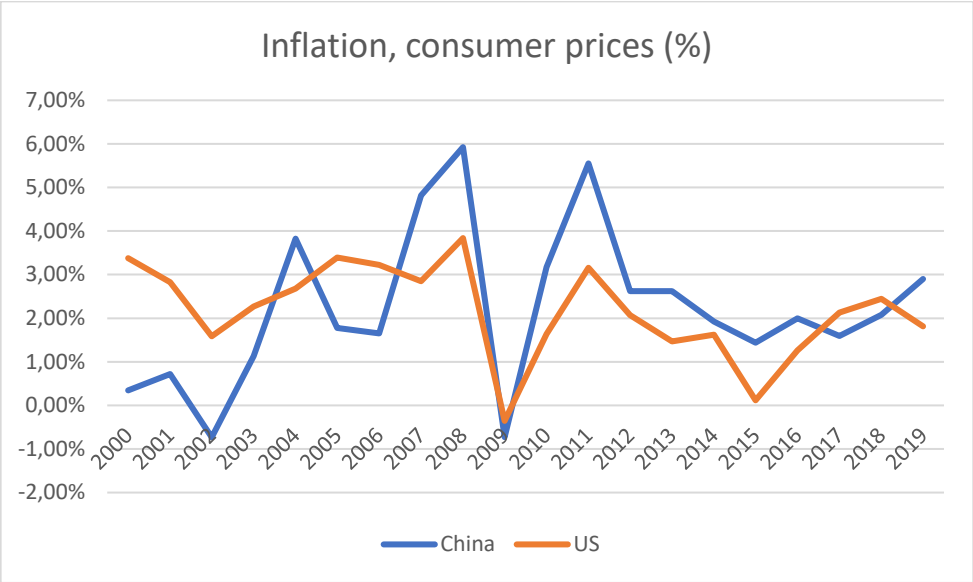

Figure 22, own elaboration

There is a big inflation gap right at the beginning of the period considered of approximately 3%. The period of deflation in China, circa 2000-2002, was a consequence of the tight monetary policy adopted by the government in order to control the high inflation that affected China during the 1990s. In fact, to maintain the growth of the State Sector, the government relied more on money creation to finance the wealth transfer from the late 1980s, contributing to high inflation.[107]

Higher peaks of inflations are also registered in China during the periods pre and post financial crisis. These are partially a consequence of the generous stimulus packages issued by the government in order to react to the slower economic growth and fall of prices. Another reason behind these high peaks in inflation could be the strong accumulation of foreign exchange reserves to avoid possible scenarios similar to the "Asian Crisis" of the 1990s. Nevertheless, foreign exchange reserves built up by the central bank purchases of foreign currency using the local currency as payment, directly increases the home currency money supply which can fuel inflation. A way to avoid this effect is the sterilisation of foreign exchange purchases previously described or, an increase in the required reserves set by the PBOC.[108]

In the last 7/8 years, the inflation has been more stable with the value roughly in line for

[107] China's Financial System: Past, Present, and Future, Franklin Allen, Jun Qian, Meijun Qian, SSRN Electronic Journal, March 2007

[108] The Chinese Financial System, An Introduction and Overview, Douglas J. Elliott and Kai Yan

China and the Unites States, varying at approximately 2%. The exception is given by the strong drop of the Chinese inflation which occurred in 2015, corresponding with China's crisis. The more stable the inflation, the more reliable is the performance comparison based on nominal returns. In periods where the inflation is high, it has to be considered that the returns are partially eroded by the higher inflation.

In terms of exchange rates, the situation has been more stable over the sample as showed by the chart below.

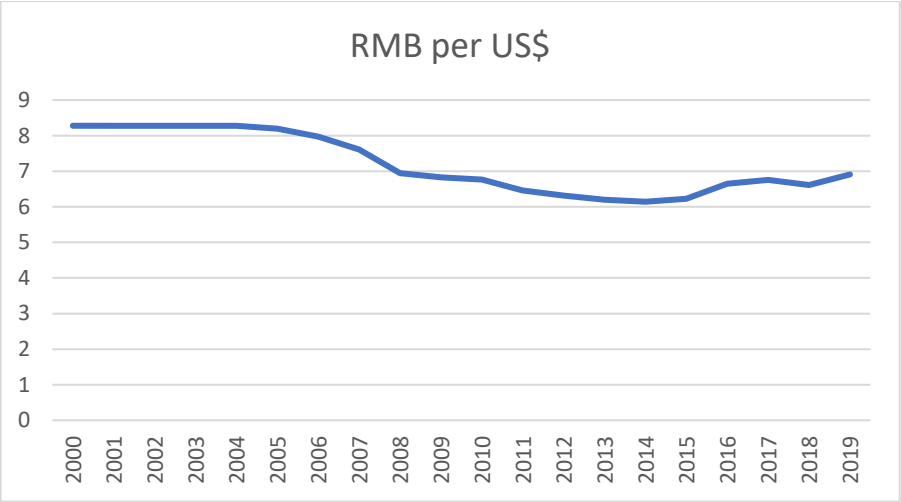

Figure 23, own elaboration

The PBOC historically had a tight control on the exchange rate. In the 1980s however, the Renminbi was set to unrealistically high levels in exchange with Western currency, causing several problems in terms of currency transactions. During the years, China worked to make the RMB more convertible without completely giving up the control, as the currency trades within a narrow band specified by the Chinese central government. Strictly connected with the recent policy of international integration and opening up of the economy, the institutions are working to make the tax system more progressive and improving at the same time the exchange rate flexibility and policy transparency. In this regard, an efficiently functioning Foreign Exchange market is fundamental to help the financial system prepare for the greater capital flow volatility. These are all essential processes in order to allow for a successful shift from high speed to high quality growth. Overall, China certainly has the resources to achieve a smooth transition to a floating exchange rate thanks to the large amount of foreign currency reserves. Until now, the markets have adjusted quite well to the increased volatility due to the increased flexibility, without evident shocks.[109]

[109] People's Republic of China, IMF Report No. 19/266

A flexible or floating exchange rate has some clear advantages over a fixed exchange rate. With a flexible exchange rate the government does not need to hold a considerable amount of foreign reserves, that are otherwise necessary to maintain a certain level of exchange rate when the pressure on the currency increases. At the same time, a floating exchange rate gives the advantages of the free market, freeing the government from problems concerning the balance of payment, as the relation between the exchange rate and the BOP will be driven by demand and supply.

Concerning the performance analysis, it is based on local currencies (RMB for the Chinese indexes, US$ for the benchmarks) in order to capture the relative points of view of domestic investors.
From the point of view of an international investor, it should be noted that due to appreciation of the Renminbi relative to the dollar, the return over the sample for an investment in the Chinese markets should be adjusted, and therefore increased, to the change in the exchange rate. Furthermore, the effects of taxes have not been considered to avoid adding a further layer of complications.

3.2 Preliminary analysis

3.2.1 Return

The starting point is represented by the monthly prices. In order to have more information about the performance, the monthly returns have been calculated from the monthly prices utilising Excel and resulting in 247 observations to analyse.

It is important to take into account the fact that as the returns have been calculated through a mathematical calculation starting from the Price Index, they differ from those that can be gathered from the Total Return Index.
If a price index only considers price movements (capital gains or losses) of the securities that make up the index, a total return index includes even dividends, interest, rights offerings and other distributions realised over a given period of time. Therefore the monthly returns, calculated from the Price Index, do not assume the reinvestment of all cash distributions but rather isolate solely the price increase/decrease over time. The main consequence is that the return of a total return index will be always higher than the return of the respective price index.

The returns can be calculated in two different way: as logarithmic returns (r) or as simple arithmetic returns (R).

$$r_t = \ln(\frac{P_t}{P_{t-1}}) \qquad R_t = \frac{P_t}{P_{t-1}} - 1$$

Where P_t represents the Price Index with monthly frequency of observation. The logarithmic returns, above calculated, are more appropriate in a situation where it is necessary to analyse returns over multiple time periods. The main difference between simple or linear returns and logarithmic returns is the fact that simple returns are not cumulative whilst log returns are cumulative. The additivity is a very convenient property as it allows for easier time-aggregation when analysing multi-period returns.

The log return for a time period is the sum of the log returns of partitions of that time period. Therefore, the annualised log return can be obtained simply by summing up the log returns of the months within the year. Furthermore, the average return can be computed by averaging the sum of individual log returns. Taking the average of simple returns does not give you an average of the individual returns.

On the other hand, log returns are not always the best, as they are rather an approximation. The log return is in fact a mathematically convenient proxy for the percentage change in the price.
Simple returns are more appropriate in situations where low frequency financial data is analysed. When returns are very small, common for trades with short holding durations, there would not be much difference between simple and log returns, as $\ln(\frac{P_t}{P_{t-1}})$ is approximately equal to $\frac{P_t}{P_{t-1}} - 1$. However, as the time interval becomes greater, the difference in computation becomes significant. Because the time interval of the analysis is wide, covering a period of 20 years, the computations will be based on logarithmic returns.
From a buy-and-hold style investor point of view, it may be better to look at the log-returns because they cancel out prices fluctuations, whereas, percentage changes in price (simple returns) do not.
Because logarithmic returns are additive, it becomes easy to show the cumulative returns of the different indexes simply by summing the monthly log returns over time.[110]

[110] Why Log Returns, quantivity.wordpress.com

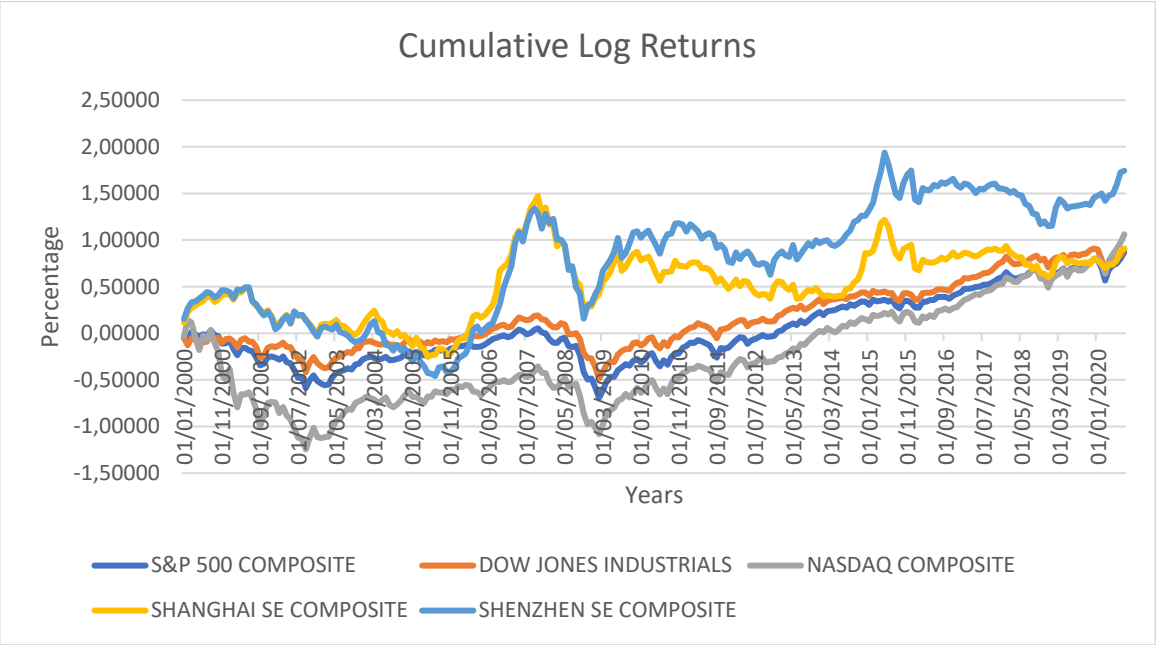

Figure 24, own elaboration

As it can be seen from the Cumulative Returns chart, the Chinese stock markets have outperformed, usually, the three benchmarks taken into account. The returns spread is particularly large in the biennial pre financial crisis during the years 2006 to 2008. Additional two peaks can be highlighted, 2009-2012 and 2014-2018. The reasons and motivation behind the spread behaviour will be analysed in the following part of the chapter.
Another interesting factor is the relative comparison between the two mainland stock markets. If before 2010 the SSE was mostly on par or overperforming compared to the SZSE, after, we notice a quick inversion of the trend, with the SZSE consistently overperforming all the other indexes considered in the analysis. It must be considered that the chart is taking into account the cumulative log returns rather than the simple arithmetic returns. The approximate relation between the simple returns (R) and the log returns (r), can also be expressed as following: $r_t = \ln(1 + R_t)$.

Logarithmic returns make it possible to talk about an average return, simply by taking the arithmetic average of the log returns over a certain period.

The first two basic indicators that will be considered are the monthly average returns and the standard deviation of monthly returns. They respectively express the risk and rewards associated with investing in the indexes.
The monthly mean return has been obtained from the arithmetic average of the 247 monthly returns. They have been subsequently annualised in order to obtain a more meaningful result for comparison purposes.

In the case of log returns, as they scale linearly with time it is sufficient to multiply the average monthly return by 12 to obtain a reasonable approximation.
The two United States benchmarks; the S&P 500 and the Dow Jones both show a very similar result, with respectively 4,2% and 4,38%. This is not surprising as their target is somewhat similar, with the difference that the Dow Jones tracks only the 30 largest cap companies whilst the S&P has a wider range, targeting the 500 largest companies listed in the United States. They both reflect the performance of blue chip companies and they aim to provide a wide picture of the stock market movements.

It can be noted that the annualised log return of the SSE Composite is 4,4%, very close to the two benchmarks previously described, however, if we look at the chart of Cumulative Log Returns we can see how the SSE Composite cumulative returns have been higher compared to the S&P 500 during most of the period. This is a consequence of the fact that the investment horizon of the analysis covers a wide sample of 20 years, that tend to cancel out the return variations when looking simply at the average annualised return.
The performance of the Shenzhen Stock Exchange has been more impressing, with an annualised return of 8,43%. Overall, the good performance of the Chinese indexes over the United States benchmarks works as a validation of the fact that there is a certain tendency which unites several economies: developing countries such as China who have an immature and highly speculative trading environment tend to offer higher returns than developed countries.

The third benchmark taken into account is the NASDAQ Composite which showed over the sample period a higher annualised return, equal to 5,14%. This is mainly due to the recent and steep growth in monthly returns, starting from approximately 2010. This behaviour is more evident from the Cumulative Log Return chart, following the grey line. The NASDAQ Composite is a very broad index but heavily skewed towards the information and technology sector, therefore, this can be an explanation of the recent favourable performance. The information and technology's biggest players have progressively increased their solidity and profitability, and they are usually characterised by a very low level of debt. Their capacity to perform even in situations of high stress (for example during the recent global pandemic) is one of the main reasons for the recent positive performance of the Nasdaq which overperformed both the S&P 500 and the Dow Jones.

An interesting aspect to note is the high gap between the A and B shares return for both the Chinese mainland stock markets. From the data considered, the B shares overperformed the A shares, with an average return spread of 4% between these two.

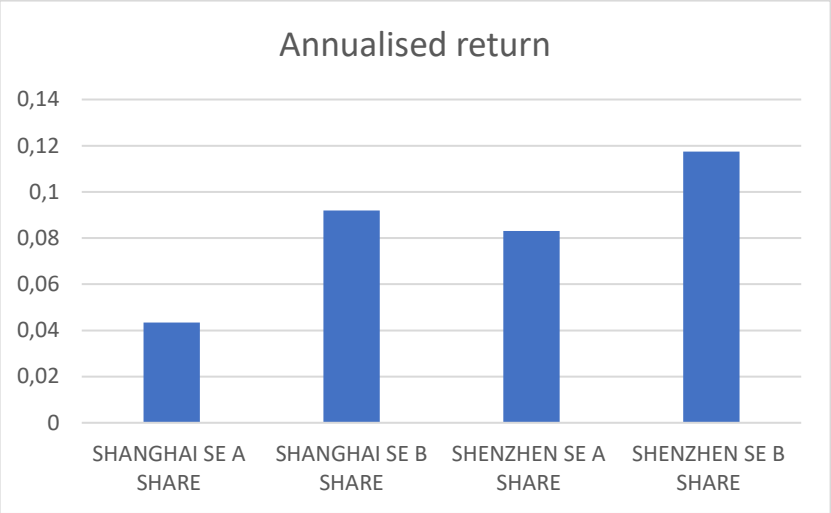

Figure 25, own elaboration

A few assumptions can be formulated in regards to this phenomenon.

The B Share markets, where shares are traded in foreign currency, were more widely available to foreign investors that had instead a very difficult time accessing A shares because of the Chinese government regulations. Since the establishment of the B shares markets shortly after the A shares, many investors have been attracted to participate and trade, allowing for more room for speculation. The Chinese market shares many characteristics with the other emerging market countries, namely high risk and high potential gain. Due to China's exponential economic growth, its market has been an appealing investment for foreign funds and investments.

Several companies are quoted both on the A and B share markets, however, due to currency exchange reasons Chinese investors may have difficulty accessing B shares. While these shares are traded in differing currencies, they are issued at Renminbi face value. Due to the limited access, it often occurred that the stock of the same company traded at much higher valuations on the A shares market when compared to B shares. The difference in Price Index levels is particularly prominent in the Shanghai Stock Exchange, where the A Share Index level is more than 14 times higher than the B Share Index level. There are different factors responsible for the price and returns differences that will be further analysed later in this

document.[111]

On the other side, the limits to Chinese investor participation to the financial markets could have hindered the returns on the A Share markets, together with a tighter control exercised by the institutions. These observations however stand true only if we consider the very first period of the sample of observation.

An in-depth analysis into the respective annualised return makes it evident that the current situation is very different from the past. The recent politics of opening up are heavily changing this trend. Whilst the access to the A shares market is facilitated and its performance pushing ahead, the B shares market has substantially dropped due to a heavy wave of sell-offs. Taking into account just the 2019-2020 performance in the data, the average monthly return of the SSE A Share Index was 1,55% against the -0,34% of the B Share counterpart. Looking at the Shenzhen market instead, the gap is even higher: 2,97% for the SZSE A Share Index against the 0,68% of the SZSE B Share Index. There is evidence of an absence of growth characterising the B Share markets, that have been slowly but steadily losing relevance over the year. Today, the combined market value of B shares amounts to less than 0.2% of the capitalisation of A shares issued by companies in Shanghai. Interest in B shares has also declined, specifically in terms of average daily trading volume. Traders have bought and sold about 25 million B shares on average per day in Shanghai in the last year, compared to 27.1 billion for A shares.

Some of the possible causes pointed out by the analysts to justify the negative performance are the worsening liquidity and deteriorating corporate fundamentals. Today, the B market is quite an illiquid market and has not seen any new listings in quite some time. Given its small size, it is also is very vulnerable to any sell-offs that may trigger a chain reaction of negative returns.

However, the main trigger can likely be found in its own success. The high returns of the B Share markets have contributed to the liberalisation process that China has decided to undertake, opening the door for foreign investors to more than 3,000 companies with A shares. As China's capital market is constantly opening up, the advantages of B shares are disappearing.

Along with the progressive opening, the Chinese institution has progressively eased foreign

[111] B-Shares, Investopedia

exchange market rules to elevate RMB trading, allowing for faster and easier trading of local currency shares whilst simultaneously decreasing the previously existing valuation spread.[112]

3.2.2 Risk

Looking at the average return alone is not enough to have an idea about the indexes' performance, but it must instead be related to the risk.

In terms of indexes' risk, we are concerned by the variability of the returns from the average. The standard deviation is the main indicator used for the purpose. The sample standard deviation has firstly been calculated on the log monthly returns and then subsequentially annualised. I decide to compute the sample rather than the population standard deviation as the starting point is represented by the monthly observation of the Price Index which can be interpreted as a sample of a larger population. From the analysation of the sample, the monthly observations, we try to generalise the findings in regards to the indexes movements over time.

In order to get an estimate of the annual standard deviation of returns, it is necessary to multiply the monthly statistic by the squared root of 12. This is a consequence of the fact that the standard deviation scales with the squared root of time.

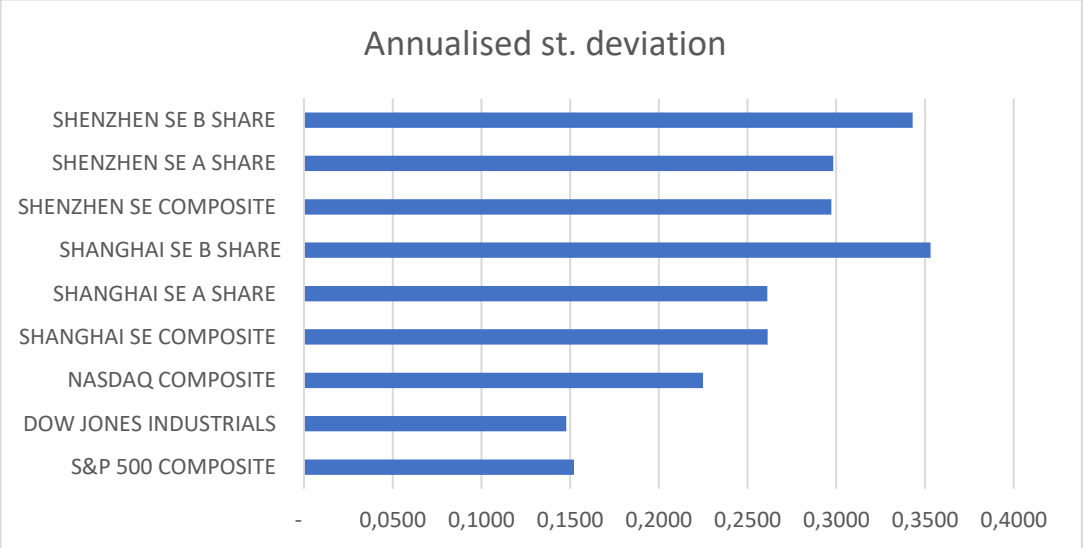

Figure 26, own elaboration

[112] Mysterious sell-off in forgotten B shares shows the extent of China's unfinished capital market reforms and liberalisation, Zhang Shidong, South China Morning post, 2020

If in terms of returns, the Chinese markets were leading and consistently outperforming the benchmarks, we could not say the same about the level of risk associated. The two benchmarks, S&P 500 and Dow Jones are once again very close in terms of risk, with an annual volatility level of around 15%. The latter in particular, associates a lower risk to a slightly higher average annualised return compared to the former.
The volatility of returns for both the SSE and SZSE indexes is much higher, reflecting a history of speculation and high returns. The higher volatility can be a consequence of various factors such as a lesser diversification in composition and a higher sensitivity to fluctuations. The paradigm under which higher returns are matched to higher risk seems to be respected by the data, apart from some slight inconsistencies as for the S&P 500 and Dow Jones, however, it is not too relevant and within a reasonable margin of error.
Looking at the Chinese A Share indexes, it is evident how close they are both in terms of annualised return and volatility to the respective Composite Index. Today, the dimension of the B Share market in both the SSE and the SZSE is very limited, therefore, it is natural that the composite performance reflects almost completely the A Share market. Before 2001, A shares and B shares markets were completely segmented from each other. A shares could only be owned by domestic investors and B shares were legally accessible to international investors only. The China Securities Regulatory Commission (CSRC) proclaimed the opening of the A shares market by employing a Qualified Foreign Institutional Investors in 2002. Since then, the B Share market started to lose appeal and size, slowly becoming a sort of "dead market", with very few participants and stocks traded.

With the opening up of the A Share market, the government decided to opt for a more coherent trading policy that would promote integration between A and B markets. It however did not completely solve the issue of price differentials between the two share markets that exist for dual-share firms, issuing both A and B shares. The low trading activity and liquidity of the B side, together with the restrained size of the market, are responsible for the low B shares prices and high returns. The relatively illiquid B-shares have a higher expected return and are priced lower in order to compensate investors for increased trading costs. These factors also make it harder to overcome the differentials that cannot simply be alleviated by arbitrage activities as it would happen in an efficient and perfectly liquid market. For these reasons, even if a certain level of market segmentation still exists, it is very hard to exploit.[113] In general, the bigger the index the more diversified it is and therefore it carries a lower

[113] B-shares' Discount Puzzle in China: A Revisit of Dual-share Firms, Donald Lien & Chun-Da Chen, 2017

investment risk expressed in terms of volatility. For example, composite indexes are more diversified than their counterparties, as they are composed of more stocks and cover a bigger part of the Chinese market. From the above chart, is evident this sort of situation with United States benchmarks leading not only due to their size and stability but also due to their efficient diversification in terms of business. The Nasdaq shows higher volatility compared to the other two United States benchmarks even due to the fact that it is strongly focused on a specific sector, the information technology sector.

Another measure of variability of returns that can be taken into account to express the risk of an index, is the mean absolute deviation. Even if it is of secondary importance compared to the volatility, it can have its applications. It is measured on the monthly returns as

$\frac{1}{n} * \sum |r_t - \bar{r}|$.

The standard deviation is considered the most appropriate measure of variability when the mean is the best measure of the distribution's center, and when the distribution of data is normal. The mean absolute deviation, even if less used, can arguably be considered a better gauge of variability when there are distant outliers or the data is not well distributed. In the case of large outliers, the standard deviation will register higher levels of dispersion or deviation from the center, compared to the mean absolute deviation.[114] The standard deviation is often preferred because it is mathematically easier to work with when calculations become more complicated.

Looking at the values measured for the mean absolute deviation of monthly returns, there is evidence to show that they are consistently lower than their counterparties, measured for standard deviation. Due to the way that the latter is computed, summing the square of the deviations from the mean, higher weight is given to high deviations. The fact that the difference between these two statistics is quite significant, less in the case of the benchmarks and more in the case of the Chinese indexes, can suggest that the returns of the indexes might be far from being normally distributed. This aspect will be analysed more in depth in the following pages.

[114] The Difference Between Standard Deviation and Average Deviation, Investopedia

3.2.3 Correlation

The correlation can be also computed in order to measure the degree at which Index returns are moving in the same way as the benchmark considered. It is measured as the covariance between the two divided by the product of their respective standard deviations. The correlation is scaled between +1 and -1: a positive correlation means that the index and benchmark considered tend to move in the same way. If negative, when the return of one is increasing, the return of the other is decreasing. In the case of zero correlation an absence of linear relationship between the two is reflected, however, does not deny other forms of non-linear relationships.

The correlation has been computed three times for each index, first, taking the S&P 500 as a benchmark and after, the Dow Jones and Nasdaq.

Once again the S&P 500 and Dow Jones show to be very similar benchmarks in terms of return distribution, with a correlation equal to 0,958. The Nasdaq is instead more positively correlated with the S&P 500 (0,854) than with the Dow Jones (0,749). In every case the correlations are very high, as it is expected from such broad indexes that aim to replicate the global market movements.

Switching to the Chinese point of view, that remains the core of this analysis, the correlations decrease dramatically, even despite remaining positive for all the comparisons taken into account. As we talk about the same type of securities it is rather difficult to have negative correlations. The SSE and SZSE's correlation with the S&P 500 is respectively 0,32 and 0,268. The trend confirms the tendency of developing countries to have a much lower correlation with the rest of the world's markets. It also highlights one of the characteristics of China's stock market: the insulation. The fact that foreign investors did not have access to the A Share market for many years and even today have limits and constraints, has contributed to the creation of a sort of market segregation. Market segregation and the currency shield helped China to protect its economy and markets during the Asian economic crisis of 1997 and the global financial turmoil of 1998 yet simultaneously acted as a barrier to the international integration.[115]

China created the B Share market in order to overcome some of the downsides, but as we have stated before, its size is not enough to avoid the insulation.

[115] China Stock Market in a Global Perspective, Sheldon Gao, Dow Jon Indexes, 2002

Indeed, the fact that China's economy has been and remains partially an insulated economy, despite the important progress in reforming and opening its markets explains why stock markets do not depend very much on the fluctuations of the global market. The situation in terms of insulation has improved recently with the integration policies issued, and it is testified by the increase in returns correlation. The correlation between the SSE Composite and the SZSE Composite with the S&P 500 has raised respectively to 0,50 and 0,39 if we take into account only the monthly returns relative to the last 5 years.
The correlation with the NASDAQ Composite is slightly lower for both the mainland China's markets compared to the other two benchmarks considered. The two indices that have the lowest correlation with the benchmarks are the B Share markets. Overall all the Chinese indexes analysed display a lower correlation with the Nasdaq compared to S&P 500 and Dow Jones Industrials.
With the recent reforms aimed to enhance competition and financial integration, it is reasonable to expect that the correlation between broad indexes and the Chinese stock markets will further increase in the near future. The SSE and SZSE will more likely line up progressively more with the other big players, both in terms of returns and volatility. This however, does not take into account the recent trade tensions between China and the United States, as a further escalation will most likely destabilise and bring unpredictable results in terms of share prices.

3.3 Risk-adjusted performance measurement

3.3.1 Measures which assume normally distributed returns

The basic statistics analysed until now are not sufficient enough to compare the relative performance of the Chinese stock markets. A better tool for this purpose is constituted by the risk-adjusted performance measurements. This category includes several ratios that differ by characteristics and applications, yet they all share a common aspect: they compare the return to the risk taken in order to earn this return.
The return in the risk-adjusted performance measurements is generally measured either in terms of absolute return or relative return. Relative return means the return is in excess to a certain target, that can be an index of benchmark or the risk free return.

Risk-adjusted performance measures are commonly used for performance evaluations to rank competing investment strategies ex-ante and ex-post, according to their respective risk-

adjusted returns. Therefore, they can be a very effective tool for the comparison of Stock Indexes over the years.[116]

One of the most used ratios to evaluate the performance of a fund or an index in our case, is the Sharpe Ratio. Introduce by William F. Sharpe in 1966, it expresses the return for unit of risk. It is calculated as the ratio between the mean excess return and the annualised volatility, as follows:

$$Sharpe\ Ratio = \frac{\bar{r}_i - r_f}{\sigma_i}$$

where:

$\bar{r}_i =$ average annualised Index return

$r_f =$ risk free rate of return

$\sigma_i =$ annualised standard deviation of the Index returns

The Three Month Treasury Bill Rate has been taken as a proxy for the risk free rate. In order to obtain an annualised value of the risk free, I have taken the average of the monthly observed rates of the Treasury Bill along with the sample, from 2000 to 2020, as it is already accompanied by a reference period of one year.[117] In order to properly talk about excess returns (return minus risk free rate), it would be necessary to take into account the risk free rate relative to each respective country. In the case of China, it is hard to find a reliable source for the risk free return. It is not feasible due to the lack of information about rates and their development over time, therefore, it has been adopted a unique measure of free risk for all the indexes considered, without distinctions. Besides the evident drawback, it allows for a more direct comparison focused solely on mean and standard deviation of the returns.
This ratio is often adopted due to its ease of calculation and it is based on the mean-variance criterion developed by Markowitz: the individual preference of investors are based only on two parameters, mean and variance (or standard deviation as measure of the volatility). Individuals prefer, given a certain level of risk, portfolios characterised by higher returns. A higher Sharpe Ratio means a better performance of the fund/index.[118]
The values for the Sharpe Ratio have been annualised, as this ratio is most commonly

[116] Risk-Adjusted Performance Measurement – State of the Art, Alexandra Wiesinger, 2010
[117] Data from the Federal Reserve System
[118] Il criterio media-varianza e il modello CAPM, Enrico Saltari

computed on an annual reference. The table below reports the values, ranked by the highest to the lowest.

Name	Sharpe Ratio
SHENZHEN SE B SHARE	0,2961
SHENZHEN SE COMPOSITE	0,2300
SHENZHEN SE A SHARE	0,2250
SHANGHAI SE B SHARE	0,2150
DOW JONES INDUSTRIALS	0,1885
S&P 500 COMPOSITE	0,1712
NASDAQ COMPOSITE	0,1577
SHANGHAI SE COMPOSITE	0,1076
SHANGHAI SE A SHARE	0,1051

Table 1, own elaboration

It is evident how the indexes relative to the B shares market are considerably overperforming relative to their counterparties, mainly due to their relatively high returns compared to the rest of the sample. It is interesting to observe that the Shenzhen SE Composite performed extremely well in comparison to all the others, overperforming even the Shanghai B Share index. In particular there is a big gap in terms of Sharpe Ratio with the Shanghai SE Composite, that is positioned at the bottom of the rank under the S&P 500 and NASDAQ Composite. The SSE returns were higher than the benchmarks on average, but not enough to compensate for the higher risk that characterise the Chinese share markets. What is to be remembered in this analysis is the fact that whilst earning high returns compared to other indexes, China's stock markets bear more risk. However the SZSE returns were considerably higher, enough to outperform all the United States benchmarks. The Sharpe Ratio is not however free from shortcomings, as this will be soon noted.

Another relevant ratio is the M^2, that can be seen as a sort of evolution of the Sharpe Ratio, as it is computed starting from it. The M^2, also know as Modigliani-Modigliani measure, measures the risk-adjusted return relative to that of some benchmarks. Due to its structure, it can allow an easier comparison of the indexes, in our case.

It is calculated as follows:

$$M^2 = r_f + \sigma_b * S_i$$

where:

σ_b = standard deviation of the benchmark's returns

S_i =Sharpe Ratio of the index of interest

Three measures of M^2 have been computed for each index, following the same approach adopted for the correlation. The three benchmarks of choice are the three United States indexes. It has a clear application advantage compared to that of the Sharpe Ratio: it is not a dimensionless ratio but is instead expressed in percentage returns, making it much more intuitive. The Sharpe Ratio can in fact be tedious to interpret, especially in cases where it assumes a negative value.
In terms of M^2, the returns are higher when we take into account the Nasdaq as the benchmark, due to the fact that is the one with the highest dispersion. As expected, due to the similarity between the metrics, the results are in line with the Sharpe Ratio, with the Shenzhen markets overperforming the Shanghai markets. The Chinese markets are not as well performing as it could have seemed from a first superficial look to returns, with values that are considerably closer to each other, mainly due to the fact that they tend to bear too much risk.
When the benchmark coincides with the index for which the M^2 is being computed, the M^2 becomes equal to the annualised return of the index by construction.

The Sharpe Ratio however carries some issues, as previously introduced. One of the most relevant is connected to volatility, used as the only measure of investment's risk. The volatility, measured by the standard deviation of returns, does not discriminate between gains and losses, contrary to what a rational investor would do. As volatility does not treat variability in gains and losses separately, the Sharpe Ratio penalises for both downside and upside variability in returns in the same way. In reality investors tend to have a mixed risk attitude: they can be risk seeking in the domain of gains, as the potential for very high rewards is attractive, and risk adverse in the domain of losses.

With the Value-at-Risk (VaR) the volatility as a measure of risk is dropped in favour of a different approach: it aims to estimate the maximum loss that the investor can face with

his/her investments, over a certain target horizon and with pre-established confidence levels. The VaR focuses specifically on the downside risk. In this analysis we look at the maximum percentage loss (negative return) that the index will encounter over the period considered, in 95% or 99 % of all cases depending on the confidence level adopted.
In order to compute the VaR for our indexes, the parametric approach has been adopted. To obtain a parametric approximation it is necessary to assume that the stock returns are normally distributed. With just two factors, mean return and standard deviation, it is possible to plot the normal distribution curve and apply the Value-at-Risk. The VaR is calculated as a quantile of the standard normal distribution at a certain confidence level, using the expected value and the standard deviation as follow:

$$VaR = \bar{r}_i + z_c * \sigma_i$$

where:

z_c = c-quantile of the standard normal distribution

Depending on the confidence level considered, 95% or 99% in our case, z_c will be respectively equal to -1,645 or -2,326.[119]
Despite its ease of calculation, this measure is based on very strong assumptions, namely returns normally distributed and i.i.d. These have historically proven to be far from reality, as we will see later on.
The VaR can be computed either on a monthly horizon, taking into account monthly average return and standard deviation of monthly returns, or on an annual horizon.

We can take as an example the monthly VaR value for the S&P 500: at a confidence level of 95% it is equal to -0,069. It signifies that there is a 5% chance that the Index will lose 6,9% or more in a month. The VaR calculated for the Chinese Indexes is higher (in absolute value), respectively -12% and -13% for the SSE and SZSE.
The two main benchmarks, S&P 500 and Dow Jones, have the lowest value for VaR both at 95% and 99% confidence level, acting as a confirmation of the fact that they carry less financial risk. From the computation of the yearly VaR, we can see how there is a 5% possibility that the SSE and SZSE could lose 39% or more in a year, compared to 20% of the two main United States benchmarks. This is a consequence of the fact that the Chinese

[119] VaR, RDocumentation

markets have shown to be highly speculative over the years, bringing potentially high returns but also being able to lose more than a third of their value in just a single year.

Another interesting statistic that can be computed based on the VaR is the Reward to Value-at-Risk. It can be calculated as follows:

$$RVaR = \left(\bar{r}_i - r_f\right) * 1/|VaR|_i$$

The RVaR effectively measures the mean excess return on VaR, therefore, can be directly compared with the Sharpe Ratio giving a different prospective on risk. It allows to gauge the performance of an index rescaled by a measure of extreme risk as opposed to total risk.[120]

Name	Reward to VaR (95%)
SHENZHEN SE B SHARE	0,2273
SHENZHEN SE COMPOSITE	0,1690
SHENZHEN SE A SHARE	0,1647
SHANGHAI SE B SHARE	0,1553
DOW JONES INDUSTRIALS	0,1397
S&P 500 COMPOSITE	0,1251
NASDAQ COMPOSITE	0,1114
SHANGHAI SE COMPOSITE	0,0729
SHANGHAI SE A SHARE	0,0711

Table 2, own elaboration

In the table above we can see the indexes ranked by this statistic's value. The VaR considered in order to compute the RVaR is the annualised VaR, thus allowing for a consistent and meaningful comparison of data.
The values are in line with what we have seen for the Sharpe Ratio, meaning that by taking into account the Value-at-Risk instead of the standard deviation as measure of the indexes' risk, the ranking does not get affected.

One issue connected with the VaR is that it does not make any statement about the loss outside the confidence level considered. The Conditional Value-at-Risk (CVaR) has been developed properly to overcome this shortcoming. CVaR describes the expected loss under

[120] Reward-to-Value-at-Risk Ratio, Dowd, 2000

the condition that the VaR is exceeded. Also known as Expected Shortfall (ES), it considers only those values of the distribution that exceed the VaR, by taking a weighted average of the extreme losses in the tail of the distribution of possible returns. In terms of risk exposure, the CVaR leads to a more conservative approach compared to that of the VaR. As it takes into account values beyond the threshold, it is particularly useful in order to evaluate the more volatile investments. CVaR can arguably be considered better than VaR as it gives an average loss rather than simply a wide range of potential losses.[121]

The CVaR has been calculated on monthly returns, at a 95% confidence level, following a parametric approach, meaning that it is adapted for the normal distribution of returns and utilises the parameter of the normal distribution, as for the VaR previously calculated.
By construction, it is naturally lower than the VaR, focusing on the amount of tail risk. The S&P 500 Index has a CVaR value of -0,087, lower than the VaR value of -0,069.

The Expected Shortfall for the SSE SE Composite and SZSE SE Composite is respectively equal to -0,152 and -0,170. This means that in the latter case, in the worst 5% of the returns the average index loss will be 17%. It is arguably better to consider this 'worst case scenario' due to the fact that the simple VaR could lead to an underapproximation of the risk. Through the ES we can have an idea of the magnitude of the negative returns in the worst 5% of the cases.
The gap between VaR and the Expected shortfall is also an interesting indicator. Indeed, an index presenting a low VaR but big Expected Shortfalls, is likely to suffer from big shocks in its returns. That is why for the indexes with the same VaR, the lower the gap between VaR and ES, the better. The behaviour however, in terms of gap between VaR and CVaR is similar, only slightly higher for the B Share indexes. In general the 2 indexes, S&P 500 and Dow Jones, are confirmed to be the safest in the sense that they will face the lowest maximal loss with a 95% confidence interval and present the lowest risk in case of abnormal losses, averaging at 8,5%.

The CVaR or ES can also be computed on annualised inputs in order to obtain a yearly metric. By the use of the ES as a measure of risk, we can compute the Conditional Sharpe Ratio, firstly introduced by Argawal and Naik in 2004, as follow:

$$CSR = \frac{\bar{r}_i - r_f}{-CVaR_i}$$

[121] Risk-Adjusted Performance Measurement – State of the Art, Alexandra Wiesinger, 2010

Below, we have the ranking following the Conditional Sharpe Ratio value.

Name	Conditional Sharpe Ratio
SHENZHEN SE B SHARE	0,1721
SHENZHEN SE COMPOSITE	0,1293
SHENZHEN SE A SHARE	0,1261
SHANGHAI SE B SHARE	0,1193
DOW JONES INDUSTRIALS	0,1067
S&P 500 COMPOSITE	0,0958
NASDAQ COMPOSITE	0,0860
SHANGHAI SE COMPOSITE	0,0568
SHANGHAI SE A SHARE	0,0554

Table 3, own elaboration

The ranking accurately reflects the one relative to the original Sharpe Ratio. Therefore, we can conclude that focusing specifically on the tail risk does not affect any index in a particular way, but rather, has a smooth effect on all the samples: in a similar way, the Conditional Sharpe Ratio is consistently lower than the Sharpe Ratio for all the indexes analysed.

3.3.2 Measures which account for higher moments of distribution

The ratios described and measured until now were based on a very strong assumption: the normal distribution of returns. In fact, only if the returns follow a Gaussian distribution it makes sense to talk about volatility as a good measure of financial risk, as only in this case the probability distribution depends only on mean and variance (or standard deviation).
In the real world however, very rarely are the returns normally distributed. Instead, they are often characterised by a certain level of skewness and kurtosis that are respectively the third and fourth standardised moments of a distribution, after mean and variance.

The skewness, that measures the probability of obtaining returns different from the mean, is a measure of the asymmetry of the distribution. A normal distribution of returns for example, is perfectly symmetric, with a skewness level of zero.
A positive skewness means that more extreme values on the right tail of the distribution exist. In this case it happens that mean > median > mode. In the case of negative skewness, it

happens the opposite: mode > median > mean. There is a greater probability compared to that of the normal distribution, to face extreme negative returns. The chart below summarises what has been stated.

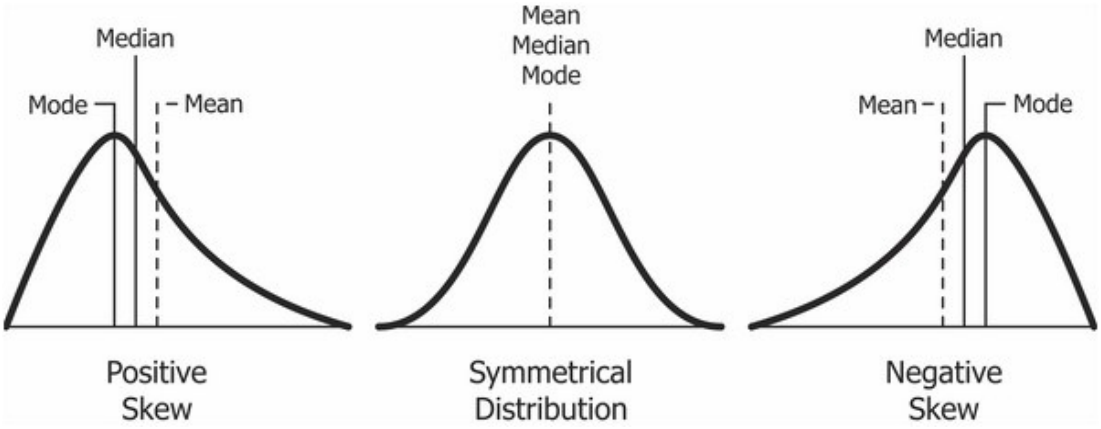

Figure 27, Skewness, orelly.com

In order to measure the degree of asymmetry of the returns' distribution, the sample skewness has been computed as follow:

$$S = \frac{n}{(n-1)(n-2)} \sum \left(\frac{r_i - \bar{r}_i}{\sigma_i} \right)^3$$

$S > 0$ means positive skewness, whilst $S < 0$ means negative skewness.

The kurtosis measures the extreme value in either tail of the distribution, in other words, it measures whether the data is heavy/light tailed compared to the normal distribution. A normal distribution has a kurtosis value of 3 and is called *mesokurtic*. A distribution with kurtosis higher than 3, called *leptokurtic*, is characterised by high peaks and 'fat tails'. On the contrary, a *platykurtic* distribution (kurtosis < 3) tends to be flattered with thinner tails. In this case, the probability of extreme outliers is lower than that of the normal distribution.
For ease of interpretation, I decided to calculate the Excess kurtosis (Kurtosis – 3), that is normalised around the zero, as follows:

$$EK = \left\{ \frac{n(n+1)}{(n-1)(n-2)(n-3)} \sum \left(\frac{r_i - \bar{r}_i}{\sigma_i} \right)^4 \right\} - \frac{3(n-1)^2}{(n-2)(n-3)}$$

We distinguish three cases:

if $EK = 0$ the distribution is *mesokurtic*;

if $EK > 0$ the distribution is *leptokurtic*;

if $EK < 0$ the distribution is *platykurtic*.

Going back to our data, skewness and kurtosis have been computed on the basis of monthly returns. We can see a clear pattern in term of skewness, as all the indexes exhibit negative skewness besides two exceptions: the SSE and SZSE B Share indexes are instead characterised by a positive skewness. This indicates that a big part of returns are underperforming compared to the average, that is lifted up by some highly positive returns. It goes to show again that these two markets, due to their small size and limitations, tend to behave very differently from the rest of the world.
The skewness value is somewhat similar for all the 3 United States benchmarks, around -0,75 for S&P 500 and Dow Jones and -0,81 for the Nasdaq. The two Chinese Composite indexes show a higher value of skewness, despite still being negative. It sits respectively at around -0,53 and -0,39 for the Shanghai and Shenzhen Index, somewhat closer to the zero skewness of the symmetric normal distribution. The B Share indexes are the only that show positive skewness.
Investors commonly prefer a positive skewness in regards to returns distribution due to the fact that such a distribution is characterised by a negative tail that is less 'heavy', meaning that the probability of downward potential, that is the probability of occurring in very negative performance, is lower compared to a negatively skew distribution. Simultaneously, the probability of highly positive returns, even if small, is higher.
In other words, people are attracted to huge possible gains even if they have a low probability and even if the mean return is low, similar to that of a lottery. There is evidence from behavioural finance that individual tends to be risk seeking in lotteries where the probabilities of very high gains are low, assuming a gambling behaviour.

In terms of excess kurtosis, the returns' distributions for every index show positive values: each one of the indexes is characterised by a *leptokurtic* distribution of returns. An excess of kurtosis implies that investors will occasionally face extreme returns, both positive and negative, at a higher frequency compared to what is predicted by the normal distribution of return. The previous risk-adjusted performance ratio was based on volatility as a measure of the risk, without taking into account the 'kurtosis risk' implied by a positive excess kurtosis. In fact, if a risk averse investor prefers a *platykurtic* distribution of returns, due to the stability

of returns because of the lower probability of tail events, a *leptokurtic* distribution entails an additional risk that has to be taken into account in performance evaluation.
Extreme values of kurtosis can be again observed from the returns distributions of the B Share markets, in particular the Shenzhen SE B Share. The excess kurtosis level of this one reaches an incredibly high value of 23,6, meaning that there is a big amount of risk that the standard deviation on returns is not able to capture. The Chinese composite indexes are instead close to the benchmarks in terms of kurtosis. The Shenzhen is able to do better displaying the lowest value, with an excess kurtosis of 1,19 very close to the *mesokurtic* normal distribution.

In order to get a first index rank based solely on higher moments, it is possible to compute the Skewness-Kurtosis Ratio, defined as $\frac{S}{EK}$. Given the fact that rational investors typically prefer a return distribution characterised by high positive skewness paired with low kurtosis (or excess of kurtosis), the highest the ratio the better, if, like in our case, the excess kurtosis is positive for any given index.[122]

Name	Skewness-Kurtosis Ratio
SHANGHAI SE B SHARE	0,1005
SHENZHEN SE B SHARE	0,0996
SHANGHAI SE A SHARE	-0,2581
SHANGHAI SE COMPOSITE	-0,2624
SHENZHEN SE A SHARE	-0,3143
SHENZHEN SE COMPOSITE	-0,3263
NASDAQ COMPOSITE	-0,4046
S&P 500 COMPOSITE	-0,4940
DOW JONES INDUSTRIALS	-0,5129

Table 4, own elaboration

The B Shares markets are on top of this ranking solely due to the fact that they are the only ones that exhibit a positive skewness. However, the Shanghai B shares market precedes the Shenzhen B shares due to the fact that the latter has been penalised by the extreme kurtosis. It has to be stated that the perception of high kurtosis as a negative treat depends on the investor: a particularly risk seeking investor could see it as a chance to earn higher returns. Considering the Chinese B Share indexes that have the highest skewness, having a high

[122] Investing in the Chinese Stock Markets: Historical Perspective and Performance Analysis

kurtosis increases the probability of abnormally high returns without necessary increasing too much the downside risk.
The United States benchmarks are instead the worst performing, predominantly due to their higher negative skewness.

More importantly, skewness and kurtosis can be incorporated in the performance ratios in order to improve their application. One of the alternative performance measures that accounts for the higher moments is the Adjusted Sharpe Ratio. This ratio, an evolution of the standard Sharpe Ratio, was developed by Pezier and White in 2006 in order to overcome some of the shortcomings of the original ratio.

It is defined as:

$$ASR = SR\left[1 + \left(\frac{S}{6}\right)SR - \left(\frac{EK}{24}\right)SR^2\right]$$

Where SR represents the Sharpe Ratio, S the skewness ad EK the excess of kurtosis.
It is based on the same concept previously introduced: investors prefer positive skewness and negative excess kurtosis, therefore, the ASR includes factors that account for it. In order to obtain a coherent measure of the ASR and to confront with the initial results for the SR, it is necessary that the inputs are annualised. To annualise skewness and kurtosis we refer to the method of cumulants, determined by the central moments.
A cumulant can be defined in our case as: $k_1 = E(x),\ k_n = E(x-\mu)^n$
The basic statistics previously computed can therefore be defined in terms of cumulants as follow: $mean = k_1, \quad variance = k_2, \quad st.deviaton = \sqrt{k_2},$

$$skewness = \frac{k_3}{{k_2}^{\frac{3}{2}}}, \quad ex.kurtosis = \frac{k_4}{{k_2}^2}\ .$$

One of the properties of these cumulants is that they all scale linearly with time, given that x is i.i.d. This is the reason behind the fact that the standard deviation scale with the square root of time, as we previously described. Given $x = r_i$ in our case, to annualise the monthly skewness it is necessary to multiply by $\frac{1}{\sqrt{12}}$ whilst to annualise the monthly excess kurtosis we have to multiply by $\frac{1}{12}$, following the computation above.[123]

[123] Annualization and General Projection of Skewness, Kurtosis and All Summary Statistics, Attilio Meucci, 2010

In terms of Adjusted Sharpe Ratio, the indexes can be ranked as follow:

Name	Adjusted Sharpe Ratio	Sharpe Ratio
SHENZHEN SE B SHARE	0,3038	0,2961
SHENZHEN SE COMPOSITE	0,2290	0,2300
SHENZHEN SE A SHARE	0,2240	0,2250
SHANGHAI SE B SHARE	0,2158	0,2150
DOW JONES INDUSTRIALS	0,1871	0,1885
S&P 500 COMPOSITE	0,1701	0,1712
NASDAQ COMPOSITE	0,1567	0,1577
SHANGHAI SE COMPOSITE	0,1073	0,1076
SHANGHAI SE A SHARE	0,1048	0,1051

Table 5, own elaboration

As we can see, the difference is marginal. The ranking does not undergo variations. If it is true that in the real world the stock returns tend to deviate from the normal distribution, in case of broad indexes the normality of returns can still be a reasonable approximation. In particular for the Composite indexes, skewness and kurtosis, when annualised, have a very small impact on performance. For the Shenzhen B Share indexes the situation is slightly different, as the positive skewness has a marginal superior positive impact on performance, but still not as relevant.

A version of the Value-at-Risk, denominated as Modified VaR (MVaR), exists and adjusts to skewness and kurtosis. In particular, this is done by modifying the quantile of the standard normal distribution using a Cornish-Fisher-Expansion. The modified quantile z_{cf} is calculated by the following expression:

$$z_{cf} = z_c + \frac{(z_c{}^2 - 1) * S}{6} + \frac{(z_c{}^3 - 3z_c) * EK}{24} - \frac{(2z_c{}^3 - 5z_c) * S^2}{36}$$

z_c is the quantile of the normal distribution at 95% confidence level, equal to -1,645.

The MVaR is therefore computed as:

$$MVaR = \bar{r}_i + z_{cf} * \sigma_i$$

By taking the yearly MVaR, that considers annual inputs, the Modified Sharpe Ratio can be calculated as:

$$MSR = \frac{\bar{r}_i - r_f}{-MVaR_i}$$

At this point, the MSR can be compared directly with the RVaR: if returns are normally distributed they will yield approximately the same results.[124]

It is important to remember that the observations are based on an annual horizon, the differences on a monthly basis would be much more accentuated.

Name	Modified Sharpe Ratio	Reward to VaR (95%)
SHENZHEN SE B SHARE	0,2790	0,2273
SHENZHEN SE COMPOSITE	0,1654	0,1690
SHENZHEN SE A SHARE	0,1613	0,1647
SHANGHAI SE B SHARE	0,1604	0,1553
DOW JONES INDUSTRIALS	0,1340	0,1397
S&P 500 COMPOSITE	0,1200	0,1251
NASDAQ COMPOSITE	0,1067	0,1114
SHANGHAI SE COMPOSITE	0,0710	0,0729
SHANGHAI SE A SHARE	0,0692	0,0711

Table 6, own elaboration

The main aspect here is the increase in performance of the B Shares visible yet again, however not enough to visibly affect the ranking. This is due to the positive skewness that reduces the downside risk and increases the possibility of extreme positive returns. For the rest of the indexes the difference is not significantly large.

To summarise, four additional versions of the original Sharpe Ratio have been computed. The RVaR, CSR, ASR, MSR. The tendency that can be highlighted by switching from the

[124] Risk-Adjusted Performance Measurement – State of the Art, Alexandra Wiesinger, 2010

Gaussian method to the two others (ASR and MSR) is clear: indexes that present a higher skewness have a better Sharpe ratio, with the kurtosis that tends to have a secondary and more marginal effect on performance. On the other side, Sharpe ratio's values become smaller when using Value at Risk and Expected Shortfall at the denominator instead of the standard deviation. Such effect is logical, as with VaR we consider the worst-case risk. Using CVaR further decreases the Sharpe ratio as it takes into account the expected shortfall outside the confidence interval instead of the maximum loss with a predetermined confidence interval. The effects are consistent throughout all the samples an do not affect the ranking in a relevant manner. As such, even whilst more advanced ratios that take into account higher moments (such ASR and MSR) are preferable to capture the actual return distribution, the effects on their relative performance is negligible.

3.3.3 Measures which do not assume any distribution

The last category of performance measures includes measurements which do not assume any distribution at all, therefore, implicitly accounting for higher moments of distribution. These are based on Lower Partial Moments, that measure risk by considering only those deviations that fall below a pre-defined threshold. In such a way there is no need for parametric assumptions on mean and standard deviation and there are no constraints on the form of the underlying distribution.[125]

Firstly, as a measure of risk, there is the downside risk commonly measured by the Downside Deviation. It is another of those 'worst case scenario' measurements, focused only on the negative variability of returns. It is defined as the standard deviation of the returns that sit below a certain threshold, set by the investor depending on the inner degree of risk aversion.[126]

$$Downside\ Deviation = \sqrt{\frac{\sum \min\left(r_i - r_t; 0\right)^2}{(n-1)}}$$

where r_t is the return threshold. Often the risk-free rate is used as a target return, therefore the 3-Month Treasury Bill Rate has been used as threshold.
As the Downside Deviation can be interpreted as a 'bad deviation', the ratio between the

[125] Risk-Adjusted Performance Measurement – State of the Art, Alexandra Wiesinger, 2010
[126] Downside Risk Definition, Investopedia

Downside Deviation and the standard deviation can tell us how much variability there is in the negative returns (relative to the threshold) compared to the overall volatility of returns. For all the indexes the ratio is lower than 1, meaning that the Downside Deviation is lower than the standard deviation. For the three United States benchmarks, the ratio is higher at over 80%, meaning that there is a significant high amount of volatility in the returns below the risk-free return. The percentage decrease to an average 73% for the Chinese Composite indexes whom are able to do better from this point of view. Therefore, if it is true that the Chinese indexes tend to have more volatile returns, a relatively larger portion of volatility comes from returns that are overperforming the risk-free rate, that can therefore be considered as 'good volatility'. Even if the benchmarks have a better Sharpe Ratio compared to the SSE (composite and A Share), the Downside Deviation shows that the latter can arguably have some advantage over the others. The B Share markets proved to be the ones with the lower level of Downside Deviation over standard deviation, equal to around 64%.

However, investors could want to invest in indexes with high downside risk if it is compensated by a high upside potential. This is the reason for which the Omega ratio has been created as the ratio between upside potential and downside potential.
The Omega ratio measures the relation between the expected excess returns and the expected excess losses compared to a threshold set by the investor. The threshold considered is once again the free risk rate.[127] It is calculated as follows:

$$Omega\ Ratio = \frac{\sum \max\left(r_i - r_t; 0\right)}{\sum \max(r_t - r_i; 0)}$$

Mathematically, if the threshold is set equal to the average return, the Omega Ratio is equal to 1. From the Omega Ratio we can see a correlation between downside risk and performance: higher downside deviation leads to better risk-adjusted performance. This is definitely not the general case, but in the case of our data the downside potential is paired by high upside potential and thus by the fact that propose very interesting investments for investors who are ready to take more risk with a long term horizon. Once again, the Shenzhen market outperforms the Shanghai market: this can be explained by the fact that whilst Shenzhen indexes have higher downside risk, they also have better upside potentials.
In this case however, the two B Shares indexes are on top of the ranking. In particular the Shanghai SE B Share overperform the Composite and A Share indexes of the SSE: this is

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essentially due to a better distribution of the risk between upside and downside potential that the standard deviation didn't capture.

Name	Omega Ratio
SHENZHEN SE B SHARE	1,3057
SHANGHAI SE B SHARE	1,1980
SHENZHEN SE COMPOSITE	1,1911
SHENZHEN SE A SHARE	1,1865
DOW JONES INDUSTRIALS	1,1575
S&P 500 COMPOSITE	1,1412
NASDAQ COMPOSITE	1,1301
SHANGHAI SE COMPOSITE	1,0888
SHANGHAI SE A SHARE	1,0866

Table7, own elaboration

The Sortino Ratio, introduced by Sortino and Van de Meer in 1991, is very similar to the Sharpe Ratio but takes the Downside Deviation (DD) as denominator as measure of the risk.

$$Sortino\ Ratio = \frac{\bar{r}_i - r_f}{DD}$$

Compared to the Omega Ratio, negative deviations from the return threshold are more strongly weighted due to the square. r_f could be substituted by whatever target return the investor choose. The inputs have been annualised.

Name	Omega Ratio	Sharpe Ratio
SHENZHEN SE B SHARE	0,4647	0,2961
SHENZHEN SE COMPOSITE	0,3268	0,2300
SHANGHAI SE B SHARE	0,3225	0,2150
SHENZHEN SE A SHARE	0,3207	0,2250
DOW JONES INDUSTRIALS	0,2345	0,1885
S&P 500 COMPOSITE	0,2124	0,1712
NASDAQ COMPOSITE	0,1942	0,1577
SHANGHAI SE COMPOSITE	0,1410	0,1076
SHANGHAI SE A SHARE	0,1380	0,1051

Table 8, own elaboration

The Sortino Ratio is naturally higher than his counterpart, the Sharpe Ratio, for computational reasons.

Two aspects are important here. Firstly, we can see how much bigger is the difference in values between the different indexes compared to the Sharpe Ratio, where values were closer. The Sortino Ratio is a more advanced ratio as it is not constrained by a certain type of return distribution, therefore, it should give us a more complete image of the real indexes' performance. Secondly, following the Sortino Ratio the SSE B Share index seems to perform better, overperforming the SZSE A Share and positioning very close to Shenzhen Composite. This is a consequence of the fact that the indexes are in general much closer in values in terms of Downside Deviation than in terms of standard deviation. Consequentially, the mean excess return has a higher impact on the performance measure following the Sortino computation, giving the upper hand to the B Share indexes that display the highest mean return out of all the sample.

Finally, in order to perform a direct comparative analysis between index and benchmark, it is possible to use the Information Ratio. The information ratio (IR) is a measurement of portfolio returns beyond the returns of a benchmark, compared to the volatility of those returns.[128] In this case the S&P 500 has been chosen as the comparative benchmark as it is probably the most widely used to represent the market behaviour.

[128] Information Ratio – IR, Investopedia

It is computed as:

$$Information\ Ratio = \frac{\bar{r}_i - \bar{r}_b}{Tracking\ error}$$

$\bar{r}_b$ is the annualised mean return of the benchmark (S&P 500). The tracking error, used as a proxy for the risk, is a relative measure of risk computed as the standard deviation of excess return of the index over the benchmark. It is annualised following the same computation used for the standard deviation of monthly returns.

A necessary condition for the calculation of the Tracking error is that the Index of interest cannot follow perfectly the benchmark, otherwise the denominator would tend to zero. It is one of the most used metrics to assess indexes' performance.

Name	Information Ratio
SHANGHAI SE COMPOSITE	0,0079
SHANGHAI SE A SHARE	0,0054
SHANGHAI SE B SHARE	0,1420
SHENZHEN SE COMPOSITE	0,1431
SHENZHEN SE A SHARE	0,1383
SHENZHEN SE B SHARE	0,2240

Table 9, own elaboration

Following this performance measure, all the Chinese indexes show a positive Information Ratio: this is due to the fact that they all carry a positive excess return relative to the S&P 500. The IR also measures the consistency of an investment's performance, as the tracking error identifies the level of consistency at which the index tracks the performance of the benchmark. A lower tracking error is equal to a higher consistency. The Shenzhen indexes, besides the higher tracking error, are able to overperform thanks to their relative higher excess return. There is a considerable gap between the Shanghai and Shenzhen indexes, that is a consequence of the fact that the values of tracking error are not far from each other. Therefore, the higher excess return of the Shenzhen market over the S&P 500 affects significantly the results.

However, the high tracking error is not necessarily a negative feature, as it is not focused specifically on the downside risk both rather track both direction of risk. A relative lack of

consistency can be therefore the result of a positive active management, a consequence of the fact that the Index tend to have great exploit in performance.

3.3.4 Final considerations

Regarding the Chinese indexes, there are a few considerations that can be drawn.
From the different metrics computed, it is evident that the Chinese markets carry a higher level of risk. The high value of volatility confirmed somewhat the idea that the Chinese exchanges are a sort of casino. The speculation has been definitely one of the main drivers of volatility throughout the years. Much of the returns of Chinese indexes are the result of many taken risks, but, at least in the case of the Shenzhen market, it seems a price that is worth to pay given the high returns.

By taking the point of view of an American investor who would like to diversify his/her portfolio, the investment in Chinese indexes is a good opportunity. They both provide a low level of correlation with the most common benchmarks that are supposed to track the overall market behaviour, provided that the investor is not particularly risk averse.
The difference risk-adjusted methods tend to follow the same line: The Shanghai Composite performed similarly to the S&P 500 and Dow Jones Composite, even if slightly lower overall. The Shenzhen Composite is instead the best performing over the Composite indexes, performing a 60% better on average over the rest of the group. If we look at the higher moments, the Chinese markets returns' distribution presents higher skewness compared to the benchmarks, even if still negative. A higher level of skewness and similar excess kurtosis over the sample, made possible for the Chinese indexes to maintain their ranking even when ratios that account for higher moments are analysed.

The Shanghai SE Composite confirmed to be the worst performing according to most of the data from the last 20 years. The returns are high in absolute value, but not high enough to justify the risk that such investments carries. The frequent bubbles that knocked the Chinese market down and China's high inflationary economic are just few factors that prevented the Shanghai Stock Market to perform well. The high volatility, as we have seen, is a proper characteristic of emerging markets, especially present in the moment that these markets start to be open to the public. The high volatility observed through the period is definitely influenced by the initial speculator wave occurred in the early 2000s. In a short period of time the Shanghai Stock Exchange was able to impose itself as the fourth largest stock exchange,

in terms of market capitalisation, after the NYSE, the NASDAQ and the Japan Exchange Group. The growth however has not been linear, with important effects on the long term performance, but rather often boosted by speculative trades.
Two market bubbles can be identified during this period. The first one, in February 2007, was mainly caused by false expectations of investors who anticipated the Chinese government to raise interest in endeavour to tackle inflation. This however, did not turn into reality and the SSE fell sharply, tumbling 9% in one single day due to heavy sell-offs.[129]
The effects were not limited to the Chinese environment only, but were also worldwide. For example, the indexes relative to the S&P 500 and Dow Jones Industrial dropped significantly, in the order of 3% to 4%.

The second bubble burst in 2015 but lasted up until a year later. The high presence of small investors and stock valuations that by far outpaced the country's economic growth, made the financial environment particularly prone to market bubbles. Prior to 2015, the government put several policies in place, aiming to boost trading and stock market prices. It was essentially a mean to enable highly indebted companies, especially state-owned companies, to raise money in equity markets and stimulate demand via the wealth effect. However, thanks to key factors such as the legalisation of margin financing from 2010, loose monetary policies including interest rates and reserve ratio cuts, the government efforts ended up boosting leverage and credit growth in the stock market, resulting soon after in the burst of a bubble. The upsurge in stock prices from November 2014 onwards clearly did not reflect the performance of the underlying companies, considering that the economy was slowing down and profits declining. The CSRC tried to counteract the market instability by introducing trading limitations and margin requirements, but it was too late. The price fall was particularly steep even due to the structure of the stock market, largely financed by debt.[130]

The performance however, has not been as bad as it might seem. From the different ratios it is clear how often the SSE SE Composite was very close to the benchmarks. In particular, if we focus only on downside risk, the Shanghai exchange overperformed two of the three benchmarks (Sortino Ratio), even if by a very small margin.
Better performance can be observed from the Shenzhen Stock Exchange. Without considering the B Share market that is a small niche nowadays, the Shenzhen Composite and A shares are constantly on top of the ranking measures. The Exchange however associates to the highest

[129] Chinese Stock Markets: Underperformance and its Determinants, Roman Kováč, 2015
[130] The possibilities of investing in Chinese Stock Market with a small budget, Ekaterina Panchenko, 2016

return the highest risk independently by the instrument of measure. Not only has it the highest standard deviation of returns, but even the highest VaR, downside deviation and tracking error. On the other end, the distribution of returns can be considered preferable compared to the benchmarks, due to the highest Skewness-Kurtosis Ratio that impacted in all those measurements that account for higher moments than mean and standard deviation.

The reasons behind the good performance can be multiple. As was previously described, the Shenzhen Exchange has a different size and composition from that of the Shanghai Exchange. In terms of market capitalisation the SZSE is only 2/3 of the SSE, but has a higher number of listed companies (2,317 against 1,797) and higher volume traded. According to official data, there is a considerable difference in the average P/E ratio. On average, a stock in the SZSE is traded at 32,24 times the annual earnings per share.[131] In the SSE instead, the average P/E ratio is much lower, equal to 15,59.[132] The P/E ratio of the SZSE is more than double in comparison. This data tells us that together with a higher amount of trading, there is probably more speculation in this market which can also explain the higher volatility of returns. A high P/E ratio may signify that a company is overvalued, however, it could also indicate that the company is expected to grow and do well, and earnings will increase over time justifying the higher multiple. Many companies that are growing at a fast rate typically have a higher P/E ratio.

In terms of composition the Shenzhen Stock Exchange tends to be composed by more entrepreneurial and technology-focused companies. A relative large group is also composed by mining companies.[133] These smaller types of companies tend to be more innovative and profitable, they are often characterised by a steep curve of growth that easily drives their share price up in a relatively short amount of time. These characteristics open up more possibilities for short-term high returns.

Moreover, the fact that the SZSE is particularly dominated by individual retail investors is an additional factor that can justify the increase in volatility and high returns, that often are paired together.

A sort of parallelism can be drawn between the SZSE and the Nasdaq. Both markets are characterised by a wide number of companies listed, with a large number of tech companies listed. The parallelism can also be extended to the performance: as the SZSE overperform the SSE, the NASDAQ Composite is overperforming compared to the S&P 500 and Dow Jones

[131] szse.cn
[132] sse.cn
[133] Shenzhen Stock Exchange (SZSE), fxcm.com

Industrial in every risk-adjusted measure. The risk associated with the index tend to be higher but is compensated by the higher returns.

The B Share market instead, displayed extreme characteristics both in terms of returns and volatility. The extreme characteristics are the reflection of an inefficient market. In terms of size, it is not nearly comparable to the A Share market, with only 100 companies that had issued B shares in the market by the end of 2017. The B-share market was established in 1992 in order to attract foreign investments, but it has revealed to be an unsuccessful experiment in the long term. Despite the high returns, the market has progressively shrunk during the years, thanks to a very limited number of players. Some issues like the poor market liquidity have prevented institutional investors from making sizeable investments. Its importance was further reduced since the Chinese government, after the entry in the WTO, decided for the increase of foreign investor direct investment in the A Share market. [134] Today, with the progressive opening of the A Share market, the B Share arguably serves no purpose and it is often referred as a "zombie market". The government tried to fix the situation during the years through different reforms, for example by opening, from March 2001, B shares to domestic investors holding US dollars. However, too few domestic investors held sufficient foreign currency to make the project sustainable.

Many companies are progressively starting to convert their B shares into other types of shares (H shares for example) and, besides the relative complexity of the conversion process, this seems to be a viable option going forward. By looking at a more recent years sample, the performance of the B Share market has considerably fallen. Especially in terms of valuations, the B shares have recently been below those of the other Chinese stocks. Therefore, the conversion could represent a profitable opportunity for the companies themselves: to have a more active market and a potential boost in share prices.[135]

Overall, the outstanding GDP growth that China was able to achieve in the last decades (GDP of 2017 was almost 14 times the GDP of 1996)[136], was mainly supported by the banking system, that represented the key instrument of centrally planned investment policies. China's stock market, despite the strong growth since 1990, was always a secondary tool in terms of economic support, often hindered by frequent regulatory interventions and restrictions on the tradability of shares, together with a mass of non-negotiable or non-tradable share, owned by

[134] A Study on the Relationship Between CAPM and China Stock Market, Gao Yan, Yang Xin
[135] End of the road for China's 'B' market, Josh Noble, Financial Times, 2013
[136] Data from The World Bank Database

the state.

The Chinese stock markets have often been referred to as a casino mainly due to the fact that they have been inefficient. There has been an issue of price informativeness connected with the high volatility of stock prices. If prices continue to fluctuate significantly, it is hard to form viable expectations on future behaviour and returns. However, starting from the new millennium and especially since the entry in the World Trade Organisation in 2001, many reforms have been issued in order to fix these problems and improve the stock market efficiency, especially through a progressive increased international integration. Today, competition, efficiency and price informativeness has improved to the point that the Chinese markets cannot be considered anymore a casino but are rather progressively assuming many of the characteristics that are proper of a developed and mature stock market.

There is evidence for example that stock price informativeness about future earnings and investments has increased from 2001, particularly for privately owned firms, increasing corporate investment efficiency. Investors that operate in a developing market with a relatively high degree of economic risk and limited opportunities for international diversification tends to require a higher equity premium.

A developed and efficient stock market, with less volatility and higher liberalisation tends instead to reduce the cost of capital for firms.[137] Other aspects such as the improvements in regulatory protection of minority shareholders, increases in accounting transparency and audit quality, privatisation of SOEs, have all contributed to progressively filling the gap with other, more developed stock markets.

By computing the correlation of returns between S&P500 and SSE, SZSE respectively, on the last 5 year period, the values are considerably higher (from 0,31 to 0,49 for the SSE, from 0,25 to 0,38 for the SZSE), meaning that the Chinese market is progressively aligning to the global market and thus, to the benchmarks.

The Chinese market, however, still preserves its characteristics: the high excess returns and relatively low correlations offer a good opportunity for global investors seeking diversification as well as high average returns. Provided that there is a certain level of risk that an investor has to be ready to bear, the Shenzhen Stock Exchange in particular seems to be an appealing option, especially given the fact that the accessibility has been greatly improved over the recent past.

[137] The Real Value of China's Stock Market, Jennifer N. Carpenter, Fangzhou Lu, Robert F. Whitelaw, 2020

Conclusion

Throughout this thesis, the objective was to provide a thorough understanding of the Chinese financial system and its evolution, with a particular focus on the risk and performance profile of Chinese Equity indexes throughout the last two decades (2000-2020) compared to a sample of benchmarks that are supposed to track the global market performance.

The Chinese economy went through different stages of evolution that led it to what is today: a global leading power. From the Communist Revolution to the transition to a capitalist economic model, China was able to re-emerge from the dark years of Western domination thanks to a strong production system deeply devoted to exportation. The constant current account surplus was the main fuel to the development of China's economic system, allowing for a wide range of expansionary policies and the building up of reserves. More recently, China is progressively switching from an economy based on production to an economy based on services, from high speed to high quality growth. Many efforts are being made in order to open up the system to the global market, to improve efficiency through the competition and deleveraging.

China's financial system has gone as well through several changes in the recent past, following the overall development and transformations of the general economic system. The banking system proved to be the dominant force in the financial system, playing a central role in funding the growth of all the different types of firms. Despite providing most of the credit and owning the majority of the corporate bonds, the banking sector has been pledged by different issues over the years that affected its efficiency. Issues such as the relative high amount of NPLs or the shadow banking phenomenon, have been targeted by different reforms over the years, but are still not completely dealt with.

On the other hand, the development of other sectors such as the asset management and bond market, have been slowed down due to restrictions in capital flows. The recent trend of 'opening up', adopted by the Chinese government have however helped the situation, giving to these sectors the push that they need to grow and achieve in the near future levels that are comparable to more developed financial systems.

The non-standard financial sector has been instead the fastest growing, on the shadows of the other standard sectors. The non-standard financial sector relies on alternative financing channels including internal finance, and on mechanisms based on trust, reputation and

relationships. It has been particularly relevant for firms belonging to the Hybrid Sector, that were often not targeted by the banking loans.
China's stock market has been growing fast since it was reopened in 1990, after a long stop in trading caused by the Communist Revolution. Even in this field, different reforms have been implemented to open up the Chinese economy to the global market.

The performance analysis has focused on the returns of the two mainland stock markets, the SSE and SZSE, as the HKSE has some key differences: it is smaller and was also not subjected to many of the regulations and limitations applied during the years to the mainland exchanges.
Over the last 20 years, the Shanghai and Shenzhen stock markets have presented high returns paired with high volatilities. There are different determinants that can be highlighted in order to justify this behaviour. The Chinese Exchanges are characterised by a relatively high presence of individual investors. The high presence of individual investors is also a key determinant of the high level of speculation that has characterised these stock markets during their history, reflected by a high turnover rate. The considerable number of small and medium capitalisation stocks also helps to increase speculation, as these are generally easier to manipulate and tend to be more volatile compared to blue-chip stocks.
The relation between individual investors and high return-volatility is reinforced by the evidence: in the analysis the SZSE, that is composed by a relatively higher number of individual investors compared to the SSE where most of the institutional investors prefer to trade, has showed higher average return and volatility over the sample.
In terms of correlation with the United States benchmarks, the Chinese Composite indexes showed returns that are only loosely correlated, with values under 0,3. Between the two stock exchanges, the SZSE has proven to have yet again the lowest correlation in terms of returns. This means that these markets should be quite resilient to global market movements, making them a good investment for traders looking to diversify their portfolios. However, it is important to take into account that for many years the Chinese markets have been highly insulated. They had been isolated up until 2002, when reforms were started in order to open up the economy. Although with several limitations, from 2002 foreign investors were allowed to trade a progressively increasing number of A shares through QFII. Before, the only solution for foreign investors was the B Share markets, specifically targeted for foreign investments.
The performance analysis has taken into account the SSE B Share Index and SZSE B Share Index to track the performance of these particular markets. These indexes have proven to

differ significantly from the others in terms of characteristics. They achieve the highest returns and are at the same time the most volatile of the sample, whilst also being the least correlated with the benchmarks. However, if these markets were an interesting investment opportunity back in the beginning of the 2000s, today they are considered to be "dead markets". They progressively lost appeal during the years due to the opening up of the A Share market to foreign investors, with less and less participants and companies keen to issue B shares. As the B Share markets are today very far from being efficient because of the lack of liquidity and extreme volatility, the performance measures are not necessarily a good indicator and cannot be relied upon in this case.

The empirical analysis focused on the risk and performance profile of Chinese Equity indexes has shown a constant pattern regarding the risk-adjusted performance measures: the Shenzhen Stock Exchange has overperformed the Shanghai Stock Exchange independently from the kind of measure adopted. The latter has instead shown to be the worst performer of the group, behind the Dow Jones Industrial and the S&P 500.
The Sharpe Ratio, despite being a rather simplistic performance measure, proved to be quite reliable in measuring the performance of the indexes, as the ranking did not change whilst taking into account more advanced measures. Taking into account higher moments of the returns distribution did not significantly affect the risk-adjusted measures but still delivered some interesting results: the Chinese indexes are the ones with the higher volatility but also the higher Skewness-Kurtosis ratio. Due to the shape of the returns distribution, that entails less probability of extreme negative returns, they performed better under those metrics that take into account higher moments of the distribution like the Adjusted Sharpe Ratio or the Modified VaR.
The results remain constant even without looking at a specific distribution of returns, by taking into account a metric like the Omega ratio, that measures the relation between the expected excess returns and the expected excess losses compared to a certain threshold, set in our case equal to the risk-free rate.

We can come to the conclusion that over the 2000-2020 period, China has presented a good opportunity of diversification, especially if we look at the SZSE. The overperformance of the SZSE over the SSE is probably due to the fact that Shenzhen Stock Exchange is mainly composed of small-cap stocks, characterised by higher price movements due to the fact that they often attract individual investors that want to make short-term profits.
The good performance and low correlation need however to be contextualised, as the

observation period is quite large. From the point of view of an American/international investor, the exchange rate variations and the inflation are two additional variables to consider. The exchange rate remained quite stable during the years thanks to the control exercised by the Chinese authorities, the appreciation during the sample of the Renminbi over the American dollar favours a potential buy-and-hold investment over the whole sample. Regarding the inflation, it has been on average constant, with more variations towards the beginning of the period and higher stability towards the end of the period.

Today, China is very different from what it was twenty years ago, especially from an economic point of view. China's economy was very closed and insulated, with limited access to foreign investments and funds. Therefore, it is natural to find a lower correlation with the global stock market movements. Since the access to the WTO, China progressively adopted a policy aimed to the international integration. In fact, by looking at the last 5 years of returns, it is proven to be considerably more correlated with the United States benchmark. If from one side we can conclude that the Chinese markets partially lost their appeal as a diversification investment, from the other they gained in efficiency and price informativeness. In particular, the price informativeness has increased for private firms, more than for SOEs, increasing the corporate investment efficiency.

It is possible to conclude that the stock markets have performed reasonably well during the sample period, and that the financial system has served China well overall during the nation's rapid development. As the country will move towards higher levels of economic sophistication and international integration, the financial system will be fundamental in supporting the economy. In terms of stability, it is essential to control the level of NPLs, that caused many problems to the Chinese economic system in the past, as well as improving the overall regulatory environment to avoid the risk of potential crisis and market crashes, especially since foreign competition and capital inflows will be more present going forward.

Part of the transition from the status of a developing country to a developed one, entails that the financial markets will most likely increase their role in the financial system, which, for a long time was dominated by the banking sector.

There are problems concerning the Chinese stock market that should be addressed in the future in order to spur its development. The stock classification system overcomplicates the market structure and can discourage foreign investors. It will be necessary to find a solution for the B Share markets as they cannot anymore be considered as active markets, with respectively 49 and 46 companies quoted in the SSE and SZSE and a combined market value

of B shares that amounts to less than 0.2% of the capitalisation of A shares. A possible solution, as previously cited, is the conversion to other types of shares. In order to further improve the price informativeness it is also essential to increase and strengthen the position of institutional investors in the markets, especially regarding the SZSE.

Finally, to increase the role of the market and reduce the dominance of the public sector in many industries it is fundamental a further development of a more efficient regulatory environment and supervision system and the development of a more stable, transparent and open trading system. The reforms have already started, for example through the removal of the foreign ownership limit for Chinese banks and asset management companies, and through new foreign investment laws including provisions on equal treatment of foreign and domestic firms. However, there are still important steps to be achieved, in particular concerning the flexibility of the exchange rate.

Despite the recently uncertain environment, caused by the trading tensions with the United States, the acceleration in the opening up of the private sector and intensification in reforms of state-owned enterprises are expected to further increase in the role of the financial markets as a fundamental tool for China's medium and long term growth.

Name	S&P 500	DOW JONES	NASDAQ	SSE COMP	SSE A SHARE	SSE B SHARE	SZSE COMP	SZSE A SHARE	SZSE B SHARE
Arithmetic avg return	0,0035	0,0037	0,0043	0,0037	0,0036	0,0077	0,0070	0,0069	0,0098
Monthly free-risk rate	0,0013	0,0013	0,0013	0,0013	0,0013	0,0013	0,0013	0,0013	0,0013
Monthly standard deviation	0,0440	0,0427	0,0649	0,0754	0,0754	0,1020	0,0858	0,0861	0,0990
Mean absolute deviation	0,0325	0,0314	0,0480	0,0550	0,0550	0,0703	0,0649	0,0652	0,0631
Corr. (S&P 500)	1,0000	0,9582	0,8544	0,3200	0,3204	0,2292	0,2676	0,2656	0,2608
Corr. (Dow Jones)	0,9582	1,0000	0,7486	0,3126	0,3126	0,2490	0,2561	0,2540	0,2631
Corr. (NASDAQ)	0,8544	0,7486	1,0000	0,2656	0,2670	0,1068	0,2292	0,2282	0,1546
Skewness	-0,7541	-0,7483	-0,8121	-0,5286	-0,5233	0,4474	-0,3875	-0,3760	2,3508
Excess Kurtosis	1,5267	1,4590	2,0069	2,0141	2,0276	4,4531	1,1876	1,1961	23,6016
Skewness-Kurtosis Ratio	-0,4940	-0,5129	-0,4046	-0,2624	-0,2581	0,1005	-0,3263	-0,3143	0,0996
VaR (95%)	-0,0688	-0,0666	-0,1025	-0,1204	-0,1204	-0,1601	-0,1341	-0,1347	-0,1531
VaR (99%)	-0,0987	-0,0957	-0,1468	-0,1718	-0,1718	-0,2296	-0,1925	-0,1934	-0,2206
Cornish-Fisher expansion	-1,8177	-1,8176	-1,8228	-1,7492	-1,7475	-1,4240	-1,7282	-1,7249	-0,3965
Modified VaR	-0,0764	-0,0740	-0,1141	-0,1283	-0,1282	-0,1375	-0,1412	-0,1416	-0,0295
Z (5%)	-2,0627	-2,0627	-2,0627	-2,0627	-2,0627	-2,0627	-2,0627	-2,0627	-2,0627
CVaR (95%)	-0,0872	-0,0844	-0,1297	-0,1519	-0,1519	-0,2027	-0,1699	-0,1707	-0,1945
W (5%)	-2,5692	-2,5582	-2,6494	-2,5862	-2,5866	-2,4119	-2,4180	-2,4149	-2,7964
Modified CVaR	-0,1094	-0,1056	-0,1678	-0,1914	-0,1914	-0,2383	-0,2004	-0,2010	-0,2671
Downside Deviation	0,0354	0,0343	0,0527	0,0575	0,0574	0,0680	0,0604	0,0604	0,0631
Omega Ratio	1,1412	1,1575	1,1301	1,0888	1,0866	1,1980	1,1911	1,1865	1,3057

Name	S&P 500	DOW JONES	NASDAQ	SSE COMP	SSE A SHARE	SSE B SHARE	SZSE COMP	SZSE A SHARE	SZSE B SHARE
Avg free-risk rate	0,0159	0,0159	0,0159	0,0159	0,0159	0,0159	0,0159	0,0159	0,0159
Annualised return	0,0420	0,0438	0,0514	0,0440	0,0434	0,0919	0,0843	0,0830	0,1175
Annualised standard deviation	0,1523	0,1479	0,2250	0,2613	0,2612	0,3532	0,2971	0,2983	0,3431
Mean excess return	0,0261	0,0279	0,0355	0,0281	0,0274	0,0759	0,0683	0,0671	0,1016
Sharpe Ratio	0,1712	0,1885	0,1577	0,1076	0,1051	0,2150	0,2300	0,2250	0,2961
M^2 (S&P 500)	0,0420	0,0446	0,0399	0,0323	0,0319	0,0487	0,0510	0,0502	0,0610
M^2 (Dow Jones)	0,0413	0,0438	0,0393	0,0318	0,0315	0,0477	0,0500	0,0492	0,0597
M^2 (NASDAQ)	0,0545	0,0583	0,0514	0,0401	0,0396	0,0643	0,0677	0,0665	0,0825
Annualised Skewness	-0,2177	-0,2160	-0,2344	-0,1526	-0,1511	0,1292	-0,1119	-0,1085	0,6786
Annualised Kurtosis	0,1272	0,1216	0,1672	0,1678	0,1690	0,3711	0,0990	0,0997	1,9668
Adjusted Sharpe Ratio	0,1701	0,1871	0,1567	0,1073	0,1048	0,2158	0,2290	0,2240	0,3038
Yearly VaR (95%)	-0,2084	-0,1995	-0,3186	-0,3858	-0,3863	-0,4891	-0,4045	-0,4076	-0,4468
Reward to VaR (95%)	0,1251	0,1397	0,1114	0,0729	0,0711	0,1553	0,1690	0,1647	0,2273
Yearly Cornish-Fisher expansion	-1,7033	-1,7029	-1,7071	-1,6844	-1,6840	-1,6003	-1,6744	-1,6735	-1,4036
Yearly Modified VaR	-0,2173	-0,2081	-0,3326	-0,3961	-0,3965	-0,4734	-0,4133	-0,4161	-0,3640
Modified Sharpe Ratio	0,1200	0,1340	0,1067	0,0710	0,0692	0,1604	0,1654	0,1613	0,2790
Yearly CVaR	-0,2721	-0,2613	-0,4126	-0,4950	-0,4955	-0,6367	-0,5286	-0,5322	-0,5901
Conditional Sharpe Ratio	0,0958	0,1067	0,0860	0,0568	0,0554	0,1193	0,1293	0,1261	0,1721
Annual Downside Deviation	0,1227	0,1188	0,1827	0,1993	0,1989	0,2355	0,2091	0,2093	0,2185
Sortino Ratio	0,2124	0,2345	0,1942	0,1410	0,1380	0,3225	0,3268	0,3207	0,4647
Tracking Error	0,0000	0,0436	0,1235	0,2569	0,2568	0,3511	0,2954	0,2967	0,3371
Information Ratio	#DIV/0!	0,0413	0,0762	0,0079	0,0054	0,1420	0,1431	0,1383	0,2240

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