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Buy the Rumor; Sell the News: Predicting Growth in the Shanghai Stock Exchange Resulting from the 2020 Foreign Investment Law

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Buy the Rumor; Sell the News: Predicting Growth in the Shanghai Stock Exchange Resulting from the 2020 Foreign Investment Law

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Dedications:

This thesis is dedicated to the Dwyers, whose unwavering support has been my greatest motivation. You all have my sincerest thanks.

la famiglia è tutto

Abstract: This thesis seeks to prove that China's Shanghai Stock Exchange responds to relevant policy changes, and, as a result, the new 2020 Foreign Investment Law will result in market growth. This is done by establishing a historical precedent, analyzing the significant changes brought about by the new law, and finally using three economic models to provide a mathematical basis.

Glossary:

Foreign Direct Investment: A foreign direct investment (FDI) is a purchase of an interest in a company by a company or an investor located outside its borders. Generally, the term is used to describe a business decision to acquire a substantial stake in a foreign business or to buy it outright in order to expand its operations to a new region. (Hayes, 2023)

Intellectual Property: a work or invention that is the result of creativity, such as a manuscript or a design, to which one has rights and for which one may apply for a patent, copyright, trademark, etc. (Oxford Dictionary)

SHSI: Abbreviation for Composite Shanghai Stock Index; also known as SSE Composite Index.

Stock Index: An index is a method to track the performance of a group of assets in a standardized way. Indexes typically measure the performance of a basket of securities intended to replicate a certain area of the market. (Chen, 2022) Examples Include the S&P 500 or the DOW Jones.

Stock Market: The stock market broadly refers to the collection of exchanges and other venues where the buying, selling, and issuance of shares of publicly held companies take place. Such financial activities are conducted through institutionalized formal exchanges (whether physical or electronic) or via over-the-counter (OTC) marketplaces that operate under a defined set of regulations. (Chen, 2022)

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Chapter 1: Introduction

Stock exchanges have existed for centuries. These exchanges play a crucial role in capitalist economies, allowing companies of a certain value to raise funds by liquidating a percentage of said company's ownership. In turn, this allows for numerous financial ventures that benefit consumers, enterprises, and governmental assets. In the US and many other "Western" states, these exchanges have become so ingrained that retirements, inheritances, and wages/benefit packages are often paid via shares or bonds. This idea that stock markets are not only an essential form of investment but also necessary to promote economic growth is agreed upon by many economists. Arestis, Demetriades, and Luintel discuss this in their Journal *Financial and Economic Growth: The Role of Stock Markets*:

> Recent theoretical contributions suggest that stock markets may promote long-run growth. Stock markets encourage specialization as well as acquisition and dissemination of information (Diamond 1984; Greenwood and Jovanovic 1990; Williamson 1986) and may reduce the cost of mobilizing savings, thereby facilitating investment (Greenwood and Smith 1997). Well-developed stock markets may enhance corporate control by mitigating the principal-agent problem through aligning the interests of managers and owners, in which case managers would strive to maximize firm value (Diamond and Verrecchia 1982; Jensen and Murphy 1990). (Arestis et al, 17)

This excerpt implies that a well-functioning market promotes financial gain on a national level and provides soft power to corporations without directly impeding governmental affairs. Furthermore, the consequential need for educated employees promotes human capital growth, in-turn creating high-income job opportunities that encourage upper-level education. To summarize, stock markets and the exchanges that operate within create an outlet for financial gain by giving power to corporations and investors. The benefits associated with having a stock market are worth the risk, considering how many opportunities are lost by not having one. This is

the reason that there are dozens of well-functioning stock markets that can be found in nearly every high-GDP country (Desjardins 2016).

While many global economic leaders have made use of stock markets for over a century, China, due to the results of Mao Zedong's reforms, did not re-legalize the trading of shares until its 1978 shareholding reform. However, until 1984, the vast majority of shares were state-owned, removing the potential for consumer benefit. It would not be until 1991 that the Shanghai and Shenzhen stock exchanges would open; this centralization of stocks allowed for massive growth and provided much needed competition for the Hong Kong exchange, which had existed since 1914. Since then, the market has demonstrated a potential for growth, and given the nature of China's rapid development over the past three decades, growth would be expected (Ramo, 1998). Given this, why is it that in 2023, over forty years since its inception, the Shanghai Stock Index (SHSI) has a market cap that is nearly one fourth the size of the US [$US 7.62 trillion versus $US 27.7 trillion] and an index that is one tenth [SHSI 3,462; DOWJ 34,738] (Statista 2021)? Although growth has been slow compared to China's competitors, the new 2020 Foreign Investment Law (FIL) is resolving many of the restrictions that have hindered investors. This piece of legislature, along with China's continued efforts to globalize, has the potential to maximize stock-market growth in the near future. In my research, I explore the following:

Do recent policy changes and a historically globalizing market indicate the potential for growth in the Shanghai Stock Exchange?

This research is valuable for a number of reasons. First, Foreign Investment is necessary for economic growth on a national scale. Intranational investment is also valuable, and without a functioning, popular stock market, China is missing an opportunity for economic gain.

Understanding that China receives hundreds of billions in FDI each year, it appears obvious that both investors and the country itself are being hindered by the current, nonoptimal market (Macrotrends, 2022). While this drives investors towards other sectors such as construction and manufacturing, these ventures have proven to have their downsides as this paper will discuss later. To simplify, there appears to be profit for both the foreign investors and national parties involved in China's foreign investment market, and it has not been capitalized to its full potential; this is especially true for China's Shanghai Stock Exchange.

Chapter 2: Historical Analysis

To understand why the Shanghai Stock Exchange has not been fully utilized by investors until now requires an understanding of past legislation. The reason these legal changes are so important is because China has a policy-driven stock market, meaning that legal or regulatory changes result in significant fluctuations in market performance. Yang-Chao Wang and his colleagues discuss this in their research Journal titled, *Policy Impact on the Chinese Stock Market*:

> Most studies of the Chinese stock market agree that policy factors affect the stock market. Han and Tang [21] claim that the Chinese stock market and government policies are inextricably linked. Wang et al. [22] show that the Chinese stock market overreacts to policy information and that it is an obvious "policy market". Peng and Xiao [23] conclude that more than 60% of the policies resulted in great stock market volatility from 1991 to 2001. Zou et al. [24] demonstrate that policy factors are the primary reason for market movements in a similar period with 16 huge market fluctuations, whose amplitudes exceeded 20%. (Wang et al 2017, 3)

Considering this, it can be assumed that the recent 2020 Foreign Investment Law (FIL) will result in a market response by the time it is fully implemented in 2025. This also explains why knowledge of previous policy changes and their corresponding market variations can help predict future outcomes.

Section 1: The History behind China's Policy-Driven Stock Market

Beginning in 1979, after Deng Xiaoping took over Mao Zedong's position as the leader of the PROC, China adopted a Contract Responsibility System (CRS). This system allowed farmers to produce a contractually specified quantity of commodities, and any surplus commodities were allowed to be sold on the free market (Koo 1990, 1). Eventually, other production-based enterprises adopted the same policy. This is the origin of a semi-free market in

China, and the CRS was able to lessen the state's control while also empowering business owners. Henry Mok would go on to write about the importance of the CRS in his publication, *The China Review*:

> Although flawed, the contract responsibility system has stabilized revenue flows to the state, improved efficiency in enterprises and contributed to raising a new generation of managers. It serves a useful role in the transition of Chinese state-owned enterprises to share-holding (joint-stock) companies. (Mok 1995, 24.2)

Following the implementation of the CRS, another enterprise reform in 1984 would further lessen the state control on markets. This reform would allow companies to issue shares in order to raise capital, and by 1988, thousands of companies were doing so (Mok, 1995, 24.2). It is important to note that although companies were allowed to issue shares, there was still no official Stock Exchange in Mainland China. Consequently, there were no consistent regulations on how shares were to be bought and sold or who could buy them. This lack of regulation and its resulting issues would lead to the opening of the Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange in December of 1990 (Hu et al 2018, 5).

The importance of the SHSE's opening cannot be ignored. It symbolized the drastic reforms Deng Xiaoping had implemented to bring China out of the Mao era and into the globalizing economy. Although the SHSE would go on to dwarf the Shenzhen Stock Exchange, this was not the case early on. While the Tiananmen Square incident disrupted all investment in 1989, prior to that, bond trading had been dominating in prior years; this was because of the lucrative return-rates China was offering in the 1980s as it issued bonds to acquire the funds necessary to establish a capital market (Thomas, 2001. 279). Due to the popularity of bonds, China imposed that the SHSE should specialize in bond trading, rather than stocks. This was because China wished for the Shanghai Stock Exchange to be the premier exchange; however,

this misjudgement that bonds would be more popular than stocks led to Shenzhen briefly existing on equal footing to Shanghai when it opened six months later in July, 1991. As can be seen in the figures below, the Shanghai Stock Exchange has consistently outperformed Shenzhen. Despite Shenzhen having more company listings in recent years, the fact that the SHSE has a higher market cap with less listings further proves that it is the dominant exchange. It should be noted that due to surplus trading in 1994, credit restrictions and moderations on listings began in 1995, hence the convergence following 1994 (Thomas, 2001. 281). This is just one example of China's stock exchanges reacting to policy changes.

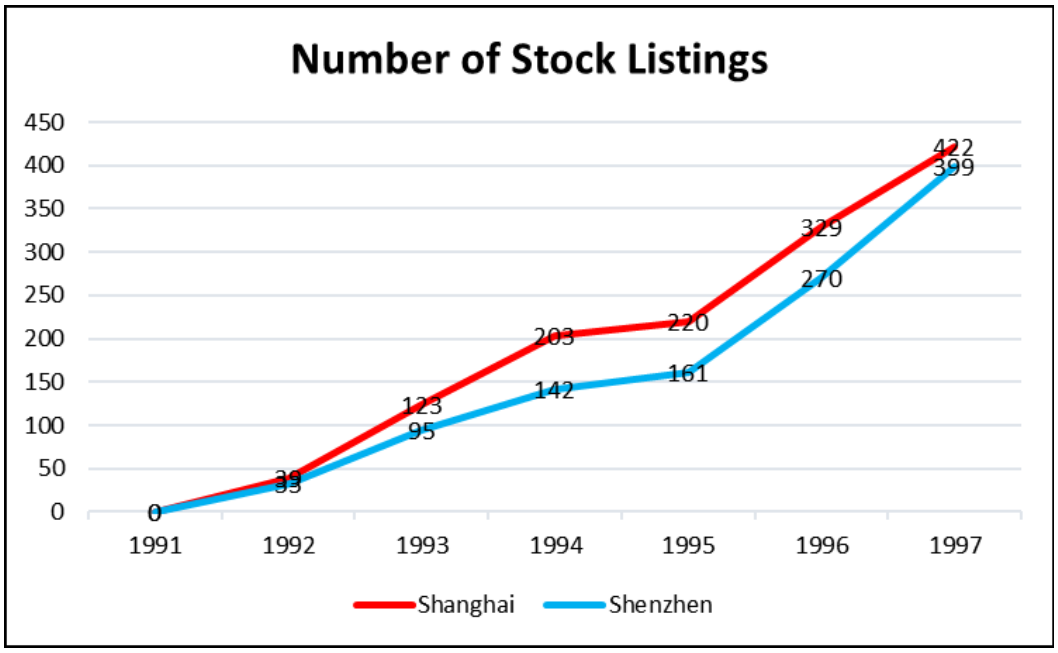

Figure 1: Stock Listings of the Shanghai and Shenzhen Stock Exchanges

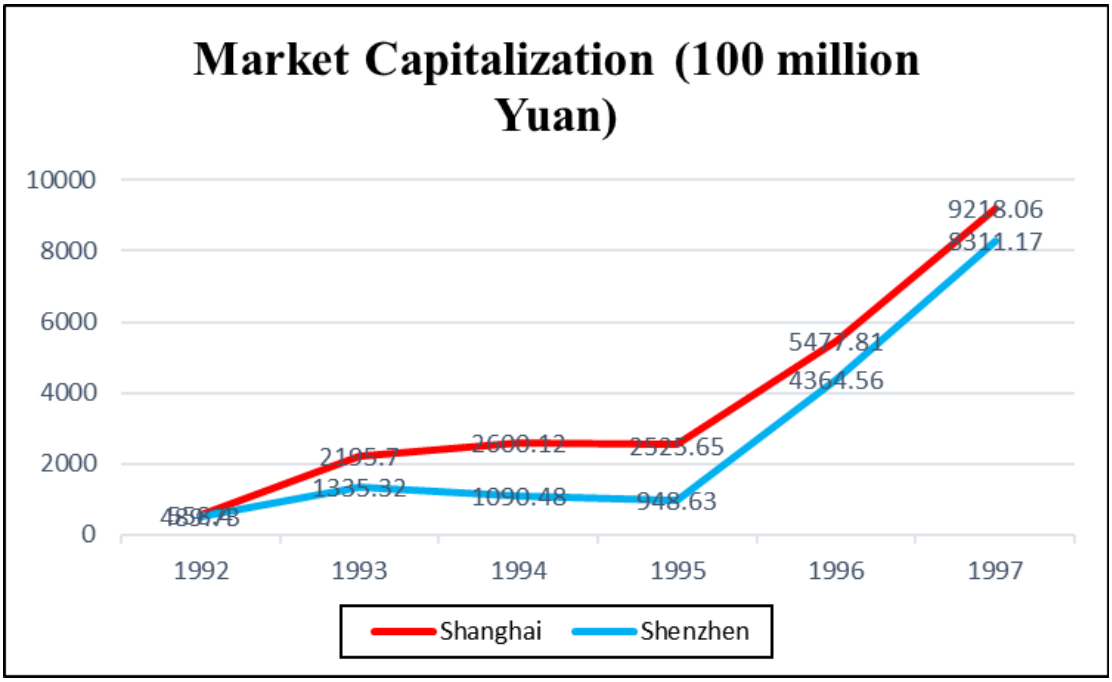

Figure 2: Total Market Cap for Shanghai and Shenzhen Stock Exchanges

2017	Shanghai	Shenzhen
Companies Listed	1396	2089
Market Capitalization	$5.09 trillion USD	$3.62 trillion USD

Table 3: Shanghai and Shenzhen Stock Exchanges' listed companies and market cap

Data for Figures 1 and 2 was sourced from Thomas's *Western Capitalism in China: A History of the Shanghai Stock Exchange*, which cites IFC: World Bank and *China Securities Market Year Book*

Data for Table 3 was sourced from the World Federation of Exchanges

Moving on, a functional, regulated market was the largest step China had taken towards a free-market economy in decades. Although this was a monumental change, China did not have enough investors to grow this market extensively or compete with other global leaders. Even though China would go on to become the world's largest investor by 2010, it would take time to achieve that (Carpenter et al 2015, 3). A proper response to the lack of investment in their

emerging market would have been to rely on foreign investment as a catalyst for gross investment, especially given that China's foreign direct investment was experiencing a significant boom. While FDI does not account for investments made in the stock market, nonetheless it shows foreign investors' willingness to invest in China. From 1991 to 1993 China's FDI grew from 4.37 billion USD to 27.52 billion USD, and FDI went from 1.14% of GDP to 6.19% (Macrotrends, 2022). This means that over the course of three years, China's GDP grew roughly 16%, while FDI increased by about 530%. Despite this rapid growth in foreign investment, China put foreign investors at a disadvantage by dividing the issuance of shares into A shares and B shares in 1992. A shares were offered to national investors, and B shares were available to foreign investors. Grace Hu in her paper, *Chinese Capital Market: an Empirical Overview*, provides a concise definition of the two:

> *A* Shares represent the shares listed on the two main stock exchanges that are denominated in Renminbi (RMB)...which comprise approximately 96% of all shares traded.
> *B* Shares were established in 1992 in both Shanghai and Shenzhen. Initially, the participants were exclusively foreign investors. Since February 19, 2001, however, this market was opened to domestic individual investors. On the Shanghai Stock Exchange, prices are denominated in U.S. dollars…By the end of 2016, there [were] 100 listed companies with B shares traded on the two exchanges, accounting for only a tiny proportion of the total market. (Hu et al, 2018)

This decision to segregate the market between foreign and domestic investors created a host of problems and deterred future investments. In Figure 4, the graph from Figure 1 is broken down into A and B shares, showing how much larger the A share market was.

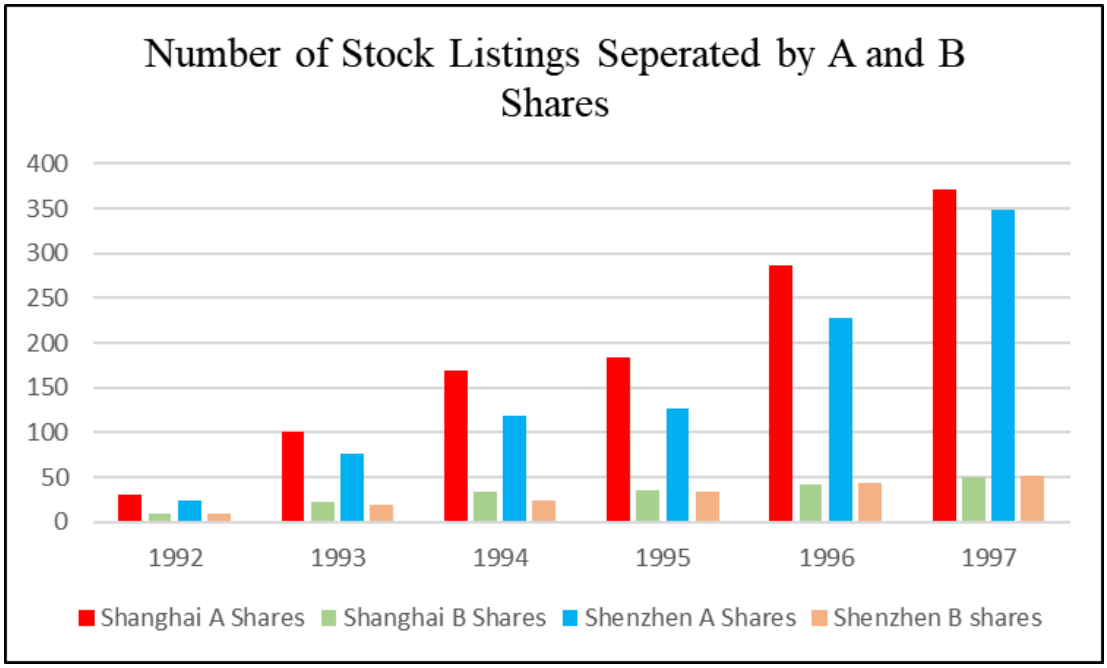

Figure 4: Stock Listings separated by A and B Share

Data for Figure 4 was sourced from Thomas's *Western Capitalism in China: A History of the Shanghai Stock Exchange*, which cites IFC: World Bank and *China Securities Market Year Book*

Due to this market split, foreign investors only had access to a fraction of the total market, and by the time national investors gained access to B shares, it was too late. The A share market had already been established as the dominant market in China, so buying B shares would put domestic investors at a disadvantage since there were more buyers in the A share market. Despite the inefficiencies of the SHSE, foreign investors were still swarming to China during this post-Mao era of deregulation and globalization. Consequently, they would find alternatives to the SHSE to invest in: namely, real estate. Joshua Ramo's article, *The Shanghai Bubble*, goes into detail about the extent of this in both Shanghai and China as a whole. As he put it, "Foreign capital, which seeks a vacuum, flowed into one area that was both deregulated and accessible: real estate (Ramo 1998, 10)." The article describes the massive amount of FDI that entered China's real estate market between 1992 and 1998. During this time, roughly half of the FDI

flowing into Shanghai was invested into real estate. These years were crucial to the growth of the SHSE, but the already-established real estate market was more appealing than the SHSE, which disenfranchised foreign investors. Ramo addresses both the fact that A and B shares are problematic and the implications of the FDI boom during this time:

> [The] incredible demand for investment opportunity in China has artificially inflated the Chinese-only share market. This inflation is easy to spot because of a growing divergence between the values of the two kinds of shares. In 1996, the average price of A shares grew 50 percent more than the equivalent price for B shares. The difference in prices got the attention of World Bank economists working on a China survey, who observed that "the price differential between the two implies there is a large amount of capital inside China seeking a home." (Ramo 1998, 4)

Looking at a graph of the Shanghai Stock Index, which measures the performance of the SHSE, provides visual context. Figure 5 shows the index from 1991 to 1998; within the figure, it is evident that the SHSE saw explosive growth immediately after its opening followed by a plateau. This proves the lack of new investors following its initial growth boom. In summary, the splitting of A and B shares drove foreign investors away from the SHSE and created a dichotomous market that could not grow symbiotically. In turn this created a real estate bubble as investors sought better investment opportunities, which caused an oversupply of housing. As a result, foreign investors lost money and were further deterred from investing in China.

Figure 5: Shanghai Stock Index from 1991-1998

Source:https://www.macrotrends.net/2592/shanghai-composite-index-china-stock-market-chart-data

Despite disappointing returns on real estate investments, China would continue efforts to globalize its markets in 2001 by joining the World Trade Organization (WTO). However, before doing so, China established the China Securities Regulatory Commission (CSRC) to regulate its stock market (Carpenter et al 2015, 4). The establishment of the CSRC was noteworthy in the way it actively deterred fraud. The role of the CSRC, which could be likened to the Securities and Exchange Commission (SEC) in the US, is to ensure a legal operation of the capital market by supervising the issuance and trading of shares and securities, while investigating and penalizing any in violation of market laws (CSRC, 2008). Essentially, the CSRC exists to make sure no fraudulent activity is happening in any of China's capital markets. The existence and aptitude of a regulatory commission such as the CSRC is necessary to avoid any impediments to

natural market growth. To elaborate, according to Chunxin Jia's publishing in the *Journal of Business Ethics*:

> Fraudulent behavior by listed companies damages the economy in general and capital markets in particular. Siebert (2002), for example, reports that from 2000 to 2002, more than US$7 trillion in wealth was lost in U.S. financial markets due to fraud, leading investors to lose their faith in the integrity of capital markets. (Jia et. al, 2009)

Of course, fraud will continue to exist in some fashion, but having agents in place to deter and penalize fraudulent activity shows that China's markets were continuing to prioritize investors' security.

However, the CSRC also has several issues keeping it from being as effective as the SEC in the US. First, it is second in the chain of command, as it receives its power from the State Council. According to the CSRC's overview found on their website:

> China Securities Regulatory Commission (CSRC), a ministerial-level public institution directly under the State Council, performs a unified regulatory function, according to the relevant laws and regulations, and with the authority by the State Council, over the securities and futures market of China, maintains an orderly securities and futures market order, and ensure a legal operation of the capital market. (CSRC, 2008)

The State Council is the chief administrative power of the state (NPC, 2023). While on one hand, having the State Council oversee the CSRC creates a form of checks and balances, on the other, it limits the efficiency and productivity of the CSRC by creating a lengthier chain of command. In Chapter three of this thesis, it will be discussed that the State Council now directly oversees Foreign Investment, which will be more effective. As it was, the largest flaw in the CSRC's operations was that it had too many responsibilities for a single agency. Tondkar's paper on the CSRC discusses this:

> If the CSRC were modeled after the regulatory agencies found in more developed countries such as the U.S. SEC, its sole role would be that of capital-markets regulator.

> The CSRC, however, undertakes an all-encompassing role, i.e. the CSRC is a regulator, state planner, selector, and advisor. (Tondkar et. al, 2003)

Due to these flaws, the CSRC existed as a functioning yet nonoptimal regulatory commission. As will be discussed later, the reforms made by the 2020 FIL make drastic improvements on regulating market activity and ensuring the safety of foreign investors.

While the establishment of the CSRC and subsequent admission to the World Trade Organization (WTO) showed China's interest in globalizing its market, it was actually the Qualified Foreign Institutional Investor Program (QFII) beginning in 2002 that directly affected the role foreign investors had in the SHSE. The QFII allowed foreign investors to purchase *A* shares on the SHSE, given they meet the requirements. To qualify, investment institutions had to have at least 5 million USD in managed assets, have no disciplinary actions against them in the three years preceding their application, and they had to be assessed by an appropriate Chinese governmental institution (CFI, 2020). This incentivized foreign investors and saw corresponding growth, but the QFII was an imperfect program. In addition to its strict regulations, the CSRC also dictated a limit on the amount of money that could be invested and withdrawn by foreign parties annually. Then, the withdrawn money was subjected to a ninety-day "lock up period" before it could finally be returned (CFI 2020). Although the QFII gave investors more opportunities than ever before, the strict regulations denied access to many potential investors.

The next significant policy change occurred in 2005 when the CSRC announced that the government would begin selling its state-owned shares to stimulate market growth (Reuters 2009). This was noteworthy, as prior to it, the market's volatility was largely dictated by the state; the government's large number of shares across many companies allowed the state to control prices. Following this, the SHSI saw several large fluctuations, eventually growing from

1,012 points in July 2005, to 6,124 points in October of 2007 (Macrotrends 2022). Within this timeframe, there are several pieces of evidence that show the effects of policy changes on China's stock market. The following points are taken from Reuter's 2009 article, *Rise and Fall of China's Stock Market since 2000*. Following the CSRC's announcement that the government would sell state-owned shares, the SHSI progressed to its all-time low over the next two months. This was due to the fear of a market crash following a large liquidation of shares. The CSRC then announced in May of 2006 that the share reform had been successful; consequently, the market saw its largest monthly growth in roughly four years. In May of 2007, the Ministry of Finance tripled the tax on stock trades from 1% to 3%. Within a week, the SHSI had fallen 21%. On April 24, 2008, the SHSI grew 9.3% after the ministry revoked the tax increase (Reuters 2009). These pieces of evidence further prove that the performance of the SHSE is directly influenced by relevant policy-changes. The following section will compare key economic indicators following years with significant policy changes to establish this correlation.

Section 2: Comparing Economic Indicators to Policy Changes

Year	GDP (Billions)	GDPpc	SHSI (Average closing)	P/E (Price to Earnings ratio)	Market Cap	GDP %Change	GDPpc*	SHSI*	P/E*	Market Cap*
2000	1,211.34	959.37	1,866.33	52.76	2,693,086.00	N/A	N/A	N/A	N/A	N/A
2001	1,339.39	1,053.11	1,960.26	49.70	2,759,056.48	11%	10%	5%	-3.05	2%
2002	1,470.55	1,148.51	1,568.07	38.62	2,536,372.00	10%	9%	-20%	-11.08	-8%
2003	1,660.28	1,288.64	1,467.70	36.05	2,980,492.19	13%	12%	-6%	-2.57	18%
2004	1,955.34	1,508.67	1,487.00	30.84	2,601,434.10	18%	17%	1%	-5.21	-13%
2005	2,285.96	1,753.42	1,157.24	18.45	2,309,613.18	17%	16%	-22%	-12.39	-11%
2006	2,752.13	2,099.23	1,615.02	21.35	7,161,237.68	20%	20%	40%	2.90	210%
2007	3,550.34	2,693.97	4,231.91	51.47	26,983,887.00	29%	28%	162%	30.12	277%
2008	4,594.30	3,468.30	3,017.12	27.37	9,725,190.00	29%	29%	-29%	-24.10	-64%
2009	5,101.70	3,832.24	2,747.33	23.30	18,465,522.00	11%	10%	-9%	-4.07	90%
2010	6,087.16	4,550.45	2,827.52	22.48	17,900,724.00	19%	19%	3%	-0.82	-3%
2011	7,551.50	5,614.35	2,670.11	17.57	14,837,623.00	24%	23%	-6%	-4.91	-17%
2012	8,532.22	6,300.62	2,219.14	12.48	15,869,844.00	13%	12%	-17%	-5.09	7%
2013	9,570.40	7,020.34	2,191.70	11.48	15,116,527.00	12%	11%	-1%	-1.00	-5%
2014	10,475.68	7,636.12	2,238.22	11.32	24,397,402.00	9%	9%	2%	-0.15	61%
2015	11,061.55	8,016.43	3,739.79	18.10	29,519,420.00	6%	5%	67%	6.78	21%
2016	11,233.27	8,094.36	3,005.24	14.97	28,460,763.00	2%	1%	-20%	-3.14	-4%
2017	12,310.40	8,816.99	3,249.69	17.37	33,132,482.00	10%	9%	8%	2.40	16%
2018	13,894.81	9,905.34	3,185.96	15.19	26,951,502.00	13%	12%	-2%	-2.18	-19%
2019	14,279.93	10,143.84		14.13	35,551,970.00	3%	2%		-1.06	32%
2020	14,687.67	10,408.67		14.86	45,532,159.00	3%	3%		0.73	28%
2021	17,734.06	12,556.33		17.19	51,969,834.00	21%	21%		2.33	14%

Table 6: Economic Indicators 2000-2021

* represents percent change

Data for this figure is sourced from CEIC Data, Macro Trends, and the World Bank (https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=CN) (https://www.macrotrends.net/2592/shanghai-composite-index-china-stock-market-chart-data) (https://www.ceicdata.com/en/china/shanghai-stock-exchange-pe-ratio)

The table above contains several indicators that show both economic and market performance from 2000 until 2021. It is important to keep in mind that for many of these years, China's stock markets were in a non-optimal state, this is the reason that market indicators and economic indicators' performances do not always correlate well. The indicators used are as follows: gross domestic product and gross domestic product per capita (GDP and GDPpc); Shanghai Stock Index yearly closing average (SHSI); price to earnings ratio for Shanghai Stock Market Composite Index (P/E); and market capitalization, or market cap. The right-most columns show the year-to-year percent change with green indicating positive performance and red indicating negative. Below are definitions of these indicators as well as the reasoning behind their selection.

> GDP: "Gross domestic product (GDP) is the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period. As a broad measure of overall domestic production, it functions as a comprehensive scorecard of a given country's economic health. (Fernando, 2022)" Although factors such as inflation or production costs can affect the accuracy of GDP, it still provides the most complete view of an economy as a whole.

GDPpc: “GDP per capita is the sum of gross value added by all resident producers in the economy plus any product taxes (less subsidies) not included in the valuation of output, divided by mid-year population. GDP per capita is the sum of gross value added by all resident producers in the economy plus any product taxes (less subsidies) not included in the valuation of output, divided by mid-year population. Growth is calculated from constant price GDP data in local currency. Sustained economic growth increases average incomes and is strongly linked to poverty reduction. GDP per capita provides a basic measure of the value of output per person, which is an indirect indicator of per capita income. Growth in GDP and GDP per capita are considered broad measures of economic growth.(World Bank, 2023)” As mentioned within the World Bank’s definition, dividing total GDP by a country’s population, GDPpc provides a more understandable value. This is useful when looking at China, as their large population results in large GDP values.

SHSI: Although there are multiple Shanghai Stock Indexes, this table uses the SSE Composite Index, also written as the SHSI. A stock index, such as the Dow Jones or S&P 500, summarizes the performance of multiple stocks to represent total market performance. The Shanghai Composite index is defined on the SHSE website. “SSE Composite Index is composed of all eligible stocks and CDRs listed on Shanghai Stock Exchange. This index is designed to reflect overall market performance of companies listed on Shanghai Stock Exchange. (SSE Composite Index 000001)” The index is calculated by the following method:

$$\text{Current Index} = \text{Current Total Market-Cap} / \text{Divisor} \times \text{Base Level} - 2$$

$$\text{Where Current Total Market-Cap} = \sum(\text{Security Price} \times \text{Number of Shares issued})$$

P/E: “The price-to-earnings ratio is the ratio for valuing a company that measures its current share price relative to its earnings per share (EPS). The price-to-earnings ratio is also sometimes known as the price multiple or the earnings multiple. (Fernando, 2022)”

$$P/E\ Ratio\ = \frac{Market\ Value\ per\ Share}{Earnings\ per\ Share}$$

Essentially, P/E ratios represent how much money is required to make a profit. For example, if an investor bought a share for two dollars and made a one dollar profit, the P/E ratio would be 2. The lower the P/E ratio, the cheaper it is to make money on an investment, which means low P/E ratios reflect an undervalued stock or stock market. In some cases a high P/E ratio could be a good thing. For instance, if investors are confident a market is going to grow, then they will all buy into the market, consequently raising prices. This in turn will give said market a higher P/E ratio. The P/E ratio in this table uses all listed stocks weighted by their average volume.

Market Capitalization: “Market capitalization refers to the total dollar market value of a company's outstanding shares of stock. The investment community uses this figure to determine a company's size instead of sales or total asset figures. In an acquisition, the market cap is used to determine whether a takeover candidate represents a good value or not to the acquirer. (Fernando, 2022)” Market capitalization, could be likened to the GDP of a stock or stock market. It is the value of all outstanding shares. Growth in market cap could represent more companies entering a stock market or an increase in average stock value. The market cap in this table uses all shares listed in the SHSE.

Given these indicators, it is expected that GDP and GDPpc will represent economic growth, while SHSI, P/E ratio, and Market Cap will represent stock market growth.

Based on the argument that China's economy and markets are policy-driven, one would predict that large policy changes would have corresponding results. The QFII, which was announced in 2002, was not implemented until 2003 (Reuters, 2011). During 2003 and 2004, the table shows a large turnaround in the SHSI: going from -20% to +1%. P/E ratios steadily dropped during this time. Additionally, although market capitalization fluctuated from 2002 to 2004, there was an 18% spike in 2003. This is likely due to the new qualified investors entering the market, consequently raising share prices. In 2005, the CSRC proposed that the State would begin selling its shares. According to a 2009 Reuters article, "The Shanghai index hits its lowest in more than eight years on fears the selling of government holdings will flood the market with new equity. This marks the low of the bear market (Reuters, 2009)." This is reflected in the -22% drop in the SHSI. However, in 2006, the CSRC announced that reforms were successful. This announcement is followed by massive growth in both the SHSI as well as market cap. P/E ratio suffers the largest increase in the entire given time period; this is due to the massive increases in investment causing a rise in stock prices. In order to slow this bubble, China tripled its tax on stock trading in 2007 (Dong, 2007). The next year shows a responsive decrease in market cap, SHSI value, and P/E ratio. The aforementioned tax was revoked in 2008. Consequently, SHSI and market cap grow, while P/E ratio decreases. These changes perfectly illustrate the policy-driven argument. When a positive policy change is made, such as the 2006 announcement, the market responds positively. When a negative policy change is made, such as in 2007, the inverse occurs.

Moving forward, there are outliers in 2015 and 2016. These fluctuations are not directly attributable to a policy change. However, the reason for the bubble and subsequent crash during this time period can still be considered a result of government influence. An article by AVA Trade EU says this:

> The Chinese government must also be apportioned its fair share of the blame for the bubble. In a bid to salvage debt-ridden and poorly performing state-owned companies, the government, through the CSRC, relaxed margin trading conditions. State-owned media also openly encouraged the public to invest in the stock market, and they managed to lure a poorly educated retail investing group that would be battered severely in the markets. The ruling Communist Party also actively advised its members (over 88 million at the time) to participate in the China Dream through the stock market. In every sense, the government promised a never-ending bull run in the stock market, but investors would instead be stuck in a bear trap, many of them with hefty debt obligations to both formal and informal lenders. (Liberson, 2021)

Although this article comes across as opinionated rather than strictly factual, its argument does correspond with another article from HandWiki, which summarizes a CNBC article:

> The trading population that developed in China differed in important ways from those elsewhere in the world. In China, the stock market trading activity is dominated by individual investors (close to 85%) – also known as 'retail investors.' Indicative of the sheer size of investor inflow into the markets, after several months of a bull market developing in China, more than 30 million new accounts were opened by retail investors in the first 5 months of 2015, according to data from the China's Securities Depository and Clearing Corp. And while a larger, more active investing population generally means greater market capitalization, many of these new traders were inexperienced and easily manipulated by the buying frenzy, with nearly two thirds having never entered or graduated high school, according to a survey by China's Southwestern University of Finance and Economics. As a result, momentum and rumors among the traders carried more weight than reason when it came to investing decisions, creating a trend of impulsive buying and overvaluation in the market. (Epub, 2022) (Chemi, 2015)

These articles are worth noting, as despite their opinionated nature, they do represent both a European and American view of the Shanghai Stock Exchange during this time. These articles serve as a representation of foreign investors' thoughts at the time, therefore these articles still

support the argument that foreign investors will respond to the decisions and policy changes of China and its CSRC.

As a whole, the table certainly shows evidence of the relationship between policy-changes and market growth. With this in mind, breaking-down the 2020 Foreign Investment Law and applying several economic models to predict future profitability now has a historical context supporting the previous claims that the 2020 FIL will result in market growth.

Chapter 3: 2020 Foreign Investment Law Analysis

The Foreign Investment Law ensures China's investment environment and foreign investment system in legal form and plays an important role in stabilizing the confidence of multinational companies to China… said Zhao Beiwen, deputy director of the Institute of World Economy, Shanghai Academy of Social Sciences. (Xinhua, 2023)

The 2020 FIL is the most progressive policy change China has implemented in recent years, specifically in terms of foreign investment promotion and protection. Furthermore, as this bill is enacted, it simultaneously replaces, "the three previous laws governing foreign investment and foreign investment enterprises (Jones Day, 2020)." Thus, there is merit in gleaning the significance of certain influential articles through a systematic analysis of this legislative bill. The new FIL was published in 2020, but will not be fully implemented until 2025; this means that multiple sources have already been published regarding the bill's impact, thus providing a healthy amount of discourse and helping to mitigate the amount of speculation. Additionally, any legal "gray area" left within the FIL will be interpreted by the Supreme People's Court in China (Zhang, 2020; 179).

Prior to the new Foreign Investment Law, potential investors were subject to Foreign Investment Enterprise (FIE) laws (Zhang, 2020; 195). Generally speaking, this was a nonoptimal program, wherein all sectors of foreign investment were required to obtain government approval. Additionally, Chinese institutions were under no legal obligation to treat Foreign Investment Enterprises and domestic enterprises equally. Article 4 of the new 2020 FIL amends this inequitable process by not only limiting required government approval to a specific number of sectors known as the negative list, but also by giving foreign investors equal rights as domestic investors:

> **Article 4** The State shall implement the management systems of pre-establishment national treatment and negative list for foreign investment.
>
> For the purpose of the preceding paragraph, pre-establishment national treatment refers to the treatment given to foreign investors and their investments during the investment access stage, which is not lower than that given to their domestic counterparts; negative list refers to special administrative measures for the access of foreign investment in specific fields as stipulated by the State. The State shall give national treatment to foreign investment beyond the negative list. (FIL)
>
> Note: The english translations used are provided by the National Development and Reform Commision from the PROC. Foreign Investment Law of the People's Republic of China

The term "national treatment" is a status of equality given to investors, and prior to the new 2020 Foreign Investment Law, this national treatment was not obtainable until after a potential FIE or foreign investor had been admitted by the government. This new legally-binding equity, prior to government approval, removes the potential for discrimination, bureaucratic impediments, or underhanded practices. This article serves as an indirect recognition of prior shortcomings in China's process to admit new foreign investors, and it is a great step towards fair competition.

This article also establishes a negative list, which defines the sectors that will require foreign investors to gain government approval; typically, these sectors have stricter guidelines. Consequently, foreign investors and FIEs attempting to gain access to sectors on the negative list are not given national treatment. While this could be a hindrance in certain cases, China has continued to reduce the number of sectors on the negative list over the past five years; additionally, the negative list has become a national-level law, thus removing local authorities' ability to alter it (Zhang 200). The negative list contains both restricted and prohibited sectors, as clarified by Article 28:

> **Article 28** Foreign investors shall not invest in any field forbidden by the negative list for access of foreign investment (hereinafter referred to as the "negative list").
>
> For any field restricted by the negative list, foreign investors shall conform to the investment conditions provided in the negative list.
>
> Fields not included in the negative list shall be managed under the principle that domestic investment and foreign investment shall be treated uniformly.

The negative list is less significant than it might seem, as in most cases, it only restricts or prohibits specific parts of a sector. For example, this list prohibits foreign investment in nuclear plants and compulsory education (China foreign investment Law : the 2022 "negative" list). Currently, the negative list appears to be an understandable precaution taken by China in order to protect national security and other sectors deemed crucial to China's economy. However, it is still important to note that China reserves the right to change this list, whether that be for better or worse.

Concerning the negative list, China began making several influential changes in 2019 that will work symbiotically with the 2020 FIL. Jones Day's summary of the new FIL explains this:

> [A] joint venture with a Chinese partner is no longer required in oil and gas exploration, and certain financial sectors (securities, futures, and life insurance) will be fully open from 51% to 100% foreign ownership in 2021. On the other hand, the Encouraged Industries Catalogue is being expanded so as to attract more foreign investment in high-end and intelligent manufacturing, advanced service industries, modern pharmaceutical and agricultural industries, advanced technology, new materials, and other promising sectors. (Jones Day, 2020)

Removing joint ventures as the only method for foreign investors to operate in major sectors such as oil, gas, and insurance is a significant change. Joint ventures, which in this case are investment entities composed of one foreign and one domestic party, are a natural deterrent to foreign investment. It forces foreign enterprises to give up control and share profits. Eliminating this hurdle allows foreign enterprises to enter the Chinese market and maintain total authority

over their enterprise. It would seem that this is exactly what China is attempting to achieve, as they have also opened other major financial sectors to 100% foreign ownership. Across the board, nearly every other high-value industry is having restrictions lessened. While the new negative-list may seem opposed to FDI at first glance, it has certainly been implemented alongside a plethora of beneficial changes.

As stated earlier, Articles 4 and 28 establish well-defined sectors for investors, while also granting equal rights. These two articles alone are weighty changes; however, the fields that see the most improvement are investment protection and intellectual property rights. Articles 5, 9, 25, and 39 all relate to the protection and promotion of foreign investors:

> **Article 5** The State shall protect foreign investors' investment, earnings and other legitimate rights and interests within the territory of China in accordance with the law.
>
> **Article 9** All national policies on supporting the development of enterprises shall equally apply to foreign-funded enterprises in accordance with the law.
>
> **Article 25** Local people's governments at all levels and their relevant departments shall strictly keep their policy commitments made to foreign investors and foreign-funded enterprises and perform all contracts entered into in accordance with the law…
>
> **Article 39** Where a staff member of an administrative department abuses his/her functions and powers, neglects his/her duties or engages in malpractice for personal gain during the work relating to promotion, protection and management of foreign investment, or divulge or illegally provide to others any trade secret he/she is aware of during the performance of duties, a penalty will be imposed upon him/her in accordance with the law; if a crime is constituted, he/she will be held criminally liable.

Articles 5 and 9 further establish the equality of foreign and domestic investors, while also appointing the State as the overseer of compliance. This also eliminates the CSRC's chain-of-command problem mentioned in Chapter 2. Next, Article 25 addresses local-governments' role: specifically, to strictly adhere to the policies put in place by the State. Lastly, article 39 asserts that any case of malpractice is a criminal offense. These four articles

work together with articles 4 and 28 to paint a very clear picture of where China stands on foreign investors; they are to be held equal and protected in all possible ways.

With each article, the safety of investors becomes more assured. The bill goes on to address one of China's largest hindrances to foreign investment: intellectual property rights. Intellectual property rights are, understandably, essential for foreign and domestic enterprises to have mutual growth. Situations wherein a domestic country does not respect the intellectual property of foreign enterprises result in a constant, looming threat of losing one's patents or copyrights. In turn, this leads to secrecy and isolation, which causes a nonoptimal market economy. Studies from the European Union Intellectual Property Office (EUIPO) found that intellectual property rights play a large role in international trade, macroeconomic growth, and the financial success of large companies:

- Companies that own IPRs have 20% higher revenue per employee than companies that do not.
    - Correcting for relevant factors such as sector, company size and country, this revenue premium rises to 55% and even higher for SMEs.
- IPR-owning companies pay wages that are on average 19% higher than firms that do not own IPR.
- About 60% of large companies own IPRs.
- Although less than 9% of small businesses own IPRs, the firms that do have 68% more revenue per employee than firms that do not.
- IPR-intensive industries generated 29.7% (61 million) of all jobs in the EU during the period 2017-2019.
- IPR-intensive industries accounted for most of the EU's trade with the rest of the world and generated a trade surplus, thus helping to keep the EU's external trade balance in surplus (EUIPO 2013-2023)

As these studies make apparent, international property rights (IPRs) positively affect several economic sectors. Despite this fact, China's IPR laws have been lackluster from their economic opening in the 1970s until the new 2020 FIL. While China has continuously revamped their IPR laws, such as when they joined the WTO in 2001, they have not enforced them. In a 2007 journal by Daniel Gervais, he states that , "As the International Intellectual Property Alliance stated in its recent Special 301 Report, copyright piracy in China resulted in $2.2 billion of US trade losses in 2006 alone (Yu, 2007; 174)." This journal goes on to explain that China has been able to attract foreign investors despite its lackluster IPR laws because of other factors, such as low labor costs and impressive growth-rate. While China has been able to attract foreign investment, it would be intuitive to state that better IPR laws would only serve to attract more foreign investment. This is why articles 21 and 22 indicate, yet again, that China's new 2020 FIL is making numerous changes in order to catalyze foreign investment growth.

> **Article 21** A foreign investor may, in accordance with the law, freely transfer inward and outward its contributions, profits, capital gains, income from asset disposal, royalties of intellectual property rights, lawfully obtained compensation or indemnity, income from liquidation and so on within the territory of China in CNY or a foreign currency.
>
> **Article 22** The State shall protect the intellectual property rights of foreign investors and foreign-funded enterprises, and protect the legitimate rights and interests of holders of intellectual property rights and relevant right holders; in case of any infringement of intellectual property right, legal liability shall be investigated strictly the legal liability in accordance with the law.

Articles 21 and 22 guarantee the protection of FIE's intellectual property. Additionally, article 21 provides a "fail-safe" by giving foreign investors the option to withdraw both their intellectual property and any capital associated therein. By ensuring foreign investors' assets, both tangible and intangible, the 2020 FIL has set-up a low-risk yet lucrative opportunity.

Thus far, most of the articles addressed have focused on safeguarding FIEs and foreign investors. Naturally, this is one of the most important deciding factors for foreign engagement; however, the other deciding factor, lucrativeness, also plays a large role. The aforementioned changes surrounding the negative list, joint ventures, and percent-ownership will all be incentives. Additionally, Article 17 introduces a new right for FIEs; that is, the right to go public:

> **Article 17** Foreign-funded enterprises may conduct financing through public offering of shares, corporate bonds and other securities or by other means.

Going public, which is done through an initial public offering (IPO), is a method for private companies to sell shares of their company publicly. All companies with listed shares for sale to retail investors on a stock market have gone public. This process allows companies and their investors to realize gains, raise equity, and liquidate assets (Fernando, 2022). Ibbotson and Ritter discuss the reasoning behind going public in their 1995 publishing, *Handbooks in Operations Research and Management Science*:

> Most companies start out by raising equity capital from a small number of investors, with no liquid market existing if these investors wish to sell their stock. If a company prospers and needs additional equity capital, at some point it generally finds it desirable to 'go public' by selling stock to a large number of diversified investors. Once the stock is publicly traded, this enhanced liquidity allows the company to raise capital on more favorable terms than if it had to compensate investors for the lack of liquidity associated with a privately-held company. (Ibbotson & Ritter, 1995, 993.)

The profitability of going public and the performance of a company's stock varies from company to company. Nonetheless, it is a useful tactic that countless high-value companies utilize. This new ability for foreign-funded companies to go public on Chinese stock exchanges coupled with the elimination of separate A and B share markets creates an entirely new, better market for foreign investors to capitalize on.

In conclusion, the new 2020 FIL has implemented changes to amend many of the pre-existing barriers for foreign investment. The protection and promotion of foreign enterprises composes most of the 42 articles; however, the bill also includes other major changes such as new IPR rights and the ability for foreign funded companies to publicly list and offer shares on stock exchanges. Article 42 elaborates that existing companies will have five years to implement these changes, so it will take time to wholly realize the results:

> **Article 42** The Law shall come into effect as of January 1, 2020. The Law of the People's Republic of China on Sino-Foreign Equity Joint Ventures, the Law of the People's Republic of China on Wholly Foreign-owned Enterprises and the Law of the People's Republic of China on Sino-Foreign Cooperative Joint Ventures shall be repealed simultaneously.
>
> Foreign-funded enterprises, which were established in accordance with the Law of the People's Republic of China on Sino-Foreign Equity Joint Ventures, the Law of the People's Republic of China on Wholly Foreign-owned Enterprises and the Law of the People's Republic of China on Sino-Foreign Cooperative Joint Ventures before the implementation of the Law, may retain their original organization forms and other aspects for five years upon the implementation hereof. Specific implementation measures shall be formulated by the State Council.

Despite any uncertainty, there have already been positive results from the implementation of the 2020 FIL. CGTN, a Chinese news outlet, released an article mentioning the benefits:

> The National Development and Reform Commission says China had utilized about 160 billion US dollars of foreign direct investment at the end of 2021, ranking second in the world. This is mainly thanks to a foreign investment law passed in 2020 and other supporting policies that help relax market restrictions. (CGTN, 2022)

It is worth noting that, as a Chinese news outlet, CGTN may provide biased information. Counterpoints to the benefits mentioned above are brought up in Zhang's 2022 article, *Protection of Foreign Investment in China: The Foreign Investment Law and the Changing Landscape*:

> The FIL reveals China's commitment to overhauling the legal regime for foreign investment in China. Nonetheless, many important issues raised by foreign investors, including restrictions on key economic factors, remain unresolved. Moreover, certain

> provisions of the FIL are vaguely drafted and leave room for discretionary interpretation. (Zhang, 2022; 4)

Alltogther, the new 2020 FIL follows years of positive changes in China aimed at promoting foreign investment, as described in Chapter 2. The changes brought about by the new Foreign Investment Law have already shown positive results, and there appears to be limited reasons for growth to slow. In response to this, investors acting solely on profitability would be incentivized to enter the Chinese market, especially when considering the claim made in Chapter 2 that China has a policy-driven economy. With this in mind, Chapter 4 uses economic models to calculate the profitability of entering the Shanghai Stock Exchange as an investor.

Chapter 4: Economic Models

Whereas the previous chapters have argued that the Chinese economy and its stock exchanges will see future growth based on a historical analysis and recent policy changes, Chapter 4 aims to provide models to further prove this argument. The models that will be used are as follows: a three-factor model based on the research of John Bogle and a paper by Jack Vogel, The Capital Asset Pricing Model (CAPM), and The Arbitrage Pricing Theory Model (APT). The models, which all use different methods to predict investment returns, will be applied to the Shanghai Stock Exchange Composite Index and in some cases the Shanghai Stock Exchange's 180 Index. These indexes consist of a number of different stock listings in order to create an average score that represents the performance of the stock exchange or some portion therein. See Chapter 2 Section 2 for a definition of the SHSI or the glossary for the definition indexes as a whole.

Section 1: Introducing the Models

The first model this thesis will use is a three-factor model that was originally written about by John Bogle and Michael Nolan in their 1991 article titled *Establishing Reasonable Expectations for Financial Market Returns* and elaborated on by Jack Vogel, Ph.D in his 2021 paper titled *How to Predict Stock Returns*. John Bogle was the founder of The Vanguard Group, which is currently the second largest investment firm in the US. He is also the creator of index trading (Chen, 2022). The model is as follows:

Predicted Return = Starting Dividend Yield + Earnings Growth Rate + %Change in P/E

P/E ratios have already been explained in this thesis. Earnings growth rate is the percentage change in earnings for a company over a period of time. For example, if a company earned $100 last year and $105 this year, then their earnings growth rate would be 5%. As summarized by Investopedia, dividend yield is, “a financial ratio (dividend/price) that shows how much a company pays out in dividends each year relative to its stock price (Fernando, 2022).” According to Vogel’s paper, the model is historically accurate as well. When Vogel applied this model to the S&P 500, the model predicted that the S&P 500 would earn 13.57% from 1/1/2000 through 12/31/2019. In reality investors would have earned 12.56% (Vogel, 2019. 2). When applied to a negative earnings situation, it is less accurate. From 1/1/2000 to 12/31/2009, the S&P 500 had an annualized return of -0.95%. However, the model predicted a return of -4.07% (Vogel, 2019. 1). With these two scenarios, it could be concluded that this model tends to overestimate returns, while accurately predicting positive or negative returns. It can also be concluded that the longer the period of time measured is, the more accurate the prediction will be.

The second model this thesis will use is the capital asset pricing model (CAPM Model). The CAPM Model, similar to the Vogel Model, seeks to predict the expected returns on an investment. David Mullins describes this in the *Harvard Business Review*:

> The capital asset pricing model (CAPM) is an idealized portrayal of how financial markets price securities and thereby determine expected returns on capital investments. The model provides a methodology for quantifying risk and translating that risk into estimates of expected return on equity. A principal advantage of CAPM is the objective nature of the estimated costs of equity that the model can yield. (Mullins, 1982)

Mullins uses the term *idealized* because this model, like many economic models, assumes that, “(1) securities markets are very competitive and efficient… (2) these markets are dominated by rational, risk-averse investors, who seek to maximize satisfaction from returns on their

investments (Mullins, 1982).” The Shanghai Stock Market fits these assumptions. The CAPM Model is as follows:

Expected Return of Investment = Risk-Free Rate + Beta of the Investment*Market Risk Premium

Or

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

This model differs from the Vogel Model in that it prioritizes risk when calculating estimated return. On the other hand, it excludes influential economic indicators such as PE ratio and market cap. This is why it is important to use several models that have different variables.

Defining the CAPM Model variables will aid in understanding the model’s results. Risk-free rate describes the expected return on an investment with zero risk. For example, in the US, investments such as treasury bonds that are guaranteed by the government would be similar to a risk-free investment. Of course, in reality, there is no truly risk-free investment. In this model, three-month Chinese treasury bonds will act as the risk-free rate, as they are guaranteed by the government. Additionally, most US-based CAPM Models also use three-month treasury bonds (Hayes, 2022).

In regards to the risk-free rate, it could be argued that for a country with volatile treasury rates, using the current return rate does not provide an accurate representation. This is not the case for China. As seen in the figure below, three-month treasury rates have been fairly consistent, excluding the 2008 financial crisis. This model will use the annualized 2022 value, which is 2.82%.

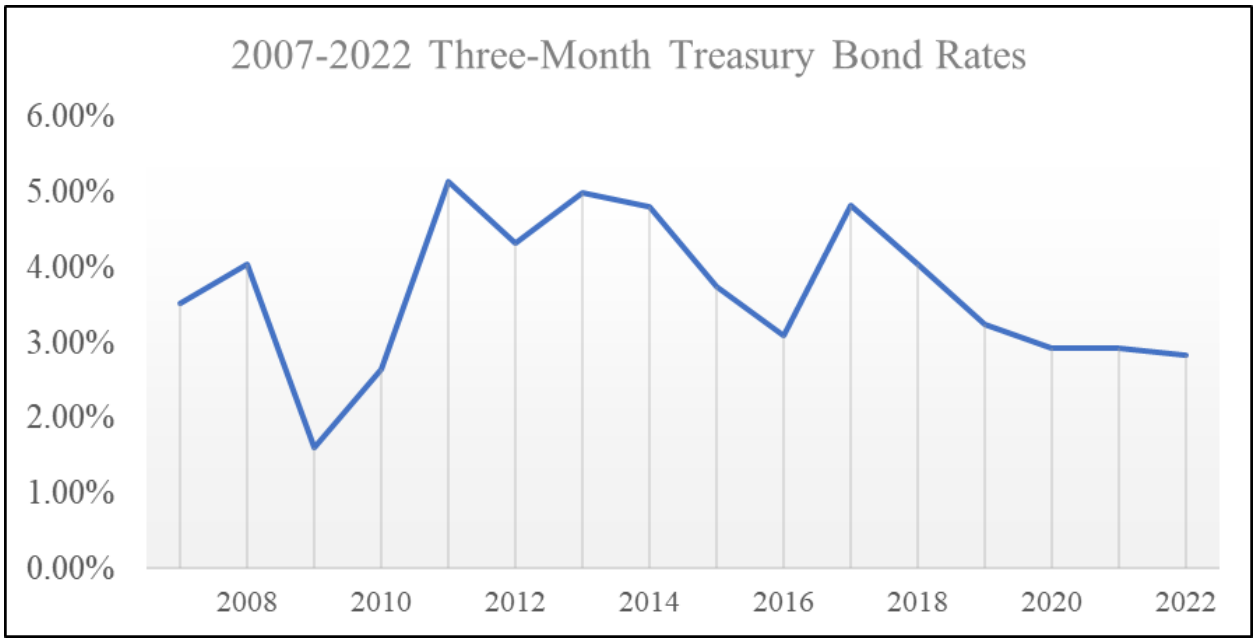

Figure 7: China's 3-Month Treasury Bond Rates
Data for this figure was sourced from CEIC's *Short Term Interest Rates: 3-Month Treasury Bills* CDMNext

The next variable, market risk premium, is the difference between the expected return of the entire market and the risk free rate. The expected return of the market is similar to what is predicted in the Bogle Model. It could be used for an investment portfolio or, as in this model's case, a stock index. The difference between the expected return of a market and the risk free rate, shows the added value of investing with risk. For example, consider this scenario. An investor has two options. First, he can invest in a risky investment that has an expected return of 25%. Alternatively, he could buy a treasury bond that is risk-free and has a guaranteed return of 5%. The risk premium would then be 20%, showing the increased profits of choosing the riskier option. The influence of risk on an investor is different for every individual. (Mullins, 1982; Chen, 2022)

Expected returns, in real investments, are a bit more complicated than the above example. In practice, to give the expected return, investors look at historical averages during different periods or scenarios. Then, these different periods or scenarios are given a probability (Chen, 2023). To illustrate, consider an investment that was made ten years ago. During eight of those years, the investment returned 10%. During two of those years, the investment returned 0%. The investment would be considered to have an 80% probability of 10% return and a 20% probability of 0% return. The expected return would then be 8%. Of course, you can expand this to include infinite periods or scenarios; however, specific scenarios are better used on more limited investments, such as investing in a single company. Considering the aggregate nature of this thesis, it will use two time periods. The first time period will be from 2003 until 2018. This period begins with the implementation of the QFII, which represents the entrance of foreign investors into the market. The second period will be from 2019 until 2022. This period represents the announcement of the 2020 FIL. Both periods will be given a probability of 50%, as it is undecided if the market will change based on the 2020 FIL or if it will behave similarly to previous trends. Additionally, it should be mentioned that the first time period, or period 1, includes the 2008 financial crisis. While the probability of a similar financial crisis occurring is up for debate, this model will include it because of the other policies occuring at the time that are relevant to this thesis. It can be expected that the performance of period 1 will be lowered due to this. The data for the CAPM Model comes from Yahoo Finance (Yahoo, 2023 Link) and CEIC (CEIC, 2023 Link) . The model will use indexes' adjusted closing prices, which are closing prices after dividends have been paid; this is because dividends are considered a risk-free investment.

Lastly, Beta will be calculated twice for this model. Beta measures the risk of an investment compared to the risk of investing in the market as a whole (Chen, 2022). Since this model will use the SHSI, which is a composite index and includes the entire market, the first beta will have a value of 1. The second calculation of beta will use the SSE 180 Index: an index that includes the 180 largest companies listed on the SHSE, similar to the United States's DOW Jones. Using indexes to represent market behavior is typical, and most US models use the S&P 500 as their basis for the entire market (Mcclure, 2021). The reason for including the SSE 180 will be better explained in Section 3.

The third and final model this thesis will use ideas from the Arbitrage Pricing Theory Model (APT). The model, as described by Hayes's 2020 article from Investopedia, "is a multi-factor asset pricing model based on the idea that an asset's returns can be predicted using the linear relationship between the asset's expected return and a number of macroeconomic variables that capture systematic risk (Hayes, 2020)." The model is similar to the CAPM Model in the way it utilizes expected returns to predict an investment's profitability. Unlike the CAPM Model, however, the APT Model allows the usage of a chosen risk factor. China, for example, has markets that are heavily affected by policy changes. This variable is a double edged sword. On one hand, it makes models that do not account for policy changes less accurate, as their influence is undeniable. On the other hand, it should make investments easier to decide on; when investors know that the market will respond to a variable, they can better predict when to buy or sell. This thought is the reason that the APT Model is useful for foreign investors, and it is written about in Bruno Solnik's article from *The Journal of Finance* titled *International Arbitrage Pricing Theory*:

> The attractive and simple domestic CAPM conclusion that a well identified market portfolio is efficient does not exist in the international framework, so that the IAPM does not yield operational (and easily testable) conclusions. The Arbitrage Pricing Theory formulated by Ross (8, 9) provides a fruitful alternative to these utility based models. (Solnik, 1982; 449)

The article goes on to explain that when a market is influenced by a variable, which in this case is policy changes, the unit of measurement is irrelevant; all that matters is that investors homogeneously believe the market will respond to said variable. That is to say, differences in currency or differences in market sectors are nonfactors. Consequently, differences between foreign and domestic investors are also nonfactors, so long as they agree that the market will respond to policy changes. This idea is the logic behind the final model, which will solve for the covariance of policy changes and stock market responses in China.

Section 2: Bogle Model

The following model will use data from the reported first and second halves from 2019 through 2022. These are the years since the announcement of the 2020 FIL. The table below, which comes from *Siblis Research Ltd*, contains the data that will be used in the model. It should be noted that differences between P/E ratios in this table and the one seen in Chapter 2 Section 2 are due to the fact that this table does not use annualized averages. This is because Bogle's Model does not use annualized averages. Lastly, EPS(TTM) stands for Earnings Per Share (Trailing Twelve Months); The EPS(TTM) in this table begins with a base value of 100.

Date	SSE Composite Index Value	P/E (TTM)	EPS (TTM) *	Forward P/E	CAPE Ratio	Dividend Yield (TTM)
12/31/2022	3,089.26	13.24	111.34	9.98	13.73	2.64%
6/30/2022	3,398.62	13.77	117.77	11.53	15.23	2.06%
12/31/2021	3,639.78	15.45	112.38	12.19	16.59	1.99%
6/30/2021	3,591.20	16.25	105.42	12.33	16.66	1.95%
12/31/2020	3,473.07	17.37	95.41	13.26	16.47	2.02%
6/30/2020	2,984.67	14.62	97.39	11.52	14.31	2.19%
12/31/2019	3,050.12	14.55	100.00	10.92	14.70	2.24%

Table 8: Shanghai Composite Index Data Points (Data sourced from *Siblis Research LTD.)*

This model differs from Bogle's original model in several ways. First, rather than using a ten-year period, it will use a three-and-a-half-year period. Next, rather than annualized data, it will use bi-annual data; this is in effort to make up for the lack of data points due to the shorter period. Next, The model still functions as it should, but as mentioned previously, longer periods tend to be more accurate. However, the 2020 FIL has not been implemented long enough to measure a ten-year period.

Predicted Return = Starting Dividend Yield + Earnings Growth Rate + %Change in P/E

This model will use 2.24% as its starting dividend yield. This is of course the easiest variable in play, as only the starting yield is needed. Percentage change in P/E ratio is calculated by using the first and last reported halves. The percentage change from 12/31/2019 to 12/31/2022 is 8.93%. Earnings growth rate is calculated by taking the percentage change of three one year periods as well as the total percent change, then using the arithmetic and geometric average of those four values; the median of arithmetic and geometric averages will be used.

Conclusion:

Note: For the sake of brevity, most calculations have been simplified to only show their formula and solution. The full calculations and data tables have been put into a technical appendix. A full URL can be found beneath the bibliography.

Technical Index

Predicted Return = Starting Dividend Yield + Earnings Growth Rate + %Change in P/E

$$Predicted\ Return = 2.24\% + 5.715\% + 8.93\% = 16.885\%$$

This simple model, which uses the SHSI, concludes that an investment made in 2023 would expect to see annual returns of 16.885%. This would be considered a lucrative investment; many investors consider anywhere from 7% to 10% to be a good return on investment (Indeed, 2023)(Birken, 2022). Investors using this model would be incentivized to invest in the Shanghai Stock Exchange. This model is in agreement with the claims made in Chapters 2 and 3.

Data for the above model comes from *Siblis LTD* China Shanghai Stock Market P/E, CAPE Ratio & Earnings

The model itself is based on a paper by Jack Vogel, Ph.D. Vogel Paper

Section 3: CAPM Model

The data for this model comes from CEIC Global Database. According to their website's introduction:

> Founded in 1992 by a team of expert economists and analysts, CEIC Data provides the most expansive and accurate data insights into both developed and developing markets. With our local experts on the ground in more than 18 countries, we are the service of choice for economic and investment research by economists, analysts, investors, corporations, and universities around the world. (CEIC, 2023)

CEIC Data is especially useful, as they contain various financial data for China that cannot be found elsewhere. The model begins by using the SHSI and is as follows.

Conclusion for Shanghai Composite Stock Index

Expected Return of Investment = Risk-Free Rate + Beta of the Investment(Market Risk Premium)

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

$$ER_m = (0.5)(Period\ 1) + (0.5)(Period\ 2)$$

$$ER_m = (0.5)(13.69) + (0.5)(4.75) = 9.22\%$$

$$ER_i = (2.82) + 1(9.22 - 2.82) = 9.22\%$$

As can be seen, the model cannot function properly with a beta of 1, as the return for the market and the return for an investment will be identical. The CAPM Model relies heavily on the difference in risk between the market as a whole and the risk of the investment in the model. However, if a different index is used, then the model is still viable. This will also give a more accurate representation of the real return on investments foreign investors will see, as investors are unlikely to invest in the market as a whole. In this next model, risk-free rate will remain the same. The model will be worked twice. Once with an expected Period 2 market return of 4.75%, as seen above, and once with an expected Period 2 market return of 16.86%, as seen in the Bogle Model. The new index will be the SSE 180. It is similar to the United State's DOW Jones, and it "consists of the 180 largest and most liquid A-share stocks listed on Shanghai Stock Exchange. The Index aims to reflect the performance of the Shanghai blue chips (SSE, 2023)." This also means beta must now be solved for.

Scenario 2: SSE 180 Index

Beta:

$$\beta = \frac{Covariance}{Variance}$$

$$Covariance = Measure\ of\ a\ stock's\ return\ relative\ to\ that\ of\ the\ market$$

$$Variance = Measure\ of\ how\ the\ market\ moves\ relative\ to\ its\ mean$$

Covariance measures how two stocks move together. A positive covariance means the stocks tend to move together when their prices go up or down. A negative covariance means the stocks move opposite of each other. (Nickolas, 2021)

Variance, on the other hand, refers to how far a stock moves relative to its mean. For example, variance is used in measuring the volatility of an individual stock's price over time. Covariance is used to measure the correlation in price moves of two different stocks. (Nickolas, 2021)

Note: These equations and the following covariance & variance equations are sourced from Steven Nickolas's *Beta Formula: How to Calculate the Beta of a Stock*, Adam Hayes's *Covariance: Formula, Definition, Types, and Examples,* and Adam Hayes's *What is Variance in Statistics? Definition, Formula, and Example*

Covariance:

$$Covariance = \sum \frac{(Ret_{180} - Avg_{180})x(Ret_{sse} - Avg_{sse})}{Sample\ Size - 1}$$

$$(Ret_{180} - Avg_{180})x(Ret_{sse} - Avg_{sse})$$

$$(-\ 21.6\% - 18.87\%)x(-\ 24.59\% - 13.69\%) = 1549.19$$

The above calculation shows the covariance's numerator for one year within the period. This process is then repeated for each year in the data before it can be divided by n-1. The end result yields a covariance for period one of 2888.79. Solving again for period two yields a

covariance of 211.44. See the technical appendix for a full description. Covariance has proven to be relatively high in both periods. This means that one would expect the SSE 180 Index to respond to market changes similarly to the SHSI, also called the SSE Composite Index.

Variance:

$$V^2 = \frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{N}$$

$x_i = Each\ value\ in\ the\ data\ set$

$\overline{x} = Mean\ of\ all\ values\ in\ the\ data\ set$

$N = Number\ of\ values\ in\ the\ data\ set$

$V^2 = variance$

Note: All values will come from the SSE 180 Index tables seen in the covariance section in the technical appendix.

Calculations yielded a variance of 3387.74 for period one and a variance of 303.48 for period 2.

Beta Conclusions:

Now that covariance and variance have been solved for both period 1 and period 2, beta can be calculated.

$$\beta = \frac{covariance}{variance}$$

$$\text{For period 1: } \beta = \frac{2888.79}{3387.742} = 0.85$$

$$\text{For period 2: } \beta = \frac{211.44}{303.48} = 0.70$$

Median beta: 0.775

By having a beta of less than one, it is concluded that the SSE 180 is historically less volatile than the market as a whole. The CAPM Model can now be solved with a more accurate representation of real investments.

CAPM Model: Solving with a 4.75% Estimated Return

Expected Return of Investment = Risk-Free Rate + Beta of the Investment(Market Risk Premium)

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

$$ER_i = (2.82\%) + (0.775)(9.22 - 2.82) = 7.78\%$$

CAPM Model: Solving with a 16.885% Estimated Return [Bogle Model]

$$ER_i = R_f + \beta_i(ER_m - R_f)$$

$$ER_i = (2.82\%) + (0.775)(15.29 - 2.82) = 12.48\%$$

CAPM Conclusions:

Depending on the expected return of Period 2, this CAPM Model predicts a 7.78% or 12.48% annual return on an investment made in the SSE 180 Index with probability heavily based on the expected market returns of periods 1 and 2. The expected returns are

also the most debatable aspect and should not be considered absolute. To give a more accurate result, the intended investments of investors would be needed. With that information, economic periods and indexes could be narrowed to reflect the historic performance of said investment.

Regardless, there is still useful information to be gained from running the CAPM Model. First and foremost, all versions of the model predicted growth. This means that the market as a whole is expected to see growth as well as the SSE 180 Index. The SSE 180 Index's growth implies that blue-chip, or high-value, stocks expect to see between 7.78% and 12.48% growth. The expected return on market, weighted by the two-period probability, claims that the market as a whole can expect 9.22% growth. When using this model along with the Bogle Model, one would infer that the Shanghai Stock Exchange can expect to see between 9.22% and 16.885% annual growth with a median value of 13.05%. The reason estimated market return's value is used instead of the final estimated return on investment is because this thesis seeks to argue that the market as a whole will see growth. The fact that the SSE 180 has a high variance value but still has a beta of less than one indicates that the SHSE is a volatile market. In regards to the accuracy and applicability of this model, Mullins has this to say in his Harvard Business Review article:

> …[Tests] of the model confirm that it has much to say about the way returns are determined in financial markets. In view of the inherent difficulty in measuring the cost of equity, CAPM's deficiencies appear no worse than those of other approaches. Its key

> advantage is that it quantifies risk and provides a widely applicable, relatively objective routine for translating risk measures into estimates of expected return. (Mullins, 1982)

To conclude, while it would be foolish to consider one model's results a guaranteed prediction of how an investment will perform, the CAPM Model still provides information in support of this thesis's argument and in agreement with the Vogel Model. The CAPM Model indicates that the Shanghai Stock Exchange will see growth in the coming years. Of course, these models are unable to show what role policies play in this growth; this is why the following Arbitrage Pricing Theory Model is useful.

Section 4: Arbitrage Pricing Theory Model

Remember from the CAPM Model's calculation of covariance that two sets of numbers are required; this is because a set of *x* and *y* variables is necessary in order to measure their correlation. However, as the macroeconomic factor chosen for this model is policy changes, there is a missing set of numbers. Still, there is a way to satisfy this requirement that will also serve to prove the strength of correlation between policy changes and stock market responses. The first set of values will be the difference of average monthly values (taken from the SHSI) before and after a significant policy change. The second set of values will represent policy changes. For each policy change, a value of +1 or -1 will be assigned based on whether the change would be considered a positive or negative change. More specifically, positive changes are those that would incentivize investment, and negative changes are those that would deter investment. As a whole, the goal of this model is to show specifically the strength of correlation between policy changes and stock market responses. With these two sets of variables, we can move forward with calculating the covariance for policy changes and SHSI performance.

The policy changes that this model will use are listed below, along with a brief description and explanation of the value they will be assigned. In an effort to prevent biased or niche results, the policies used span sixteen years and cover a variety of topics.

1. On November 5, 2002, The Qualified Foreign Institutional Investor policy was announced (Tan, 2018). As it was not implemented until the following year, this model will use the January of 2003 value for the SHSI (Reuters, 2011). The entry will be given a value of +1 because it allowed new investors to enter the market.
2. In May of 2005, the CSRC suspended IPOs and announced that the State would begin to sell shares (Reuters, 2010). This entry will be given a value of -1 because it caused investors to leave the market, assuming the large amount of new shares for sale would drive down stock prices.
3. In May of 2006, the State allowed for IPOs to begin again and announced that the selling of state shares was successful (Reuters, 2010; Reuters, 2009). This entry will be given a value of +1 because it reverses the negative effects of the above entry.
4. On May 30, 2007, the State raised the Stock Trading Tax (Reuters, 2009). This entry will be given a value of -1 due to the fact that it deterred investment by lowering profits.
5. In December of 2011, The Renminbi Qualified Foreign Institutional Investor program was launched (Tay, 2018). This entry will be given a value of +1, as it allowed new foreign investors to enter the market.
6. Throughout September and October of 2013, Xi Jinping announced and began defining the Belt and Road Initiative (Xinhua, 2016). The policy does not directly affect the stock market, however it is worth including, as it does promote overall trade for China. This entry will be given a value of +1, because it benefitted global trade for China (Mcbride, 2023).
7. On July 22, 2019, the Shanghai Stock Exchange opened its STAR Market (Xinhua, 2019). The market consisted of tech companies, and was implemented to compete with the United States; this is due to the rising influence of tech companies in the US's stock market (Kolakowski, 2019). This entry will be given a value of +1 because it added companies to the SHSE and showed China's intent to promote technology-sector investments.

The monthly SHSI values used will not be listed; however, the logic behind their selection has already been discussed. The data used is sourced from *CEIC Data Manager*. In regards to data, the SHSI behaved rather predictably, with positive policy changes resulting in growth and negative changes resulting in regression. A notable outlier was the STAR Market implementation; despite the companies on the STAR Market seeing significant growth, the market as a whole still lost value in the following month. This could be due to the impact COVID-19 had on investments. The following calculations solve for the covariance of China's

policy changes and their corresponding stock market responses. The calculation itself was run on *ncalculators.com.*

x_i	$x_i - \mu_x$	y_i	$y_i - \mu_y$	$(x_i - \mu_x)(y_i - \mu_y)$
1	0.5714	65.64	64.9014	**37.08465996**
-1	-1.4286	-98.41	-99.1486	**141.64368996**
1	0.5714	201.08	200.3414	**114.47507596**
-1	-1.4286	-288.95	-289.6886	**413.84913396**
1	0.5714	93.19	92.4514	**52.82672996**
1	0.5714	78.89	78.1514	**44.65570996**
1	0.5714	-46.27	-47.0086	-26.86071404
$\sum x_i = 3$		$\sum y_i = 5.17$		$\sum (x_i - \mu_x)(y_i - \mu_y) = 777.67428572$
$\mu_x = \frac{3}{7} = 0.4286$		$\mu_y = \frac{5.17}{7} = 0.7386$		

$$\sigma_{XY} = \frac{777.67428572}{7}$$
$$\sigma_{XY} = 111.0963$$

Figure 15: Covariance Calculation for Policy Changes

As can be seen, there is a covariance of 111.1 between policy changes and corresponding stock market responses. While this model could be improved by including more policy changes or adding specific values based on the significance of a given policy change, the simple fact that there is a positive covariance is enough to further the argument of this thesis. That is, policy changes in China consistently result in stock market responses. Consequently, it should be expected that the new 2020 FIL is no exception. In this chapter, the results of all three models are in agreement that the Shanghai Stock Exchange will see growth in the coming years.

Chapter 5: Conclusions

This thesis has sought to argue that the Shanghai Stock Exchange will see future growth due to recent policy changes in foreign investment legislature, namely the 2020 Foreign Investment Law, as well as the historical precedent of China's continued efforts to promote foreign investment. The results of this thesis agree with these claims. Chapter 2 establishes two key principles for this argument. First, China has a long-running historical precedent of promoting foreign investment. This precedent begins as far back as 1979 when Deng Xiaoping implemented the Contract Responsibility System, consequently pushing China's markets towards capitalism. This Contract Responsibility System was also the forebearer of the Shanghai Stock Exchange, which would open at the end of 1990. These early changes set the groundwork for the Qualified Foreign Institutional Investor policy in 2003. This policy marks when foreign investors first gained access to the whole Shanghai Stock Exchange and it was preceded by two more landmark changes; China creating the China Securities Regulatory Commission, which was put into place in order to protect investors, and subsequently entering the World Trade Organization in 2001. Numerous other policy changes were put in place between 2003 and 2019 when the new Foreign Investment Law was announced, and these have all served to establish the fact that China is and has continued its efforts to promote foreign Investment.

The second argument of Chapter 2 is that China's economy is policy-driven; more specifically, China's stock market reacts to relevant policy changes, which was originally written about in Yang-Chao Wang's 2017 Research Journal titled *Policy Impact on the Chinese Stock Market*. The findings of Chapter two agree with this claim. As discussed in Reuter's 2009 Article, *Rise and Fall of China's Stock Market Since 2000*, Investors react negatively to

policy-changes that would inhibit trade or lessen profits. Conversely, Investors react positively to policy changes that would promote trade or increase profits. Examples of investor response included the State-selling of shares in 2005 and the stock stamp tax in 2007. The table in Chapter 2 Section 2 used market indicators to validate this claim. Market Capitalization, Shanghai Stock Index value, and Price to Earnings Ratio all responded to policy changes, indicating that the market as a whole responds to policy changes. Lastly, the news articles included in the same section show that foreign investors are either incentivized or dissuaded to invest based on the actions of China and its CSRC.

Chapter 3 discusses the 2020 Foreign Investment Law, which replaces all previous investment laws; this chapter aims to prove that investors will see the new 2020 FIL as a positive policy change. The chapter analyzes the ten most significant articles out of the forty-two articles in the bill. Out of the articles discussed, several noteworthy changes were evident. First, new and guaranteed Intellectual Property Rights are a change that would increase profits for foreign firms. Data from the European Union Intellectual Property Office explained the extent of these benefits. Next, the reduced negative list increases the number of sectors foreign investors can invest in. Additionally, foreign funded firms are now allowed 100% ownership in major economic and financial sectors such as oil, gas, and insurance. Furthermore, these foreign funded firms can also go public on the Shanghai Stock Exchange. These changes will incentivize foreign investors to enter the Chinese market. Lastly, the bill emphasized the severity of discrimination against foreign investors in any fashion and included appropriate punishments for any who violate the rules put in place by the bill. Overall, the entirety of the 2020 Foreign Investment Law is aimed at protecting and promoting foreign investment; as a result, investors responding to policy change would react positively to its implementation.

Finally, Chapter 4 uses the Bogle, CAPM, and APT Models to provide a mathematical argument that agrees with the claims of Chapters 2 and 3. While there is no model in existence that can predict with certainty how a stock market will behave, all three models did predict growth in the coming years. The models used various indexes, time periods, and variables to provide an answer that is unbiased to any one factor. Consequently, investors using any of these models would be motivated to invest in the Shanghai Stock Exchange.

To conclude, the factors discussed in this thesis point towards growth in the Shanghai Stock Exchange in the coming years. This is due both to the fact that historically, positive policy changes have resulted in growth, as well as the fact that the economic indicators and models used in this thesis imply future growth. However, the overall volatility of the stock market and vague articles within the 2020 Foreign Investment Law leave room for debate. As mentioned previously, the policy-driven stock market is a two-edged sword; the influence that China's government has on its stock market retains the potential to support or deter foreign investment. It would be reasonable to expect growth in the coming years, but this expectation hinges on the behavior of China itself.

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