The Introduction of Competition to China's Petroleum Sector: A Policy Analysis

by

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B.A. in Economics, Simon Fraser University, 2005

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Department of
Economics

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Spring 2008

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Abstract

The Chinese market for petroleum has been controlled by three dominant companies since 1998. The circumstances have however, changed since China’s inclusion in the WTO as policy makers now desire a more competitive market. The goal of this paper is to analyze the different economic factors that pose impact on the Chinese petroleum market as the market shifts from monopoly environment to the new competitive market. Observations will be made on the few dominant firms and their role in shaping a big, albeit problematic market. To do this, the profit level for these firms will be compared with similar companies elsewhere. Aside from the dominant firms, China also faced a problem regarding gasoline shortage in recent times. Foreign investment also played a big part in the history of the market. A brief overview of Russia’s petroleum industry as well as some of its distinctive characteristics will also be discussed.

Key Words: gasoline; China; anti-trust; reform
For Dad and Mom, parents that I have and will always love and respect.

致：親愛的爸爸媽媽，感謝父母多年以來對我的教導和養育之恩。
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1.0 Introduction

Over the last three decades China has moved from a centrally planned economy to a more market oriented one. This move involved the introduction of competition to industries that, for many years, were monopolized by state-owned enterprises. The petroleum sector, comprised of the crude oil, refining and distribution industries, is an example. This project provides a critical analysis of the policies that were implemented to inject competition into this sector. The project begins with a description of the general liberalization of the Chinese economy and the industrial organization of the petroleum sector at the inception of the liberalization process. A descriptive analysis of the policies that were implemented and their effects on the sector’s organization is then provided. The recent performance of the sector is reviewed with emphasis on supply shortages in 2005 and current pricing policies and it is concluded that incumbents exert considerable market power. Some policy initiatives such as abolishing government price control, privatization with emphasis on the Russian experience, relaxation of restrictions on direct foreign investment in the sector, and a rigorous enforcement of the newly legislated Anti-Monopoly Law are considered.

Petroleum prices and consumption in China have been rising at an alarming rate since the 1990’s. Together with strong and rapid economic growth, China’s demand for petroleum skyrocketed and it became a net oil importer in 1993 (Figure 1). In 2005, China imported 158.3 million tonnes of crude and refined petroleum products at a cost of 58.2 billion US
dollars\(^1\). This phenomenon attracted great economic and political attention; especially with China recently becoming the second largest gasoline consuming country in the world\(^2\).

**Figure 1:** China's Oil production and Consumption: 1980-2007\(^3\)

This has given the government a degree of concern over the rising gasoline price. They reason that the rising domestic price of gasoline may potentially slow down the growth that China is currently experiencing. It is no surprise that the National Development and Reform Commission (NDRC)\(^4\) stepped in and set a ceiling price to prevent the domestic

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http://news.163.com/05/1111/02/228BJUEK0001124T.html


\(^4\) The National Development and Reform Commission is a macroeconomic management agency under the State Council, which studies and formulates policies for economic and social development, maintains a balance of economic aggregate and guides the overall economic system restructuring.
price from further rising (Figure 2). While this policy may be able to insulate the price impact to society growth, it could also create shortages that may harm the economy in the long run. Figure 2 shows that the gasoline price in China rose more slowly when compared to the U.S., a representative country that is often used as a comparison.

**Figure 2: China and U.S. gasoline price (2001-2007)**

The dominant gasoline companies in China are comprised of three state-owned companies, China National Offshore Oil Company Ltd (CNOOC), China National Petroleum Corporation (CNPC) and China Petroleum & Chemical Corp (CPCC). CNPC and CPCC are both vertically integrated in the sense that they are active all the way along the supply chain of gasoline (exploration, extraction, refining and distribution). Unlike the former two companies that are vertically integrated, CNOOC instead has exclusive

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Note: U.S. gasoline price includes tax whereas China’s does not.
rights for offshore exploration and extraction. CNPC and CPCC have each been monopolizing their own regional area with the hope to gain enough momentum to compete with foreign companies after the market is opened. The government has been using this as a means to justify its role as a price regulator. However, disadvantages such as gasoline shortages and monopoly inefficiency as well as the lack of competition in China’s gasoline market are becoming more and more severe and are breeding difficulties for the creation of a competitive market which is the government’s goal.

This paper is divided into five sections with each section discussing a different aspect regarding the petroleum sector. The first section introduces the current situation of China’s gasoline market as well as the purpose of this research. It is followed by Section II which starts with a descriptive analysis of the liberalization process of the Chinese economy with the primary emphasis placed on the petroleum sector. Some background details of the petroleum market are covered. Section III outlines the pricing policy before 2007, using Sinopec’s (CPCC) financial situation. This is followed by a discussion on the causes of the 2005 gasoline shortage of southern China in section IV. This is where government intervention in price setting is identified as the main problem for such shortages. The paper ends with some policy suggestions about the necessity of introducing foreign investment to bring in competition, and the complementary effects of the anti-trust law using Russia as a case study.
2.0 Liberalization of the Chinese economy and the petroleum sector

As a socialist country, China was known for its state-owned companies and central planning. After its liberalization, an increasing number of state-owned companies became privatized with others being shut down due to low profitability. Despite these ongoing developments, the Chinese government still exerted strict controls on critical industries such as telecommunication, petroleum and banking. Due to political reasons as well as the fact that these industries are of great importance on the nation’s future and economy, the government granted incumbent firms administrative monopoly power to further their own goals. This section provides a brief overview of the petroleum sector’s economic liberalization, and brings the focus to the fact that competition has not yet been brought to the sector.

2.1 Brief chronology of the process of economic liberalization.

It is helpful to review the chronology of the process of economic liberalization in China in order to understand the evolution of the petroleum sector. According to Wei and Liu (2001), and Yusuf et al (2006), the four major stages of economic reforms occurred as follows:

The first stage of reformations took place from 1978 to 1983. It was during this time when the Chinese Communist Party (CPP) accepted the fact that the country was in dire need of an economic reform. Realizing the fact that their economy can no longer sustain
itself without foreign trade and technologies, the CPP established the “four modernizations” principle to move China further away from communism beliefs. The four categories of modernization were agriculture, science, industry and national defence. Learning from their past mistake with “The Great Leap Forward” and “Cultural Revolution”, it was apparent to the CPP that utopian advances were failures and that incentives were needed for firms to expand. This led to numerous reforms and experiments taking place in the country. One of the most prominent features of the “four modernizations” was the creation of special economic zones (SEZs). Foreign investments were allowed to flow into these zones without undermining the socialist philosophy that the CPP holds dearly. In opening up these SEZs, the CPP successfully allowed China to take its first step into the global market. It was during this time period of massive changes when China gained the momentum it needed to move toward a large scale economy.

Delighted by their success in the first period of reform, the CPP commenced a campaign to organize a series of dramatic economic changes between 1984 and 1991. The first stage was very successful which cause CPP to move on to a second stage of reform. To start things off, the CPP deregulated the control over state-owned industrial enterprises. This gave the enterprises the flexibility they needed to improve their performance and efficiency. This caused a trend that eventually allowed individuals to have more discretion over businesses. The breaking up of the single “mono-bank” marked the turning point for the then successful reforms. While this decision may have seemed to benefit the economy, it was actually characterized by political corruption. Due to the fact that these new commercial banks did not operate based on profitability, a large amount of bank assets remained inactive for a long period of time. Many systems regarding
performance resulted and market prices were implemented which ultimately resulted in the
dual price system. The system would determine the price of goods distributed through
administrative channels but abolished the control of goods produced outside of the state
plan. However, the dual price system proved to be a double-edged sword as it allowed
corrupt government officials to gain enormous profits through loop holes. This and the
high inflation rate caused dissatisfaction among the population and resulted in the
“Tianmen Square event” in 1989. At this point, the CPP decided to slow down the reform
process and to focus on stopping the inflation. It was also during this time when the dual
price system was beginning to seem inferior to market-determined prices. While this
stage of reform was not as successful as the first one may have been, it did result in
increasing foreign investment throughout the whole time frame. Noting the success of
SEZs, similar zones were implemented throughout the coast cities of China. So as we can
see, although stage two might have had some flaws and inadequate decisions, the overall
economy was still progressing relatively well. However, due to the tragedy of the
“Tianmen square event”, this stage remains highly controversial as to whether or not it
was successful.

The third stage was marked with various different strategies to further stabilize and
stimulate the economy. Such strategies included further liberalization of industrial input
prices, adoption of a new enterprise accounting system and value-added tax (VAT). The
VAT was designed to decrease the reliance of the government on enterprise profits, so
that it may spread out its sources of income. The stock market boom was another key
event during this stage. Between 1993 and 1997, the stock market dramatically rose from
9.6 billion yuan worth of stocks to 1,715.4 billion yuan. One thing to note is that even
though there were stock holders in the country, they exerted no control over the selection of the management of the companies in which they held shares of. The right to do that still belonged to the government and the CPP. Inflation problems were still present, caused by the internal structure and the relationship between state-owned enterprises and state-owned banks. Although the inflation rate was eventually brought down by the then head of the central bank, the flaws of the internal system remained. Foreign investment followed the course of the previous two stages and continued its steady growth. However, by 1994, it showed signs of slowing down. This was due to the fact that competition for foreign investments was rising throughout the world. Also, there were government discussions that hinted at the implementation of unfavourable policies regarding foreign firms. For these reasons, foreign investment declined from 1994 through 1996. The stock market boom which occurred during this phase contributed greatly to the economy. While the stocks did not give shareholders the rights that were expected, it did however, provide them with an alternative means to invest their savings.

Stage four marked a time frame where the government tried to re-establish the foundation of the fragile banking system. Its attempt to deal with the state-owned enterprise (SOE) problems was also a crucial component of this stage. Although a series of large reforms occurred for the state-owned enterprises, they were still deemed problematic by the government due to their lack of financial progress. To counter their problems regarding these enterprises, the government had a large number of state-sector employees laid off to put their payroll in check. To further counter the problems caused by the SOEs, the economic policy makers proposed a plan to promote China’s accession to the WTO which would expose the state-owned enterprises to foreign competition. Believing that
this would benefit the country by speeding up the reform of the SOEs, the government set the plan in motion. It can be argued that this plan may also have inadvertently contributed to a sharp rise in foreign investments when talks of WTO reached other investing nations. Realizing that the banks were ineffective in their current ways, four asset management companies were set up to relieve the burden of nonperforming assets from commercial banks. However, some criticized such establishments as ineffective. During this time period, China became a member of the WTO as well as a visible force in the global market. It had successfully demonstrated to the other nations that foreign investments in China were as welcome as they were profitable.

2.2 A description of the liberalization of the petroleum sector

With the liberalization occurring throughout different economic environments, it is simple yet crucial for us to analyze and acknowledge the impact it had on the petroleum sector. To improve the understanding on the issue, it would be important to look at the evolution of the market structure and the price setting mechanism.

2.2.1 The liberalization of the petroleum sector

Before 1949, the Chinese oil industry “played a very inferior role.” (Bartke, 1975) After years of prolonged wars and revolutions, China’s petroleum industry had a new start when the People’s Republic of China was established. Appendix B provides a brief summary of the history of the petroleum sector. In 1949, the Ministry for the Fuel Industry was founded. Later in July 1955, the Ministry of the Petroleum Industry (MPI) was separated and became an independent administrative body of the oil industry. The MPI became the “commander” of the oil and petrochemical industry during the period of
the command economy from the 1950s to 1970s. Initially, oil production was as low as 120,000 tonnes in 1949 which included the help from Soviet experts. China’s energy demand was much higher than supply. This gap of about 14 mmt was filled by imports from the Soviets during the 1950s. To counter this reliance on imports, the government conducted a quasi-military “massive campaign” (Zhang, 2004) which eventually resulted in the discovery of several major oil fields such as Daqing (1959) and Shengli (1973). This allowed China’s oil development to shift from the traditional oil fields in the west to the basins in the east. China’s crude oil production increased sharply during that time, even though production was dampened during the 1966 to 1968 period due to the Cultural Revolution. China achieved Mao’s “self-reliance” goal in 1965, and started to export oil to other countries, notably Japan. From 1973 to 2003, the Daqing oilfield exported more than 200 million tonnes of crude to Japan (Howe and Kambara, 2007).

After Mao’s death, Deng Xiaoping came to power and a series of significant experiments were carried out during the ten year period between 1980 and 1990. The intent was to overcome the problem of depleting resources in developed oil fields as well as to reduce government investments in oil exploration. To expand the production, the “Big contract” model was adopted with dual oil prices. Petroleum Administrative Bureaus for the oil fields were allowed to export oil at a higher international price after they achieved the quota set by the government. They were however, required to sell the quota at a lower domestic price. This brought more incentives for production and created the opportunity to gain more capital in exploration and development. Under Deng’s design, agriculture and light industry were also more in favour than heavy industry, as such, the importance
for oil industry was weakened. In the mean time, the petroleum industry that was once a part of government ministries was slowly transformed into business corporations. In 1982, both the CNOOC and CPCC were set up under the MPI. In 1988, the MPI was abolished and the CNPC was downgraded to an inferior status. CPCC was specialized in refining and downstream businesses, whereas CNPC was specialized in exploring and upstream businesses (Zhang, 2004). However, product pricing, marketing expenditures and capital investments remained, for the most part, under the strict control of the central government.

By 1997, there were five petroleum majors in China: CNPC, CNOOC, Sinopec, China National Star Petroleum Corporation (CNSPC) and Sinochem. Each specialized in one of three sector activities. CNPC and CNOOC were specialized in onshore and offshore exploration and production. On the other hand, CNSPC focused mainly on downstream business with little involvement in exploration and production. Sinopec and Sinochem were specialized in the refining and petrochemical sectors, and in export and import respectively. Petroleum sales companies at provincial and national levels (private owners) were in charge of retailing.

In the late 1990s, world oil prices were low. Together with the financial crisis in Asia, China’s oil and petrochemical industry experienced a huge drop in profit. Since the 1990s when the globalization tide whipped through the world, China realized that it was essential to become a member of the World Trade Organization (WTO). However, entry to the WTO required China to open up its markets to foreign companies and the petroleum market was no exception. The central government proposed a major
restructuring\(^6\) that involved the creation of two giant companies that were market oriented as well as profitable. The premise for this was the hope that they could compete with the global oil companies by reducing their costs through achievement of economies of scale and scope. In March 1998, the new Sinopec Group\(^7\) (also called CPCC, the parent company for Sinopec) and CNPC (the parent company for PetroChina) were created. CPCC and CNPC exchanged assets with each other and became vertically integrated with similar size. This allowed the two companies to combine their strengths in R&D in both upstream and downstream. The big three have each been operating in separate areas since then (CPCC in the south, CNPC in the north and CNOOC in marine oil fields). Many local sales companies were also transferred to the big two. The big two were allowed marketing activities and retail business in each other’s territories. The government hoped to initiate their empowerment through competition with each other and the eventual establishment of internal structures that resemble modern large corporations.

In terms of total revenues, CPCC was rated as the top 17\(^{th}\) company in the world with CNPC as the 24\(^{th}\) company (Fortune Magazine, 2007). CNPC possess more self-produced crude oil whereas CPCC imports more crude oil\(^8\). CPCC and CNPC are vertically integrated, owning their own complete supply chain in the crude oil industry. CNOOC on the other hand, handles offshore crude oil exploration and production; however, it does not have its own retail stations. Table 1 provides some relevant information about these

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7 CNPC was merged with Sinopec Group in March 2000.
8 CPCC and CNPC are vertically integrated, with business from exploration, mining and refining crude oil to distribution and retail stores. CNOOC handles offshore crude oil exploration and production, but it does not have its own retail stations or refineries.
three companies' operations. Figure 3 is an organization chart of China's petroleum
companies.

Table 1: CNPC, CPCC and CNOOC's operations in 2006

<table>
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<tr>
<th>Company</th>
<th>Revenue US$ millions</th>
<th>Oil reserve</th>
<th>Refinery Capacity</th>
<th>Service stations</th>
</tr>
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<tr>
<td>CNPC</td>
<td>98,784.9(^9)</td>
<td>2.19 billion barrel(^{10})</td>
<td>115.87 million tonne(^{11})</td>
<td>18,207(^{12})</td>
</tr>
<tr>
<td>CPCC</td>
<td>83,556.5(^{13})</td>
<td>3.8 billion barrel(^{14})</td>
<td>169.5 million tonne(^{15})</td>
<td>28,801(^{16})</td>
</tr>
<tr>
<td>CNOOC</td>
<td>11,403.517</td>
<td>2.5 billion barrel(^{18})</td>
<td>0 million tonne(^{19})</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 3: Organization chart of China's petroleum companies\(^{20}\)

Source: Kambara and Howe, 2007

10 http://english.peopledaily.com.cn/200508/24/eng20050824_204299.html (people's daily online)
11 http://www.cnpc.com.cn/CNPC/ywycp/lyhgyw/
12 http://www.cnpc.com.cn/CNPC/ywycp/lyhgyw/
14 http://www.hoovers.com/Sinopec-corp.--ID__102508--/free-co-factsheet.xmhtml
17 http://finance.google.com/finance?q=NYSE:CEO
18 http://www.hoovers.com/cnooc--ID__102890--/free-co-factsheet.xmhtml
20 Source: Kambara and Howe, 2007
During a period of low production in 1949, China set a very high price for petroleum products to consumers to protect the petroleum firms. After three “five-year plans”, China was able to develop several major oil fields which increased the production level greatly. However, the domestic price level was still lower than the world level. In March 1960, the government set a formal petroleum price. During the early 1970s, more oil fields were discovered and petroleum refining capacity was expanded (Figure 4). As a result, domestic supply came to exceed domestic demand and the government took this opportunity to make a major adjustment to the price level. Beginning 1981, China started its economic reforms. The contract system was first adopted in the oil and petrochemical industry was followed by the implementation of the “Dual Oil Price” system. This system allowed petroleum firms to export any surplus crude oils at the global price after meeting the domestic quota. The petroleum industry eventually went on to earn 12.6 billion yuan under the dual price system (Zhang, 2004).
Starting in 1995, the government again adopted a new policy known as the “Two–Tier Pricing Scheme”. The “scheme” consisted of two grades of crude oil and three levels (Table 2). Each of the three price level corresponds with a major oil field. This was an example of one of the many policies that the government issued in order to regulate prices. After the big restructuring of the petroleum industry in July 1998, gasoline prices were determined by negotiations between CPCC and CNPC, without government intervention. Then from June 2000 until late 2006, the NDRC exerted control over gasoline price setting. It should be noted that NDRC took the other countries’ gasoline price into consideration in setting domestic gasoline price. It is at this time frame when

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China’s petroleum pricing ceased to be determined by any particular interest but instead, by the influence of the world’s oil price.

Table 2: Two-Tier Pricing System (Yuan per tonne of crude oil)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Daqing level</th>
<th>Shengli level</th>
<th>Liaohe level</th>
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<tbody>
<tr>
<td>Grade I</td>
<td>754</td>
<td>684</td>
<td>N/A</td>
</tr>
<tr>
<td>Grade II</td>
<td>1320</td>
<td>1230</td>
<td>1160</td>
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As China imported an increasing amount of oil and the price of crude oil has been climbing since 2002, the price regulation could no longer reflect the oil price with accuracy. For that reason, the NDRC tried to adopt a new price policy by considering international crude oil price fluctuations.

2.2.2 The result on industry structure after the introduction of the new state-owned enterprises

After the economic reforms in the 1980s, the Chinese government continuously claimed that markets were all following market oriented models. It is indeed undeniable that since the 1980s, China has been actively reforming its economy and market structure. A variety of industries are responding to market incentives. However, does this reform also hold true for the petroleum sector? What is the result on its industry structure after the introduction of new state-owned enterprises (SOEs)?

To understand the current market structure, it is essential to first analyze the large SOE petroleum companies and determine if they behave as monopolists. After the restructuring in 1998, it had been mentioned that CNPC and CPCC were vertically integrated with influences in the entire supply chain from extraction to retailing. CNPC
acquired direct access to the market for refined products and was able to create a brand name through massive amounts of advertisement. On the other hand, Sinopec (CPCC) had secured access to reliable supplies of crude oil with new oil-producing assets at its disposal. This reinforced Sinopec’s position as one of the dominant SOEs in the market. Moreover, Sinopec’s downstream experience would help improve CNPC’s marketing skills. With these advantages, both companies acquired significant advancement in these fields and became the two giant companies that dominated northern and southern China.

In terms of market shares, CNPC is the absolute leader in upstream sector; it accounts for more than 66.37% of domestic crude oil production and 40.6% of refining capacity. On the other hand, Sinopec is the largest power in refinery sector, where it accounts for 59.4% of refining capacity and 22.77% of crude oil production (Table 1).

When the big three were formed in 1998, petroleum assets in specific geographic areas were allocated to particular companies. In accordance to the rules, CPCC runs most of the business in 19 provinces in central and southern China, whereas CNPC operates mainly in the other 15 provinces in northern and western China (Figure 5).
In effect, two giant petroleum companies were granted regional monopolies over petroleum refining and gasoline distribution. What’s more, this power was not developed with regards to economic strategies, but it is instead created through government policy. This was the predominant reason scholars defined China’s petroleum sector as controlled by administrative monopolies. On top of all that, the transportation and delivery of gasoline from Chinese refineries to gas stations in China and in other countries in the world are mainly by train, trucks and ships. This is determined by the nature of the gasoline industry, and delivery of gasoline through pipelines in China only amount to 2% to 3%. This transportation method further allowed the CNPC and CPCC’s market position to be strengthened.
2.2.3 “Competing” SOEs and their lack of efficiency

From the above information, it is clear that China’s petroleum market was still far from a competitive market even after the introduction of the new SOEs. In other words, the introduction of competing SOEs has not brought competition and efficiency to the sector due to the fact that they have territorial dominance and are frequent collaborators instead of competitors. This resulted in the lack of competition which was reflected in the industry’s structure described above.

In Beijing’s view, gasoline is of vital importance to the nation’s economy and to people’s welfare. Therefore the gasoline market has always been state-owned to protect it from any potential threats. When China entered the WTO on December 11th, 2001, the retail gasoline market was to be opened to foreign companies by 2004, and the wholesale market by 2007. Even under such circumstances, the CNPC and CPCC still currently account for more than 50% of the market share in China’s gasoline retail market\(^{22}\), whereas the other 40% is taken up by small and medium businesses, such as milk and coal companies. These industries have their own gasoline stations but their main suppliers are still CNPC and CPCC, which establishes a heavy reliance relationship between the two.

With the monopoly power in their hands, the two dominant firms effectively control market share in the retail sector. In the early 1990s, there were a limited number of retail gasoline stations mostly state-owned, which caused there to be insufficient supply to meet the demand. As such, the central government encouraged private capital to enter the petroleum market by allowing entry with simple regulatory procedures. This started a

\(^{22}\) Xinhua News, November 10th, 2005.
trend which eventually resulted in private gasoline stations being built everywhere along highways, and the stations could purchase from the refineries directly. As such, local enterprises accounted for between 85% and 90% of the gasoline retail market; those owned by government accounted for the residual. However, after the restructuring in 1998, higher standards for running refineries were enforced. Refineries must have an annual capacity exceeding 10 million tonnes. Many privately owned petroleum firms were forced to shut down or merge with the big two under administrative orders. Refineries were also not allowed to sell gasoline to private firms. Therefore, after the 1998 reform, the share of gasoline stations owned by local enterprises dropped to about 40%. By 2000, Sinopec had 20,259 service stations and PetroChina had 11,350, which was about double the number they held prior to the 1998 reform.

As such, the reason for the current monopoly situation is mainly due to administrative interventions, as Sheng (2005) points out. For example, Document 38 gave CNPC and CNCC the right to monopolize specific regional petroleum markets. The Act included absolute rights to monopolize any industries related to the petroleum market, which included extracting, refining and retailing.

The initial reason to establish two giant petroleum SOEs was because the smaller firms that supplied much of the outputs suffered from diseconomies of small scale and low levels of technology. It was determined that these inefficiently small operations would have to be eliminated. However, seeing the results now, it can be concluded that the policy only addressed the problem on a technological level and severely overlooked the fact that the cost of monopoly may easily surpass the cost of small scale petroleum firms.
From an economist’s perspective, if these small firms were to be left alone, they would have either ceased to exist or expanded in size. This would have allowed the firms to become large, with better technology as well as efficiency. Monopolizing the market allowed costs to rise higher, with the existing problem no longer adjustable (Sheng, 2005).

The lack of efficiency is reflected in the governance issues. What is the corporate governance structure for it? Ewing (2005) has examined the Chinese corporate governance progress. He pointed out that the corporate governance for many major state-owned firms still has many Chinese characteristics. For example, PetroChina’s (CNPC’s main company) directors are appointed by certain ministries. Their bonuses are strongly linked to factors other than business performance, such as the Communist Party’s strength within the company.

In addition, it is worthwhile to look at the objective function of the managers in the new SOEs. While their objective should be maximizing profit and redistributing it to society to maximize social welfare like other state-owned corporations, the actual truth is that these firms lack the cost efficiency of other leading foreign gasoline companies. Their profit is not maximized as they are not making the effort to minimize their costs. One might ask why these firms are only interested in maximizing revenue rather than profit. One plausible answer suggests the principal and agent problem, where one party, called an agent, acts on behalf of another party, called the principal. Shareholders in this case are the principals. They, of course, want to pursue the highest profit so they can get larger dividends at the end of each year. However, it is the difference in interest between
Shareholders and agents that push the firms to maximize revenue rather than profit. As the surplus income goes to the shareholders pockets, it is not in the agents’ best interests to minimize costs for the firm. They would instead prefer to maximize their own utility by buying more luxurious office goods, maintaining a nicer working environment and striving for a better pension plan coverage. All of these will substantially increase the firm’s costs and therefore contribute to a lower profit margin.

As a socialist country, China’s corporations used to be 100% state-owned. The disadvantage of this is clear. Adam Smith once said (cited in Ewing, 2005) in The Wealth of Nations that “the directors of such companies, (however) being managers rather of other people’s money than their own, it cannot well be expected that they should watch over it with the same anxious vigilance which the partners in a private copartner frequently watch over their own”. This is the principle-agent problem discussed above. The SOEs had such bad performances that the government had to start the reform in the late 1980s to improve corporate governance (Yusuf et al, 2006). Government introduced the standard corporate system as well as the joint-stock system with the hope to change their performance. For example, the major SOEs are listed (or are trying to be listed) on overseas stock exchange markets and more foreign investors are encouraged to sit on the boards of the corporations. Shares for the listed SOEs are classified as state shares, person shares and tradable shares. The Chinese Securities Regulation Commission was set up in October, 1992 to monitor and regulate Chinese corporation’s securities standards. However, why do the inefficiency problems in the big three still exist and with such severity?

23 CNPC was listed in NYSE and HKSE in April 2000, CPCC was listed in NYSE, HKSE and LDSE in October 2000, CNOOC was listed in NYSE and HKSE in February 2001.
Output and costs are well related to the worker's effort. Without their positive contributions to the firm, productivity would hardly be matching the world level. This is one of the reasons that excite public policy in favour of the anti-trust law. Many economists have come to realize that companies without competition will bring corruption, lower efficiency, and ultimately, a poorer performance. That is why Western economies place more emphasis on deregulation, privatization, and the importance of free markets. After years of reform, the interference from government in the big three has declined, but is still very strong especially from the local governments. As Ewing summarizes in his paper, the three key components of corporate governance are financial markets, institutional investors and shareholders. Poor regulations, restrictions on institutional investors and shareholders' rights are still influencing the performance of the big three negatively.

As scholars pointed out, the successful introduction of corporate governance reforms and a healthy competition market mechanism will "carry important economic and political ramifications for China." (Ewing, 2005). Using PetroChina\textsuperscript{24} as a case study, Ewing analyzed its governance structure and points out that government officials are still the dominant leaders in the board, and performance bonuses are not linked to stock price, shareholder wealth or customer satisfactions, but to criteria such as "improving ideological and political work, enhancing Party conduct and anti-corruption campaign" and "eliminating various factors causing instability, succeeding in preventing occurrence

\textsuperscript{24} CNPC is the parent company of PetroChina, just like CPCC for Sinopec.
of any mass commotion and any severe offense against Party conduct, and anti-corruption disciplines by any officer of Daqing.25.

Another way that would have been ideal to demonstrate the inefficient structure for the petroleum SOEs would be a comparison for average labour productivity. However, such comparison would be invalid in this case as there are factors within the Chinese petroleum industry that would distort the figure. For example, the most convenient way to calculate revenue is by using Price x Quantity. As we know, price is set by the NDRC and would therefore be inaccurate in reflecting the actual market revenue. Another problem stems from the wage difference between western companies and Chinese petroleum firms. It is widely known that China's labour cost is significantly lower than that of western countries. As we can see from the table, PetroChina employs more than 4 times the amount of labour as BP. As such, the big three would minimize cost through large amount of cheap labour which will cause the comparison between the companies to be inaccurate. Therefore, we can derive that the profit per employee ratio for the Chinese petroleum firms would be lower than that of western countries, regardless of its efficiency.

25 This statement is from the 2001 performance contracts for PetroChina's vice presidents and general managers, cited in Ewing, 2005.
Table 3: Productivity for PetroChina, Sinopec, BP, Exxon and PetroCanada in 2006

<table>
<thead>
<tr>
<th>Company</th>
<th>Revenue ($million)</th>
<th>Net Profit ($million)</th>
<th>Employee</th>
<th>Profit/ Employee ($ million)</th>
<th>Profit/ Revenue</th>
<th>Employee Revenue ($million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PetroChina</td>
<td>87,768</td>
<td>18,610</td>
<td>446,290</td>
<td>0.21</td>
<td>0.04</td>
<td>0.20</td>
</tr>
<tr>
<td>Sinopec</td>
<td>137,121</td>
<td>6,454</td>
<td>340,886</td>
<td>0.05</td>
<td>0.02</td>
<td>0.40</td>
</tr>
<tr>
<td>BP</td>
<td>265,906</td>
<td>21,116</td>
<td>97,000</td>
<td>0.08</td>
<td>0.22</td>
<td>2.74</td>
</tr>
<tr>
<td>Exxon</td>
<td>365,467</td>
<td>39,500</td>
<td>82,100</td>
<td>0.11</td>
<td>0.48</td>
<td>4.45</td>
</tr>
<tr>
<td>PetroCanada</td>
<td>16429</td>
<td>1537</td>
<td>5156</td>
<td>0.09</td>
<td>0.30</td>
<td>3.19</td>
</tr>
</tbody>
</table>

Zhang (2004) demonstrated more evidence of the inefficiency of the Chinese petroleum SOEs. For examples, the amount on R&D for the big two is considerably lower than the global majors; the technological capabilities of both upstream and downstream are backward, and the market capitalisation ability is much lower due to serious doubts about their operational efficiency and high uncertainty. Monopoly power should be held culpable for the low efficiency of the SOEs.

3.0 Has the price setting mechanism by NDRC been effective?

While it holds true that the two major companies have been exerting monopoly power in the market, it should also be noted that they do not possess the right to set the price. This is due to the fact that they are administrative monopolies instead of economic monopolies. However, beginning in 2000, the NDRC commenced a strategy of adjusting market prices. Under this policy, one has to wonder how the SOEs are managing to earn profits. At the same time, why are widespread shortages of gasoline so frequent?

3.1 The SOE petroleum firms’ profit situation under current pricing behaviour

From time to time the U.S. Energy Information Administration (EIA) carries out studies on the pricing of gasoline in the U.S. It was reported that during 2004, the percentage composition for retail price of gasoline was: 12% for distribution and marketing, 18% for refining costs and profits, 23% for federal and state taxes, and 47% for crude oil cost. The percentage composition in 2005 was 9% for distribution and marketing, 19% for refining costs and profits, 19% for federal and state taxes, and 53% for crude oil cost.

Using Sinopec as an example, the percentage composition in 2006 was 21.56% for distribution and marketing, 10.47% for refining costs and profits, 0% for federal and state taxes\(^ {31} \), and 67.97% for crude oil cost (calculation procedures are shown in Appendix

---

\(^ {31} \) China does not impose a fuel tax on consumers.
A). The profit only took up 2.64% of the retail price, which was similar to the 3% profit percentage that PetroCanada claims\textsuperscript{32}.

Certain scholars have also tried to compare gasoline prices across countries as shown in Table 4.

<table>
<thead>
<tr>
<th>Country</th>
<th>Price after tax $US/ litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venezuela</td>
<td>0.045</td>
</tr>
<tr>
<td>Nigeria</td>
<td>0.1</td>
</tr>
<tr>
<td>Egypt</td>
<td>0.17</td>
</tr>
<tr>
<td>Kuwait</td>
<td>0.21</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>0.24</td>
</tr>
<tr>
<td>China</td>
<td>0.62</td>
</tr>
<tr>
<td>US</td>
<td>0.75</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.59</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.6</td>
</tr>
<tr>
<td>Italy</td>
<td>1.61</td>
</tr>
<tr>
<td>Norway</td>
<td>1.69</td>
</tr>
<tr>
<td>Holland</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Since tax systems and levels vary across countries, it would be appropriate to exclude all kinds of taxes on gasoline before comparing their prices. The paper mentioned that if

\textsuperscript{32} According to the 2006 annual report of Petro Canada, for the pump price, 48% is crude cost, 34% is tax, 15% is refining and market cost, only 3% is profit.

gasoline tax were excluded, China’s gasoline price would be very close to most of the western countries and therefore, cannot be viewed as over-priced. Table 5, which excludes all the taxes, provides better comparisons.

Table 5: Gasoline prices (#93 octanes) across countries on August 1st, 2005

<table>
<thead>
<tr>
<th>Country</th>
<th>Yuan/litre (including tax)</th>
<th>Yuan/litre (excluding tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>4.26 (No gasoline tax)</td>
<td>4.26</td>
</tr>
<tr>
<td>US</td>
<td>5.33</td>
<td>4.49</td>
</tr>
<tr>
<td>France</td>
<td>11.9</td>
<td>4.09</td>
</tr>
<tr>
<td>Germany</td>
<td>12.58</td>
<td>4.39</td>
</tr>
<tr>
<td>Britain</td>
<td>12.7</td>
<td>4.13</td>
</tr>
</tbody>
</table>

On the other hand, it is well known that the big three are the most profitable and substantial state-owned enterprises, (they are all listed companies) even though their production is not as efficient when compared with the top gasoline companies in other countries. According to their annual reports, the big three earned about $US 21 billion net profit in 2006, as opposed to 1 billion in 1998 before they were restructured. Their annual reports showed very strong financial results and these were reflected in their stock prices. CNPC is the most profitable company in Asia. This is partly because they own a lot of oil fields and pay low royalties to the government. This allows them to earn substantial profits. In foreign gasoline industries, when firms pump oil from the field, the government will impose fees in the form of a natural resource tax. This is perfectly logical and expected from a society’s point of view. Without these taxes, firms would

have incentives to extract the resource too rapidly. These natural resource taxes are normally high especially when compared to China. According to various reports35, the natural resource tax rate is ten times more in western countries than in China. For instance, during the time when crude oil prices went up by a factor of 6 (from $US 10/barrel in the 1990s to $US 60-70/barrel these days), the said tax did not increase in a proportionate amount (from $US 1-4/tonne in 1990s to $US 2-4/tonne nowadays). In other words, the percentage increase in the oil price was much higher than the percentage increase in the resource tax, which led to criticisms regarding the tax system for not being sensitive to the world oil price. To correct this problem, the Chinese government implemented another tax for revenue earned above $US 40/barrel. However, despite some minor effects, the tax rate was still too low to narrow the profit gap. In other words, the associated profit for the two majors is mainly the resources rent due to the low royalty.

### 3.2 Description and explanation of the shortages of 2005.

Despite popular beliefs, the two majors do not earn monopoly rent with monopoly power. This is attributed to the fact that the government controls the retail price of fuels.

According to government response, the main reason that the price is still set by government agents is because it is understood that the power to determine price cannot be given to a market that is controlled by monopolies prior to setting up an ordered and competitive oil market. This is extremely true in today's high gasoline price condition. Although government pricing intervention can regulate the profit level for the monopoly SOEs, it can at the same time lead to shortages and disequilibrium.

Between 2000 and 2006, the NDRC set the price of gasoline by taking the trends in world gasoline prices into consideration. This was a logical move because more than 40% of oil was imported\textsuperscript{36}. The initial consideration only included Singapore, but after November 2001, it went on to also include New York and Rotterdam\textsuperscript{37}. Using the average price of the three markets from the previous month, if there is a change of more than 8% in the average price, NDRC would consider adjusting the price of gasoline. Table 6 shows the changes of the gasoline price since 2002. It indicates that before 2005, the percentage increase was relatively lower and the frequency of change was less than 3 times per year. Since 2005 however, the changes have become much larger in percentage terms and more frequent.

\textsuperscript{36} By estimate, more than 75% of oil requirements will be imported by 2030. source: EIA (http://www.uofaweb.ualberta.ca/chinainstitute/nav03.cfm?nav03=53949&nav02=43884&nav01=43092)
\textsuperscript{37} Source: News.sohu.com 2006.
Table 6: The Chinese gasoline price adjustment since 2001

<table>
<thead>
<tr>
<th>Year</th>
<th>Initial price (Yuan/ton)</th>
<th>Final price (Yuan/ton)</th>
<th>Percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002 whole year</td>
<td>2830</td>
<td>3020</td>
<td>6.71</td>
</tr>
<tr>
<td>2003 January 28th</td>
<td>3020</td>
<td>3210</td>
<td>6.2913907</td>
</tr>
<tr>
<td>2003 May 8th</td>
<td>3210</td>
<td>2920</td>
<td>-9.034268</td>
</tr>
<tr>
<td>2003 December 5th</td>
<td>2920</td>
<td>3210</td>
<td>9.9315068</td>
</tr>
<tr>
<td>2004 March 31st</td>
<td>3210</td>
<td>3467</td>
<td>8.0062305</td>
</tr>
<tr>
<td>2004 August 25th</td>
<td>3467</td>
<td>3744</td>
<td>7.9896164</td>
</tr>
<tr>
<td>2005 March 23rd</td>
<td>3744</td>
<td>4044</td>
<td>8.0128205</td>
</tr>
<tr>
<td>2005 May 23rd</td>
<td>4044</td>
<td>3894</td>
<td>-3.709199</td>
</tr>
<tr>
<td>2005 June 25th</td>
<td>3894</td>
<td>4094</td>
<td>5.1361068</td>
</tr>
<tr>
<td>2005 July 23rd</td>
<td>4094</td>
<td>4394</td>
<td>7.3277968</td>
</tr>
<tr>
<td>2006 March 26th</td>
<td>4394</td>
<td>4694</td>
<td>6.827492</td>
</tr>
<tr>
<td>2006 May 24th</td>
<td>4694</td>
<td>5194</td>
<td>10.651896</td>
</tr>
<tr>
<td>2007 January 14th</td>
<td>5194</td>
<td>5965</td>
<td>14.84</td>
</tr>
<tr>
<td>2007 October 31st</td>
<td>5965</td>
<td>5980</td>
<td>0.0025</td>
</tr>
</tbody>
</table>

Table 7: The world oil price adjustment 2002-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Initial price (USD/barrel)</th>
<th>Final price (USD/barrel)</th>
<th>Percentage change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002 whole year</td>
<td>28.95</td>
<td>29.03</td>
<td>0.15812867</td>
</tr>
<tr>
<td>2003 January 28th</td>
<td>29.03</td>
<td>30.02</td>
<td>1.9537529</td>
</tr>
<tr>
<td>2003 May 8th</td>
<td>30.02</td>
<td>22.33</td>
<td>-14.8852991</td>
</tr>
<tr>
<td>2003 December 5th</td>
<td>22.33</td>
<td>27.23</td>
<td>11.1435285</td>
</tr>
<tr>
<td>2004 March 31st</td>
<td>27.23</td>
<td>31.51</td>
<td>8.75762282</td>
</tr>
<tr>
<td>2005 March 23rd</td>
<td>39.29</td>
<td>48.75</td>
<td>15.5255778</td>
</tr>
<tr>
<td>2005 May 23rd</td>
<td>48.75</td>
<td>42.93</td>
<td>-8.2680191</td>
</tr>
<tr>
<td>2005 June 25th</td>
<td>42.93</td>
<td>52.55</td>
<td>14.8981652</td>
</tr>
<tr>
<td>2005 July 23rd</td>
<td>52.55</td>
<td>52.24</td>
<td>-0.41783644</td>
</tr>
<tr>
<td>2006 March 26th</td>
<td>52.24</td>
<td>54.17</td>
<td>2.61228389</td>
</tr>
<tr>
<td>2006 May 24th</td>
<td>54.17</td>
<td>63.49</td>
<td>12.2936154</td>
</tr>
<tr>
<td>2007 January 14th</td>
<td>63.49</td>
<td>50.12</td>
<td>-15.7050763</td>
</tr>
<tr>
<td>2007 October 31st</td>
<td>50.12</td>
<td>81.27</td>
<td>43.40755</td>
</tr>
</tbody>
</table>

Source: [http://tonto.eia.doe.gov/dnav/pet/hist/wtotworldw.htm](http://tonto.eia.doe.gov/dnav/pet/hist/wtotworldw.htm)
Table 6 shows that the gasoline price increased by 6.71% in 2002, 6.29% by the end of 2003, 16.64% over 2004, 17.36% in 2005 and 18.21% in 2006. However, the effect of these gradual adjustments were still very minor compared to the sharp increase in the world prices. On the other hand, between January and September 2005, the world oil price increased from $US35.16/barrel to $US60.75/barrel. This was a 73% jump. To reflect the increase in world crude oil price, how much should domestic gasoline price increase in order for firms to maintain the profitability? I do the calculation as follow:

Suppose the price of gasoline \( p = x + y \) where \( x \) is the cost of the oil used to make the gasoline and \( y \) is all other cost of making the gasoline including profit. Therefore, if \( x \) changes by \( \Delta x \) and \( y \) is constant, we have:

\[
\frac{\Delta p}{p} = \frac{\Delta x}{x + y} = \frac{\Delta x}{x} \times \left[ \frac{1}{1 + \frac{y}{x}} \right]
\]

This shows that the gasoline price should change at a lower rate than the world oil price. For example, if \( p = 3744 \text{yuan/ton} \) and \( x = 35.16 \text{US$/barrel}=2328.9035 \text{yuan/ton} \), then \( y = p - x = 3744 - 2328.9035 = 1415.0965 \text{yuan/ton} \), hence using the above equation, we can derive that:

\[
\frac{\Delta p}{p} = 0.622 \times \frac{\Delta x}{x} = 0.622 \times 0.73 = 0.45.
\]

38 Note: 1 barrel = 0.11776 ton; 1 US$ = 7.7 yuan
Base on the information shown in Table 6, we can easily calculate that China’s gasoline price was raised by a mere 17.36% in 2005. However, to maintain the same profitability for the gasoline companies, the price of gasoline should increase by 45% as shown in my calculation. Figure 6 further demonstrates the pricing gap between the actual price and the predicted price. This is clearly an act against human nature as people are rational and price sensitive, and producers will sell their products to the market that offers them a higher price. The huge national and international pricing gap led to a breakout of a sudden gasoline shortage in southern China in 2005.

The advantage for gasoline price targeting is its relative stability. On the other hand, we have the trade off which is the delay for reflecting the up-to-date oil price. This results in a situation known as the “upside down” phenomenon, where the wholesale price of
gasoline is lower than the cost of crude oil plus the refining cost. This was also another factor that contributed to the shortages in southern China in 2005.

As the crude oil price continued to increase in 2005\(^39\), the NDRC issued a policy which only allowed the gasoline price to increase from 3,744 yuan/ton in January to 4,394 yuan/ton in September in 2005. This was an unimpressive increase of 17.36% because at that time, China was still recovering from the impact of SARS. If the NDRC had increased the gasoline price by a lot, it would have been very likely to have created a substantial negative impact on China’s economy and society. According to a report (Wei, 2006) on transportation in Zhejiang Province, the percentage of the gasoline cost to transportation expenses increased from 18.7% in 2001 to 29.6% in 2005. For the transportation companies’ expenses (total cost of running the business), the increase of gasoline price accounted for only 1.8% in 2002, but jumped to 7.4% in 2003, 11.7% in 2004 and up to 26.6% in 2005. This created a negative impact on the profit margin, competition power and motive force of the development of the firms. According to a research study by Statistic China (2004) cited by the China Economic Herald\(^40\), if the world oil price increases 1% and lasts for a year, China’s GDP will decrease by 0.01% as a result of the increase in world oil price.

At the same time, the world market offered higher prices, which gave incentives to the gasoline companies to either export the oil for better prices, or store it in hopes of selling it later at a higher price (but according to the companies’ claims, the shortage was

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39 The crude oil price hit the recorded high $US 78.4/barrel on July 14th, 2005. From January to July, 2005, the crude oil price increased by 60%.

40 Source: http://www.ceph.com.cn/guonei_detail.asp?id=20249&type=113
because of the bad weather caused by the Matsa typhoon\textsuperscript{41} which delayed the deliveries).

In 2005, China imported 12,681.8 million tonnes of crude oil, 3.3\% more than the previous year, and exported 806.7 million tonnes of crude oil, a 46.9\% increase when compared to 2004\textsuperscript{42}. This led to the sudden gasoline shortage event in southern China (Canton area) from July to September, which negatively affected industrial production and social stability. During that period, regular clean gasoline (87 and 89 octane) was absent in almost the entire Guangdong Province (particularly the Pearl Delta Region), and not much later, the 91 octane also became unavailable. Hundreds of automobiles waited outside gasoline stations, while signs saying “gasoline not available yet” were displayed on the stations. During the three month shortage, the GDP growth of Guangdong Province declined more than 30\% (The Economic and Trade Commission of Guangdong Province). The reason such a strange event broke out was partly because of the monopolistic nature of the market structure since other vendors were required to purchase from CPCC because it had the refineries. Among the 520 gasoline stations in Guangzhou, more than 70\% were directly owned by CPCC\textsuperscript{43} (CNPC only owned 6\%), other vendors also had to purchase gasoline from CPCC as CPCC has the refineries (CNPC’s petroleum refineries were not in southern China). Therefore, once CPCC and CNPC stopped selling gasoline, no one had the inventory to supply the market demand.

The Department of Finance even proposed to waive the 5-6\% import tax for gasoline in November 2005, and increased the export tax on January 1\textsuperscript{st} 2007 to solve the shortage


problem. On the first quarter of 2007, export declined to almost zero. However these were not long term solutions. This tragic case gave a deep lesson to the policy makers: the monopolizing companies are not reliable for the stability and social benefit of the country and public, competition is the key to a healthy market. Therefore shortly thereafter, NDRC proposed further changes in the price determination method.

3.3 The price setting mechanism by NDRC needs to be changed.

According to government information, it is not feasible to force the gasoline price to be lower than the world gasoline price in the long run. Rather, it is more realistic to link it to the up-to-date crude oil price plus the company’s cost and profit margin to set the price. As long as the price is controlled by the government, it would not be surprising for shortages to occur across the country. Since NDRC no longer has the authority to control crude oil prices, they instead focus on their ability to manipulate retail gasoline prices. Such acts of manipulation of price would ultimately place the whole market in an awkward position. This raises several complaints from the big three as they kept losing in the refining section because the wholesale price of gasoline was lower than the input cost, about 80% of which was from crude oil. In order to offer the incentive for refining, it is better to tie the gasoline price to current crude oil price. The only way to prevent further gasoline shortages is to let the market adjust the price without government interventions.

45 http://ido.3mt.com.cn/Article/200703/show666689c30p1.html
46 http://www.changgi-cn.com/marketing/marketingnews_3.html
4.0 Alternative policies to correct the problem

After exploring the current monopoly situation of China’s gasoline market, it is time to think about possible policies to correct the problem. It is to nobody's surprise that the current gasoline market in China is filled with old flaws and emerging issues. In times like this, many policy makers would suggest different policies to redirect the market in a healthy direction. Some of these suggestions are viable while others simply would not work. Understanding the pros and cons of these suggestions would give a better understanding of the difficulty faced in the petroleum market as well as several conceptual ideas to improve the status of the market.

4.1 Maintain Status Quo.

With the monopoly power given by the government, the big three have been abusing their power by taking control of the petroleum sector. As long as there are no fundamental changes to the pricing system and industry structure, severe problems will persist. The world has been experiencing a trend of rising energy prices. Constant gasoline supply shortages occurring throughout southern China with scales always larger than the last, such as the 2005 Southern China shortage and 2007 diesel shortage. On the other hand, Sinopec and CNPC still ask for subsidies from the government. Their efforts to negotiate more favourable policies with the government such as low royalties have been met with continual success. For example, CNPC earned 81.8 billion Yuan during January to June, 2007, which was 1.1 billion more than January to June, 2006. However, both CPCC and
CNPC are still asking for subsidies from the central government. In 2006, CPCC and CNPC received lump sum subsidies of 10 billion Yuan and 5 billion Yuan respectively from the government. According to CNPC, this was because of the increasing wages due to business achievements, expansion, promotions and inflation. Yet in essence, such expenses should not be compensated by the government but by the firm itself. This unfair deal is what sparked the interests of both domestic and foreign competitors to desire a less unfair competing environment. This conflict poses as a headache to the policy makers, who always seem to prefer a slow and controllable liberalization.

What’s more, the low competitive nature and corruption of the major SOEs are constant concerns for the policy makers. Besides the low efficiencies described in section 2.2c, administrative monopoly power also leads to corruption. For example, the chairmen of the big three are appointed by the government and work as ministers. The chairman of the CPCC was arrested shortly after his resignation because of suspected corruption in June 2007\textsuperscript{47}. According to a study, the illegal revenues collected through all kinds of fees by all administrative monopolies between 1998 and 2001 were as high as 53 billion Yuan\textsuperscript{48}. Seeing that figure, it is not surprising that scholars would say administrative monopoly is the most effective means to produce corruption. It is easy to conclude that it is only a matter of time before some sort of reform takes place to address the problems that the petroleum market is facing. Therefore, maintaining status quo would not work due to the fact that the market is becoming more corrupted in its business nature with each passing day.

\textsuperscript{47} Source: www5.chinesenewsnet.com/MainNews/Forums/BackStage/2007_6_22_12_51_11_259.html
\textsuperscript{48} Source: http://www.lm.cn/science/frontSciTech/200709/t20070904_145163.htm
4.2 Make a more competitive market

After several years of practice, the government gradually recognized the problem caused by monopolies and the momentum to impose regulations grows stronger as time passes. What are the viable options for the government to replace the current petroleum monopoly market with a competition market? Several possible solutions will be explored below to provide some of the pros and cons associated with each suggestion.

4.3 De-concentrate

De-concentration has been suggested as a counter to the problem posed by the monopolistic nature of the SOEs. It is apparent that for competition to start, it would require more adversaries with equal strength. Domestic de-concentration is also an easier means to implement for the government. This especially holds true for crucial industries that are important to the nation's economy. Acts of selling off some state-owned assets or separating existing SOEs into smaller ones would meet with more positive response from the government. The following paragraphs would explore the feasibility of some of the more outstanding suggestions.

4.3.1 Airline Example: De-concentrate via separation of the SOEs

One of the policies that were recommended to implement this idea suggested the separation of big SOEs into various smaller ones. The Chinese airline market can be used in this case to reflect the possible outcome of this policy, if it were to be implemented in the petroleum sector. China once attempted to adopt this policy in the airline market but the result was a catastrophic failure. In order to introduce competition into the market, the Chinese government separated the only commercial airline in the country into six major
ones back in 1987 (Wang et al, 2006). This decision sparked the interests of various investors, and the country witnessed a dramatic increase in the number of commercial airline firms. In a short time period, China's airline firms have increased from one firm to as many as thirty firms. However, things started to look bad in 1993 when the competition ironically begun to have a negative impact on the overall market. By 1998, due to the fact that the demand was lacking as well as the effects of financial crisis, it became apparent that the airlines were losing money at an increasing rate. All these reasons contributed to the eventual re-unification of major airlines in 2002, when 9 of the most prominent airlines were merged into 3. There were many reasons that contributed to the failure of the separation policy. China's airline firms were outdated in terms of technology, income and size when compared to modern countries back then. When separated, none of these SOEs had the resources to establish itself as a competitive global airline. On top of that, the competition was simply too intense and chaotic for any firm to stand out. As witnessed in this example, if Sinopec, CNOOC and CNPC were to separate into smaller SOEs, they would no doubt face a similar fate as the airline market. Smaller SOEs would simply lack the size and the resources to establish themselves as main petroleum firms.

4.3.2 Russia’s Example: Sell off some or all assets to private sectors.

Borrowing upon the reforming experience of other countries with a similar background will give some forecasts to the possible future of China’s petroleum industry. Russia is one of the few countries with giant petroleum reserves that is in the process of making the transition from a centrally planned economy to a market oriented one. Russia also happens to be one of the major petroleum producing countries with more than 8 billion
tonnes of output in 2005 (Reynolds, 2007). Russia began its privatization in 1990 (Black et al., 2000), and this included the petroleum industry. This section will examine Russia’s reform process in the petroleum industry, as well as the impact of the anti-trust law on the said industry.

Similar to China’s state-owned companies, petroleum companies in Russia used to be extremely inefficient. Before the collapse of the Soviet Union in 1992, there were more than three hundred state-owned petroleum companies, governed by many “Red Directors” (Black et al., 2000). These companies were small and independent in their own business which included exploration, refining, delivering and sales. The Soviet Union expanded its petroleum export production greatly during this time in order to stimulate the weak economy. Its annual petroleum production topped the world between 1985 and 1991, with annual production of 596 million tonnes in 1987. However, as a result of the extraction of the high quality oil fields together with outdated technology and lack of foreign investments, production deteriorated and output dropped substantially. Thus Russia’s share in the world market dropped from a high of 25.7% in 1987 to a low of 9% in 1994 (Reynolds, 2007).

Natural resource industries have always been a great contributor in Russia, contributing to as much as 50% of its fiscal revenue. In order to maintain the growth of the domestic economy, the Russian government wanted to expand its share of the international market, with the hope to build up a stable domestic market. However, all of the Russian petroleum companies at that time lacked the scale required to compete with international giants such as Exxon and BP. After the collapse of the Soviet Union, these firms were
mostly bought out by local businessmen and soon thereafter, merged to become 8-10 big companies, including Lukoil, Yukos, Sibneft, TNK-BP, Rosneft, Slavneft and Surgutneftegaz (Reynolds, 2007). Since the priority at the time was to counter the financial loss that the country has been experiencing, the Russian government primarily acquired cash by selling off assets and shares of the firms during the process of privatization. This marked the turning point from their past "giving policy" to a new "selling policy". During this time, the government also allowed the purchase of state-owned properties through loans, allowing many individuals to purchase a large amount of state-owned firms. The primary example would be Mikhail Khodorkovsky. Using his bank as a source of loans, he acquired 78% of Yukos' shares which were worth more than 20 times the value of his bank. The same concept was also adopted by other individuals which caused the main oil firms in Russia at the time to be owned by several very wealthy individuals. These firms were all vertically integrated, doing business from exploration, refining, delivering to sales. In 2003, the big 9 companies hold 72.7% of the crude oil reserve, 86.7% of production, 78.0% of crude oil processing, 86.8% of petroleum export, 23.2% of gas stations, 90.3% of total employees and 84.4% of exploration and development (China's Petroleum Net, 2007). Only one of these companies remained state-owned: Gazpromneft. However, the privatization of the Russian oil industry caused several major problems. First, some individuals emerged during this reform and became extremely wealthy while the poverty level of the country as a whole was still rising. Due to the poverty level of the population, the general public in Russia seemed to regard privatization in a bitter and hateful way. The shares in petroleum industry held by government dropped to only 7% in 2004. Also, the
government wanted to attract foreign investments to help modernize domestic companies so that more oil fields in harsh environment could be explored (Likhterova, 2004).

When the Russian government decided to implement the privatization policy, they did it in the hope of acquiring an income to spend in the interest of the country. In actual practice however, this never happened. Due to the fact that a large amount of state-owned assets were either lost or stolen during the process of privatization, the actual income from privatization was extremely slim. Under the socialist concept, any income from the privatization of a state-owned firm belonged to the society which should have been equally divided among the people. However the reality always seems to work differently. Not only did the society not receive the income, the income was instead lost due to corruption and capital outflow. This severely weakened the economic foundation of the country in both the short and the long run. In the end, GDP shrunk during 7 of the 10 years following the privatization. Normally, privatizing a market would not result in such a dire consequence. However, since the privatization took place in the entire country, the disturbance of the market could be felt within the whole country in a prolonged period of time. Due to this, Russia is no longer one of the leading countries in terms of economic status, with a trend of becoming one of the third world countries. Thus, there exist several major flaws regarding the privatization of SOEs. A reform of such large scale requires careful planning and simulation to ensure that the policy does not backfire on the economy. From Russia's privatization example, it is apparent that privatization is not a simple solution for the problems that China's petroleum sector is facing, but instead, is just a suggested policy that could instead harm the economy in the long run. Thus a privatization with great haste and not enough planning will simply not work, because this
will lead to a great loss of state treasure. (Black et al, 2000).

From the above discussions, we can see that just reforming internally will not be able to quickly bring healthy competition to China’s petroleum industry. There are too many flaws and considerations that are involved with internal reforms. Perhaps some magnitude of change regarding domestic de-concentration is desired, however, it would not succeed without other forms of restructuring. As such, de-concentration via external entry will be considered below to illustrate more approaches to solving the problems faced in the petroleum market.

4.3.3 De-concentrate via local entry

De-concentration through the introduction of new entrants can happen in two different ways. Both domestic and foreign investors have shown an interest to participate in the market. In the past, the Chinese government at one time allowed retailers to setup private gas stations. However, that was quickly abolished as it was against the direction of the government whose interest was to control the market.

The issue of entry into the petroleum market is covered earlier in the paper (page 40) regarding the private gasoline stations (Sheng, 2005). Despite the success of these privately owned stations, the government imposed the Document No. 38 which caused a significant decrease in the amount of gas stations owned by local population\(^\text{49}\). Thus one of the most prioritized suggestions is to remove Document No. 38 in order to allow and encourage private capital to join the petroleum industry, especially in refining and retail business. The government went in the right direction back then when they allowed

\(^{49}\) Gasoline stations owned by local population currently account for approximately 10%. Source: [http://fj.fjesen.com/fujian/2008-03/19/content_450169.htm](http://fj.fjesen.com/fujian/2008-03/19/content_450169.htm)
privately owned stations to operate. It is most likely in their best interest to allow the same thing to happen again without any intervention. This way, the distribution market will have a healthy amount of competition as well as high motivations to expand and grow. Besides, policies regarding the entry of local business are a lot easier to implement than most of the other suggestions.

4.3.4 De-concentrate via foreign entry

On the other hand, direct foreign investment can bring in large amount of investment and advanced expertise, but countries like China and Russia will not welcome foreigners to become too involved in industries that are crucial to the national economy and security like petroleum, particularly in refining and distribution. Thus the opening of foreign investment became a long and tedious stage for the petroleum sector. In the early stages before 1982, the government strongly opposed the notion of foreign investment in oil and gas explorations as it required the granting of foreign access to China's land and terrestrial resources (Zhang, 2004). However, this opposition could not last long as the government soon realized that China lacked the expertise and equipment that were required in this field. In March 1978, representatives of foreign oil companies were invited by Beijing for preliminary discussions regarding the investment details. During this time, the second oil crisis was on the verge of approaching which made offshore exploration and development extremely appealing. On the other hand, due to the fact that Chinese negotiators had no prior experience in this field, they faced difficulties in their attempt to create a beneficial contract for the country. There was also the fear of being labelled as a "sell out" which was defined as those who would sell the country's resources to foreigners in an unfavourable manner. This was an extremely dangerous line to tread.
on during the 1970s as it was a serious political crime in the radical government (Kambara & Howe 2007). After many difficulties and hardships, offshore exploration and development were finally opened to foreign companies in 1982 and CNOOC was given the exclusive right to co-operate with them. Four more companies were established under CNOOC with the purpose of providing specialized services to the foreign companies. These were the Bohai Petroleum Corporation, The South Yellow Sea Petroleum Corporation, The South China Sea East Petroleum Corporation and the South China Sea West Petroleum Corporation (Kambara & Howe 2007). Each company was responsible for dealing with foreign companies in its respective offshore area. Onshore territory on the other hand, was gradually opened up after 1985 following the success of offshore explorations (Zhang, 2004). Some efforts were made throughout the end of 1990s to introduce foreign investment into the petroleum market, however; it was also apparent that foreign investments were still too low as the total foreign investment in 1998 for Sino-foreign joint contracts accounted for only $558 million USD (Zhang, 2004). This trend has however, been slowly altered as of late. By 2005, the amount of foreign investments present in the Chinese petroleum market has already exceeded $10 billion USD. In April 2001, PetroChina established a joint venture with British Petroleum to operate several gasoline stations. Exxon Mobil has also recently announced that it would establish a joint venture with Sinopec that involves setting up 500 service stations within the next 3 years (Guo, 2007). Shell has also established similar contracts with Sinopec (Zhang, 2004). Therefore, recent trends have demonstrated that foreign firms are now more interested in downstream opportunities in China's petroleum market.

50 Source: www.chinavalue.net/Media/Article.aspx?ArticleId=15868&PageId=2
These foreign investments bring in the resources, technology as well as the capital that the petroleum firms require in order to expand. However, the most important aspect of foreign investment is that it brings a sense of insecurity to the local petroleum giants such as Sinopec, CNOOC and CNPC. This insecurity will develop into an incentive to further improve the scale of the firm in order to face the competition that foreign firms bring in. This shows that the government is currently going in the right track to further reinforce the petroleum SOEs. However, more work is still needed to further expand the firms in the correct direction especially in the refining sector. For example, opening the refining sector to foreign companies will also bring the competition that will encourage the big three to enlarge in order to compete with these foreign companies.

4.4 Need for Anti-trust to protect entrants from dominant incumbents

After reviewing the possible policies to improve the operation of the market, the focus will now be placed on the anti-trust law and its effect on the economy. The following section will analyze China’s monopoly situation and the contents of its anti-trust law. Monopolies distort the operation of the market and almost always disrupt the natural competition that would stimulate the economy. The forming of monopolies is the direct consequence from an extremely flawed and vague regulation that can be easily exploited.

4.4.1 The monopoly situation in China

A firm is defined as a monopoly when it owns nearly all, if not all, of the market share for a given type of product or service. However, market shares and the size of the firm are not necessarily the predominant factor to a monopolistic market partly due to the fact that market share can be accumulated through legal competition. There are several
industries where large scale operations are a necessity to run the firm in an orderly fashion, such as petroleum and telecommunication. To nobody's surprise, it is crucial for a company to become bigger in order to realize lower average production costs. In practice, many countries and governments encourage their companies to expand in order to compete in the world market. For example, in 1998, Exxon merged with Mobil with combined assets of 72.2 billion $US, BP merged Amoco with combined assets of 48 billion $US, and in 2001 Philips merged with Conoco, with assets totalling more than 100 billion $US. These giant companies influence the petroleum markets in their own area of operation and at the same time assert their control over global resources, technologies and markets.

In comparison, the big three have shown signs of a monopolistic firm in their own territories since they were established, and as such, the debacle for gasoline shortage can happen and causes the burden on consumers to be very high. The main reason is not because the established firms followed monopolizing practices or because the petroleum sector is a natural monopoly. Rather it is the result of government actions. The petroleum companies are administrative monopolies. Administrative monopoly exists when the government boards interrupt and influence competitive markets by manipulating their power on law and administrative rules. This will lead to more serious consequences than economic monopoly since it is the legal agent that destroys competition. However, this is the most common type of monopoly in countries such as the former Soviet Union and China.

Administrative monopoly in practice means that a company monopolizes the market
through non-market methods rather than price searching (NDRC sets the price rather than the companies), such as domestic protection and favourable policies. For instance, the big three have very strong relationships with some government agents and hence they have strong incentives to collude with the government.

4.4.2 The principle of anti-trust

The circumstances and situations of different countries are never the same, and there exists differences in legislation and judicature among the varying nations as well. However, the economic principle for the anti-trust law is held constant. With a strong market power, a monopoly will have the incentive to raise the price of the good above the market equilibrium, and lower the production of the good. Due to the high pricing, consumers are worse off and the loss on the consumer side will ultimately lead to a net social loss. There also exist negative externalities due to monopoly, such as corruption and production inefficiency. Therefore, monopoly remains widely undesired and criticized.

Many countries have recognized that not only will monopoly lower a firm's efficiency; it will also have the effect of impeding a country's competitive spirit. This situation is grave because it is this competitive spirit that contributes to the driving force behind a country's economic and productive growth. As such, the anti-trust law is also known as the Economic Constitution by many economists. The second industrial revolution started in the capitalist countries during the 1860s, when a series of corporations became bigger by adopting new technologies in such industries as railway, steel and telecommunications. This monopoly hurt the competition so greatly that the American
government passed a series of the anti-trust laws: the Sherman Act (1890), the Clayton Act (1914), the Robinson Patman Act (1936), the Celler Kefauver Act (1950) and the Hart-Scott-Rodino Act (1976). Since then, more than eighty countries have passed their own anti-trust laws.

Given the inefficiency of monopoly, bringing in competition would be the optimal solution as described in section 4.2. However, there are still costs of implementation and enforcements in order for the law to be effective. The usual costs include, but are not limited to, labour, administration, research and court costs. The recovered economic welfare should be compared with these in order to see whether a net social gain exists in this case.

4.4.3 An outline for China’s anti-trust law

After a fourteen-year journey, China finally passed its first comprehensive anti-trust law on August 30, 2007. The following is an outline of the contents of China’s anti-trust law. China’s Anti-Monopoly Law contains eight chapters and fifty-six articles. Chapter one starts with the general provisions, including the objective, monopolistic conduct definition and the task, duty and power for the anti-monopoly Committee under the State Council. Chapter two goes over the monopoly agreements, including situations against and not against the law. Chapter three discusses abuse of a dominant market position, while Chapter four regulates concentrations, including procedures, to apply for merging, and the factors that the Committee will consider. Chapter five outlines the abuse of administrative powers to restrict competition, with details to delimitate that. Chapter six is about investigations of suspicious monopoly behaviour. Chapter seven provides the
legal liability for those against the law. We can see that the law strictly prohibits market monopolistic conducts (Li and Fung, 2007).

A company can gain a dominant market position and market share through legal competition and innovation, which is perfectly fair. However, when a company abuses its dominant market position by using its market power, there will be negative impacts to the competitive market. This is the reason why the anti-trust law exists: to counter and forbid such an act. Concentrations and mergers are also considered as legal ways for companies to grow and expand. However, when a company becomes too big, it might acquire an excessive amount of strength on the output market (monopoly) and input market (monosony), and this may allow the company to interrupt natural competition. For example, in Chapter 2 and 3, monopoly agreements and abuse of dominant market position are clearly defined and prohibited. This is a very important aspect to consider regarding policies that involve the de-concentration via external entries. CNPC and Sinopec are dominant incumbents in exploration, refining and retail distribution, so it becomes next to impossible for new competitors to stay in the market without the protection of the anti-trust law’s protection. These are characteristics of economic monopoly, which is monopoly in its simplest form. Most anti-trust laws, such as the ones issued by China and Russia, will cover the above problem. It is important to point out that China’s anti-trust law covers administrative monopoly as well. Article 7 expresses that industries that are critical to the national economy shall be protected by the state. In simpler words, the government allows the monopoly to progress without intervening. The reasoning behind Article 7 is to keep the crucial industries consistent with CPP’s policy that these industries remain operational under the control of the state. Under the belief
that any disruption to these industries would upset the balance of the economy, the
government exerts a high degree of control over these industries while constantly offering
support and aid. On the other hand, the government does recognize the various negative
effects that monopolies have on the economy. Therefore, Article 31 exists to clearly
prohibit administrative monopoly from happening in the economy. This is a particularly
important regulation for the giant petroleum SOEs. They have an intimate relation with
government agencies, favourable policies are successfully negotiated more often than not.
Many high officials in the government have worked for one of the giant SOEs in the past.
The opposite also holds true that many of the officials from the SOEs come from
government agencies. (Guo, 2007) With the anti-trust law, there will no longer be as
much foul-play and corruption between the giant SOEs and the government. As China
has now implemented its own anti-trust law, rigorous implementation will be the key to a
successful reform. Despite some potential difficulties such as the corrupted nature of the
Chinese economy and the control that the state still has on the various crucial industries,
this anti-trust law will be the next step for the Chinese market to take towards a more
competitive and open market.
5.0 Conclusion

With the anti-trust law's regulation, gasoline monopolies have been significantly decreased and limited in countries all over the world. China's gasoline market provides a good opportunity for policy makers to examine how to transform from a monopoly market to a healthy competitive market.

Sheng (2005) reviewed the structure of China's petroleum industry and its price setting mechanism in the past and the present. It also focused on the debacle of the Chinese gasoline shortage in 2005. By analyzing the current pricing mechanism, this paper considers liberalization to be a necessity for a successful reform of any markets. However, China's situation is very complicated because of the poor foundation that the market is built on. We cannot just simply reduce the big three into many smaller firms as it will cause the smaller firms to lack the scale required to compete with other giant companies such as Exxon and BP. At the same time, following Russia's privatization example and just blindly sell off the state-owned assets to the private sector would be an act of folly as well. Thus, the problem that monopoly causes has become an issue of utmost importance since existing problems must be dealt with before any reformations.

On the other hand, de-concentration via entry to bring in a suitable and healthy amount of competition is recommended. This allows the market to start in the direction of western petroleum firms, which have been proven to be successful. This can be accomplished by allowing domestic private and foreign investments to enter the market.
Russia also uses privatization, foreign investment and anti-trust law to reinforce its own market. They initiate multiple carefully planned policies in order to maintain balance while moving forward. The international giant companies do not behave as monopolies because of formal regulations. As such, anti-trust law legislation is emphasized. China has been trying to set up a formal anti-trust law since 1994, with a draft passed in June 7th 2006, and the actual law passed on August 30th, 2007, effective from August, 2008. With this, China will now take its first official step in eliminating the monopolistic nature of the petroleum market, effectively ending the fundamental problem that has persisted within the economy for a prolonged period of time.
Reference List


Appendices

Appendix A: Calculations

(Source: All the numbers are from Sinopec2006 annual report. Website address: http://english.sinopec.com/en-ir/)
Distribution cost + profit + wholesale price + tax = retail price
(This formula comes from the EIA)

Wholesale cost = (32,589 * $4,867)51 + (72,934 * $4,152)52 + (5,427 * $4524)53
= $ 485,984,379 thousand RMB
(We know 1 litre of crude oil can yield various materials, however, the output that is focused on are gasoline, diesel and kerosene. Therefore, I conduct the calculation based on the three main components.)

Distribution cost = distribution expense - wholesale cost = 563,324 million RMB - 48,984,379 thousand RMB = (563,324 - 485,984.379) million RMB = 77,339.621 million RMB
(Since the distribution cost presented in the annual report also includes the wholesale cost, we need to subtract this to get the pure distribution cost. From the annual report, refinery throughout is converted at 1 tonne to 7.35 barrels)

Distribution cost / tonne = 77,339,621 thousand RMB / (32,589 + 72,934 + 5,427) thousand tonne = 677.067 RMB / tonne = 92.118RMB/barrel
(Now to obtain the distribution cost per tonne, we divided our distribution cost that we acquired by the mass in tonnes.)

Refining cost (include crude oil)/tonne = 605,660 million RMB / 144.83 million tonne
= 4,181.87 RMB/tonne
(As we have the value for refining cost as well as the number of tonne that were refined, we can use them to find the ratio of refining cost per tonne.)

Input54/output55 = 144.83 million tonne / 111.809 million tonne = 1.295

51 Gasoline wholesale cost.
52 Diesel wholesale cost.
53 Kerosene wholesale cost.
54 Crude oil.
55 Gasoline, diesel, kerosene.
(Since the refining cost calculated above includes not only the 3 main resources of focus, but also other unwanted substances; it is crucial to eliminate these various materials during the process in order to obtain a precise figure. This is accomplished by acquiring the ratio between crude oil and the 3 primary outputs.)

Modified refining cost\(^{56}\) (include oil) = \(4,181.87/1.295 = 3,228.41\) RMB/tonne = 439.239 RMB/barrel

Total cost = refining (include crude oil) + distribution cost = 3,228.41 + 697.067 = 3,925.477 RMB/tonne = 534.079 RMB/barrel

Retail price = 579.61 RMB/barrel
(Given by the annual report)

Profit = price - total cost = 579.61 - 534.079 = 45.531 RMB/barrel = 334.653 RMB/tonne

Crude oil = 3,750 / 1.295 = 2,895.753 RMB/tonne = 393.98 RMB/barrel
(Given by the annual report)

Refining cost = refining cost (including crude oil) - crude oil price = 3,228.41 - 2,895.753 = 322.657 RMB/tonne

We have obtained all the costs, now we can proceed to solving the percentages for distribution, refining, tax and crude oil:

Distribution/retail price = 92.118 / 579.61 = 15.893%

(Refining + profit) / retail price = (332.657 + 334.653) / 4,260.1335 = 15.664%

Crude oil / retail price = 393.98 / 579.61 = 67.973%

Profit/retail price = 7.86%

\(^{56}\) Refining cost only restricted to gasoline, diesel and kerosene.
Distribution
15.893%

Crude Oil
67.973%

Tax
0%

- 1 October 1949: the People’s Republic of China was established. The central government set up the ministry of fuel industry, responsible for the production and development of crude oil, coal, and electrical power.
- April 1950: the Bureau of Petroleum Administration was set up under the ministry of Fuel Industry.
- 17 January 1975: the Ministry of Fuel and Chemical Industry was abolished and the Ministry of Petroleum and Chemical Industry and the Ministry of Coal Industry were established.
- 5 March 1978: the Ministry of Petroleum and Chemical Industry was abolished. The Ministry of Petroleum Industry and Ministry of Chemical Industry were established.
- 1980: the State Energy Commission was established, responsible for administration over the Ministry of Petroleum Industry, the ministry of Chemical Industry and the Ministry of Electrical Power.
- 1982: the State Energy Commission was abolished and the three ministries were placed under the administration of the State Council.
- 5 February 1982: China National Offshore Oil Corporation (CNOOC) was established.
- 12 July 1983: China National Petrochemical Corporation (Sinopec) was established.
- 17 September 1988: China National Petroleum and Natural Gas Corporation (CNPC) were established. Earlier in the same year, the Ministry of Petroleum Industry was abolished. The Ministry of Energy was established taking over governmental responsibility from the previous three ministries – the Ministry of Petroleum Industry, the Ministry of Coal Industry, the Ministry of Nuclear Industry – and responsible for electrical power industry from the Ministry of Hydro and Electrical Power.
- 1993: the Ministry of Energy was abolished.
- 24 January 1996: China National Star Petroleum Corporation (CNSPC) was established based on the exploration functions spun off from the Ministry of Geology and Mineral Resources.
- April 1998: the Ministry of Chemical Industry was abolished. The State Bureau of Petroleum and Chemical Industry were established taking over the governmental functions of the Ministry of Chemical Industry and that of CNPC and Sinopec. It was under the administration of the State Economic and Trade commission.
- 7 July 1998: CNPC and Sinopec were restructured into China National Petroleum and Natural Gas Group Company (CNPC) and China National Petrochemical Group Company (Sinopec group).
- 5 November 1999: PetroChina Company Limited (PetroChina) was established based on the core assets of CNPC.
- 28 February 2000: China Petroleum and Chemical Corporation (Sinopec Corporation) was established based on the core assets of Sinopec group.
- March 2000: Sinopec Group merged with CNSPC, which was renamed as Sinopec Star Petroleum Co. Ltd.
- 7 April 2000: PetroChina was floated on the Hong King and New York Stock Exchanges.
- 19 October 2000: Sinopec Corporation was floated on the Hong Kong, New York, and London stock exchanges.
- 28 February 2001: CNOOC was floated on the Hong Kong and New York Stock Exchanges.
- 2001: the State Bureau of Petroleum and Chemical Industry were abolished along with other bureaus of industrial administration.