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大陸公務用車建議採購清單對機構用車銷售量的影響

The Effect of China's Governmental Vehicle

Procurement List on the Institutional Vehicle Sales

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When the going gets tough, the tough gets going. There will be many obstacles and challenges in my future career. I would certainly keep the spirit in mind and move forward to become the better person.

Abstracts

On November 18th 2011, China enact detail rules on the management of governmental vehicle procurement list. Few months later, on February 24th 2012, an unprecedented governmental vehicle procurement list was published. The procurement list includes 412 types of vehicles which are all China's own brands. This research analyzes the effect of this governmental vehicle procurement list on the sales of listed vehicle given the background of Xi Jinping's anti-corruption campaign.

The empirical evidence shows that when Xi Jinping launched preliminary policy in December 2012, increased sales of vehicle being on the procurement list in 2013 are averagely 45.5 cars per month more compared to increased sales of unlisted vehicles. Also, the market share of listed vehicle can be witnessed a steady increase over time.

Keywords: Governmental Vehicle; Anti-Corruption; Xi Jinping; Sales; Market Share

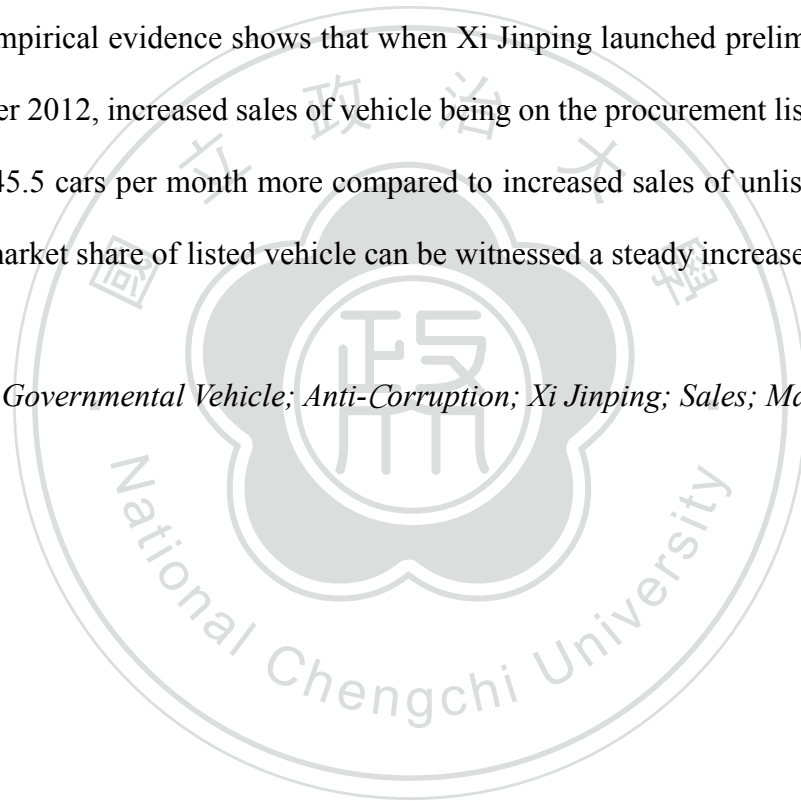


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1. Introduction

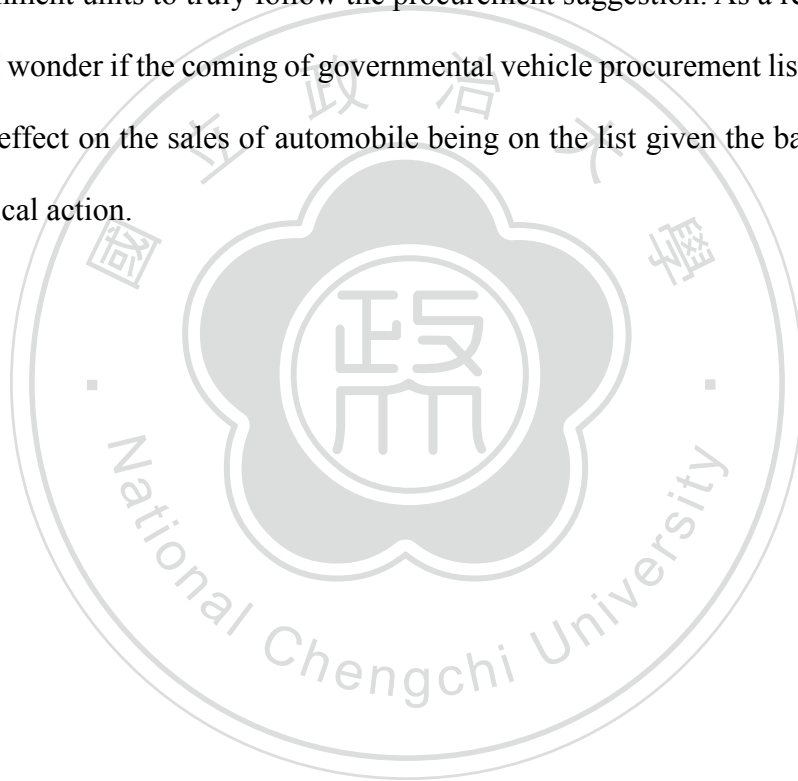
Since 1978 the Chinese economic reform and opening up, the “Socialism with Chinese characteristic” has led the economic growth of China into rapid growth. The 14.2 percent GDP growth rate was an unachievable number for nearly most of the countries and, during year 2010 to 2011, China even kept averagely 10 percent GDP growth rate. As we all know that the Communist Party has been possessing absolute power to affect every aspect since planned economy, it cannot be denied that economy in China would still be directed after market-oriented economy. Also, people's thinking and social media are controlled by government. The coming of new policy would usually be expected to make great changes because of the China government's executive power.

On the other hand, the social legal system and regulation on different industries should also have corresponding progress to meet the fast economic development. The automobile industry, for instance, shows a speedy progress under government's protection and the growing domestic demand has driven to establish many own brands by cooperating and learning the technics with matured automobile brands from foreign countries.

Moving to the public sector, although the amount of governmental vehicle kept growing higher, however, this was resulted from the incomplete regulation system and corruption problem. It further caused the over purchasing of governmental vehicle which is illegal. The former Premier of State Council, Wen Jiabao, he said that in 2012 government would be more dedicated to reforming the fiscal condition by coming up the ways to lower the spending when reporting the annual government affairs in National People's Congress. Strictly controlling the three public expenditures and making a completeness of governmental vehicle usage were the priority to seek lower

administrative cost.

As expected, the governmental vehicle procurement list was released on February 24th in 2012 and this procurement list would be the first procurement list of governmental vehicle. Besides, in the end of same year, no one could have ever thought that the largest anti-graft campaign would be brought by Xi Jinping. Both of the events may change the behavior of government procurement. This list was expected to affect the governmental vehicle procurement while anti-corruption campaign might indirectly push government units to truly follow the procurement suggestion. As a result of all of the above, I wonder if the coming of governmental vehicle procurement list would have significant effect on the sales of automobile being on the list given the background of series political action.



2. Literature Review

There are only few articles concerning the governmental vehicle procurement list, mostly talking about the reform of China's governmental vehicle. To begin with, there has been many automobile policies in China since the rapid growth of automobile industry. The issuing of new policy usually would bring many different influences. These may change people's economic behaviors and have impact on stakeholders. A distinctive case would be the auction of private car licenses in Shanghai and lottery of automobile licenses in Beijing.

China intended to control the vehicle quantity given the situation that the traffic congestion and carbon emission problem in China was becoming serious and, in 2008, the auction procedure was modified in Shanghai. In the recent years, the quota fluctuated between 8,000 to 9,000 and rarely exceeded 10,000. As for Beijing, the new policy in January 2011, lottery of automobile licenses has reduced the number of newly registered vehicles as expected from 810,000 in 2010 to 174,000 in 2011 (*Feng Suwei and Li Qiang 2013*).

“Energy security” is also a reason why China keeps promoting the use of energy-saving vehicles since the consumption of gasoline from transportation takes a considerable proportion. A study shows that China has become a net oil importer since 1993 with oil dependency rate 7.5% and the oil dependency rate has been over 50% already in 2007 (*Leung, G. C. 2011*). Indeed, the restrictions on private car ownership implemented in Beijing and Shanghai have not only controlled the quantity of issued license but also relieved the excessive vehicle fuel consumption. (*Ouyang, M. et al. 2011*)

A similar policy was took placed in Singapore after Dr. Ning Hongyeo formally announced the motor vehicle scheme would be adopted in 1990. The buyer who wants

to purchase the car needs to bid for the certificate of entitlement which is valid for 10 years (*Chia, N. C. et al. 1996*). Such quota restriction on vehicles increased the cost of possessing a car and the amount of vehicle consequently decreased both in China and Singapore.

A direct policy that will influence sales of vehicle would be imposing tax and subsidy on vehicles. To let the electric cars penetrate into the market, China launched the Electric Vehicle Subsidy Scheme. Afterwards, China directly use subsidy on energy-efficient vehicles to boost the sales. The initial subsidy was a direct deduction of 3,000 per vehicle for the sales price in 2010 and it stayed effective until September 30th 2011 (*He, H. 2013*).

It can be observed that the policy led by strong government would usually be dominated. This time, China released the governmental vehicle procurement list may have equivalent effect on sales of vehicle being on the list. Furthermore, it may possibly give the positive impression on those chosen on the list for society and thus further increase sales of listed vehicle (*Sun Zongbo. 2012*).

3. The Reform Movement of Regulations on the Governmental Vehicle

3.1 The Definition of Governmental Vehicle

Based on management regulations on the use of governmental vehicle (政黨機關公務用車配備使用管理辦法), the governmental vehicle refers to the car utilized during government operation. It could be classified into two categories, the governmental vehicle for general use and law enforcement. The functions of governmental vehicles for general use include confidential communications, emergency purposes and special and technical needs.

3.2 The Reform of Governmental Vehicle in the Early Period

In 1994, a regulation regarding the management of governmental vehicle (關於政黨機關汽車配備和使用管理的規定) [1] was issued which firstly specified the number of governmental vehicle supposed to be provided and vehicle specification for different rank leaders. It shaped the initially confusing terms of governmental vehicle use to have a basic outline. Also, it ruled that governmental vehicles for above sub-provincial leader use should purchase domestically manufactured car instead of luxury imported car. Nevertheless, violation cases still happened one after another during procurement process.

In 1999, the adjustment (關於調整黨政機關汽車配備使用標準的通知) [2] of previous management regulations was released. Because this announcement regulated the upper limit regarding the engine displacement and price of governmental vehicle for different official's levels, it had tackled problems derived from the incomplete content of governmental vehicle procurement rule to certain extent. The later governmental car management system is basically based on this adjustment.

With the rapid development of China's economy, the domestic automobile industry took this express train and had founded many local own brands by cooperating with

other foreign brands. Furthermore, cheap labor cost accelerated the speed of development and created a prosperous scene of automobile industry while the governmental vehicle matter, on the contrary, became more problematic with the more complex car industry. The public fund wasted over past years had accumulated considerable number of money and this brought the voice of making a more systematic procedure for the governmental vehicle purchasing such as transparently disclosing the procurement information, strictly verifying and implementing the budget.

In 2003 and 2004, 《Government Procurement Law of the People's Republic of China》 [3] and the regulations regarding the specification and register of governmental vehicle (中央國家機關公務用車編制和配備標準的規定) [4] were announced respectively. Former government procurement law orders that government should reveal the procurement report on the designated website to be under supervision of public. The later regulation limits the unnecessary purchasing of governmental vehicle to ensure the purpose of governmental vehicle is really to support the government operation rather than private use and it is worth of mentioning that it denotes the suggested year of governmental vehicle.

Later in 2008, the notification concerning about the further enhancement of energy saving and concrete measures of citizen's power-saving action (關於中央和國家機關進一步加強節油節電工作和深入展望全民節能行動具體措施的通知) [5] reset the specification standard for the governmental vehicle which was originated from the awakening concept of energy efficiency and carbon reduction at that time. The engine displacement and price of governmental vehicle for general use had altered from initially 2.0 L and below 250000 RMB to 1.8 L and below 160000 RMB.

A forward-looking reform movement of governmental vehicle was started with a proposal “how to reverse the current difficulties of governmental vehicle reform” proposed by the member of Central Revolutionary Committee of the Chinese

Kuomintang after 11th Chinese People's Political Consultative Conference. This proposal stated the difficulties of governmental vehicle reform that the China government was facing and was attached great importance by the State of Council. In May 2010, the State of Council issued the suggestion of critical tasks for deepening reform of economic system (關於 2010 年深化經濟體制改革重點工作意見的通知) [6] and ,in the same year, the National Development and Reform Commission had done wide-ranging research on the issue of governmental vehicle reform which canceled part of leader's private-use car and revised the previous standard of governmental vehicle. This action, that the State of Council seriously considered the proposal from people's willingness, could say the reform of governmental vehicle has marched forward to public vision.

3.3 The Reform of Governmental Vehicle in More Recent Years

Through the effort of National Government Offices Administration and other government agencies, a new regulation on management of official vehicle (政黨機關公務用車配備使用管理辦法) [7] was released accompanied by the management policy on the budget and final account of governmental vehicle (政黨機關公務用車預算決算管理辦法) [8], claiming that the new era of governmental vehicle reform has come. The accounting entry such as car maintenance was included this time to further strengthen the control of expenditure management.

After several evolutions, it could be said that the administration system of governmental vehicle was totally legalization, systematization and transparency. For example, the management right was centralized and systematically distributed to the different level departments to guarantee tasks were able to be executed normally. Government administration at all level as management subject would thoroughly check

series of required works from the procurement to maintenance, and loose management was unallowable.

China government started adopting the centralized procurement and recruiting the professional team in charge of the public tender to purchase governmental vehicles satisfied the expected standard. Governmental vehicles should be legally registered and used. As for the amount of governmental vehicle, it should strictly accord to the total number of people in those government bodies that they are affiliated with. To be more transparent, the information of governmental vehicle use had to be recorded and shown including time, reason, place, mileage and related spending. After that, cars should be parked to original place so that it could avoid governmental vehicles for private use. Furthermore, it ruled that maintenance and other related cost such as the insurance and gasoline refilling should be done in fixed place to evade interest conflict. Finally, it also specified the suggested year to use and procedure of dealing retired cars such as auction. From the very first procurement to eventually the discard of governmental vehicle, all the processes were associated with concrete rules.

3.4 The Governmental Vehicle Procurement List

Through the collective effort of government, the expenditure on governmental vehicle had declined in the following few years. The successful reform of reducing the three public expenditure, however, did not satisfy the central government.

On November 18th 2011, under the requirement of Central Communist Party and State of Council, the joint team composed of the Ministry of Industry and Information Technology, National Government Offices Administration and its bodies enact detail rules on the management of governmental vehicle procurement list (政黨機關公務用車選用車型目錄管理細則) [9]. The pace of working out the governmental vehicle procurement list seemed unstoppable. According to detail rules, the specialists in the

professional team evaluated the application from enterprises and compared the price-performance ratio of different kinds of cars to finally decide which vehicle model would be on the list.

On February 24th 2012, a groundbreaking governmental vehicle procurement list (2012 年度政黨基管公務用車選用車型目錄(徵求意見稿)) [10] was published which has been widely asking for public opinion. This list is the first procurement list for the governmental vehicle giving a reference when government units are going to purchase cars. However, there is no mandatory regulation forcing government units to purchase vehicles on this procurement list. That is, governments units could decide on their own if to purchase vehicles on the list.

Although gathering many perspectives from society, the procurement list was criticized by the European Union Chamber of Commerce and Europe side claimed it would have action to revenge against this list. The major reason is that, among 412 different types of cars, none of the European brand was been on the list and these 412 types of vehicles are all China's local brands. However, this is because detail rules of the list demands that the research and development expense in the recent two years should not be less than 3 percent of the core operating revenue as a mandatory condition. This compulsory requirement automatically excludes the foreign brands since nearly no foreign brand could meet this requirement. Most of the foreign brands set their R&D center outside China so that all the foreign automobile manufacturers failed to be chosen on the procurement list.

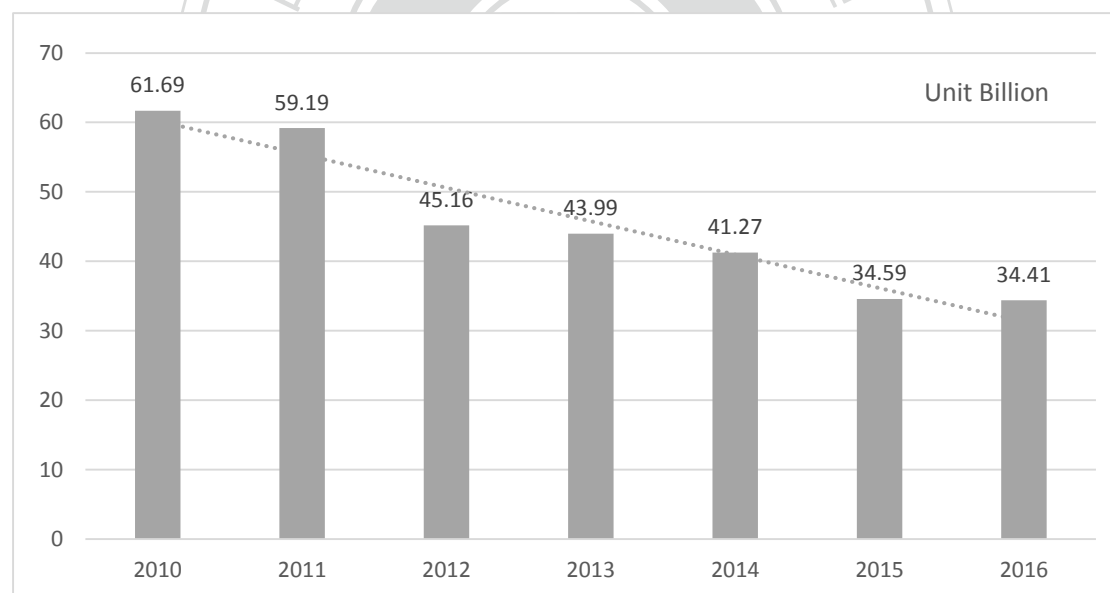
Another requirement of detail rules includes the enterprises who want to apply for being a part of list should have independent industrial property right. On the other hand, detail rules also revise the price and engine displacement of governmental vehicle. The price should not exceed 180,000 RMB and engine displacement should not exceed 1.8 liter for general use cars. The coming of list could tell China's strong determination of

using China's domestic own brand. The previous rule only required to purchase domestically made cars which are not able to call China local brand yet.

Table 1 : The Vital Selection Requirements of Detail Rules

1. The R&D expense of enterprise in the recent 2 years should not be less than 3 percent of core operating revenue
2. The price should not exceed 180,000 RMB for general use cars
3. The engine displacement should not exceed 1.8 liter for general use cars
4. The enterprise should have independent industrial property right
5. The vehicle should have sold for more than 3 months constantly and would keep selling for longer than 6 months after chosen

Figure 1: Budget of Central Level Procurement on Governmental Vehicles



*For the year 2010, the number is the actual executed number, not the budget. Source [11]

The number on Figure 1 illustrates the budget planned for the procurement on governmental vehicles from the year 2010 to 2016, according to the annual report from the Ministry of Finance of China. Overall, it showed a downward trend over time at 34.41 billion in 2016 which had nearly reduced half of the expenditure compared to

61.69 billion in 2010. This decreasing number also demonstrated the austerity promoted by the Central Communist Party after Xi Jinping came to power.

3.5 Anti-Corruption Campaign of China

While China left the planned economy and opened its gate to the whole world, embracing the free economy, politically, the state of the China remained the same which is highly excessive centralization of power. Thus, Attitudes of Chinese Communist Party (CCP) usually dominates the trend of policy and atmosphere of society. It is commonly known that “Power tends to corrupt, and absolute power corrupts absolutely.” The issue of corruption problem has been being the underlying apprehension of China's development. Backing to the era of Hu Jintao, China government kept declaring its determination to fight against the corruption problem and included anti-corruption program as one of the crucial development policy of all time. However, the effect seems limited.

In 2007, during the 10th National People's Congress, Wen Jiabao the Premier of People's Republic of China at that time once responded to the reporter's question that “the political corruption is deeply rooted and occurs constantly with the development of market-oriented economy now. Moreover, it is becoming severe and even many high-level leaders are involved. To eradicate this problem, we must start with every detail since the corruption are resulted from many aspects. One of the vital is the excessive centralization of power that seemingly could not have enough restriction and supervision.” Such statement shows that the lack of supervision power might cause the abuse of power (*Tang Yenbo 20080*).

Xi Jinping's consecutive campaign to fight against corruption was begun with a dramatic event of Chinese politics, Wang Lijun incident. In February 2012 Wang Lijun, the vice-mayor of Chongqing and head of public security bureau, tried to disclose the

truth of a British businessman Neil Heywood's murder to the United States consulate and then sought for the political asylum from the U.S consulate. His action was denied by U.S and, however, put suspicious murder Ku Kailai, the wife of Chongqing Party Chief Bo Xilai under the spot light. The Central Communist Party investigated murder case again and this scandal triggered the sudden end of Bo Xilai's political career who had ever been seen as a prospective candidate of elite Politburo Standing Committee. Because of Wang's incident, Bo Xilai was accused for “serious disciplinary violations” and later on sentenced to be life imprisonment for bribery, embezzlement and abuse of power (Yuen, S. 2014).

Nevertheless, this is not the end of story. The rumor that Bo Xilai was in the political opposition against Xi Jinping side and secretly planning to overthrow the regime that Xi Jinping and Li Keqiang were going to take over was widely spread. The other people involving with Bo Xilai's conspiracy included Zhou Yongkang, Ling Jihua and Guo Boxiong said as “New Gang of Four.”

Few months later, In November 2012, when Xi Jinping was elected to the post of CCP General Secretary, a largest scale campaign against corruption in China's modern history was ready to take into action. From the central government to the local government, senior officials to petty officials, Central Commission for Discipline Inspection, after the significant reform undergone by Xi Jinping, was going to combat every illegal crime.

Firstly, there were several political declarations. On the 4th December 2012, Central Politburo of the Communist Party of China held an annual congress to organize China's main economic and political goal next year. Xi Jinping announced an “Eight-point Regulations” to ensure the official discipline to be seriously regarded within the Communist Party and be closer to the masses. The key points of these regulations include “leader should work and listen to public and low-level officials,” “the lavish

bureaucratic things should not exist during official events,” “there should be fewer traffic control when the leaders pass to avoid inconvenience to people.” Basically, all the regulations emphasized on practicing the thrift way, eliminating the unnecessary form of interaction between government affairs (*Yuen, S. 2014*). The eight-point regulations could be said as the first-wave of this anti-corruption campaign. In the next year, the central party released a 2013 to 2017 work plan to form a mechanism for preventing corruption known as “5-years Anti-Graft Campaign.” [12]

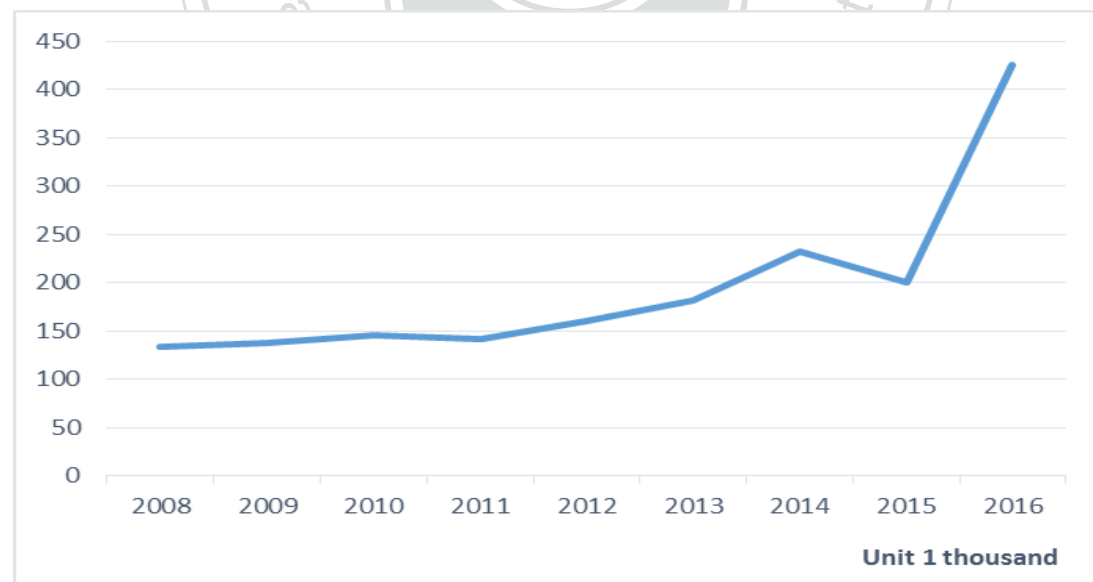
These eight-point regulations were followed by a series of crackdowns of many well-known officials. Holding the principle that all big tigers and small flies must be crack down, Xi Jinping broke the unspoken rule which has been being for many years regarding “Politburo Standing Committee criminal immunity,” especially for the retired one. The rule originated from the Cultural Revolution and it ruled that leaders should not investigate each other to avoid sorts of chaos that would mess the Communist Party. Li Chuncheng was the first big tiger to be caught after the 18th Party Congress in December 2012. After Li, Zhou Yongkang, the biggest tiger was knocked down by Xi Jinping. The relevant high-level managers and relatives of state-owned enterprise under Zhou Yongkang's control were also questioned and arrested one by one which were said to be more than 300 people. It was a sensational news at that time and all over the media no matter within China or overseas. Finally, on 11th June of 2015, the Tianjin court judged all of Zhou Yongkang's accusations and he admitted that these accusations were all true and what he had done really harmed the Communist Party which were not consistent with the spirit of central will. Zhou Yongkang, who had ever been in the influential position as a member of Politburo Standing Committee, was a demonstration of Xi Jinping's determination to radically reform all the long term problem. With the announcement by court, Zhou Yongkang was claimed to be life imprisonment and the judgement again broke the unwritten rule that the retired former central leader would

not be taken to the court.

Since Xi Jinping became the new leader of China on 14th March of 2013, more and more officials were gradually placed under investigation. Moreover, the campaign had reached to the economic sector. Many executives of state-owned enterprises also could not escape from the campaign. The most famous example was the kingdom of Zhou's petroleum industry.

Another distinctive case would be Jiang Jiemin [13], who got arrested immediately after taking government job as the head of State-owned Assets Supervision and Administration Commission. He was the former head of China National Petroleum Corporation (CNPC) and its subsidiary firm PetroChina. This oil giant was claimed for receiving large amount of bribe and ended up his career in jail. It is noteworthy that Zhou was the former head of CNPC.

Figure 2: Nationwide Party Discipline Investigation of Chinese Officials



*For the year 2008, the official statement is only calculated until June. Therefore, it is approximately double the number which is sum up from January to June. Source [14]

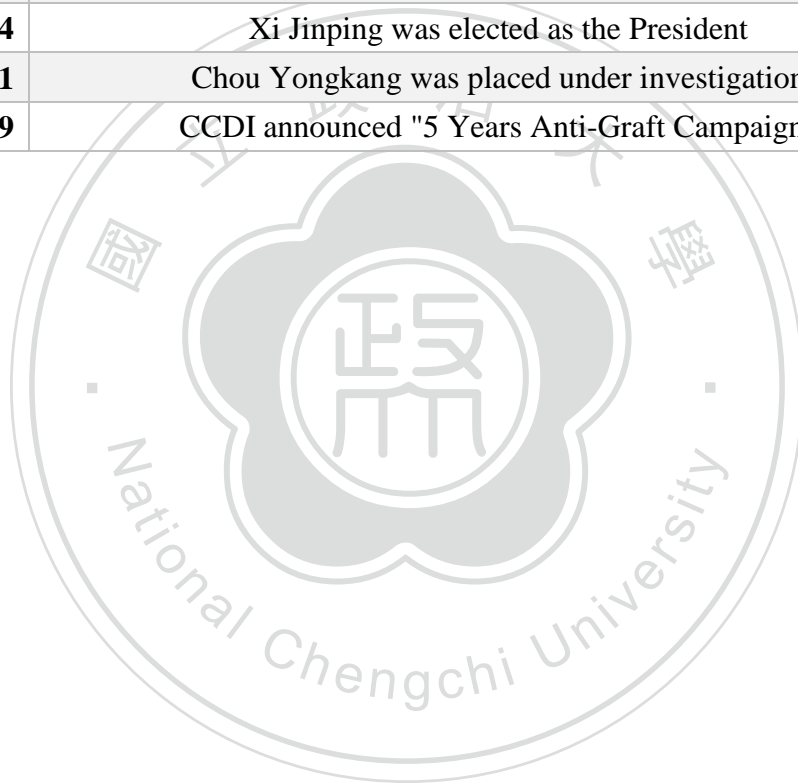
Figure 2 shows the nationwide number of people who was punished for

disciplinary issue according to the official announcement of Central Commission of Discipline Inspection. It could be seen that before 2012, the number remained constant. With the ascension of Xi Jinping in the end of 2012, the number of officials being punished because of disciplinary violations started to rise. Until 2013 and 2014, the number was around 182000 and 232000 government officials respectively. Followed by a peak in 2014, it decreased for a small amount of people and the number started to rocket in 2016 which is more than double the amount of people at 426000 officials compared to last year 2015. In addition, in 2016, there was around 11000 officials involved in “serious disciplinary violations” and sent to the judicial system. Until 2017, there were approximately 200 high-ranking officials got punishment.

The ongoing campaign to deal with graft in Xi's era still kept expanding to every corner of China. The pattern of anti-corruption campaign is quite notable which heavily relies on the Central Commission of Discipline Inspection. Usually the probes are initiated by the CCDI and consequently reported the corruption case on its website. The CCDI is the internal disciplinary body designated to check the malfeasance and corruption within the Communist Party which indicates that it is highly centralization of power. At a closer look at other countries, usually this kind of ministry of supervision department in a country is independent with all the other powers and undergone in a legal system. However, apparently, what Xi Jinping want is to have the supervision power exclusively. Xi Jinping had integrated the disciplinary body vertically to make it easy to control and established a special inspection team to conduct the routine check of government units. Some political observers argue that the Xi Jinping's real purpose of anti-corruption actions behind the scene is not only to reform China's politic and economy but to eliminate his political rivals. No matter what, one thing is sure that this biggest anti-graft campaign in China under Xi Jinping would not show any sign of slowing down (*Yuen, S. 2014*)

3.6 Important Timing

Date	Event
2011/11/18	Detail rules on the management of governmental vehicle procurement list was issued
2012/02/24	The governmental vehicle procurement list was issued
2012/09/28	Bo Xilai was expelled from the party and sent to judicial system
2012/11/15	Xi Jinping was elected as the General Secretary
2012/12/03	Li Chuncheng was placed under investigation
2012/12/04	The "Eight-Point Regulations" was announced
2013/01/09	Xi Jinping announced anti-corruption on TV program
2013/03/04	Xi Jinping was elected as the President
2013/12/01	Chou Yongkang was placed under investigation
2013/12/09	CCDI announced "5 Years Anti-Graft Campaign"



4. Method

4.1 Difference-in-Difference Method

The difference-in-difference method is widely used in econometrics and quantitative research which estimates the change brought by a certain treatment such as a policy or event between the control and treatment group over time. It could be used for analyzing the effectiveness of policy or event. A typical difference-in-difference equation is derived as below:

$$Y = \beta_0 + \beta_1 D^{post} + \beta_2 D^{tr} + \beta_3 D^{post} D^{tr} + \varepsilon \quad (1)$$

Table 2: The Process of Obtaining Difference-in-Difference Estimator

Y	$D^{post}=0$ (Pre-Event)	$D^{post}=1$ (Post-Event)	Difference
$D^{tr}=0$ (Control Group)	β_0	$\beta_0 + \beta_1$	$(\beta_0 + \beta_1) - \beta_0 = \beta_1 \quad (2)$
$D^{tr}=1$ (Treatment Group)	$\beta_0 + \beta_2$	$\beta_0 + \beta_1$ $+ \beta_2 + \beta_3$	$(\beta_0 + \beta_1 + \beta_2 + \beta_3) - (\beta_0 + \beta_2) =$ $\beta_1 + \beta_3 \quad (3)$
Difference-in-Difference Estimator	$(\beta_1 + \beta_3) - \beta_1 = \beta_3 \quad (3) - (2)$		

Where both D^{post} and D^{tr} are dummy variables. If $D^{post} = 1$, it represents the time after the program; If $D^{post} = 0$, otherwise. If $D^{tr} = 1$, it represents the

treatment group, where it represents listed vehicles in this study; If $D^{tr} = 0$, otherwise. Therefore, we can denote the regression outcome by coefficients as Table 2 above. By calculating the difference between the first difference and second difference, finally we could get the coefficient of interaction term β_3 which is thus the difference-in-difference estimator.

There are many studies utilizing difference-in-difference method. (Schultz, T. P. 2004) evaluated the “Progresa Program” which offers poor household in rural area of Mexico education grants to see the effect on children's school enrollment by difference-in-difference method and it further indicates that the level of enrollment rate in the poor Pregresa localities (treatment group) are higher than non-Pregresa localities (control group). Another previous study using difference-in-difference method is (Zhu, D. 2011) which tries to figure out the impact of Chinese boycott against the automobile manufacturers of French in terms of sales and market share of French automobile. It shows that during the potential boycott period, sales and market share of French automobile significantly decreased.

4.2 Data Description and Variables

The source of data is D.M.V's recorded data. The data is the sales data of institutional car covering the year from 2009 to 2013 marketed in China. It includes the monthly sales, price, automobile model, where it is sold and the specification such as displacement and fuel type. As for the specification information, it is collected from the Internet based on the automobile model.

There are 1,588,472 observations in the original dataset. As for automobile characteristics, the majority of fuel type is the gasoline which occupies 97.91 percent and the second large is the diesel vehicle which occupies 1.97 percent for the listed

vehicles. For the unlisted vehicles, the composition is very similar at the number of 97.78 percent and 1.78 percent respectively. Figure 3 depicts the average engine displacement of car sold in this 5-years dataset. The vehicles chosen to be on the procurement list this time are basically compact vehicles so that the engine displacement is generally smaller than unlisted vehicles. It is because the detail rules set upper limit for the price and size of engine displacement (180,000 RMB, 1.8 L. for general use one). The characteristics between the listed and unlisted vehicles are marginally different. Especially, after 2012, the gap of average size of engine displacement between listed vehicles and unlisted vehicles gradually became smaller.

There is an insufficient part of this research. Although this research will focus on the effect of governmental vehicle procurement list in public sector, the record of sales volume in this dataset cannot actually be distinguished whether vehicles are bought by the government units or private institutions.

Figure 3: Vehicle Characteristic—Engine Displacement

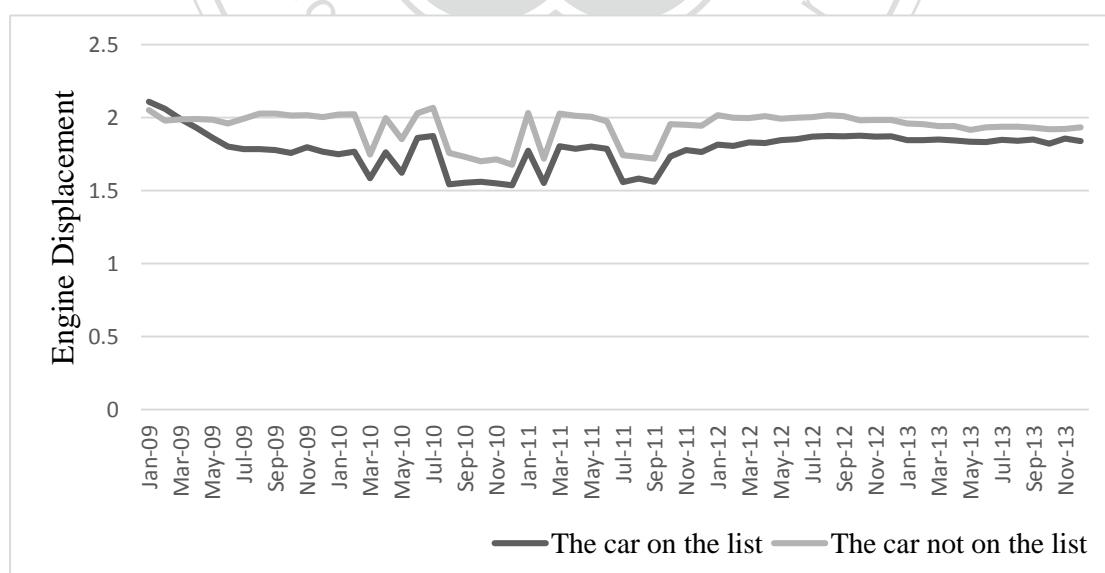


Table 3: Summary Statistics for Listed Vehicles

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>Sales</i>	122,993	1.83972	3.37797	1	236
<i>Size</i>	121,424	11.7334	2.39133	7.72968	18.1959
<i>Price</i>	120,719	12.3039	9.83906	2.68	82.8
<i>Displacement</i>	122,979	1.76169	0.35652	1	2.4
<i>Horsepower</i>	121,424	88.0373	28.76	33.5	239
<i>Fuel Inefficiency</i>	117,934	7.6609	1.68481	2.8	16.28

Table 4: Summary Statistics for Unlisted Vehicles

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>Sales</i>	1,465,479	2.23498	5.50835	1	938
<i>Size</i>	1,460,487	12.6747	3.83809	1.50154	110.456
<i>Price</i>	1,449,624	14.9338	12.9198	1.18	108.9
<i>Displacement</i>	1,465,415	1.95352	0.51545	0.8	5.7
<i>Horsepower</i>	1,461,084	97.8668	33.4379	4	257
<i>Fuel Inefficiency</i>	1,374,248	8.05053	1.78135	2	21.7

Table 5: Automobile Sales and Other Characteristics for year 2012 and 2013

	Jan. 2012-Jun. 2012		Jul. 2012-Dec. 2012	
	Listed Vehicle	Unlisted Vehicle	Listed Vehicle	Unlisted Vehicle
Sales (average)	1.95	2.58	1.95	2.59
Price (10,000 RMB)	12.65	15.72	13.45	15.46
Displacement(liters)	1.83	2.03	1.87	2.01
Horsepower	88.77	100.80	89.26	100.24
Fuel Inefficiency	7.70	8.23	7.66	8.21
Size (cubic mm)	11.58	12.68	11.47	12.74
	Jan. 2013-Jun. 2013		Jul. 2013-Dec. 2013	
Sales (average)	1.45	1.73	1.42	1.66
Price (10,000 RMB)	12.54	14.63	12.33	14.11
Displacement(liters)	1.84	1.95	1.84	1.94
Horsepower	86.80	98.69	86.66	96.82
Fuel Inefficiency	7.43	8.10	7.38	7.99
Size (cubic mm)	11.33	12.69	11.27	12.57

5. Empirical Analysis

5.1 Sales Trend

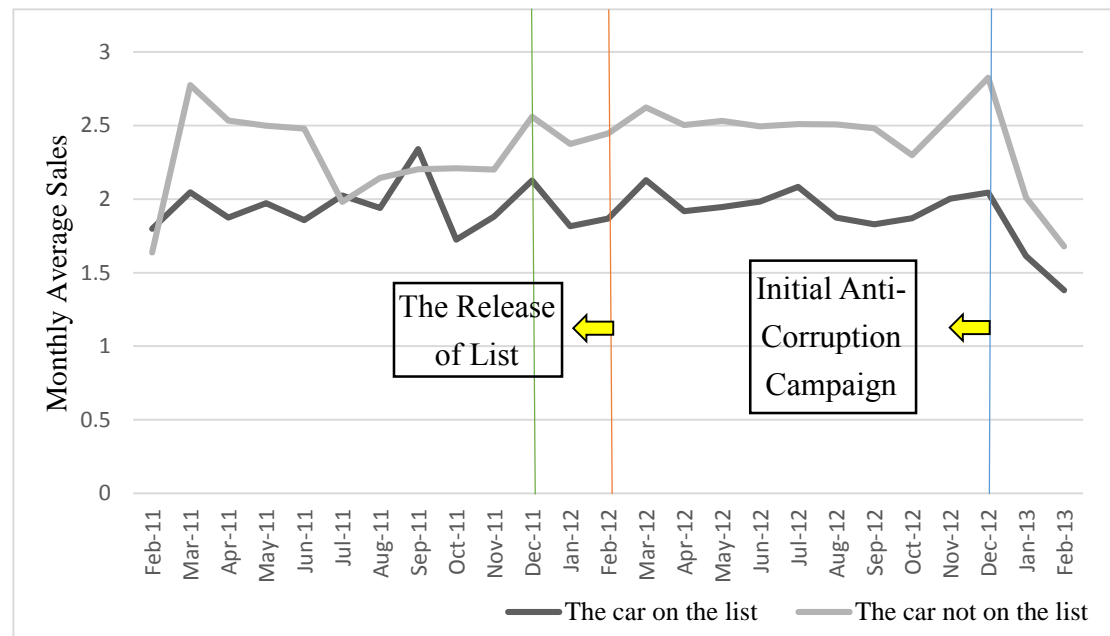
I begin with the sales trends for listed and unlisted automobiles sold in China. Figure 4 shows the monthly average quantity of vehicle sold before and after 1 year that the procurement list was issued. The horizontal axis is the monthly period from February 2011 to February 2013. The orange vertical line mark is the time when the procurement list was published.

Generally, the listed vehicles and unlisted vehicles follow the same trend after the issuing of procurement list. The sales of listed vehicle slightly increased from February to June in 2012 while the sales of other vehicle levelled off. Although the sales of listed vehicle and unlisted vehicle both grew up right after the event, automobiles on the list rose marginally more. However, interestingly, when Xi Jinping held the position of General Secretary in December, both sales witnessed a plummet. The monthly average sales of listed vehicle were initially at number of 2 in December 2012. After 2 months, there were only around 1.5 cars sold for the listed vehicles. As for unlisted vehicles, the decreased magnitude was even higher than listed vehicles that it suffered a dramatic fall from 2.8 to only 1.6 left in February 2013. It might be resulted from Xi Jinping's practice of austerity according to eight-point regulations. *Nancy Qian and Jaya Wen* (2015) indicated that the import of luxury good easily to be observed by the public has reduced after Xi Jinping launched anti-corruption campaign. Besides, Xi's anti-corruption campaign might drive not only the drop in China's automobile sales but the government units to seriously regard the procurement list of governmental vehicle and purchase the suggested type of vehicle.

Although Figure 4 illustrates the sales movement of listed vehicle may have been affected by the coming of procurement list and later Xi Jinping's ascension. In the next section, I would test vehicles which are on the list and compare vehicles which are not

on the list as control group with difference-in-difference method. By doing so, we may see a more accurate outcome of effect of political action on listed vehicle sales.

Figure 4: Sales Trend of Listed Cars and Unlisted Cars



*For the green line, it is the time when detail rules were published; for the orange line, it is the time when the governmental vehicle procurement list was published; for the blue line, it is the time when Xi Jinping announced eight-point regulations

5.2 Econometric Model

There are two options to select the dependent variable, market share and sales. To see both of the effectiveness, I would use both of these two variables for my estimation. Sales are aggregated by the specific month, year and model type. Therefore, after data processing, each number of sales then represents the specific automobile model sold in certain month of year and there are 57320 observations left. It is ordinary to aggregate by the automobile model since the procurement list provides model code of each chosen automobile. For my estimation, the dependent variables y_{it} is taken as the market share expressed on a 100-point scale or sales volume of automobile model i in month t .

The next question would be how to construct the effect of procurement list. Firstly, I assume that the effect started from the next month that the detail rules were published which is in December 2011 as the earliest timing and make the assumption that it would last continuously then. Later on, I would check the effect from month to month. The model for my estimation is composed as follow:

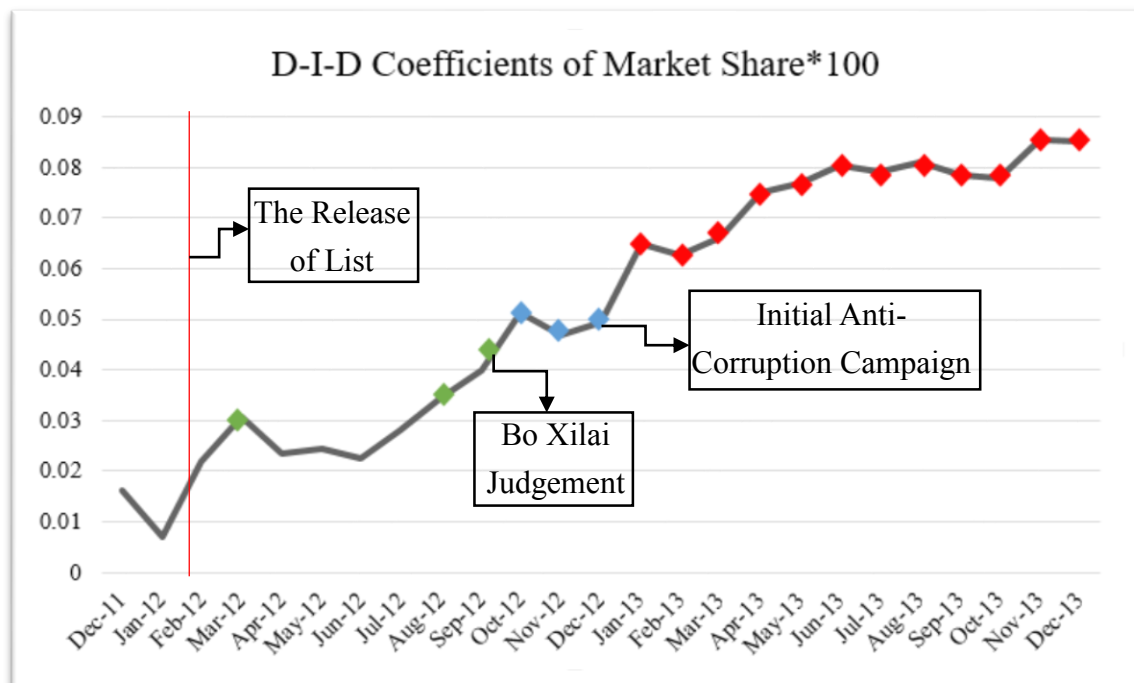
$$y_{it} = \alpha_i + \lambda_t + \beta_t \mathcal{L}_{it} + \varepsilon_{it} \quad (4)$$

Where α_i and λ_t are the fixed effects for the model code i and month t singly; ε_{it} is the econometric error term. In the sample, t is carried out from 1 to 60 and the effect of procurement list begins from t_{36} (December 2011) until t_{60} (December 2013). The model code fixed effects α deal with differences among all different model types in average automobile characteristics, supply and demand factors, as well as any other factor affecting market share or sales which remains constant over time. Also, the time fixed effects λ control for the average change over time by removing month-to-month changes. Finally, including the cross-term \mathcal{L} could let the interpretation of β_t as a set of difference-in-difference estimators. The term that I concern is $\beta_t \mathcal{L}_{it}$, which incorporates the effect of coming of procurement list on the market share or sales of listed vehicles. The variable \mathcal{L}_{it} is equal to one when the model code i is the one on the procurement list and $t \geq 36$ when the detail rules of procurement list are released (the potential effect period); \mathcal{L}_{it} is zero otherwise. Therefore, β_t , which is automatically set to zero for months before the publishing of procurement list, derives the set of difference-in-difference estimators for the period of potential effect of procurement list. To be more explicit, β_t quantifies the variation in market share or sales of listed vehicles after the issuing of the detail rules relatively compared to other unlisted vehicles in the dataset.

Table 6: The Estimation Result for Both Market Share and Sales

	yit:Market Share		yit:Sales	
	(5)	(6)	(7)	(8)
β_{36}	0.000163 (0.000117)	0.000072 (0.000108)	-1.6795 (11.4640)	-7.5679 (11.8742)
β_{37}	0.000071 (0.000140)	-0.000162 (0.000115)	3.9194 (7.6756)	-11.4953 (6.1335)
β_{38}	0.000220 (0.000145)	-0.000031 (0.000126)	8.2978 (8.9232)	-8.1820 (8.1161)
β_{39}	0.000307* (0.000148)	0.000042 (0.000128)	5.8974 (10.7441)	-11.4630 (10.3510)
β_{40}	0.000235 (0.000155)	-0.000041 (0.000134)	7.5575 (9.6219)	-10.7243 (8.7755)
β_{41}	0.000244 (0.000153)	-0.000043 (0.000126)	3.2302 (9.8331)	-15.5619 (8.8803)
β_{42}	0.000225 (0.000157)	-0.000066 (0.000134)	7.8092 (9.5568)	-11.4484 (8.4095)
β_{43}	0.000283 (0.000156)	-0.000015 (0.000130)	9.6121 (9.5409)	-9.9173 (8.3430)
β_{44}	0.000344* (0.000159)	0.000019 (0.000128)	11.2281 (9.6371)	-10.2368 (8.1742)
β_{45}	0.000398* (0.000162)	0.000054 (0.000128)	17.3001 (9.3453)	-5.4986 (7.4985)
β_{46}	0.000513** (0.000170)	0.000158 (0.000136)	30.4597** (9.3029)	6.8069 (7.0730)
β_{47}	0.000470** (0.000169)	0.000111 (0.000134)	21.6793* (9.9609)	-2.2441 (8.1412)
β_{48}	0.000493** (0.000171)	0.000122 (0.000134)	19.1367 (10.4246)	-5.4020 (8.7034)
β_{49}	0.000649*** (0.000172)	0.000262* (0.000128)	32.5471*** (9.4568)	6.7208 (6.9420)
β_{50}	0.000626*** (0.000184)	0.000214 (0.000138)	46.4278*** (10.3768)	18.7372** (7.0678)
β_{51}	0.000662*** (0.000185)	0.000259 (0.000139)	38.4696*** (10.1141)	11.4482 (7.1471)
β_{52}	0.000749*** (0.000191)	0.000330* (0.000143)	42.8143*** (10.4782)	14.7864* (7.3903)
β_{53}	0.000770*** (0.000199)	0.000345* (0.000149)	44.4745*** (10.9194)	15.9717* (7.7414)
β_{54}	0.000804*** (0.000204)	0.000367* (0.000155)	49.1393*** (11.2711)	19.7292* (7.9226)
β_{55}	0.000790*** (0.000205)	0.000345* (0.000155)	47.0274*** (11.3163)	17.0721* (8.0105)
β_{56}	0.000811*** (0.000207)	0.000345* (0.000155)	48.5300*** (11.4890)	17.1823* (8.0718)
β_{57}	0.000785*** (0.000210)	0.000302 (0.000156)	46.9589*** (11.5426)	14.4892 (8.0328)
β_{58}	0.000780*** (0.000217)	0.000283 (0.000164)	48.5186*** (12.0704)	15.0883 (8.5144)
β_{59}	0.000855*** (0.000217)	0.000339* (0.000162)	51.7567*** (11.9434)	17.0232* (8.3391)
β_{60}	0.000851*** (0.000227)	0.000332 (0.000172)	49.7835*** (12.6666)	15.0921 (9.0609)
Model FEs	Yes	No	Yes	No
Number of obs	57302	57302	57302	57302
	* 10% significance level	** 5% significance level	*** 1% significance level	

Figure 5: Difference-in-Difference Coefficients of Market Share*100



*The green mark are the coefficients at 10% significance level. The blue mark are the coefficients at 5% significance level. The red mark are the coefficients at 1% significance level.

5.3 The Estimation Result

The estimated coefficients of the procurement list from t_{36} to t_{60} are displayed in the Table 6, including the effect on the market share and sales of listed vehicle. The regressions are run with and without the control variable, the model code of vehicle, in two independent variables. Thus, there are in total four columns of estimation. In the four estimations, standard errors are robust to heteroscedasticity.

For the estimation (5) and (6), the number of coefficient represents the influence of procurement list on the market share of listed vehicles by percentage. For instance, the coefficient of period 39 in estimation (5) is 0.000307 which means, compared to the unlisted vehicles, the vehicles being on the procurement list (the listed vehicles) increase 0.0307% market share more from the previous period to this period. On the other hand, for the estimation (7) and (8), the number of coefficient thus represent the

influence of procurement list on sales. Then, for example, the number of coefficient in period 46 in estimation (7) is 30.4597 that means being on the procurement list relative to the unlisted vehicles could increase 30.4597 sales volume more from last period to this period.

In the estimation (5), the time and model code fixed effects are included. For the direction of effect, the estimated difference-in-difference coefficients are all positive. However, In the beginning, from t_{36} to t_{43} , nearly all the coefficients are not significant while only period t_{39} is significant at 10% significance level. It can be observed that the coefficients afterwards are gradually becoming statistically significant. In October 2012, one month after Bo Xilai was judged and expelled from the party, the coefficient begins to be significant at 5% level. According to Figure 4, the average monthly sales drop dramatically after December 2012. Interestingly, right after the time that first tiger Li Chuncheng was placed under investigation and eight-point regulations were announced by Xi Jinping, in the next month (January 2013), the market share of listed car could be said to have gained significantly more at 1% level relative to unlisted vehicles.

Moreover, the coefficients keep being significant at 1% level until the last period. Also, taking a glance at Figure 5, the influence magnitude of policy shows an upward trend over time. In the earlier timing, the numbers of coefficient are also relatively lower than the timing when preliminary anti-corruption campaign was started.

The similar trend same as estimation (5) could be witnessed in estimation (7). Before December 2012, only few coefficients are significant. After Xi Jinping comes to power with the determination to eliminate the corruption problem, the coefficients begin to be significant at 1% level. Numbers of coefficient are double or even triple the number before. That is, overall, the increased sales of listed vehicle after December 2012 are relatively double or triple the quantity it was before. Without the model type fixed effect,

the trend of estimation (6) and (8) also becomes positive after period 49 (January 2013) although the coefficients are not that significant in contrast to estimations with model type fixed effect.

The more significant results and larger numbers of coefficient can be seen over time when the detail rules and procurement list are released. Later on, after the initial anti-graft action is launched by Xi Jinping, the effects on not only the sales but also the market share of listed vehicle are even stronger. According to Figure 4, after political action by Xi Jinping, the sales of automobile in China start to decline, but sales performance of vehicles being on the procurement list is relatively better than those not on the procurement list.

In addition, the timing December 2012 was just the beginning of anti-graft campaign, the more systematic and complete programs against the corruption were carried out especially afterwards, including what this research mentioned about in the chapter 2, the biggest tiger Zhou Yongkang who was sentenced to life imprisonment and 5-years anti-graft campaign organized by CCDI. It can be said that, with the strong China's determination to reform and eliminate the deep-rooted corruption problem, government units will be more likely to obey the policy from central party. Therefore, the procurement list of governmental vehicle may be more influential on sales and market share of listed vehicle in the future.

6. Conclusion

Decreasing three public expenditures and reforming the governmental vehicle system have been the goal of China for many years. Not until Xi Jinping's effort has this goal become successful. The austerity promoted by the central party influences both government and society. The investigation of model level data with difference-in-difference method demonstrates the coming of governmental vehicle procurement list has substantial effect on the market share and sales of listed vehicle. The effect starts to be very significant especially after Xi Jinping's anti-corruption campaign and announcement of eight-point regulations. In 2013, the increased sales of vehicles on the procurement list are averagely 45.5 cars per month more compared to increased sales of unlisted vehicles. Also, the market share of listed vehicles can be witnessed an upward trend over time. With the unstoppable pace of China's political actions and policies, it can be forecasted that the effect of this governmental vehicle procurement list will keep having remarkable effect on governmental vehicles.

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