

# The Game of the China DTH Markets between State-Controlled and Copycat Brands

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**Abstract.** This paper discusses the game of China DTH markets between state-controlled and copycat brands. Using the multi-stage game theory to analyze the struggles between the governmental controlled and “copycat” DTH markets, it is found that both sides have paid huge economic costs. After using CAS for encryption, the government has effectively controlled the DTH source and prevented the proliferation of the copycat market, creating the environment of the normal operation and commercialization. But, the DTH market became the monopolize market under government control.

**Keywords:** DBS, copycat brand, game.

## 1. Introduction

Since the introduction of DTH in China, it has been subjected unprecedentedly to the impact of the copycat market. These impacts has directly affected the normal growth of the DTH as well as hindered the development and growth of China’s radio and television industry. It also challenges the government's ability to control and monopoly market. There are two important factors for the existence of the “copycat” DTH dishes. One is the laxity of the government to monitor and reinforce the rules and laws, allowing criminals to take advantages of this fact. The second is the economic interest that caused the rapid and unstoppable development of the “copycat” DTH dishes. Due to the above, the paper discusses in detail the game between governmental controlled and “copycat” DTH dish.

## 2. The Review of DTH

DTH is a successful combination of advanced video compression technologies with the inexpensive, broad and limitless coverage of satellites.

On the world satellite roadmap, DTH is a latecomer. Since it came in 1993, the satellite digital television industry has experienced a developmental boom, with over 30 countries worldwide expanding its satellite business. The US and Europe became the regions with the most matured operations of DTH. It has even changed the structures of the radio and TV market as well as the telecommunications market, thus, to a certain extent, promoting the merging of telecom, cable and Internet market.

### 2.1. The Operation and Development of DTH in China

The television industry has long been monopolized by cable TV in China. TV subscribers had to receive TV signal through a coaxial cable while cable operators deliver its programs to millions of households through cable networks. The coverage of the remote villages by cable is an expansive project. The start of the DTH services will provide a more “spacious” platform for broadcast TV. At the same time, DTH can provide a great platform for China’s domestic digital premium pay-TV channels and easily covers the remote villages.

### 2.2. The Operation and Functionalities of the Chinasat-9 DHT Satellite

Chinasat-9 is the first DHT satellite of China launched On June 9, 2008. The launched Chinasat-9 satellite covered 98% of China’s vast land. A subscriber only needs to use a satellite dish with a diameter of 45 cm to receive directly digital TV programs. For initial programming, 47 free SD channels are delivered to

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TV subscribers through non-encrypted transmission. With improved viewing qualities, it was a great convenience for those in the remote areas of China to watch TV programs and listen to radio.

The successful launched of Chinasat-9 has brought the development of China's broadcast TV into a brand new era. With its large capacity, strong signal and many programming, DTH has become a favorite amongst the majority of the people.

### **2.3. The Government's Policies on the "Control" of DTH**

In October of 1993, decree no. 129 of the State Council issued[1]. It states that the receiving of satellite signals should have the prior approval on the government. No individual should be allowed to install unauthorized satellite receivers. Ever since then, the reception of China's satellite TV signals has been subject to strict government control.

To take advantages of the resources, the technologies and the vast coverage of the DTH satellite and take increase the numbers of viewers watching TV in rural and remote regions of China, the SARFT<sup>1</sup> had began, in 2006, to devise new strategies and modify the "The policies of the management and operation of the ground segment the satellite." To improve the overall coverage of television in China, the "Every Village"<sup>2</sup> project was initiated and legalized. At the same time, a white paper on the technology of China's DTH Satellite for the "Every Village" was written, specifying that the "Every Village" system is one of the most important projects during the Communist party's eleventh "Five year" plan. The project was specifically designed to increase the radio and TV coverage in remote region and resolve the problem of having electricity but no access to radio and television in the mountainous areas. Gradually, China's satellite policies have gone from strict control by the government to gradual liberalization. This has laid a foundation for the operation of the direct to home (DTH) satellite[3].

### **2.4. A Technical Introduction to the Structure of China's DTH**

From the beginning, China has used its own independent proprietary satellite transmission technology standard ABS-S to develop its DTH, laying a solid technical foundation for efficient transmission and vast coverage. The 4 Ku transponders on the Chinasat-9 satellite can transmit 47 SD digital TV channels to all regions of China. Not only that, it can also provide programming guide (EPG), broadcasting data and STB software upgrade.

Because there's an overly dependence on the technologies of the ABS-S standard and its incompatibilities, initial security measures were placed on controlling and managing the chipsets instead of using the highly secured CAS encryption technology on the streams itself. When there were loopholes in the management of the chipsets, many of the domestically manufactured chipsets were supplied to the black market for copycat products. This has resulted in the rapid growth of domestically made copycat satellite receivers. To slow the spread of copycat satellite receivers, all digital satellite TV signals were encrypted at the beginning of 2010, thus preventing copycat receivers to receive DTH signals. Effectively, the encryption scheme has stumped the growth of copycat receivers in a short period of time. The government had, since the introduction of encryption, executed 33 security upgrades and each time, the copycat market had corresponding countermeasures. The government's control and the copycat market have created a multi-stage game. Finally, the introduction of the NDS<sup>3</sup> CAS system has technically invalidated the ability of the current copycat receivers to watch DTH programs. The government's control became the winner.

## **3. An Overview of the "Copycat" DTH Market**

The market for "copycat" DTH dish, like that of cellphone, has created huge demands on the "copycat" market. The word "copycat" was originally used to describe the imitation of previously monopolized products and how these products can now be mass produced and at a very low cost compared to the original. This has formed the "copycat" culture in China. The "copycat" DTH dish denotes any privately installed

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<sup>1</sup> SARFT: State Administration of Radio, Film and Television.

<sup>2</sup> "Every Village" project is the project that deliveries free DTH dishes and TV programs to the subscribers in remote villages of China.

<sup>3</sup> NDS is the world's leader in pay-TV-field to help pay-TV operators to secure their programs. Over one-third of the pay-TV households in the world relies on NDS technology.

satellite dish system that has not been granted permission by the government. The existence of “copycat” dishes has disrupted, to some extent, and caused an impact to the regular operations of the DTH for the once monopolized satellite market has been broken. On the bright side, the development of “copycat” dishes had made DTH TV more common, allowing China to become the world’s largest DTH operator.

Technical barriers, market demands and driven profit are the main reasons for the rapid development of the “copycat” dish in such a short period of time. It is the result of full competition of the market.

Firstly, the ABS-S technology used in DTH satellite of China is easy to break by the illegal reception when the illegal ABS-S chipset is diffused on the market. Even the SARFT has taken great security measures in the manufacturing of these chipsets including strict licensing, registration and control. Offering the possibility changes the DTH market contracture from monopolistic to the perfect competition.

Secondly, China has over 400 million television subscribers, of which 199 millions are cable viewers[3]. The remaining 200 million viewers depend on DTH and terrestrial broadcasting to watch television programs. In addition, because DTH programs are the same as those of cable and the fact that they can be found everywhere on the market, “copycat” DTH dishes have become a favourite of everybody. Not only do the rural farmers like “copycat” DTH dishes, but the people from the cities also love them. According to statistics, in 2009 alone, there were over 40 millions “copycat” satellite receivers available on the market[4].

Finally, because of the many layers of bureaucracy involved, project tenders and selection procedures are often very slow, providing market and business opportunities for the “copycat” DTH dishes. In order to achieve profit quickly, a few of the legal DTH dish manufacturers sold ABS-S chipsets to the “copycat” DTH dish suppliers. At the same time, in order to increase their market share and maximum profits, various chipset makers supplied a lot of ABS-S chipsets to the “copycat” DTH dish market. To speed up the development of the “copycat” DTH dish market and lower the overall cost, some chipset vendors went so far as supplying the total solution to the “copycat” DTH dish manufacturers. Between the markets accepted pricing and the cost of production, there is a handsome profit to be made. When manufacturers discovered this huge profit margin, they entered the “copycat” market as well, creating a complete “copycat” DTH dish industrial chain, speeding up the development of the “copycat” market and creating a large DTH market demand. It is shown that the perfectly competitive market has a strong vitality and competitive.

In addition, “copycat” DTH dishes requires less work than authorized DTH dishes because there are no certification required, no tax given and no after-sale services provided, all of which will naturally reduce the cost. For example, the cost of a “copycat” DTH dish is less than \$24 US dollars which is very affordable by most of the rural farmers. This is another reason why “copycat” DTH dishes can significantly impact the DTH market.

## **4. The Game between Government Controlled and “Copycat” DTH Dishes**

The successful launch of the Chinasat-9 satellite, dubbed the “DTH” satellite, in June of 2008, provided a public welfare service platform. DTH satellites utilize free-of-service model to provide coverage and through government tenders, free DTH dishes are given to those in remote villages. This is known as the “Every Village” project. For the first phase of the tender, the SARFT requested a total of 3.698 million units of DTH dishes. And to prevent “copycat” DTH dishes, the DTH satellites are encrypted. In October of 2009, the second phase of the tender included encrypted CA solutions and required 8.65 million units. In July of 2010, the third phase of the tender asked for 650 thousand units. That’s a total of 12.998 million units. Due to huge demands from the rural market and driven by profitability, the development of “copycat” DTH dishes all over China has accelerated. In a short period of time, there are over 40 million “copycat” DTH users[4].

### **4.1. Analysis of Multi-stage Game**

The Chinasat-9, launched in June of 2008, is used for the “Every Village” project. Under the project, all DTH dishes will be distributed free-of-charge by the government. Since initially, there was no encryption to the programs, it has attracted a lot of the manufacturers to come up with an imitation, leading to a flood of “copycat” DTH dishes. The government tried to use controls the market to deter the “copycat” market. At the

same time, the “copycat” market tried to break the controls. Thus the multi-stage game between the government and the “copycat” market is formed.

Starting on January 4, 2010, the Chinasat-9 started to upgrade frequently and most of the channels were encrypted. This has allowed the users with legitimate receivers to watch TV while forcing those with illegal “copycat” receivers to stop receiving satellite signals. Overnight, users with “copycat” receivers went from having the ability to watch 47 free channels to having access to only 12 minority language channels which are not encrypted. These users essentially experienced a “blackout” TV screen.

#### **4.2. The Government’s Monopoly**

By using encryption methods, such as NDS, the government can use bureaucracy and technologies to form a monopoly on the DTH market. Not only can the government control the market, but it can also form a monopoly, preventing fair market competition. It’s because of this monopoly that can cause some companies to have low efficiency as well as inappropriate use of resources.

The cost of upgrading the Chinasat-9 is low but it will take, for the average hacker, a lot of investment in breaking the encryption. This cost will ultimately be borne by the “copycat” dish buyers and users. These buyers need to go back to where they bought the “copycat” dishes and pay \$2.5 US dollars to upgrade the receiver. If the buyers cannot find who sold them the “copycat” receivers, then they will need to pay another \$24 US dollars to buy new “copycat” receivers that have been fitted with the latest hacked software, in order to watch encrypted TV channels. Due to increasingly strict government control and frequent upgrades, “copycat” DTH dish vendors had to perform upgrades to already sold “copycat” dishes, collecting upgrade service fees, or sell newly de-encrypted receivers. Ultimately, it’s the consumers who had to pay the price. By imposing frequent updates, the government’s strategy of curbing “copycat” dishes has not only backfired but instead increased the price of “copycat” dishes even higher. The real beneficiaries are the hackers and “copycat” vendors.

#### **4.3. Accelerated the Upgrades of Encryption**

Since the start of the “Every Village” project, the government had given out the DTH satellites free of charge to farmers in the remote regions. Even though these DTH satellites have not been sold on the market, the consumer demands for free television has sustained and grew the “copycat” market.

To crack down on the “copycat” DTH dishes, on December 27, 2009, the SARFT started the encryption of the Chinasat-9 satellite. On January 9th at 9am, Chinasat-9 satellite started sending encrypted signals. Over 3.698 million users with government issued receivers were able to view 47 TV channels while those with “copycat” receivers can only watch 12 channels.

Almost weeks later on the morning of January 23rd, the SARFT performed a second encryption and software update on the Chinasat-9. On February 10th, the Chinasat-9 went through a third upgrade. On March 3rd, the SARFT initiated a fourth upgrade on the Chinasat-9 satellite. Once again, the “copycat” receivers sold on the black market were deemed unusable. On May 28th, 2010, the Chinasat-9 satellite went through a fifth upgrade. This was an unplanned upgrade, aiming to deter the sales of “copycat” dishes on the black market.

Finally, the Chinasat-9 satellite has been upgraded a total of 33 times. During the one-month duration of the World Cup of Soccer, Chinasat-9 has its signals upgraded 6 times. Due to the constant upgrades of the satellite, a new line of business had sprung up: paid STB system upgrade. Vendors who had sold “copycat” DTH dishes will charge \$2-\$3 US dollars for each system upgrade or a warranty fee that covers a lifetime of upgrades. This is to ensure that “copycat” receiver purchasers can continuously watch free television. Multiple satellite upgrades enabled the “copycat” dealers to reap the profits of this multi-billion dollar market.

The government’s “controlled” plans of upgrading the satellite monthly have changed to weekly. The frequent upgrades resulted in an increase in the price of the receiver and less time for the “copycat” vendors and users to come up with the hacked software. Yet these upgrades can only temporarily deter the “copycat” market by increasing its overall cost but it cannot totally wipe out the existence of the “copycat” market.

#### **4.4. Employed the CAS System from NDS**

In order to achieve strict control and the complete abolishment of the “copycat” DTH dishes, the SARFT has employed the CAS system from NDS to guaranteed technical securities. The cost of using the CAS system was to invalidate the 3.698 million receivers purchased for the first phase of the “Every Village” project, a direct economic loss of over 218 million US dollars. The cost of NDS CAS receivers had greatly increased as well. An additional 300 million US dollars was needed to equip the 8.65 million already purchased receivers with NDS CAS. In addition, the 40 million “copycat” DTH dishes were disabling and caused about 1 billion US dollars loss of famers.

According to the Chinese government's "National" Cultural Reform and Development Plan in the period of "Twelfth Five-Year" " , the SARFT has explicitly indicated that the DTH should reach 50 million subscribers in 2012, 100 millions in 2013 and 150 millions in 2014 and 200 millions in 2015[6]. Such a huge DTH dishes development plan required up to 10 billion US dollars.

Therefore, the process of game between government control and “copycat” market has caused over 1.5 billion US dollars loss. To reach the 200 million DTH users goal of government in 2015, the government needs to invest more than 10 billion US dollars. In the government monopoly market after using NDS CAS, when the China’s DTH dishes could ever achieve a record of 60 million subscribers?

#### **5. Conclusion**

In this paper, through the analysis of the game between the government controlled and “copycat” DTH dish market and the development of the DTH dish market, it is found that China has a huge market potential for DTH dishes and the ability for rapid expansion. The perfect competition “copycat” DTH dish market has promoted more than 40 million users shortly and help China becomes the world leader of DTH dishes with over 60 million subscribers. The existence and rapid development of the “copycat” market are the results of the breakthrough in technology, huge market demands and driven interests. During the multi-staged game between the government and the “copycat” market, both had paid huge economic costs. The usage of the NDS CAS system had effectively put an end to the proliferation of the “copycat” DTH dish market; however, the government monopoly market is formed. Lack of the competition in the monopoly market and face of a large number of demand for funds, when it can achieve its goal of 200 million DTH subscribers.

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