

# ***Similarities Between Cycles in China's Hog Futures Market and Cycles in the Labor Market***

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**Abstract:** Labor markets and commodity futures markets have been important areas of study in economics over the past few decades. However, most scholars view them as two separate fields. This article attempts to fill this gap by examining the relationship between hog futures cycles and labor market cycles, exploring similarities between them. Hog futures are one of the most active contracts in the agricultural product futures market. The labor market is an important part of economic activity, directly affecting the financial situation of households, businesses and governments. The cycles that exist in these two markets can be seen as the result of fluctuations in supply and demand. By analyzing the hog futures cycle and the labor market cycle, this article explores the Chinese government's intervention methods and intervention purposes and finds similarities.

**Keywords:** Chinese hog futures market, Chinese labor market, economics cycle

## **1. Introduction**

China is the largest pork consumer in the world. Although the proportion of China's per capita pork consumption has been decreasing year by year, it still accounts for more than 60% of the total meat consumption. Pork has always been the mainstay of meat consumption [1]. In order to stabilize the supply of pork, to avoid the closure of pig farming enterprises, the Chinese government allows pig farming companies to use the pig futures market to hedge risks. Judging from the hog futures prices in the past seven years, it can be clearly seen that hog futures are cyclical. At the same time, the number of employed college students in China has skyrocketed in recent years, and the investment environment has shrunk under the policy of preventing the epidemic, resulting in a decline in the number of jobs. This means that many college students have difficulty finding jobs. Many news reports show that from 2022 to 2023, many Internet companies began to lay off workers on a large scale, but in the past ten years, the Internet industry has expanded rapidly and recruited a large number of programmers. This information undoubtedly reflects the downward phase of the labor market cycle.

## 2. The Cycle of the Hog Futures Market

### 2.1. Confirmation of Trading Varieties in Hog Futures Market

Futures related to pork have a very long history around the world, but the hog futures market was only listed and traded on the Dalian Commodity Exchange on January 8, 2021. In fact, China has been researching and developing pork futures market transactions for the past 20 years. Hog futures is the longest-studied trading variety in Dalian Commodity Exchange so far, and it is a very special trading variety in the 30-year history of China's futures industry. Since pigs need to go through several growth stages in the process of pig breeding, it is difficult to ensure uniform living characteristics, and after slaughter, they need to be stored in frozen warehouses to avoid decay and loss. This makes it difficult for the futures market to determine the trading species according to the loading of pigs in different periods. China has revised its trading rules many times in the past ten years. For example, from May 2009 to October 2011, the trading method adopted was to use pig ketone carcass as the target and deliver cash. Later, because the China Securities Regulatory Commission hopes to follow the financial services and the real economy, it conducts comparative research on three different targets of hogs, ketones, and piglets on pork-related futures. At the beginning of 2019, African swine fever spread in China. It was not until January 8, 2021, that hog futures were successfully approved for listing and trading.

### 2.2. Supply and Demand in the Hog Futures Market

The hog futures cycle discussed in this article is the price cycle of the hog futures market in which hogs are the main trading target. The Chinese hog futures cycle is a cyclical change in pork prices caused by changes in supply and demand. According to its historical price changes, it can be summarized into four stages: the decrease of pork supply, the increase of pork price, the increase of pork supply, and the decline of pork price. The breeding cycle of pigs determines that a complete hog supply lasts approximately three years. It takes 7 months for a piglet to become fertile from piglet to gilt. The gestation period of fertile sows lasts about 4 months, followed by a 1-month lactation period. Therefore, it takes about 5 months for a sow to produce a litter. After the sows give birth, they go through a 1–2 month nursery period and a 4–5 month fattening period, and the pigs are ready for slaughter. To sum up, it takes 7 months for breeding companies to purchase piglets and breed them into fertile sows, and it takes about 12 months to breed piglets produced by fertile sows to slaughter. The time it takes to replenish the stalls and the time when the price of pork increases due to the increase in pork supply, the cycle of a round of pigs is about 3 years [2]. Combined with Chinese people's meat consumption preferences, even though the proportion of beef and mutton in China's meat consumption continued to increase from 2000 to 2010, pork consumption still accounted for more than 60% of meat consumption [1].

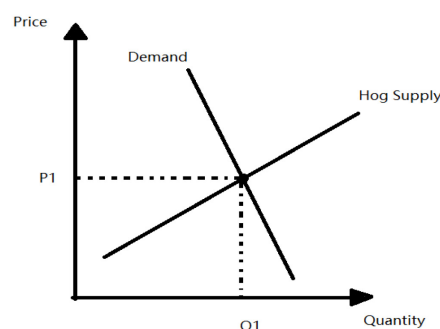


Figure 1: Supply and Demand Curves in the Hog Market.

The supply and demand curves are shown in Figure 1. It is not difficult to see that the supply curve in the Chinese pork consumption market is very elastic, while the demand curve is inelastic. This leads to a greater impact of price changes on the supply side.

### 2.3. The Reasons and Methods for the Chinese Government to Regulate the Price of Pigs

The factors that affect the price of pork are not only the cycle of breeding pigs on the supply side, but some agricultural product futures related to pig feed will also have an impact on pork. The ratio of pork to corn is a data that many futures investment companies and governments value. Hereinafter, this ratio is called a pig-to-grain ratio. The higher the pig-to-grain ratio means the higher the price of hogs.

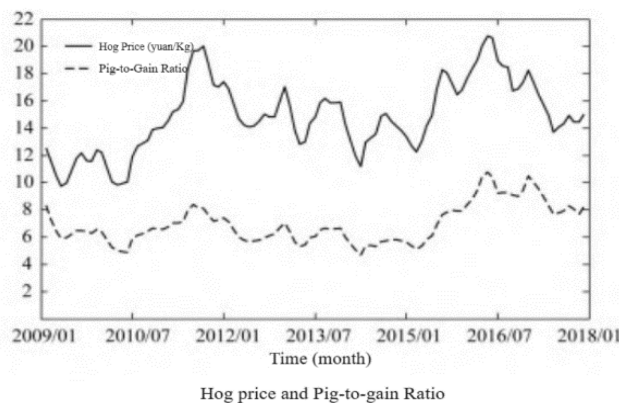


Figure 2: The relationship between the price of hogs and the Pig to Food Ratio [3].

The figure 2 shows the high correlation between the pig-to-grain ratio and the hog price [3]. As long as there is no major innovation in farming technology, this law will remain unchanged for a long time. It is based on the relatively stable relationship between input and output that a pig-to-gain ratio of 6:1 is recognized as the break-even point for pig farming (six portions of corn can produce one portion of hog) [4]. This has also become the basis for the decision-making of government regulatory departments. There are many events in 2022 that lead to lower world corn production and thus higher corn prices. The first is that the La Niña climate has a negative impact on corn production in Argentina. The main reason is that Ukraine, one of the largest corn exporters, has been involved in the Russia-Ukraine conflict, which has led to a large decline in the relevant agricultural products (especially feed) that China can import. Rising prices of wheat and corn can also boost the prices of grains that can be used as energy feed. Therefore, before the Russia-Ukraine conflict ends, the price of pig feed in China is likely to remain high[5]. Increase the supply of pork to increase the price of pork. In February 2023, China's National Development and Reform Commission issued an announcement titled "It is planned to purchase and store 20,000 tons of frozen pork in the near future" [6]. The figure 3 can show the new price of hogs after government intervention. On the one hand, this method can reduce the losses of breeding companies and self-employed. The stored pork can be put into storage later in the next pork supply shortage to stabilize the pork price and reduce the social impact of the hog price cycle. China is using policy as a tool to adjust the impact of the pig price cycle on society in order to avoid the recurrence of the African swine fever that had a great impact on the pig market at the end of 2018.

### 3. The Cycle of China's Labor Market

#### 3.1. Labor Market Cycles are Caused by Fluctuations in Supply and Demand

Compared with the price cycle of the hog futures market, China's labor market has also experienced several cycles in the past 30 years. The definition of the labor market cycle described in this paper is the fluctuation of wages and the number of college students in related majors due to the mismatch between supply and demand. Over the past 30 years, Chinese universities have expanded their enrollment of a large number of students. Since 1998, the scale of China's higher education has been relatively stable, but the annual growth rate of the expansion of college students from 2000 to 2008 has been carried out at a rather exaggerated speed. About five times more college graduates entered the workforce in 2008 than in 2000 [7]. In fact, this was not unbearable for the Chinese labor market at that time. The reason is that China's economy grew rapidly during that period, and the expansion of enterprises made the market have enough jobs to accommodate a large number of graduates. China has taken drastic precautionary measures since the Covid-19 outbreak, which has severely slowed down the pace of China's economic development. During the epidemic, many companies had to cut expenses in order to maintain operations. At the same time, about 8 million college students will graduate from college every year in 2020 and 2021 [7]. A labor glut occurs when demand decreases, and supply increases in the labor market. The supply and demand curves after government intervention is presented in figure 3.

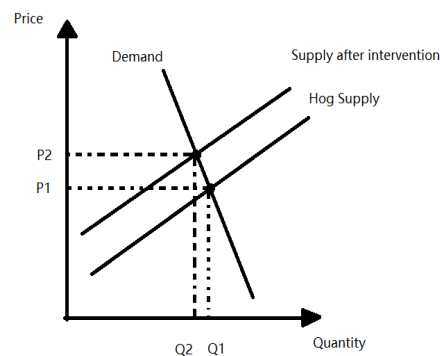


Figure 3: Supply and demand curves after government intervention.

#### 3.2. Occupations that Reflect Labor Market Cycles in Recent Years

There is an additional circumstance that makes this labor surplus even more damaging among Internet programmers. The rapid development of China's Internet industry in the past 20 years has led a large number of college students to study computer science.

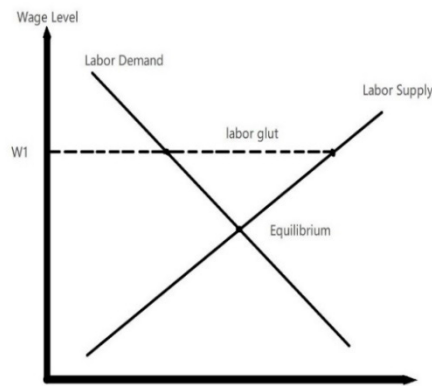


Figure 4: Higher salaries in popular occupations.

As shown in Figure 4, programmers used to be an above-average paid occupation. High wages have triggered many people to choose to enter the labor market from computer science majors, and as a result, there has been a huge glut in the labor market supply of programmers. However, in recent years, the growth rate of Internet companies has reached a bottleneck that is difficult to break through. This has caused many companies to be unable to provide enough jobs for graduates majoring in computer science every year. In 2022 and 2023, there will be many news reports about large-scale layoffs of Internet companies, especially Tencent, the largest Internet company in China. In 2022, Tencent will lay off about 20% of its employees according to its business adjustment plan, and the entire Internet-related industry will have substantial layoffs [8]. Programmers can no longer enjoy the dividends brought about by the rapid development of the technology industry as they did 10 years ago. There have been several similar hot career cycles since China's reform and opening up, and there was a huge demand for college students majoring in English and marketing in the 1990s. After the market is gradually saturated, these graduates also face the same problem of layoffs that graduates majoring in computer science may encounter in 2022.

### 3.3. The Government's Policy Intervention on the Employment of College Graduates

In the past years, China's labor market for graduates has faced very severe challenges. The youth unemployment rate continues to increase. On August 15, 2022, data released by the National Bureau of Statistics showed that in July 2022, the surveyed unemployment rate of 16-24-year-old population reached 19.9%, which was 3.7 percentage points higher than the same period of the previous year. China's relatively special education system makes it easy for young people to be out of the labor market for a long time, especially the recruitment policy for fresh graduates. The Chinese government subsidizes the recruitment of fresh graduates by SMEs. However, due to the expansion of university enrollment, a considerable number of fresh graduates flood into the labor market every year. College students who miss out on applying as graduating students do not have an advantage in their second year, as companies will no longer receive government subsidies for hiring them. This makes it easy for frictional unemployment in the labor market to turn into long-term unemployment. Many students graduating from universities have to register for postgraduate examinations in order to be fresh graduates. The number of postgraduate applicants in 2020 is twice that of 2015 [10]. At present, the difficulties encountered by China's labor market are due to the fact that the economic cycle has reached a bottleneck period. High youth unemployment rate is related to low economic growth rate, limited new jobs, and the degree of employment protection in the labor market [9]. Last year, the Chinese government began to use economic policies to stimulate the economy to develop the number of jobs in the labor market, and introduced a series of policies that are conducive to youth

employment. This kind of policy is still to regulate the market by changing the demand side, and it can only alleviate the problems that arise during the economic development cycle.

#### 4. Conclusion

Whether it is the supply of live pigs or the employment of teenagers, it is all about people's livelihood in China. The Chinese government attaches great importance to such issues. What these problems have in common is that government policies act directly on companies to regulate supply and demand. Young people's wages are similar to the price of hogs, and any oversupply will drive down prices (whether it is the price of labor or the price of hogs). The number of college students graduating each year and the number of sows on hand are also similar inverse indicators, reflecting wages and prices to a certain extent. Breeding companies prefer to keep their pigs for a longer period of time when the price of pigs falls. This behavior is similar to that of fresh graduates who choose to apply for graduate studies when the employment situation is difficult.

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