

The Impact and Role of the Pig Cycle on Chinese Economy as well as the Investment Logic of the Pork Industry and the Forecast for the Future of Pork Price

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Abstract: Pigs play a very important role in the Chinese economy and because of the change in supply and demand has produced the pig cycle the investment in pork enterprises mainly focuses on the market's expectation of pork price changes which is the underlying logic of pork investment.

Keywords: Pig cycle; Investment; Balance of supply and demand; Pig-to-food ratio; Macro-control

Pig, which is a very important part in our daily life. And the changing of the situation of pigs will have some effects on Chinese economy. So the rules and logic of changing of situation of pigs go by the name of "Pig Cycle". How can we judge what part of Pig Cycle, that we stay now. And how can we find some investment chances from Pig Cycle. It is my topic.

1. What is Pig Cycle and the reason why make the Pig cycle

Pig Cycle means the price of pork change in regular cycles, and the cyclic trajectories of Pig Cycle always appear this cycle: high price of pork ~ the sow population has increased significantly ~ the supply of live pig increase ~ the price of pork decrease ~ sows are culled in large number ~ the supply of pig decrease ~ the price of pork increase.



The data is from Baidu

Here is the pork price change curve between 07.14.2006 and 09.16.2022. We can easily find the price of pork like a wave and this stock takes about three to four years, and it is also a time of a Pig Cycle.

And here are some reasons.

Firstly, the pork production is erratic, because the Chinese economy grew fast in the last 20 years, the pig industry, the pig industry has not developed in tandem with Chinese rapid industrialization and urbanization. Government and investor tend to invest a lot of land, manpower and financial resources in urbanization and industrialization, resulting in a small amount of capital flowing into the pig industry. Also, the demand of labor increases in urbanization and industrialization, many farmers leave the countryside for fast-growing places. It will have two effects on the pig industry. Firstly, the income of farmers who work in fast-growing places increases. It will make the demand of meat increase by the increase of life quantity. And what is more, the large number of farmers who leave the countryside will make the number of pig farmers decrease, then the supply of pig will decrease, because there are many uncertainties in the process of raising pigs, such as illness and insecure profit.

序号	统计时间	年末人口 (万人)	城镇人口 (万人)	乡村人口 (万人)
1	2002	128453	50212	78241
2	2003	129227	52376	76851
3	2004	129988	54283	75705
4	2005	130756	56212	74544
5	2006	131448	58298	73160
6	2007	132129	60633	71496
7	2008	132802	62403	70399
8	2009	133450	64512	68938
9	2010	134091	66978	67113
10	2011	134735	69079	65656
11	2012	135404	71182	64222
12	2013	136072	73111	62961
13	2014	136782	74916	61866
14	2015	137462	77116	60346
15	2016	138271	79298	58973
16	2017	139008	81347	57661
17	2018	139538	83137	56401
18	2019	140005	84843	55162

The above data is from Baidu

Secondly, the industry standard for pig breeding in China is low, because free-range farmers account for a large proportion of pig farming, and free-range farmers always lack of knowledge and forecasting of real-time and accurate market information. More of them may blind and disorderly expansion or panic exit from the market by the pork price fluctuate wildly. Although the proportion of free-range farmers is decreasing year by year, it still accounts for a large part of the entire market, but this is already a trend.

Thirdly, the government and relevant authorities can not make alerts quickly, because the production of pig is disperse, and the number of pig company is big. Also errors are unavoidable in sampling testing. In addition, there are many problems between producer and local government. For example, some companies may send false information to dodge taxes, then it will make the total information have difference between true information.

Fourthly, illness also a important part of pig. Swine fever can seriously affect the number of pigs slaughtered. For example, some part of Chinese province happen Epidemic Diarrhea in piglets, then it makes the number of piglets decrease in a large number. The rate of death of piglets is more than 50% in some farms.

2. Why pig played a important role in Chinese economy

Pork is Chinese main consumer meat. In past 20 years, the overall annual output value exceeds 40 million tons, accounting for 60% of meat. And we also is the biggest pork production country and biggest pork consumed country in the world. According date, in 2021, China's pork production accounted for 44.09% of the world, ranking first in the world; China's pork consumption accounts for about 46% of the world's pork consumption, and the per capita pork consumption is about twice the world's per capita level.

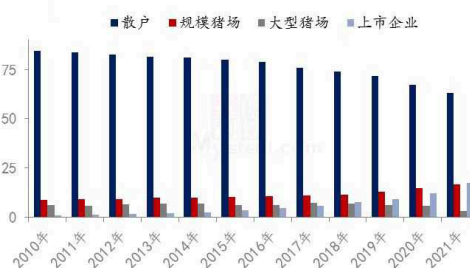
So, the changing of price of pork is a strong correlation and CPI (Consumer Price Index)

According this picture, two lines are highly correlated, it can show the important of pork in Chinese economy.

In addition to being closely connected to the CPI, the price of pork and the sales of pork can show the demand of protein of people. And the demand of protein reflects the market demand for manual labour, the fiery degree of the overall economy and the affluence of the entire society. For example, the lack of manual labour will increase and the economy will become unstable by the price of pork increase, so Chinese government always will use macroscopic readjustment and control and contractionary monetary policy to make economy growth that stay in a healthy rate of increase. Firstly, the demand of bond will decrease because the increasing of profit from saving money in bank, it has a big negative impact on the financial services industry and the stock market in the short time. And the business also will decrease the invest by the increase of deposit rate in the most of industries, then these industries will also be varying degrees of downturn. In addition, the cost of loans will increase, it also have effects on growth of companies. What is more, the government can alleviate high inflation through macro-control and contractionary monetary policy, ensure the stability of prices and the normal life of residents when the economy is overheated, and also ensure the steady development of enterprises and maintain the growth rate of enterprises in a safe and reasonable range. Therefore, the price of pork can directly reflect the current situation of China's



近十年养殖规模占比情况 (%)



The data is from Baidu



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economy, which can help the government to better guide the development of the market in a healthy direction and prevent the huge bubble and high leverage generated when the economy overheats.

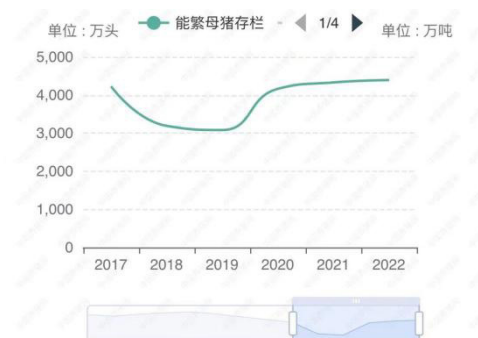
3. How we judge what cycle are we going through

Firstly, the changing of the price of pig is the most intuitive data to understand the stage we are in. When the price is high, high profit will make more people to raise hogs or pigs, then we can know we stay in the process that high price of pork to the sow population has increased significantly. But it also has many limitations. The first limitation is that the price of rising or down is not quick, it. The rate of change of the price will show oscillating rise, oscillating decline or oscillating back and forth in a price range. So the short-time sharp fluctuations can affect investors' judgment. In addition, the growth of pigs is cyclical, there is still a long growth cycle before the pigs enter the market. So when the effect appears on the changing of pork price, it has a serious lag. It also has negative effects on investors' judgment.

Secondly, which I think the most important reason to judge pig market is pig-to-food ratio. There are two formulas to calculate pig-to-food ratio. First formula is that $\text{pig-to-food ratio} = \frac{\text{weight(kg)} \times \text{protein in pig food(\%)}}{0.1 + \text{equivalent} \times [\text{fat in pig food(\%)} / 4] \times [\text{crude fiber in pig food(\%)} / 2]}$. And the second formula, which a formula is easy and commonly used, is that $\text{pig-to-food} = \frac{\text{hog price(RMB per 0.5kg)}}{\text{corn price(RMB per 0.5kg)}}$. When we judge pig-to-food ratio, when the pig-to-food ratio less than 6, which is three-level warning. And when this ratio less than 6 and the duration time more than three weeks, which is two-level warning. If the pig-to-food ratio is less than 5, which means the price of pig too low or price of forage too high, which is one-level warning. At that time, large-scale pork enterprises began to lose money. Conversely, when the pig-to-food ratio is more than 9, it is also the three-level warning. And when the pig-to-food is more than 10 and less than 12, the duration time is more than 2 weeks, which is two-level warning. At this level warning, the high price of pork may have negative effects on people's daily life, government will have some plan to control the price of pork, such as increase the supply of pork. And the government will increase the power of supply of pork when the pig-to-food is more than 12, which is one-level warning. So we can accord the pig-to-food to judge whether the investors can invest pig industry or buy some relevant wealth management products, because this data shows the earning power for pig industry.

Thirdly, the other index is the number of sow stock that can multiply. The sow stock that can multiply means the number of newborn pigs, and the growth cycle of pig is about 10 months. When the price of pork goes down, business needs to obsolete some sow stock that can multiply to make sure to decrease the loss. So the number of sow stock that can multiply always can show the supply of pork in ten months later in the market. Then people can accord relationship between supply and price to forecast trend of price of pork in the future to invest correlative project.

4. What part of Pig Cycle, that we stay now, and Prediction for the next pig cycle



The above data is from the YangZhuBao App

Through the data, we found that the pig-to-food ratio came to 5.1 on April 21, 2023 (data from China Pig Network), which has approached the first-level warning of 5.0. However, the increase in the production of breeding sows will lead to a larger supply of pork in the next 10 months, and will not lead to an increase in pork prices.

I think the main reason for the decline in the pig-to-food ratio from 2020 is the continued increase in the price of corn feed, especially in 2020, when the auction supply of corn was significantly reduced. In addition, the decrease in corn sown area in the northeast in 2020 led to a decrease in the supply of corn, and the decrease in sown area was due to worsening weather. Including the 2020 corn planting period in the spring, it was also delayed by seven to 10 days due to weather conditions, which will directly affect the corn supply during the autumn harvest. Coupled with the subsequent Russia-Ukraine conflict, the increase in global food prices will also have some impact on the price of corn. Corn, as the main feed for pigs, has a huge impact on the cost of livestock farmers.



The picture shows the price changes of corn futures on a monthly basis. (Data from Flush Futures Connect App)

We found that there was a wave of sharp increases in pig prices in 2022, in my opinion, first of all, because with the gradual control of the epidemic in the second half of 2022, people are getting bigger and bigger, resulting in more demand than supply in the market. Secondly, in the first half of 2022, domestic imports of pigs decreased significantly, resulting in insufficient supply when demand suddenly increased in the second half of the year. In addition, due to the skyrocketing of corn feed from 2020 to 2021, because the production cycle of a pig is ten months, many pig breeding enterprises began to lose money in 2022, and in order to reduce losses, farmers began to reduce the amount of pigs slaughtered.

In my personal opinion, I think that we are now in the second half of the last pig cycle, and there is still some time before the start of a new pig cycle, because the factors that led to the decline in the pig-to-food ratio are due to the surge in feed prices and the recovery of a supply driven by the increase in demand for pork after the epidemic, the price of pigs themselves has not yet reached a bottom area, and the number of breeding sows continues to increase. I think the next pig cycle will happen when China's economy recovers, China's stock market starts to rally, and people's enthusiasm for investing is once again ignited. I think Chinese equities will start coming out of the bull market in June. The first reason is that in the June mid-year report release season, many companies' earnings will improve, because the liberalization of the epidemic last year will lead to a wave of performance-driven stock price increases. In addition, from the perspective of the fourth industrial revolution of mankind, the future will be a development based on computing power, and people's production methods will change. Including things like artificial intelligence, large models, etc., are all driven by computing power. There is also according to the cycle, now we are in the recession period of the Combo cycle, according to the cycle, the next Combo cycle will start in 2026, and before that, the money in the market will flow into the financial market without the direction of investment. What's more, after the Chinese government deleverages real estate enterprises and firmly adheres to the concept that houses only live in and do not speculate, most houses will lose their financial attributes and only retain their residential attributes, and the funds flowing out of real estate will be a large number. This money will flow to the stock market because China's real estate now depends on local urban construction investment companies, and these companies are burdened with a large amount of debt, so these urban construction investment companies will first divest inferior assets and some liabilities, retain high-quality assets, and with the improvement of the carbon trading market, every grass and tree can be incorporated into urban construction investment companies as assets. So how to solve these days' debts? With the emergence of the registration system in the Chinese stock market, these urban construction investment companies will be listed on a large scale through debt-to-equity swaps, and a large amount of cash flowing from real estate will also flow into the stock market and the secondary market. What is more, Due to the economic downturn, the Chinese government has repeatedly lowered the interest rates on loans and deposits, which will lead to lower borrowing costs for investors and lower yields on deposits. For most people, the stock market is one of the few places where they can get in touch with investment, because



The picture shows the price changes of pigs futures on a monthly basis (Data from Flush Futures Connect App)

the threshold for entering the stock market is relatively low. Therefore, when the bull market starts, the average return rate of stocks will still increase, and ordinary people will be more inclined to withdraw money from the bank and put it into the stock market. For the stock market, this is incremental capital. And a large number of low-interest loans have been lent from banks. When the entity is not very optimistic, the secondary market will also become one of their choices.

So, with the bull market coming, people's investment enthusiasm will rise, which means that the economy will start to overheat, accompanied by a rise in pork prices. I boldly predict that the next pig cycle will start in 2024 and reach its peak in 2026 and start to fall.

5. Analysis of pork in the Chinese stock market and related individual stocks



This is the monthly historical movement of the pork concept sector in the Chinese stock market (data from Flush App)

The pork concept of the Chinese stock market (sector code: 885573) has experienced three big rises, the first big rise is from April 2015 to August 2016, we can find that from 2015, pig prices began to continue to rise, the market's performance expectations for pork companies continued to increase, and it is not difficult to find that there were two obvious pullbacks in the middle of this pork price increase, which was also reflected in the stock market, from 2015 to April to August 2016, The pork concept sector also showed a significant correction, indicating that the market's expectations for pork companies have been changing and causing sharp fluctuations in stock prices, which also shows the importance of pork prices to the profits of pork companies and the strong correlation between pork prices and pork company valuations.

The second surge was from November 2018 to April 2019, and the main reason for this surge was that the number of breeding sows was rapidly decreasing, which thought that the supply of pork would become less leading to an increase in pork prices, and the market's expectations for future pork prices were extremely strong, resulting in large-scale funds grabbing chips in the bottom area, prompting this wave of rise. This also shows the importance of the indicator of breeding sow inventory to pork prices, and also forms a market resonance.

As the market came to a high, it swung sideways for a while, indicating that the market diverged, and some people believe that expectations have been met, and when the price of pork rises, the positive landing, expectations are fulfilled, and it is about to start falling. But some people believe that the price of pork may continue to rise, so an 8-month shock has been formed, a game between the long and short sides. In February 2020, there was a small correction in pork prices, which led to a decline in the stock market. However, pork prices quickly recovered and rose rapidly, setting a record high, exceeding expectations for the first time in history. In my opinion, the reason is first of all because the reduction in the number of breeding sows in 2019 led to a rise in pork prices caused by the reduction in the supply of pigs after 10 months of the pig growth cycle, coupled with the epidemic, the supply of pork has further decreased, and I think the epidemic is the reason why pork is further pushed to a high price, because according to the increase, in fact, in the second round of increase, the price expectation of the normal pig cycle caused by the rise in pork prices has been reached. But the market is orderly, the world is disorderly, and emergencies are caught off guard.

Starting in October 2020, with the improvement of the epidemic situation, the price of pork began to fall rapidly. When the epidemic broke out again in the second half of 2021, the pork sector began to rise again. It's not very violent, and there are a lot of locked-in chips on the top that need to be digested. However, it is not difficult to see that changes in the pork sector index have a lot to do with the performance expectations of pork companies and the strength of the epidemic. The main reason for this is that the outbreak of the epidemic will inevitably affect the number of live pigs to be slaughtered. When the supply becomes smaller, the price of live pigs will naturally increase, and the performance of pork companies will also increase accordingly.

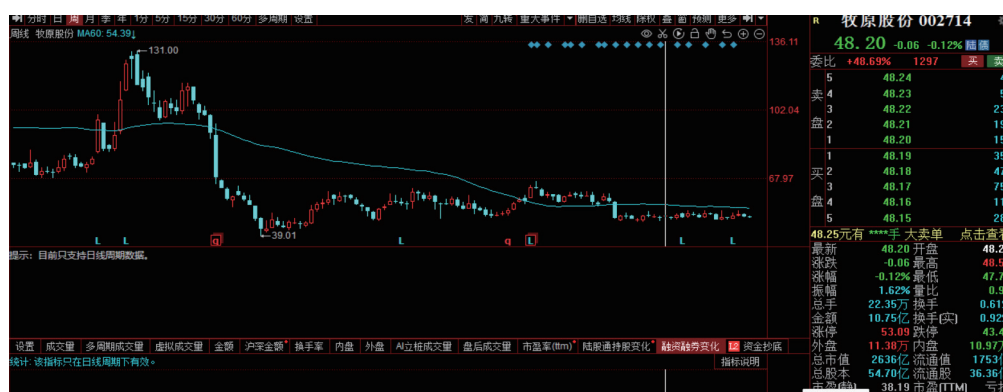
According to my analysis, the price fluctuations of pork-related stocks have a strong relationship with market expectations of pork prices, because pork prices represent the profit margins of pork companies.



The above data is from the Flush App

Hunan New Wellful Co.,Ltd(stock code: 600975) is the largest domestic exporter of live livestock for Hong Kong and Macao, and a national key leading enterprise in agricultural industrialization, whose main business is pig breeding, meat sales and feed processing. This is the stock that has been a big gainer in the pork sector in China recently. From the technical point of view of the stock, the main force fluctuates at the bottom of the stock price for a long time, absorbing enough chips, and the Hunan New Wellful Co.,Ltd touched the short-term lowest price of 7.17 yuan on March 13, 2023, and the price rose rapidly in the afternoon, breaking through the 45-day moving average, 21-day moving average and 18-day moving average all the way, and in the pullback after the skyrocketing, it did not fall below the 18-day moving average, and when it was about to touch the 18-day moving average on March 24, the stock price ushered in a second wave of skyrocketing, rising to a short-term high of 13.45 yuan, Although the current price has fallen, and on April 18 downward talks touched the 18-day moving average to test market pressure, but the market is still very strong, April 18 is a long lower shadow, the current stock trend is still strong and did not fall below the average, the time behind has a good prospect From the fundamental point of view of the stock, the inventory of Hunan New Wellful Co.,Ltd has been decreasing, and since March 14, the price of pork sold by Hunan New Wellful Co.,Ltd has continued to climb, although it is not as good as the market average, But it's still a big gain for individual stocks. And from the curve chart of the pork price sold by Hunan New Wellful Co.,Ltd it is not difficult to see that it has a high correlation with the trend of the stock price, which also proves that the underlying logic of investing in the pork industry I mentioned in the previous part of the article is the expectation of the company's profit caused by the expectation of pork prices.

But there are also some potential risks here for Hunan New Wellful Co.,Ltd , the company's 2022 annual report chose to be released at the end of April, it is possible that the actual controller of the company is not sure of the company's performance, when the annual report is released, if it is not as expected, it may cause huge fluctuations in the stock price in the short term, and the risk will increase.



盈利能力指标						
销售净利率	2.26%	-16.69%	-31.51%	9.68%	17.26%	26.87%
销售毛利率	8.46%	-9.49%	-23.03%	16.74%	24.12%	32.83%
净资产收益率	2.70%	-12.81%	-9.85%	12.91%	16.24%	17.23%
净资产收益率-摊薄	2.68%	-13.93%	-10.26%	12.70%	15.49%	17.06%
营运能力指标						
营业周期(天)	131.93	130.24	141.25	152.88	173.64	163.72
存货周转率(次)	2.06	1.39	0.64	2.36	1.56	1.10
存货周转天数(天)	131.38	129.52	140.63	152.52	173.41	163.53
应收账款周转天数(天)	0.55	0.72	0.62	0.35	0.23	0.19
偿债能力指标						

The above data is from the Flush App

Muyuan Foods Co.,Ltd (stock code: 002714) is a leading stock in the pork industry, the company has a complete pig industry chain and horizontal pig house and feeding system, compared with competitors in the same industry in the supply chain has obvious comparative advantages, the company's main business is pig breeding sales and pig slaughter. The company's pig breeding business accounts for 96.28% of the company's operating income, which means that the fluctuation of pork prices will have a great impact on the company's performance. Technically, stocks are currently in the trend of box shock after a round of huge declines, and they can sell high and sell low in box shocks to earn interest spreads. From the company's fundamental point of view, the company's sales gross margin and sales net profit margin have both declined, which cannot avoid the rapid decline in pig prices. And the company's inventory cycle has improved only slightly. In addition, it is expected that the pig price trend of Muyuan Foods Co.,Ltd is strongly correlated with the company's stock price trend, which once again verifies that my judgment on the underlying logic of the pork industry is correct. In general, the price of Muyuan Foods Co.,Ltd pigs has fallen, and it needs to be observed at present, and some high selling and low sucking can be done appropriately in the box, and the big investment opportunity of Muyuan Foods Co.,Ltd lies in the arrival of the next pig cycle.

6. Summary

Pigs play a very important role in the Chinese economy and because of the change in supply and demand has produced the pig cycle, the investment in pork enterprises mainly focuses on the market's expectation of pork price changes, which is the underlying logic of pork investment.

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