

A Research on the Seasonal Effect on the Price of Live Pig in China Over Past 20 Years

Zhang Haochun(Michael), Yu Linxuan(Shawn), Cao Yukun(Henry), Lu Mingyang(Leo)
Beijing National Day School

May 17, 2023

Proposal

1.Research Question

The Research mainly focused on studying the oscillation of the price of live pig due to seasonal factors. Our group observed that the price of live pig is oscillating with a period of approximately 1 year, so we wonder if there's a relationship between season and the price of live pig.

2.Background Research

Recent years, the price of live pig varies frequently with a roughly periodic pattern. Therefore, to study the fluctuation pattern and growth trend of our country's pork price, and put forward corresponding measures to regulate it, is not only the need for the healthy development of the pig breeding industry, but also the need for stabilizing residents' meat consumption. Many foreign scholars has studied on the price fluctuations of live pigs and pork. In order to explain the price fluctuations of agricultural products such as live pigs, Kaldor introduced a theory about the relative difference in the elasticity of supply and demand to analyze the market stability conditions, and named it "cobweb theory". Ezekiel used the cobweb model dynamic analysis method to study the fluctuation process and results of pig supply and price after they deviate from the equilibrium state. Talpaz proposed the high-frequency cobweb theory, pointing out that pork and other agricultural products may have several short cycles in a long cycle, and short cycles need to be identified in a long cycle. For recent studies, Liu in 2021 had identified different factors that affected the fluctuation of pig price, including seasonal factors, and claimed that seasonal changes of pork price is caused by the "seasonality" and "festivity" of pork demands

3.Sampling and Experimental Design

Variables: monthly price of live pig and time

Type of study: Observational study

Data collection:official website of the National Bureau of Statistics of China
this is the [link](#)

Scope of inference:The data is valid and can be generalized to the population of price of live pig in China

4.Exploratory data analysis

The price of live pig is price of pig that has not been slaughtered, written in yuans per kilogram. The monthly price of live pig is choosed as an indication of the market value of pork in the research. Compared to the final price of pork, the market price of live pig is less effected by area difference, advertising and other unpredictable factors, and the data is easier to collect. We have collected the monthly price of live pig from January 2003 to April 2023.

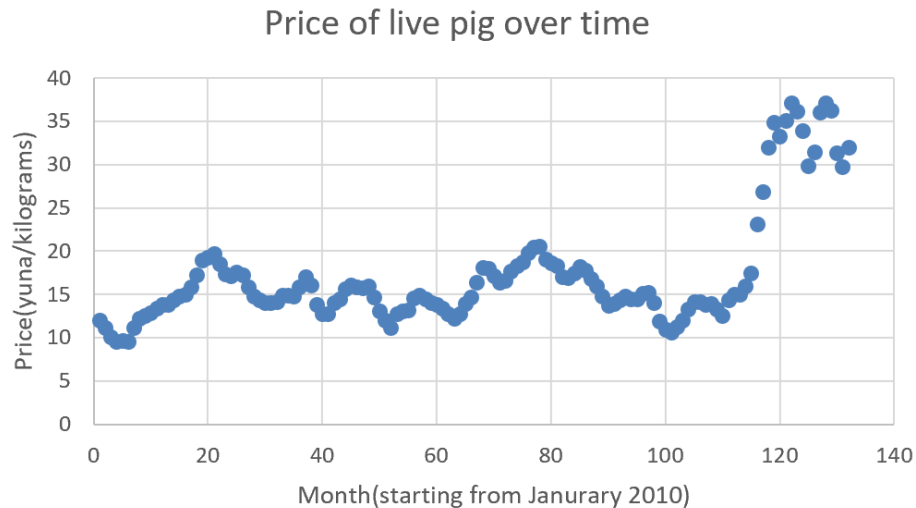


Figure 1: scatterplot of price of live pig over time

We divided one year into two parts: from March to August, representing Spring and Summer, and from December to February, representing the Autumn and Winter. We will calculate the mean and standard deviation of the two parts. Our group wants to see if there's a significant difference on price of live pig between the two parts of the year. We will do a two sample Z test with the collected data. Following conditions should be checked:

Is the distribution of data a normal distribution?

Is the data set large enough

Is the price of live pig in two seasons independent of each other

5. Group Task Assignments and Timeline

In the project, Henry will write the Introduction part, Shawn will do background research, Michael will design the Method and Procedures and will do the analysis of the data. Leo will write the conclusion and future development of the project. The proposal and data collection will be done by May 17th, the report will be done before May 26th and a presentation will be on May 26th.

6.data

Due to space constraints, the data in the table below is only a subset of the data collected by our group

accumulated month	market price of live pig
1	5.91
2	5.74
3	5.67
4	5.63
5	5.56
6	5.53
7	5.78
8	6
9	6.25
10	6.74
11	7.23
12	7.34
13	7.46
14	7.42
15	7.73
16	8.08
17	8.15
18	8.46
19	8.63
20	9.01
21	9.32
22	9.26
23	8.88
24	8.84
25	8.8
26	8.8
27	8.71
28	8.48
29	8.27
30	8.08
31	7.97
32	7.92
33	7.87
34	7.31
35	7.09
36	7.25
37	7.5
38	7.29

References

- [1] JIANG Liuyi, DING Jiayun, ZHOU Zhengping. (2014). Research on pork price fluctuation law and regulatory countermeasures in China-Empirical analysis based on H-P filter method. Explorations in Economic Issues, 9, 96–101. <http://www.cqvip.com/QK/95595X/201409/662015370.html>
- [2] Ezekiel, M. (2010). The Cobweb Theorem. <http://academic.oup.com/qje/article/52/2/255/1862362>
- [3] Talpaz, H. (1974). Multi-Frequency Cobweb Model: Decomposition of the Hog Cycle. American Journal of Agricultural Economics, 56(1), 38–49. <https://doi.org/10.2307/1239345>
- [4] Liu, Yangfang. (2021). Analysis and Trend Anticipation of the Fluctuations of Chinese Swine Price. Chinese Swine Industry, 7(6), 18-20.