How does Agricultural Input Price Effect on Farmers’ Income: Experimental Study from Sugarcane Sector

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Introduction
China is one of the world’s major sugar production and consumption countries. Since the 1990s, the government has implemented many effective policies to stimulate the development of sugar industry. The sugar industry has made considerable progress and development. However, in recent years, the agricultural input price rose, affecting the income of farmers. Thus, the increasing cost of planting sugarcane seriously affects farmers planting initiative.

Objective
The study attempts to address the following questions:
1. Whether there’s a relationship between agricultural input price and farmer’s income?
2. How does agricultural input price effect on farmers’ income?
3. How does farmers’ income effect on agricultural input price?
4. What should we do to control the negative effects?

Data Source and Research Method
We make the net profit per mu on sugarcane planting as the representative of farmers’ earnings, and calculated the index of sugarcane farmers’ income with the retail price index (we take 1980 as the base year), then marked as M1. We make the index of agricultural input price as the representative of agricultural input price, marked as PI. We take the natural logarithm on R and PI respectively, marked as \(\ln M1\) and \(\ln PI\), the first difference of \(\ln M1\) and \(\ln PI\) marked as \(\Delta\ln M1\) and \(\Delta\ln PI\).

This paper establishes vector autoregressive model to analyze the dynamic relationship between the rise of agricultural input price and the income of sugarcane farmers. Before presenting the VAR model, we first test unit roots. Based on residuals test and stability test in the VOX model, we explain the model of response path and the role of the influence of variable by using impulse response function and variance decomposition approach.

The regression equation is as follows:

\[
\Delta\ln M1 = 3.44253\ln PI + 2.55343\ln PI - 0.50573\ln PI - 0.10423\ln PI - 0.0598 (1) \quad (3.3745 - 1.9963 - 0.3068 - 0.2346 - 7.2289) \quad (R^2 = 0.5899 - 0.2095 - 0.4363 - 0.2108 - 0.3109) \quad (2)
\]

\[
\Delta\ln PI = 0.7533\Delta\ln PI - 0.47405\Delta\ln PI - 0.01453\Delta\ln PI - 0.00588\Delta\ln PI - 0.0039 (2) \quad (1.8699 - 1.2895 - 1.7641 - 0.5001 - 0.4892) \quad (R^2 = 0.3229 - 0.1489 - 1.4872 - 0.0019 - 0.0019)
\]

The significance level of the equation and goodness of fit can explain the problems. Therefore, the regression results are reliable. The VAR model also has been passed residual test and stability test.

The Explanation from Impulse Response Function
Figure 2 The Path Curve of Impulse Response Function

Conclusions and Recommendations
1. The above indicates that sugarcane farmers’ net income shows negative response to the increase of agricultural input price, which tends to be stable.
2. Agricultural input price shows right response to the sugarcane farmers’ net income.

References

Further Information
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