Advance Journal of Food Science and Technology 6(7): 873-876, 2014
DOI:10.19026/ajfst.6.125
ISSN: 2042-4868; e-ISSN: 2042-4876

Submitted: March 14, 2014 Accepted: April 15, 2014 Published: July 10, 2014

Research Article

Research on Agricultural Food Marketing Circulation Efficiency in China

[1, 2]Jinbo Chen and [2]Kaijun Leng
[1]College of Economics and Management, Huazhong Agricultural University, Wuhan 430070,
[2]Research Centre of Hubei Logistics Development, Hubei University of Economics,
Wuhan 430205, China

Abstract: This study aims to investigate the agricultural food marketing circulation efficiency in China using the factor analysis. The marketing efficiency of agricultural food products is related to the growth of farmer income and the expansion of domestic demand and directly affects the development of national economy. Based on the domestic and foreign reference, this study has established a new agricultural food product marketing efficiency evaluation index system. The factor analysis method was adopted to measure the Chinese agricultural food product marketing efficiency. The analysis results demonstrate that the residents' income and consumption level have great influence on the agricultural food products circulation. Hence, the strategy for improving the marketing efficiency of agricultural food products has been proposed in this study.

Keywords: Agricultural food products, factor analysis, marketing efficiency

INTRODUCTION

Since China's reform and opening up, great changes have taken place in China's agricultural food products market. Supply and demand of agricultural food products has reached a general balance, but structural surplus and deficiency still appear in several years. In recent years, with continuous improvement of China's economy, China's agricultural economy has entered a new stage of development, agricultural food production' capacity has increased steadily and significant changes have taken place in supply and demand of agricultural food products. However, due to immature development of Chinese agricultural food product circulation industry, overall circulation system is still not sound, regional and structural imbalance of supply and demand in farm product market has emerged (Shepherd, 1963). On one hand, under circumstances of oversupply of farm products, little room has been left for price rises and sales have come across great difficulties. On the other hand, agricultural food production randomness, blindness and convergence are serious (Fred, 1990). China's agricultural food products circulation has already greatly influenced the building of a new socialist countryside and growth of farmers' income. Therefore, construction of the new socialist countryside needs to strengthen the building of rural modern circulation system, deepen reform of rural circulation system and explore the rural market actively. At the same time, governments should also improve efficiency of market circulation and guarantee stable supply of agricultural food products. Rural market circulation efficiency, therefore, has become an important factor, affecting development of national economy. The circulation efficiency of agricultural food products has become an indispensable part in improving efficiency of the rural market circulation (Charles and Mark, 2000).

In recent years, agricultural food product circulation infrastructure has improved largely and the efficiency of China's agricultural food products circulation has developed to a certain extent. Kumar and Husain (1998) analyzed circulation efficiency of different circulation channels and circulation price difference of chickpeas in utter Pradesh Hamirpur by investigating local farmers and middlemen. Chahal *et al*. (2004) used multi-layered random sampling and discovered with increase of circulation cost and price difference, circulation efficiency declined. However, very limited work has been done to improve efficiency of China's agricultural food products circulation. How can we scientifically measure the circulation efficiency? What factors influence the circulation efficiency? These questions still need to be answered.

In order to investigate the agricultural food marketing circulation efficiency, this study has proposed the factor analysis method to analyze its circulation efficiency in China. Empirical analysis has been carried out to establish a new agricultural food product marketing efficiency evaluation index system. The analysis results demonstrate that the residents' income and consumption level have great influence on

Corresponding Author: Jinbo Chen, College of Economics and Management, Huazhong Agricultural University, Wuhan 430070, China

the agricultural food products circulation. The findings of this study may provide useful reference for improving the marketing efficiency of agricultural food products.

MATERIALS AND METHODS

We assume the following theoretical assumptions:

- Agricultural food products circulation efficiency relies on the resident's income and consumption level. Economy dynamic efficiency is core issue of research on capital accumulation and economic growth. And from experience perspective, rising household income and consumption will inevitably lead to increase of total retail sales of consumer goods, which will improve agricultural food product circulation scale and enhance agricultural food products circulation efficiency (Kherallah *et al*., 2002). Therefore, this study assumes the following hypotheses:

H1: Residents income and consumption level have positive effect on agricultural food products circulation efficiency.

- Agricultural food products circulation efficiency relates to agricultural food products producer price index. From economic perspective, increase of agricultural food production price will inevitably increase cost of agricultural food product circulation enterprises. Under the premise that selling price is constant, profits of agricultural food product circulation enterprises will be affected, leading to efficiency decrease of agricultural food product circulation enterprises. The price of agricultural food production of whole society is mainly measured by agricultural producer price index (Higgins *et al*., 2007). Therefore, this study makes the following hypothesis:

H2: Agricultural food products price index has a negative effect on the agricultural food products circulation efficiency.

- Agricultural food products circulation efficiency relates to agricultural food products current input index. Most of China cities are in the stage of increasing economies of scale. These cities should expand scale of retail industry and gain efficiency relying on increased investment (Hunt *et al*., 2005). Hence, we make the following hypothesis:

H3: Agricultural food products circulation efficiency index has a positive effect on agricultural food products current input index.

- We also make another hypothesis:

H4: The transportation condition has a positive effect on agricultural food products circulation efficiency.

RESULTS AND DISCUSSION

Herein we set up an indicator system for measurement system of circulation efficiency of agricultural food products, as shown in Table 1 by use of China Statistical Yearbook 1999-2010.

Table 1: Measurement system of circulation efficiency of agricultural food products

Measurement index	Variable
Inventory rate	Total amount of inventory/Total sales, *X*1
	Buying and selling rate purchases/Sales, *X*2
Inventory turnover ratio	Main business cost/The total amount of inventory, *X*3
	Total assets turnover Main business income/Total assets, *X*4
Rate of profit	Profits/ Main business income, *X*5
	Current assets turnover Main business income/ Current assets, *X*6
Inventory of GDP	Total amount of inventory/GDP, *X*7
	Cost-profit ratio Profits/Main business cost, *X*8
The net interest rate of the assets	Profits/Total assets, *X*9
Total assets growth rate	Total assets growth/Last year's total assets, *X*10
Sales growth rate	Sales growth/Last year's sales, *X*11

Table 2: Data of measurement system of circulation efficiency of agricultural products

Year	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
1999	0.149	0.882	5.390	1.349	0.050	1.931	0.014	0.055	0.068	0.0240	-0.363
2000	0.136	0.881	5.931	1.416	0.056	1.986	0.011	0.062	0.079	-0.023	0.011
2001	0.143	0.889	5.387	1.467	0.060	2.118	0.011	0.067	0.088	-0.094	-0.023
2002	0.125	0.889	6.227	1.479	0.066	2.087	0.009	0.074	0.098	0.0230	0.028
2003	0.115	0.891	6.556	1.447	0.073	2.017	0.008	0.083	0.106	0.1510	0.153
2004	0.125	0.881	6.024	1.519	0.101	2.113	0.009	0.116	0.153	0.1600	0.193
2005	0.133	0.873	5.692	1.573	0.120	2.185	0.010	0.139	0.188	0.1380	0.162
2006	0.117	0.854	6.171	1.562	0.131	2.264	0.008	0.153	0.205	0.0790	0.113
2007	0.111	0.878	6.420	1.638	0.142	2.351	0.007	0.170	0.232	0.0680	0.115
2008	0.132	0.836	5.670	1.731	0.158	2.444	0.009	0.190	0.274	0.2840	0.285
2009	0.126	0.821	5.984	1.702	0.149	2.402	0.009	0.178	0.253	0.0990	0.067
2010	0.136	0.841	6.120	1.740	0.163	2.471	0.011	0.210	0.285	0.2900	0.296
2011	0.145	0.872	6.410	1.766	0.159	2.485	0.021	0.260	0.296	0.2870	0.311

Table 3: Rotated component matrix

Component	Factor 1	Factor 2
*X*1	-0.107	-0.974
*X*2	-0.894	0.125
*X*3	0.0370	0.918
*X*4	0.9660	0.190
*X*5	0.9580	0.237
*X*6	0.9530	0.162
*X*7	-0.275	-0.889
*X*8	0.966	0.210
*X*9	0.973	0.197
*X*10	0.762	0.167
*X*11	0.661	0.518

Table 4: The factor score

Year	*F*1	*F*2
1999	-1.04445	-1.96599
2000	-1.01632	-0.41333
2001	-0.78485	-1.03348
2002	-0.95353	0.67914
2003	-0.96092	1.47568
2004	-0.21842	0.43125
2005	0.25855	-0.31146
2006	0.23801	0.70178
2007	0.2257	1.43807
2008	1.54987	-0.43516
2009	1.08744	-0.10473
2010	1.61891	-0.46177
2011	1.72561	0.25612

Table 5: Agricultural food products circulation efficiency in China

Year	Circulation efficiency	F_1	F_2
1999	-1.34	-1.04445	-1.96599
2000	-0.82	-1.01632	-0.41333
2001	-0.86	-0.78485	-1.03348
2002	-0.43	-0.95353	0.679140
2003	-0.18	-0.96092	1.475680
2004	-0.01	-0.21842	0.431250
2005	0.08	0.25855	-0.31146
2006	0.39	0.23801	0.701780
2007	0.61	0.22570	1.438070
2008	0.91	1.54987	-0.43516
2009	0.70	1.08744	-0.10473
2010	0.95	1.61891	-0.46177
2011	0.97	1.72561	0.256120

Indicator system in Table 1 mainly consists of three aspects, including circulation velocity, circulation efficiency and circulation development. Due to limitation of China Statistical Yearbook data, data of agricultural wholesale retail trade over the limitation in this study has been processed. The wholesale business of agricultural food products consist of agricultural and livestock food products, food wholesale industry, beverages and tobacco products wholesale industry. While Yearbook does not provide data of agricultural food retail industry in China Statistical Yearbook, data of agricultural food retail in this study is calculated by dividing retail data by GDP (ratio of Gross Agricultural Production in GDP). The specific data is shown in Table 2.

SPSS17.0 is used to analyze data in Table 2 data and results are shown in Table 3 and 4. In Table 3, the first factor has a larger absolute value of the load factor to X2, X4, X5, X6, X8, X9, X10, X11 and the second factor has a larger absolute value of the load factor to X1, X3 and X7. Therefore, circulation efficiency of agricultural products can be reduced to 2 measured variables from the previous 11 variable, represented by *F*1 and *F*2, respectively.

Then we can calculate the agricultural food products circulation efficiency from Table 3 and 4.
The weight of the first factor:

$$F1 = 5\ 9.486/87.64 \approx 0.679 \quad (1)$$

The weight of the second factor:

$$F2 = 28.154/87.64 \approx 0.321 \quad (2)$$

According to weight of common factor, the circulation efficiency of China agricultural food products can be drawn as follows:

$$E = 0.679F1+0.321F2 \quad (3)$$

The value of circulation efficiency of China agricultural food products, *E*, during 1999 to 2010 can be acquired by putting the data in Table 4 is into (3). The results are listed in Table 5.

As seen from Table 5, the circulation efficiency of China agricultural food products between 1999 and 2010 basically shows an upward trend, which illustrates that China is remarkably improving its circulation efficiency with continuous development of China's economy.

Furthermore, we have carried out the influencing factors analysis. In previous assumptions, agricultural food products circulation input factors are mainly measured by market number, booth number, business area, corporate enterprise number, number of practitioners at the end of year; while transportation condition factors are mainly measured by railway mileage, highway mileage, inland waterways, civil aviation and airline mileage. In order to get data of agricultural input factors and transportation condition factors, this study adopts a method of factor analysis by processing data in Table 2 and 3. The analysis results are listed in Table 6.

Through empirical study on factors affecting China agricultural food products circulation, we conclude residents' income and consumption level, circulation of agricultural inputs and transportation conditions, directly affect efficiency of China's agricultural products. Therefore, to improve efficiency of China's agricultural food products circulation, we have to work on these four aspects and specific proposals are as follows:

- Government should set practical policies to improve residents' income. As shown in Table 6, the higher the income, the higher the efficiency of circulation of agricultural food products. Therefore, the government can improve residents' income

Table 6: The influencing factors

Year	Circulation efficiency	Resident income	Price index	Consumption level	Agricultural products circulation input	Transportation conditions
1999	-1.34	8064	104.7	3346	-1.11423	-1.61890
2000	-0.82	8533	103.6	3632	-0.85907	-1.27215
2001	-0.86	9226	104.2	3887	-0.78485	-0.87366
2002	-0.43	10178	104.9	4144	-0.7393	-0.71570
2003	-0.18	11094	104.4	4475	-0.74935	-0.33138
2004	-0.01	12358	113.1	5032	-0.49253	-0.12823
2005	0.08	13747	101.4	5573	-0.3344	0.25796
2006	0.39	15346	101.2	6263	0.18125	0.44444
2007	0.61	17926	118.5	7255	0.49073	0.68041
2008	0.91	20541	114.1	8349	1.20688	0.79439
2009	0.70	22327	97.60	9098	1.36483	1.07775
2010	0.95	25028	110.9	9968	1.83004	1.68506
2011	0.97	27251	116.5	11120	2.03156	1.97652

proportion in national income distribution by reducing state's financial revenues, increase minimum wage standard, increase labour's income in the first round of fortune distribution, standardize stock and real estate market, increase proportion of property income in gross income and make relevant financial and tax subsidy polices and increase income of farmers and residents in poor areas.

- Government can provide consumers with consumption guidance and improve level of consumption. From Table 6, it can be seen that increasing household consumption level has a positive effect on improving efficiency of China's agricultural food products circulation. Accordingly, the government should set policies to guide the consumers and improve the level of consumption. With this respect, China's government could establish and improve the social security system, take active measures to develop and expand rural consumption market and continue to foster new consumption hot spots.
- Agricultural products circulation infrastructure in China should be strengthened to improve efficiency of agricultural food products circulation. From Table 6, it can be seen that improvement of circulation of agricultural inputs and national transport conditions can increase efficiency of Chinese agricultural products in circulation. Therefore, on one hand, governments at all levels should establish and regulate markets of agricultural products circulation, take measures to attract social capital investment to increase the business scale of enterprises in agricultural products circulation. On the one hand, governments at all levels should continue to strengthen construction of national infrastructures, especially public transportation infrastructure.

CONCLUSION

This study creatively carries out an empirical study on China agricultural food products distribution efficiency and the affecting factors by use of factor analysis and correlation analysis. Conclusions drawn from the research have a certain degree of reference value and practical significance. As there is great difficulty in collecting accurate data for the research and impact of international economic environment on circulation industry is not taken into consideration, the present research results have certainly limitations and still need further study.

ACKNOWLEDGMENT

This study is sponsored by the New Rural Development Research Institute of Hubei Province.

REFERENCES

Chahal, S., S. Singh and J. Sandhu, 2004. Price spreads and marketing efficiency of inland fish in Punjah: A temporal analysis. India J. Agr. Econ., 6: 487-498.

Charles, A. and E. Mark, 2000. Is channel coordination all it is cracked up to be? J. Retailing, 76(4): 511-547.

Fred, E., 1990. Criteria of marketing efficiency. Proceeding of the 33rd Annual Meeting of the American Economic Association, Atlantic City.

Higgins, V., J. Dibden and C. Cocklin, 2007. Building alternative agri-food networks: Certification, embeddedness and agri-environmental governance. J. Rural Stud., 24(1): 15-27.

Hunt, I., B. Wall and H. Jadgev, 2005. Applying the concepts of extended products and extended enterprises to support the activities of dynamic supply networks in the agri-food industry. J. Food Eng., 70(3): 393-402.

Kherallah, M., C. Delgade, E. Gabre-Madhin, N. Minot and M. Johnson, 2002. Reforming Agricultural Markets in Africa. Johns Hopkins University Press, Baltimore.

Kumar, R. and N. Husain, 1998. Marketing efficiency and price spread in marketing of gram-a case study of Hamirpur district, UP. India J. Agr. Econ., 53(3): 390.

Shepherd, G., 1963. Agricultural Price Analysis. University of Iowa Press, Ames.