

Empirical Econometric Research on the Influencing Factors of Maoming Agricultural Development

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Abstract. Agriculture is a very important industry in a country or region. In order to promote the development of agricultural production in Maoming City, this paper uses the econometric method to conduct quantitative empirical analysis of Maoming City's agricultural development. The results show that Maoming City's planting, forestry, animal husbandry and fishery have promoted the agricultural development of Maoming City. Therefore, it can be concluded that in order to accelerate the development of agriculture in Maoming City, investment in planting, forestry, animal husbandry and fishery should be increased.

1. Introduction

Agriculture is the most basic production sector of social material production and an indispensable source of power for economic development and social progress. There are different industries in agriculture. The development of different industries has different promoting effects on the development of regional agriculture. The contribution of the gross value of different industries to the total output value of regional agriculture is different, and the driving effect is also different. This paper focuses on the relationship between the development of different industries and the growth of agricultural production. This paper uses the econometric model to study the impact of various industries on the gross agricultural product, with the aim of achieving the optimization and balance of the development focus of different industries, thus promoting the further development of agriculture in Maoming.

Agriculture in a region consists of different characteristic industries. In this paper, we will study the contribution of crop farming, forestry, animal husbandry and fisheries industries in Maoming to the total agricultural output value of Maoming. This paper will establish an econometric model to study the composition ratio and impact of different industries in agriculture.

Planting is a major component of agriculture. Due to the gaps in climate latitude, the characteristics of planting industries in different regions are different. The Maoming area is dominated by tropical farming. The most representative of them is Maoming Litchi Industry, whose sales range, planting area and output are very considerable. The crop industry has made an important contribution to the growth of agricultural output in Maoming.



2. Data Description

Thirty years of local agriculture data during 1980-2012 is selected from the website of Maoming Municipal Statistics Bureau to analyze the influence of all factors to the agriculture gross output. The data is shown in Table 1.

Table 1. Maoming City Agricultural Production Data from 1980-2012

Year	A Gross agricultural output value						Total output value year-on-year growth rate (%)
		1. Planting industry	2. Forestry	3. Animal husbandry	4. Fishery	5. Agriculture, forestry, animal husbandry and fishery services (side business)	
1980	128062	61379	9205	24663	8264	24551	0.1
1981	134869	64642	9694	25973	8704	25856	5.3
1982	148238	71049	10655	28548	9566	28419	21.1
1983	150927	72338	10848	29066	9740	28935	0.2
1984	163024	74939	11134	32025	8781	36145	4.2
1985	181390	82588	15044	44741	12532	26485	3.1
1986	213007	101810	18184	44828	16204	31980	11.9
1987	264503	116923	22226	54763	32518	38073	9.3
1988	363658	153618	38916	76490	44097	50537	9.2
1989	420274	194812	32242	94086	49392	49742	5.1
1990	462222	216764	34013	106673	52374	52398	7.7
1991	544973	273487	34945	114043	62258	60240	9.7
1992	677190	352828	40492	143610	77640	62620	20.8
1993	877096	426102	35131	225301	122394	68168	12.2
1994	990272	427260	35621	323902	120932	82557	4.0
1995	1388534	640823	38778	461459	150470	97004	21.0
1996	1626753	693015	44769	608677	160559	119733	8.0
1997	1751388	779344	49012	616399	164051	142582	22.1
1998	1888301	826297	50200	667465	182193	162146	13.4
1999	1926650	883887	56761	581621	183596	220785	16.2
2000	2040604	893139	60386	644823	199539	242717	8.1
2001	2209291	963705	61480	702744	214381	266981	8.6
2002	2327858	1089241	65981	762405	240090	170141	8.2
2003	2413389	1120046	78473	813557	261008	47321	4.5
2004	2582479	1256779	76126	896387	280128	73059	6.0
2005	2666097	1290134	83624	907070	298374	86895	4.1
2006	2846090	1468067	79610	905245	305290	87878	4.5
2007	3183963	1533664	81756	1140338	330990	97215	3.6
2008	3737903	1713608	74673	1420161	411874	117587	3.6
2009	3853846	1868370	83766	1327656	452960	121095	5.2
2010	4346193	2116352	221464	1371298	501723	135356	4.0
2011	5079403	2418981	269851	1675578	541381	173611	4.0
2012	5423716	2726200	276131	1672381	582412	166593	3.3

Data Sources: Maoming Bureau of Statistics

3. Model Setting

The design model is as following:

$$\ln Y = C_0 + C_1 \ln X_1 + C_2 \ln X_2 + C_3 \ln X_3 + C_4 \ln X_4 + u$$

Y represents the total agricultural output value of Maoming city (unit is 10,000 yuan). X1 indicates the output value of Maoming planting industry (unit is 10,000 yuan). X2 indicates Maoming forestry output value (unit is 10,000 yuan). X3 indicates the output value of Maoming animal husbandry (unit is 10,000 yuan). X4 indicates the output value of Maoming fishery (unit is 10,000 yuan). C1, C2, C3, C4 are parameters to be estimated. C0 is a constant term.

4. Model Parameter Estimate and Result

The least square regression is carried out with Eviews analysis software, and the regression result is shown in Figure 1.

View	Proc	Object	Print	Name	Freeze	Estimate	Forecast	Stats	Resids
Dependent Variable: Y									
Method: Least Squares									
Date: 12/06/15 Time: 19:29									
Sample: 1980 2012									
Included observations: 33									
Variable	Coefficient	Std. Error	t-Statistic	Prob.					
C	58224.34	14103.98	4.128220	0.0003					
X1	1.065754	0.178619	5.966627	0.0000					
X2	1.043607	0.405850	2.571414	0.0157					
X3	1.223461	0.161416	7.579550	0.0000					
X4	0.238493	0.708521	0.336606	0.7389					
R-squared	0.998917	Mean dependent var	1727641.						
Adjusted R-squared	0.998762	S.D. dependent var	1530308.						
S.E. of regression	53843.98	Akaike info criterion	24.76430						
Sum squared resid	8.12E+10	Schwarz criterion	24.99104						
Log likelihood	-403.6109	Hannan-Quinn criter.	24.84059						
F-statistic	6455.098	Durbin-Watson stat	0.362219						
Prob(F-statistic)	0.000000								

Figure 1. Analysis Result after Regression

The following equation is obtained via the parameter estimate.

$$\ln Y = 58224.34 + 1.0658 \ln X_1 + 1.0436 \ln X_2 + 1.2235 \ln X_3 + 0.2385 \ln X_4$$

$$(14103.98) \quad (0.1786) \quad (0.4059) \quad (0.1614) \quad (0.7085)$$

$$t = (4.1282) \quad (5.9666) \quad (2.5714) \quad (7.5796) \quad (0.3366)$$

$$R^2 = 0.9989 \quad F = 6455.098$$

5. Conclusion

The results can be got in the following by the regression equation.

(1) The output value of Maoming planting industry has a significant influence to the total agricultural output value of Maoming city. Provided that other conditions are invariant, the output value of Maoming planting industry increasing 1 unit, the total agricultural output value of Maoming increases 1.0658 unit correspondingly.

(2) The output value of Maoming forestry has a significant influence to the total agricultural output value of Maoming city. Provided that other conditions are invariant, the output value of Maoming

forestry increasing 1 unit, the total agricultural output value of Maoming increases 1.0436 unit correspondingly.

(3) The output value of Maoming animal husbandry has a significant influence to the total agricultural output value of Maoming city. Provided that other conditions are invariant, the output value of Maoming animal husbandry increasing 1 unit, the total agricultural output value of Maoming increases 1.2235 unit correspondingly.

(4) The output value of Maoming fishery has some influence to the total agricultural output value of Maoming city. Provided that other conditions are invariant, the output value of Maoming fishery increasing 1 unit, the total agricultural output value of Maoming increases 0.2385 unit correspondingly.

Planting is a major component of agriculture. Due to the gaps in climate latitude, the characteristics of planting industries in different regions are different. Maoming City is mainly based on tropical farming. The most representative of them is Maoming Lizhi Industry, whose sales range, planting area and output are very considerable. The crop industry has made an important contribution to the growth of agricultural output in Maoming.

The climate of Maoming is conducive to the growth of forest trees. Developing forestry is an important channel for promoting Maoming's economic development. Maoming has various advantages in developing forestry. If we take advantage of these advantages and do a good job in the development of the forestry economy, then Maoming's economic level will continue to increase.

The animal husbandry in Maoming is mainly composed of sericulture and livestock. The overall development trend of animal husbandry in Maoming City has increased. The role of Maoming Animal Husbandry in promoting the total agricultural output value in Maoming is moderate.

Due to its proximity to the ocean, Maoming fishery is relatively developed. In particular, the production of Maoming's freshwater products has always had a considerable output value, and it also contributes to the promotion of regional agricultural output. Maoming is the main export base for tilapia.

The development of Maoming fishery is relatively stable. The rapid development of fishery production value has increased year by year. The role of fishery production value in promoting agricultural development in Maoming is constantly strengthening.

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