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.

| Year | A Gross agricultural output value | 1. Planting industry | 2. Forestry | 3. Animal husbandry | 4. Fishery | 5. Agriculture, forestry, animal husbandry and fishery services (side business) | Total output value year-on-year growth rate (%) |
|------|-----------------------------------|----------------------|-------------|---------------------|----------|-------------------------------------------------|-----------------------------------------------|
| 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 | 3183663                           | 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.

![Figure 1. Analysis Result after Regression](image)

The following equation is obtained via the parameter estimate.

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

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

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

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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