



Analyze the Impact of Operation Mechanism on the Economic Development of the Development Zone Based on Data Mining Methods

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Abstract

By constructing a systematic GMM model, this paper uses data from 212 national economic and technological development zones from 2004 to 2018 to study the impact of the management system on the economic development of the development zone from the perspective of data mining and statistical applications. The research found that the market-oriented management system can promote the economic development of development zones. This finding shows that the market-oriented operation mechanism may be a channel to break the involution of the development zone management system.

Key words: *Development Zone; Management system; involution*

1. INTRODUCTION

At present, the development zone is facing an important turning period of transformation, upgrading and development. We must carefully and systematically face the development dilemma of the involution of the management system and mechanism of the Development Zone, and seek the reform and innovation direction of the management system and mechanism of the Development Zone in the process of industrial structure transformation and upgrading (Huang Jianhong, 2019; sun Chongming and ye Jihong, 2020).^[1-2] Local governments are trying to optimize the management system of the Development Zone in order to find a "prescription" to get rid of the convoluted development dilemma in the management system of the development zone. Many local governments are promoting the transformation of the management system of the development zone from government led to market led (Zhao Xiaolei, 2011).^[3] For example, in the outline of the 14th five year plan of Jiangxi Province, It is clearly proposed to accelerate the market-oriented reform of the management system of the Development Zone, and comprehensively implement the operation mode of "management committee + platform company + industrial fund" and the construction mode of "Development Zone + theme Industrial Park". However, what is the theoretical logic of the transformation from

government led to market-oriented? Why can the market-oriented management system promote the development of the development zone?

Based on the above problems, this paper takes 212 national economic and technological development zones from 2004 to 2018 as research samples, and uses the systematic GMM method to study the impact of management system on the economic development of development zones. The empirical results show that the market-oriented management system is more conducive to promote the economic development of the development zone than the government led management system.

2. THEORETICAL MECHANISM ANALYSIS

Referring to the research of existing scholars, according to whether the development zone has established a "Development Corporation" to operate the Development Zone, that is, whether there are enterprises to participate in the operation of the Development Zone, this paper divides the management system into government led and market led. If the development zone is operated by establishing a Development Corporation, the management system of the development zone is market led, otherwise it is government led.

In the new period of transformation and upgrading of development zones, the government led management system, which is born out of the old system, will inevitably expose defects. First, the legal status of the management organization is not clear. At present, the legal status, power scope and management mode of the management organization of the development zone are unclear (Sun Chongming, 2016; Zhang kexuan, 2018),^[4-5] resulting in the lack of guarantee of the power of the Management Committee of the development zone and the incomplete decentralization of power, which makes the advantages of the management system of the Development Zone unable to be brought into play and further restricts its development. Second, the management authority has been soft decomposed. In recent years, the economic management authority of the development zone has been continuously diluted, the management authority is facing the risk of being dismembered, and the pressure of the development zone's degradation to the general administrative region system is increasing (Wang Ya, 2015; Qian Zhenming, 2016).^[6-7] Third, the traditional management system tends to return. With the acceleration of the transformation and upgrading process of the Development Zone, there is more friction between the innovative system of the development zone and the traditional system. The internal structure of some development zones is becoming more and more bloated and complex, showing the trend of system return (Xie Jajie, 2016).^[8]

For the market-oriented management system, this model effectively separates the economic affairs and administrative affairs of the economic development zone. The special economic activities of the development company can reduce the pressure of enterprises in the economic development zone and improve the operation efficiency of enterprises, so as to promote the development of the economic development zone and enhance the competitiveness of the economic

development zone (Xiao Xinming, 2015).^[9] At present, China's investment and development environment is in a prosperous development period, which is different from the government led economic development zone. Taking the market as the leading economic development zone can maximize the allocation of resources, which is conducive to the overall improvement of economic benefits of the economic development zone.

3. RESEARCH DESIGN

3.1 Sample selection and data source

This paper selects the national economic and technological development zones from 2004 to 2018 as the research sample, and 212 national economic and technological development zones as the research object. All data are from China business Yearbook (2004-2018) issued by the Ministry of Commerce. The value data involved in each index have been converted into constant prices in 2004.

3.2 Variable selection and model construction

See Table 1 for specific description and explanation of variables. In order to avoid the impact of excessive abnormal fluctuations in data, the GDP is taken as logarithm to measure the economic development level of the economic development zone. According to the above division of the management system of the Development Zone, it is 1 when the management system is market-oriented, otherwise it is 0. The economic development level of ETDZ is also affected by other factors. According to the existing research, the degree of opening to the outside world, tax revenue, fiscal revenue and industrial structure will affect the economic development level of ETDZ. These indicators are considered as control variables. See Table 1 for the specific indicator measurement or description.

TABLE 1: VARIABLE DESCRIPTION

Classification	Symbol	Definition	Indicator description
Explained variable	lngdp	Economic development level of ETDZ	GDP of ETDZ is taken as logarithm
Core explanatory variable	ms	management system	The market leading type is 1
Control variable	open	Opening to the outside world	Total exports + total imports / GDP
	gi	Tax revenue	Tax revenue / GDP
	gs	Fiscal revenue	Fiscal revenue / GDP
	sts	Advanced industrial structure	Added value of tertiary industry / added value of secondary industry

In this paper, the lag period of the explained variable is introduced into the model as the explanatory variable, and the System GMM is selected as the core estimation method to estimate the model. In dynamic panel regression, referring to the practices of Baum et al. (2003) and Gan Chunhui et al. (2011),^[10-11] this paper treats all explanatory variables as endogenous variables, and uses their lag term and difference sub item as instrumental variables to estimate the panel generalized moment. A

$$\ln gdp_{it} = \alpha_0 + \alpha_1 \ln gdp_{it-1} + \alpha_2 ms_{it} + \alpha_3 open_{it} + \alpha_4 gi_{it} + \alpha_5 gs_{it} + \alpha_6 sts_{it} + \varepsilon_{it} \quad (1)$$

4. EXPERIMENTAL RESULTS AND ANALYSIS

In order to compare and test the robustness of the results, the regression results of mixed OLS and IV are also listed in this paper. Table 2 shows the test results of model (1). The coefficients of the three regression results of the operating mechanism MS are positive and significant at the level of 1%, which is consistent with the expectation of our research hypothesis 1. This shows that the market-oriented management system has a positive impact on the economic development of the economic development zone. In the new period of transformation,

model (1) is constructed to test hypothesis 1, i represents each national economic development zone and t represents the year, ε is a random perturbation term. According to the theoretical analysis, the core explanatory variable MS coefficient in the model (1) is expected to be significantly positive, that is, when the management system of the economic development zone is market-oriented, it can better promote the economic development of the economic development zone.

upgrading and development of the Development Zone, the market-oriented management system has absolute market advantages. Because it operates in accordance with the modern enterprise system, directly faces the market, has streamlined institutions, low management cost and high operation efficiency, and can complement and promote each other with the administrative functions of the management committee. The government led management system lacks market function in resource allocation, which has been difficult to adapt to the development of the Development Zone under the development environment of market economy.

TABLE 2: REGRESSION RESULTS OF MODEL (1)

	OLS	2SLS	GMM
	lngdp	lngdp	lngdp
ms	0.380*** (5.970)	0.370*** (5.765)	0.216*** (24.073)
open	0.093*** (3.029)	0.139*** (4.244)	0.016*** (7.204)
gi	-1.525*** (-5.441)	-2.249*** (-6.903)	-0.962*** (-35.293)
gs	1.577*** (7.764)	2.137*** (7.606)	0.311*** (35.166)
sts	0.052*** (2.634)	0.036* (1.903)	0.003** (2.339)
L.lngdp			0.877*** (355.091)
_cons	5.528*** (127.088)	5.627*** (126.766)	0.903*** (51.375)
R ²	0.057	0.064	
AR1			0.000
AR2			0.555
Hansen			0.188

Note: ① *, **, *** respectively mean significant at the level of 10%, 5% and 1%, and the values in brackets are t statistics; AR1 and ar2 represent the first-order and second-order regression residual autocorrelation test respectively.

The estimated coefficients of opening to the outside world are significantly positive, indicating that the

greater the degree of opening to the outside world of the economic development zone, the greater the possibility

of absorbing advanced and innovative management means, and the more obvious the role of promoting the economic development of the economic development zone. The greater the ratio of fiscal revenue to GDP, the greater the proportion of emerging industries, resource-based industries and high value-added industries in the economic development zone, and the better the economic development of the economic development zone. The estimation coefficients of industrial structure upgrading are significantly positive, indicating that the increase of the proportion of the tertiary industry in the secondary industry can promote the economic development of the economic development zone. The proportion of tax revenue in GDP of ETDZ can represent the degree of intervention of ETDZ in enterprises. The estimated coefficients of tax revenue are all significantly negative, indicating that the economic development zone's intervention in enterprises has achieved a negative effect, and excessive tax will weaken the production enthusiasm of enterprises.

5. RESEARCH CONCLUSIONS AND POLICY RECOMMENDATIONS

Taking 212 national economic development zones in China from 2004 to 2018 as research samples, this paper establishes a systematic GMM model to empirically study the impact of Development Zone Management System on its economic development. The main conclusions are as follows: compared with the government led management system, the market-oriented management system can better promote the economic development of the development zone. In the new era of transformation, upgrading and development of the Development Zone, the market-oriented management system is the direction of the system reform of the development zone.

This paper holds that the development zone needs to further weaken the leading role of the government and enhance the role of the market on the road of promoting the reform of the management system. For the development zone with government led management system, we should deepen the reform of the management system of the Development Zone in combination with our own development and take the road of market-oriented development and construction. Based on market orientation and with the help of the government, strive to integrate the role of the government and the role of the market, and promote the transformation and upgrading of the development zone through the joint efforts of the government and the market.

Acknowledgments

This work is supported by the key project of National Social Science Foundation of China (19AJUY003) and the humanities and Social Sciences project of colleges

and universities in Jiangxi Province (JJ162001).

REFERENCES

- [1] Huang Jianhong. Innovation of governance system and mechanism in the transformation and upgrading of national development zones: dimension and topic [J]. *China Administration*, 2019 (05): 52-59.
- [2] Sun Chongming, ye Jihong. Why is the management system of the development zone "involved" in the process of transformation— Analysis based on Administrative Ecology [J]. *Administrative forum*, 2020,27 (01): 42-48.
- [3] Zhao Xiaolei, Shao Shuai, Yang Lili. Management system and economic development efficiency growth of China Development Zones -- An Empirical Analysis Based on Malmquist index and GMM [J]. *Financial research*, 2011,37 (08): 4-15.
- [4] Sun Chongming. Research on innovation of governance system of development zones in the process of transformation and upgrading [D]. Suzhou University, 2018.
- [5] Zhang kexuan, fan Xiangsheng. Analysis and improvement strategy of "quasi government" management system and mechanism of Development Zone -- Based on the analysis of functional zones such as Luoyang high tech Zone and Yibin District [J]. *Administrative science forum*, 2018 (08): 9-15.
- [6] Wang Ya. Practice and Thinking on the innovation of management system and operation mode of development zones in China [J]. *China Administration*, 2015 (04): 145-147.
- [7] Qian Zhenming. Management system reform of development zones in the process of Urbanization: Problems and countermeasures [J]. *China Administration*, 2016 (06): 11-15.
- [8] Xie Jiajie. Industrial transformation and upgrading of development zones: market dominance is the key [J]. *Shanxi youth*, 2016 (05): 234.
- [9] Xiao Xinming. Research on the management system of development zones in China [D]. Central China Normal University, 2015.
- [10] Christopher F. Baum, Mark E. Schaffer, Steven Stillman. Instrumental Variables and GMM: Estimation and Testing [J]. *The Stata Journal*, 2003,3(1).
- [11] Gan Chunhui, Zheng Ruogu, Yu Fangfan. The impact of China's industrial structure change on economic growth and fluctuation [J]. *Economic research*, 2011,46 (05): 4-16 + 31.

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