

Empirical Analysis on Capital Allocation Efficiency of Hubei Listed Companies according to Industries

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Abstract: The development of high-tech industries is the goals and direction of industrial restructuring. This paper focuses Hubei Province located in central China, the shortage of capital resources has become the bottleneck of the listed companies' development. This paper uses Jeffrey Wurgler allocative efficiency model based on the industry, and Eviews software to analyze listed companies in Hubei Province and the transfer of resources, and factors influencing efficiency of capital allocation, gives references to optimize the capital resource allocation of listed enterprises in Hubei and improve their capital efficiency.

Key words: Hubei listed company; Capital allocation efficiency; Industry capital allocation

1 Introduction

Central China strategy is significant and far-reaching strategic significance, in the process capital and talent are indispensable important factor. However, competition in attracting capital, the central region was lagging behind. Some scholars has calculated that the last century, most of the eastern region after 1990 more than 200 billion yuan of net capital inflow of the state, while the central basic state was a net outflow of capital, the west is only increased by an annual influx of more than 100 million structure, which became the key reason between the region widening gap. Such a situation can not quickly be reversed then the central region will take off the lack of basic factors of production. As the central province, Hubei Province in central China should play a central strategy of the role of fulcrum. Compared with the coastal provinces, Hubei's capital market is far smaller than in Guangdong, Zhejiang and other provinces, so the limited resources in a reasonable allocation of capital for accelerating the economic development of Hubei Province in particular, show an important role. This article based Wurgler's sector allocation efficiency model, based on the use of high-tech enterprises in Hubei Province data listed empirical research, try to find high-tech enterprise in Hubei Province's capital market allocation efficiency, proposed a reasonable proposal to enhance the core of the strategy for Hubei Province in central China.

1.1 Domestic and foreign capital allocation review the relevant theory

The so-called efficiency of capital allocation is the low rate of return on capital from the region (or industry) flow to the high rate of return on the regional (or industry) level.

Theoretical studies show that financial markets function is to achieve the maximum optimal allocation of capital, thereby contributing to sustained economic growth. The financial system of capital allocation efficiency, also means that sectors with high returns on capital relative to the industry will get more funding than low returns on capital, this process will help to improve the ongoing efficient use of capital. In addition, with the scientific and technological development, technological innovation input and output results, not only the basis for measuring the effective allocation of capital, but also as a measure of management efficiency, management efficiency and competitiveness standards. Therefore, by examining the ability of technology innovation across multiple industries to study the efficiency of capital allocation is necessary.

In recent years, with the wealth of data and panel data in mature measured approach, carrying out the angle based on industry estimates of capital allocation efficiency, analysis and comparison, has become an important research fields at home and abroad. Wurgler (2000) constructed directly estimate the efficiency of capital allocation model --- sector investment response factor, and then select the World Bank's 65 countries of the panel data as the study sample, direct examination the degree of financial market efficiency of capital allocation. It found that the degree of financial market variables and industry investment in response to a significant positive correlation coefficient, the more developed financial markets, and its "up" investment industry increase the greater the magnitude, in the "down" reduce the greater the magnitude of investment in the industry, showing that capital higher allocative efficiency. Further research found that the efficiency of capital allocation and share of the economy China's economy has a significant negative correlation, but with stock market information content and the rights of minority shareholders has a significant positive correlation, particular, is that for strong

protection of minority shareholders rights can be effectively inhibition in declining industries "over-investment." Cai Hongyan, Yan Qingmin Wurgler improved model, researched the 39 industries in China's capital allocation efficiency and found that inefficient allocation of capital, market allocation of capital and non-market allocation of capital has significant negative correlation. But the article does not give the model test results, we can not know whether the model is suitable for measuring the status of the Chinese economy.

The research results at home and abroad despite our understanding of the financial system and technology innovation efficiency of capital allocation provides a useful reference, but in previous studies there are still some limitations:

1) Only single-factor analysis, only the industry profits or increase the value of the following as the only independent variables into the econometric model, neglecting other possible factors impact the industry fixed capital formation efficiency, which is not complete.

2) Generally only annual data for long-term studies, there is no short-term monthly analysis. The lack of two points: first, the annual model vulnerable to exogenous factors (such as changes in economic structure, inflation, investment or consumer preference for the concept, etc.), bring conclusion to the model uncertainties; second, easily lead to neglect of short-term details. In fact, the short-term corporate investment behavior, showing a lot of different business characteristics of long-term investment behavior of the Year from the monthly short-term perspective, can reveal a lot of valuable information on industry investment.

3) Panel Data Models have been constructed, only a measure of factors over the same period, ignoring the impact of dynamic factors, namely, fixed capital formation does not take into account factors in the past (historical events) on the current capital formation.

2 Methods and Model

2.1 Research Methods

According to the theory of neoclassical economics, Pareto optimal allocation of capital necessary and sufficient condition of each item is the ratio between the marginal cost is equal to the corresponding price everywhere, as a mathematical expression $MC_b / MC_a = P_a / P_b$, the type after a simple conversion, you can obtain the following expression:

$$P_b - MC_b / MC_b = P_a - MC_a / MC_a \quad (1)$$

Equation (1) shows that: for A, B two investments, if the project A is greater than the marginal rate of return project B, then the increase in investment for project A, while reducing investment in the project B, you can achieve the Pareto optimal allocation of capital^[3]. In other words, for industry which efficiency is "up" to increase investment, in the "down" to reduce investment in the industry, it means improving the efficiency of capital allocation.

It is in accordance with the above logic, first proposed in 2000 Jeffrey Wurgler, a possible measure of the efficiency of capital allocation - investment response factor, Jeffrey Wurgler construct a direct estimate of the efficiency of capital allocation model is as follows:

$$\ln I_{i,c,t} / \ln I_{i,c,t-1} = \partial_c + \eta_c \ln V_{i,c,t} / V_{i,c,t-1} + \varepsilon_{i,c,t} \quad (2)$$

Type (2), I as stock of fixed assets; V as profit; i as the industry number; t as the year; C as the country; η_c as modulus of elasticity, said profits increased by the impact of investment level, the sign is positive, indicating in the "up" increased investment in the industry, but in a "down" sector investment reduced; % of the value is greater, showing the response that changes in investment increase or decrease is more sensitive.

2.2 Model Specification

This paper argues that relying on a simple measure of profit factors control the impact of capital formation to solve the efficiency of capital allocation is not enough, it is necessary to introduce in the model other important factors, analysis of these factors on the mechanism of fixed capital formation, capital allocation in order to further reveal the efficiency and interaction. Especially in China, financial institutions, loans to industry have a significant role in fixed capital investment; government investment behavior imposed on the industry of intricate; industry itself for a variety of rational or irrational factors to consider, it is In addition to factors other than a profit incentive to invest in other spontaneous; the same time, the last time the historical events happened in fixed assets investment for the current existence of significant impact. Especially in the short term, these factors impact on fixed capital formation is more evident. Based on the above considerations, Wurgler extend the model to construct

the dynamic panel data model (Dynamic Panel Data Model), the profitability of the business, current liabilities, the Government's support will include factors such as panel data model:

$$InFAI = C + a_0 InIAV + a_1 InCLS + a_2 InTAX \tag{3}$$

FAI year for the industry because of the variable fixed capital formation. Since the variable factors affecting the changes; IAV year for the industry's added value or profit, reflecting the industry's profitability; ELD in the industry for the year the number of current liabilities; TAX representative of current income tax payments paid in the industry, reflecting the Government's support the industry; subscript i said the number of industry, t is time. Coefficients a0, a1, c, respectively, reflected the first effects of the three sectors within the industry fixed capital formation of the various elements of elasticity. If the coefficient is greater than zero, indicating that the industry is a capital allocation efficiency. When a good growth industry, these factors relative to the previous period will increase the stock of fixed assets have increased the pace of development, and their respective percentages of increase is exponential increase in the percentage of these effects a0, a1, a2-fold, ^[1]so that more money will flow in a good performance of the industry; if the industry's decline over time these factors are reflected in the coefficients of the fixed assets of the industry speed the formation of the relative decline, indicating a relatively small inflow of funds performance poor industry, capital allocation is still efficient; if the coefficient is less than zero, indicating that the lack of industry capital allocation efficiency, but the growth rate of the stock of fixed assets, but on the decline, poor performance of the industry that has been more investment, and growth of the industry would actually get stronger with less capital investment. If the elasticity is zero, indicating that the ability of the industry to attract capital has nothing to do with the industry performance.

2.3 The selection of indicators and data sources

This sample came from Hubei, Shanghai Stock Exchange and Shenzhen Stock Exchange listed company sector a major economic indicators in the average balance of net fixed assets, average balance of current liabilities), corporate income tax this year. The actual industry data to current prices. To reduce skewness model. The introduction of the indicator data in the model, are taking the natural logarithm, and the relevance of each variable to test, using statistical software EVIWS measure, we classified the industry in 2010 as a benchmark, and ultimately determine the 31 industries (5 and delete the data was not comprehensive industry: the oil industry, instrumentation, food industry, textile industry, environmental protection industry), the cross section of 26 industries in the region, the time span T for 1 year.

3 Empirical Analysis

3.1 Mixed data model

This article sub-industry data in 2010 as mixed data, using the general multiple linear regression (model 3) to analyze the important factors affecting capital allocation.

We have some information of listed companies in Hubei Province as a benchmark to analyze the listed companies in Hubei Province, the characteristics of the sub-industry structure, for 2010, listed companies in Hubei Province is divided into 31 sectors, as detailed in Figure1.

From the Shanghai Stock Exchange, Shenzhen Stock Exchange in 2010 in Hubei Province to find listed companies by the industry data on the allocation of capital, see Figure 2.

Based on the above data and models, application eviews software analysis was Table 1.

Table 1

Dependent Variable: LOG(Q)
 Method: Least Squares
 Date: 05/09/11 Time: 22:54
 Sample: 1 26
 Included observations: 24
 Excluded observations: 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.246599	3.854809	-0.582804	0.5665
LOG(X1)	-0.036538	0.698384	-0.052318	0.9588
LOG(X2)	0.823064	0.416302	1.977082	0.0620
LOG(X3)	0.335427	0.579619	0.578702	0.5693
R-squared	0.387928	Mean dependent var		10.54494
Adjusted R-squared	0.296117	S.D. dependent var		2.569402

S.E. of regression	2.155669	Akaike info criterion	4.525091
Sum squared resid	92.93821	Schwarz criterion	4.721434
Log likelihood	-50.30110	F-statistic	4.225300
Durbin-Watson stat	1.141155	Prob(F-statistic)	0.018158

Thus, the sample regression equation is:

$$\ln Q = -2.246599 - 0.036538 \ln X_1 + 0.823064 \ln X_2 + 0.335427 \ln X_3$$

$$(-0.582804) \quad (-0.052318) \quad (1.977082) \quad (0.578702)$$

$$R^2=0.387928 \quad \bar{R}^2=0.296117 \quad F=4.225300$$

Regression results show that 24 industries in 2010, LOGQ 38.7% change in the other three variables can be explained by changes in the 5% significance level, F statistic critical value of F0.05 (3,20) = 3.10 indicates that the model established a significant linear relationship. t0.025 (20) = 2.086, LOGX1, LOGX2, LOGX3 the corresponding t statistic is less than the critical value, which is not significant.

$\bar{R}^2 = 0.296117$ shows that fixed capital formation for 38.79% of the change in value can be the logarithm of net current liabilities of the logarithm of the number of tax changes on the interpretation. -0.036538, 0.823064, 0.335427 Represent the net profit, current liabilities, revenue elasticity of fixed capital formation. That is the same as current liabilities and taxes, the net profit for every 1% increase in fixed capital formation will be reduced by 0.036538 percent; when the net profit and revenue unchanged, for every 1% increase in current liabilities, fixed capital formation will increase by 0.823064 percent; when unchanged net profit and current liabilities, revenue for every 1% increase in fixed capital formation will increase 0.335427%.

(1) industry profits significantly influencing factors. Industry profits regression coefficient is negative, showing that industrial economic efficiency of the industry's fixed capital formation efforts to impose a negative effect, but the regression coefficient t statistic was not significant, indicating that the capital of Hubei Province configuration is inefficient.

(2) Industry liabilities (loans) were not significant factors. Industry liabilities (loans) regression coefficients are positive, the indirect impact of the efficiency of capital allocation in Hubei Province.

(3) the impact of tax payments industry factors was not significant, and are positive, showing that these factors have on the industry's fixed capital formation efforts exerted a positive influence. Those profits turned over more industries, access to investment more in line with free capital flows and effective economic laws, Hubei industry growth of fixed capital associated with the degree of government support has been strong.

Table 2 White Heteroskedasticity Test

F-statistic	0.201721	Probability	0.971597	
Obs*R-squared	1.595128	Probability	0.952927	
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 05/09/11 Time: 12:40				
Sample: 1 26				
Included observations: 24				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.176225	109.1583	-0.001614	0.9987
LOG(X1)	-14.10442	34.36342	-0.410449	0.6866
(LOG(X1))^2	0.828807	1.904461	0.435192	0.6689

LOG(X2)	15.28103	17.28451	0.884088	0.3890
(LOG(X2))^2	-0.735977	0.795548	-0.925120	0.3679
LOG(X3)	-4.241618	12.87095	-0.329550	0.7458
(LOG(X3))^2	0.298832	0.953221	0.313497	0.7577
R-squared	0.066464	Mean dependent var		3.872426
Adjusted R-squared	-0.263020	S.D. dependent var		7.111447
S.E. of regression	7.992139	Akaike info criterion		7.233287
Sum squared resid	1085.863	Schwarz criterion		7.576886
Log likelihood	-79.79944	F-statistic		0.201721
Durbin-Watson stat	0.806372	Prob(F-statistic)		0.971597

Clearly, the test statistic is 1.595128, x_2 distribution list check availability $x_{0.05}(26) = 38.9$, as $1.595128 < 38.9$, and thus do not reject the null hypothesis, there is no recognized model heteroscedasticity.

4 Optimize the Efficiency of Capital Allocation Recommendations

(1) Business investment rational, irrational investors try to avoid conflict. Meanwhile, the Government should continue to improve management, enhance the well-profit industry support, and promote its rapid growth.

(2) Investment in overheating alert.

(3) Strongly encourage capital flow between the various regions, breaking regional barriers, further open up the regional financial market and encourage inter-regional flow of credit so that the efficiency of capital allocation in all regions of convergence, to achieve maximum efficiency of capital allocation.

(4) Develop a higher level of large numbers of personnel to achieve personnel decentralization.

5 Conclusion

The central region is located in Hubei Province, inadequate sources of capital investment to drive economic growth to become the bottleneck. The rise of the middle part, try to narrow the economic gap between the eastern region to launch and maintain a high investment rate and investment rate of advancement is to achieve a prerequisite for capital allocation.

Empirical research shows that the financial elements and factors of spontaneous investment capital allocation efficiency of the industry there is no big difference, but the profit factor, government support factors on capital allocation efficiency of the industry are quite different, indicating that the allocation of capital of Hubei The main reason is the high efficiency of existing market mechanisms is difficult (lack of market signals) performance based on industry profitability and make investment choices; lack of cross-enterprise decision-making capacity for efficient investment;^[2] government investment policy and industrial policy in the leading the formation of the investment status of rigidity between the different sectors affected the smooth flow of capital. Therefore, Hubei need for more flexible financial system and financial policy should be to break trade barriers, encouraging capital flows between industries, so that capital from the traditional labor-intensive or capital-intensive industries to a single factor-driven high technology and human capital Reserve a wealth of industry flows, the industry's balance of capital allocation efficiency; need to create a number of dynamic industries and businesses, to encourage and guide enterprises to take the road of independent innovation, focus on strengthening the technological innovation and talent development, of investment-driven to innovation-driven transformation; the same time, the Government should grasp the industrial development law of the macro, strategic guidance to industry to accelerate the development of low power, low-emission economy; strictly limit the high-energy, high water consumption, high pollution and waste of resources, industrial development.

Figure 1 Hubei Industry and Its Listed Companies List of Companies By Industry

Listed in Hubei Company Industry	Listed companies by industry
Pesticides and fertilizers	Hubei Yihua Sanonda A
Commercial department	E Wushang A Wuhanzhongbai Wuhanzhongshang Hanshangjituan
Transportation	Changhangfenghuang Zhonghangzhongji
Chemical fiber industry	Hubeijinhuian
Chemical industry	Tianmao group Double Loop Technology Huitian rubber industry Ding Dragon Shares Xingfa group
Plastic Products	Wuhan Plastics Kaile Technology
Machinery industry	Xiangyang Automobile Bearing Jingshan Light Machine Jiangzuan share Huazhongshukong Seong shares
Iron and steel industry	Daye Special Steel Wuhan Steel shares
Automotive	*ST boying Hubei Energy Dongfeng Motor
Financial sector	Changjiang Securities
Environmental Protection Industry	Sangde Environment
Real Estate	Fuxing Share Southland Properties Dobb Share Zhongzhu holding Huayuan Real Estate Zhongyin share
Power industry	Kaidi Electric Power ChangyuanElectric Power *STxianglong
Biopharmaceutical	Guangji Pharmaceutical Yongan Pharmaceutical Renfu Pharmaceutical ST Pharmaceutical Wuhan Jianmin Mayinglong jiuzhoutong
Textile industry	STmaiya
Electronic Devices	Huagong Technology Guangxun Technology Taiji share Sanan guangdian
Hotel Tour	Santé suodao
Electronic information	Wuhan fangu Liyuan information Yangtze Communications *STjinglun Fiber Communications
Oil industry	Guochuang gaoxin
Instrumentation	Gaode hongwai
Power Equipment	Zhonghua yuandian
Road and Bridge	Chutian speed
Building materials	Ge zhouba
Apparel & Footwear	Eastern Jin Yu Mailyard
DevelopmentZone	East Lake High-tech
Water and electricity supply	Wuhan Holdings
Glass industry	Guangdian stock Sanxia xincai *STliyang
Animal husbandry and fishery	STchangyu
Food industry	Angel Yeast
Cement industry	Huaxin Cement
Aircraft	Aerospace Electronics

Figure 2 2010 Listed Companies in Various Industries in Hubei Province Capital Allocation of the Relevant Data on the Unit (million)

Industry	Net profit 2010	Current Liabilities 2010	Income Tax 2010	Fixed assets 2010
Pesticides and fertilizers	59633.89	711832.74	15617.42	174214.219
Commercial department	62539.07	1078373.32	28304.3	148181.723
Transportation	4625.06	299114.43	916.09	272979.165
Chemical fiberindustry	336.58	46162.86	-937.31	27033.3996
Chemical industry	40614.26	452768.08	8424.51	410091.96
Plastic Products	5520.75	209692.53	3564.54	46241.0334
Machinery industry	17291.69	147232.11	3872.85	123140.901
Iron and steel industry	226614.88	4103621.74	57975.07	5027512.75
Automotive	161119.72	2049500.83	33808.08	956662.398
Environmental Protection Industry	20699.27	103480.55	3195.44	141.819409
Real Estate	88929.74	911736.49	27743.06	745.885664
Power industry	-597.2	1025727.36	17385.39	114631.841
Biopharmaceutical	40885.32	304381.96	11404.79	63908.283
Electronic Devices	20744.8	47773.43	3233.41	15797.4125
Hotel Tour	2975.73	28212.72	2418.21	289.814147
Electronic information	69430.82	527093.05	8130.2	101127.086
Power Equipment	4410.79	3566.63	653.94	950.508903
Road and Bridge	39985.1	133636.15	13218.47	244321.067
Building materials	137673.61	2339529.6	44655.09	100993.686
Apparel & Footwear	7303.3	279133.93	3075.55	9448.17948
DevelopmentZone	1758.64	134705.75	3096.68	46724.2183
Water and electricity supply	11095.34	44604.21	2831.6	36234.1152
Glass industry	14053.52	288893.03	1796.55	73444.4039
Animal husbandry and fishery	2301.63	263565.33	59.51	2046.55053
Cement industry	57257.91	511391.12	17131.62	72952.7009
Aircraft	16227.27	270804.56	4691.64	79877.4949

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