Research on the Impact of Industrial Policy on Enterprise Investment: Evidence from China

Haifen Lan

School of Management, Shanghai University, Shanghai 200444, China

Heaven2648@163.com

Abstract

From the perspective of investment direction, the paper analyses the impact of industrial policy on the investment scale and efficiency of enterprises. The results show that industrial policy support can significantly increase the overall investment scale of enterprises, but has no significant impact on the investment efficiency of enterprises. Further research finds that industrial policies have different effects on investment behavior in different directions. Industrial policy reduces the efficiency of inward investment, while it increases the scale of outward investment. The conclusion of this paper provides a direction for the investment management of enterprises and has practical significance.

Keywords

Industrial policy, Investment scale, Investment efficiency, Investment direction.

1. Introduction

Overinvestment and underinvestment coexist in Chinese enterprises. In this regard, macro-control often falls into a dilemma. As an important means for government to intervene in the economy, industrial policy can affect the external environment of enterprises and thus affect their investment decisions. China's selective industrial policies have different impacts on various industries. Support of industrial policy is an opportunity for enterprises, and correspondingly, non-support of industrial policy is a threat.

The existing literature mainly evaluates the investment behavior of enterprises from the two dimensions of investment scale and investment efficiency [1, 2]. It is difficult to comprehensively evaluate the level of enterprise investment, and such conclusions can not provide direction for enterprises to improve investment. Therefore, the paper adds a third dimension of investment direction to deeply investigate the impact of industrial policy on enterprise investment.

2. Theoretical Analysis and Research Hypotheses

2.1 Industrial Policy and Investment Scale

Industrial policy support can bring resources to enterprises, thus providing necessary financial support for investment activities. When enterprises are supported by industrial policies, they can get a large number of government subsidies and tax incentives. In addition, this government action also has indirect authentication function, which can absorb external financing for enterprises. So that both inward and outward investment in enterprises can be funded. Therefore, following hypotheses are put forward:

H1: Industrial policy is positively related to the scale of enterprise investment.

H2: Industrial policy is positively related to the scale of enterprises' inward investment.

H3: Industrial policy is positively related to the scale of enterprises' outward investment.

2.2 Industrial Policy and Investment Efficiency

When the government supports an industry, it will create a good environment for the development of enterprises. For example, relaxing project approval will make it easier for enterprises to get approval

for their business projects. But it can also bring optimism. Thus enterprises may ignore the evaluation of project benefits and risks, and blindly carry out projects. In addition, managers may use the resources brought by industrial policy support for self-interested purposes, rather than investment behavior based on the goal of maximizing shareholder value due to information asymmetry [3]. Therefore, following hypotheses are put forward:

H4: Industrial policy is negatively correlated with the efficiency of enterprise investment.

H5: Industrial policy is negatively correlated with the efficiency of enterprises' inward investment.

H6: Industrial policy is negatively correlated with the efficiency of enterprises outward investment.

3. Research Design

3.1 Sample Selection and Variable Design

This paper uses a sample of all A-share listed firms for four years (2014 to 2017). Consistent with Zhu et al. (2015) [4], financial companies, ST listed companies and new entries are not included in the sample. The industry grouping classification is conducted according to the industry classification standard revised by CSRC in 2012, and the industries with too small sample size are excluded. The final sample size after excluding firms with missing proxies of main variables resulted in 6,292 firms-year observations. The data on industrial policy support are hand-collected from the five-year plans. Financial data used to compute various measures are extracted from the WIND database. All continuous variables are winsorized to the 1 and 99 percentiles to control for extreme values.

3.2 Variable Definition and Model design

3.2.1 Dependent variables

The dependent variables include investment scale and investment efficiency. And each corresponds to three sub-variables: total one, inward one and outward one. Investment scale is measured by as new increased investment to total assets, and investment efficiency is measured by the absolute residual value of Richardson's model [5], which is as follows:

$$INVEST_{i,t} = \alpha_0 + \alpha_1 GROWTH_{i,t-1} + \alpha_2 SIZE_{i,t-1} + \alpha_3 LEV_{i,t-1} + \alpha_4 CASH_{i,t-1} + \alpha_5 AGE_{i,t-1} + \alpha_6 RET_{i,t-1} + \alpha_7 INVEST_{i,t-1} + \sum YEAR + \sum INDUSTRY + \varepsilon \quad (1)$$

3.2.2 Independent variable

Consistent with prior studies, industrial policy support information is obtained by reading through the national five-year plan outline document [6, 7]. For this variable, 0 means there is no support, however, 1 means there is explicit policy support.

3.2.3 Control variables

The choice of control variables is driven by prior studies, which have found them to be significant factors in influencing the investment decision-making. The control variables include free cash flow, growth ability, capital structure, corporate size and cash stock. The meanings and calculation methods of variables are shown in Table 1.

Table 1 Variables

Variable	Proxy	Calculation
Total investment scale	TINV	cash paid for the purchase of fixed assets, intangible assets and other long-term assets exceeds cash recovered from the disposal of fixed assets, intangible assets and other long-term assets divided by the total assets
Inward investment scale	ININV	increase fixed assets and intangible assets divided by total assets
Outward investment scale	OUTINV	new outward investment to total assets

Total investment efficiency	TE	the residuals of Richardson's model of total investment scale, in absolute value
Inward investment efficiency	INE	the residuals of Richardson's model of inward investment scale, in absolute value
Outward investment efficiency	OUTE	the residuals of Richardson's model of outward investment scale, in absolute value
Industrial policy	IP	Dummy variable, if the industry is supported by industrial policy, then IP=1; otherwise, IP=0
Free cash flow	CF	net cash flow from operating activities divided by total assets
Growth ability	GROWTH	growth rate of sales revenue
Capital structure	LEV	total debt divided by total assets
Firm size	SIZE	natural log of the book value of the firm's assets
Cash stock	CASH	cash and cash equivalents to total assets
Stock return	RET	(closing price - opening price) / opening price
Listed age	AGE	Ln (research year - listed year +1)

Since industrial policies change the investment level of enterprises by increasing the cash flow, this paper constructs the following investment-cash flow sensitivity model to monitor the effect of industrial policies by examining the cross-terms of IP and CF:

$$INVEST_{i,t} = \beta_0 + \beta_1 IP_{i,t} + \beta_2 IP_{i,t}*CF_{i,t} + \beta_3 CF_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 LEV_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 CASH_{i,t} + \sum YEAR + \sum INDUSTRY + \varepsilon \quad (2)$$

4. Empirical Analysis

4.1 Descriptive Statistics

A breakdown of the descriptive statistics for the dependent and independent variables are provided for the overall sample in Table 2. There are obvious differences in investment decision-making level among enterprises. There are coexistence of reducing investment and expanding investment among TINV, ININV and OUTINV. And there are coexistence of efficiency optimum and inefficiency among TE, INE and OUTE. In addition, the mean value for industrial policies is 0.4879, which indicates that nearly half of enterprises are supported by industrial policies.

Table 2 Descriptive Statistics

Variable	Obs	Mean	SD	Min	Max
TINV	6292	0.0397	0.0399	-0.0170	0.1922
ININV	6292	0.0391	0.0574	-0.1314	0.2607
OUTINV	6292	0.0013	0.0440	-0.1696	0.1930
TE	6292	0.0194	0.0226	0.0000	0.2096
INE	6292	0.0431	0.0501	0.0000	0.4212
OUTE	6292	0.0255	0.0350	0.0000	0.2010
IP	6292	0.4879	0.4999	0	1
CF	6292	0.0450	0.0679	-0.1523	0.2409
GROWTH	6292	0.1221	0.2961	-0.5095	1.4800
LEV	6292	0.4560	0.1977	0.0735	0.8764
SIZE	6292	22.6409	1.2555	20.2807	26.4351
CASH	6292	0.1427	0.1060	0.0122	0.5413

4.2 Regression Analysis

Model (409) introduces the interaction term between IP and CF to test hypotheses. Table 3 and Table 4 show the result of it.

4.2.1 Industrial Policy and Investment Scale

Table 3 shows the impact of industrial policies on the scale of investment. As can be seen from column (1), the coefficient of the interaction term is 0.0432, with a significant positive correlation at the level of 1%. This suggests that industrial policy can effectively promote the increase of overall investment by improving the cash flow of enterprises, and H1 is verified.

Next two columns are the regression results with inward investment scale and outward investment scale as dependent variables, respectively. In column (2), the coefficient of IP*CF is positive but not significant. And in column (3), the coefficient of IP*CF is positive and significant. The comprehensive results show that the increase of capital brought by the industrial policy mainly flows to the outward investment of enterprises. H2 fails the verification while H3 is verified.

Table 3 Industrial policy and investment scale

VAR	(1)TINV	(2)ININV	(3)OUTINV
IP	-0.0012 (-0.86)	0.0005 (0.27)	-0.0026 (-2.20)
IP*CF	0.0432*** (2.98)	0.0199 (0.98)	0.0337** (1.98)
CF	0.0561*** (6.36)	0.0184 (1.42)	0.0347*** (3.14)
GROWTH	0.0087*** (4.97)	0.0305*** (10.67)	-0.0210*** (-8.98)
LEV	-0.0084** (-2.53)	-0.0093* (-1.94)	-0.0005 (-0.13)
SIZE	0.0020*** (4.03)	0.0040*** (5.67)	-0.0018*** (-3.11)
CASH	-0.0524*** (-10.91)	-0.0651*** (-9.60)	0.0108* (1.82)
CONS	0.0119 (1.08)	-0.0340** (-2.15)	0.0456*** (3.50)
YEAR	Controlled	Controlled	Controlled
INDUSTRY	Controlled	Controlled	Controlled
OBS	6292	6292	6292
ADJ-R2	0.1301	0.1070	0.0410

4.2.2 Industrial Policy and Investment Efficiency

Table 4 shows the impact of industrial policies on the efficiency of investment. The results show that the coefficient of the interaction term is 0.0101, and it is not significant. This indicates that enterprises supported by industrial policies can not affect the investment efficiency of enterprises on the whole. Thus H4 is not verified.

After differentiating the investment direction, industrial policies have different effects on the investment efficiency of enterprise. Industrial policy is significantly positively correlated with the efficiency of inward investment at the level of 10%, while it is still not significantly correlated with the efficiency of outward investment. That is to say, industrial policy only aggravates the inefficiency of enterprises' inward investment. H5 passes the verification while H6 fails.

Table 4 Industrial policy and investment efficiency

VAR	(1)TE	(2)INE	(3)OUTE
IP	-0.00034 (-0.46)	-0.0031* (-1.70)	-0.0030** (-2.30)
IP*CF	0.0101 (1.16)	0.0330* (1.85)	0.0168 (1.21)
CF	0.0058 (1.14)	0.0001 (0.01)	-0.0012 (-0.13)
GROWTH	0.0044*** (4.24)	0.0135*** (5.33)	0.0055*** (2.93)
LEV	0.0008 (0.40)	0.0050 (1.17)	0.0115*** (3.59)
SIZE	-0.0012*** (-4.17)	-0.0025*** (-3.95)	-0.0019*** (-4.12)
CASH	-0.0058* (-1.92)	-0.0321*** (-4.77)	-0.0180*** (-3.67)
CONS	0.0490*** (7.64)	0.0995*** (7.28)	0.0734*** (7.09)
YEAR	Controlled	Controlled	Controlled
INDUSTRY	Controlled	Controlled	Controlled
OBS	6292	6292	6292
ADJ-R2	0.0441	0.0419	0.0266

5. Conclusions and Suggestions

This paper focuses on the investment behavior of listed enterprises, and analyzes the impact of industrial policies on the investment scale and investment efficiency from the perspective of investment direction. The results show that, on the whole, the industrial policy support can significantly increase the investment scale of enterprises, but has no significant impact on the investment efficiency of enterprises. While distinguishing investment activities from capital flows, it is found that the industrial policy support has a different impact on the two types of investment behaviors. Industrial policy reduces the efficiency of inward investment, while it increases the scale of outward investment.

The conclusion of this paper provides a direction for the investment management of enterprises. Since the influence of industrial policy on the two types of investment behaviors is different, enterprises need to take different management measures for different investment projects. For the investment in internal operation, enterprises should focus on the return rate of projects to improve the efficiency of investment. And for the outward investment, enterprises can expand money input on the basis of ensuring sufficient operating funds.

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