Pisco Med Publishing

Original Research Article

Regional Heterogeneity of the Impact of FDI on China's Marketization Process

Jingwei Guo[1], Xizhe Chen[1], Yinghong Wang[1], Yefei Gao[1], Jingkai Wang[2], Liang Zhao[6]

[1]Shanghai Starriver Bilingual School, Shanghai, China

[2]Shangrao No.1 Middle School, Shanghai, China

[3]St.Johnsbury Academy, Vermont, U.S.A.

Abstract: As the process of marketization gradually takes place in China after 1978's initiation of the reform and opening-up policy, FDI which is attracted by China's preferential policies has become the main driving force of Economic growth. This paper tries to identify the determinants of marketization from the perspective of FDI based on provincial panel data ranged from 2000 to 2017 in China. Two-way-fixed effect model shows that the relationship between FDI and Marketization Level existed huge regional heterogeneity in China. Specifically, Eastern regions with higher development showed a stronger relationship, while in less developed western regions, this relationship was less significant. We also explore the heterogeneity from the time periods. The results indicate that FDI's positive effect on Eastern China's marketization level was slowing down, while FDI's positive effect on Western China's marketization level was escalating.

Keywords: FDI; Marketization; Heterogeneity; Economic Growth; Fixed Effect Model

1. Introduction

Since December, 1978, Chinese government has altered its organizing structures and policies with the emphasis on internal reform and, equally importantly, opening up the gate of the country to the international world. It was named as "Economic Reform and open up."[1] The reform also changed the economic strategy of China, which then facilitated marketization, a restructuring process focusing on the domination of the economic structure by market force and mechanism instead of central command and macroeconomic adjustment by government, leading to the establishment of "Socialist Market Economy" (Wang, 2015). The newly designed economic system allowed the country to absorb vast amount of foreign direct investment (FDI).[2] After Economic Reform and open up, China has been one of the countries with most amount of FDI. As of the end of year 2017, China has become the country with second largest amount of FDI (Gao, 2019).[3,4] Although FDI has been observed as a positive stimulus to the marketization process of Chinese economy by motivating systematic reform and innovation, it is also a fact that FDI is out-of-balance between east and west region of the country (Sheng, 2009; Wu, 2006).[4] Wu (2006) points out in his research that the causes behind the imbalance is due to government policies' early priority on east region and coastal area and the inherent locational and economic advantage of the above region has rendered it attractive to FDI.[5] Great market potential, stable socio-economic environment, low labor cost, and equipment of relatively complete infrastructure are all the factors that determine the destination of FDI, and in the case of China after 1978, the east was allowed to absorb more FDI than the west region did (Zhang, 2013). As a result, inflow of FDI facilitated the change and advancement of the east China by altering the economic system and people's mindset and opinion towards an open economy.[4] The perfected economic system, elevated level of marketization, and increased acceptance and efficiency of the government of the east further increased the advantage of this region, so that even more FDI was concentrated on the east (Wu, 2006). In recent years, the west is still more favored by FDI and the above causes have largely determined the current structure within the country.

2. Literature review

2.1 FDI facilitates china's marketization process

[6]The entry of FDI into China forces the Chinese government to accelerate the transformation of its functions, because the entry of FDI will put forward higher requirements for the fairness of market competition, the completeness of laws and regulations,

doi: 10.18282/l-e.v9i3.1598

and the efficiency and transparency of government work. The entry of FDI also promoted the changes of the distribution system and the labor and personnel system, and promoted the marketization of resource allocation. (Qi Chen & He Chen, 2014) For example, from 1979 to 1984, FDI was mainly concentrated in four special economic zones, whose influence was mainly reflected in the preliminary exploration of the socialist market economic system. The entry of FDI also promotes the development of domestic factor market and the perfection of competition rules.

[6]Before the mid-1990s, due to the restrictions of relevant laws and regulations in China and the general hesitating attitude of foreign investors, foreign investment mainly adopts the mode of joint venture and cooperative operation. The main purpose of these approaches is to take advantage of China's preferential policies, public relations, domestic sales channels and other advantages to reduce the risks of foreign companies' production and operation in China. (Qi Chen He Chen,2014)[7] However, with the gradual improvement of China's investment environment and the increasingly promising market prospect, the growth rate of the share of the wholly-owned foreign companies began to accelerate. Especially in the middle and late 1990s, foreign companies took advantage of the further relaxation of China's opening up policy to quickly seize the Chinese market by choosing the extremely advantageous wholly-owned foreign companies. (Zhang, 2006) These changes have also facilitated China's marketization.

2.2 FDI's influence on eastern china's marketization process

[8]Due to the support of government in the east of China, FDI is usually located in this region. It appears mostly in the Pearl River Delta. However, this brings problems. (Yuan, Li, 2010).

[9]FDI companies came to this region, letting the price of land to raise. More labors were attracted to this area. However, it also caused high-level skilled labors' shortage. Thus, FDI companies would move to Bo Hai Coastal Region, for example Shanghai and Beijing. This region has more resources of land and concentrate a large amount of high skilled workers. However, this caused a change in every region, where some place had more investment and some place less of it. It might then lead to unbalanced development in the east of China (Li, 2010).

[9]There is a negative correlation between investment by state-owned enterprises and the FDI. The FDI helped the regions to develop and it attracted more state-owned companies to invest in this area. This would cause the crowding-out effect, which is disadvantageous to the FDI (Li, 2010).

[10]FDI might cause merger or acquisition on companies with future development or higher efficiency. This might restrict the development of some local companies (Shi, 2003).

[8]Because of the FDI, the east region in China is more developed. Thus, the price of the labor and other resources has raised. Comparing to the South-Asia region, the price of labor is no longer that competitive. Thus, a lot of FDI companies would rather invest in the South-Asia region (Yuan, Li, 2010).

[10]FDI companies usually invested in the manufacturing industries in the east of China. They don't usually invest in the agriculture industry, causing the industrial structure changing (Shi, 2003).

[8]Due to the historical reason, the east part of China's FDI developed for longer time compared to the west of China. Thus, FDI in the east of China is facing overcapacity, relatively saturated investment and more competition (Yuan, Li, 2010)

3. Summary statistics

3.1 Data summary

In the study, we adopted data from the most professional and authentical database in China: National Bureau Statistics of China.[15] Besides, in order to quantify marketization level, we adopted Fan gang Wang xiaolu's Marketization Index Research Report[16] which is the well-known and authentic marketization index in China.

We took the following data from the database of National Bureau Statistics of China: total amount of foreign investment, total amount of import and export, acceptance of patent applications, fiscal expenditure, sales of commercial housing, primary industry GDP,secondary industry GDP, tertiary Industry GDP, GDP, per capita disposable income and the number of registered capital of foreign-funded enterprises. In addition, we obtained the marketization index from Fan gang Wang xiaolu's Marketization Index Research Report. These data will help to back up our examinations, and provide a more comprehensive angle of analysis.

The data we collected examine the situations of 31 provinces including Eastern region provinces—Beijing, Tianjin, Shanxi Province, Heilongjiang Province, Shanghai, Jiangsu Province, Zhejiang Province, Anhui Province, Fujian Province, Jiangxi Province, Shandong Province, Henan Province, Hebei Province, Hubei Province, Hunan Province, Guangdong Province, Hainan Province, and Western region provinces— Inner Mongolia Autonomous Region, Liaoning Province, Jilin Province, Guangxi Zhuangzu Autonomous Region, Chongqing, Sichuan Province, Guizhou Province, Yunnan Province, Shaanxi Province, Gansu Province, Qinghai Province, Ningxia Huizu Autonomous Region, Xinjiang Uygur Autonomous Region, Xizang Autonomous Region from 2000 to 2017.

In order to avoid extreme values, we process the data by using log processes and per GDP calculations.

Among variables in the modeling section, marketization index is the explained variable; total amount of foreign investment is settled as the explanatory variable; total amount of import and export, acceptance of patent applications, fiscal expenditure, sales of commercial housing, primary industry GDP,secondary industry GDP, tertiary Industry GDP are introduced as the controlled variables.

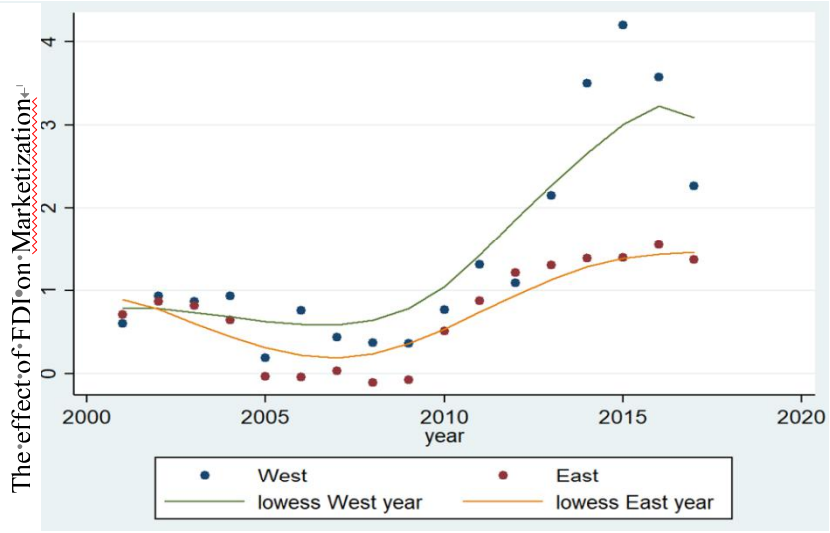
From the standard deviations, it is easy to draw conclusion that the marketization index in different provinces are significantly different, while the amount of FDI in provinces does not share great variance. This raises a question of where and why did the similar amount of FDI input result in great level of marketization and subtle level of marketization, which is discussed in the literature review sections.

3.2 Empirical modeling result

The model shown below is the final model based on the baseline modeling result which displays the effect of FDI on both Eastern and Western Marketization process from 2000 to 2020.

From the model, it is obvious that the positive impact of FDI on Eastern Region's marketization process in larger than that of in the Western Region before roughly the year of 2003.

Figure 1. Impact of FDI on eastern and western marketization level.



4. Empirical modeling

4.1 Empirical model

To assess the impact of FDI on marketization process, we construct the following regression model.

$Yit = \alpha 0 + \alpha 1\ FDI1it + \alpha 2X\ it + \delta i + \mu t + \varepsilon it$

In the model, subscript "I" refers to provinces while "t" refers to time. The term "$\alpha 0$" is the constant. Y is the explained variable while FDI1 is the explanatory variable. "X it" is the combination of controlled variables including import and export, innovation, fiscal expenditure, sales of commercial housing, primary gdp, secondary gdp, tertiary gdp, population and number of firm. "δi" captures province fixed effect while μt captures year fixed effect. At last, "εit" is the error term, random disturbances.

4.2 Baseline modeling and results

To examine the relationships between FDI and Eastern 's and Western's yearly marketization, we use the baseline modeling, extract the coefficients of FDI in considering the year dummy variable, and make the final model (see in 3.2) which directly compares the impacts of FDI on Eastern 's and Western's marketization process.

Table 2. Eastern region baseline result

	(1) MARK	(2) MARK	(3) MARK	(4) MARK	(5) MARK	(6) MARK	(7) MARK	(8) MARK	(9) MARK
FDI1	0.508	0.00325	0.620**	0.573**	0.589**	0.576**	0.573**	0.304	0.111
	(1.27)	(-0.01)	(3.14)	(2.98)	(3.17)	(3.07)	(3.05)	(1.59)	(0.62)
year=2000 # FDI1	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
year=2001 # FDI1	0.810	0.665	0.798**	0.775**	0.761**	0.764**	0.762**	0.751**	0.709**
	(1.33)	(1.39)	(2.71)	(2.71)	(2.75)	(2.76)	(2.75)	(2.81)	(2.85)
year=2002 # FDI1	2.122**	1.089	1.113**	1.153**	1.109**	1.118**	1.104**	0.974**	0.865**
	(2.75)	(1.78)	(2.96)	(3.15)	(3.13)	(3.15)	(3.10)	(2.83)	(2.69)
year=2003 # FDI1	2.439**	0.989	1.223**	1.269**	1.216**	1.219**	1.188**	1.007**	0.817*

	(3.00)	(1.53)	(3.07)	(3.27)	(3.25)	(3.25)	(3.12)	(2.73)	(2.37)
year=2004 # FDI1	2.605**	0.693	1.169**	1.190**	1.094**	1.096**	1.055**	0.916*	0.639
	(3.08)	(1.02)	(2.79)	(2.92)	(2.78)	(2.78)	(2.61)	(2.34)	(1.74)
year=2005 # FDI1	1.824*	-0.161	0.190	0.238	0.0853	0.0830	0.0447	-0.107	-0.285
	(2.13)	(-0.23)	(0.45)	(0.57)	(0.21)	(0.21)	(0.11)	(-0.27)	(-0.77)
year=2006 # FDI1	1.925*	-0.112	0.437	0.379	0.254	0.248	0.213	0.0526	-0.0404
	(2.25)	(-0.16)	(1.02)	(0.91)	(0.63)	(0.62)	(0.52)	(0.13)	(-0.11)
year=2007 # FDI1	-0.536	-0.156	-0.282	-0.272	-0.296	-0.292	-0.291	-0.132	0.0308
	(-1.13)	(-0.42)	(-1.22)	(-1.22)	(-1.37)	(-1.35)	(-1.34)	(-0.62)	(0.15)
year=2008 # FDI1	-0.667	-0.345	-0.396	-0.353	-0.387	-0.385	-0.385	-0.240	-0.106
	(-1.34)	(-0.88)	(-1.64)	(-1.50)	(-1.71)	(-1.69)	(-1.69)	(-1.08)	(-0.51)
year=2009 # FDI1	-0.657	-0.405	-0.357	-0.277	-0.371	-0.369	-0.370	-0.215	-0.0732
	(-1.24)	(-0.97)	(-1.39)	(-1.10)	(-1.53)	(-1.52)	(-1.52)	(-0.91)	(-0.33)
year=2010 # FDI1	1.884*	-0.0759	0.759	0.712	0.556	0.553	0.540	0.503	0.508
	(2.00)	(-0.10)	(1.63)	(1.57)	(1.27)	(1.26)	(1.23)	(1.18)	(1.28)
year=2011 # FDI1	2.398*	-0.0512	0.891	0.828	0.915	0.906	0.892	0.807	0.876*
	(2.41)	(-0.06)	(1.79)	(1.71)	(1.96)	(1.93)	(1.90)	(1.78)	(2.07)
year=2012 # FDI1	2.389*	0.168	1.139*	1.051*	1.108*	1.102*	1.094*	1.093*	1.214**
	(2.45)	(0.22)	(2.35)	(2.22)	(2.43)	(2.41)	(2.39)	(2.47)	(2.95)
year=2013 # FDI1	2.407*	0.311	1.122*	1.035*	1.007*	1.008*	1.006*	1.073*	1.301**
	(2.48)	(0.40)	(2.33)	(2.21)	(2.23)	(2.23)	(2.22)	(2.45)	(3.18)
year=2014 # FDI1	2.269*	0.406	1.118*	1.040*	1.104*	1.107*	1.108*	1.180**	1.381***
	(2.43)	(0.54)	(2.42)	(2.32)	(2.55)	(2.55)	(2.55)	(2.81)	(3.52)
year=2015 # FDI1	1.894*	0.644	0.936*	0.979*	0.951*	0.961**	0.970**	1.110**	1.390***
	(2.37)	(1.02)	(2.39)	(2.57)	(2.59)	(2.61)	(2.63)	(3.11)	(4.14)
year=2016 # FDI1	1.327	0.654	1.069**	1.155**	0.992**	1.003**	1.014**	1.191***	1.546***
	(1.78)	(1.12)	(2.95)	(3.27)	(2.90)	(2.92)	(2.94)	(3.56)	(4.88)
year=2017 # FDI1	1.465*	0.715	0.865*	0.908**	0.837*	0.844*	0.854*	1.007**	1.369***
	(2.02)	(1.25)	(2.46)	(2.65)	(2.53)	(2.54)	(2.56)	(3.12)	(4.48)
EXP		2.417***	0.418**	0.672***	0.439**	0.480**	0.549*	0.707**	0.704***
		(13.04)	(2.81)	(4.25)	(2.73)	(2.69)	(2.43)	(3.21)	(3.43)
PATENT			1.880***	1.498***	1.498***	1.521***	1.511***	2.028***	1.348***
			(20.97)	(11.57)	(11.99)	(11.47)	(11.25)	(11.75)	(7.01)
EXP				-4.895***	-6.701***	-6.618***	-6.417***	-5.793***	-0.883

				(-3.99)	(-5.37)	(-5.25)	(-4.84)	(-4.51)	(-0.62)
HOUSING					3.248***	3.191***	3.210***	1.942*	0.696
					(4.56)	(4.42)	(4.44)	(2.58)	(0.96)
PGDP						0.401	0.366	2.129*	4.738***
						(0.53)	(0.48)	(2.57)	(5.44)
TGDP							-0.323	-1.735*	-0.0921
							(-0.50)	(-2.49)	(-0.13)
POP								-1.082***	-2.185***
								(-4.54)	(-7.79)
FIRM									1.850***
									(6.44)
SGDP									
Constant	4.644***	4.208***	2.376***	-0.544	-0.424	-0.581	-0.449	2.002*	0.0604
	(11.44)	(13.14)	(-6.41)	(-0.93)	(-0.75)	(-0.91)	(-0.65)	(2.33)	(0.07)
Observations	306	306	306	306	306	306	306	306	306
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	RE
Province Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	RE

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. Western region baseline result

	(1) MARK	(2) MARK	(3) MARK	(4) MARK	(5) MARK	(6) MARK	(7) MARK	(8) MARK	(9) MARK
FDI1	2.163	1.919	0.142	0.469	0.521	0.373	0.367	0.322	0.0627
	(1.23)	(1.06)	(0.14)	(0.55)	(0.63)	(0.44)	(0.43)	(0.37)	(-0.07)
year=2000 # FDI/gdp	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
year=2001 # FDI/gdp	1.071	1.041	0.632	0.564	0.578	0.570	0.550	0.565	0.600
	(0.41)	(0.39)	(0.44)	(0.45)	(0.48)	(0.47)	(0.46)	(0.47)	(0.51)
year=2002 # FDI/gdp	1.254	1.260	0.740	0.616	0.660	0.676	0.664	0.754	0.935
	(0.49)	(0.49)	(0.53)	(0.51)	(0.57)	(0.58)	(0.57)	(0.64)	(0.81)
year=2003 # FDI/gdp	0.810	0.819	0.885	0.666	0.558	0.575	0.565	0.649	0.862
	(0.33)	(0.33)	(0.66)	(0.57)	(0.49)	(0.51)	(0.50)	(0.57)	(0.77)
year=2004 # FDI/gdp	1.706	1.628	1.580	1.318	1.110	1.118	1.119	1.195	0.935
	(0.62)	(0.59)	(1.05)	(1.00)	(0.88)	(0.88)	(0.89)	(0.94)	(0.75)
year=2005 # FDI/gdp	1.068	1.004	1.139	0.709	0.398	0.425	0.426	0.474	0.187
	(0.39)	(0.36)	(0.75)	(0.54)	(0.31)	(0.33)	(0.34)	(0.37)	(0.15)

year=2006 # FDI/gdp	1.510	1.444	1.582	1.146	1.027	1.070	1.077	1.156	0.754
	(0.54)	(0.52)	(1.04)	(0.86)	(0.81)	(0.84)	(0.84)	(0.90)	(0.59)
year=2007 # FDI/gdp	2.979	2.891	1.525	1.351	1.097	1.131	1.168	1.237	0.440
	(0.99)	(0.96)	(0.93)	(0.94)	(0.80)	(0.82)	(0.85)	(0.89)	(0.32)
year=2008 # FDI/gdp	3.666	3.575	2.273	1.740	1.319	1.358	1.465	1.479	0.367
	(1.12)	(1.09)	(1.27)	(1.12)	(0.88)	(0.90)	(0.97)	(0.98)	(0.24)
year=2009 # FDI/gdp	4.918	4.797	2.457	1.884	1.325	1.355	1.477	1.503	0.366
	(1.44)	(1.40)	(1.31)	(1.15)	(0.84)	(0.86)	(0.93)	(0.95)	(0.23)
year=2010 # FDI/gdp	7.035	6.895	3.324	2.886	1.790	1.795	1.927	1.960	0.767
	(1.97)	(1.93)	(1.69)	(1.69)	(1.08)	(1.08)	(1.16)	(1.17)	(0.45)
year=2011 # FDI/gdp	7.260	7.078	4.184*	3.336	2.303	2.317	2.440	2.463	1.312
	(1.94)	(1.89)	(2.04)	(1.86)	(1.33)	(1.33)	(1.40)	(1.41)	(0.75)
year=2012 # FDI/gdp	6.857	6.602	3.729	3.144	1.939	1.950	2.020	2.019	1.085
	(1.85)	(1.77)	(1.83)	(1.77)	(1.12)	(1.13)	(1.17)	(1.16)	(0.63)
year=2013 # FDI/gdp	8.520*	8.156*	4.956*	4.269*	3.153	3.133	3.092	3.080	2.147
	(2.14)	(2.02)	(2.25)	(2.22)	(1.69)	(1.68)	(1.66)	(1.65)	(1.15)
year=2014 # FDI/gdp	9.182*	8.748*	6.125**	4.743*	4.420*	4.378*	4.216*	4.219*	3.500
	(2.35)	(2.21)	(2.83)	(2.51)	(2.43)	(2.40)	(2.30)	(2.30)	(1.93)
year=2015 # FDI/gdp	7.992*	7.746	6.456**	4.779*	4.735*	4.671*	4.468*	4.525*	4.201*
	(2.02)	(1.95)	(2.98)	(2.52)	(2.59)	(2.55)	(2.43)	(2.45)	(2.32)
year=2016 # FDI/gdp	5.089	4.927	5.138**	3.667*	3.618*	3.644*	3.395*	3.413*	3.576*
	(1.59)	(1.53)	(2.93)	(2.38)	(2.45)	(2.46)	(2.27)	(2.28)	(2.43)
year=2017 # FDI/gdp	1.683	1.689	3.278*	2.073	1.938	2.009	1.888	1.923	2.262*
	(0.68)	(0.68)	(2.41)	(1.74)	(1.69)	(1.74)	(1.63)	(1.66)	(1.98)
IMEX		1.065	-1.539	-0.0430	-0.108	-0.0207	-0.0493	0.0713	0.0319
		(0.69)	(-1.82)	(-0.06)	(-0.15)	(-0.03)	(-0.07)	(0.09)	(0.04)
PATENT			1.973***	1.140***	1.049***	1.065***	1.067***	0.923***	0.886***
			(22.53)	(9.07)	(8.55)	(8.52)	(8.54)	(3.52)	(3.44)
EXP				-2.844***	-2.609***	-2.589***	-2.859***	-2.805***	-1.908***
				(-8.35)	(-7.86)	(-7.75)	(-6.91)	(-6.62)	(-3.73)
HOUSING					5.722***	5.618***	5.085***	5.451***	5.429***
					(4.29)	(4.18)	(3.56)	(3.53)	(3.58)
PGDP						-0.892	-0.898	-1.555	-1.838
						(-0.68)	(-0.69)	(-0.93)	(-1.11)

TGDP							1.557	1.451	1.223
							(1.10)	(1.02)	(0.87)
POP								0.239	-0.542
								(0.63)	(-1.19)
FIRM									1.081**
									(3.00)
SGDP									
Constant	2.865***	2.833***	2.436***	0.387	0.456	0.617	0.0499	-0.157	-0.850
	(4.93)	(4.85)	(-6.16)	(0.80)	(0.98)	(1.18)	(0.07)	(-0.19)	(-1.03)
Observations	252	252	252	252	252	252	252	252	252
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	RE
Province Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	RE

5. Conclusion and further studies

5.1 Conclusion

Based on provincial panel data ranged from 2000-2017 in China, two-way-fixed effect model shows that FDI is one of the key driving forces of marketization in China, we identified a significant positive effect among those two variables, besides that, we also find that this relationship exists huge regional heterogeneity in China, more specifically, Eastern regions with higher development shows a stronger relationship, while in less developed western regions, this relationship is less significant. We also explore the heterogeneity from the time periods, the results show that 2002 is one of the turning points of relationship among FDI and marketization.

5.2 Further studies

According to the empirical modeling baseline result, there is a negative correlation between population and marketization, and a negative correlation between primary/secondary/tertiary industry GDP and marketization. Further studies can focus on other factors affecting marketization.

Also, to analyze the relationship between FDI and marketization process, further studies can sub-divide marketization level into three aspects including non-state-owned economic development, development of product market, and development of factor market.

References

1 Wang, Xinglin. Chinese Marketization's contribution to Economic Growth. Global Market Information Guide 31(2015): 26–26.

2 Gao, Yuebo. The Study on the Impact of Marketization Level on China's ability to Attract FDI. Diss. 2019.

3 Sheng, Jinfei. FDI and China's Marketization Progress. Diss. Nankai University.

4 Wu, Xianzhong. An Empirical Study on FDI and the Difference between Marketization of China's East and Midwest Economies. Diss. East China Normal University.

5 Zhang, Liang. Financial Market Development, Labor Market Incompleteness, and FDI). Diss. Nankai University.

6 Qi XinFang, Chen Fangju, He YiSheng, Chen Yunlu. The study of the status, effect and problems of FDI in China). Diss. International trade 112 class.

7 Kevin H. Zhang Foreign Direct Investment and Economic Growth in China: A Panel Data study for 1992-2002 The conference of "WTO, China and Asian Economies".