

EAST ASIAN DEVELOPMENT NETWORK



EADN WORKING PAPER No. 80 (2014)

Financial Development, Foreign Direct Investment, and Investment Allocation in China

(February 2013)

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Abstract

Using a panel data set covering 30 manufacturing industries for the period 1999-2007, this paper assesses the effects of financial development and foreign direct investment (FDI) on the efficiency in the allocation of China's industry investments. The empirical results suggest a strong complementary effect between FDI and banking market development on the efficiency of investment, which prove that both banking market development and FDI have significant positive functions in the efficiency of capital allocation. However, there is a strong substitution effect between FDI and stock market development on investment efficiency, which means stock market development plays a negative role in channeling funds to better investment opportunities. Tests of the role of financial market structure in improving investment allocation indicate that bank-based financial market development has positive effect on investment efficiencies. Further studies indicate FDI spillovers and financial markets development affect the average level

of industrial investment, which favors capital accumulation.

Key words: Foreign direct investment, financial development, allocation of investment

JEL Classification: E51 F21 G11 O16

1. Introduction

A fundamental role of the financial system is to allocate capital efficiently, since capital must be invested in the sectors that are expected to have high returns, and withdrawn from sectors showing poor prospects. Financial development does more than just provide a sideshow to the real economy, since it helps a country take better advantage of its investment opportunities (Wurgler2000). While the financial sector may not account for all of the cross-country variations in the quality of capital allocation, it can explain substantial proportions. Recent studies have focused on the effect of a country's financial development on economic growth. Calderon and Liu (2003) found that financial development generally leads to economic growth, and financial deepening propels economic growth through more rapid capital accumulation and productivity growth, which is stronger. But Rioja and Valev (2004) pointed out that financial development has an uncertain impact on growth in countries with very low levels of financial development; a large, positive effect on growth in countries with intermediate levels of financial development; and a positive, but smaller effect on countries with high levels of financial development. Christopoulos and Tsionas (2004), who investigated the long-run relationship between financial depth and economic growth, found a unidirectional causality from financial depth to growth.

Is better capital allocation a reason why economic growth is associated with financial development? Ndikumana (2005) said financial intermediation affects domestic investment, notably by alleviating financing constraints, thus allowing firms to increase investments in response to an increased demand for output. Based on their study, Galindo et al. (2007) confirmed that financial liberalization improves the efficiency with which investment funds are allocated. For their part, Islam and Mozumdar (2006) examined the impact of financial market development on the extent to which firms have to rely on internal capital for making investments, and uncovered evidence of a negative relationship between financial market development and internal capital. Pang and Wu (2009) looked into the channels of capital allocation through which finance promotes growth, and found that countries with developed financial markets invest more in growing industries and pull out investments from declining ones.

It is a well-known fact that foreign direct investment (FDI) flows have increased dramatically over the last three decades or so in China. It is widely believed that FDI enhances the productivity of host countries and promotes economic development. This notion stems from the fact that there are two mechanisms through which FDI growth-enhancing effects may take place. First, the FDI-growth nexus may involve an impact of FDI on capital accumulation (Alguacil et al. 2008). Second, owing to the technology and knowhow embodied in FDI, host economies are expected to benefit from these investments since FDI creates technological externalities, knowledge spillovers or demonstration effects for the local economy.

There are three fundamental mechanisms for FDI spillovers to take place. First, the

entry of multinational corporations (MNCs) may lead to greater competition in domestic markets, which then forces domestic firms to utilize their resources and technology more efficiently, leading to productivity gains. Second, knowledge may spillover to domestic firms via labor turnover. Third, foreign firms in domestic markets may have demonstration effects on domestic firms.

FDI seems to be the most direct and efficient way of acquiring technologies enjoyed in the most advanced economies, and hence an important mechanism of economic convergence. However, empirical evidence on whether FDI contributes to growth is mixed. FDI has been shown to have both beneficial and detrimental effects on growth, while many studies find it have no impact at all (Akinlo 2004; Herzer, Klasen and Nowak-Lehmann 2008). The inconclusive results of the empirical research have led some authors to call for caution when drawing generalized conclusions about the existence of externalities associated with foreign direct investment. Most of the previous studies on FDI often assume that its spillovers occur automatically as a consequence of foreign firms' presence in domestic markets. The channels of FDI spillovers are not explicitly taken into account in such studies (Alguacil et al. 2011). Findings in literatures indicate that a country's capacity to take advantage of FDI externalities maybe limited by local conditions such as the development of local financial markets (Alfaro et al.2004), the human capital (Borensztein et al. 1998), and the policy environment (Balasubramanayam et al. 1996).

Is capital allocation a reason why economic growth is associated with the entry of FDI, since the foreign capital injected into the host economy could also contribute to a

country's development through more efficient investment fund allocation at the industry level, as FDI changes the structure of imperfectly competitive industries? The arrival of FDI will typically bring two forces at work to change supplies and demands in a number of related industries. One is a competition effect under which multinationals substitute for domestic final-goods producers. Another is a linkage effect of intermediate-goods producers, creating complementarities that could benefit domestic final-goods producers (Markusen et al. 1999).

Despite this body of theory, there is little direct evidence on whether FDI improves capital allocation. This paper seeks to fill the gap by complementing an emerging literature that studies the relationship between FDI and capital allocation. FDI may ease credit constraints by bringing in scarce capital, since domestically owned businesses in developing countries such as China are much more likely to face credit constraints than multinational firms. However, not all FDI around the world represents net capital flows, but often such investments are financed in local markets. According to Harrison and McMillan (2003) one major reason why domestic enterprises are more credit-constrained than their foreign counterparts in the same sector is crowding out by foreign entrants, which are more profitable and more liquid than domestic firms.

Alfaro et al. (2003) said FDI alone plays an ambiguous role in contributing to economic growth but countries with well-developed financial markets gain significantly from FDI. Wang (2006) said improving the efficiency of financial market decreases financing costs and improve the learning capacity of labor, which in turn will increase the spillover effect of FDI and promote economic growth in greater degree. Yang and Lai

(2006) show that while FDI promotes capital accumulation in China, lower efficiency of financial system hampers absorption of technology spillover for local firms. Zhao and Zhang (2007) assert that negative technology spillover of FDI results from China's financing deepening lagging behind the inflow of FDI. Noting the condition of fixed FDI, Sun (2008) said financial development positively influences the domestic capital accumulation and economic growth. Financial development is helpful in absorbing FDI inflows, provides better services to foreign-owned companies, and transforms the potential FDI spillover effect to real productivity.

Wurgler (2000) pointed out that the results showing how financial markets development improves capital allocation are subject to the usual qualifications inherent in cross-country analysis, such as small sample size and coarse data and definitions. One way to improve these cross-country results is to examine in-country changes in capital allocation over time. Using the panel data set covering 30 manufacturing industries for the period 1999-2007, this paper assesses the effects of financial development and FDI on the efficiency in the allocation of China's industry investment. The empirical results suggest that FDI fulfills a significant positive function in channeling funds to better investment opportunities. Moreover, FDI and banking market development have a strong complementary effect on investment efficiency, which proves that banking market development and FDI have significant positive contributions to the efficiency of capital allocation. However, FDI and stock market development have a strong substitution on investment efficiency, which in turn enables stock market development to play a significant negative function in channeling funds to better investment opportunities.

Tests of the role of financial market structure in improving investment allocation show that bank-based financial market development has a positive impact on channeling funds to better investments. Further studies indicate that FDI spillovers and financial markets development affect the average level of industrial investment, which is in favor of capital accumulation.

The paper proceeds as follows. Section 2 presents the methodology of measuring the efficiency of capital allocation and the empirical specification. Section 3 discusses data and the measurement of key variables and demonstrates some descriptive evidence. Section 4 presents the main results and analysis. Section 5 shows some additional robustness checks and extensions results. Section 6 concludes the paper.

2. Methodology

2.1 Measuring the Efficiency of Capital Allocation

Following the approach of Wurgler (2000), the first step to measuring capital allocation efficiency is to find its proxy, which assumes that optimal investment implies increasing investment in growing industries and decreasing investments in declining industries. This paper estimates the elasticity of investment for each industry in each province or region of China covered by this study, and compares the results with the elasticity for each country covered by Wurgler (2000) and with the elasticity of investment for each industry in each country discussed in Pang and Wu (2009). This paper estimates the following simple specification for each province or region of China firstly:

$$GINV_{ip,t} = \alpha_p + \eta_p GVI_{ip,t} + \varepsilon_{ip,t} \quad (1)$$

Where $GINV_{ip,t} = \ln(I_{ip,t}/I_{ip,t-1})$, $I_{ip,t}$ is the amount of gross fixed capital formation, and $GVI_{ip,t} = \ln(V_{ip,t}/V_{ip,t-1})$, $V_{ip,t}$ is the value added. Hence $GINV_{ip,t}$ and $GVI_{ip,t}$ denote the growth of investment and value added from year $t-1$ to t ; i indexes manufacturing industry; indexes province or region; and t indexes year. The slope estimate in Eq. (1) is an elasticity which measures the extent to which province p increases investment in its growing industries and decreases investment in declining industries.

This study also presents the investment elasticity for industry i in each province in China or region p using the following regression:

$$GINV_{ip,t} = \alpha_p + \eta_i GVI_{ip,t} + \varepsilon_{ip,t} \quad (2)$$

The efficiency of capital allocation is measured by the parameter η_{ip} , the elasticity of investment with respect to value added. The difference between Eq. (1) and Eq. (2) is that the latter estimates the elasticity of investment for each industry in each province or region in China compared to one elasticity for each province or region in the former.

2.2 Empirical Specification

By looking at a specific mechanism by which the financial market and FDI spillovers affect the efficiency of capital allocation, this paper presents the following specification, which shows that financial markets and FDI spillovers variables explain some of the cross-province variation:

$$EFF_p = \alpha + \beta_1 FDI_p + \beta_2 FDI_p + \varepsilon_p \quad (3),$$

where EFF is the efficiency measure of capital allocation in China's province or

region p , FD measures the level of financial development in a province or region p . FDI denotes the foreign presence or FDI inflows in a province or region p .

As this paper focuses on the effects of financial markets and FDI spillovers on capital allocation across provinces and industries, it estimates the following equation:

$$EFF_{ip} = \alpha_i + \lambda_p + \beta_1 FD_p + \beta_2 FDI_{ip} + \varepsilon_i \quad (4),$$

where EFF is the efficiency measure of capital allocation of industry i in a province or region p , and α_i and λ_p are vectors of industry- and province-specific effects, respectively, which greatly reduce the problem of omitted variables bias. The main interest is in the sign and significance of parameter β_s since the hypothesis states that financial markets development and FDI spillovers may have some impact on the capital allocation efficiency.

There are plausible reasons to expect that financial markets may complement the spillover effects of FDI since well-developed financial markets enhance the competitive response of the domestic industry and enable domestic firms to capitalize on linkages with new multinationals. Alfaro et al. (2004) confirmed that countries with well-developed financial markets benefit significantly more from FDI than countries with weaker markets when FDI is combined with a range of measures of financial development. This paper goes further by looking at the differential effects of FDI spillovers and financial market development on capital allocation across industries, and whether this differential effect is related to the level of financial development which can reduce information asymmetry and lower the cost of raising funds from outsiders.

Employing the above methodologies, the paper interacts FDI with financial market

development indicators as a regressor. To ensure that the interaction term does not proxy for FDI or the level of financial market development, both FDI and financial market development variables are also included in the regression. Thus this paper presents the following equation:

$$EFF_{i,p} = \alpha_i + \lambda_p + \beta_1 FDI_p + \beta_2 FDI_{i,p} + \beta_3 FDI_p \times FDI_{i,p} + \varepsilon_i \quad (5),$$

3. Data and Descriptive Evidence

3.1 Data Sources

This paper uses the Support System for China Statistics Application (ACNR) Database as a source of basic manufacturing statistics. The database reports on annual capital formation and value added for the period 1999–2007 for 30 two-digit SIC China's manufacturing industries, spread across 22 provinces, four autonomous regions (excluding Tibet), and four municipalities. The province-level proxies of financial development are from the *China Compendium of Statistics 1949-2008*, which gives the total loans and the deposits of industrial enterprise, the raised capital of listed companies in the deposits and loans of financial institutions, and basic statistics on security and insurance sheets.

The province-level proxies of FDI spillovers are from the *China Statistical Yearbook* (NBSC 2000–2008), which covers 30 manufacturing industries operating between 1999 and 2007 (with the exception of 2004, when no data was available). The industrial statistics come from state-owned and non-state-owned industrial enterprises with principal revenues amounting to over 5 million yuan for the period 1999-2006. For 2007, industrial

statistics come from industrial enterprises above designated size and with principal revenue of over 5 million yuan. The data comprises the gross industry output values of industrial enterprises above designated size, and industrial enterprises with capital infusions from Hong Kong, Macao, Taiwan, and other countries.

Data for foreign presence proxy of each industry across 30 provinces or regions for the period 1999-2007 are from the ACNR Database, which reports the gross industry output values of industrial enterprises above designated size, and industrial enterprises with foreign capital infusions from Hong Kong, Macao, Taiwan, and other foreign sources. Data measuring industrial dependence on external finance are also from ACNR Database, which reports the 2005 assets-liability ratio of industrial enterprises above designated sizes of industry by region in each province and region.

3.2 Definitions of Key Variables

The dependent variables used in this paper are estimated from Eqs. (1) and (2), EFFP and EFFIP, which present the efficiency measure of capital allocation in China's province or region p and the efficiency measure of capital allocation of industry i in province or region p , respectively. Independent variables are as defined as follows:

Financial market development variables. The ideal measure of financial development should capture the key functions of financial markets: channeling funds from lenders to borrowers, encouraging risk sharing, and alleviating asymmetric information problems through better monitoring and screening, among other measures. Unfortunately, no

reliable single measure is available to reflect all of these aspects. Thus, this paper uses various measures of financial development.

One of these is the ratio of total loans to industrial enterprise by bank sectors to gross regional product of industry, *Credit_I*, as the main measure of financial development, which is determined by the average total loans to industrial enterprise during the period 1999-2007 to the average gross regional product of industry during the same period, that is:

$$Credit_I = \frac{\sum_{t=1999}^{2007} L_{I_t}}{\sum_{t=1999}^{2007} GRP_{I_t}}$$

Where L_{I_t} refers to the total loans to industrial enterprise, and GRP_{I_t} is the gross regional product of industry in year t for each province or region p .

Another measure used is the ratio of total loans by bank sectors to the gross regional product, *Credit*, which is measured by the ratio of average total loans during period 1999-2007 to the average gross regional product during period 1999-2007, that is:

$$Credit = \frac{\sum_{t=1999}^{2007} L_t}{\sum_{t=1999}^{2007} GRP_t}$$

Where L_t is the total loans, and GRP_t is the gross regional product in year t for each province or region p .

The above two measures are expected to capture one important function of the banking sectors, which is to provide funds to productive firms and industries.

The third measure is the ratio of stock market capitalization to gross regional product, *Stock*, which is measured by the average raised capital amounts of listed companies during the period 1999-2007 to the average gross regional product during the period 1999-2007, that is:

$$Stoc = \sum_{t=1999}^{2007} S_t / \sum_{t=1999}^{2007} GRP_t$$

Where S_t is the raised capital of listed companies and GRP_t is the gross regional product in year t for each province or region p .

FDI spillovers variables. This study uses foreign presence and FDI flows as the main measure of FDI spillovers to capture their impacts on the efficiency of capital allocation.

FDIP, the foreign presence in each province or region p , is defined as the average percentage of gross industry output value of industrial enterprises with capital infusions from Hong Kong, Macao, Taiwan and other foreign sources in the same industry during the period 1999-2007, that is:

$$FDIP = \sum_{t=1999}^{2007} FTV_t / \sum_{t=1999}^{2007} TV_t,$$

where FTV_t is the gross industry output value of industrial enterprises with foreign capital infusion by region, and TV_t is the gross regional product of industrial enterprises above designated size by region in year t for each province or region p .

FDIF, the FDI inflows in each province or region p , is defined as the ratio of the total investment of foreign-funded enterprises by region to the gross regional product during the period 1999-2007, that is:

$$FDIF = \sum_{t=1999}^{2007} Flow_t / \sum_{t=1999}^{2007} GRP_t,$$

where $Flow_t$ is the total investment of foreign-funded enterprises by region at yearend, and GRP_t is the gross regional product in year t for each province or region p .

FDIIP, the foreign presence in each industry of province or region p , is defined as the average percentage of gross industry output value of industrial enterprises with capital

infusions from Hong Kong, Macao, Taiwan, and other foreign sources in the same industry within a province or region during the period 1999-2007, that is:

$$FDI I P = \sum_{t=1999}^{2007} FTV_{it} / \sum_{t=1999}^{2007} TV_{it}$$

where FTV_{it} is the gross industry output value of industrial enterprises with capital infusions from Hong Kong, Macao, Taiwan, and other foreign sources in industry by region, and TV_{it} is the gross regional product of industrial enterprises above designated size of industry I by region in year t for each province or region p .

To check the robustness of the results, this paper controls for a number of industrial as well as provincial or regional characteristics in the analysis. These variables are discussed when the paper performs robustness checks.

3.3 Descriptive Evidence

Efficiency of Capital Allocation in 30 Chinese Provinces and Regions

Table 1 shows the provincial elasticity estimates from Eq. (1). One notable and reassuring feature of these coefficients is that they are all positive. A second feature is that the range of estimates is very wide, from 0.12(Yunnan) to 0.87(Jiangsu), which implies a large variation of investment opportunities across Chinese provincial economies. The next highest estimates are those from Shanxi, Zhejiang and Guangdong, with magnitudes above 0.7, while the next lowest estimates come from Xinjiang, Guangxi, and Jilin, with magnitudes below 0.2. The relationship fits best in Guangdong and Zhejiang, with an R^2 of 0.6. All provinces with low elasticity estimates, such as Yunnan, Xinjiang, Jilin, Shanxi and Guangxi, have weaker fits.

Table 1. Estimates of industry investment elasticity to value added for Chinese provinces and regions

Province	EFF	Adjusted R-squared	Obs.	Rank
Beijing	0.41	0.28	226	19
Tianjin	0.38	0.24	227	21
Hebei	0.61	0.29	232	9
Shanxi	0.21	0.06	218	26
Inner Mongolia	0.48	0.16	198	14
Liaoning	0.34	0.14	233	23
Jilin	0.20	0.04	229	27
Heilongjiang	0.53	0.26	226	13
Shanghai	0.67	0.56	229	7
Jiangsu	0.87	0.56	234	1
Zhejiang	0.73	0.60	234	3
Anhui	0.24	0.12	234	25
Fujian	0.68	0.37	234	6
Jiangxi	0.54	0.23	233	12
Shandong	0.64	0.46	233	8
Henan	0.41	0.21	233	18

Hubei	0.46	0.25	232	16
Hunan	0.54	0.39	234	11
Guangdong	0.71	0.60	234	4
Guangxi	0.17	0.05	227	28
Hainan	0.47	0.12	197	15
Chongqing	0.68	0.38	226	5
Sichuan	0.45	0.20	233	17
Guizhou	0.56	0.33	221	10
Yunnan	0.12	0.06	211	30
Shaanxi	0.73	0.38	222	2
Gansu	0.32	0.11	224	24
Qinghai	0.38	0.20	161	22
Ningxia	0.39	0.21	176	20
Xinjiang	0.17	0.07	198	29

Table 2 presents a summary analysis of the key variables in this study. There is considerable variation in the efficiency measure of capital allocation variables: the efficiency measure of capital allocation in China's provinces or regions, $EFFP$, ranging from 0.12 to 0.87; and the efficiency measure of capital allocation of industry I in provinces or regions p , $EFFIP$, ranging from -1.12 to 2.48. The financial market development variables also range extensively: the ratio of total loans to industrial enterprises by bank sectors to gross regional product of industry, $Credit_I$, ranges from

0.23 to 0.87; the ratio of total loans by bank sectors to gross regional product, *Credit*, ranges from 0.62 to 1.99; the ratio of stock market capitalization to gross regional product, *Stock*, ranges from 0 to 0.09. The FDI variables also show variations: the foreign presence in each province or region, FDIP, ranges from 0.02 to 0.61; the FDI inflows in each province or region, FDIF, range from 0.01 to 0.3; the foreign presence in each industry of province or region, FDIIP, ranges from 0 to 1.

Table 2. Statistical summary

	Mean	Maximum	Minimum	Std. Dev.	Observations
EFFP	0.47	0.87	0.12	0.20	30
EFFIP	0.78	2.48	-1.12	9.70	878
CREDIT_I	0.38	0.87	0.23	0.12	30
CREDIT	1.03	1.99	0.62	0.28	30
STOCK	0.02	0.09	0.00	0.02	30
FDIP	0.20	0.61	0.02	0.18	30
FDIF	0.07	0.30	0.01	0.07	30
FDIIP	0.21	1.00	0.00	0.22	884

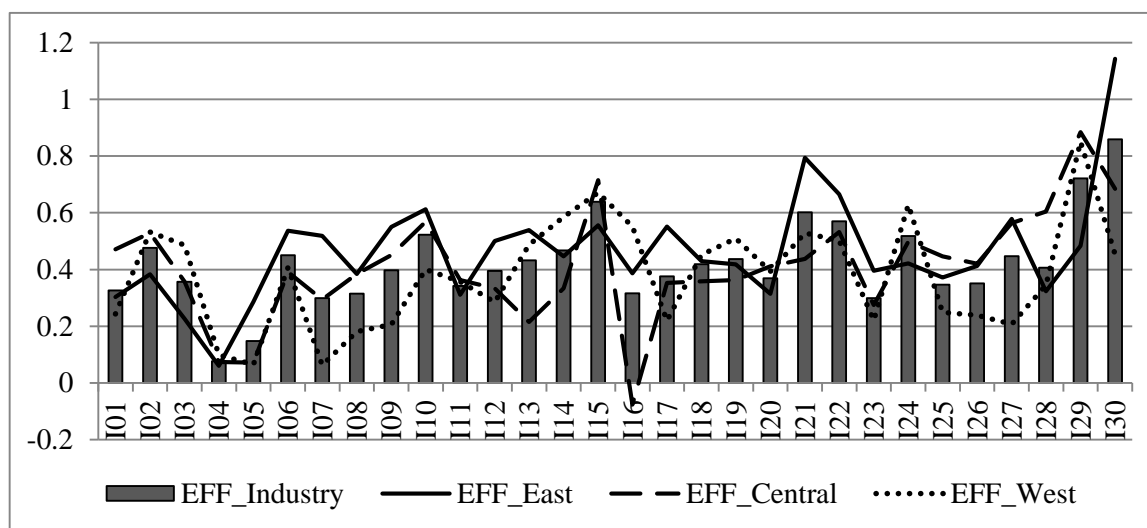
Before turning to econometrics, the paper illustrates the efficiencies of capital

allocations across industry investments in Chinese provinces and regions. Figure 1 shows the average elasticity by industry. The Y-axis in the figure represents the average efficiencies of capital allocation while the X-axis represents the two-digit ISIC (*International Standard Industrial Classification*) industrial sectors. The figure suggests a large variation of efficiencies of capital allocation for each industry investments since the average elasticity is wide, from 0.1 (tobacco sector) to 0.86 (recycling and disposal of waste sector). The next highest average elasticity comes from the manufacture of artwork and other manufacturing subsectors, namely, medicine, smelting and pressing of nonferrous metals, metal products, and paper and paper products, with a magnitude above 0.5. The next lowest average elasticity is found in the manufacture of textiles, with a magnitude below 0.2.

Provinces and regions are divided into three groups: east, central, and west. While the patterns of capital allocation efficiencies across industry investments in the groups are different, Figure 1 shows the efficiencies of capital allocation for most industries in the east groups are higher than those in the central and west groups, particularly in such sectors as the recycling and disposal of waste, melting and pressing of nonferrous metals, manufacture of metal products, general purpose machinery, textile and apparel, footwear and caps, leather, fur, feather and related products, processing of timber, wood, bamboo, rattan, palm and straw products, and manufacture of furniture, paper and paper products, which also have higher efficiencies of capital allocation among the industries.

Figure 1. Elasticities across industry investments of groups of Chinese provinces and

regions



Note: Chinese provinces and regions compositions are grouped accordingly. The East group includes Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan. The Central group consists of Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan. The West group comprises Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Inner Mongolia, and Guangxi.

The two-digit ISIC industrial sectors are the following: I01 — Processing of Food from Agricultural Products, I02 — Manufacture of Foods, I03 — Manufacture of Beverages, I04 — Manufacture of Tobacco, I05=Manufacture of Textile, I06 — Manufacture of Textile Wearing Apparel, Footwear and Caps, I07 — Manufacture of Leather, Fur, Feather and Related Products, I08 — Processing of Timber, Manufacture of Wood, Bamboo, Rattan, Palm and Straw Products, I09 — Manufacture of Furniture, I10 — Manufacture of Paper and Paper Products, I11— Printing, Reproduction of Recording Media, I12 — Manufacture of Articles For Culture, Education and Sport Activities, I13 — Processing of Petroleum, Coking, Processing of Nuclear Fuel, I14 — Manufacture of Raw Chemical Materials and Chemical Products, I15=Manufacture of Medicines, I16=Manufacture of Chemical Fibers, I17 — Manufacture of Rubber, I18 — Manufacture of Plastics, I19 — Manufacture of Non-metallic Mineral Products, I20 — Smelting and Pressing of Ferrous Metals, I21 — Smelting and Pressing of Non-ferrous Metals, I22=Manufacture of Metal Products, I23 — Manufacture of General Purpose Machinery, I24 — Manufacture of Special Purpose Machinery, I25 — Manufacture of Transport Equipment, I26 — Manufacture of Electrical Machinery and Equipment, I27 — Manufacture of Communication Equipment, Computers and Other Electronic Equipment, I28 — Manufacture of Measuring Instruments and Machinery for Cultural Activity and Office Work, I29 — Manufacture of Artwork and Other Manufacturing, I30 — Recycling and Disposal of Waste.

4. Empirical Results

The regression results for the model specified in Eq.(3), with the dependent variable,

EFFP, are reported in Table 3. This section focuses on the coefficients of financial market development and FDI spillovers variables.

In column (1)-(3) of Panel A in Table 3, the indicator of financial market development, *Credit_I*, *Credit*, and *Stock* entered the model one by one, and the FDI spillovers variable is FDIP. Contrary to expectations, the results are not supportive of the idea that financial market development in China leads to improved efficiency in investment allocation. The coefficients on financial market development variables are all negative, albeit insignificantly, which suggests that financial market development in China has a weak function in channeling funds to better investments. However, the coefficients on *FDI* spillover variables are significantly positive at 5 percent, which indicates that the FDI has a significantly positive effect on improvements in investment allocation. Columns (4) and (5) of Panel A present the results when the bank sector and stock sector financial development indicators, *Credit_I*, *Stock* and *Credit*, *Stock*, are included in the model at the same time. However, observations that China's financial market development has a weak function in channeling funds to better investment opportunities while the FDI has a significantly positive effect on improvements in investment allocation remain.

Table 3. Effects of financial market development and FDI on capital allocation efficiency in China's provinces and regions

Panel A. Financial market development and the FDI spillovers

	(1)	(2)	(3)	(4)	(5)
Credit_I	-0.44			-0.38	
	(-1.60)			(-1.07)	
Credit		-0.14			-0.06
		(-1.07)			(-0.37)
Stock			-1.90	-0.61	-1.36
			(-1.19)	(-0.31)	(-0.63)
FDIP	0.45**	0.50**	0.46**	0.45**	0.48**
	(2.45)	(2.56)	(2.44)	(2.42)	(2.39)
C	0.55***	0.51***	0.41***	0.53***	0.46***
	(4.74)	(3.89)	(7.23)	(4.19)	(3.04)
Obs.	30	30	30	30	30
Dependent variable	EFFP	EFFP	EFFP	EFFP	EFFP
R ²	0.24	0.20	0.21	0.24	0.21

Panel B Financial market development and the FDI inflows

	(6)	(7)	(8)	(9)	(10)
Credit_I	-0.45			-0.39	
	(-1.56)			(-1.05)	
Credit		-0.11			-0.02
		(-0.84)			(-0.12)
Stock			-1.93	-0.61	-1.75
			(-1.15)	(-0.29)	(-0.77)
FDIF	0.86*	0.95*	0.87*	0.87*	0.89
	(1.70)	(1.75)	(1.69)	(1.68)	(1.62)
C	0.58***	0.52***	0.44***	0.57***	0.46***
	(4.92)	(3.80)	(8.05)	(4.35)	(2.90)
Obs.	30	30	30	30	30
Dependent variable	EFFP	EFFP	EFFP	EFFP	EFFP
R Squared	0.16	0.11	0.13	0.16	0.13

Note: The *t*-statistics are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels.

To further study FDI's role in inducing significant positive effects on improvements in investment allocations, the FDI spillovers variable, FDIP, is replaced with FDIE. Nevertheless, results reported in Panel B suggest that FDI has a significant positive effect on improvements in investment allocation, although China's financial market development has a weak role in bringing funds to better investment opportunities.

Table 4. Effects of financial market development and FDI spillovers on the efficiency of capital allocation for each industry in China's provinces or regions

	(1)	(2)	(3)	(4)	(5)	(6)
Credit_I	1.429		3.336	-6.477		-13.28***
	(0.52)		(0.92)	(-1.38)		(-2.66)
Credit_I*FDIIP				26.31**		136.0***
				(2.08)		(6.98)
Stock		-4.575	-16.95		30.41	75.42***

		(-0.29)	(-0.82)		(1.30)	(3.03)
Stock*FDIIP					-140.7**	-833.2***
					(-2.04)	(-7.16)
FDIIP	5.813***	5.799***	5.799***	-3.830	8.403***	-28.68***
	(3.88)	(3.87)	(3.87)	(-0.78)	(4.27)	(-4.90)
Ind	0.0190	0.0188	0.0186	0.0201	0.0223	0.0432
	(0.50)	(0.50)	(0.49)	(0.53)	(0.59)	(1.17)
Id	0.0410**	0.0399*	0.0370*	0.0551***	0.0332	0.0425**
	(1.98)	(1.89)	(1.73)	(2.53)	(1.56)	(1.97)
C	-2.840*	-2.168*	-3.096*	-0.458	-2.589**	0.668
	(-1.83)	(-1.77)	(-1.96)	(-0.24)	(-2.09)	(0.35)
Obs.	878	878	878	878	878	878
DV	EFFIP	EFFIP	EFFIP	EFFIP	EFFIP	EFFIP
R ²	0.0185	0.0183	0.0193	0.0234	0.023	0.0793

Note: The *t*-statistics are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels. Ind and Id are industry- and province-specific effects variables, respectively.

The regression results for the model specified in Eq. (4) and Eq. (5) with the dependent variable, EFFIP are presented in Table 4. In column (1)-(3) of Table 4, the indicators of financial market development, *Credit_I* and *Stock*, are integrated into the model one at a time, and the FDI spillovers variable is FDIIP. The coefficients on financial market development variables are all insignificant, which suggests financial market

development of China has a weak impact on channeling funds to better investment opportunities, the coefficients on FDI spillovers variables are positive and significant at 1 percent, which indicates FDI has a significant positive effect on improvements in investment allocation.

The inclusion of interactive effect variables is meant to test the joint importance of financial market development and FDI. Regressions in columns (4)-(6) of Table 4 puts the spotlight on the role of FDI in improvements in investment allocation through financial markets by interacting the FDI variable with financial market development variables in Eq. (5). To determine the importance of financial sector development in enhancing improvements in investment allocation, one can ask this hypothetical question: To what extent does a one standard deviation increase in the FDI variable enhance improvements in investment allocation by receiving the mean level of financial markets variable in the sample? The effect of financial sector development on the efficiency of investment is calculated as follows:

$$PEFF_FD = \frac{\partial EFF_{i,p}}{\partial FD_p} = \beta_1 + \beta_3 FDI_{i,p}$$

The effect of FDI on the efficiency of investment is calculated as:

$$PEFF_FDI = \frac{\partial EFF_{i,p}}{\partial FD_p} = \beta_2 + \beta_3 FD_p$$

In column(4) the coefficient on the ratio of total loans to industrial enterprise by bank sectors to gross regional product of industry, banking market development variable, *Credit_I*, is insignificantly negative while the coefficient on interaction of the FDI variable with *Credit_I* is significantly positive. If the mean value for FDIIP is 0.21, then the effect of

banking market development on efficiency of investment is $PEEF_{FD}=0+0.21*26.31=5.53$, since the coefficient on the variable *Credit_I* is insignificant. As it turns out, banking market development has a significant positive function in channeling funds to better investment opportunities. If the mean value for *Credit_I* is 0.38, then the effect of FDI on efficiency of investment is $PEEF_{FDI}=0+0.38*26.31=10$, since the coefficient on FDI variable is insignificant. FDI also has a significant positive function, which becomes greater than the effects when it does not consider the role of banking markets in channeling funds to better investment opportunities.

In column (5) the coefficient on the stock market development variable, *Stock*, is insignificantly positive while the coefficient on interaction of FDI variable with *Stock* is significantly negative. The effect of stock market development on investment efficiency is $PEEF_{FD}=0+0.21*(-140.7)=-29.5$, since the coefficient on the stock market development variable, *Stock*, is insignificant. Stock market development has a significant negative function in channeling funds to better investment opportunities. If the mean value of *Stock* is 0.02, then the effect of FDI on efficiency of investment is $PEEF_{FDI}=8.403+0.02*(-140.7)=5.59$, which also suggests that FDI has a significant positive function, which, however, is less than the effects when the model does not consider the role of stock markets in channeling funds to better investment opportunities.

The results shown in column (6) of Table 4 illustrate the consistent consequence when regressions include the simultaneous interaction of bank sector and stock sector financial development indicators with the FDI variable in the model. The impact of banking market development on the efficiency of investment is

$PEEF_{FD} = -13.28 + 0.21 * 136.0 = 15.28$, but the effect of stock market development on efficiency of investment is $PEEF_{FD} = 75.42 + 0.21 * (-833.2) = -99.6$. This shows that banking market development has a significant positive function in channeling funds to better investment opportunities while stock market development has a significant negative function in channeling funds to better investment opportunities. The effect of FDI on investment efficiency is $PEEF_{FDI} = -28.68 + 0.38 * 136.0 + 0.02 * (-833.2) = 6.34$, which again suggests that FDI has a significant positive function in channeling funds to better investment opportunities.

Columns (1) to (3) show that financial market development variable is statistically insignificant. However, when introduced as an interactive term with FDI variable, the impact of financial market development becomes significant. The interaction between the local bank sector development and the extent of FDI spillovers suggests a complementary effect, which means that they are interdependent and that the positive impact of banking sector development on efficiency of investment allocation should be complemented by FDI spillovers. FDI significantly promotes efficiency of capital allocation within provinces and regions that have more developed banking markets while the positive actions of banking market development are reinforced along with increased FDI.

FDI by MNCs, which are among the most technologically advanced firms, is considered to be a major means of access to advanced technologies by developing countries. This spillover effect is believed to be both direct—MNCs providing subsidiaries an efficiency advantage—and indirect—MNCs generating positive spillovers. The entry

of FDI typically changes supply and demand in a number of related industries, since FDI could change the structure of imperfectly competitive industries. Increased competition brought about by the coming of MNCs may force local firms to improve their technologies and then in favor of the investment allocations of the host country' industries.

China's domestic firms may also upgrade their own production methods as they gain more knowledge through exposure to the MNCs' superior technology and more efficient management techniques. Domestic firms could improve their investment allocation if they are not constrained by their balance sheet positions or by reduced access to bank credit, which encourages firms to follow MNCs' investment decisions since they have the ability to raise external funds when they are conscious of the MNCs' market investment signals. On the contrary, when the effect of interaction between stock sector development and FDI on investment allocation efficiency is considered, one finds a significant substitution effect, which indicates FDI impedes stock sector development from having a positive influence on effective capital allocation.

China has enjoyed huge economic growth for more than 30 years even if it is still faced with issues of investment efficiency. The Chinese stock market, however, remains inefficient for many China's listed firms, which are owned by the state, have poor quality, and face high policy risk that is associated with the market (Wang et al. 2009). Stock market development is therefore in a weak position to channel funds to better investment opportunities. Based on these results, FDI has a significant positive effect on improvements in investment allocation. Moreover, there is a strong complementary effect

between FDI and banking market development on efficiency of investment, that is, the contribution of banking sector development to channeling funds to better investment opportunities is enhanced by its interaction with FDI. This, even as China's banking market development is deemed weak when its interactivities with FDI are neglected.

A look into the interaction between banking market development and FDI shows that they have a significant positive impact on bringing funds to better investment opportunities. The positive role of FDI is significantly enhanced with heightened local bank sector development. However, there is a strong substitution effect between FDI and stock market development on investment efficiency, which means stock market development has a significant negative role in channeling funds to better investment opportunities.

5. Additional Robustness Checks and Extensions

5.1 Structure of the Financial Market

At a broad level, the literature on the linkage between financial development and growth explores two channels of impact. The first is the depth of the financial system, as measured by indicators such as the ratio of bank credit to GDP, or the ratio of stock market capitalization to GDP. The second is the structure of the financial system, as measured by indicators such as the ratio of bank credit to stock market capitalization. The debate on the relative merits of bank-based versus market-based financial systems has a long history. The bank-based theory emphasizes the positive role of banks in development and growth. It argues that banks can finance development more effectively than markets.

By contrast, the market-based theory highlights the advantages of well-functioning markets in promoting successful economic performance. Big, liquid, and well-functioning markets foster growth and profit incentives, enhance corporate governance, and facilitate risk management, diversification, and the customization of risk management devices (Luintel et al. 2008; Ndikumana2005).

As discussed in Section 4, an analysis of the role of FDI in improvements in investment allocation through financial markets shows that stock market development has a negative function while credit market development has no impact on channeling funds to better investment opportunities. This section relies on China’s structure of the financial system variables, FSTR1 and FSTRU2, which are measured by the ratio of total loans to industrial enterprise by bank sectors, and total loans by bank sectors to stock market capitalization, respectively, to determine the role of financial market development in improvements in investment allocation. Table 5 presents the results.

Table 5. Structure of the Financial Market

	(1)	(2)	(3)	(4)
FDIIP	7.108***	7.084***	-2.581	-3.717
	(4.15)	(4.14)	(-1.00)	(-1.37)
FSTRU1	0.0124		-0.0325*	

	(1.34)		(-2.53)	
FSTRU2		0.00509		-0.0135**
		(1.35)		(-2.59)
FSTRU1*FDIIP			0.257***	
			(4.98)	
FSTRU2*FDIIP				0.108***
				(5.08)
Ind	0.0212	0.0211	0.0409	0.0413
	(0.51)	(0.51)	(0.99)	(1.00)
Id	0.0516*	0.0520*	0.0341	0.0328
	(2.26)	(2.28)	(1.50)	(1.43)
C	-3.462*	-3.510*	-1.291	-1.141
	(-2.53)	(-2.54)	(-0.91)	(-0.79)
Obs	795	795	795	795
DV	EFFIP	EFFIP	EFFIP	EFFIP
R ²	0.0238	0.0239	0.0535	0.0548

Note: The t-statistics are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels. Ind and Id are industry- and province-specific effects variables respectively.

In columns (1) and (2) of Table 5, the coefficients on FDI spillovers variables are positive and significant, which again indicates FDI has a significant positive effect on improvements in investment allocation. The coefficients on FSTRU1 and FSTRU2 are positive, though insignificant, which implies that the ratio of bank loan to domestic raised capital in stock market increases the effect in investment allocation. The results seemingly favor a bank-based view even if the banks' function is weak. The coefficient on an interaction between FDI variable with FSTRU1 and FSTRU2 in columns (3) and (4) are significantly positive, which sheds some light on the debate on the comparative merits of banks vs. stock markets in stimulating investment, and indicates that bank-based financial market development has positive a function in allocating funds to better investment opportunities.

If the mean value for FDIIP is 0.21, then the effects of bank based structure of the financial system on the efficiency of investment are $PEEF_FD = -0.0325 + 0.21 * 0.257 = 0.021$ for FSTRU1 and $PEEF_FD = -0.0135 + 0.21 * 0.108 = 0.009$ for FSTRU2, respectively. This shows that a bank-based structure of the financial system has a significant positive function in directing funds to better investment opportunities. The effects of FDI on efficiency of investment are positive since the coefficients on interaction terms are significantly positive while the coefficients on FDI variable are insignificant, which implies that FDI has a significant positive function in moving funds to better investment opportunities.

Indeed, China's bank-based financial systems are in a much better position than market-based systems to address agency problems and economic shortsightedness. Banks can ease distortions emanating from asymmetric information by forming long-run relationships with firms, and through monitoring, contain moral hazard¹ (Luintel et al. 2008). As a result, bank-based arrangements can produce better improvement in resource allocation and corporate governance than market-based institutions.

5.2 Industrial Investment Ratio

Although the above empirical results imply that China's financial market development does not promote capital allocation efficiency, it does not necessarily reject the hypothesis that China's financial market development affects the average level of industrial investment over a long period of time. There are a number of studies around channels through which financial market development facilitates growth. Beck et al. (2000) posited that financial markets enhance economic growth mainly through productivity growth, while their effects on savings and capital investments are rather limited. Carlin and Mayer (2003) showed that countries with better financial markets tend to have more research and development investments in industries that depend more on external finance, while financial development has little differential effect on industrial physical capital investment.

This section utilizes the industrial investment ratio (gross fixed capital formation

¹ In economic theory, a moral hazard is a situation in which a party is more likely to take risks because the costs that could result will not be borne by the party taking the risk. In other words, it is a tendency to be more willing to take a risk, knowing that the potential costs or burdens of taking such risk will be borne, in whole or in part, by others. A moral hazard may occur where the actions of one party may change to the detriment of another after a financial transaction has taken place.

divided by value added) as the dependent variable to examine the relationship between industrial investment and financial market development. Table 8 presents the results of the following regression:

$$INV_{p,t} = \alpha + \beta_1 FD_{p,t} + \beta_2 FDI_{p,t} + \beta_3 FD_{p,t} \times FDI_{p,t} + X_t + \varepsilon_{p,t} \quad (6),$$

where INV corresponds to the industrial investment ratio in a province or region p over a particular period of time t ; FD and FDI denote the level of financial development and the foreign presence in province or region p in a particular period t , respectively, and X stands for the vector of control variables, which include per capita gross regional product (in log, $LNGDP$), and ε_{it} is the error term.

Table 6 presents the results of Eq. (6), with the industrial investment ratio, INV , as the dependent variable. The Hausman test² is used to select the proper specification between fixed-effect and random-effect approaches for the regression model. Columns (3) and (4) list the results of the fixed-effect and the random-effect specifications, respectively, since the statistics of the Hausman test are not available here³ when the stock market development variable, $Stock$, enters the equation. The coefficients on FDI spillovers and financial market development variables are all significantly positive at a conventional level, which indicates that FDI and financial market development affect the average level of industrial investment. This further suggests that the primary contribution of China's

² Hausman test compares an estimator θ_1 that is known to be consistent with an estimator θ_2 that is efficient under the assumption being tested. The null hypothesis is that the estimator θ_2 is indeed an efficient (and consistent) estimator of the true parameters. If this is the case, there should be no systematic difference between the two estimators. If there exists a systematic difference in the estimates, we have reason to doubt the assumptions on which the efficient estimator is based. The Hausman statistic is distributed as χ^2 and is computed as: $H = (\theta_1 - \theta_2)'(V_1 - V_2)^{-1}(\theta_1 - \theta_2)$ where θ_1 is the coefficient vector from the consistent estimator, θ_2 is the coefficient vector from the efficient estimator, V_1 is the covariance matrix of the consistent estimator, V_2 is the covariance matrix of the efficient estimator.

³ The Hausman statistic is usually positive, however, it is also in favor of fixed effect estimates when the difference in the variance matrices $(V_1 - V_2)$ is not positive definite.

financial development is driven mainly by factor accumulation, through mobilizing saving for investment, rather than through fostering efficiency and innovation.

Taken as a whole, the results in this section validate the important hypothesis about how FDI spillovers and financial market development improve the allocation of capital. This in turn indicates that FDI has a significant positive effect on improvements in investment allocation that are associated with increased investment in growing industries and decreased investment in declining industries, or both, while China's financial market development has no significant function in channeling funds to better investment opportunities and even exacerbates “wrong” investment decisions. The hypothesis that industries that are more dependent on external finance tend to grow faster in provinces with more developed financial markets is not supported by the findings of this study. The results of testing the role of financial market structure in improvements in investment allocation seem in favor of bank-based view, though its function is minimal. This shows bank-based financial market development has a positive role in channeling funds to better investment opportunities. However, FDI spillovers and financial markets development affect the average level of industrial investment, which is in favor of capital accumulation.

Table 6. Industrial investment ratio

	(1)	(2)	(3)	(4)
FDIIP	0.703***	0.619**	0.604**	0.425*
	(3.77)	(2.91)	(2.80)	(2.54)

Credit_I	0.375***			
	(8.74)			
Credit		0.171***		
		(3.42)		
Stock			0.701**	0.780**
			(2.62)	(2.90)
LGGDP	-0.353***	-0.474***	-0.490***	-0.476***
	(-15.24)	(-23.99)	(-25.47)	(-25.18)
C	3.621***	4.752***	5.062***	4.967***
	(16.53)	(25.27)	(31.42)	(29.82)
Obs	240	240	240	240
Adjusted R ²	0.8452	0.7994	0.7949	0.3899
Hausman Test	30.4200	8.1400	NA	NA
P Value	0.0000	0.0432		
Model Selection	FE	FE	FE	RE

Note: The t-statistics are in parentheses. ***, **, * denote significance at the 1%, 5%, 10% level. Ind and Id are industry- and province-specific effects variables respectively.

6. Conclusion and Policy Implications

Using the panel data set for 30 manufacturing industries generated between 1999 and 2007, this paper assesses the effects of financial development and FDI on the efficiency in the allocation of China's industry investment. The empirical results suggest that FDI has significant positive function on channeling funds to better investment opportunities. Moreover, there is a strong complementary effect between FDI and banking market development on the efficiency of investment, which turns out that both banking market development and FDI have significant positive function on the efficiency of capital allocation. However, there is a strong substitute effect between FDI and stock market development on the efficiency of investment which results in the stock market development has significant negative function on channeling funds to better investment opportunities.

The test of the role of financial market structure on the improvement effect in investment allocation seems in favor of bank-based view, which indicates bank-based financial market development has positive function on channeling funds to better investment opportunities. Further studies indicate FDI spillovers and financial markets development do affect the average level of industrial investment, which favors capital accumulation.

The results in this study inform policies aimed at increasing the efficiency of capital allocation and boosting domestic investment. First, FDI can play an important role in economic growth, not only by capital accumulation but also via enhancement of efficiency. More prudent policies might involve eliminating barriers that prevent foreign

firms from establishing enterprises and seek to improve domestic conditions, especially the financial markets development, which should have the dual effect of attracting foreign investment and enabling host economies to maximize the benefits of such foreign investment.

Second, the evidence shows that the indicators of banking markets development do not only improve the investment level but also have positive functions vis-à-vis the efficiency of capital investment. This suggests that the primary role of China's financial system goes beyond mobilizing savings and boosting the quantity of investments but extends to enhancing investment efficiency. China has made significant strides in building more robust and efficient financial systems, in particular, China's commercial banks, which continue to play a dominant role in China's financial systems, have improved markedly. Indeed, China will benefit from reducing policy uncertainty, strengthening the regulatory framework, and enforcing creditor and investor rights. This will create an environment that facilitates the development of banks as well as stock markets, which will promote the efficiency of capital allocation.

Such a role requires deeper, broader, and more liquid financial systems since financial development can promote not only static efficiency, which leads to a more efficient allocation of resources, but also dynamic efficiency by facilitating the entry of new players into the market. In particular, expanding financial access to small and medium-scale enterprises and would-be entrepreneurs is vital for dynamic efficiency in which new products, services, and industries bring about structural change and deliver significant gains over time.

References

- Akinlo, A.E. 2004. Foreign direct investment and growth in Nigeria: An empirical investigation. *Journal of Policy Modeling*; 26(5):627–639.
- Alfaro, L., A. Chanda, S. Kalemli-Ozcan, and S. Sayek. 2004. FDI and economic growth: the role of local financial markets. *Journal of International Economics*, 64(1):113–34.
- Alguacil, M., A., Cuadros and V. Orts. 2008. EU enlargement and inward FDI. *Review of Development Economics*, 12(3): 594–604.
- Alguacil, M., A. Cuadros and V. Orts. 2011. Inward FDI and growth: the role of macroeconomic and institutional environment *Journal of Policy Modeling* 33(3):481–496.
- Balasubramanayam, V. N., M. Salisu, and D. Sapsford. 1996. Foreign direct investment and growth in EP and IS Countries. *Economic Journal* 106(434): 92-105.
- Beck, T., R. Levine, and N. Loayza. 2000. Finance and the sources of growth. *Journal of Financial Economics* 58(1-2):261–300.
- Borensztein, E., J. De Gregorio and J.-W. Lee. 1998. How does foreign direct investment affect economic growth? *Journal of International Economics* 45(1):115–135.
- Calderon, C. and L. Liu. 2003. The direction of causality between financial development and economic growth. *Journal of Development Economics* 72(1):321-334.
- Carlin, W. and C. Mayer. 2003. Finance, investment and growth. *Journal of Financial Economics* 69(1):191–226.
- Christopoulos, D.K. and G.T. Efthymios. 2004. Financial development and economic growth: evidence from panel unit root and cointegration tests. *Journal of Development Economics* 73 (1):55-74.
- Galindo, A., F. Schiantarelli, and A. Weiss. 2007. Does financial liberalization improve the allocation of investment? Micro-evidence from developing countries. *Journal of Development Economics*. 83(2):562–587.
- Harrison, Ann E. and M.S. McMillan. 2003. Does direct foreign investment affect domestic credit constraints? *Journal of International Economics* 61(1):73-100.
- Herzer, D., S. Klasen and F. Nowak-Lehmann. 2008. In search of FDI-led growth in developing countries: the way forward. *Economic Modelling*: 25(5):793-810.
- Islam, S.S. and A. Mozumdar. 2007. Financial market development and the importance of internal cash: Evidence from international data. *Journal of Banking & Finance* 31(3):641-658.
- Luintel, K.B., M. Khan, P. Arestis, and K. Theodoridis. 2008. Financial structure and economic growth. *Journal of Development Economics* 86(1):181-200.
- Markusen, James R. and Anthony J. Venables, 1999, Foreign direct investment as a catalyst for industrial development, *European Economic Review*, 43(2), pp.335-356.
- Ndikumana, L. 2005. Financial development, financial structure, and domestic investment: international evidence. *Journal of International Money and Finance* 24(4):651-673.
- Pang, J. and H. Wu. 2009. Financial markets, financial dependence, and the allocation of capital. *Journal of Banking & Finance* 33(5):810–818.
- Rioja, F. and N. Valev. 2004. Does one size fit all?: a reexamination of the finance and growth relationship. *Journal of Development Economics*. 74(2):429-447.
- Sun, L. 2008. Financial development, FDI and economic growth. *Journal of Quantitative & Technical Economics* 25(1): 3-14.
- Wang, Y., L. Wu, and Y. Yang. 2009. Does the stock market affect firm investment in China? A price informativeness perspective. *Journal of Banking & Finance* 33(1):53-62.

- Wang, Y. 2006. FDI Spillover, financial market and economic growth. *Journal of Quantitative & Technical Economics* 23(1):59-68.
- Wurgler, J. 2000. Financial markets and the allocation of capital. *Journal of Financial Economics* 58(1-2):187-214.
- Yang, X. and M. Lai. 2006. FDI and technology spillover: theoretical and empirical research on the role of financial development. *Journal of Quantitative & Technical Economics* 23(6):72-81.
- Zhao, Q. and C. Zhang. 2006. Economy growth and technology spillover effects of FDI: the case of JingJinJi Area, *Journal of Quantitative & Technical Economics* 23(3):111-120.