

# IMF Working Paper

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## Determinants of Corporate Investment in China: Evidence from Cross-Country Firm Level Data

*Nan Geng and Papa N'Diaye*

**IMF Working Paper**

Asia and Pacific Department

**Determinants of Corporate Investment in China: Evidence from Cross-Country Firm Level Data**

**Prepared by Nan Geng and Papa N'Diaye**

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**Abstract**

This paper analyzes the evolution of investment in China, its main features, and its key determinants. In recent years, manufacturing, real estate, and infrastructure have been the main drivers of investment. Investment remains largely concentrated in coastal areas, but there has been a shift to greater investments inland in recent years. The empirical analysis of the determinants of investment indicates that financial variables, such as interest rates, the exchange rate, and the depth of the domestic capital market are important determinants of corporate investment. The results suggest in particular that financial sector reform, including that which deregulates and raises real interest rates as well as appreciates the real effective exchange rate, would lower investment and help rebalance growth away from exports and investment toward private consumption.

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Author's E-Mail Address: [pndiaye@imf.org](mailto:pndiaye@imf.org), [ngeng@imf.org](mailto:ngeng@imf.org)

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## I. INTRODUCTION

China's investment as a share of GDP is now fast approaching 50 percent of GDP, up from slightly under 30 percent in 1982. This level of investment is high by most standards, including when compared with other countries with a similar development strategy, countries with similar income levels, and the rest of the world alike. Most of the investment has been concentrated in the manufacturing sector, encouraged by various cost advantages, including a low cost of capital, labor, utilities, pollution, energy, land, tax incentives, and an undervalued currency. There is a real question of how long China can sustain such a high rate of investment against the backdrop of weak demand from the rest of the world, in particular from the United States and euro area. Persistent high rates of investment run the risk of creating overcapacity in many sectors, exerting deflationary pressure, increasing nonperforming loans in the banking system, and ultimately deteriorating the general government's fiscal position. Such a buildup of excess capacity would also have consequences for the rest of the world, as excess capacity in the manufacturing sector in China would further dampen tradable prices in global markets, potentially creating trade tensions. The Chinese government realizes these risks and envisages in its 12<sup>th</sup> Five-Year Development Plan a set of reforms to rebalance economic growth away from exports and investment towards private consumption. Key to such a structural change is the plan to reform the financial system, which include liberalizing interest rates, developing capital markets, reforming the exchange rate system, and raising the costs of various inputs to production—capital, labor, energy, land, water—and reducing the high level of corporate savings and investment.

This paper provides an overview of corporate investment in China and its key determinants using both macro-and firm-level data for China and evidence from other economies' experience. The empirical frameworks relate investment as a share of output to standard determinants of investment (including growth, real interest rate, and measures of uncertainty) as well as indicators of financial sector development. The main highlights are as follows:

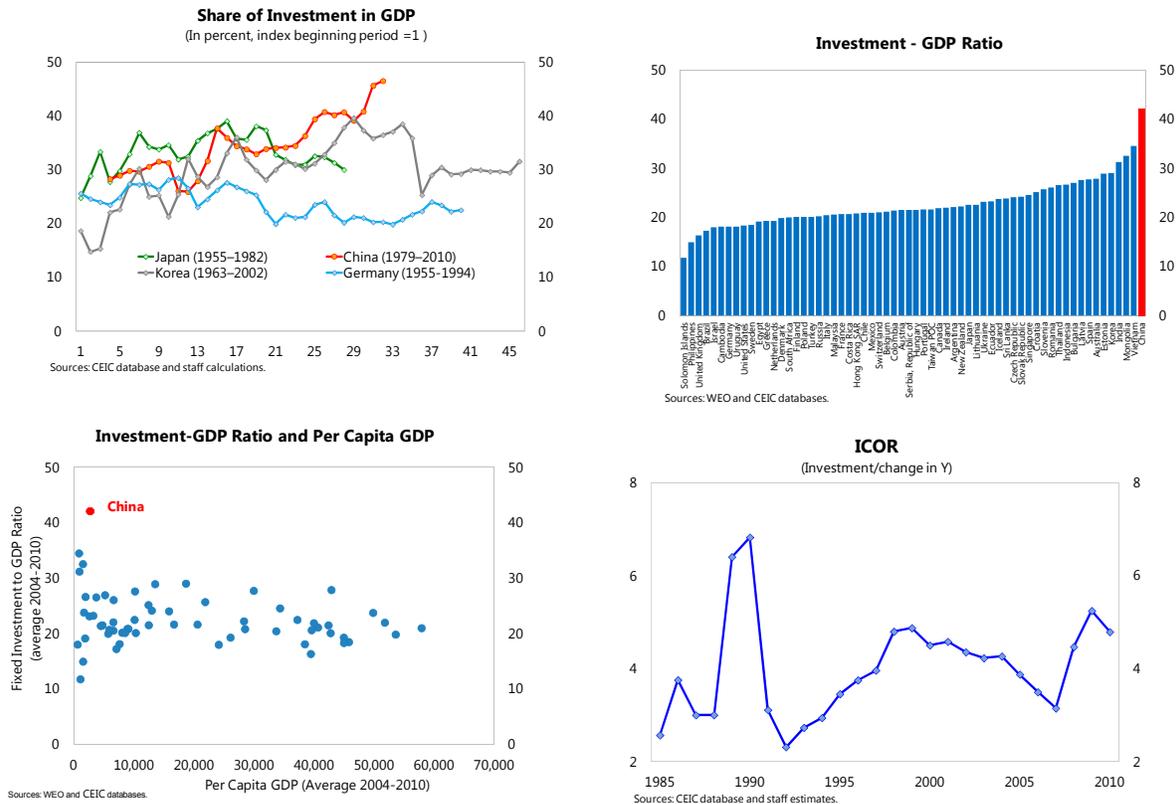
- Investment remains mainly driven by manufacturing, real estate, and more recently infrastructure. It is largely concentrated in coastal areas despite a recent move inland, reflecting the government's urbanization efforts focus on rural development and construction of large inter-provincial transportation networks (especially railways and roads).
- China's effective cost of capital is low, especially when compared with the high level of return investment can generate, and this creates strong incentives for firms to over-invest.
- The empirical analysis of the determinants of investment indicates that financial variables such as interest rates, the exchange rate, and the depth of the domestic capital market are important determinants of corporate investment.
- The empirical analysis suggests that financial sector reform, including that which raises interest rates, appreciates the real effective exchange rate, and develops the domestic capital market, would lower corporate investment, and help rebalance the

Chinese economy. All else equal, developing the domestic capital market alone would increase investment.

The remainder of the paper is organized as follows. Section II provides an overview of the evolution of investment in China and factors that may have influenced it; section III discusses the role of the cost of capital; section IV presents the empirical frameworks; and section V concludes.

## II. EVOLUTION OF INVESTMENT

At over 50 percent of GDP, China's investment is high by most standards. First, China's level of investment stands out when compared with economies that have had a similar development strategy, relying heavily on exports. This has not always been the case; in the early years of China's development both the level and evolution of investment appeared similar to that of other export-oriented economies such as Japan, Korea, and Germany. Second, China's investment stands out when compared with economies with similar income levels notwithstanding the large variation in the level of investment by these economies. And finally, China's investment is high when compared with the rest of the world.



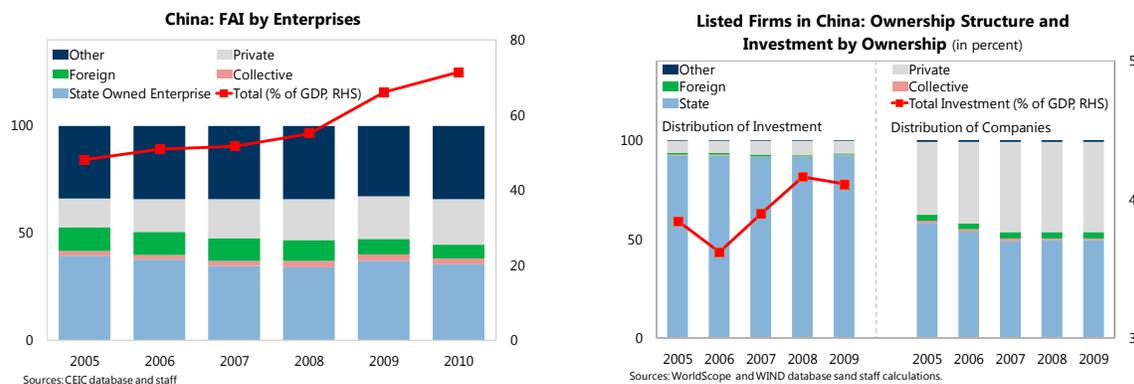
From the national accounts, investment in China has contributed over half of GDP growth on average over the past 10 years (5¼ percentage points out of average of 10 percent). Little is known about the effectiveness of investment, but existing research suggests a high depreciation rate of capital in the range of 10–15 percent and a declining ICOR. In terms of

the capital stock, estimates of China's capital stock using perpetual inventory methods show a capital output ratio of about 2.4, close to that of the United States.<sup>1</sup> Nevertheless, by unit of labor input, China's capital output ratio remained at around 1/10 of U.S. levels. In what follows we will try to highlight the main features of investment in China, including who is investing, the sectors and regions where investment is going, the financing of investment, and the cost of capital.

### A. Who is investing?

Detailed data on investment by type of enterprises are published as part of the high frequency fixed assets investment data released by the National Bureau of Statistics on a monthly basis. These data however do not match the national accounts data because the former includes spending for land acquisition, purchase of used capital, and reflects only capital spending for projects over RMB 500,000.

By type of enterprises, about 35 percent of total fixed asset investments stem from state-owned enterprises, 20 percent from private companies and the remaining from “other” enterprises (which include shareholding companies, joint-stock companies, and share cooperatives). The relative shares of these different categories have evolved substantially over the past five years, with the share of investment by private companies almost doubling. This has come at the expense of state-owned enterprises whose investment declined steadily until 2008, when investment by SOEs accounted about 34 percent of total investment (down from 39 percent in 2005). In 2010, the share of investment by SOEs rose slightly to 35 percent of GDP because of the extraordinary stimulus package put by the government in response to the global financial crisis. A downward trend can also be observed in the share of foreign-funded firms, with their investment declining from about 11 percent in 2005 to around 6½ percent in 2010. These foreign-funded firms include firms from Hong Kong SAR, Macao SAR, Taiwan Province of China, and other economies.



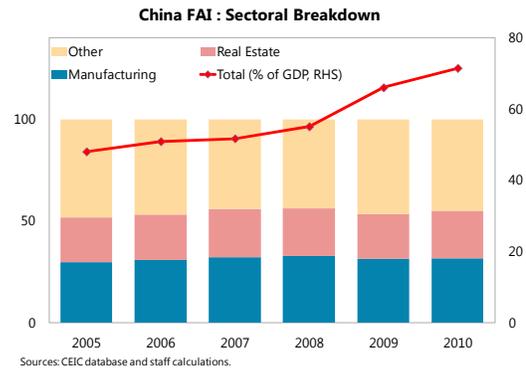
While listed firms data show similar trends on the relative roles of SOEs and private companies, the level is very different from that observed in FAI data. One main reason for

<sup>1</sup> The results are generally invariant to the choice of the initial capital output ratio—that is whether it is initially set at 2.5 or set at the ratio of initial investment and steady state growth of investment plus depreciation.

this discrepancy in the shares of investment accounted for by SOEs and private companies is that listed firms are dominated by SOEs (with listed SOEs representing half of the listed firms) which tend to be much larger than listed private companies.

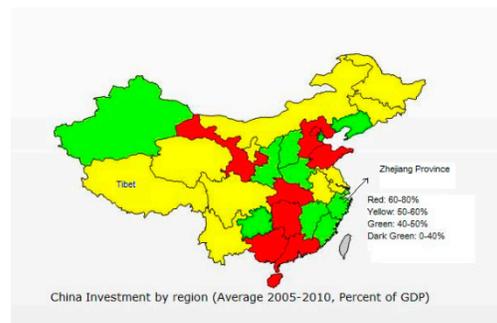
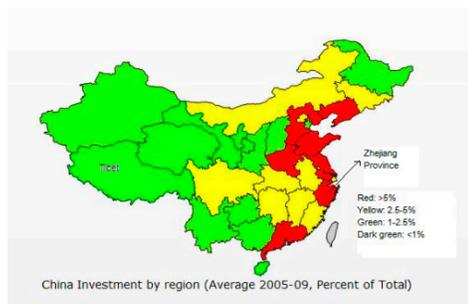
### B. Which sectors are enterprises investing in?

About 32 percent of investment goes into the manufacturing sector, 23 percent into real estate, and the rest goes to various other sectors of the economy with transportation (11 percent) and utility (8¾ percent) sectors receiving important shares. These latter sectors have seen a large increase in investment in the past two years because the government stimulus package was mainly geared toward these sectors. The government's RMB 4 trillion stimulus package included about RMB 1¾ trillion for transportation and utility infrastructure and RMB 1 trillion for earthquake reconstruction.



### C. Which regions are enterprises investing in?

Eastern regions, particularly large coastal cities, have the highest share of investment in percent of total investment. This reflects mainly the large presence of manufacturing firms in coastal areas. Although provinces mid-west and further inland get a smaller share of investment in relation to total investment, the amount they receive are substantial when compared with the region's GDP. For example, while Xizang Autonomous Region (Tibet) gets less than ¼ percent of total investment, that investment represents 58 percent of Tibet GDP. Similarly, while Zhejiang province receives about 6 percent of total investment, that investment represents only 42 percent of Zhejiang's GDP.

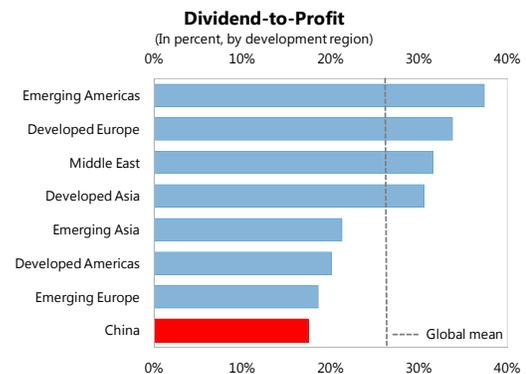
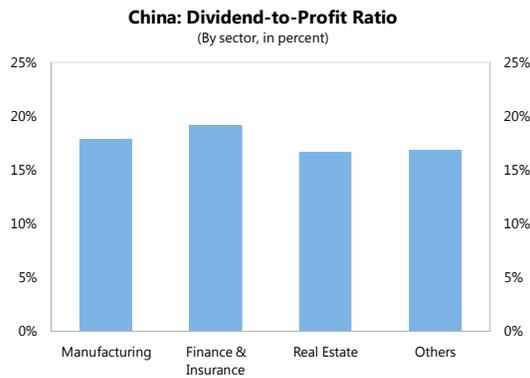
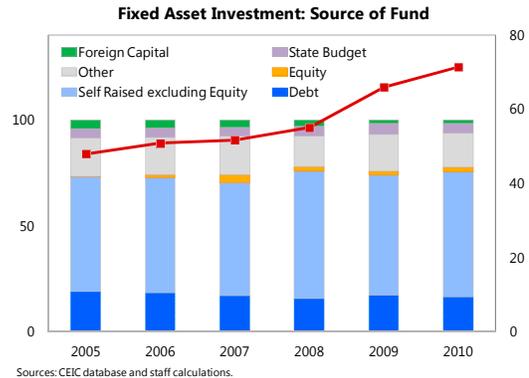


This reflects in many ways the role of state-owned enterprises in less developed regions and the fact that SOEs tend to invest more than other enterprises.<sup>2</sup>

<sup>2</sup> Barnett and Brooks (2011).

## D. How is investment financed?

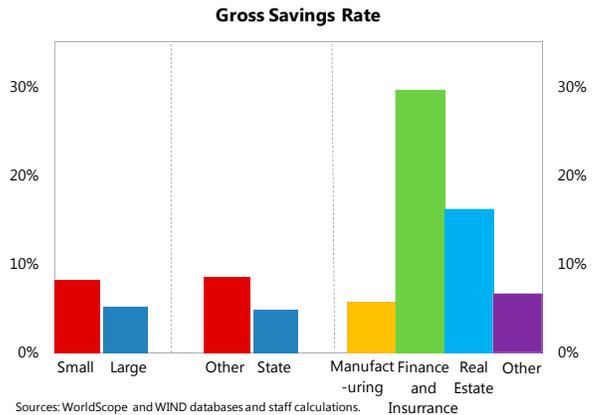
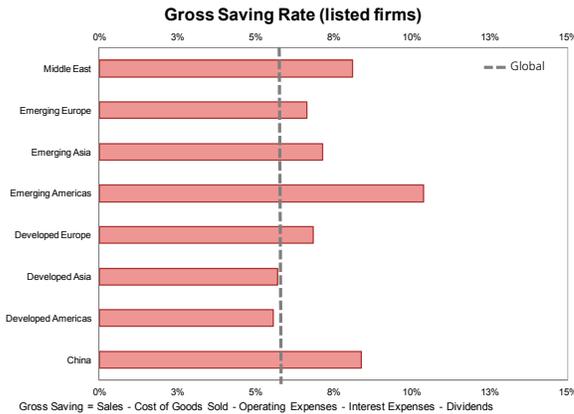
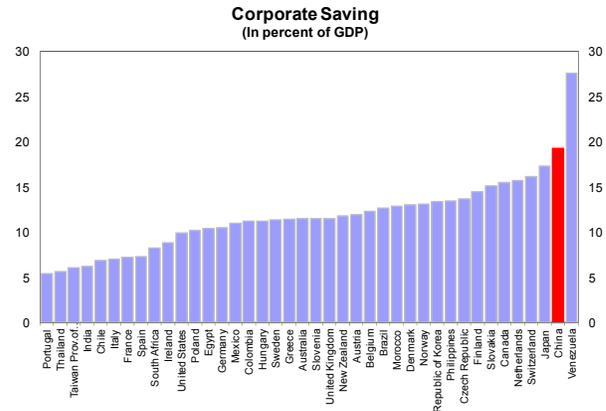
Investment is financed primarily through retained earnings and bank loans. Financing through self-raised funds now accounts for just below 60 percent of total financing according to FAI data, up from about 54 percent in 2005. This large and increasing share of financing through self-raised funds reflect healthy profits of Chinese corporations and the fact that until recently many firms paid small, if not any, dividends (compared with companies in other economies). Before 2007, SOEs were not required to pay dividends to the state. Since the 2007 State Capital Management Budget reform, SOEs are often required to pay at least 5–10 percent dividends annually, depending on the industry. Enterprises in industries with low competition are required to pay 10 percent.<sup>3</sup> Dividends are higher on average in the finance and insurance sector than in other sectors of the economy as there is little competition in the banking system. By international standards, Chinese listed firms pay less dividends than corporates do on average in the rest of the world.



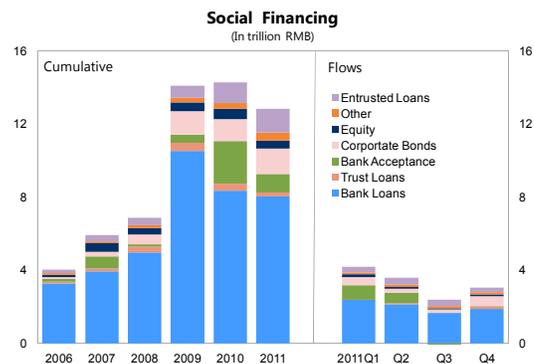
<sup>3</sup> Military SOEs and some particular types of SOEs (under the umbrella of specific public institutions) were exempt from this requirement. In 2011, the dividends payment requirements were raised to 10–15 percent, but Military SOEs and SOEs under the umbrella of specific public institutions were required to pay 5 percent of their profits to the state.

### E. Implications for corporate savings

The requirement for SOEs to pay to the state at least 5–10 percent dividends did little in reducing corporate savings or the self-financing of investment because dividends paid by SOEs are paid into a special capital budget that is used to finance state enterprise investment.<sup>4</sup> This dividend policy, the lack of contestability in many markets, and cheap capital all contribute to relatively large (gross) savings for Chinese listed and nonlisted corporations by international standards. Amongst listed companies, savings rates are highest for banks and real estate companies, averaging about 30 percent and 16 percent, respectively, during 2005–09. Gross savings rates for manufacturing firms are around 5 percent. By size, gross savings rates are about 60 percent higher for small firms than for large firms, the main reasons being that small firms pay fewer dividends than large firms and have less access to credit, which force them to rely more on retained earnings for financing investment. This latter reason also explains why nonstate owned firms save more than state owned firms.



The second largest source of financing of corporate investment is debt financing, including bank loans and corporate bonds. This represents about 17 percent of total investment financing by listed firm. Bank financing is the prime source of debt financing, China’s large savings rates for both the private (especially households) and public sectors providing ample and cheap funds. At the



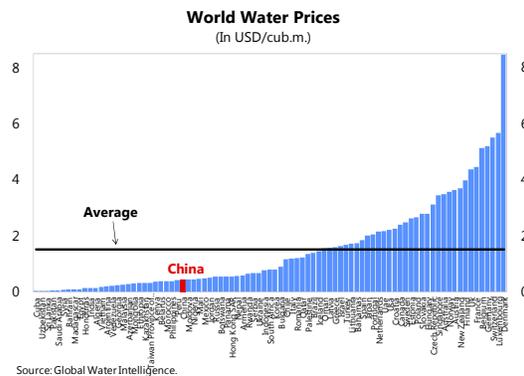
<sup>4</sup> See APD Regional Economic Outlook (2009).

macroeconomic level, bank loans represented about 63 percent of total social financing as end 2011, while corporate bonds accounted for 11 percent of total social financing. Household savings now represent about 23½ percent of GDP and are primarily in the banking system, earning on average negative real rates over the last 7 years.

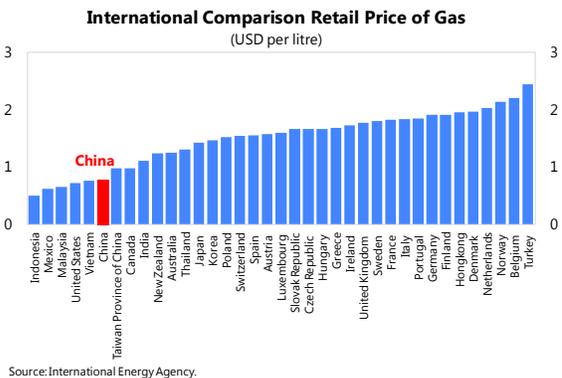
### III. COST OF CAPITAL

China's capital intensive growth relies on various low-cost factor inputs, including land, water, energy, labor, and capital. This offers Chinese firms a competitive edge and creates incentives for capital intensive means of production. Studies estimate the total value of China's factor market distortions could be almost 10 percent of GDP<sup>5</sup>. Factor inputs are priced below market prices for many industries and are low compared to other economies. This is the case for land, water, energy, and capital.

**Land and water.** In China, all land belongs to the state and local governments have the discretion to sell industrial land use rights to companies for up to 50 years. In many cases industrial land is provided for free to enterprises to attract investment.<sup>6</sup> For water, the price in China is about one third of the average of a sample of international comparators.



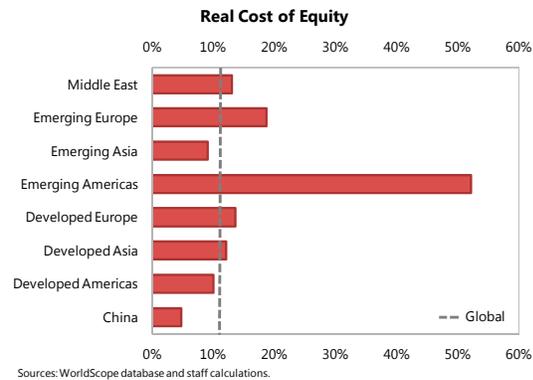
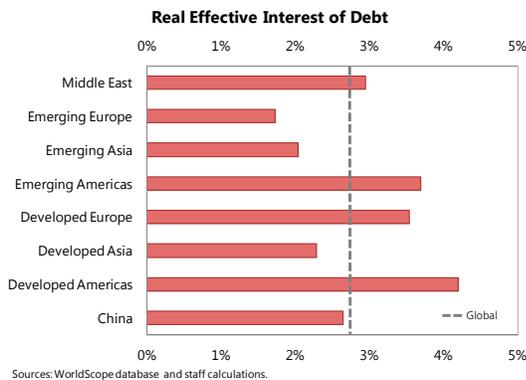
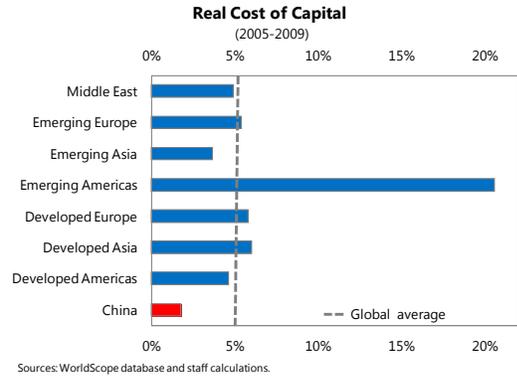
**Energy.** Cross country data on the cost of energy shows that the price of gasoline in China is relatively low, although similar to that in the U.S. For electricity, the cost is also somewhat below the average of international comparators although discussions with private counterparts reveal that many companies are able to negotiate significant discounts to the regulated price. Having said this, China is making progress in bringing energy costs in line with international levels: oil product prices have been indexed to a weighted basket of international crude prices; natural gas prices were increased by 25 percent in May 2010; and preferential power tariffs for energy-intensive industries have been removed.



<sup>5</sup> See Huang and Tao (2010).

<sup>6</sup> See Huang (2010).

**Capital.** By various cross-country measures, the cost of capital appears low in China. Estimates based on data for 30,000 firms across 53 economies, show that the real cost of capital—defined as a weighted average of the real cost of bank loans, bonds, and equity—faced by Chinese listed firms is below the global average.<sup>7</sup> This reflects mainly the fact that the cost of equity for Chinese firms is low relative to rest of world since Chinese firms, mainly SOEs, pay little if any dividends, compared with the global average (dividends payments averaged 33 percent of profits during 2000–08 according to the World Bank).<sup>8</sup> On average, equity cost is about 5 percent in China versus 12 percent for the rest of the world. In terms of debt cost, Chinese listed firms are not out of line with companies in the rest of the world. Real effective interest rates paid by Chinese listed firms average about 2½ percent compared with a world average of 2¾ percent during 2005–09.



Capital looks especially cheap when compared to its high productivity in China. In particular, an estimate of the marginal product of reproducible capital (i.e., capital adjusted for land) shows China's return to capital is well above the average real loan rate of many advanced and emerging economies.<sup>9</sup>

<sup>7</sup> Weights are assumed to be the relative shares of equity and debt in corporate liabilities. Here the cost of equity is measured following the methodology in Box 2 of ECB November 2004 Monthly Bulletin.

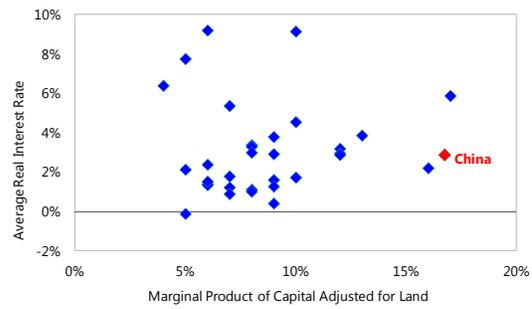
<sup>8</sup> See the World Bank Report No.53254 (2009).

<sup>9</sup> The marginal product of reproducible capital in China is estimated following Caselli and Freyer (2005) and is the ratio of the income share of capital excluding land and other non reproducible items to the capital output ratio. The capital stock is derived from the perpetual inventory methods. Alternative and more dated estimates of the return to capital in China by Chong-En Bai et al. (2006) show a return to capital of about 20 percent in 2005, down from 25 percent during 1973–1993.

This gap between real lending rates and the marginal product of capital is a rent that is shared between financial and nonfinancial corporations. Assuming the marginal product of capital (net of depreciation) is equal to the return to capital, this return can be distributed to banks, households and nonfinancial corporations with banks being remunerated at the spread between average deposit and lending rates, households' being paid real deposit rates, and nonfinancial corporations getting the remainder of the marginal product of capital. Such a simple exercise shows that, in China, the returns to capital are largely shared between financial and nonfinancial corporations. Households have subsidized these corporations on average over the past seven years given China's real deposit rates were negative during that period. Raising the cost of capital in China will therefore allow households to keep some of the returns to their capital, and help support consumption.<sup>10</sup>

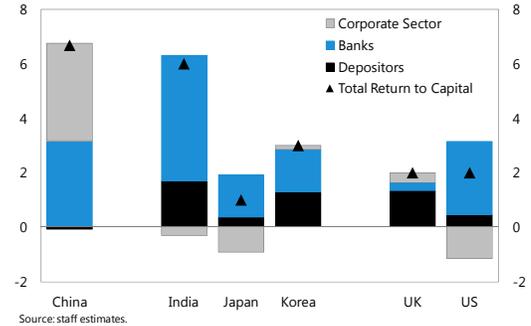
Nonfinancial corporations get a slightly bigger share of the return to capital than financial corporations. This distribution of the return to capital amongst the various players in China's economy is in stark contrast with what is observed in countries like India, Korea, Japan, the United States, and the United Kingdom. Unlike in China, households in these countries get at least some share of the returns to capital and the corporate sector ends up appropriating relatively little of the returns to capital.<sup>11</sup>

**International Comparison: Marginal Product of Capital Adjusted for Land vs Average Real Interest Rate (2004-10)**



Source: staff estimates.

**Distribution of the Returns to Bank-Intermediated Capital (Real returns, in percent)**



Source: staff estimates.

#### IV. EMPIRICAL DETERMINANTS OF INVESTMENTS

To explain the dynamics of investment in China we use both firm-level data and cross-country data. For the analysis based on firm-level data, we regress corporates capital expenditure (in relation to sales) on past capital expenditure, the capital output ratio squared, stock market capitalization in relation to GDP, real interest rates, the change in the real effective exchange rate, real GDP growth, the current account balance in relation to GDP, foreign debt to GDP ratio, the relative price of capital to output, and the volatility of output. These variables capture the effects of various factors, including stickiness in investment, adjustment costs (captured by the capital output ratio squared), capital market development, cost of capital, exchange rates, country risk, countries' level of development, profit

<sup>10</sup> See Guo and N'Diaye (2010) on the role of property income in private consumption in China.

<sup>11</sup> This representation might not depict very well the situation in the United States because corporations rely less on bank financing than elsewhere. U.S. flow of funds data suggest that as at end September 2011, bank loans accounted for about 3½ percent of total nonfinancial corporates liabilities, while corporate bonds accounted for about 40 percent of total liabilities.

opportunities, uncertainty, and the availability of external financing.

The model is estimated using the dynamic panel data estimator developed by Arellano and Bond (1991) with both an unbalanced panel of 27,997 firms across 53 economies and an unbalanced panel of 1,908 firms in China during 1990–2009.<sup>12</sup> To handle simultaneity lagged values of the contemporaneous regressors were used as instruments and a special correction for correlation was applied. All variables that enter with a lag on the right hand side of the equation are considered exogenous. The set of instruments also includes country dummies, but no country dummies are included in the regression itself.

**Table 1. Determinants of Corporate Investment (Evidence from Firm Level Data) 1/**

<b>Explanatory Variables</b>	<b>Cross Country</b>	<b>China</b>
<b>Capex ratio</b> (lagged 1 year)	<b>0.307 **</b> [0.000]	<b>-0.031 **</b> [0.002]
<b>Investment Adjustment Cost</b> ((K/Y) <sup>2</sup> (lagged 1 year))	<b>-0.004 **</b> [0.000]	<b>-0.030 **</b> [0.000]
<b>Stock Market Capitalization/GDP</b>	<b>1.043 **</b> [0.011]	<b>0.080 **</b> [0.003]
<b>Real Interest Rate</b> (lagged 1 year)	<b>-2.420 **</b> [0.199]	<b>-0.253 **</b> [0.008]
<b>Appreciation of REER</b>	<b>-0.411 **</b> [0.076]	<b>-0.417 **</b> [0.009]
<b>Real GDP Growth</b>	<b>1.620 **</b> [0.245]	... ...
<b>Current Account Balance/GDP</b> (lagged 1 year)	<b>2.700 **</b> [0.387]	<b>-2.230 **</b> [0.062]
<b>Foreign Debt Risk</b>	<b>-1.342 **</b> [0.089]	<b>-4.104 **</b> [0.062]
<b>Relative Price of Capital to GDP</b>	<b>5.081 **</b> [0.206]	<b>1.467 **</b> [0.044]
<b>Volatility of GDP growth</b> (lagged 1 year)	<b>-3.260 **</b> [0.489]	<b>-4.210 **</b> [0.124]
<b>Observations</b>	<b>185,217</b>	<b>7,532</b>
<b>Number of Firms</b>	<b>27,997</b>	<b>1,908</b>
<b>AR(1)</b>	<b>0.019</b>	<b>0.008</b>
<b>AR(2)</b>	<b>0.117</b>	<b>0.267</b>
<b>Hansen J Test (Prob&gt;Chi_2)</b>	<b>0.72</b>	<b>0.45</b>

Source: Staff Estimates.

1/ GMM estimates using an unbalanced panel of firms over the period 1990-2009. Robust standard errors in brackets, with \*\* indicating significance at 5 percent level.

Table 1 shows the results of the firm-level data regressions. Column two shows the results based on cross country data and column three shows the results for China only.<sup>13</sup> The results

<sup>12</sup> See appendix for a description of the data.

<sup>13</sup> Both results pass the autocorrelation test at order 1 and 2 (AR(1) and AR(2)) and the over-identification test (Hansen J statistic).

based on cross country data indicate that investment is positively related to capital market development, output growth, the relative price of capital, and negatively related to adjustment costs, real interest rates, changes in the real effective exchange rate, country risk, and uncertainty. While most of these results are consistent with our priors—e.g. capital market development increases financing opportunities and instruments (Beck and Levine 2001, and Leahy et al. (2001))—the sign of the relative price of capital is less obvious. Indeed, as shown in Caselli and Freyer (2005), the price of capital relative to that of output is higher the less advanced the economy. With investment rates being in general higher in less developed economies, the result in Table 1 could simply be capturing the positive relationship that exist between the level of development and that of investment.

Table 2 shows the results of the estimation of a similar investment equation using aggregate national accounts data. The model relates total investment to real interest rates (lagged), real GDP growth, volatility of growth, indicators of financial development (here the number of listed firms per ten thousand people), indicators of economic development, the debt to GDP ratio, and change in exchange rate. Dummy variables specific to China were introduced to see to whether China stands out. The model was estimated using the Generalized Method of Moments estimator using an unbalanced panel of 52 economies.

Overall, the results are consistent with our priors. Investment falls with real interest rates, uncertainty, countries' level of development, when countries external financial rise. Investment rises with growth opportunities, financial development, and here with an appreciating currency except for China, which may reflect the importance of manufacturing firms. In more details, the following results in Table 1 and Table 2 are noteworthy:

- Real interest rates have a negative impact on investment. At the aggregate level, a 100 basis points increase in real interest rates reduces corporate investment in China by about ½ percent of GDP. Based on these estimates, raising real interest rates to the level of the marginal product of capital net of depreciation would probably lower investment by about 3 percent of GDP. The estimated effect for China of real interest rates on investment is much larger than the average of the other 52 economies in the panel. The estimated impact of interest rates changes on corporate investment is about half as big when estimated based on the firm-level data. This could possibly reflect the smaller reliance of this sample (which are large, listed enterprises) on bank-intermediated financing.
- Exchange rate appreciation also lowers investment. A 10 percent appreciation would reduce total investment by around 1 percent of GDP. The large concentration of manufacturing companies in the firm-level sample means that the estimated impact of exchange rate appreciation from the firm-level data is much larger.
- Indicators of capital market development suggest more developed financial systems tend to promote higher investment, largely by easing the financing constraints faced by firms.

**Table 2. Determinant of Investment (Evidence from Aggregate Data) 1/**

Explanatory Variables	Coefficients
<b>No. Listed Comp per 10K people</b>	<b>3.900 **</b> [0.507]
<b>Real Interest Rate (lagged 1 year)</b>	<b>-0.054 **</b> [0.019]
<b>Appreciation of REER</b>	<b>0.121</b> [0.044]
<b>Real GDP Growth</b>	<b>0.215 **</b> [0.053]
<b>Current Account Balance/GDP (lagged 1 year)</b>	<b>-0.073 **</b> [0.023]
<b>Foreign Debt Risk</b>	<b>-0.013 **</b> [0.003]
<b>Relative Price of Capital to GDP</b>	<b>0.198 **</b> [0.090]
<b>Volatility of GDP growth (lagged 1 year)</b>	<b>-0.118</b> [0.079]
<b>Relative Per Capita GDP</b>	<b>-2.114 **</b> [0.772]
<b>Constant</b>	<b>22.228 **</b> [0.531]
<b>No. Listed Comp per 10K people (China specific)</b>	<b>1151.2 **</b> [80.637]
<b>China specific Real Interest Rate (lagged 1 year)</b>	<b>-0.351 **</b> [0.092]
<b>China specific Appreciation of REER</b>	<b>-0.254 **</b> [0.070]
<b>China specific Constant</b>	<b>5.110 **</b> [0.721]
<b>Observations</b>	<b>840</b>
<b>Number of Economies</b>	<b>52</b>
<b>Durbin Watson Test (p-value)</b>	<b>0.33</b>

Source: Fund staff estimates.

1/ GMM estimates using an unbalanced panel of firms over the period 1990-2009. Robust standard errors in brackets, with \*\* indicating significance at the 5 percent level.

## V. CONCLUSION

This paper analyzed the evolution of investment in China, its main features, and its key determinants. In recent years, the manufacturing, real estate, and infrastructure have been the main drivers of investment. Investment remains largely concentrated in coastal areas, although there has been a slow move inland in recent years. The empirical analysis of the determinants of investment indicates that financial variables, such as interest rates, the exchange rate, and the depth of the domestic capital market are important determinants of corporate investment. The results suggest in particular that financial sector reform, including that which raises real interest rates and appreciates the real effective exchange rate, would lower investment and help rebalance growth away from exports and investment toward private consumption.

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## Appendix: Data Definition

The firm level data used in this paper are from Worldscope database and Wind database which report data on listed financial and nonfinancial corporations' annual financial statements during the period 1990–2009 for around 53 economies worldwide. The following tables present an overview of these economies and the distribution of companies in the sample.

**Table A1. Distribution of Firms**

<b>Economy</b>	<b>Number of Firms</b>	<b>Share of sample</b>
Argentina	65	0.23
Australia	1,614	5.76
Austria	82	0.29
Belgium	112	0.40
Brazil	169	0.60
Canada	1,139	4.07
Chile	166	0.59
<b>China</b>	<b>1,908</b>	<b>6.82</b>
Colombia	26	0.09
Czech Republic	11	0.04
Denmark	168	0.60
Egypt	68	0.24
Finland	119	0.43
France	554	1.98
Germany	614	2.19
Greece	165	0.59
Hong Kong	919	3.28
Hungary	34	0.12
India	1,944	6.94
Indonesia	334	1.19
Ireland	45	0.16
Israel	154	0.55
Italy	265	0.95
Japan	3,790	13.54
Korea (South)	880	3.14
Luxembourg	26	0.09
Malaysia	938	3.35
Mexico	108	0.39
Morocco	20	0.07
Netherlands	131	0.47
New Zealand	130	0.46
Norway	178	0.64
Pakistan	140	0.50
Peru	65	0.23
Philippines	187	0.67
Poland	332	1.19
Portugal	47	0.17
Russian Federation	63	0.23
Singapore	604	2.16
Slovakia	7	0.03
Slovenia	12	0.04
South Africa	325	1.16
Spain	127	0.45
Sri Lanka	28	0.10
Sweden	378	1.35
Switzerland	232	0.83
Taiwan Province of China	922	3.29
Thailand	500	1.79
Turkey	218	0.78
United Kingdom	1,700	6.07
United States	5,218	18.64
Venezuela	13	0.05
Zimbabwe	3	0.01
<b>Total</b>	<b>27997</b>	<b>100</b>

Source: Worldscope and Corporate Vulnerability Unit Database.

The following tables provide information on the ownership and industry distribution of the China specific listed firms data. The tables show that sample is dominated by manufacturing firms, mainly state owned (including companies belonging to government agencies, SASAC, and other SOEs).

**Table A2. The breakdown of Chinese listed firms by industry**

<b>SIC</b>	<b>Number of Firms</b>	<b>Share of sample</b>
Agriculture, Forestry and Fishing	40	2.10
Mining	44	2.31
Manufacturing	1111	58.23
Utilities	69	3.62
Construction	38	1.99
Transportation	73	3.83
IT	151	7.91
Wholesale and Retail Trade	101	5.29
Finance and Insurance	34	1.78
Real Estate	118	6.18
Social Services	52	2.73
Communication and Cultural Indu:	17	0.89
Comprehensive	60	3.14
<b>Total</b>	<b>1908</b>	<b>100</b>

Source: Worldscope and WIND Databases.

**Table A3. Breakdown of Chinese Listed Firms by Actual Ownership**

<b>Ownership Type</b>	<b>Number of Firms</b>	<b>Share of sample</b>
Government Agency	137	7.18
SASAC	762	39.94
SOE	81	4.25
Private	826	43.29
Collective	19	1.00
Foreign	58	3.04
University	9	0.47
Other	16	0.84
<b>Total</b>	<b>1908</b>	<b>100</b>

Source: Worldscope and WIND Databases.