[Article]

Lending Bias during the Financial Reform Period in China seen in Wuxi City microdata, 1993-1996*

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1. INTRODUCTION

We investigate whether there was a lending bias, that provided state-owned enterprises (SOEs) with easier access to external bank loans for investment than non-state enterprises, in the manufacturing sector in Wuxi City, Jiangsu province from 1993 to 1996. We are also interested more generally in whether financial reform in China since 1994 has reduced this acknowledged bias.

Chow and Fung (1998) found that investment of manufacturing enterprises in Shanghai from 1989 to 1992 was sensitive to cash flow, and that SOEs were able to borrow external funds for investment more easily than private enterprises because of a lending bias. This bias continued after that time as a result of government policy. Monitoring by banks of SOEs receiving loans was perfunctory and banks continued lending even to SOEs which failed to generate profits to repay their loans. In short, SOEs faced only very soft budget constraints in that period.

A second phase of financial reform[1)] began in China around 1993/4. In 1993 the People's Bank of China (PBC) centralized its business. Local branches of PBC, formerly under the control of local government, now came directly under the control of PBC head office. In 1995 China approved the 'Central Bank Law' giving PBC the authority to execute financial policies independently of local governments. These reforms reduced the influence of local government on monetary policies and on loan allocation to enterprises (see Xie, (1996)). Before 1994 local governments in China, mainly provincial governments, could

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1) The first phase of financial reform in China began in 1984, when the People's Bank of China (PBC) was formally changed to a central bank. Under supervision by PBC, state-owned specialized banks were (re)established, and a banking system was created that was largely controlled by the State.

force branches of PBC in their region to extend credit. The PBC also allowed soft budget constraints for local governments, and for enterprises in financial trouble which had been bailed out by local government. Centralization within PBC led to tougher budget constraints for local governments and SOEs (Qian and Roland, 1998, pp.1156-1157). In 1998, PBC integrated its 30 provincial branches into 9 transprovincial branches. This change further reduced the influence of local government on monetary and financial policies. Furthermore, the four main state-owned banks - the Industrial and Commercial Bank of China, the Agricultural Bank of China, the People's Construction Bank of China and the Bank of China - have been fully commercialized since 1994. These banks are now very concerned with the profitability and quality of the enterprises to which they lend. These reforms together make it possible to reduce the lending bias in favor of SOEs. It is claimed that state-owned banks are reducing their lending to SOEs, many of which carry large bad debts, and are shifting their lending to medium and small non-state enterprises.[2] Below, we study these changes in lending patterns using firm level micro data for Wuxi City, Jiangsu province from 1991 to 1997.[3]

Our investigation of enterprises in Wuxi City looks closely at the liquidity constraints faced by collective-owned township and village enterprises (COTVEs). Chow and Fung (1998) found that collective-owned enterprises (possibly including COTVEs) faced weaker liquidity constraints than SOEs in Shanghai from 1989 to 1992. Specifically, this related to the availability of cash flow. Chow and Fung suggest that this discrepancy is a result of inter-firm loans and close relations between SOEs and collective-owned enterprises.[4] However, our recent survey in Wuxi City, in the other regions in Southern Jiangsu province, and in Shanghai City found that COTVEs[5] had faced worse funding problems than other enterprises, including SOEs. Banks in China have recently tightened their lending to all types of enterprise; we found that bank lending has been tightened more to COTVEs than to other enterprises. Consequently, COTVEs might have been more liquidity-constrained than other enterprises in Wuxi City during 1993-1996. However, the financial reform in China from 1994 might still have reduced the lending bias against COTVEs. It is possible that the reforms improved the liquidity constraints of COTVEs, but that COTVEs were still more liquidity-constrained than other enterprises including SOEs. Our econometric analysis

2) See, for example, Cull and Xu (2000, p.14): "In the past couple of years, loans went increasingly to the private and to township and village enterprises (TVEs); banks recognized that extending new loans to SOEs was throwing good money after bad." However, their sampling period (1980-1994) is unable to verify the shift in their data set.

3) Econometric analysis uses some data differences and lag variables. This reduces the data period to 1993-1996.

4) Chow and Fung's empirical results on the liquidity constraints faced by collective-owned enterprises may reflect the fact that urban collective-owned enterprises (UCOEs) are equally or less liquidity-constrained than SOEs. Our empirical results also show that UCOEs, like SOEs, face no liquidity constraints (availability of cash flow).

5) Most 'COTVEs' we interviewed had already been privatized into share-holding enterprises (SHEs) or private enterprise (PEs) by the time we visited them.

will shed light on this issue.

Chow and Fung (1998) also point out that if non-state enterprises rely more on internal funds than the less efficient SOEs, then weaknesses in the banking and financial sector of China's transitional economy will lead to inefficiency in capital allocation (Chow and Fung, 1998, pp.303, 315). In our previous study we confirmed that COTVEs in Wuxi City were technically more efficient than almost all other enterprises, including SOEs, during the sample period, 1991-1997 .[6] Accordingly, if the investments of COTVEs depended more on internal funds than for SOEs and other enterprises, then the Chinese banking system was misallocating funds.

We also look at two issues involving corporate finance in China: the formation of business groups, and the effect of collateralizable assets on bank lending.

Hoshi *et al.* (1990; 1991) state that business groups together with the banking system in Japan mitigate both the asymmetric information problem between creditors and debtors, and the liquidity constraints faced by Japanese firms affiliated with a business group. Chinese policymakers have encouraged the formation of business groups from the mid-1980s onwards, as in Japan and South Korea where they are known as *keiretsu* and *chaebol* [7] . If asymmetric information on internal and external finance leads to liquidity constraints on enterprises in the Chinese economy, then business groups might have mitigated the constraints on non-state enterprises or COTVEs.

Ogawa *et al.* (1996) found that land assets owned by Japanese firms improve their borrowing power and hence their liquidity, by functioning as collateral to allow investment. They also state that land values are particularly important in overcoming borrowing constraints for industries having a number of small firms. Asymmetric information between creditors and debtors should be obvious in such industries, driving a wedge between the costs of internal finance and external finance.[8] In the Japanese economy, land assets, which are a type of collateralizable asset, act to reduce the gap between the two. We therefore examine whether collateralizable assets held by firms (here, fixed assets) enable them to access external funds more easily in the Chinese economy. If so, then development

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6) Shiraishi and Yano (2004) Many of the enterprises for which data were used in these efficiency measurements are also involved in the present estimation of investment functions.

7) Keister (2000, pp.8-11).

8) COTVEs or private enterprises (PEs) in China could correspond to 'small firms' in Japan which face a large gap between the costs of internal finance and external finance.

9) Chinese households and enterprises presently face restrictions on using their land as collateral in credit markets. Krusekopf (2002, p.299) points out that the lack of secure land tenure might prevent households in rural China using their land as collateral; interference in land tenure by local officials has led to insecurity which hinders the development of the land market. Our recent field survey in Wuxi City, in the other regions in Southern Jiangsu province, and in Shanghai City, found that enterprises also have difficulty using their land as collateral because of restrictions on land use which lead to a weak land market. These restrictions are tighter in rural areas, and are also tighter in Wuxi City than in Shanghai City, which is the most developed area in China. It is therefore more difficult for COTVEs in Wuxi City to use their land assets as collateral.

of the small land assets market in China may give non-state enterprises better access to bank loans, by increasing the value of collateralizable assets held by firms.[9)]

Section 2 describes our basic empirical model and estimation procedure, and discusses the data employed. Section 3 considers the results, and conclusions are presented in Section 4.

2. BASIC MODEL AND DATA

Earlier studies of the link between internal funds and investment that used firm level micro data include Fazzari *et al.* (1988) and Chow and Fung (1998). In their analysis of investment behavior of Chinese enterprises, Chow and Fung (1998, p.304) adopt a sales accelerator model of the following form:

$$(I/K)_{it} = \alpha_i + \beta_1 (\Delta S/K)_{it} + \beta_2 (\Delta S/K)_{i,t-1} + \beta_3 (NP/K)_{it} + \beta_4 (DEP/K)_{it} + e_{it},$$

where I_{it} is the gross investment of firm i at the end of year t, and K_{it} is the capital stock of firm i at the beginning of year t. The relation between I_{it} and K_{it} is:

$$I_{it} = K_{i,t+1} - (1-s)K_{it},$$

where s denotes the scrap rate of capital, which we take as 3 % in each year. Here α_i is a firm-specific coefficient, S_{it} denotes sales made by firm i in year t, and $\Delta S_{it} = S_{it} - S_{i,t-1}$. In this model the ΔS terms represent sales accelerators. The variables NP_{it} and DEP_{it} denote the net profit and depreciation of firm i at the end of year t. The NP_{it} term represents a cash flow source for the firm, and the DEP_{it} term measures internal funds for replacement of investment in the firm. Finally, the error term e_{it} is taken to be independently and identically distributed over i and t with zero mean and variance σ_e^2.

Unfortunately DEPit is unavailable in our sample, and we must therefore construct a proxy for it. The size of current depreciation depends strongly on that of current capital stock; in many cases they are proportional. We therefore construct a proxy for DEPit: PDEPit as

$$PDEP_{it} = \gamma K_{it-1},$$

where γ is the depreciation rate, now assumed to be a constant 10 %.[10)] Instead of using the current capital stock (K_{it}) we prefer that in the previous year (K_{it-1}) when calculating the depreciation, because: (1) if $PDEP_{it} = \gamma K_{it}$ and were normalized by K_{it} for regression analysis, then the normalized variable $PDEP_{it}/K_{it} = \gamma$ would not in fact be a variable; (2) our proxy, $PDEP_{it} = \gamma K_{it-1}$ immediately indicates the book entry of depreciation at the end of year t-1, and should provide a better measure of replacement capital used for investment in year t than its value at the end of year t, γK_{it}. Accordingly, we take as our basic model

10) The assumption is not essential for our estimation. Under various assumptions about γ, for example γ =1 (100 %) in the simplest case, we find almost identical estimates.

the following expression:

$$(I/K)_{it} = \alpha_i + \beta_1 (\Delta S/K)_{it} + \beta_2 (\Delta S/K)_{i,t-1} + \beta_3 (NP/K)_{it} + \beta_4 (PDEP/K)_{it} + e_{it}, \quad (1)$$

This basic model supposes that investment is a function of sales accelerator and internal funds. If the firm is financially constrained, the net profits NP_{it} represent the internal funds available for investment.[11] If the firm is under liquidity constraints, $(NP/K)_{it}$ should be statistically significant in explaining investment behavior, and its coefficient is expected to be positive. By including $(PDEP/K)_{it}$ as an independent variable in our model, we can examine the influence of internal funds for replacement investment on the investment behavior of the firm. However, $(PDEP/K)_{it}$ is less important than $(NP/K)_{it}$ as an internal funds variable since depreciation is merely a book entry and there is no cash inflow. The variables in expression (1) are not in logarithmic form since ΔSs and NP can become negative. We have firm-level data for the period 1991-1997, but the seven years of observation (1991-1997) are reduced to four years (1993-1996) after constructing the differences in K ($I = K_{+1} - (1-s) K$) and S ($\Delta S = S - S_{-1}$) and the lagged difference in S ($(\Delta S/K)_{-1}$). Chow and Fung (1998) make estimates using the first difference method suggested by Hsiao (1986) in order to remove terms involving firm-specific effects (Chow and Fung, 1998, p. 306). Their estimates therefore neglect all constant offset (intercept) terms. The first difference method is not used below since we wish to study the differing effects of internal fund variables on annual investment behavior over as many years as possible. In our estimation procedure we cross the key variables from expression (1) with enterprise type dummies, year dummies and other variables.

Our estimation procedure uses firm level micro data for Wuxi City, Jiangsu province from 1991 to 1997. The micro data for large and medium size industrial enterprises is taken from the *Wuxi Statistical Yearbook* for 1992-1998. Sales and net profits are measured by sales value and net profit value at current prices. Capital stock K is measured by the nominal original value of fixed assets for each year.

11) It is possible that a firm's accounts receivables seriously reduce its internal funds (Triangle Debt). In that case NP does not represent current cash flow, because of accounts receivables in NP, and increasing ΔS has a negative impact on investment by increasing accounts receivables in sales and a resultant reduction in internal funds. Since we are not able to use accounts receivables (and accounts payables) data for the sample enterprises, we cannot examine and control explicitly the effect of accounts receivables on investments by firms. However, Watanabe (2002, p.12) argues that accounts receivable and payables among enterprises, which were regarded as a social and economic problem causing Triangle Debt, have gradually become an orderly inter-enterprise credit. Moreover, according to our recent field survey, even if firms of good reputation have some accounts receivables, they in many cases also have sufficient accounts payables to compensate for these, so that their accounts receivables do not seriously reduce their internal funds. They are then incorporated into an orderly inter-enterprise credit relationship based on their reputation. Our sample enterprises reported as "large and medium size industrial enterprises" in the *Wuxi Statistical Yearbook* can be regarded as typical firms of good reputation in Wuxi City. It is therefore reasonable that firms' accounts receivables will not seriously reduce their internal funds.

3. ESTIMATION RESULTS

We first report the descriptive statistics of the relevant variable, classified by type of enterprise, as shown in Table 1. Only a small number of enterprises are classified as PEs (private enterprises) and UCEs (urban cooperative enterprises); the descriptive statistics and estimates for PEs are similar to those of share-holding enterprises (SHEs), and details of UCEs are similar to those of urban collective-owned enterprises (UCOEs). We therefore combine SHEs and PEs into a single category (SHE & PE), and UCOEs and UCEs into a further category (UCOE & UCE).

Table 1 Observations Number and Averages of I/K, ΔS/K, and NP/K

Enterprise Type/Year	1993	1994	1995	1996
Observations Number[1]				
SOE	82	82	85	89
COTVE	38	44	52	50
SHE & PE	8	12	13	10
JV	12	18	19	18
UCOE & UCE	36	38	40	42
total	176	194	209	209
I/K[2]				
SOE	0.410	0.349	0.169	0.301
COTVE	0.435	0.347	0.204	0.607
SHE & PE	0.223	0.285	0.225	0.355
JV	0.469	0.311	0.297	0.340
UCOE & UCE	0.289	0.323	0.158	0.339
total average	0.386	0.336	0.191	0.388
ΔS/K				
SOE	0.482	-0.144	0.174	0.191
COTVE	1.622	0.417	0.722	0.184
SHE & PE	0.565	0.265	0.228	0.240
JV	-0.046	0.271	0.146	0.243
UCOE & UCE	0.544	-0.435	0.221	0.052
total average	0.708	-0.010	0.320	0.168
NP/K				
SOE	0.061	0.037	0.011	0.030
COTVE	0.128	0.146	0.146	0.127
SHE & PE	0.151	0.270	0.220	0.077
JV	0.072	0.088	0.095	0.110
UCOE & UCE	0.071	0.024	0.009	-0.013
total average	0.082	0.078	0.065	0.054
PDEP/K				
SOE	0.094	0.083	0.081	0.092
COTVE	0.083	0.082	0.083	0.093
SHE & PE	0.114	0.118	0.102	0.149
JV	0.089	0.083	0.086	0.083
UCOE & UCE	0.092	0.086	0.084	0.094
total average	0.092	0.086	0.084	0.094

(Notes)

1) Total number of observations is 788.

2) Average I/K, ΔS/K, NP/K, and PDEP/K of all 788 observations is 0.322, 0.069, 0.285, and 0.089, respectively.

Table 1 shows that the relevant firm level micro data comprise unbalanced panel data. Estimation using balanced panel data in fact gives similar estimates to unbalanced data; we present below only estimates using unbalanced data. Second, the investment rate (I/K) was found to decline once - in 1995 - due possibly to economic retrenchment in China; it recovered in 1996 across all types of enterprises. In particular, the investment rate (I/K) of COTVEs increased rapidly, to 0.607. This increase suggests some structural change involving the investment behavior and corporate finance of COTVEs. Third, by looking at NP/K, the stronger performance of COTVEs, and SHEs & PEs, and the weaker performance of SOEs, UCOEs & UCEs, become clear. Joint Ventures (JVs) occupy an intermediate position except in 1996. COTVEs were predominant in sales growth performance (ΔS/K), but this dominance was lost in 1996. We turn now to the estimation procedure and results.

3-1. Investment Function without Enterprise Type and Year Dummy Variables

We first examine estimates of the investment function without regard to enterprise or year. These estimates are given in Table 2.[12]

Table 2 shows that the instantaneous estimated coefficient of the cash flow variable, NP/K, is positive and significant. The investments of manufacturing enterprises in Wuxi City from 1993 to1996 were sensitive to cash flow. In Table 2 the coefficient of PDEP/K is significantly positive, suggesting strongly that manufacturing enterprises in Wuxi City were liquidity-constrained also in their replacement (depreciation) capital. The coefficient of ΔS/K is also statistically significant at the 5% level, and the investment behavior of our sample enterprises is partly explained by the sales accelerator principle.

Table 2 Investment Regression Equation without Enterprise Type and Year Dummy Variables [1]

	Fixed Effects [2),3)]
Independent Variables	eq.(1)
ΔS/K	0.024*
	(2.201)
$(\Delta S/K)_{-1}$	0.011
	(1.502)
NP/K	0.337**
	(2.343)
PDEP/K	3.758*
	(4.134)
R^2	0.390
Adj.R^2	0.165
Obs. No.	788

(Notes)

1) The table presents regression coefficients. The dependent variable is I/K.
The Breush-Pagan test rejects the null hypothesis of homoscedasticity. Therefore, we report in paretheses the t statstics that are based on heteroscedasticity-consistent standard errors presented by White (1980).

2) Random effects model is rejected by Hausman test at 1% level.

3) In order to save space, we ommit estimated coefficients of firm-specific dummy variables.

* Siginificant at 5%

** Siginificant at 1%.

3-2. Effect of Enterprise Type and Year

We now study how liquidity constraints vary for differing types of enterprise, using an expression in which the cash flow variable NP/K and the replacement capital variable PDEP/K in expression (1) are crossed with enterprise type dummies:

12) In all following estimates, the investment expression with firm-specific and time-specific fixed effects - the two-way fixed effects model - was also estimated. We do not show these results, but they are substantially the same as with only firm-specific fixed effects in Tables 2-4, 7, and 8.

$$(I/K)_{it} = \alpha_i + \beta_1 (\Delta S/K)_{it} + \beta_2 (\Delta S/K)_{i,t-1} + \Sigma_{type} \beta_{3J} (NP/K)_{it} * D_{enterprise\ type} + \Sigma_{type} \beta_{4J} (PDEP/K)_{i,t} * D_{enterprise\ type} + e_{it}, \quad (2)$$

Here $D_{enterprise\ type}$ includes DCOT (COTVE dummy), DSP (SHE & PE dummy), DJV (JV dummy), and DUU (UCOE & UCE dummy). We use SOEs as our benchmark.

Results are presented in Table 3. The estimated coefficient of NP/K is not statistically significant. Of the estimated coefficients of $NP/K*D_{enterprise\ type}$, only that of NP/K*DCOT (the COTVE dummy) is significantly positive: COTVEs alone were liquidity-constrained by the availability of cash in Wuxi City during 1993-1996.[13] The significantly positive coefficients of PDEP/K indicate that SOEs were also liquidity-constrained in terms of replacement capital. The estimated coefficient of PDEP/K*DCOT is not statistically significant, indicating that in terms of replacement capital COTVEs were not more liquidity-constrained than SOEs during the sample period, but the coefficient of PDEP/K*DSP alone is positive and statistically significant among those of $PDEP/K*D_{enterprise\ type}$. This indicates that, regarding replacement capital, SHEs & PEs faced stronger liquidity constraints than other types of enterprises. These parameter estimates show that COTVEs faced the most serious liquidity constraints of all our enterprise types during the sample period, and that SHEs & PEs were also more liquidity-constrained than SOEs, JVs, and UCOEs & UCEs.

Table 3 Investment Regression Equation with Enterprise Type Variables [1]

	Fixed Effects [2), 3)]
Independent Variables	eq.(2)
ΔS/K	0.022*
	(2.013)
$(\Delta S/K)_{-1}$	0.013
	(1.017)
NP/K	-0.042
	(-0.182)
NP/K*DCOT	0.795**
	(2.670)
NP/K*DSP	-0.162
	(-0.881)
NP/K*DJV	-0.043
	(-0.096)
NP/K*DUU	-0.223
	(-0.711)
PDEP/K	4.500**
	(3.549)
PDEP/K*DCOT	-0.496
	(-0.872)
PDEP/K*DSP	0.665**
	(2.601)
PDEP/K*DJV	1.076
	(0.593)
PDEP/K*DUU	-1.604
	(-1.125)
R^2	0.404
Adj.R^2	0.173
Obs. No.	788

(Notes) see Table 2.

We next study whether the liquidity constraints faced by COTVEs regarding their cash availability varied year by year, based on

13) When the sales accelerator variables ΔS/K and $(\Delta S/K)_{-1}$ in expression (2) are crossed with enterprise type dummies, the estimated coefficients of ΔS/K for SOEs, JVs, and UCOEs & UCEs are significantly positive, in contrast to coefficients for COTVEs, and SHEs & PEs. Similar results are found for the coefficient of $(\Delta S/K)_{-1}$ (results not shown). These observations, together with the statistically nonsignificant estimated coefficients of NP/K, NP/K*DJV, and NP/K*DUU in Table 3, show that the investment behavior of SOEs, JVs, and UCOEs & UCEs conforms to the sales accelerator principle.

the expression:

$$(I/K)_{it} = \alpha_i + \beta_1 (\Delta S/K)_{it} + \beta_2 (\Delta S/K)_{i,t-1} + (\Sigma_{year=1993\sim96} \beta_{3l} (NP/K)_{it} * DCOT * D_{year} + \Sigma_{type} \beta_{3J} (NP/K)_{it} * D_{enterprise\ type}) + \Sigma_{type} \beta_{4J} (PDEP/K)_{i,t} * D_{enterprise\ type} + e_{it}, \quad (3)$$

where D_{year} includes $D_{1993} \sim D_{1996}$. We wish to examine also variations of difference between the liquidity constraints faced by SHEs & PEs and the others in terms of replacement capital year by year. To do this we construct a model which includes interaction terms of year dummies and PDEP/K*DSP in expression (3):

$$(I/K)_{it} = \alpha_i + \beta_1 (\Delta S/K)_{it} + \beta_2 (\Delta S/K)_{i,t-1} + (\Sigma_{year=1993\sim96} \beta_{3l} (NP/K)_{it} * DCOT * D_{year} + \Sigma_{type} \beta_{3J} (NP/K)_{it} * D_{enterprise\ type}) + (\Sigma_{year=1993\sim96} \beta_{4l} (PDEP/K)_{i,t} * DSP * D_{year} + \Sigma_{type} \beta_{4J} (PDEP/K)_{i,t} * D_{enterprise\ type}) + e_{it}. \quad (4)$$

These results are shown in Table 4.

In both eq. (3) and eq. (4a) of Table 4, in the coefficients of $NP/K*DCOT*D_{year}$, only those of $NP/K*DCOT*D_{1993}$ and $NP/K*DCOT*D_{1996}$ are significant. This suggests that the liquidity constraints faced by COTVEs regarding their cash availability were relaxed by an investment boom in 1994-1995, although they faced renewed liquidity constraints in 1996 after the boom was over. Financial reform in China since 1994 does not appear to have reduced the lending bias that favored SOEs against COTVEs.[14) 15)] Of the estimated coefficients of $PDEP/K*DSP*D_{year}$ presented in eq. (4a) of Table 4, only those of $PDEP/K*DSP*D_{1995}$ and $PDEP/K*DSP*D_{1996}$ are significantly positive, indicating that the liquidity constraints difference between SHEs & PEs and the others regarding replacement capital were also stronger after 1994 than before. The estimation results in Table 4 show that the misallocation of investment funds between enterprise types did not improve even after 1994.

Did financial reform since 1994 therefore make no change in the efficiency of investment fund allocation? We next investigate investment efficiency within each enterprise type during 1993-1996. We regress NP/K against the investment rate in the previous year, $(I/K)_{-1}$, within each enterprise type. If investment efficiency improved within an enterprise type, a higher investment rate in the previous year should lead to greater current profitability over time; the explanatory power of $(I/K)_{-1}$ for NP/K should increase.

Table 5 shows estimates of the investment efficiency regression for COTVEs, and Table

14) Park and Sehrt (2001, p.627) find that the responsiveness of bank lending to stated policy concerns, such as SOE output and profitability, is significant and is greater after 1994. Clearly China's SOE lending problem did not cease in spite of the announcements of reform. This finding is consistent with the lending bias favorable to SOEs after 1994.

15) We found a lending bias in favor of SOEs also in Fujian province from 1993 to 1998 , see Shiraishi and Yano (2003).

Table 4 Investment Regression Equation with Enterprise Type and Year Dummy Variables [1]

	Fixed Effects [2),3)]	
Independent Variables	eq.(3)	eq.(4a)
ΔS/K	0.020*	0.022*
	(1.957)	(2.003)
$(\Delta S/K)_{-1}$	0.011	0.013
	(1.005)	(1.016)
NP/K	-0.025	-0.013
	(-0.109)	(-0.058)
NP/K*DCOT		
$NP/K*DCOT*D_{1993}$	0.856**	0.824**
	(2.843)	(2.804)
$NP/K*DCOT*D_{1994}$	0.592	0.581
	(1.654)	(1.618)
$NP/K*DCOT*D_{1995}$	0.483	0.474
	(1.528)	(1.460)
$NP/K*DCOT*D_{1996}$	0.953**	0.945**
	(3.676)	(3.635)
NP/K*DSP	-0.162	-0.139
	(-0.886)	(-0.748)
NP/K*DJV	-0.045	-0.045
	(-0.100)	(-0.102)
NP/K*DUU	-0.212	-0.202
	(-0.682)	(-0.646)
PDEP/K	4.507**	4.574**
	(3.578)	(3.615)
PDEP/K*DCOT	-0.414	-0.462
	(-0.828)	(-0.854)
PDEP/K*DSP	0.663**	
	(1.866)	
$PDEP/K*DSP*D_{1993}$		0.523
		(0.540)
$PDEP/K*DSP*D_{1994}$		0.316
		(0.660)
$PDEP/K*DSP*D_{1995}$		0.734*
		(2.029)
$PDEP/K*DSP*D_{1996}$		0.715*
		(2.196)
PDEP/K*DJV	1.028	0.986
	(0.570)	(0.545)
PDEP/K*DUU	-1.543	-1.573
	(-1.089)	(-1.107)
R^2	0.451	0.508
Adj.R^2	0.230	0.310
Obs. No.	788	788

(Notes) see Table 2.

6 for SHEs & PEs.

Table 5 shows the investment efficiency - the regression results of NP/K on $(I/K)_{-1}$ - of COTVEs each year from 1993 to 1996. Table 5 shows that the increase of $(I/K)_{-1}$ has a positive effect on NP/K each year, with a stronger effect in 1996 according to the adjusted R squared value (0.264) and t value (12.011). Table 6 shows that the effect of $(I/K)_{-1}$ on N/P in 1996 is stronger for SHEs & PEs. Consequently, the investment efficiencies of COTVEs, and SHEs & PEs were improved in 1996 (or 1995). This is possibly a result of the financial reform stemming from 1994 which made banks more sensitive to profitability in financing.[16] The investment of COTVEs in 1995 then generated profit (NP/K) more efficiently, which in turn might lead to their higher investment rate in 1996 as is shown in Table 1, since COTVEs were liquidity-constrained in their cash availability. In contrast, the investment efficiencies of SOEs, and UCOEs & UCEs have declined year by year (regression results not shown). The financial reforms from 1994 have not softened the lending bias favoring SOEs, and UCOEs & UCEs over COTVEs.

3-3. Effect of Business Groups and Collateralizable Assets on Investment by Enterprises

To examine whether the formation of business groups and collateralizable assets gave enterprises easier access to external bank lending, we estimate coefficients in several models that include terms representing these factors. Business group dummy (DG) and collateralizable assets variables (K) are introduced into expression (4). DG indicates that the firm was affiliated with a business group,[17] and K, the nominal original value of fixed assets, can be regarded as a collateralizable assets variable.

Table 5 Investment Efficiency Regression of COTVEs in 1993-96 [1)]

	OLS			
Independent Variables	1993	1994	1995	1996
Constant	0.005*	0.007*	0.008*	0.007**
	(1.988)	(2.260)	(2.166)	(3.061)
$(I/K)_{-1}$	0.159**	0.152**	0.251**	0.308**
	(9.288)	(9.256)	(9.325)	(12.011)
Adj.R^2	0.125	0.120	0.109	0.264
Obs. No.	38	44	52	50

(Notes)
1) The table presents regression coefficients. The dependent variable is NP/K.
Numbers in parentheses are the t statistics.
* Siginificant at 5%.
** Siginificant at 1%.

Table 6 Investment Efficiency Regression of SHEs & PEs in 1993-96 [1)]

	OLS			
Independent Variables	1993	1994	1995	1996
Constant	0.001	0.001	0.003	0.0002
	(0.897)	(0.444)	(0.770)	(0.125)
$(I/K)_{-1}$	0.685**	0.932**	0.515**	0.166**
	(15.459)	(12.279)	(7.464)	(31.267)
Adj.R^2	0.209	0.188	0.104	0.580
Obs. No.	8	12	13	10

(Notes) see Table 5.

We first investigate the effect of formation of business groups on the liquidity constraints faced by manufacturing enterprises in Wuxi City. The effect of business group formation on the liquidity constraints faced by COTVEs regarding cash availability can be examined using empirical models which introduce NP/K*DCOT crossed with business group dummy (DG) into expression (4). NP/K*DCOT is the variable representing cash availability of COTVEs. In terms of replacement capital, every type of enterprise in Wuxi City faced liquidity constraints, and SHEs & PEs faced stronger constraints as shown in Tables 3 and 4. We examine the effect of business group formation on the liquidity constraints faced by every type of enterprise, or the difference in liquidity constraints compared with SHEs & PEs, regarding replacement capital by adopting models which introduce into expression (4)

16) Park and Sehrt (2001, pp.635-636) found that the separation of policy and commercial lending following the creation of the Agricultural Development Bank of China, which is a policy bank for rural China, allowed the Agricultural Bank of China to be commercially oriented from 1994 to 1996; the Agricultural Bank of China is a large money lender to COTVEs and other TVEs. This observation is consistent with the increasing proportion of loans going to TVEs (almost 20% in 1996). The change may be reflected in the improved investment efficiencies of COTVEs in 1996.

17) In our sample we are able to distinguish firms affiliated with a business group and independent firms only in 1995 and 1996. DG therefore indicates only that the firm was affiliated with a business group from 1995 to 1996.

the variable crossing PDEP/K or PDEP/K*DSP with business group dummy (DG). Results are presented in Table 7.

It is difficult to find empirical evidence that the formation of business groups had some effect on the liquidity constraints faced by manufacturing enterprises in Wuxi City during the sample period. In the estimates of expressions (4b) and (4c) in Table 7, the coefficients of NP/K*DCOT*DG are not statistically significant. The estimated coefficient of PDEP/K*DG in expression (4b) in Table 7, and that of PDEP/K*DSP*DG in expression (4c) are also not statistically significant.[18] Consequently, enterprises affiliated with a business group were not less liquidity constrained than independent enterprises. This may be because business groups in Wuxi City circulate information about a specific affiliated firm only within that group, and do not convey it to external financial institutions.[19]

Next, we discuss the effect of collateralizable assets (K) on investment behavior (Table 8). We now suppose that the coefficient of NP/K*DCOT varies with the value of K:

$$(\beta_3 + \beta_{3K} K)\ (NP/K*DCOT) = \beta_3(NP/K*DCOT) + \beta_{3K}\ (NP/K*DCOT*K),$$

and introduce NP/K*DCOT*K into expression (4).[20] The coefficient of NP/K*DCOT*K now represents the variable part of the coefficient of NP/K*DCOT. If more collateralizable assets made it easier for COTVEs to access external bank lending, the coefficient of NP/K*DCOT*K should be negative.

In the estimates of expression (4d), the coefficient of NP/K*DCOT*K is significantly negative. Collateralizable assets held by COTVEs clearly enabled them to access external funds more easily during 1993-1996. We now examine whether the effectiveness of collateralizable assets in giving COTVEs easier access to external lending tended to increase with time. This is done by estimating an expression in which NP/K*DCOT*D_{year} in expression (4) is crossed with collateralizable assets variables (K). The resulting estimates are given in eq. (4e) of Table 8. The estimated coefficients of NP/K*DCOT*D_{1993}*K, NP/K*DCOT*D_{1994}*K, NP/K*DCOT*D_{1995}*K and NP/K*DCOT*D_{1996}*K are all significantly negative, and become larger year by year. The (absolute values of) the estimated coefficients of NP/K*DCOT*D_{1995} *K (-0.00004) and NP/K*DCOT*D_{1996}*K (-0.00008) are four and eight times as large as those of NP/K*DCOT*D_{1993}*K and NP/K*DCOT*D_{1994}*K (-0.00001). It is therefore likely that collateralizable assets became particularly effective in

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18) Even when DG is crossed with NP/K*DCOT*D_{year}, PDEP/K*D_{year} and PDEP/K*DSP*D_{year} in our empirical models, these estimated coefficients are not significant for any year during 1993-1996 (results not shown).

19) China's largest business groups (*keiretsu* in Japan, *chaebol* in South Korea) all had a high performing internal finance company by the mid-1990s , see Keister (2000, pp.95-99). However, business groups in Wuxi City, including the vast rural area within it, might not have set up such schemes.

20) In Table 8, PDEP/K*DCOT or PDEP/K*DCOT*D_{year} is not crossed with the collateralizable assets variable (K). This is because the estimated coefficient of PDEP/K*DCOT or PDEP/K*DCOT*D_{year} crossed with K is not statistically significant, and also because the estimates become unstable when PDEP/K*DCOT or PDEP/K*DCOT*D_{year} crossed with K is used as an independent variable in regression.

Table 7 Investment Regression Equation (4) with Business Group Dummy Variables[1)]

Independent Variables	Fixed Effects[2),3)] eq.(4b)	eq.(4c)
ΔS/K	0.021*	0.026*
	(1.999)	(2.227)
$(\Delta S/K)_{-1}$	0.017	0.019*
	(1.797)	(2.091)
NP/K	-0.029	-0.008
	(-0.128)	(-0.036)
NP/K*DCOT		
$NP/K*DCOT*D_{1993}$	0.824**	0.822**
	(2.670)	(2.608)
$NP/K*DCOT*D_{1994}$	0.587	0.571
	(1.621)	(1.575)
$NP/K*DCOT*D_{1995}$	0.488	0.474
	(1.522)	(1.478)
$NP/K*DCOT*D_{1996}$	0.939**	0.935**
	(3.623)	(3.594)
NP/K*DCOT*DG	0.049	-0.039
	(0.145)	(-0.125)
NP/K*DSP	-0.142	-0.134
	(-0.762)	(-0.715)
NP/K*DJV	-0.043	-0.046
	(-0.096)	(-0.102)
NP/K*DUU	-0.211	-0.198
	(-0.675)	(-0.631)
PDEP/K	4.643**	4.576**
	(3.653)	(3.610)
PDEP/K*DG	-0.510	
	(-0.700)	
PDEP/K*DCOT	-0.494	-0.453
	(-0.871)	(-0.846)
PDEP/K*DSP		
$PDEP/K*DSP*D_{1993}$	0.524	0.501
	(0.541)	(0.516)
$PDEP/K*DSP*D_{1994}$	0.310	0.310
	(0.647)	(0.646)
$PDEP/K*DSP*D_{1995}$	0.739*	0.722*
	(2.041)	(2.029)
$PDEP/K*DSP*D_{1996}$	0.738*	0.647
	(2.253)	(1.607)
PDEP/K*DSP*DG		0.183
		(0.292)
PDEP/K*DJV	0.964	0.981
	(0.532)	(0.542)
PDEP/K*DUU	-1.575	-1.571
	(-1.108)	(-1.104)
R^2	0.509	0.510
Adj.R^2	0.309	0.308
Obs. No.	788	788

(Notes) see Table 2.

Table 8 Investment Regression Equation (4) with Collateralizable Assets Variables [1)]

Independent Variables	Fixed Effects[2),3)] eq.(4d)	eq.(4e)
ΔS/K	0.027*	0.025*
	(2.221)	(2.234)
$(\Delta S/K)_{-1}$	0.016	0.014
	(1.797)	(1.554)
NP/K	-0.034	-0.036
	(-0.146)	(-0.160)
NP/K*DCOT		
$NP/K*DCOT*D_{1993}$	1.263**	0.852**
	(3.695)	(2.838)
$NP/K*DCOT*D_{1994}$	0.715*	0.617*
	(1.940)	(2.067)
$NP/K*DCOT*D_{1995}$	0.717*	0.658*
	(2.038)	(2.219)
$NP/K*DCOT*D_{1996}$	1.343**	1.501**
	(3.218)	(3.996)
NP/K*DCOT*K [4)]	-0.00005*	
	(-2.126)	
$NP/K*DCOT*D_{1993}*K$		-0.00001*
		(-2.005)
$NP/K*DCOT*D_{1994}*K$		-0.00001*
		(-2.329)
$NP/K*DCOT*D_{1995}*K$		-0.00004*
		(-1.921)
$NP/K*DCOT*D_{1996}*K$		-0.00008**
		(-2.820)
NP/K*DSP	-0.140	-0.142
	(-0.754)	(-0.770)
NP/K*DJV	-0.046	-0.049
	(-0.103)	(-0.110)
NP/K*DUU	-0.217	-0.220
	(-0.696)	(-0.709)
PDEP/K	4.533**	4.440**
	(3.588)	(3.524)
PDEP/K*DCOT	-0.316	-0.406
	(-0.769)	(-0.823)
PDEP/K*DSP		
$PDEP/K*DSP*D_{1993}$	0.516	0.521
	(0.534)	(0.541)
$PDEP/K*DSP*D_{1994}$	0.316	0.320
	(0.662)	(0.673)
$PDEP/K*DSP*D_{1995}$	0.737*	0.738*
	(2.041)	(2.050)
$PDEP/K*DSP*D_{1996}$	0.714*	0.713*
	(2.196)	(2.199)
PDEP/K*DJV	1.029	0.854
	(0.570)	(0.474)
PDEP/K*DUU	-1.588	-1.604
	(-1.120)	(-1.135)
R^2	0.540	0.557
Adj.R^2	0.354	0.374
Obs. No.	788	788

(Notes)
1), 2), 3), *, **: see Table 2.
4) The sample average of K for COTVEs is 3875 (000 RMB).

giving COTVEs better access to external finance after 1994. This is possibly because state-owned banks became more commercialized and concerned with the safety of financing.

4. CONCLUSIONS

We have estimated the coefficients in expressions for investment for a sample of manufacturing enterprises in Wuxi City, Jiangsu province from 1993 to 1996. Our results imply several conclusions. First, COTVEs alone were liquidity-constrained in their cash availability. The liquidity constraints faced by COTVEs regarding the availability of cash flow persisted even in 1996, suggesting that the financial reform in China from 1994 did not reduce the lending bias against COTVEs (and favoring SOEs). Liquidity constraints differences between SHEs & PEs and the others regarding replacement capital were also stronger after 1994 than before. Second, within COTVEs, the investment efficiency - the allocative efficiency of investment funding - improved around 1996. This was probably a consequence of the financial reforms, which made banks more sensitive to profitability and quality of financing and improved the efficiency of allocation of funds within COTVEs. Clearly, though the financial reform in China from 1994 did not rectify misallocation of funds between enterprise types by 1996, it did reduce misallocation of funds within types of enterprises. Third, the formation of business groups did not ease the liquidity constraints faced by affiliated enterprises in Wuxi City. Each member firm's information was presumably circulated transparently within that business group; some institutional device could be established to convey information about individual firms to external lenders in Wuxi City. Fourth, collateralizable assets became particularly effective in giving COTVEs better access to external finance after 1994. This improvement could be because state-owned banks were by then fully commercialized and sensitive to the safety of financing. Measures such as developing the weak land assets market in China might now give rise to more efficient capital allocation. By increasing the values of their collateralizable assets, this would give COTVEs (more generally, the now privatized 'formerly collective-owned TVEs'), which are visibly more efficient than SOES and other types of enterprise, better access to bank loans.

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ABSTRACT

Lending Bias during the Financial Reform Period in China seen in Wuxi City microdata, 1993-1996

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[Keywords]
Lending bias, Liquidity constraints, Financial reform since 1994, Collective-owned township and village enterprises.
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We examine empirically whether financial reform in China since 1994 has reduced the lending bias that operated in favor of state-owned enterprises (SOEs) and against non-state-owned enterprises such as collective-owned township and village enterprises (COTVEs), in the manufacturing sector in Wuxi City, Jiangsu province. The reforms did not reduce the lending bias, though they probably improved the efficiency of allocation of funds within COTVEs. Liquidity constraints faced by enterprises affiliated to a business group in Wuxi City were not reduced, but after 1994 collateralizable assets became particularly effective in giving COTVEs better access to external finance.