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## An Attempt to Profile the Finances of China's Enterprise Sector

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## **IMF Working Paper**

Asia and Pacific Department

### **An Attempt to Profile the Finances of China's Enterprise Sector**

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#### **Abstract**

<p>The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.</p>
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This paper examines the leverage, efficiency, and debt-repayment capacity of the Chinese enterprise sector using aggregate and firm level data. The cash coverage of interest expense, in particular, is used as a bridge between enterprise finances and banks' asset quality in order to develop insights on banking soundness. The interest coverage analysis corroborates the high level of nonperforming loans in the financial system. This underscores the urgency of hardening budget constraints on state-owned enterprises and stemming the flow of new bad loans by accelerating ongoing structural reforms.

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## I. INTRODUCTION

The closely intertwined state enterprise, financial sector, and medium-term fiscal challenges represent the central economic problem facing China. The weak performance of state-owned enterprises (SOEs) has burdened the state commercial banks (SCBs) with a large amount of nonperforming loans (NPLs), creating contingent liabilities that could threaten medium-term fiscal sustainability. Although the authorities have made significant progress in improving the governance and performance of SOEs and SCBs (see section II), the remaining agenda is formidable, and the financial costs of reforms are large and difficult to quantify. For example, measures of asset quality and capital adequacy are not readily available or reliable,<sup>2</sup> with official estimates continuing to evolve.<sup>3</sup>

This paper examines the systemic risks arising from state banks and enterprises and their policy implications from the perspective of enterprise balance sheets. It examines the leverage, efficiency, and debt-repayment capacity of China's enterprise sector. The risk profile of enterprises, in turn, holds a mirror to financial system soundness, given that most credit has been lent to enterprises until recently.

The analysis uses aggregate financial data published by the National Bureau of Statistics (NBS) and two firm level data sets on China's listed companies (see Appendix I). The aggregate data describe China's enterprise sector (including state and nonstate enterprises), while the firm level data allow an examination of the finances of listed enterprises (most of which remain under majority state ownership and control).<sup>4</sup> The cash coverage of interest expense forms the

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<sup>2</sup> Loans are classified only after principle (not interest) payments are past due, and only the portion of principle past due (according to the original payment schedule) is classified as nonperforming, not the entire loan and unpaid interest. Similarly, provisions were capped at 1 percent of total loans until recently and most Chinese banks maintain loan loss reserves of only 1–2 percent of total loans. The authorities recently adopted a new regulation on loss loans and related provisions, which permits up to 100 percent of provisioning for loss loans. The authorities are also working on a new loan classification standard, with some banks already implementing the new scheme (much closer to international best practice) in parallel with the existing requirement.

<sup>3</sup> The average NPL ratio for SCBs officially was estimated at 25 percent prior to the transfer of NPLs to the asset management companies (AMCs) in 1999. However, a recent reappraisal of loan portfolios has produced revised estimates. Thus, even after the NPL transfer, the officially reported NPL ratio is now 26.6 percent as of end-September 2001.

<sup>4</sup> The aggregate level data spans 1994–2000, while the two firm level data sets span 1998–mid-2000 and 1995–1998, respectively. While the rise in SOE profitability, particularly in the year 2000, is reflected in the aggregate data and analysis, the firm level statistics do not fully capture the recent improvement in enterprise sector performance.

bridge between the enterprise sector analysis and assessment of financial sector asset quality. This measure has provided useful insights into financial sector vulnerabilities elsewhere in the region (Ramos and others, 1998, and Goldman Sachs, 2000), but has not been applied to China.

The remainder of this paper is organized as follows. Section II provides a brief overview of the SOE and financial sector reform measures that have been initiated thus far. Section III presents the analysis of data on China's enterprise sector. Section IV concludes with a discussion of the empirical results and their policy implications.

## II. OVERVIEW OF SOE AND FINANCIAL SECTOR REFORM

The restructuring of SOEs and the financial sector has been the most difficult of China's structural reforms. The financial performance of SOEs has historically been weak, reflecting macroeconomic and industry-specific factors, including poor management, overstaffing, high debt, outdated products and technologies, an excessive social welfare burden, and high tax rates. SOE losses have required heavy subsidization by the state which, before the start of reform in the late 1970s, was provided by direct budgetary allocations, but thereafter took the form of loans from the SCBs. By the mid-1990s, it became clear that reforms of the SOEs and SCBs could no longer be delayed. Even so, the pace of reform remained conditioned by concerns about social stability, as layoffs from SOEs added to regional income disparities and strained an inadequate social safety net.

The focus of recent SOE reform has been to privatize small enterprises and to commercialize large ones under the principle of "seize the large and release the small." Some progress has been made on hardening budget constraints, and enterprise profitability has improved over the past three years, following the authorities' initiative in 1998 to revitalize medium and large SOEs. Better earnings mainly reflect outside factors such as higher oil prices and interest savings from debt-equity swaps, but durable efficiency gains have been secured through layoffs, a reduced social welfare burden, and by cutting excess capacity.<sup>5</sup>

Financial sector reforms have focused on commercializing SCBs' lending operations. Reforms were initiated by establishing policy banks to relieve the four large SCBs of their policy lending, while taking steps to commercialize and hold the SCBs accountable for their own operations and financial results. A range of reforms were introduced after the onset of the Asian crisis, which included limiting local government interference in bank lending decisions, abolishing the Credit Plan, recapitalizing the SCBs through a Y 270 billion bond issue in 1998, and transferring Y 1.4 trillion of NPLs to four AMC's during 1999-2000. Internal SCB reforms have included the revamping of loan approval and analysis procedures, the introduction of more incentive-based compensation systems, branch rationalization, and staff reductions.

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<sup>5</sup> According to official statistics, the aggregate profits of large- and medium-sized SOEs surged by 135 percent in 2000, to Y 240 billion. Available data through September 2001 suggest that the upward trend in SOE profitability has leveled off.

These efforts, however, have not yet succeeded in ending non-commercial lending to SOEs and their operational inefficiencies. Enterprise management is still weak, outside governance limited, excess labor high, and exit channels for poorly performing SOEs limited. Bank loans satisfy the working capital and investment needs of SOEs, many of which accumulate inventories unlikely to be sold and receivables with little prospect of repayment. Cash-short enterprises then accumulate tax payables and are kept afloat by debt rollovers and new loans from banks, whose capacity to assess and price credit risk remains limited. Even if lenders intended to distinguish good risks from bad ones, corporate accounting practices distort financial statements to a degree that makes it difficult to screen and monitor borrowers.<sup>6</sup>

### III. ENTERPRISE SECTOR ANALYSIS

This section examines two types of data on Chinese enterprises: (i) an aggregate data set for all industrial enterprises, including SOEs, published in the annual *China Statistical Yearbook*; and (ii) data on individual listed enterprises, most of which are state owned. The available data confirm the weak financial condition of the enterprise sector. They also suggest that enterprise finances are vulnerable to considerable downside risk from even a moderate weakening of their business environment. Deficiencies in the quality of corporate financial data, however, warrant some caution in interpreting these conclusions.

The financial condition of enterprises, particularly SOEs, has important implications for banking system soundness, given that SOEs are the predominant users of bank credit. SOEs accounted for over one-half of outstanding credit in 2000, two-thirds of which were of less than one-year maturity.<sup>7</sup> While loans to consumers (currently around 2 percent of total loans) have been growing rapidly in recent years, credit to enterprises will continue to represent a large share of bank assets. The financial system's risk exposure to the enterprise sector should decline over time, however, as a growing share of new credits are granted to private enterprises and banks lend on an increasingly commercial basis.

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<sup>6</sup> Firms overstate profits and assets. All goods produced are valued at market prices, regardless of whether they are sold or paid for. Unsold goods accumulate as inventories, while goods sold but not paid for accumulate as receivables. Both are then valued at market prices and classified as current assets. Furthermore, both inventories and receivables are credited as revenues in the income statement and included in profits, even though neither of them generates cash. Appendix I details the statistical adjustments made to correct for the data anomalies.

<sup>7</sup> It is worth noting that the credit stock—at 127 percent of GDP at end-2000—is high by emerging market standards, reflecting China's high savings rate.

### A. Aggregate Level Analysis

Although the share of SOEs in China's industrial sector has been declining, it is still sizable. The share of state enterprise output and employment has been on a declining trend since 1994 (Table 1).<sup>8</sup> Nevertheless, SOEs continue to generate over 50 percent of industrial value-added and employ more than half of the industrial workforce. Also noteworthy is the steady rise in the value-added of foreign-funded enterprises, which doubled between 1994–2000, in contrast to that of collective-owned firms, which fell by more than one half.<sup>9</sup>

SOEs control the bulk of productive assets in the industrial sector. SOEs held two-thirds of the net fixed assets of all industrial enterprises in 2000 (Table 2).<sup>10</sup> By contrast, collective enterprises' share of fixed assets fell by two-thirds between 1994 and 2000, with shareholding and foreign companies increasing their shares modestly. The decline in the share of collectives is attributable to falling growth and investment of township and village enterprises (which are classified as collectives), and because many collectives were actually private and were reclassified as such in 1998. A noteworthy trend is the rising share of fixed assets in the total assets of all enterprises, particularly that of SOEs. The share of net fixed assets in SOEs' total assets stood at 44 percent in 2000, up from under 36 percent in 1994.

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<sup>8</sup> The jump in SOEs' share of industrial value-added in 1998 (as well as in their share of industrial fixed assets—Table 2) resulted in part from a broadening of the classification to also include enterprises in which the state has a controlling share. In addition, it may reflect the impact of increased fiscal spending—which was largely channeled through SOEs—to support growth following the Asian financial crisis.

<sup>9</sup> Shareholding companies doubled their share of industrial value-added in both 1999 and 2000, but the increase in part stems from the reclassification of firms out of collective- or state-owned and into shareholding companies.

<sup>10</sup> The increase in SOEs' share of fixed assets may also reflect (in addition to the broadening of classification noted in footnote 8) a pickup in “technological renovation” investment following the authorities' plan adopted in 1998 to rehabilitate large SOEs.

Table 1. Output, Employment, and Value-Added of Industrial Enterprises, 1994–2000

	1994	1995	1996	1997	1998	1999	2000
Output	(Percent of total)						
State-owned 1/	37.8	34.6	34.0	30.2	26.5	26.3	...
Collective-owned	38.2	37.3	36.9	36.4	36.1	32.9	...
Individual-owned	10.2	13.1	14.5	17.1	16.1	16.9	...
Shareholding	4.3	3.1	3.1	4.2	7.3	9.1	...
Foreign-funded 2/	9.6	11.9	11.4	12.1	14.0	14.8	...
Employment	(Percent of total)						
State-owned 1/	66.4	66.5	66.3	65.0	57.2	54.5	51.1
Collective-owned	24.4	22.7	22.2	21.4	16.9	15.2	13.7
Other	9.2	10.7	11.5	13.6	25.9	30.3	35.2
Value-added	(Percent of total)						
State-owned 1/	54.5	54.5	49.4	47.3	58.3	55.7	51.9
Collective-owned	28.4	25.4	29.2	27.1	17.4	14.6	11.6
Shareholding	5.8	5.1	5.4	7.4	3.0	7.4	13.5
Foreign-funded 2/	11.3	15.0	16.1	18.2	21.3	22.3	23.0

Sources: *China Statistical Yearbook*, various issues. 1/ Including enterprises with a controlling share by the state for 1998–2000. 2/ Including Hong Kong SAR, Macao SAR, and Taiwan Province of China.

Table 2. Net Fixed Assets of Industrial Enterprises, 1994–2000

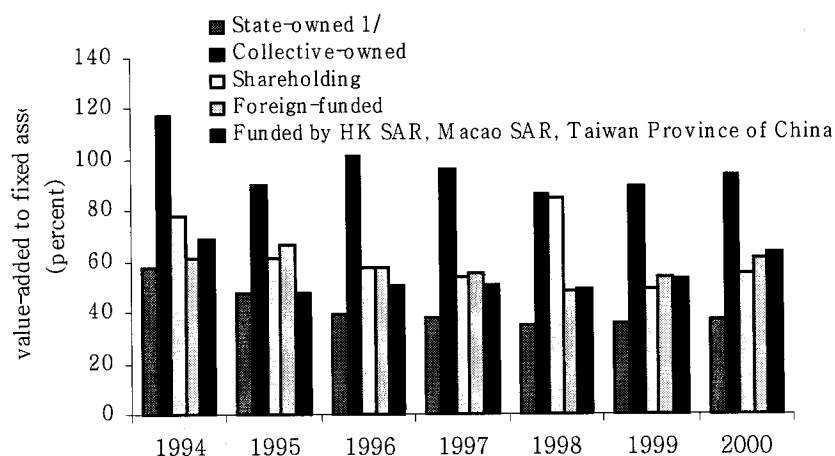
Net Fixed Assets	1994	1995	1996	1997	1998	1999	2000
	(Percent of total)						
State-owned 1/	65.7	64.4	64.9	62.4	71.3	68.1	65.4
Collective-owned	16.9	15.8	14.9	13.9	8.6	7.2	5.8
Shareholding	5.2	4.7	4.9	6.7	1.5	6.6	11.4
Foreign-funded	7.2	6.6	7.8	9.2	9.3	9.4	9.3
Hong Kong SAR, Macao SAR, and Taiwan Province of China	5.1	8.4	7.6	7.8	9.3	8.8	8.1
	(Percent of total assets)						
State-owned 1/	35.5	36.8	42.0	41.5	42.6	42.2	43.9
Collective-owned	29.5	29.9	32.3	33.0	33.9	33.9	33.9
Shareholding	26.0	28.8	30.3	32.2	34.3	35.7	43.2
Foreign-funded	36.6	31.1	33.0	35.3	37.9	38.6	37.9
Hong Kong SAR, Macao SAR, and Taiwan Province of China	32.3	36.6	37.7	39.0	40.2	40.1	38.4
All enterprises	33.6	34.7	38.4	38.5	40.8	40.5	42.0

Source: *China Statistical Yearbook*, various issues. 1/ Including enterprises with a controlling share by the state for 1998–2000.

However, the efficiency of investment in the SOE sector is relatively low (Figure 1). The ratio of value added-to-fixed assets for SOEs was 37 percent in 2000, compared with 56 percent for shareholding companies, 61 percent for foreign companies, and 94 percent for collectively-owned firms. Although the efficiency of all groups fell during 1994–2000, the relative drop in this ratio was sharpest for SOEs, at 35 percent.



Figure 1. Efficiency of Industrial Enterprises



Source: *China Statistical Yearbook*, various issues. 1/ Including enterprises with a controlling share by the state in 1998-2000.

Leverage among industrial enterprises remains high, despite the downward trend in recent years (Table 3). The liabilities-to-equity ratio for all enterprises stood at 144 percent in 2000—down from 200 percent in 1994. Enterprise leverage is on par with levels prevailing in Brazil, Indonesia and Thailand in the run up to their financial crises and much higher than those of the Czech Republic, Hungary, and Poland, where the median debt-equity ratios of listed companies stood at 43, 14, and 45 percent, respectively, in 1998-99.<sup>11</sup>

Table 3. Leverage of Industrial Enterprises, 1994–2000

Total Liabilities-to-Equity	1994	1995	1996	1997	1998	1999	2000
	(Percent)						
State-owned 1/	211	192	186	184	176	160	155
Collective-owned	234	243	249	234	209	192	188
Shareholding	117	122	130	131	191	109	97
Foreign-funded	167	120	131	129	129	125	127
Hong Kong SAR, Macao SAR, and Taiwan Province of China	161	164	174	164	148	140	136
<b>All enterprises</b>	<b>200</b>	<b>186</b>	<b>184</b>	<b>177</b>	<b>171</b>	<b>152</b>	<b>144</b>

Source: *China Statistical Yearbook*, various issues. 1/ Including enterprises with a controlling share by the state for 1998–2000.

Interest coverage has strengthened mirroring the decline in leverage, but it is still low.<sup>12</sup> Chinese enterprises' interest coverage averaged 3.6 times in 2000, which is low by international

<sup>11</sup> Cross-country leverage indicators are sourced from a database constructed from corporate financial indicators in the Worldscope database.

<sup>12</sup> Interest coverage (operating profit-to-interest expense) is computed by estimating interest expenses, which are calculated by multiplying reported total liabilities by the prevailing interest rate on short-term loans.

comparison (Table 4).<sup>13</sup> SOEs had the lowest coverage at 2.9 times, while shareholding companies had the highest at 5.7 times. By contrast, interest coverage ranged between 10-20 for listed companies in Hong Kong SAR and Singapore; and between 5-10 for listed companies in Germany, Japan, and the United States (Pomerleano, 1998). Listed companies in the Czech Republic, Hungary, and Poland also had strong interest coverage of 6-11 times in 1999.

Table 4. Interest Coverage of Industrial Enterprises, 1994–2000

Operating Profit-to-Interest Expense	1994	1995	1996	1997	1998	1999	2000
	(Times)						
State-owned 1/	1.7	1.6	1.5	1.6	1.9	2.4	2.9
Collective-owned	2.3	2.1	2.3	2.7	3.4	5.5	4.3
Shareholding	2.4	2.2	2.0	2.3	3.9	3.6	5.7
Foreign-funded	2.3	2.3	2.3	2.7	3.3	4.6	5.1
Hong Kong SAR, Macao SAR, and Taiwan Province of China	1.9	1.7	1.7	2.0	2.7	3.4	3.9
All enterprises	1.9	1.8	1.8	2.0	2.3	3.0	3.6

Sources: *China Statistical Yearbook*, various issues; and authors' estimates. 1/ Including enterprises with a controlling share by the state for 1998–2000.

SOE profitability was the weakest among industrial enterprises during 1994–2000 (Table 5). Foreign funded enterprises were the most profitable, with an operating profits-to-assets ratio of 17 percent, almost double that of SOEs.

Table 5. Profitability of Industrial Enterprises, 1994–2000

Operating Margin	1994	1995	1996	1997	1998	1999	2000
	(Percent of assets)						
State-owned	12.7	11.4	10.5	9.4	8.6	8.7	10.4
Collective-owned	17.3	16.8	17.0	16.7	16.1	21.7	16.7
Shareholding	14.5	13.5	11.9	11.6	17.8	11.4	16.8
Foreign-funded	15.5	14.1	13.5	13.6	13.0	15.2	17.2
Hong Kong SAR, Macao SAR, and Taiwan Province of China	13.0	11.4	11.3	11.2	11.2	11.9	13.4
All enterprises	13.9	12.7	12.1	11.3	10.3	11.0	12.5

Source: *China Statistical Yearbook*, various issues. Note: Operating margin = sales minus cost of goods sold. 1/ Including enterprises with a controlling share by the state for 1998–2000.

<sup>13</sup> In the run up to the Asian crisis, the median interest coverage for the domestically listed companies of the crisis countries ranged between 2–3 times in 1996 (Claessens, 1998).

## B. Firm Level Analysis

Firm level data allow a more in-depth analysis of China's enterprise sector than has been available in the literature until now. Two sets of firm level data are analyzed: (i) data for a subset of listed enterprises (from the Worldscope database); and (ii) a data set of virtually all listed enterprises (pursuant to the disclosure requirements of the China Securities Regulatory Commission (CSRC)). Indicators of enterprise financial risk are generated for each company.

In summary, the firm level analysis suggests that Chinese enterprises are financially weak and exposed to adverse macroeconomic developments. In particular:

- *China's corporate sector is largely unprofitable and illiquid.* Several enterprises in the firm-level data sets—accounting for 20-30 percent of the total debt of all sample firms—are unable to generate enough cash flow to pay interest on their debts.
- *The corporate sector is susceptible to even modest interest rate and demand shocks.* Sensitivity analysis suggests that a moderate rise in interest rates and drop in sales could cause 40-60 percent of the debts of all firms to become unserviceable, underscoring the financial fragility of the sector.
- *The interest coverage analysis corroborates the high level of NPLs in the banking system.* With implied NPLs in the 20-30 percent range, the analysis suggests that the nearly 30 percent NPL figure reported by the four large SCBs is a lower bound (since the interest coverage analysis does not include amortization).

The results of the firm level analysis are broadly consistent with those of the aggregate enterprise sector data. The financial parameters and results derived from the two samples of listed enterprises are compatible with and, where directly comparable (i.e., on leverage, profitability, and interest coverage), similar to the aggregate level figures discussed earlier.<sup>14</sup>

### Asset structure and leverage

The high share of receivables and inventories in total assets indicates that SOEs have been producing goods few want to buy or pay for and that their assets are overvalued. Fixed assets account for the largest share of total assets (32–36 percent), followed by receivables (16–27 percent), and inventories (12–15 percent) (Table 6). Fixed assets' share in total assets is

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<sup>14</sup> In terms of assets, the sample of listed companies accounts for 16 percent of total assets of all medium and large industrial enterprises. Assets of companies in the sample totaled Y 1,915 billion at end-1999, compared to Y 8,047 billion for all medium and large SOEs reported in the *China Statistical Yearbook*. It should be noted, however, that the two figures are not directly comparable—because listed companies include firms in the utility and transportation sectors, which are excluded from the aggregate industrial enterprise data.

broadly comparable to equivalent figures reported in the aggregate data (42 percent—see Table 2). Receivables are higher for all listed companies at 22-27 percent than for the Worldscope subset at 16-18 percent, while inventories represent near-equal shares for both groups. The difference in receivables may be attributable to the relative strength of companies represented in the Worldscope data set, which appear to have higher rates of cash collection per unit of sales.

Table 6. Asset Structure of Listed Companies, 1995–2000

Percent	1995	1996	1997	1998	1999	2000 1/
Worldscope database						
Inventories-to-assets	15.2	13.1	11.9	11.7	...	...
Net receivables-to-assets	15.5	17.7	18.3	16.5	...	...
Fixed assets-to-total assets	32.9	35.5	34.0	33.2	...	...
CSRC financial disclosures						
Inventories-to-assets	...	...	...	12.3	12.1	11.6
Net receivables-to-assets	...	...	...	21.8	26.8	26.0
Fixed assets-to-total assets	...	...	...	33.2	32.9	31.5

Source: Worldscope; company disclosures; and authors' estimates. 1/ Data refer to H1 2000.

The leverage of listed companies appears to be relatively low, but this may be misleading because of the overvaluation of inventories, receivables, and fixed assets. For both data sets, the leverage of listed companies is under 100 percent (Table 7), and much lower than the 144 percent reported in the aggregate figures (Table 3). This may reflect the fact that listed companies in the sample have access to more diverse sources of financing (including equity) compared with the enterprise population as a whole. In addition, several studies have shown that SOEs overvalue their assets (Lardy, 1998, and Steinfeld, 1998). Various adjustments have been made to assets and equity to illustrate the potential impact of asset overvaluation on measures of leverage and solvency.<sup>15</sup>

The leverage indicators increase significantly when equity is adjusted for the possible overvaluation of assets, and several companies become insolvent (Table 7). The deduction of 75 percent of the value of inventories from equity results in nearly one-fifth of all domestically-listed companies becoming insolvent and more than a doubling of liabilities-to-equity ratios. A 75 percent haircut on fixed assets pushes more than one-third of all domestically listed companies into insolvency and results in a 3-5 fold increase in their liabilities-to-equity ratios.

<sup>15</sup> Several illustrative scenarios have been calculated: First, the balance of receivables and payables is deducted from equity in all adjusted leverage ratios (Liabilities-to-Equity I-VII). Second, three progressively larger haircuts—25, 50, and 75 percent—are applied to inventories and fixed assets, the change in value of which are then deducted from equity. The haircuts are applied to inventories (Liabilities-to-Equity II-IV) and fixed assets (Liabilities-to-Equity V-VII) separately, not simultaneously.

Table 7. Leverage of Listed Companies (Illustrative Scenarios), 1995-2000

	1995	1996	1997	1998	1999	2000 1/
Worldscope Database						
			(Medians, percent)			
Liabilities-to-Equity	87.6	87.0	80.5	84.7	...	...
Liabilities-to-Equity I	78.9	78.4	69.7	76.8	...	...
Liabilities-to-Equity II	83.4	83.8	78.1	85.0	...	...
Liabilities-to-Equity III	93.4	90.3	84.6	93.0	...	...
Liabilities-to-Equity IV	109.0	96.4	94.8	100.7	...	...
Liabilities-to-Equity V	101.7	96.6	86.2	104.0	...	...
Liabilities-to-Equity VI	126.4	123.9	116.8	140.7	...	...
Liabilities-to-Equity VII	193.1	174.0	175.3	261.9	...	...
Proportion of Insolvent Companies			(Percent of sample total assets)			
Negative equity I	0.6	1.0	1.0	3.0	...	...
Negative equity II	5.5	1.0	1.8	4.4	...	...
Negative equity III	6.6	3.5	4.2	5.4	...	...
Negative equity IV	11.9	8.8	6.2	9.2	...	...
Negative equity V	0.6	7.8	7.2	10.0	...	...
Negative equity VI	2.4	12.6	13.8	16.6	...	...
Negative equity VII	12.0	15.0	22.0	25.0	...	...
CSRC Financial Disclosures						
			(Medians, percent)			
Liabilities-to-Equity	...	...	...	72.0	74.9	76.0
Liabilities-to-Equity I	...	...	...	94.0	114.9	115.9
Liabilities-to-Equity II	...	...	...	102.7	129.5	132.9
Liabilities-to-Equity III	...	...	...	114.3	146.8	147.2
Liabilities-to-Equity IV	...	...	...	127.2	170.7	166.0
Liabilities-to-Equity V	...	...	...	117.0	152.6	154.4
Liabilities-to-Equity VI	...	...	...	156.7	232.4	227.0
Liabilities-to-Equity VII	...	...	...	226.0	463.5	406.9
Proportion of Insolvent Companies						
			(Percent of sample total assets)			
Negative equity I	...	...	...	3.0	7.1	6.9
Negative equity II	...	...	...	3.3	8.5	10.9
Negative equity III	...	...	...	5.7	11.4	14.0
Negative equity IV	...	...	...	10.1	15.1	18.1
Negative equity V	...	...	...	10.2	24.0	23.8
Negative equity VI	...	...	...	13.7	32.1	30.2
Negative equity VII	...	...	...	33.8	45.8	43.2

Sources: Worldscope database; company disclosures; and authors' estimates.

Note: Liabilities-to-Equity = No adjustments made. In all seven of the remaining leverage indicators, the balance of receivable minus payables is deducted from reported equity. Liabilities-to-Equity I = The balance of receivable minus payables is deducted from reported equity. Liabilities-to-Equity II = Equity also adjusted for a 25 percent haircut on the value of inventories (i.e., equity minus 25% of inventories). Liabilities-to-Equity III = Equity also adjusted for a 50 percent haircut on the value of inventories. Liabilities-to-Equity IV = Equity also adjusted for a 75 percent haircut on the value of inventories. Liabilities-to-Equity V = Equity also adjusted for a 25 percent haircut on the value of fixed assets. Liabilities-to-Equity VI = Equity also adjusted for a 50 percent haircut on the value of fixed assets. Liabilities-to-Equity VII = Equity also adjusted for a 75 percent haircut on the value of fixed assets.

Leverage indicators for the Worldscope subset deteriorate to a similar degree, although the number of companies that become insolvent is considerably smaller (mirroring the smaller number of insolvent enterprises in the baseline scenario). The implication for locally listed companies as a whole is that overvaluation of assets may account for a substantial portion of reported enterprise equity.

### Profitability and liquidity

The profitability of listed companies has been falling during the periods examined and is now weak. The median return on equity was 7 percent in the first half of 2000 (on an annualized basis) for all domestically listed companies, and ranged from 4-7 percent during 1997-98 for the subset of listed companies covered by Worldscope. Further, while the operating margin relative to the total cost of sales is high (i.e., operating margin II), margins based on a broader measure of net operating income (i.e., incorporating total operating costs) are considerably lower, reflecting the still high social welfare burden borne by Chinese enterprises.

Table 8. Profitability of Listed Companies, 1995-2000

Medians	1995	1996	1997	1998	1999	2000 1/
Worldscope database				(Percent)		
Return on assets	5.4	4.8	3.5	1.6	...	...
Return on equity	10.3	10.0	7.2	4.0	...	...
Operating margin I	11.8	9.3	8.8	6.5	...	...
Operating margin II	28.8	28.3	28.7	26.9	...	...
CSRC financial disclosures						
Return on assets	...	...	...	5.6	5.0	4.0
Return on equity	...	...	...	10.1	9.1	7.0
Operating margin I	...	...	...	3.7	6.2	4.7
Operating margin II	...	...	...	33.9	35.4	35.3

Sources: Worldscope; company disclosures; and authors' estimates. 1/ Data refer to H1 2000.

Note: Operating margin I = sales minus total operating costs. Operating margin II = sales minus cost of goods sold.

The liquidity position of listed companies is also weak. Long-term debt accounts for only 6-8 percent of the total debt of domestically listed companies. For the set of firms covered by Worldscope, the share is higher (15-19 percent), but still relatively small. The dominant share of short-term debt in total debt puts current liabilities well above liquid assets. Current assets, which include illiquid and overvalued inventories and receivables, cover less than one-third of current liabilities. The degree of mismatch would widen further if current assets were adjusted downward for the overvaluation of inventories and receivables or for their illiquid portion.

Table 9. Liquidity of Listed Companies, 1995–2000

Medians	1995	1996	1997	1998	1999	2000 1/
	(Percent)					
Worldscope database						
LTD-to-total debt	19.0	18.4	17.0	14.6	...	...
Current assets-to-current liabilities	32.7	31.7	33.0	29.6	...	...
CSRC financial disclosures						
LTD-to-total debt	...	...	...	7.4	6.0	7.9
Current assets-to-current liabilities	...	...	...	24.2	28.5	27.9

Source: Worldscope; company disclosures; and authors' estimates. 1/ Data refer to H1 2000.

### Interest coverage and implied NPLs

The cash coverage of interest expense is an indicator of the quality of bank loan portfolios. It measures the capacity of enterprises to service their debt, thus linking enterprise financial performance to financial system asset quality. Experience in other countries has shown that this indicator often provides greater insights into the asset quality of financial institutions than conventional banking indicators, because of weak accounting and classification standards, which can result in the understatement of problem loans.<sup>16</sup> Of course, the information content of the cash coverage indicator itself hinges on the accuracy of enterprise financial statements.

In the case of China, the reported cash flow data likely overstate profits. In particular, reported earnings include accrued income from receivables. As explained in Appendix I, several adjustments are made to earnings before interest, taxes, depreciation, and amortization (EBITDA) and to interest expenses in order to provide a better measure of the interest coverage ratio. With these adjustments, the EBITDA-to-interest expense ratio is calculated for each firm. Those enterprises whose interest coverage ratio is below 100 percent are assumed to be in default on their debts, and the entire balance of their outstanding debt is treated as a “nonperforming loan.” The nonperforming loans of all companies are then tallied to yield an “implied NPL ratio” for the sample of enterprises as a whole.

The NPLs of companies with negative EBITDA are considered to be “structural.” The intuition behind segregating this subset from total implied NPLs is that “structural” NPLs belong to firms whose debt-servicing capacity will not improve by interest rate cuts or debt restructuring. As loss-making companies, they presumably have serious operational deficiencies that cannot be rectified by financial restructuring alone (Goldman Sachs, 2000).

Based on interest coverage, the implied NPL ratios broadly range between 20-30 percent (Table 10). This result corroborates the high NPL problem in the banking system. At 2-3 times

<sup>16</sup> See Ramos and others (1998) and Goldman Sachs (2000) for an analysis of Korea, Malaysia, Thailand, and Taiwan Province of China, among others.

for the Worldscope sample and 2-4 times for all domestically-listed companies, average enterprise interest coverage is weak. The interest coverage measure, however, provides only an upper bound to debt servicing capacity since it does not include amortization. The short-term duration of claims on enterprises probably means that actual NPL levels are much higher.

Enterprise interest coverage is quite sensitive to adverse changes in interest rates and demand. Two scenario analyses are carried out on the interest coverage ratios to assess the extent to which implied NPLs rise in the face of adverse financial and economic developments.<sup>17</sup> Under the higher interest rate scenario, implied NPLs rise by 3–7 percentage points. Lower sales have a greater impact: implied NPLs for the Worldscope sample more than double in three out of the four years analyzed; they rise by 6–7 percentage points in the larger sample of domestically-listed companies. The combined effect of the two shocks raises implied NPLs up to 44–57 percent and 31–45 percent, respectively, for the two samples (Table 10).

A substantial proportion of implied NPLs are structural. For the Worldscope sample in 1996-1998, about one-quarter to one-half of implied NPLs are structural; for all listed companies, some one-half to two-thirds of NPLs are structural during 1998-2000 (Table 10). The share of structural NPLs in total NPLs approaches 80 percent in both samples under the severest scenarios applied to them (EBITDA/Interest Expense III for Worldscope and EBITDA/Interest Expense IV for CSRC financial disclosures).

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<sup>17</sup> The first scenario is a 2 percentage point rise in interest rates for all firms. The second scenario is a 10 percent fall in sales revenues, which translates into a 3 percent decline in earnings, given operating margins of around 30 percent of sales in the two samples. The combined impact of the two stress scenarios is also reported.



Table 10. Interest Coverage and Implied Nonperforming Loans of Listed Companies

Medians	1995	1996	1997	1998	1999	2000 1/
Worldscope Database						
			(Percent)			
Implied Interest Rate	6.0	5.6	8.5	7.9	...	...
Adjusted Interest Rate	11.0	10.5	9.0	7.9	...	...
Interest Rate Plus 2% Shock	13.0	12.5	11.0	9.9	...	...
EBITDA/Interest Expense	306.9	215.9	235.4	220.2	...	...
Implied NPL ratio	11.0	38.1	19.0	17.0	...	...
Structural NPL ratio	0.0	8.5	10.6	13.2	...	...
EBITDA/Interest Expense I	259.7	181.4	195.5	185.9	...	...
Implied NPL ratio	14.3	44.9	19.3	21.5	...	...
Structural NPL ratio	0.0	8.5	10.6	13.2	...	...
EBITDA/Interest Expense II	-4.6	78.0	38.7	-66.0	...	...
Implied NPL ratio	43.7	44.2	49.0	56.5	...	...
Structural NPL ratio	36.9	20.9	40.4	52.6	...	...
EBITDA/Interest Expense III	-3.9	65.6	31.8	-51.4	...	...
Implied NPL ratio	44.4	49.0	49.0	56.5	...	...
Structural NPL ratio	36.9	20.9	40.4	52.6	...	...
CSRC Financial Disclosures						
			(Percent)			
Implied Interest Rate	...	...	...	7.3	5.9	5.4
Adjusted Interest Rate	...	...	...	7.3	6.0	5.4
Interest Rate Plus 2% Shock	...	...	...	9.3	8.0	7.4
EBITDA/Interest Expense	...	...	...	260.4	409.7	418.6
Implied NPL ratio	...	...	...	30.3	21.2	32.0
Structural NPL ratio	...	...	...	16.1	12.1	22.9
EBITDA/Interest Expense I	...	...	...	211.8	323.7	253.2
Implied NPL ratio	...	...	...	32.6	24.4	37.1
Structural NPL ratio	...	...	...	16.1	12.1	22.9
EBITDA/Interest Expense II	...	...	...	179.6	313.9	303.5
Implied NPL ratio	...	...	...	36.3	28.1	38.6
Structural NPL ratio	...	...	...	21.5	15.9	28.0
EBITDA/Interest Expense III	...	...	...	147.2	243.1	188.6
Implied NPL ratio	...	...	...	42.3	31.2	44.5
Structural NPL ratio	...	...	...	21.5	15.9	28.0
EBITDA/Interest Expense IV	...	...	...	...	244.1	221.1
Implied NPL ratio	...	...	...	...	40.7	39.8
Structural NPL ratio	...	...	...	...	35.2	33.7

Source: Worldscope, company disclosures, and authors' estimates. 1/ Data refer to H1 2000.

Note: EBITDA-to-Interest Expense I = Interest expense incorporates a 2 interest rate shock. EBITDA-to-Interest Expense II = Earnings incorporates a 10 percent lower sales shock. EBITDA-to-Interest Expense III = Ratio incorporates both 2 percent interest rate shock and 10 percent lower sales shock. EBITDA-to-Interest Expense IV = Earnings incorporate full repayment of annual build up in short-term nonbank liabilities.

#### IV. CONCLUSIONS

The empirical results indicate that the financial condition of China's enterprise and financial sectors is weak:

- Across a range of indicators, SOEs are less efficient and display poorer financial profiles than enterprises under other forms of ownership. They are more leveraged, less profitable, less liquid, and possess a disproportionate share of fixed assets relative to their output and value added.
- China's enterprise sector has seen a buildup of leverage to finance the acquisition of fixed assets.
- The study points to a large NPL problem in the banking system, underscoring the urgency of stemming the flow of new bad loans. To the extent that banks continue to finance unworthy borrowers, they run the risk of amassing a growing stock of liabilities that are unmatched by performing assets, presenting a potentially large future fiscal liability and drag on growth.
- The analysis also suggests that the financial position of the enterprise and financial sectors could deteriorate further under modest economic and financial stress.

These conclusions highlight the need for decisive action to strengthen SOEs and financial institutions, and have the following policy implications for China:

- The weak performance of SOEs and the contingent fiscal costs underscore the importance of accelerating planned SOE and financial sector reforms. In striking a balance between the pace of reforms and social stability, it is vital to avoid escalating quasi-fiscal losses that threaten medium-term fiscal sustainability.
- The persistence of loss-making enterprises points to the need to harden enterprise budget constraints, improve enterprise governance, and accelerate the exit of nonviable SOEs.
- Enterprise accounting and reporting practices need to be strengthened so that lenders can make accurate assessments of the true financial condition and risk profile of borrowers.
- The high level of problem loans highlights the importance of strengthening bank governance, the prudential regulation and supervision of banks, and the capacity to resolve distressed debts.

- Particular focus is needed on improving and monitoring the quality of new bank lending. Ongoing efforts to improve the risk management and operations of banks are yielding results, with recent reports suggesting SCBs are reducing the stock of NPLs.<sup>18</sup>

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<sup>18</sup> The government has targeted a 2-3 percent annual reduction in the stock of NPLs of SCBs over the next five years. Official data suggest that the SCBs are on track toward meeting this goal in 2001.

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## APPENDIX I. DATA SOURCES

As noted in the main text, one aggregate and two firm level data sets are drawn upon in the analysis of China's enterprise sector:

The aggregate data set comes from annual editions of the NBS' *China Statistical Yearbook* and cover all state and nonstate industrial enterprises with annual sales of over Y 5 million (\$0.6 million) (Table IV.1). The data is disaggregated in various ways—by ownership, provincial location, type of industry (heavy and light), and sector—and covered 162,885 enterprises in 2000.

The first firm level data set comes from the *Worldscope* database, which covers 22,000 listed companies in 53 countries (*Worldscope*, 2000).<sup>19</sup> Financial data are gathered from company reports and adjusted to conform with the evolving principles of the International Accounting Standards Committee. The overwhelming majority of these are industrial companies, with a few in the transportation and utility sectors. The selection criteria for inclusion in the data base prioritizes firms with higher market capitalization, which command greater investor interest and whose financial statements are relatively reliable. The companies chosen are therefore likely to represent top-tier firms with above-average management and financial performance among listed Chinese companies. For example, the 1998 sample of Chinese companies includes 118 listed companies, 29 of which are listed on the Hong Kong SAR Stock Exchange and the remainder on the Shanghai and Shenzhen bourses.

The second firm level sample is a much larger data set of virtually all companies listed on the Shanghai and Shenzhen stock exchanges—there are 1,055 such companies in the H1 2000 sample. The data base includes detailed balance sheet and income statement items made public pursuant to the disclosure requirements of the CSRC, and spans from 1998 through the first half of 2000. The average firm in this data set underperforms its counterpart in the *Worldscope* database, but is likely to enjoy better management and stronger finances than unlisted SOEs because of the disclosure and enterprise governance standards imposed by the CSRC.

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<sup>19</sup> It should be noted that *Worldscope* has data for only 37 companies in 1999, most of which are listed in Hong Kong SAR. Figures for 1999 are thus biased. The analysis, therefore, is based on the 1995-1998 period results for the *Worldscope* sample.

Table 1. Financial Data Sources on Chinese Firms

Data Set	Coverage (number of companies and year)	Years	Selection Criteria
Aggregate Data	465,239 (1994) – 162,885 (2000)	1994-2000	Industrial enterprises with annual sales of over Y 5 million.
Worldscope Database	118 (1998)	1995-1998	Companies with higher market capitalization and investor interest are given priority.
CSRC Disclosures	883 (1998) – 1,055 (2000)	1998-2000	All companies listed on the Shanghai & Shenzhen stock exchanges.

Sources: *China Statistical Yearbook*, various issues; Worldscope; and company disclosures.

A number of adjustments have been made to the firm level data in order to correct for deficiencies in Chinese enterprise accounting and reporting practices, which distort the true financial condition and risk profile of enterprises. These distortions and the adjustments that were made to the firm level data are summarized below.

- **Overvalued inventories.** Haircuts are applied to inventory stock values in order to obtain more accurate measures of assets (-), equity (-), and leverage (+).<sup>20</sup> Where possible, adjustments are also made in earnings figures that are known to include revenue from the build-up of inventories.
- **Overvalued receivables.** Most firms have accumulated sizable amounts of receivables and payables on their balance sheets. Given that most receivables are unlikely to be collected and most payables not paid for, payables are subtracted from receivables to yield net receivables. The stock of net receivables is then deducted from assets and capital, resulting in higher leverage ratios. Earnings are also adjusted by the annual change in net receivables when calculating the interest coverage ratio.<sup>21</sup>
- **Overvalued fixed assets.** As with inventories, haircuts are applied to reported fixed assets (owing to their under-depreciation) in order to obtain more realistic measures of assets (-), equity (-), and leverage (+).
- **Understated interest expenses.** The extent of understatement is estimated by deriving the implied interest rates from reported total debt and interest expenses, i.e., by dividing reported interest expense by reported debt. If the implied interest rate is lower than the

<sup>20</sup>The signs in the parentheses indicates the direction of change in the measure resulting from the adjustment.

<sup>21</sup> The earnings before interest, taxes, depreciation, and amortization (EBITDA)-to-interest expense is the ratio used in the study.

prevailing fixed interest rate on short-term loans, then interest expenses are adjusted upward by an amount reflecting the difference between the implied and actual interest rates. This results in lower interest coverage ratios, and higher implied NPLs.