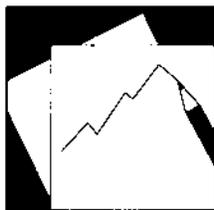


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Explaining China's Low Consumption: The Neglected Role of Household Income

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IMF Working Paper

Asia and Pacific Department

Explaining China's Low Consumption: The Neglected Role of Household Income

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Abstract

This Working Paper should not be reported as representing the views of the IMF.

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The Chinese government has recently focused on the need to increase consumption to rebalance the economy. A widely held view is that despite China's remarkably high growth, the share of consumption in total expenditure has been low and declining due to high and rising saving rate of Chinese households as uncertainty over provision of pensions, and healthcare and education costs have increased since the mid-1990s. This paper finds that the rise in saving rate has been a minor factor. Much larger has been the role of the declining share of household income in national income, which has occurred across-the-board in wages, investment income, and government transfers. The paper finds that financial sector weaknesses, by restricting firms' access to bank financing for working capital, have played quantitatively a major role in keeping wage and investment income shares low and on a declining trend.

JEL Classification Numbers: E21; E22; O4; O53

Keywords: China, Consumption, Financing Constraints, Rebalancing Growth

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I. INTRODUCTION

The Chinese government has called for rebalancing the economy towards greater reliance on consumption as the driver of growth, away from investment and external trade as has been in recent years.¹ Underlying this, is the striking trend of continuing decline in the share of household consumption in GNP, which has fallen to below 40 percent in 2005, despite the remarkable pace of sustained high economic growth.

In explaining this declining share of consumption, studies have largely focused on the household savings behavior, arguing that this trend reflects the high and rising savings by Chinese households (Blanchard and Giavazzi (2005), Kujis (2005), Modigliani and Cao (2004), Prasad and Rajan (2005)), due to a range of factors such as the rise in average household income, the increase in the proportion of working age population, and an increase in precautionary savings with the rise in the uncertainties during reforms (especially that of state-owned enterprises) and inadequate public provision of pensions, healthcare, and education.

While there is little doubt that these factors could be important in explaining the rise in the household saving rate, it is less convincing that these are the main reasons for the decline in the consumption share. In fact, data suggests that the increase in saving alone explains only a small fraction of the decline in the consumption share. The rise in household saving rate of 5 percentage points since the early 1990s can only explain 1 percentage of the 9 percentage points decline in the share of consumption that has occurred since then. During the same time the share of household income in GNP declined by 8 percentage points. It is this latter phenomenon—the proverbial elephant in the room—that is the focus of this paper.

The decline in household income's share occurred across all major sub-categories, but particularly in wages, which, unsurprisingly, is the largest component of income. The shares of investment income and government transfers also fell. Given that the decline in wage income was the largest contributory factor, it may be tempting to seek an answer in China's labor market. With 100-150 million workers either unemployed or underemployed, it is perhaps easy to argue that this slack in the labor market has prevented wages from rising as fast as productivity, leading to the continued decline in the share of wage income. If one adds to that some degree of monopolistic power in the hands of the employers and ineffective worker protection, then it is even easier to see why workers have not benefited from the huge productivity gains the economy has enjoyed. The problem with this argument is while wage rate may be kept low by the increase in labor supply, it is hard to see why employment growth could not have been faster to prevent the decline in the wage share. Moreover, the very competitive product market should help to reduce the monopolistic power of the employers. In addition, while China's labor market remains riddled with imperfections, it is hard to see that these have increased over time to generate the continued slide in the wage share.

¹ See for example, Zhou Xiaochuan's (Governor of the People's Bank of China) foreword in Jahangir Aziz et. al edited, "China and India: Learning from Each Other," IMF, 2006.

Instead, this paper explores the role of China's underdeveloped financial sector and argues that the persistent and rising difficulty for average firms to obtain financing has played a major role in explaining the co-movements in employment, household income, and consumption over the last two decades. Specifically, Chinese firms rely on bank financing for working capital to pay wages and other current expenditure, where they are credit constrained. These borrowing constraints act like taxes on labor input that discourage the use of labor and create a wedge between the market wage rate and the marginal product of labor. Because of this wedge, the labor share in national income is less than its technologically determined share and the more difficult it is for firms to borrow, the larger is this wedge and lower is labor share. The paper will argue that since the mid-1990s, pressures to reform forced Chinese banks to become more conservative in their lending operations to avoid creating new non-performing loans, which tightened borrowing constraints of firms, leading to a decline in the wage share.

To demonstrate the impact of borrowing constraints in China, the paper uses firm-level evidence to underscore its importance and then embeds such a constraint in an otherwise standard neoclassical growth to assess its macroeconomic relevance. Firms' access to financing is measured by the perceived obstacles of financing to business operation, as reported by enterprise managers in industry surveys. The effect on the use of labor input is gauged by the employment growth of individual firms. The enterprise level data provides strong support for the view that borrowing constraint was an important factor in holding back employment growth for the firms. This result holds for the general sample, and for the sample including only private firms. This negative impact of financing difficulties on employment growth is statistically significant and robust, even after controlling for other variables. Indeed, the sample provides little statistically significant impact of borrowing constraints on firms' investment. This is consistent with the view that firms tend to keep a stable level of investment given adjustment costs, while changing the level of working capital (which affects their ability to hire) to cushion against shocks.

The borrowing constraint is embedded in a neoclassical growth model as in Aziz (2006), but the set up is modified to allow employment to be endogenously determined in the model. This allows the model to assess the impact of borrowing constraints on labor demand and household income. In addition, the model can be used to simulate the impact of other factors, particularly the labor market deregulation, on the firms' use of labor input. This is useful because, many argue that the decline in the labor share relative to GDP in China simply reflects the process of urbanization—as the large pool of surplus labor moves from rural to urban areas, it would increase the labor supply and reduces the wage rate. The results show that labor market deregulation is likely to have had only a limited impact on wage share. In contrast, borrowing constraints on working capital have a much larger effect in lowering wage and household income shares. In the face of a declining household income share, rational consumers choose consumption in a manner that is consistent with a falling share of consumption in GNP, as evident in the data.

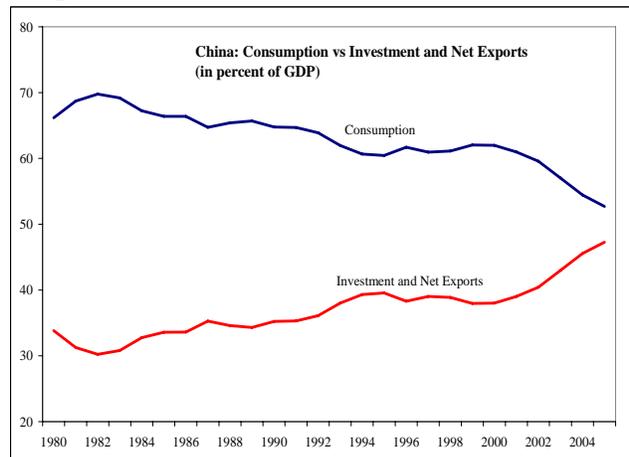
The declining share of wage income, however, would not necessarily have led to such a steep fall in household income share, if rising profits were distributed to households. This did not happen in China for several reasons. First, despite some listing in domestic stock markets,

ownership of Chinese firms is not widely held, either directly or indirectly (through institutional investors and pension funds), by households. Second, even for firms that are listed, weak corporate governance and minority shareholding rights have allowed firms to accumulate profit instead of distributing dividends. A string of scandals in the past few years associated with poor supervision of brokerage firms led to a protracted period of depressed equity prices and limited transactions such that households who owned shares did not benefit from underlying capital gains. Third, the government still retains considerable ownership of the corporate sector. In most countries, this has been a conduit of indirectly transferring corporate profit to households. State-owned enterprises (SOEs) pay dividends to the government, which uses the funds to provide goods such as education and health that are essentially private goods, and welfare payments. In China, SOEs do not pay dividends to the government, such that this conduit of profit transfer has been closed. Lastly, bank deposits are the main vehicle of savings of Chinese households. However, the interest rate on household deposits has been capped by the government. Consequently, the share of interest earnings has declined over the years. China's banks have, of course, enjoyed higher interest rate margins. However, with much of the banking sector, burdened with high non-performing loans, under-capitalized, and under-provisioned until only last year, the higher interest margin has, for all practical purposes, ended up as being "transfers" from households to corporations. For these reasons and unlike in many other countries, the rise in corporate profits did not translate into higher household income in China.

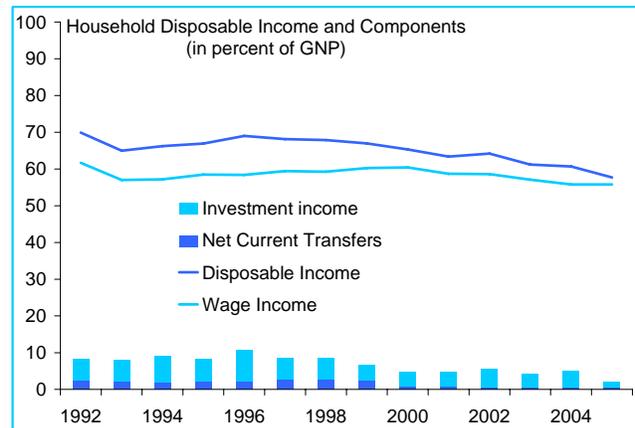
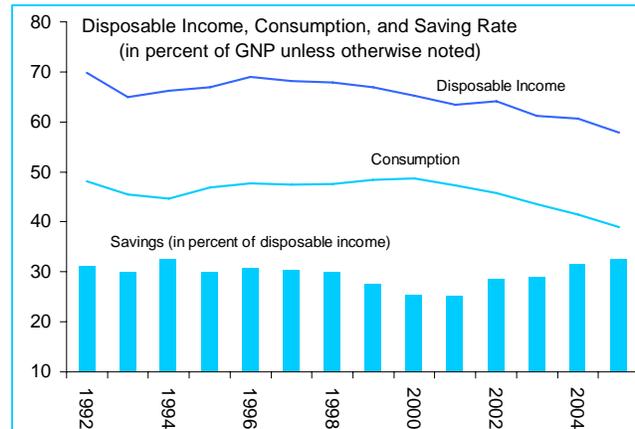
The remainder of the paper is organized as follows. Section II discusses the broad trends in aggregate data to set up the issues. Section III focuses on the micro-level evidence on borrowing constraints facing Chinese firms. The next section embeds the borrowing constraint in a standard neoclassical growth model to assess its impact on aggregate behavior.

II. WHAT DO AGGREGATE DATA TELL US?

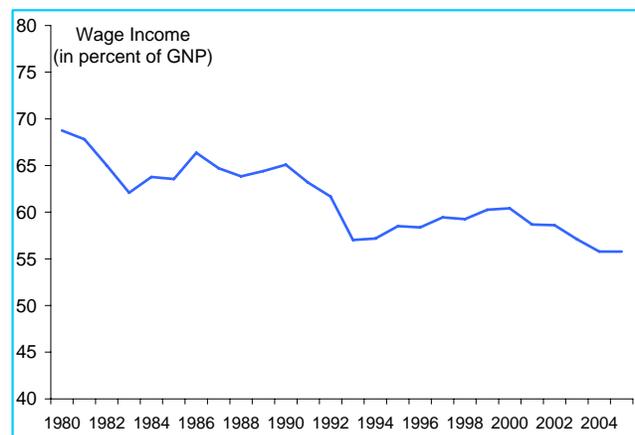
Over the last two decades, China has grown at an average rate of around 8-10 percent. This unprecedented growth rate has been driven by high savings, high investment, and high external demand. While this strategy has paid obvious dividends, increasingly questions are being raised about its sustainability; in particular, concerns have focused on the steady decline in the share of consumption in gross output. In 2005, Chinese households consumed less than 40 percent of GNP, with the ratio having declined by over 10 percentage points since the early 1980s. At the same time, there has been a steady increase in the shares of domestic investment and net exports. While it is not surprising that consumption share declined in the early stages of China's development, as is typically the case in the initial stages of development when investment is the main driver of growth, what is striking is the extent of such a decline.



Several recent studies have (Blanchard and Giavazzi (2005), Kujis (2005), Modigliani and Cao (2004), Prasad and Rajan (2005)), pointed to Chinese households' high saving rate as a major factor in explaining the decline in the consumption share. The saving rate has been rising especially since the late-1990s after the reforms to the state-owned enterprises increased uncertainty over pensions, health, and education that were previously provided by these employers. While this may have been a factor in the fall in consumption share, it is unclear how important it is quantitatively. To be sure, China's household savings is high. Since 1992, it has averaged around 19 percent of GNP, falling from 22 percent of GNP to 15.8 percent of GNP in 2001 and then rising to 19.3 percent of GNP by 2005. In terms of household disposable income, the saving rate first declined from around 33 percent in 1992 to 25 percent in 2000-2001, before rising back to 33 percent in 2005. However, if household disposable income had remained unchanged at its early 1990s level and the saving rate behaved the same as in the data, consumption share would have declined from 48.2 percent of GNP in 1992 to 46.9 percent of GNP, roughly only 1 percentage point. Instead, consumption share fell by 9 percentage points to 39.6 percent of GNP, nearly 8 percentage points more than what can be explained by the rise in the saving rate alone. Thus, the decline in household income appears to have played a more significant role than that of the rise in the saving rate.

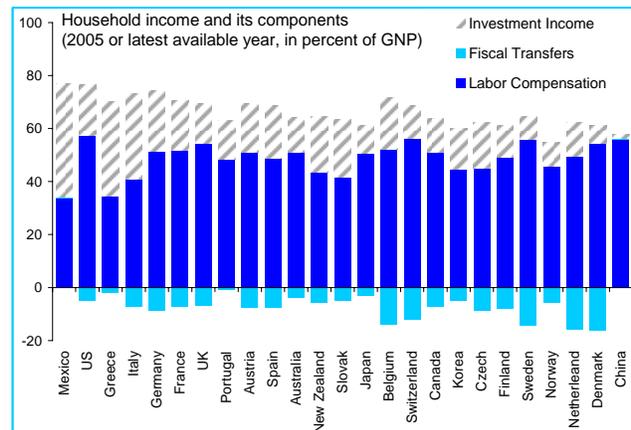


Data on all the components of household income are not available prior to 1992 from the national accounts, but various estimates suggest the decline of income as a share of GDP since the early part of 1980s (see the appendix for details). The decline in the wage share has been most pronounced among all components, it is estimated to have dropped from about 67 percent of GNP in the mid 1980s to the current level of 56 percent.



This decline in the wage share is quite remarkable, especially as the income share is relatively constant over time in most countries. Indeed, the actual decline could be even more dramatic than shown in the aggregate data, when the underlying shifts in the economic structure are taken into consideration. Gollin (2002) argues that at least two aspects of the economic structure could lead to a misrepresentation of the actual income share by the aggregate statistics.

First, a large percent of employment in the primary sector (agriculture, hunting, mining, etc) could reduce the aggregate



labor share, as typically a lower share of employee compensation accounts for a small share in the value added of these sectors. Second, a large share of self-employed workers in the economy is likely to underestimate the labor share given that standard statistical accounting attributes all income from self-employed individuals to capital. While Gollin (2002) made the case in the context of international comparison of income shares, these factors can be considered in the context of a single economy undergoing significant change. In China, the past twenty years was associated with large movement of workers from agriculture into manufacturing and services sectors, these should have by itself increased the aggregate labor share, if everything else stayed the same. In addition, all of the income of self-employed workers is attributed to labor compensation in China's national accounts, in contrast to most other countries. Thus the labor share could be overstated, given that the self-employed sector also uses capital. Therefore, the decline in the labor share is likely to be more significant than suggested by the aggregate data.

An international comparison of the household disposable income with OECD countries shows that China's disposable income is towards the lower end of the spectrum. While several countries, including Canada, Nordic countries, and Korea have quite modest personal disposable income-to-GDP ratios, they often reflect institutional differences that are not captured in aggregate national account data. For example, households in Australia and Canada transfer a much higher proportion of GDP as income taxes to the government. In return, households receive substantial publicly provided goods that are privately consumed, such as health and education, that are not included in measures of personal consumption in national accounts. In contrast, income-related taxes are relatively low in China; at the same time, government provision of health and education services has declined and is one of the lowest in the sample of countries. Once such institutional differences are accounted for, the gap of China's consumption to GDP ratio with other countries is even greater.

Selected Countries: Consumption, 2004							
(In percent of GDP, unless otherwise indicated)							
	Personal Disposable Income	Taxes on personal income ¹	Personal Consumption/Disposable Income	Personal Consumption	Labor Income	Government Consumption on health and education ²	Adjusted Consumption ³
US	74	9	95	70	57	10	80
UK	66	10	98	65	56	12	77
Australia	58	12	103	60	49	11	71
Canada	58	12	96	56	50	7	63
Korea	54	3	95	51	44	5	56
Ireland	49	...	91	44	40	10	54
France	62	8	90	56	52	6	62
Germany	66	9	88	57	51	6	63
Italy	67	...	90	60	42	12	72
Japan	59	8	96	57	51	5	61
India	84	2	76	67	...	4	70
Singapore	52	2	82	43	42	4	47
China	60	1	69	41	56	3	44

Sources: OECD; CEIC Data Company Ltd; IMF desks.

¹ 2003 figures for all except Singapore, India, and China.

² 2002 figures for all except Singapore, India, and China.

³ Personal consumption and government consumption on health and education

The decline in the wage share coincides with the relatively slow pace in employment growth, with urban employment growth averaging a little more than 3 percent each year since the early 1990s. While this slow growth was affected by the layoffs of state enterprises (about 10 percent of the urban labor force), the modest job creation in the non-government sector was also a contributing factor.² One example is the employment growth in the tertiary industry, where most of the private job growth has taken place. The average employment growth of the tertiary industry was less than 5 percent since the early 1990s, falling behind the 10 percent average real GDP growth during this period. The growth of the wage rate was stronger, averaging 15 percent each year. Therefore, the factors inhibiting more rapid job growth, particularly those of private firms, are important in understanding the declining labor share and consumption in GDP.

It is worth emphasizing that employment, income, and consumption have all grown at a fast pace, but were overtaken by the even stronger GDP growth. Urban employment grew over 100 million since the early 1990s—a nontrivial number by any means—even with the large layoffs of state enterprises. Real consumption has grown at an annual rate of 8 percent, and the income of household increased at a similar pace. Such rates are considerably higher than the consumption and income growth of other regional economies during this period. Nevertheless, job creation, income and consumption have all lagged the average annual rate of GDP of around 10 percent over this period.

² The labor statistics in China suffer from a number of measurement problems. In particular, there is a large discrepancy between the aggregate employment and the sums of the parts by ownership. This makes assessing the private sector employment growth difficult.

III. BORROWING CONSTRAINTS, EMPLOYMENT, WAGES: A FIRM-LEVEL VIEW

It may be difficult to imagine that Chinese firms face financing constraints, given the substantial liquidity in the system for the past few years and low interest rates. However, there appears to be segmentation in the market like in many other countries undergoing financial reforms, where large and cash-rich firms have easy access to credit, whereas smaller firms do not. In the case of China, while large state-owned enterprises and private firms take up much of bank credit and are the main issuers of corporate bonds and equity placements, smaller firms, especially those in the private sector, face significant constraints in accessing capital markets. These constraints reflect a variety of factors, including bank lending practices and regulatory framework that favor the state owned enterprises over the private firms (Huang (2003)), the lengthy bank restructuring since the late 1990s, which discouraged lending until recently, and the underdeveloped bond and equity markets, which provide few channels of indirect financing. Indeed, according to the business environment survey conducted by the World Bank, the share of Chinese firms that complain about access to financing as a key obstacle to their business is significantly higher than in other East Asian economies. The smaller the firms, the more constrained they are.³

Employment growth and financing constraint are linked through the role played by working capital in these models. Working capital is the net position of firms' liquidity assets, defined as the current assets (including accounts receivable, inventories, and cash and equivalents), less the current liabilities (including accounts payable and short-term debt). Working capital enables the firms to compensate workers as well as facilitate sales and production. The lack of access to credits would inhibit firms from obtaining the working capital needed to sustain their daily operation.

While both the working capital and fixed investment may be constrained by the available financing, studies show that the impact on working capital could be larger. As argued by Fazzari and Petersen (1993), there are various reasons why firms would prefer to keep a stable level of fixed investment, and financially constrained firms would use the working capital as a source of financing to smooth out the fixed investment. Firms maintain a stable fixed investment over time as the marginal cost of acquiring capital is high, and it is often uneconomical for firms to delay sound investment. In contrast, working capital is liquid and reversible, and thus less costly to adjust. Financially constrained firms thus tend to reduce their working capital rather than cutting down investment. Moreover, as argued above, an increase in firms' capital stock on the back of greater investment could serve as collaterals and thus alleviate some of the borrowing constraints. As a result, financially constrained firms may be less willing to hire workers while finding ways to keep investment strong.

A number of empirical studies examine the impact of difficulty in obtaining financing on employment growth using firm level data. Most of these studies focus on transitional

³ The World Bank survey taken in 1999 showed that 80 percent of private firms face financial constraints in China, and Chinese firms' reliance on retained earnings is higher than other countries. Although curbside credit markets exist, they charge a much higher premium for the legal and credit risks associated with the lending. Such high rates could be prohibitive for most of the firms.

countries in Eastern Europe to consider the key institutional and market factors in fostering private sector growth and job creation. Johnson, McMillan, and Woodruff (2000) use survey data to examine new firms in Poland, Slovakia, Romania, Russia, and Ukraine and find that insecure property rights is most important in inhibiting job growth. Brown, Earle, and Lup (2005), in contrast, find that availability of external financing is an important factor in promoting employment growth for small firms in Romania. To our knowledge, similar studies in the context of China have not been conducted.

Other papers have examined the saving and investment dynamics of Chinese firms but stopped short of providing explanations for the underlying factors. Using macro data, Kujis (2005) and Hoffman and Kujis (2006) both highlighted the large savings by Chinese firms. These studies explained the large savings by a number of factors, including the large share of capital-intensive industries and lack of dividend distribution by the firms. While the attribution to industry composition and dividend policy aid the cross-country comparison in their studies, little insight was provided as to what was driving the choices regarding industries and dividends, especially when the behavior of private firms are increasingly a response towards market incentives rather than being determined by policies. In what follows, we use enterprise survey data to shed light on the economic incentives behind the enterprises' behavior.

The World Bank Enterprise Survey on Productivity and Investment Climate (2002), covering 1500 Chinese enterprises from five cities, contains responses of firms to a number of

questions related to how various economic institutions, policies, and infrastructure have affected the operations and growth of business.⁴ Relevant to the focus of this paper are two questions related to financing. The first question asked about the degree to which access to financing (e.g., lack of collateral) posed for business growth, and the second question is related to obstacles posed by the cost of financing (e.g., interest rates).

China enterprise survey: Obstacles of access to financing for business operation and growth		
Degree of obstacle	Number of Firms	Percent in total
None	537	35.8
Minor	323	21.53
Moderate	298	19.87
Major	250	16.67
Very severe	92	6.13
Total	1,500	100

⁴ The Investment Climate Survey was undertaken by the World Bank in collaboration of the Chinese National Bureau of Statistics in 2001. The five cities are Beijing, Tianjin, Shanghai, Chengdu, and Guangzhou. The survey covers randomly selected firms from pre-selected industrial sectors, which are meant to reflect the general composition of Chinese enterprises. Major manufacturing and services sectors are covered, including clothing and leather products (14.1 percent), electronics and communication equipment making (12.5 percent); electronic components (14.7 percent); household electrical goods (11 percent); auto and auto parts (14.3 percent); information technology services (8.9 percent); communication services (4.6 percent); accounting, auditing and nonbank financial services (7.1 percent); advertising and marketing services (5.8 percent); and business logistics services (7 percent). See Shi (2006) and Huang (2006) for more detailed descriptions of the survey.

The managers of the firms were asked to judge the severity of financing constraint on a five-point scale ranging from zero to four, where zero represented no obstacle and four represented severe obstacle. Other questions covered in the survey included the firm's line of business, location, number of workers, source, and size of investment, etc. The firms also identified the share of government ownership in their businesses, making it possible to distinguish wholly private firms from those with government involvement in ownership. About three-fourth of the firms surveyed were fully private, while the rest were partially or fully government owned.

On the question of access to financing, more than 40 percent of the firms reported moderate to very severe obstacles, including one quarter who viewed the obstacles as major or very severe. A similar pattern emerged when it came to the question of cost of financing (not shown). Indeed, the responses to the two questions were highly correlated (above 0.75)—firms that complained about the access also cited high cost as an obstacle.

A number of studies have used this dataset to address a variety of questions. Huang (2006), in particular, examines the financing constraints faced by Chinese firms and compares them with those facing Indian firms. He finds that Chinese firms are generally more

constrained in their access to financing than Indian firms, after controlling for firms' characteristics such as age, industry, location. He also finds that in China smaller-sized firms tend to report higher degree of obstacles to obtain financing.

In this paper, the perceived financing difficulty reported by firms is used as a proxy of financing constraint facing a firm, and used to match this against its employment growth (wage bill is not reported in the survey). As the

findings are based on subjective measures rather than objective data (which are difficult to obtain), the results need to be interpreted with some caution.

Between 1998 and 2000, employment growth (defined as the percent change in the average number of employees between the two years) in firms that report greater financing

Employment growth between 1998 and 2000 by financing (standard errors of the mean in parentheses)		
Degree of obstacle to financing	Average employment growth	Number of firms
None or minor	5.36 (1.11)	676
Moderate	0.81 (1.76)	236
Major or very severe	-.97 (1.69)	261

Investment growth between 1998 and 2000 by financing (standard errors of the mean in parentheses)		
Degree of obstacle to financing	Average investment growth	Number of firms
None or minor	282 (57)	436
Moderate	555 (181)	172
Major or very severe	347 (98)	183

difficulties was significantly lower than those that did not.⁵ In contrast, there is little evidence that greater perceived difficulties in accessing financing are associated with slower investment. Indeed, the average investment rate is much higher for firms reporting moderate difficulties in accessing financing than those reporting none or minor obstacles!

To control for other characteristics of the firms investigate the relationship more formally, we use regression analysis to assess whether there is discernible impact of difficulty in accessing finance on employment growth for individual firms. The general framework is laid out as follow:

$$l_growth_i = \alpha + \beta \times financing_i + \gamma \times z_i + \varepsilon_i$$

The dependent variable l_growth_i represents the growth in the number of total employees for firm i between 1998 and 2000. The variable *Financing* represents the survey response on financing obstacles. We let the financing variable to take the value 1 if the response is no or very minor obstacles, 2 if the response is moderate obstacle, and 3 if the response is major or very severe obstacles. z represents various control variables. Firm characteristics such as its age and firm size in 1998 are included. Also included is a dummy variable that represents the presence of government ownership. Given the possibility that the restructuring of some SOES may result in reduction in employment growth and thus bias the results, the regression was estimated excluding state-owned enterprises. Following Huang (2006), a representing the firms' external orientation (based on the response to the question of whether the firm has a foreign partner or not) is added. Thus, differences in the employment growth across foreign and domestic firms, beyond those introduced by their differences in perceived difficulties in financing, can potentially be captured. We also include dummy variables corresponding to the location and industrial sub-sectors of the firms (all together 56 dummy variables).

One may view that difficulty in accessing capital markets to affect firms' performance more generally, including its ability to invest and produce. In such a case, the impact of financial access on employment growth is more indirect and works through reduced investment or production. Two additional variables: average growth in new fixed asset investment between 1998 and 2000 and increase in capacity utilization, are included sequentially in alternative specifications. It should be noted that given that only manufacturing firms report capacity utilization, the specification including both investment and capacity variables effectively focuses on manufacturing firms only.

For robustness the estimation is performed for three nested groups of firms. The first group includes all firms in the sample, about one quarter of which has full or majority state shares, and the rest with minority or no state shares. The second group includes the firms with minority or no state shares. The third group includes only the fully private owned firms (i.e., those with zero state shares).

⁵ The firms established after 1998 are excluded due to a lack of data in the initial period. Also outliers, i.e., those that report employment growth of more than 100 percent in the three years time span, were excluded. This reduced the sample size by about 7 percent.

Employment Growth and Obstacles to Finance									
	No investment/capacity variables			With investment variable			With investment and capacity (manufacturing)		
	All firms	Government share<50%	Government share=0	All firms	Government share<50%	Government share=0	All firms	Government share<50%	Government share=0
Financing Obstacle (1=none or minor, 2=modest, 3=major or very severe)	-2.45 [2.53] **	-2.80 [2.37] **	-3.08 [2.47] **	-2.15 [2.16] **	-2.43 [2.00] **	-2.71 [2.10] **	-2.60 [2.22] **	-2.61 [1.84] *	-2.89 [1.90] *
Firm's age in 1998	-0.52 [9.69] ***	-0.68 [8.69] ***	-0.68 [8.51] ***	-0.51 [9.52] ***	-0.66 [8.51] ***	-0.67 [8.33] ***	-0.50 [7.87] ***	-0.61 [7.33] ***	-0.63 [7.30] ***
Foreign Partner (1 yes 2 no)	1.25 [0.61]	1.79 [0.79]	1.97 [0.82]	0.79 [0.38]	1.21 [0.52]	1.42 [0.58]	2.72 [1.18]	3.40 [1.35]	3.61 [1.35]
Small Medium Sized Firms (1 if employee number <500, 0 otherwise)	-13.38 [5.35] ***	-13.54 [4.72] ***	-13.83 [4.76] ***	-13.15 [5.22] ***	-13.33 [4.61] ***	-13.61 [4.65] ***	-12.76 [3.83] ***	-13.99 [3.80] ***	-14.29 [3.85] ***
Government Ownership (1 if there is government share, 0 otherwise)	-6.35 [3.64] ***	-11.00 [3.33] ***	0.00 [.]	-5.98 [3.41] ***	-10.90 [3.31] ***	0.00 [.]	-6.25 [3.11] ***	-9.71 [2.71] ***	0.00 [.]
Investment Growth				0.02 [2.52] **	0.01 [2.21] **	0.01 [2.20] **	0.02 [1.82] *	0.02 [1.75] *	0.02 [1.71] *
Increase in Capacity Utilization							0.30 [5.97] ***	0.30 [4.94] ***	0.29 [4.39] ***
Constant	10.63 [2.24] **	12.26 [2.20] **	10.44 [1.80] *	9.95 [2.08] **	11.66 [2.07] **	9.79 [1.66] *	7.56 [1.50]	7.60 [1.31]	5.73 [0.94]
Observations	1172	885	827	1147	863	805	774	594	542
Adjusted R-squared	0.14	0.14	0.13	0.16	0.15	0.14	0.19	0.19	0.18

Absolute value of t statistics in brackets, based on robust standard errors
* significant at 10%; ** significant at 5%; *** significant at 1%

1/ Data are from the WorldBank Enterprise Survey (2002). Excluding outliers with employment growth exceeding 100 percent in three years (about 7 percent of the sample). The regression includes dummy variables corresponding to the city and industrial sectors of the firms (coefficients not shown).

The results are striking. Younger firms tend to have stronger employment growth than older ones. SMEs tend to have less employment growth than larger firms. Government ownership tends to be associated with less employment growth. Employment growth is affected by firms' locations and sub-sectors (the coefficients of the corresponding dummy variables are not shown in the tables), reflecting uneven job growth across regions and sectors. Most interestingly, employment growth is lower for firms that reported more difficulties in obtaining financing. The negative impact of difficulty in accessing financing on employment is statistically significant for all three nested ownership groups, and when investment and capital utilization variables were included in the specification. This finding is consistent with the view that difficulty in obtaining financing tends to reduce firms' employment growth, beyond the impact such constraints might have on investment and production.⁶

The robustness of the results is checked using alternative measures of employment. Instead of the average number of workers in each year, the end-year employment number is used to calculate employment growth. In addition, the regressions are estimated using only

⁶ A statistical issue is to what extent investment growth and capacity utilization may in itself be driven by employment growth, making the independent variables correlated with the disturbance terms that could bias the results. An ideal approach to solve this problem is to use instrumental variables in the regression to remove the link of investment growth and the disturbance errors. There are a number of variables from the survey that could be used for this purpose, including the variable representing new products introduced during the sample period or growth in sales between 1998 and 2000. However, these variables turn out to be only modestly related to the investment growth. Therefore, the instrumental variable approach does not look very promising. Given that the main interest is to capture any direct impact that financing constraint might have on employment growth, such potential bias does not change the main results.

permanent employees, yielding similar results. The only exception is that when only permanent employees are included, the results are statistically weaker.

The extent to which investment growth of the firms in the sample is affected by the perceived difficulty in obtaining financing is also investigated. Interestingly, there is little evidence that difficulties in obtaining financing have effected firms' investment growth. Difficulties in obtaining financing due to lack of alternative forms of collateral, for example, could in itself generate incentives for firms to build up capital, as it can be used as collateral to lower financing constraints. This, along with weak corporate governance and minority shareholding rights, has led to steady increase in China's corporate savings. This is also true for SOEs who do not pay the budget any dividend as part of the implicit understanding they reached with the government during the 1990s reforms. Prior to that, SOEs in China spent a significant part of their earnings on providing public utilities in the localities they operated and for their workers.⁷

Investment Growth and Obstacles to Finance 1/						
	No capacity variables			With capacity variables (manufacturing firms only)		
	All firms	Government share<50%	Government share=0)	All firms	Government share<50%	Government share=0)
Financing Obstacle (1=none or minor, 2=modest, 3=major or very severe)	-10.2 [1.31]	-10.5 [1.01]	-11.2 [1.01]	-8.8 [0.97]	-10.6 [0.88]	-12.2 [0.91]
Firm's age in 1998	-1.2 [4.25] ***	-1.7 [3.56] ***	-1.9 [3.59] ***	-1.3 [4.19] ***	-1.7 [3.69] ***	-1.9 [3.70] ***
Foreign Partner (1 yes 2 no)	22.7 [1.51]	31.2 [1.79]*	31.8 [1.75]*	12.9 [0.83]	19.6 [1.13]	21.7 [1.19]
Small Medium Sized Firms (1 if employee number <500, 0 otherwise)	-42.7 [2.79] ***	-55.7 [2.81] ***	-60.0 [2.86] ***	-45.3 [3.26] ***	-53.7 [2.94] ***	-59.2 [2.97] ***
Government Ownership (1 if there is government share, 0 otherwise)	-22.9 [2.48] **	-24.7 [1.47]	-- --	-22.5 [2.25] **	-21.3 [1.20]	-- --
Increase in Capacity Utilization				0.1 [0.36]	0.1 [0.27]	0.3 [0.47]
Constant	42.4 [1.76] *	33.2 [1.17]	30.2 [1.02]	53.7 [1.97] **	44.4 [1.38]	40.1 [1.20]
Observations	1147	863	805	774	594	542
R-squared	0.08	0.08	0.09	0.07	0.07	0.08

Absolute value of t statistics in brackets, based on robust standard errors
* significant at 10%; ** significant at 5%; *** significant at 1%

1/ Data are from the WorldBank Enterprise Survey (2002). Excluding outliers with employment growth exceeding 100 percent in three years (about 7 percent of the sample). The regression includes dummy variables corresponding to the city and industrial sectors of the firms (coefficients not shown).

⁷ The empirical results may be affected by the presence of a few large numbers of investment growth, which may have been driven by other variables. As noted before, the sample excludes those with very high employment growth (exceeding 100 percent in three years). Such a selection excludes most, but not all, of the observations with high investment growth.

Indeed, more than half of China's investment is financed by self-raised funds, while domestic loans finance less than 20 percent. The share is particularly high for private enterprises, for which more than 60 percent of private enterprise' capital is from self-raised funds, including retained earnings or internal funds, or funds raised from family and friends. The difficulties for private business to obtain financing is viewed as one reason that Chinese firms continued to desire foreign direct investment, as FDI helps to provide the needed financing that these firms cannot get domestically (Huang (2003)).

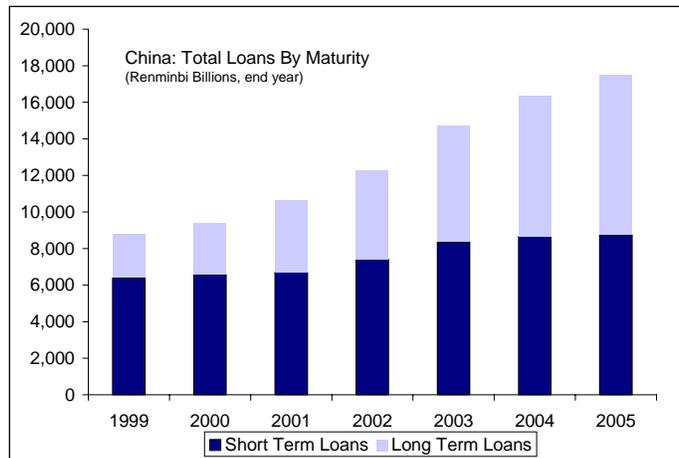
At the same time, a significant proportion of firms' borrowing is likely to be for working capital. Notwithstanding some decline of its share in total loans, short-term credit (less than one year) still account for more than half of bank

loans in 2005. Even the "long-term" loans have relatively short duration, and may partly be used for liquidity financing (a 2003 world bank survey shows that the average term of long-term loans is about 2 years). Given the prominent role of short-term financing in enterprise borrowing, the decline in the total credit growth in the past couple of years did not lead to any major moderation of investment, as firms used internal funds to smooth their investment. Indeed, Anderson (2006) argues that credit policies

Sources of Financing: Evidence from Firm Surveys 1/

Average Shares of Capital From the Following Sources (in percent of the total)	All firms	Private Firms
Retailed Earnings/Internal Funds	52	52
Personal, Family, Friends	7	9
Bank Loans	20	17
Other External Financing (other loans, equity)	10	11
Other source of financing (supplier credit, etc)	10	10
Number of firms	1321	951

1/ WorldBank Enterprise Survey (2002)



China: Fixed Asset Investment--Sources of Funds 1/

	1999	2000	2001	2002	2003	2004
(In percent of total fixed asset investment)						
State budget	7.1	7.0	7.2	7.5	5.5	4.2
Domestic loans	22.9	23.9	22.2	22.8	23.5	20.4
Bonds	1.2	0.8	0.5	0.5	0.3	0.3
Foreign Capital	7.6	6.2	5.5	5.2	4.8	4.3
Self raised	45.3	44.8	46.3	45.8	47.5	51.3
Other sources	15.9	17.3	18.3	18.3	18.4	19.5

Notes: Includes land acquisitions, source: CEIC

matter most for sectors that rely on banks for short-term financing rather than those who borrow from banks for long-term investment (such as heavy industries). The latter relies mostly on foreign investment or retained earnings.

IV. BORROWING CONSTRAINT, WAGE SHARE, AND CONSUMPTION: THE MACROECONOMIC VIEW

Having established that financing constraint may have had a significant impact on employment growth, its role on wage share, household income, and consumption is analyzed within a modified one-sector Solow growth model. Hayashi and Prescott (2002), in studying the Japanese stagnation during the 1990s, find evidence that the credit crunch during the decade did not matter much for investment as firms found other ways to finance their investment. They did not explore the implication of such constraints on consumption and attributed the stagnation to productivity declines. Kobayashi and Inaba (2005), studying the same episode, also find no support for investment friction during this period. Moreover, they find that a large labor wedge—the difference between the marginal rate of substitution of consumption and leisure and the marginal product of labor—emerged during that period. The ever-tightening borrowing constraints can account for the labor input, consumption, and investment behavior during this period. The model in this paper is an extension to Aziz (2006), where it was shown that for reasonable parameter choice, representing the average firm as a borrowing constraint one matches the data quite well in terms of consumption and investment shares. However, in that paper employment was treated as an exogenous variable and no empirical evidence was provided as to how severe the problem may have been. In this paper, in the prototype economy employment is determined endogenously.

In the model economy, a stand-in household lives in a world of certainty, optimizing her lifetime utility, subject to a standard budget constraint. Household income is made up of labor income, investment income from renting out the capital, and dividend from equity held in firms. The household values both consumption and leisure, and maximizes the lifetime utility. Labor is assumed to be indivisible, following Hansen (1985) and Rogerson (1998), so that the stand-in household either works h hours or does not work at all. The household has N_t working-age members of whom a proportion e_t works. The household's problem is to maximize:

$$\sum_{t=0}^{\infty} \beta^t N_t (\log(c_t) - g(h_t)e_t)$$

subject to the constraint:

$$N_t c_t + X_t \leq w_t h_t e_t N_t + r_t S_t + \Pi_t$$

where c is per capita consumption, X is per-period household saving, S is the stock household savings, and Π is total transfers (including government transfers net of taxes and corporate profits). There are two relative prices— w the real wage rate and r the real return from renting capital.

The disutility from work is linearized in the neighborhood of $h=40$ by

$g(h) = m \left(1 + \frac{h-40}{40} \right)$, where h is the hours worked (see Hayashi and Prescott (2002)). The

variable m captures disutility from work. It could also capture the costs of entering the labor market. A large m would suggest it is more costly for the households to work, everything else equal. In the context of China, m represents the costs for the rural labor to move to the cities, including the lack of access to the basic utilities to rural migrant population. Data on hours of work are difficult to get and China does not have an official standard workweek, which is why the workweek is assumed to be 40 hours. (Without any further constraints, the linear function implies that the stand-in household would choose $h = 40$ in equilibrium.) Since variations in h will not be analyzed, it is dropped from the remainder of the paper. As a result, all the variation in total hours worked will come from changes in employment. One way to interpret this, is to assume that the stand-in household has a family size consisting of N workers of whom E are chosen to work via a lottery, once chosen to work each worker puts in 40 hours per week.

Production is carried out using a Cobb-Douglas technology $Y_t = A_t K_t^\alpha L_t^{1-\alpha}$, where Y is aggregate output, A measures the level of total factor productivity (TFP), and L is the number of workers employed. This is operated by the representative firm that is owned by the stand-in household. It is assumed that each period wages are paid in advance of production and firms need to borrow funds to pay the wage bill. Since there is no uncertainty in the model, the set up is difficult to justify and should be seen only as a device to introduce the use of working capital. The wage bill is the working capital that will need to be borrowed from the household. All investment is undertaken by the firm using its internal savings. This is clearly an extreme assumption as firms borrow both for working capital and investment purposes. The assumption, however, keeps the model simple and helps to highlight the issue. The firm maximizes profits subject to a borrowing constraint, i.e., the amount of working capital borrowed by the firm depends on the value of its capital stock. This is similar to the assumptions in Aziz (2006); Einarsson and Marquis (2001); and Kobayashi and Inaba (2005).

Using these notations, the firm's problem is to maximize profit:

$$\sum_{t=0}^{\infty} \lambda_t \left(A_t K_t^\alpha L_t^{1-\alpha} - (1+r_t) w_t L_t - (K_{t+1} - (1-\delta) K_t) \right) \quad (1)$$

subject to the constraint:

$$(1+r_t) w_t L_t \leq \theta_t K_t$$

As wages need to be paid before production firms need to borrow $w_t L_t$. However, the funds that a firm can borrow are subject to a collateral constraint. The only collateral is the capital the firm owns. Households lend to firms such that its debt service, $(1+r_t) w_t L_t$, does not exceed, $0 < \theta_t < 1$, fraction of the firm's capital stock. Lastly, δ is the depreciation rate.

There are three feasibility constraints in this model economy that need to be satisfied in equilibrium, namely that the goods market clear:

$$C_t + K_{t+1} - (1 - \delta)K_t + G_t = Y_t - X_t \quad (2)$$

where G is government purchases, as do the household loan and labor markets:

$$S_{t+1} = S_t + X_t \quad (3)$$

$$L_t = e_t N_t$$

To derive the policy functions and the steady-state of the system, all aggregate variables are detrended as follows:

$$k_t = \frac{K_t}{\frac{1}{A^{1-\alpha}} N_t}, s_t = \frac{S_t}{\frac{1}{A^{1-\alpha}} N_t}, c_t = \frac{C_t}{\frac{1}{A^{1-\alpha}} N_t}, y_t = \frac{Y_t}{\frac{1}{A^{1-\alpha}} N_t}, \gamma_{t+1} = \left(\frac{A_{t+1}}{A_t} \right)^{\frac{1}{1-\alpha}}, g_t = \frac{G_t}{Y_t}, n_{t+1} = \frac{N_{t+1}}{N_t},$$

$$e_t = \frac{L_t}{N_t}$$

Using these notations the firm's problem becomes:

$$\text{Maximize} \quad \sum_{t=0}^{\infty} \lambda_t \left(k_t^\alpha e_t^{1-\alpha} - (1+r_t) w_t e_t - (\gamma_{t+1} n_{t+1} k_{t+1} - (1-\delta) k_t) \right)$$

subject to:

$$(1+r_t) w_t e_t \leq \theta_t k_t$$

With the necessary first order conditions being:

$$\lambda_t \left((1-\alpha) \left(\frac{e_t}{k_t} \right)^{-\alpha} - (1+r_t) w_t \right) = (1+r_t) \eta_t w_t$$

$$\gamma_{t+1} n_{t+1} \lambda_t = \lambda_{t+1} \left(1 - \delta + \alpha \left(\frac{e_{t+1}}{k_{t+1}} \right)^{1-\alpha} \right) + \eta_{t+1} \theta_{t+1}$$

where λ_t is the discount factor of firm (and will be the Lagrangian associated with the household's budget constraint) and η_t is the Lagrangian associated with the firm's borrowing constraint.

It is easy to see (from the first necessary condition) that the share of labor income is

$$w_t e_t = \frac{(1-\alpha)y_t}{(1+r_t)} \left(\frac{\lambda_t}{\lambda_t + \eta_t} \right)$$

$$\text{Household interest income is } r_t w_t e_t = \frac{r_t (1-\alpha)y_t}{(1+r_t)} \left(\frac{\lambda_t}{\lambda_t + \eta_t} \right)$$

$$\text{While that from wages and interests is } w_t e_t (1+r_t) = (1-\alpha)y_t \left(\frac{\lambda_t}{\lambda_t + \eta_t} \right)$$

If $\eta_t = 0$, i.e., the borrowing constraint is not binding, then the wage share collapses to $(1-\alpha)y_t$ as is standard. However, as long as $\eta_t > 0$, i.e., the borrowing constraint is binding, labor share and household income will be less than α . Depending on how this constraint become more or less binding over time, η_t will rise or fall, thus changing the share of household income in GDP. Ex ante since household income has been falling, one would expect η_t to be rising, which of course can occur only if the constraint becomes more binding over time. Thus, it would require θ_t to fall over time i.e., for banks to become more cautious in their lending operations. The paper will argue that this occurred since the late 1990s, as bank restructuring got underway.

For the stand-in household, the decision problem is to maximize $\sum_{t=0}^{\infty} \beta^t N_t (\log(c_t) - m e_t)$

subject to:

$$c_t + \gamma_{t+1} n_{t+1} s_{t+1} \leq w_t e_t + (1+r_t) s_t + \pi_t$$

The household's first-order maximization conditions are:

$$\lambda_t = \frac{\beta^t N_t}{c_t}$$

$$w_t = m_t c_t$$

$$c_{t+1} = \frac{c_t}{\gamma_{t+1}} \beta (1+r_{t+1})$$

Using $\lambda_t = \frac{\beta^t N_t}{c_t}$ in the firm's

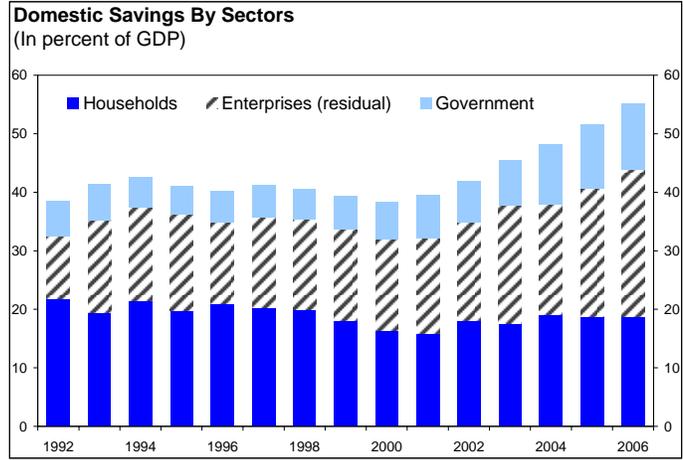
investment decision rule one gets:

$$c_{t+1} = \frac{c_t}{\gamma_{t+1}} \beta \left(1 - \delta + \left(\frac{e_{t+1}}{k_{t+1}} \right)^{1-\alpha} - \theta_{t+1} \right)$$

In a standard set

$$\text{up, } c_{t+1} = \frac{c_t}{\gamma_{t+1}} \beta \left(1 - \delta + \left(\frac{e_{t+1}}{k_{t+1}} \right)^{1-\alpha} \right),$$

i.e., the marginal rate of intertemporal



substitution is equated to the marginal product of capital. Define $\tau_t = \frac{(1-\alpha) \left(\frac{e_{t+1}}{k_{t+1}} \right)^{1-\alpha} - \theta_t}{\left(\frac{e_{t+1}}{k_{t+1}} \right)^{1-\alpha}}$,

then the equation becomes $c_{t+1} = \beta \frac{c_t}{\gamma_{t+1}} \left((1-\delta) + (1+\tau_{t+1}) \alpha \left(\frac{e_{t+1}}{k_{t+1}} \right)^{1-\alpha} \right)$,

which is equivalent to the standard case, except that the marginal return to capital is taxed by the amount τ_t . This tax is usually referred to as the investment wedge (Chari et. al (2004).

This wedge will be positive, i.e., the implicit rate of return to capital will be higher than in the standard model as long as $\eta_t > 0$, or the borrowing constraint is binding. To see this note

that when $\eta_t > 0$, $(1-\alpha) \left(\frac{e_t}{k_t} \right)^{-\alpha} - (1+r_t) w_t > 0$ and $\theta_t \frac{k_t}{e_t} = (1+r_t) w_t$, and thus

$$(1-\alpha) \left(\frac{e_t}{k_t} \right)^{1-\alpha} - \theta_t > 0.$$

Consequently, the equilibrium of this economy will look the same as one where there is negative tax on capital income equivalent to τ . As the stock of capital goes up, firms can borrow more from households and increase profit. In a period when banks are restructuring, such as in recent years in China, banks become more cautious about their lending. This intensifies the borrowing constraints faced by firms. As a result, the returns from loosening the constraint increases, which appears as a rise in the negative tax to capital income and encourages firms to increase its internal savings as can be observed. It is difficult to pin down θ_t from Chinese banking data. While prudential norms related to maximum loan-to-value ratios exist it is unclear how extensively these have been implemented and to what extent they have been binding, on average, in the 1990s. Bank assets show a large amount of short-term loans (less than one-year maturity) as noted in Section III. While some of these loans

are associated with trade credits, anecdotal and survey evidence, suggest that use of such loans for working capital purposes is quite prevalent.

Thus, a tightening of the borrowing constraint has two effects: on one hand, it reduces wage income and household income and on the other hand, it induces more savings by firms. A cursory look at the breakdown of savings across sectors shows that this is what happened in China. While household savings has averaged around 19 percent since the early 1990s as discussed in Section II, corporate and government savings have steadily increased. In fact, during the past five years, corporate and government saving each rose by around 4 percentage points of GDP, and they now represent around 19 and 10 percent of GDP, respectively.⁸

V. CALIBRATING THE PROTOTYPE ECONOMY

The next step is to calibrate the model. However, before doing so it is convenient to summarize the equilibrium of the model. The equilibrium is characterized by:

$$\text{Resource constraint: } c_t + \gamma_{t+1}n_{t+1}k_{t+1} + \gamma_{t+1}n_{t+1}s_{t+1} = ((1-g_t)y_t + (1-\delta)k_t + s_t)$$

$$\text{Consumption: } c_{t+1} = \frac{c_t}{\gamma_{t+1}} \beta \left(1 - \delta + \left(\frac{e_{t+1}}{k_{t+1}} \right)^{1-\alpha} - \theta_{t+1} \right)$$

$$\text{Capital: } k_{t+1} = \frac{1+r_{t+1}}{(1+r_{t+1} + \theta_{t+1})\gamma_{t+1}n_{t+1}} \left((1-g_t)y_t + (1-\delta)k_t - c_t + \frac{\theta_t k_t}{(1+r_t)} \right)$$

$$\text{Household investment: } \gamma_{t+1}n_{t+1}l_{t+1} - l_t = \gamma_{t+1}n_{t+1} \frac{\theta_{t+1}k_{t+1}}{(1+r_{t+1})} - \frac{\theta_t k_t}{(1+r_t)}$$

$$\text{Household income: } c_t + \gamma_{t+1}n_{t+1}l_{t+1} - l_t = c_t + \gamma_{t+1}n_{t+1} \frac{\theta_{t+1}k_{t+1}}{(1+r_{t+1})} - \frac{\theta_t k_t}{(1+r_t)}$$

$$\text{Corporate investment: } x_t = \frac{1+r_{t+1}}{(1+r_{t+1} + \theta_{t+1})} \left\{ (1-g_t)y_t - c_t + \left[\frac{\theta_t}{(1+r_t)} - \frac{\theta_{t+1}}{1+r_{t+1}}(1-\delta) \right] k_t \right\}$$

$$\text{Wage rate: } w_t = \frac{\theta_t k_t}{(1+r_t)e_t}$$

⁸ The breakdown of savings is derived by computing household savings from published household survey, computing government saving from the budget, and treating corporate savings as a residual category.

$$\text{Employment: } e_t = \frac{\theta_t k_t}{(1+r_t)m_t c_t}$$

$$\text{Interest rate: } r_t = \left(\frac{e_t}{k_t}\right)^{1-\alpha} - \theta_t - \delta$$

In steady state,

$$\frac{k_s}{e_s} = \left(\frac{\gamma}{\beta} - (1-\delta) + \theta_s\right)^{\frac{1}{1-\alpha}}$$

$$c_s = k_s \left(1 - \delta + (1-g_s) \left(\frac{e_s}{k_s}\right)^{1-\alpha} - \gamma n - (\gamma n - 1) \frac{\theta \beta}{\gamma}\right)$$

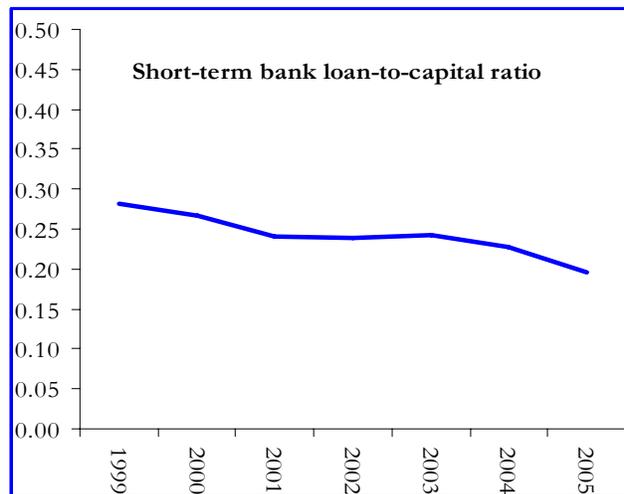
$$e_s = \frac{\theta_s \beta}{\gamma m_s} \left(\frac{k_s}{c_s}\right)$$

$$r_s = \frac{\gamma}{\beta} - 1$$

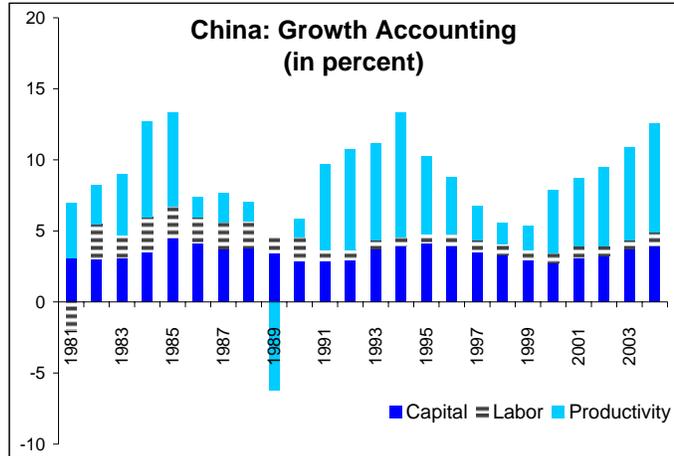
$$\frac{w_s e_s}{y_s} = \frac{\theta_s \beta}{\gamma} \left(\frac{\gamma}{\beta} - (1-\delta) + \theta_s\right)$$

Note that in steady state, neither wage rate nor the wage share relies on the disutility of working but the level of employment does. Therefore, e_s decreases with m (as job market barrier increases) but increases with θ (as borrowing constraint is relaxed). The wage share is no longer a function of α , but will fall as θ declines. A decline in θ would affect many variables in the steady state, with a smaller wage share and a larger profit share. Wage would decline, although partly offset by a rise in e . Capital to labor and capital to output ratio would rise.

Household income to GNP, consumption to GNP, and household investment to GNP ratio would decline. Corporate investment to GNP ratio would rise, leading to a rise in total investment to GNP ratio. Interestingly, y would increase given that the economy is “forced” to save to invest more in the face of the borrowing constraints.



Turning to data issues, most of the data and parameter values used follow Aziz (2006).⁹ In particular, $\alpha = 0.35$; $\beta = 0.97$; $\delta = 0.06$, data on working age population is taken from census figures, while that on employment uses published labor statistics and includes employment in the agricultural sector. The share of employment, e , is derived by deflating total employment by the working-age population. Using the calibrated parameters as a starting point, the



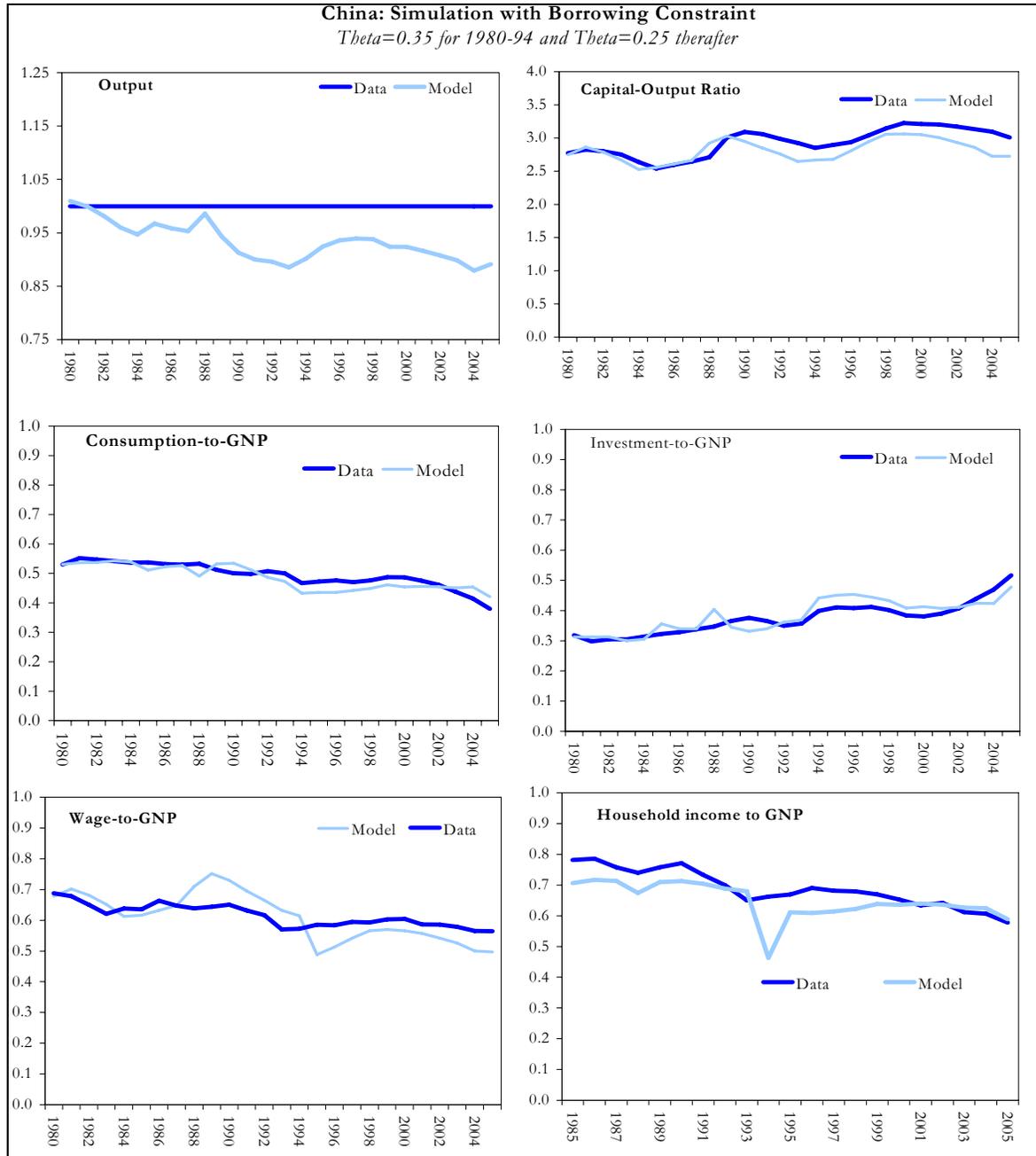
sequence of the technology parameter $\{A_t\}$ is derived first. As can be seen from the above figure, much of the China's remarkable increase in labor productivity since the 1980s has been due to technological improvements with substantial contribution from rising capital per worker. On the other hand, the capital-output ratio, after falling through the 1980s, rose sharply in the late 1980s and early 1990s before contracting by the mid-1990s. Since then it has risen steadily. These estimates are similar to those of Scheibe (2003).

This leaves two parameters to be determined, m and θ . From the household's problem evaluated at the steady state, $m = \frac{w_s}{c_s}$. Using the average values for 1980-2005, this is pinned

down to 1.25.¹⁰ As described in previous sections, borrowing constraints faced by firms are non-trivial. However, it is difficult to pin down the value of θ_t from Chinese banking data. Working capital is not separately recorded in data, however assuming that working capital based on a firm's collateral would short-term (less than one-year maturity) loans excluding trade credits, data available on such a breakdown from 1999-2005 reveals that this ratio has been declining and on average over this period the ratio of such loans to capital stock stood

⁹ See appendix for details.

¹⁰ A separate calibration was conducted using two different values, a higher one for 1980-1989 and lower for 1990-2005, consistent with the view that labor market barriers for migrant labor has fallen over the years that has increased labor market mobility (Fan Gang (2006)). However, this variation had little impact on the simulated values for most variables such as the paths for the shares of wage, household income, consumption, and investment. To be sure, there is some impact: the easing of labor restrictions tends to reduce the share of labor input and household income in the total output, i.e., the faster the decline in m , the steeper the decline in the wage and the household income as shares of GNP. The limited impact is due to two largely compensating forces: a decline in m raises e and lowers w , offsetting much of the impact on labor share and household income. In contrast to a decline, which depresses labor demand, a decline in m reduces the rate at which the wage rate rises not necessarily the wage share in the national income.

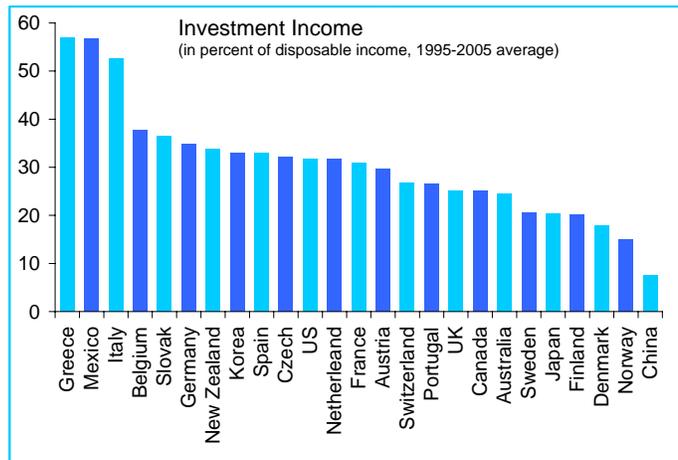


at 0.25. One option is, therefore, to fix $\theta_t = 0.25$ throughout the calibration period. However, as Aziz (2006) shows this is a poor approximation of the changes that have taken place in China's banking sector and that a declining θ_t rather than a fixed one reflects not only the nature of the banking reforms since the mid-1990s, but also mimics the macroeconomic data much better. In line with this, in this paper too θ is chosen to be 0.35 in 1980-95 and 0.25 from thereafter. The initial value of $\theta = 0.35$ was chosen such that the 1980 simulated wage share matches the data.

The simulated paths for shares of consumption, investment, and the capital output ratio follow closely the data for the entire simulation period, 1980-2005. The model also mimics reasonably well the share of wages, although the simulated wage share is about 5 percentage points of GNP lower than that in the data in around 2005. Much better match is the household income share, which suggests that even after introducing the borrowing constraint the actual investment income was lower than what is predicted by the model. The higher investment income in the model is compensated by the lower wage share.

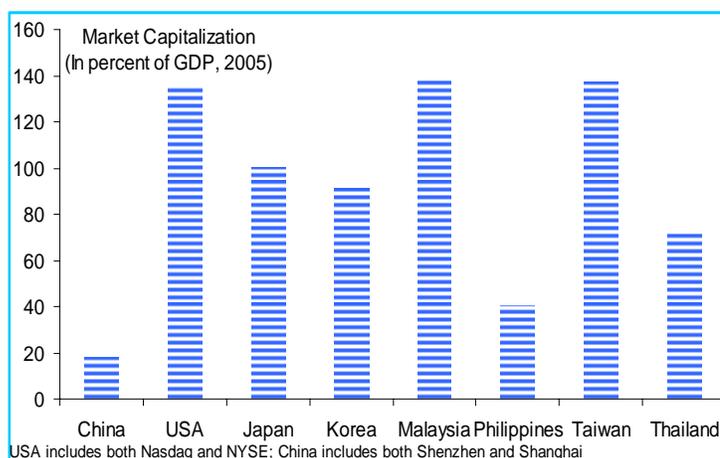
VI. INVESTMENT INCOME AND GOVERNMENT TRANSFERS

The decline in wage share by itself is not unique to China. In fact, wage share tends to be countercyclical and its fluctuations are commonly experienced. For example, in the United States, the labor share declined from 59 percent of GDP in 2000 to 56 percent of GDP in 2005. However, the impact of the decline of labor share in the U.S. on household consumption has been limited, with the personal disposable income has stayed roughly steady at around 74 percent of GDP during this period. Indeed, the implied rise in the profit share has been better distributed in these countries either directly through the financial system in the form of higher investment income, or through government transfers. These have thus provided better channels for the household to share risks with the corporate sector. Such channels have not worked well in China.



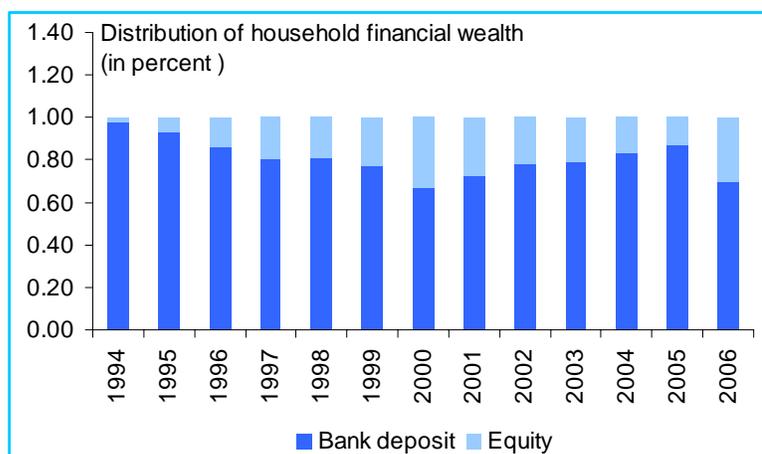
To begin, investment income in China accounts for a very small proportion of total household income. The comparison with international experience is striking. During the past decade, less than 8 percent of households' disposable income came from investments (including profit, interest rate, etc). This is one of the lowest in the world. Even after adjusting for statistical issues, such as counting operational surpluses of self-employed individuals as investment income (currently accounted as labor compensation) the picture does not change very much. As noted earlier, the share of investment income in total disposable income has been declining in recent years to stand below 3 percent in 2005.

The nexus between financial sector development and growth is a long standing branch of economics literature. However, much of this literature, especially on the empirical front, has focused on the role played by financial intermediaries in mobilizing savings and some on their role in allocating savings. On the first role in China, earlier studies found that the banking sector did not contribute that much to growth



through resource mobilization and allocation (see e.g., Aziz and Duenwald (2002)). Instead, bank financing was largely concentrated in the more sluggish state-owned enterprises, which could have aided growth indirectly by helping to maintain social stability in the economy. These early studies, given that they focused on the 1980s and early 1990s could be biased towards conditions during that period. Beyond mobilizing savings and allocating them, financial markets also play a role in distributing returns from savings. The low share of investment income in China brings into sharp focus the poor performance of the financial sector to distribute profit income from firms to households, both in the form of dividends and interest.

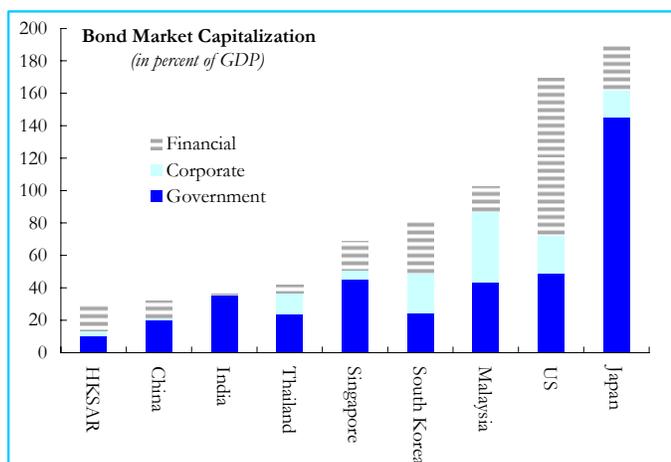
China's stock market is relatively small despite the rise of private firms and the dilution of public ownership through listings in the stock market and through sales to foreign investors. The total market capitalization accounted for 18 percent of GDP as of 2005, compared to 136 percent in the US and 75 percent in India. A number of interrelated factors have



contributed to the underdevelopment of the stock market. First, until recently, about two thirds of the shares of the listed companies in China's stock market were nontradable. The uncertainties about how the issue may be resolved have resulted in depressed stock prices and low market participation in recent years. Second, the development of institutional investors (such as mutual funds, insurance, and pension funds) has been sluggish. In China, such investment funds were established in 1998. By the end of 2002, there were only 61 closed and open-ended investment funds, holding investment assets of less than 10 percent of tradable market capitalization, compared with 50 percent in the U.S. Third, the languishing stock market and inadequate minority share protection has also discouraged individual

investors. The total individual investor accounts¹¹ of the Shanghai and Shenzhen stock exchanges averaged about 5 percent of the population, and even this number is considered a significant overstatement, given that many investors trade on both exchanges or open false account under fake names (Green (2004)). As a result, the stock market has not reflected the overall strength of the corporate sector performance. Moreover, even though some firms that are listed on the exchange have performed well, they have not distributed any significant amount of profits as dividends. Instead, they have kept these large and growing internal savings as a cheap source of financing for investment. Household holdings of equity remains quite low, at around 15 percent of total financial wealth (this ratio went up in 2006 to around 30 percent as a result of the 140 percent increase in equity prices after the end of the stock market reforms in 2005).

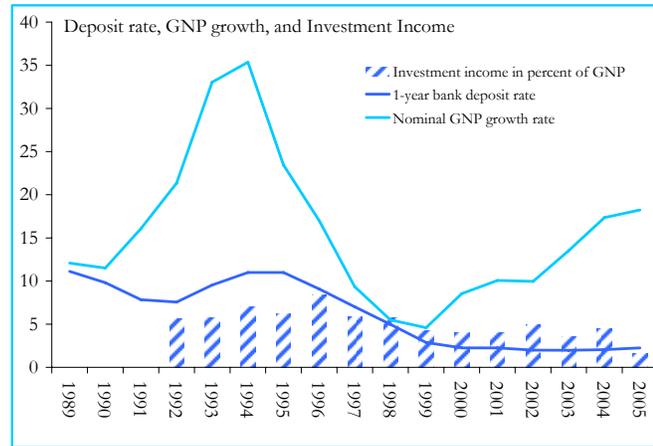
Although their influence on overall economic activity has declined over the years, state-owned enterprises (SOEs) remain a major force and are dominant players in several sectors, especially those that are resource dependent such as petroleum, steel, coal etc. Since the mid-1990s, these SOEs have undergone major reforms that have helped them to operate on commercial principles. Moreover, while in the past these SOEs had significant social obligations (such as maintenance of employee housing, schools, hospitals, etc.), these have been taken away from them as part of the reform process and handed over to local administrations. As a result, SOEs that were previously burdened with these social costs, had their balance sheets cleaned up and came out of the reform as financial much stronger entities. This helped them to generate significant profits and over the years the number of loss-making SOEs has steadily declined. However, implicit in the reform process was the tacit understanding that the profit making SOEs did not have to pay out dividends to its main shareholders (namely the government). While SOEs (federal and local government owned) have been making net profits of around 6½-7 percent of GDP since 2003 (for which data is available) and have paid out dividends to at least some of its shareholders (e.g., on the NYSE listed American Depository Receipts of some of the major Chinese companies like Petrochina, China Mobile, Sinopec, etc), the government—the main shareholder of these SOEs—has not received any profit transfers at least since 1994 when the SOE reforms were initiated. In many countries that have a large presence of SOEs, this profit transfer to the budget acts as a distributing conduit of profits to households in the form of either government transfers or



¹¹ This includes the informal asset management companies, which are registered as individual investors and not distinguishable from the former. See Green (2004). While such informal institutional investors have played an important role earlier—it is estimated that it held about 45 percent of trade market capitalization during 2000-2001, its size has declined as the poor performance of the bear market has encouraged their customers to withdrawn their funds.

government provision of such private goods as healthcare and education. China's government spending on health and education at around 3 percent of GDP is one of the lowest in the world.

Corporate bond market is also underdeveloped. This owes largely to the complex regulatory system and the restrictions such as “merit” based bond issuance that relies on government selection for each bond issue, and the cap on corporate bond interest rates. Corporate bond market accounts for about 3 percent of total bond market, even though the latter is already small relatively to the size of the economy. Treasury bonds and financing bonds (including bonds issued by policy banks and central bank sterilization bills) dominate the bond market. However, given the large liquidity in the banking system, yields on the treasury bonds and financing bonds were very low.



Reflecting the lack of alternative investment vehicles, banks continue to dominate the financial system and bank deposits have been the main if not only form of investment for most households. The banking system has enjoyed high liquidity, reflecting the high savings, a lack of alternative investment channels in the domestic market, and prevailing capital controls that prevent Chinese household from investing abroad. As a result, lending rates were much lower than the real growth, an indication that the cost of capital is too low. At the same time, banks enjoy a comfortable margin (about 4 percentage points) between the floor of lending rates and the ceiling of deposit rates as set by the People's Banks of China. Such a margin was deemed necessary to ensure adequate profitability of the banks while preventing those banks that lacked financial discipline from engaging in destructive competition to win customers. As a result, deposit rates have been even lower, averaging around 2 percent in real terms. Using the margin between bank deposit rate and the growth rate of nominal GNP, one can see that in recent years, this gap has widened and along with that investment income's share has declined.

Government transfers to households also declined since the early 1990s, standing at around ½ percent of GDP in 2005. This is well below the average of transfers from government to households in advanced and other emerging economies, and is one of the key elements in the broader decline in China's public expenditure in social services. Such a development reflects an unintended consequence of China's economic transition, particularly the absence of an effective mechanism to offset the job and income loss of households during the course of enterprise restructuring. The enterprise restructuring in the 1990s transferred the social expenditure that had been previously shouldered by state-owned enterprises such as housing, pensions, education, and health care to the local governments. The sizeable labor shedding

also increased the responsibility of local governments to pay for unemployment benefits or early retirement.¹² At the same time, the re-centralization of revenues in 1994 reduced the share of local governments in the receipt of total revenues and increased the disparity of revenue income between rich and poor regions. While it was accompanied by an increase of transfers from the central to local governments, the transfer system has fallen significantly short in providing an equalizing mechanism across regions. As a result, many local governments, particularly those in poorer area of the country, have found it difficult to meet their expenditure needs. The pooling of pensions, health care, and unemployment at the provincial levels has exacerbated this problem for regions that need to cope with regional-specific shocks.

VII. POLICY IMPLICATIONS AND CONCLUSIONS

While the rise households' saving rate, reflecting an increase precautionary savings since the 1990s, is a factor behind the declining share of consumption, evidence points to a much larger roles played by the falling share of household income and of weak financial markets have played in this. Thus, if China is to rebalance growth towards greater dependence on household consumption, improving the distribution of national income between profit and household income appears to be a quantitatively important factor.

There are several areas where reforms are needed. The most obvious is to further improve banking practice in China. This is already happening in terms of restructuring and reforms to China's large state-owned commercial banks. As a first step of this reform process, improving the overall financial conditions of the banks was considered the most important. This took the form of transferring accumulated nonperforming loans out of the banks and then recapitalizing them. Alongside, these banks were made to restructure internally and meet time-bound benchmarks on the quality of their loan portfolio, return on assets etc. While these were essential steps in the bank reform process, they had the unintended consequence of making the banks overly conservative in the absence of proper internal risk-management and risk-pricing practices. The result of the rise in conservatism implied that borrowing constraints on firms, especially the small and medium scale enterprises, became even tighter. The tightening of such constraints was mostly felt on firms' working capital and thus the overall wage share, with firms preferring to use retained earnings for investment purposes. Therefore, a key reform would be to put in place in these banks adequate risk-management and risk-pricing practices so as enable the banks to price differentiate its clients better and ease such constraints.

The cap on bank deposit rates is also hindering the smaller banks from more aggressively competing with the larger state-owned banks. While China's banking system has been generally flush with liquidity for some time now, the distribution has been lopsided. The

¹² By expenditure measures, China is considered one of the most decentralized countries, with local government accounting for over 70 percent of total expenditure. This compares to less than 50 percent in most other federations. China is also a unique case where the pooling for pensions, health care, and social safety net is performed at the subnational rather than national level. See Dabla-Norris (2005) and Wong (2005) for further discussion.

larger state-owned banks have generally been net-suppliers of liquidity while the smaller banks net-purchasers in the interbank market. Removing the cap on deposit rates will allow the smaller banks to better compete with the larger ones, and could increase deposit rates from its present low rates, helping to improve household incomes.

Further reforms in the equity market are also important. While converting the substantial non-tradable shares to tradable shares have been completed, few of these shares have been traded in the secondary market. As a result, direct and indirect shareholding by households remains limited. Also in the past 3-4 years, as the domestic equity market has been embroiled in brokerage scandals, investor confidence in the market has been low. With the reforms of the last few years, confidence appears to have returned given the remarkable rise in equity prices over the last year or so. However, large Chinese enterprises and brand names have yet to enter the market in any major way. Typically, the presence of large corporations and well known brands have encouraged households to participate in the equity market. Further dilution of public share holding both through the secondary sales of the newly converted tradable shares and fresh public offerings of large and well known public corporations will help to widen household shareholding. In this context, expansion of mutual and pension funds are also steps to help increase indirect holding of equity among households.

The government has increasingly focused on reintroducing dividend payments by SOEs in the last few years. Some form of dividend payment scheme is expected to be in place by 2007. This will be a major step forward in terms of providing the budget with additional revenue that can then be used to increase spending on education and healthcare, as well as on transfers to households. Reorienting public spending towards social areas and household transfers will help to increase private consumption.

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Appendix I: Macroeconomic Data

Gross Domestic Product and Consumption

GDP and consumption are from the national account. We use the official data before the GDP revision in early 2006 for several reasons. First, the revision only covers the period since 1993, using the new data would make historical comparison very difficult. Second, only part of the national accounts has been revised. The most relevant data for this paper—the flows of funds account—have not been revised. Using revised data would result in a large discrepancy between the two sides. Third, the economic census only covered 2004, and the historical data were backfilled by applying a statistical method that assumes a smooth path of the increase in services. Thus the information loss by not using the new data is relatively small.

GNP

Following Hayashi and Prescott (2003), GDP is adjusted for the net income on factor services to get GNP. GNP is then broken down into private consumption, government consumption, and investment, where investment includes total investment (including inventory), net exports and net factor payments. Capital stock is then derived by applying the investment, assuming the initial foreign capital to be zero.

Household Income and Its Components

We use a number of sources to compile this data for different period:

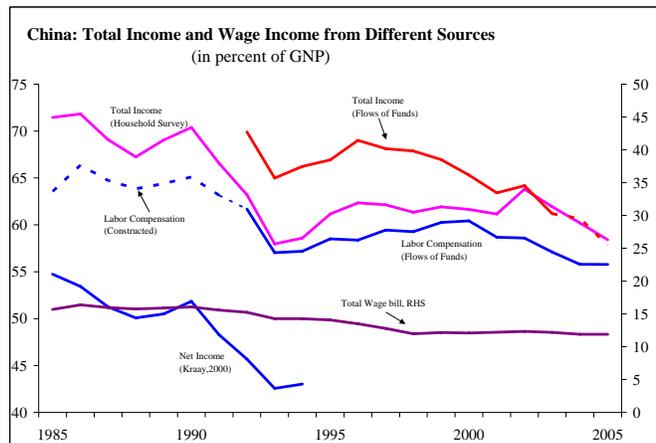
1992-2003: Data on disposable income and labor remuneration are directly available from the National Account flows of funds. According to China's statistical bureau, disposable income refers to income received by institutional sectors on the basis of total income of primary distribution and through current transfers. This is the income that is used for final consumption and savings. Labor's remuneration refers to the whole payment of various forms earned by the laborers from the productive activities they are engaged in. It includes wages, bonuses and allowances the laborers earned in monetary form and in kind. It also includes the free medical services provided to the laborers and the medicine expenses, traffic subsidies and social insurance fee paid by the laborers' working units for them. As the individual economy is concerned, since the laborers' remuneration is not easily distinguished from the operating profit, both are treated as laborers' remuneration.

2004-2005: the household income is estimated using household survey and population data, adjusting for differences with the national account flows of funds data in previous years. More specifically, household survey contains data on per capita income of rural and urban households. These numbers are multiplied by the respective population estimates and then added with an estimate of subsistence consumption. As these estimates come out about 2-3 percent below the level of the total disposable income from the flow of funds data

published by NBS for the few years before 2003, they are adjusted upwards by 3 percent to match the flow of funds data.

1985-1992: Household survey data for this period are incomplete. Only consistent series available to us are the per capita income for rural and urban households since 1985. Using these data and population estimates, we can calculate the total income from the household survey. Separately, Kraay (2000) constructed net income from 1978-1994 from the household survey. The net income measure excludes the production costs associated with household production for the rural population and transfers to family members not residing in the households for the urban population. As shares of GNP, both the gross income and the net income from the household survey displayed similar decline between 1985 and 1994. Both of them are well below the level of income recorded in the flows of funds, reflecting the differences in conceptual coverage and statistical methods. Nevertheless, different sources of data all point to the decline of income as a share of GNP.

We rely on data on total wage bill before 1992 to derive the wage share during this period. Total wage bill refers to the total remuneration payment to staff and workers in various units during a certain period of time. The calculation of total wages is based on the total remuneration payment to the staff and workers. Excluded from the “staff and workers” are those working in agriculture (unless they are working in an enterprise related to agriculture) and those working informally. Therefore, the item “labor remuneration” from the flows of funds account is a much broader coverage than total wage bill, as the former includes all the productive activities of laborers and compensation in the form of social services.



In particular, operating surpluses of individual economy (or self-employed) is included in the labor remuneration but not in the wage bill. Gollin (2002) argued that in most countries, income of self-employed workers is entirely considered as capital income, which could result in an underestimation of labor share in countries where self employment is substantial. In China the situation is opposite—as all income of self-employed workers is counted as labor remuneration, the wage share may actually be overstated! Indeed, the share of self-employed workers in total employment rose sharply during the 1990s, before coming down and stabilizing since late 1990s. This may have accounted for some increase in the



recorded share of compensation during the 1990s.

Compensation for labor from flows of funds data is also different from total wage bill with the former including compensation to farmers and compensation to employees in the form of social services provided such as free medical services provided to the laborers and the medicine expenses, traffic subsidies and social insurance fee paid by the laborers' working units for them, although the importance of these elements were unlikely to have increased in the 1990s. We use the ratio of total wage bill and compensation to labor in 1992 and apply it to the total wage bill data during 1980-1992 to construct wage income consistent with flows of funds definition.

The constructed wage series show a remarkably similar decline in the wage share as the income shares from the household survey during 1985-1992, as discussed above. This is consistent with our view that that household income, mostly driven by wage income, has declined as a share of GNP between mid-1980s to 1992.

Appendix II: Firm-Level Survey Data and Variables Used in the Cross-section Regression

The World Bank Enterprise Survey on Productivity and Investment Climate includes responses of 1500 Chinese enterprises. It asks enterprises to what degree issues related to the country's institutions, policies, and infrastructures are a problem for the operation and growth of their business. The relevant ones to this paper are the two questions related to financing. The first question is related to obstacles to business operation posed by access to financing (e.g. collateral), and the second question is related to obstacles posed by the cost of financing (e.g. interest rates). The managers of the firms are asked to judge the severity of the constraint on a five-point system ranging from zero to four, where zero represents no obstacle and four represents very severe obstacle. Other questions include the firm's line of business, location, number of employment, source and size of investment, etc. The firms also identify the share of government ownership in their responses, making it possible to distinguish wholly private firms from those with minority and majority state ownership. Most of the firms (about three quarter) in the sample are completely privately owned, with the rest with government share ranging from 1 to 100 percent.

The variables used in this paper are obtained from the survey responses. Employment growth between 1998 and 2000 is the percentage growth of the average number of total employees (including contractual employees) during the two years, based on the reply to question C.1. Investment growth is defined as the percentage growth in the value of total fixed assets between 1998 and 2000, based on the reply to question B.3. Increase in capacity utilization for manufacturing firms is defined as the change in the capacity utilization (in percent) between 1998 and 2000.

The variable *Financing* represents the survey response on financing obstacles. We let the financing variable to take the value 1 if the response is no or very minor obstacles, 2 if the response is moderate obstacle, and 3 if the response is major or very severe obstacles. z represents various control variables. Firm age is calculated as the difference between year of establishment and 1998. Small medium sized firms correspond to those with total employees less than 500 in year 2000, and the dummy variable takes on value 1 if the firm is small-medium sized, and 0 otherwise. Government ownership is defined as the presence of state shares, and the dummy variable takes the value 1 if the firm is partly or fully owned by state, and 0 otherwise. Given the possibility that the restructuring of some SOES may result in reduction in employment growth and thus bias the results, the regression is also estimated excluding state-owned enterprises. Following Huang (2006), a variable representing firms' external orientation (based on the response to question A.12) is added, which takes the value 1 (with foreign partners) and 2 (no foreign partners). Thus, differences in the employment growth across foreign and domestic firms, beyond those introduced by their differences in perceived difficulties in financing, can potentially be captured. Last, we include dummy variables corresponding to the location and industrial sub-sectors of the firms (all together 56 dummy variables).