

Household Saving in China

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Abstract: China, the world's largest and fastest-growing economy in recent years, has also experienced national saving rates that are among the highest in the world. This paper considers a variety of statistical issues that cloud the measurement of aggregate and household saving in China, and provides new empirical evidence on the importance of intertemporal considerations in explaining inter-provincial variation in household saving in China.

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1. Introduction

China, the world's largest and fastest growing economy in recent years, has also experienced saving rates that are among the highest in the world. Since the first steps towards economic reforms were taken in 1978, China's gross national saving rate has averaged 37 percent of GNP, while its economy has expanded at a remarkable 8.7 percent per year in per capita terms, lifting 200 million Chinese out of absolute poverty. Rapid growth has been accompanied by an equally-rapid process of transition, as China has progressed from a primarily rural, agrarian and state-run economy to a more urban and industrial society in which the majority of economic interactions are governed by market forces.

These transitions have had profound consequences for saving. Consider China's transition from plan to market. Before 1978, China's high saving rates, averaging 27 percent of GNP, were engineered by state fiat. Distorted relative prices favoured industry, concentrating profits in state-owned enterprises which could then be directed towards the state's investment priorities. Household incomes were very low, and households accounted for only a small proportion of total saving. The advent of economic reforms has transformed the role of the public and private sectors in saving. Price reform and vigorous competition from collectively-owned and private enterprises have eroded the operating surpluses of state industry, and with them the importance of public saving. In contrast, rising household incomes and rising saving rates have brought household saving to new prominence, with households contributing between one-quarter and one-half of total saving.

Transition to market has not only given new importance to the voluntary consumption and saving decisions of households, but it has also shaped the economic environment in which these decisions are made. In rural areas, the collapse of the agricultural commune system and the emergence of more secure property rights to land and buildings sparked a boom in rural household saving in the form of investment in land and housing. In addition, the proliferation of bank branches into even remote areas and the rapid growth of rural industry has given rural households access to a broader range of assets. Urban households, once covered by generous cradle-to-grave benefits through employment in state-owned enterprises, are finding their futures increasingly

uncertain as the financial performance of their state-owned employers has weakened. At the same time, growth in the non-state sector has meant that a small but increasing share of urban workers no longer enjoy the same generous benefits afforded their counterparts in state industry. These factors have plausibly provided strong new saving motivations for urban households. Furthermore, as incomes have risen from quite low levels, especially in rural areas, a decreasing share of income is being devoted to meeting subsistence consumption requirements, leaving more income available to act on these saving motivations.

Against this backdrop, this paper makes two contributions. The first, while mundane, is important as it concerns measurement of saving in China. As in many developing countries substantial statistical difficulties arise when measuring saving. In China these difficulties are particularly acute. I discuss at some length discrepancies between aggregate saving and its components, and between alternative measures of household saving, and discuss the implications of these for views of saving in China. Second, I examine the relevance of standard forward-looking models of consumption and saving for China. In particular, I provide new evidence on how expectations of future income growth and future income uncertainty, as well as demographic variables and proxies for the importance of subsistence consumption explain interprovincial differences in household saving rates. Consistent with the predictions of standard intertemporal models of consumption, I find that for rural households, higher future income growth is associated with lower current saving rates, as households raise their consumption in anticipation of higher expected future income. Somewhat puzzlingly, however, future income uncertainty does not appear to raise current saving rates, as would be the case for prudent households with precautionary saving motivations. Finally, there is a robust negative relationship between the share of food expenditures in total expenditures (a proxy for the importance of subsistence consumption) and household saving rates. While these results cannot explain why China's overall saving rates are so high, they do provide insights into the factors underlying the rural-urban, interprovincial, and intertemporal variations in saving in China.

Given China's size and its high saving rates, it is not surprising that considerable theoretical and empirical effort has been devoted in recent years to understanding its saving behaviour. This research can broadly be divided into two strands. The first has

emphasized the relevance for China of traditional equilibrium theories of saving, ranging from simple Keynesian consumption/saving functions to variants of the life-cycle and permanent-income hypotheses.¹ The second has argued that equilibrium theories of saving are unlikely to be relevant in an economy in transition from plan to market, and has instead argued that disequilibrium factors, especially shortages and rationing in goods and credit markets can account for China's saving experience.² These alternative hypotheses have been subject to empirical scrutiny using both aggregate and household level data, with varying success. In addition to its treatment of data issues, this paper differs from much of the existing literature on China in that it directly tests the importance of expectations of future income growth and future income uncertainty, following the approach suggested by Carroll and Weil (1994) and Carrol (1994) in the U.S. and international contexts.

The remainder of this paper proceeds as follows. The next section provides a description of trends in aggregate and household saving in China, and discusses measurement issues. Section 3 presents new evidence on determinants of household saving in China using a panel of province-level data from China's household survey. Section 4 concludes with a discussion of the policy implications and directions for further research. A brief appendix provides additional information on the household survey as well as.

¹ Examples of these include estimates of simple Keynesian consumption or saving functions (Wong (1993), Qian (1988), World Bank (1988)); tests of various implications of the permanent income hypothesis (Chow (1985), Qian (1988), Wong (1993), Wang (1995)); and tests of the life-cycle model (Jefferson (1990), Pudney (1991), Dessi (1991), Modigliani and Cao (1996)). Bai, Zhu and Wang (1993), Yusuf (1994), Zhang (1994), and Arora (1995) offer interesting descriptive analyses of saving in China but do not formally test alternative theories of saving.

² See Feltenstein, Lebow and Van Wijnbergen (1990) and Ma (1993), as well as indirect evidence via the estimates of the effects of rationing in demand systems provided by Wang and Chern (1992) Fleisher, Liu and Li (1994) and Wang and Kinsey (1994). Direct survey evidence on consumer goods availability can be found in Hussain, Ludlow, Wang and Wei (1990). Naughton (1987) provides a critical review of this evidence and suggests that involuntary saving is unlikely to be empirically important other than possibly in the very early post-reform period.

2. Measuring Saving in China

According to national accounts data, saving in China has been extraordinarily high over the past 20 years. In this section I briefly review this fact, and then present rough estimates of the composition of national and of household saving. This exercise highlights a number of data problems with important implications for the understanding of saving in China that are frequently ignored in empirical work. Finally, I describe the panel of provincial saving data based on household surveys that is used in the following section.

Measuring Aggregate Saving

Over the past thirty years, official statistics for China reveal high and rising saving rates, and rapid growth. Between 1965 and 1977, gross national saving rates averaged 26.7 percent of GNP, climbing to an average of 36.6 percent between 1978 and 1995. During these periods, per capita GNP growth averaged 5.8 percent and 8.7 percent, respectively, although the latter growth rate is probably overstated by 1 to 2 percentage points. This saving and growth performance is similar to that of other rapidly-growing economies in East Asia, although China's high saving rates were reached at much lower income levels.³ More striking is the discrepancy between China's saving experience and that of the transition economies of Eastern Europe and the Former Soviet Union. While China weathered the early stages of transition with only small declines in national saving rates, many of the other transition economies saw sharp declines in national saving rates mirroring the well-documented output collapse in these countries.⁴ As discussed below, the resilience of China's aggregate saving rates throughout the transition process reflects the fact that household saving increased rapidly during the early years of reforms, offsetting the decline in publicly-directed saving through the planning and state-enterprise apparatus. In contrast, in many transition economies, the collapse in public saving was paralleled by sharp declines in household saving.

³ A more descriptive discussion of China's growth and saving experience can be found in World Bank (1997).

⁴ See for example Denizer and Wolf (1998).

More broadly, it is worth noting that China's saving rate remains unusually high in international experience even after controlling for a set of the determinants of saving. To illustrate this point, I estimate a cross-sectional regression of gross national saving rates in a large sample of countries on a set of variables identified by Loayza, Schmidt-Hebbel and Serven (1998) as the "core" determinants of saving.⁵ I then express each of the explanatory variables for China as a deviation from the average across all countries, and multiply these deviations by the estimated coefficients. This yields a measure of the extent to which differences in China's saving rate from those of a "typical" country can be attributed to differences in known determinants of saving. The results of this exercise are summarized in Figure 1. Consistent with the earlier discussion, China's saving rates are unusually high given its level of per capita income, as indicated by the negative contribution to the predicted saving differential of this variable. In contrast, China's high growth rate and financial depth, as well as its relatively low old-age dependency ratio contribute positively to China's saving differential. Most importantly, even after controlling for these determinants of saving, China remains a large outlier in the regression, with the regression underpredicting China's saving rate by nearly 10 percentage points.⁶

What underlies these high saving rates? Figure 2 provides a rough decomposition of gross national saving in China since 1978 into public saving, corporate saving and household saving. The data for this decomposition can be found in Appendix Table 1. This decomposition is useful in that it highlights the changing role of the government and households over the course of China's economic reforms, and also because it draws attention to a number of anomalies in the data which cloud the measurement of saving in China. Public saving is defined as the current balance on the budgetary and extrabudgetary accounts of the central and local governments. Since extrabudgetary resources primarily consist of the operating surpluses of state-owned enterprises, as well as revenues from a range of informal levies, this provides a rough

⁵ I am grateful to these authors for kindly sharing their data. The results of the regression are presented in Table 1.

⁶ This residual is statistically different from zero at the 5 percent level, and is the third largest in the entire sample (only Togo and Bahrain are larger outliers).

measure of total public sector saving.⁷ In the absence of data on the current balances of the non-state sector, corporate saving is estimated as the total fixed asset investment of the non-state sector, excluding investment by individuals and investment by foreign-owned enterprises.⁸ This requires the assumption that investment by the non-state sector is primarily financed out of retained earnings. While there is some evidence in favour of this, anecdotal evidence also suggests that a significant portion of investment, particularly by collectively-owned enterprises, is financed by direct and unrecorded contributions from workers. To the extent that this phenomenon is important, this proxy will doublecount a portion of saving that should more appropriately be attributed to households. Finally, the measurement of household saving presents a number of difficulties which are discussed more fully below. For the purposes of the decomposition in Figure 2, I employ my preferred measure, which consists of the difference between income and expenditure from China's household surveys, plus fixed asset investment by individuals.

Figure 2 has two striking features. The first is the decline in this measure of public saving that is largely due to the sharp decline in the surpluses of the state-owned enterprise sector which has accompanied China's transition to a more market-oriented economy. During the pre-reform period, distortions in the pricing system and discrimination against non-state industry concentrated surpluses in the state sector, whence they could readily be allocated to the investment priorities of the state. Since the initiation of reforms, price reforms and competition from a vigorous non-state sector have combined to shrink dramatically the surpluses of state enterprises, and with them the share of the public sector in total saving.

The second feature of Figure 2 is the substantial and widening residual which remains after direct measures of public and private saving have been subtracted from total saving. While large residuals in saving decompositions such as these are typical in

⁷ A more detailed decomposition of general government and public enterprise saving for the period 1987-94 can be found in World Bank (1996), Annex 3. Fiscal decline during the reform period is documented at length in World Bank (1995). Barandiaran (1997) provides a more detailed flow-of-funds analysis of the composition of saving.

⁸ Individual investment is included in household saving, as discussed below. Foreign investment is measured here as fixed asset investment by foreign-funded and overseas-Chinese funded enterprises, and is available only since 1993 in the China Statistical Yearbook.

developing (and often also in industrial) countries, the size of the discrepancy is disconcertingly large for China, and calls into question the magnitude (although probably not the direction) of the increase in saving in China in the reform period since 1978.

One important factor contributing to this residual is the unusually large positive contribution of inventory accumulation to gross national saving, which is reflected in the total but is not included in the estimate of private saving reported above. In most countries changes in stocks are small and generally average to zero over time, while in China they have been positive and large, averaging 6.5 percent of GNP between 1978 and 1995. It is unclear why changes in stocks have been so large in China. Anecdotal evidence suggests that this in part reflects the accumulation of unsaleable output produced by state-owned enterprises. Although this constitutes saving inasmuch as it represents foregone current consumption, it is misleading to think of this as saving in the usual sense as it cannot be translated into future consumption.

In summary, while national saving rates in China are high and quite likely rising between the mid 1980s and mid-1990s, both the level and rate of change may be somewhat overstated as suggested by the rising gap between national saving and direct estimates of its components. While surprisingly large inventory accumulation accounts for a portion of this gap, significant uncertainties about the true level remain.

Measuring Household Saving

In this subsection, I turn to issues that arise in the measurement of household saving. Two alternative measures have been used in academic research and policy discourse in China, as shown in the left and right panels of Figure 3. The first is based on the difference between household income and expenditures, as reported by China's household survey (described in more detail in the appendix). Since this survey does not distinguish between current and capital expenditures of households (counting both as consumption), I augment the difference between income and expenditures with a national accounts measure of investment by individuals to arrive at household saving.⁹

⁹ Investment by individuals is not reported separately prior to 1983. For the purposes of this graph, I assume that the share of individual investment in total saving is constant at its 1983 value for these years.

On the right side of Figure 3, I construct an alternative measure of household saving, derived from changes in aggregate stocks of assets held by households and consisting of (a) the change in household saving deposits, (b) net subscriptions to government bonds, (c) the change in currency in circulation held by households, and (d) investment by individuals.¹⁰ The data underlying both panels of Figure 3 can be found in Appendix Table 2.

The household survey-based measure indicates that household saving rose sharply from 7 to 15 percent of GNP during the first six years of the post-reform period, but then declined and stabilized around 10 percent of GNP or roughly one-fourth of total saving.¹¹ In contrast, the asset-based measure of saving indicates that household saving have increased steadily from 5 percent to 20 percent of GNP, or from roughly one-seventh to one-half of gross national saving. Inspecting the left and right panels of Figure 3, it is clear that the main source of the discrepancy between these two measures is the rapid growth in household deposits in the banking system which accounts for the bulk of the increase in the second measure of saving. Ordinarily, one would expect that household income less expenditure exceeds the change in deposits, as households distribute their saving over deposits as well as other assets. Yet since 1986, the converse has been true, with the change in household saving deposits exceeding household saving by a large and rising margin.

Several factors may have contributed to the divergence between the change in household saving deposits and household income minus expenditures. First, China's rapid financial sector development since the initiation of economic reforms in 1978 has improved households' access to banking institutions, especially in rural areas.¹² This is

¹⁰ It is difficult to determine household cash holdings. Following Qian (1988), I assume that 85 percent of currency in circulation is held by households, while Mehran et. al. (1996), p. 38, report a somewhat lower share of 77 percent. In both measures I am also implicitly assuming that in the aggregate, individual investment (a substantial portion of which is investment in housing in rural areas) is financed solely by household saving.

¹¹ Although variants of these two measures have been used in many studies of household saving in China (see Section 2 of this paper), the discrepancy between them has for the most part escaped attention (see Xie (1995) for an oblique reference to this issue).

¹² For example, the number of branches of the Agricultural Bank of China, the smallest of China's four large state commercial banks, more than doubled between 1981 and 1995, from 29,000 to 67,000. See also World Bank (1995), Annex 3.2 for a description of the proliferation of urban credit cooperatives in Shanghai over the past decade, and Kumar et. al. (1997) for a description

likely to have contributed to the growth of deposits simply by encouraging a portfolio shift in the composition of household saving from physical commodities such as grain to deposits. Second, in the late 1980s and early 1990s inflation-indexed saving deposits offering very attractive real returns were made available to households, and there is some evidence that significant volumes of corporate saving have illicitly found their way into these instruments. These two reasons suggest that using the deposits-based measure of household saving might overstate actual household saving.

On the other hand, to the extent that the household survey underestimates income, and to the extent that the propensity to save out of unrecorded income is positive, the survey-based measure will underestimate the level of saving. To the extent that these omitted saving are held in the form of deposits, this can help to account for the discrepancy between the two measures. This explanation is not implausible, since growth in per capita household income from the household survey has lagged behind growth in per capita GNP by about 2.5% per year in nominal terms between 1985 and 1995. However, even if the national accounts growth rates are correct, and even if saving out of unrecorded income occurs at the same rate as out of recorded income, this would add only 2 percentage points of GNP to the household survey-based estimate of saving in 1995, which is still much smaller than is required to fully account for the difference between the two measures.¹³

How much does this discrepancy matter? On the one hand, it is not surprising that household survey measures of saving do not correspond closely to aggregate measures. Even in developed economies with strong statistical systems, there are often large gaps between survey-based measures of household deposits and those reported by the banking system.¹⁴ However, the magnitude of the discrepancy between these

of the burgeoning network of non-bank financial institutions. Honohan (1995) provides an overview of international evidence on the role of institutional factors such as access to banks in mobilizing household saving.

¹³ Cumulating 2.5% annual growth over 10 years would raise the income minus expenditure component of the household survey estimate by 28 percent, from around 6 percentage points of GNP to 8 percentage points of GNP in 1995.

¹⁴ See for example the discussion in Brandolini and Cannari (1994). They note that although household survey-based estimates of income and expenditure generally correspond fairly well with national income accounts, there are much larger discrepancies in estimates of wealth. They

two measures, and their diverging trends, make this issue of some concern for the interpretation of saving behaviour in China. At a basic level, the gap between these two measures calls into question the overall importance of household saving in understanding aggregate saving in China. The divergent trends in the two measures also have implications for alternative explanations of household saving behaviour in China. For example, one might find support for the hypothesis of involuntary saving due to scarcity and/or rationing of consumer goods using the household survey-based measure of saving (which rises first and then declines), but not using the deposits-based measure of saving (which rises continuously), given that shortages of consumer goods have if anything declined considerably since the mid-1980s.

For the remainder of this paper I employ the household survey-based measure of saving as it probably gives a more accurate picture of household saving rates. China's household survey has been closely scrutinized by a number of outside users who, while noting a variety of difficulties, generally conclude that it is of fairly high quality.¹⁵ One drawback of this choice is that the individual investment data required to construct these series is only available for a shorter time period than the income and expenditure data from the household survey (1983-1995 versus 1978-1995), and provincially disaggregated investment data is available only after 1985. In order not to lose the pre-1985 data, I take as my basic measure of the household saving rate income less expenditure from the household survey, for which I have a reasonably complete panel for 30 provinces over the period 1978-1995.

A shortcoming of this measure is of course that it does not include household capital expenditures, which, particularly in rural areas, form an important component of household saving. For the shorter period for which data is available, I construct two other measures of saving to remedy this deficiency. The first simply adds individual investment to the basic measure of saving. As noted earlier, however, it is difficult to distinguish between household investment and total private investment, given the close ties between many collectively-owned enterprises and their employees. I therefore also

note that Canada's Survey of Consumer Finances understates bank deposits by as much as 60 percent, while the corresponding U.S. survey understates deposits by 44 percent.

¹⁵ See for example Chen and Ravallion (1996) and World Bank (1997b), as well as the more detailed description of the survey in Appendix 1.

construct a very broad measure of household saving which also includes investment by collectively-owned enterprises, recognizing that this measure is in fact rather close to private, rather than household saving. I then use these alternative measures to check the robustness of the results using the basic measure, for the periods for which the alternative measures are available.¹⁶ Given that there is likely to be considerable measurement error in all three measures of saving, I will focus on long time-series averages of saving rates wherever possible in order to mitigate the effects of the time-varying component of this measurement error.

Household Saving, Income and Growth

In the remainder of this section, I document the stylized facts on average household saving rates, household income, and growth in a panel spanning China's 30 provinces between 1978 and 1995 in order to establish a set of facts with which explanations of household saving behaviour should be consistent. Figure 4, which plots the evolution over time of national averages of per capita household income, per capita household income growth, and household saving rates, reveals three interesting regularities. First, there is a strikingly-close high-frequency time-series correlation between per capita income growth and saving rates in both rural and urban households, averaging 0.49 and 0.52 respectively. Second, the relationship between saving and levels of per capita income differs markedly in the urban and rural data. In the former, saving rates and per capita income generally rise together fairly closely, with a time-series correlation of 0.82. In contrast, in rural areas between 1984 and 1992, incomes were essentially stagnant but saving first declined sharply and then rose again, describing an almost S-shaped pattern over time and resulting in a time-series correlation of essentially zero.

Third, rural household saving rates are substantially higher than urban saving rates. Between 1978 and 1995, rural saving averaged 15.9 percent of household income, while urban saving rates were a much lower 5.2 percent. Although conceptual differences between the urban and rural household survey measures of income undoubtedly play a role (see the appendix), this difference is likely to reflect the very

¹⁶ These results are available from the author upon request.

different institutional and social environment in which urban and rural households find themselves. In particular, urban households enjoy access to highly subsidized housing, education and health care benefits, and most are covered by generous (although unfunded) pension schemes through their employers. In contrast, few rural households enjoy these benefits, and most rely primarily on their own saving and their children for support in old age. Given these very different situations in which rural and urban households make their saving and consumption decisions, I will consider the rural and urban data separately wherever possible.

There is a rich diversity in saving rates, income levels and income growth across China's 30 provinces, which I will exploit in the remainder of the paper. Rural household saving rates range from a minimum of 8.6 percent (Hunan) to a maximum of 27.5 percent (Tianjin), while in urban areas saving rates range from 1.9 percent (Guizhou) to 14.3 percent (Tibet). Table 2 summarizes the cross-sectional and time-series covariation between saving, income and growth in this sample. The upper panel of Table 2 reports the pure cross-sectional correlations between household saving rates, per capita income, and growth in a panel of three six-year averages of the indicated variables for each of the thirty provinces. In contrast with the time-series evidence in Figure 4, the cross-sectional correlations between saving rates and growth, and between saving and per capita income levels, are rather modest. Correlations of saving rates and per capita income are only 0.26 in urban and rural areas, while the correlation between saving and growth is 0.05 in urban areas and 0.14 in rural areas.

A second interesting feature of the saving-growth nexus is that there is weak evidence of a negative correlation between saving rates and future per capita income growth, both in the cross-sectional and time dimensions for rural households, and cross-sectionally for urban households. This is also apparent from the aggregate evidence in Figure 4, which shows a sharp rise in rural household saving during the first six years of the reform period, preceding six years of nearly stagnant incomes.

In summary, a first glance at the data on household saving, per capita incomes and growth reveals a number of interesting regularities which can help to identify promising explanations for household saving in China, and to caution against others. First, saving rates and levels of per capita incomes exhibit a modest positive correlation

in a cross-section of provinces, and a considerably stronger time-series correlation within provinces for urban households. This lends credence to the importance of subsistence consumption in household saving decisions, with average saving rates rising as household income progresses beyond the bare minimum required for survival. Second, despite the strong time-series correlation between saving and growth documented in Figure 4, saving and contemporaneous growth rates are much less strongly correlated in the cross-section of provinces. This cautions against recourse to the prediction of the life-cycle hypothesis that high growth leads to high saving as the saving of the young outweigh the dissaving of the old. Finally, there is weak but suggestive evidence that saving rates are negatively correlated with future income growth. This points to the prediction of standard forward-looking household behaviour that households facing high expected future income growth will save less than households facing low growth, as the former consume more in anticipation of higher future income. This final prediction is taken up in more detail in the following section.

3. Evidence on Saving and Future Income Expectations

In this section, I present new empirical evidence on the relevance of standard forward-looking models of consumption and saving behaviour for China, using the panel of rural and urban provincial average saving rates described above. The methodology employed here follows closely the work of Carroll and Weil (1994) and Carroll (1994). These authors note that two fundamental predictions of standard forward-looking models of consumption and saving are (a) that expectations of higher future income (or future income growth) will lead to higher (lower) present consumption (saving), as households smooth their consumption in the face of a rising income profile, and (b) that higher future income uncertainty will lower (raise) current consumption (saving) to the extent that households have precautionary saving motivations. These predictions can be tested empirically by regressing saving rates on suitable proxies for expected future income and the variability of future income. Consistent with the theory, I find that expected future income growth is negatively associated with saving for rural households, but not urban households. However, proxies for future income uncertainty are not significantly associated with higher current saving, and surprisingly, often enter negatively.

Empirical Framework

To assess the impact of expected future income growth on current saving behaviour, I estimate the following specification:

$$s_{it} = \beta_0 + \beta_1 \cdot E_t[g_{it+1}] + \beta_2' x_{it} + \varepsilon_{it}$$

where s_{it} is the average household saving rate in province i at time t ; $E_t[g_{i,t+1}]$ is the expected growth rate of per capita household income in province i between periods t and $t+1$ based on information available at time t ; x_{it} is a vector of other potential determinants of saving rates; ε_{it} is a disturbance term; and $t=1,2,3$ indexes the three six-year periods over which data is available. The coefficient β_1 captures the effect of expected future income growth on current saving, and is predicted to be negative under the null hypothesis of forward-looking saving behaviour. As noted by Carroll and Weil (1994), the assumption of rational expectations suggests that a good proxy for expected future

income growth is actual future income growth, since rational expectations implies that expected income growth is equal to actual income growth plus an error term, i.e. $E_t[g_{i,t+1}] = g_{i,t+1} + v_{it}$. However, the presence of measurement error in this proxy variable, plus the possibility that this measurement error is correlated with saving, implies that I will require instruments for future income growth in order to identify the parameter β_1 . Given a vector of instrumental variables z_{it} which satisfy $E[z_{it}'(g_{i,t+1} + v_{it})] \neq 0$ and $E[z_{it}'\varepsilon_{it}] = 0$, and the assumption that the variables in x_{it} are exogenous, the model is (over)-identified and can be estimated using two-stage least squares.

Since the first-stage regression in this procedure is simply a regression of future growth on current variables, it is natural to turn to standard growth-regression type variables as candidate instruments, z_{it} . In particular, I use current income, the share of state-owned enterprise employment in total employment, and a dummy variable taking on the value one if the province is located on China's coast, and zero otherwise, as instruments for future growth. Current income can be thought of as capturing "convergence" effects, which have been found to be significant in a number of studies of growth in China's provinces.¹⁷ The coastal dummy is highly significant in the first-stage regressions, picking up the faster growth registered in coastal provinces, thanks to the combination of preferential policies granted to these regions and their favourable geographical location, among other factors. Finally, the share of state-owned enterprise employment is intended as a proxy for growth-inimical distortions, and generally enters negatively in the first-stage regressions. Standard tests of overidentifying restrictions will permit me to determine whether the identifying assumption that these variables affect saving only through their effects on growth is valid.¹⁸

¹⁷ See for example, Jian, Sachs and Warner (1996) and Chen and Fleisher (1996). Both these papers use provincial per capita GDP rather than the household survey measures of per capita income used here.

¹⁸ This is particularly important in the case of income, which may be correlated with saving directly, for two reasons: (1) it appears in the denominator of the left-hand side variable and is measured with error, and (2) it may have a direct influence on saving for reasons to do with, for example, subsistence consumption. However, these concerns are not as serious as they might seem. First, I use long (6-year) averages of all variables, which should help to alleviate problems of measurement error. Second, I include the share of food in total consumption as one of the explanatory variables. In any case, in almost all specifications, the overidentifying restrictions are not rejected at conventional significance levels.

It is worth noting that this procedure has the natural interpretation that agents form their expectations of future income growth using a simple cross-sectional growth regression. This feature is somewhat more satisfying than the implicit assumption of backwards-looking expectations used to justify using a moving average of past income as a proxy for permanent income (as is done for China by Qian (1988)). It is also more appealing than using the predicted values of cross-sectional regressions of income on household-specific characteristics such as age and education (as is done for China by Wang (1995)), since this methodology implicitly assume that households do not expect any changes in their economic environment which affect, for example, the returns to their education. Given the rapidly changing economic environment in China over the period under consideration, this assumption is not all that satisfying.

I augment the regressions with two additional likely determinants of saving. First, I include the share of food consumption in total consumption expenditures as a proxy for the effects of subsistence consumption. Various authors have noted that agents near subsistence levels of consumption will have lower average saving rates than richer agents, as the share of their income available for smoothing consumption intertemporally is smaller than that of richer agents.¹⁹ Accordingly, this variable is expected to enter with a negative sign in the saving equation. Second, I include the ratio of population to employment as a proxy for the dependency ratio. Although this is a rather crude proxy for a range of demographic determinants of aggregate saving rates (since it conflates demographic variables with labour force participation decisions), to the extent that low values of this ratio reflect a high ratio of prime-aged earners saving for their retirement, one might expect this variable to enter negatively into the saving equation.²⁰

To assess the effects of future income uncertainty on current saving, I use the same methodology as described above, simply augmenting the regressions with a proxy for future income uncertainty. Theories of precautionary saving suggest that variability in the unforecastable component of income is the relevant measure of income uncertainty.

¹⁹ See for example, Gersovitz (1983) for a theoretical exposition and Ogaki, Ostry and Reinhart (1995) and Atkeson and Ogaki (1996) for recent empirical contributions.

²⁰ Unfortunately, further disaggregations of this variable into its demographic and labour force participation decisions, and by old and young age, are not available by province.

I construct the unforecastable component of (the log of) income as the one-year ahead prediction errors from two alternative specifications for income: a random walk with drift (in which case the prediction errors are simply demeaned income growth itself), and an AR(1) around a deterministic trend.²¹ I then compute the standard deviation of both of these measures over the three six-year periods to obtain two alternative measures of income uncertainty.

Under the same assumptions of rational expectations as before, I can use appropriately-instrumented actual future income uncertainty as a proxy for expected future income uncertainty. However, in contrast to the previous case, the choice of instruments for future income uncertainty is less obvious than the choice of instruments for future income growth. For simplicity, I use the same set of instruments, but recognize that they are probably weaker instruments than for growth. Indeed, the first-stage regressions typically perform worse than the first-stage growth regressions. However, the coastal dummy typically enters negatively in the first-stage regressions (significantly in the case of rural income uncertainty), as does the share of state-owned enterprise employment, suggesting that these instruments do have some predictive power for future income uncertainty as well as future income growth.

Table 3 presents the results of the regressions of saving on expected future income growth, for rural and urban households, using a panel of three six-year averages for China's thirty provinces. Since expected future income growth is an explanatory variable for current saving, the model can only be estimated for the first two subperiods, i.e. 1978-83 and 1984-89. In addition to the explanatory variables noted above, the regressions also include period intercepts, so that the regressions exploit only the cross-sectional variation in the data.²² Finally, I also report results for the full sample of provinces, as well as for a subsample of higher-income provinces. To the extent that residents of poor provinces are more likely to face borrowing constraints or are near

²¹ In principle one can test which specification is more appropriate. However, given the well-known low power of tests which might discriminate between these two alternatives, it seems prudent to consider both measures.

²² It is possible that the results are misspecified due to the absence of controls for unobserved province-specific effects that are correlated with explanatory variables of interest. However, simple diagnostic tests did not lead to rejections of the null hypothesis that there is no first-order serial correlation in the residuals of almost every specification reported, casting doubt on the importance of province-specific effects.

subsistence levels of consumption, it is reasonable to expect a priori that future income growth will have a stronger effect on current saving in richer provinces. Thus, splitting the sample provides a crude control for these effects.

The most interesting feature of this table is that expected future income growth enters negatively and significantly for rural households, as predicted by standard forward-looking models of consumption and saving. The magnitude of the coefficients suggest that the results are economically significant as well. A one percentage point decline in expected future income growth results in a slightly more than one percentage point increase in the saving rate, as households reduce consumption and raise saving in anticipation of slower future income growth. These results also stand in sharp contrast with those found using cross-national data and U.S. household level data by Carroll and Weil (1994), who find that higher expected future income growth is associated with higher, rather than lower, saving rates. For urban households, however, expected future income growth has a positive, but statistically insignificant effect on saving. The results for rural households are possibly not that surprising, to the extent that they reflect high saving in the first six years of the reform period followed by lower saving in the next six. Many observers have noted that large gains in rural incomes in the early 1980s reflected primarily the one-time benefits of dismantling the commune system. It is quite plausible that rural households at the time were well aware of the transient growth benefits of these reforms and increased their saving accordingly in anticipation of slower growth after the initial benefits of reforms dissipated.

Turning to the other control variables, the share of food consumption in total consumption enters with the expected negative sign, consistent with the idea that households nearer to subsistence levels of consumption have lower saving rates. Somewhat puzzlingly, the dependency ratio enters with a positive sign, although the estimated coefficient is small and not significantly different from zero. This contrasts with the large cross-country literature beginning with Modigliani (1970) which has found that high dependency ratios are typically associated with lower saving rates. However, to the extent that high values of the dependency ratio reflect a large young-age population, and to the extent that households have strong bequest motives, it is in

principle possible to account for this result.²³ Finally, it is worth noting that for both urban and rural households in the full sample, and for rural households in the high-income sample, the null hypothesis that the overidentifying restrictions are valid is not rejected. This is a useful result because it indicates that the instruments (initial income, a coastal province dummy, and the share of state enterprise employment) affect saving only indirectly through their effect on expected future income growth.

Table 4 reports the effects of future income uncertainty on current saving rates. The upper and lower panels of the table employ the two different measures of income uncertainty discussed earlier. Neither measure of future income uncertainty enters significantly, and the signs are mixed, suggesting little evidence of a precautionary saving motivation in this sample. This contrasts with the findings of Jalan and Ravallion (1998), who find a small but statistically significant effect of income uncertainty on wealth in a panel of rural households over the period 1985-1990.²⁴ Expected future income growth, on the other hand, continues to enter with the expected negative sign for rural households. Turning to the other control variables, the pattern is quite similar to the previous regressions of saving rates on expected future income alone. The share of food consumption in total consumption enters negatively (and significantly so in the rural sample), while the dependency ratio again enters with a counterintuitive positive sign. As in the previous table, in most cases tests of overidentifying restrictions do not reject the null hypothesis that the model is correctly specified.

²³ Collins (1991) notes this as a possible reason why the effect of dependency rates on saving is ambiguous. She also notes that the standard implication that saving rates are negatively associated with dependency rates requires the assumption that the economy is growing. On the basis of these observations, she argues that dependency rates should enter both alone, and interacted with growth, in saving rate regressions. However, including this interacted variable in the regressions reported above does not significantly affect the results.

²⁴ One reason for this may be that these authors consider wealth, rather than saving as the dependent variable. As noted by Carroll and Samwick (1997), precautionary motivations are more likely to be manifested in wealth than saving rates in "buffer-stock" models of saving.

In summary, the empirical evidence suggests that expectations of future income growth affect current saving rates in a manner consistent with the predictions of standard intertemporal models of consumption, at least for rural households. In addition, the declining importance of subsistence consumption provides a promising explanation for China's rising saving rates, as the share of food consumption in total consumption (a proxy for the importance of subsistence effects) is a robust predictor of saving rates in a panel of provincial saving rates. However, these modest empirical successes are tempered by at least two factors. First, the much poorer performance of the model for urban households, and the overall modest fit of the regressions provide a warning that there is much more to be understood regarding the determinants of household saving across provinces in China. The second is the absence of significant results on future income uncertainty. This may simply reflect the drawbacks of working with aggregate data. If shocks to households are large and idiosyncratic they may matter for saving at the household level (as found by Jalan and Ravallion (1998)) but not at the aggregate level. It may also reflect the fact that the simple aggregate measures of macroeconomic volatility here do not adequately proxy for the shocks households actually experience.

4. Conclusions

In light of the data problems discussed in Section 2, and the at best suggestive nature of the econometric results in Section 3, firm conclusions are less in order than questions for further research. Although the empirical evidence on the determinants of household saving presented here reflects favourably on two complementary explanations (expectations of future income income growth and the role of subsistence consumption), these factors capture only a small fraction of the cross-provincial variation in household saving rates. Moreover, as discussed at length there are important and unresolved measurement issues that make the interpretation of trends in aggregate and household saving rates difficult. At least five sets of issues deserve further investigation as they are likely to contribute to a better understanding of this variation, as well as have important consequences for policy.

Consider first measurement issues. The large discrepancies between household survey measures of saving and growth of deposits in the banking system raise wider concerns. If this discrepancy reflects inadequacies of the household survey, this will have important implications for a range of policies (such as targetting of poverty alleviation expenditures) that rely on this survey data. If, as is more plausible, this discrepancy reflects an exaggeration of deposit growth in the banking system, this has important implications for the stability of China's financial system, which is already under pressure on the asset side from poor-performing loans to the state enterprise system.

A second set of issues relates to the role of credit constraints. The limited results above suggest that intertemporal considerations are important in rural household saving decisions. This is despite the fact that, at present, few formal consumer credit mechanisms are available in China to facilitate households' desires to shift consumption from the future to the present. In surveys of saving motivations, Chinese households consistently rank saving for anticipated purchases of consumer durables, and life-cycle events such as wedding celebrations, as important factors in their saving decisions. As financial markets develop, it is likely that these credit constraints will become less important, raising the possibility that saving will fall as a result. Although simulations of theoretical models suggest that the presence of liquidity constraints does not lead to very large buffer stocks of wealth, this factor may be more important in understanding

saving in China, where households have responded to unprecedented new affluence by making large adjustments to their stocks of durables over a relatively short period of time. Studying the transitional dynamics of theoretical models with these features, as well as more careful analysis of household level data is required to shed light on this issue.

A third set of issues relates to the ongoing process of transition to a market economy, and the greater uncertainties this has created as households are increasingly exposed to the vicissitudes of the market. In this paper, I used crude measures of aggregate income uncertainty to investigate whether this has resulted in higher saving for precautionary reasons, which provided little evidence in favour of precautionary saving motivations. More work using household level data along the lines of Jalan and Ravallion (1998) is likely to be informative in this regard. Not only does this permit construction of individual-specific measures of income uncertainty, but it would also allow investigation of more qualitative contributions to household income insecurity, such as employment status in the private or state sectors. This may in turn shed light on the consequences of further enterprise reforms for household and aggregate saving rates.

The fourth set of issues regards differences in rural and urban saving rates, and the large differences in saving rates across provinces with different income levels. It seems intuitively plausible that the higher saving rates observed in rural areas can in part be attributed to the worse coverage of pension and other social benefits in rural areas. Similarly, the data suggest that income levels in excess of subsistence consumption requirements are an important factor in understanding interprovincial saving differentials. However, a careful quantification of the magnitude of these effects is important for policy and can probably better be done using household-level rather than aggregate data. For example, exploiting regional variations in pension reform policies could shed light on the consequences of further pension reform for aggregate saving.

Finally, the analysis in this paper does not shed any light on the higher-frequency determinants of saving, since it has relied on long averages of saving rates to mitigate the effects of measurement error. Progress on this front will first require improvements in data quality. The results of such research would have implications for the

effectiveness of Keynesian demand management policies that in recent years have ranked highly among the concerns of Chinese policymakers.

Annex 1: Household Survey-based Measures of Saving in China

Annual household surveys are undertaken in China by the rural and urban household survey teams of the State Statistical Bureau (SSB). The survey collects detailed data on income and expenditure, as well as stocks of consumer durables and agricultural producer goods.²⁵ I use data published in State Statistical Bureau (1997) on provincial averages of household income and expenditure for China's thirty provinces between 1978 and 1995 to construct flow measures of household saving.²⁶

In 1995, the survey covered 35,000 urban households and 67,000 rural households, representing 0.04 percent and 0.03 percent of the urban and rural populations respectively.²⁷ The sampling frame for both surveys is based on the administrative classification of household registrations ("hukou"). All rural households are classified as "agricultural" regardless of their primary source of income, and the population of "agricultural" households in rural areas constitutes the sampling frame of the rural survey. Thus, the rural survey can be considered to be generally representative of the rural population. The frame of the urban survey is the urban population with "non-agricultural" household registrations.²⁸ Since roughly 20 percent of the urban population is classified as "agricultural", this constitutes a sizeable gap in the coverage of the urban household survey. A second gap is due to the fact that the urban survey largely excludes migrant workers, who seldom obtain "hukou" registrations. Since the long-term migrant population is estimated at about 50 million, or about one-sixth of the urban population, this too constitutes a substantial omission. However, only to the extent that saving propensities differ between omitted and included groups of the population will aggregate measures of saving rates be biased.

An additional set of concerns relate to the measurement of income and expenditure. The principal issue is that the concepts of income employed in the rural and urban surveys are different. In rural areas, the household income measure I use "net income" is measured net of production costs associated with household production. In urban areas, the household survey is geared primarily towards recording labour income, and is likely to exclude other forms of income (such as interest or self-employment income). Again, only to the extent that saving propensities out of the omitted component of income differ from those out of included income will measures of household saving rates be biased.

A final set of concerns regarding the household survey relates to the valuation of inkind income. In rural areas, the prices at which non-marketed household production is

²⁵ For a more detailed description of the rural household survey, see Chen and Ravallion (1996). World Bank (1997b), Box 1.1, provides a summary of the main deficiencies of the rural and urban surveys.

²⁶ Both surveys also collect data on household deposits and cash balances. However, summary statistics of these measures are not reported systematically in Chinese publications, so that it is not possible to consider measures of stocks of financial assets based on the household survey.

²⁷ China Statistical Yearbook (1995), Tables 9-5 and 9-15. Figures are for 1995.

²⁸ Although within this broad definition, there have been changes in the sample frame. For example, pensioners were included in the urban survey only after 1985.

valued may not adequately reflect market prices. To the extent that this results in an undervaluation of this source of income and form of consumption, household saving rates will be biased downwards. In urban areas, a range of in-kind income (such as medical, education and housing benefits) is not included in income. This too will lead to downwards biases in urban saving rates.

The specific measures of household income employed are as follows. In urban households, I use "income available for living", which consists of the total income from all sources covered by the survey, less (a) transfers to family members not residing in the household, (b) gifts, (c) payments received from boarders in the household, and (d) subsidies received for responding to the survey. The expenditure measure is "living expenditure", which nets out from total expenditures items (a), (b) and (c). In rural areas, I use "net income" as discussed above, less "living expenditures".

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Table 1: Cross-Country Determinants of Saving Regression

	<u>Coefficient</u>	<u>Standard Error</u>
Constant	-0.050	0.071
Real Interest Rate	0.012	0.102
Urbanization Ratio	-0.041	0.038
Log(Real per capita GNDI)	0.039***	0.009
Growth in Real per capita GNDI)	0.991***	0.260
M2/GNP	0.098***	0.031
Old Dependency Ratio	-0.600***	0.159
Young Dependency Ratio	-0.028	0.048
Terms of Trade	-0.035	0.029
Inflation Rate	-0.032	0.134
Domestic Credit Flow/GNDI	0.076	0.292

Dependent variable is gross national saving/gross national disposable income (GNDI).
For variable definitions, see Loayza, Schmidt-Hebbel and Serven (1998).

Table 2: Provincial Correlations Between Saving, Income and Growth

	Correlation of Household Savings Rates with:			
	Per Capita Income	Per Capita Income Growth		
		Contemporaneous	Future	Lagged
Cross-Sectional				
Urban	0.26	0.05	-0.13	0.09
Rural	0.26	0.14	-0.14	0.16
Time-Series				
Urban	0.81	0.68	0.05	-0.33
Rural	0.14	0.21	-0.20	0.08

This table reports correlations between saving rates, per capita income and growth in a panel of three six-year averages of indicated variables for thirty provinces. Cross-sectional (time-series) correlations are correlations of variables in deviations from period (province) means. Past (future) growth refers to average growth during the previous (next) six-year period.

Table 3: Saving and Expected Future Income Growth

Dependent Variable: Household Savings Rate

	Full Sample		High Income Sample	
	Urban	Rural	Urban	Rural
Future Income Growth	1.857 (1.521)	-1.042** (0.504)	0.128 (0.493)	-1.090** (0.506)
Share of Food in Total Consumption	-0.401 (0.263)	-0.374*** (0.145)	-0.094 (0.150)	-0.776*** (0.222)
Dependency Rate	0.115 (0.094)	0.046 (0.037)	0.033 (0.084)	0.040 (0.038)
R-Squared	0.004	0.137	0.203	0.199
P-value for test of over-identifying restrictions	0.141	0.105	0.015	0.477
Number of Observations	55	55	30	32

High-income sample refers to provinces with average household income greater than 500 and 1000 constant 1990 yuan in rural and urban areas, respectively. Results are based on a panel of three six-year averages of indicated variables. All regressions include period intercepts. Instruments for future income growth consist of current income, a coastal province dummy, and the share of state enterprise employment in total employment. Standard errors are in parentheses, and * (**) (***) indicate significance at the 10 (5) (1) percent levels.

Table 4: Saving and Expected Future Income Uncertainty

Dependent Variable: Household Saving Rate

	Full Sample		High Income Sample	
	Urban	Rural	Urban	Rural
Future Income Growth	1.926 (2.071)	-1.276*** (.549)	-.339 (.765)	-1.153** (.586)
Future Income Uncertainty (1)	-.075 (1.493)	-1.194 (.808)	0.713 (.644)	-.210 (.560)
Share of Food in Total Consumption	-0.408 (.299)	-.585*** (.210)	-.076 (.147)	-.810*** (.261)
Dependency Rate	.118 (.112)	.061* (.037)	0.017 (.084)	(.040) (.040)
R-Squared	0.003	0.093	0.128	0.178
P-value for test of over-identifying restrictions	0.045	0.472	0.012	0.250
Number of Observations	55	55	30	32
Future Income Growth	1.235 (.935)	.906* (.485)	2.309 (2.318)	-.101** (.512)
Future Income Uncertainty (2)	-0.899 (-0.705)	-0.619 (-0.518)	-2.109 (-1.86)	0.115 (-0.453)
Share of Food in Total Consumption	-.456* (-0.260)	-.542*** (-0.1920)	-0.433 (-0.391)	0.722** (-0.238)
Dependency Rate	0.055 (-0.063)	0.077 (-0.050)	0.241 (-0.256)	0.067 (-0.054)
R-Squared	0.005	0.178	0.001	0.236
P-value for test of over-identifying restrictions	0.463	0.533	0.248	0.326
Number of Observations	52	53	28	31

Future income (1) and (2) refer to the standard deviation of the one-year ahead forecast errors assuming that income is a random walk with drift, and an AR(1) around a deterministic trend, respectively. High-income sample refers to provinces with average household income greater than 500 and 1000 constant 1990 yuan in rural and urban areas, respectively. Results are based on a panel of three six-year averages of indicated variables. All regressions include period intercepts. Instruments for future income growth and future income uncertainty consist of current income, a coastal province dummy, and the share of state enterprise employment in total employment. Standard errors are in parentheses, and * (**) (***) indicate significance at the 10 (5) (1) percent levels.

Figure 1: Accounting for China's Saving Rate

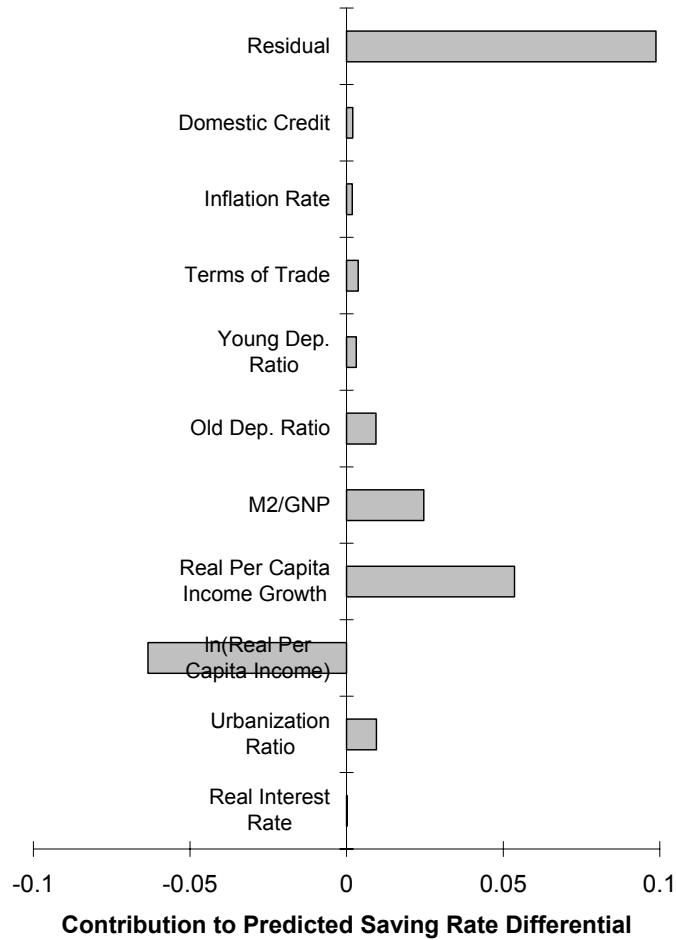
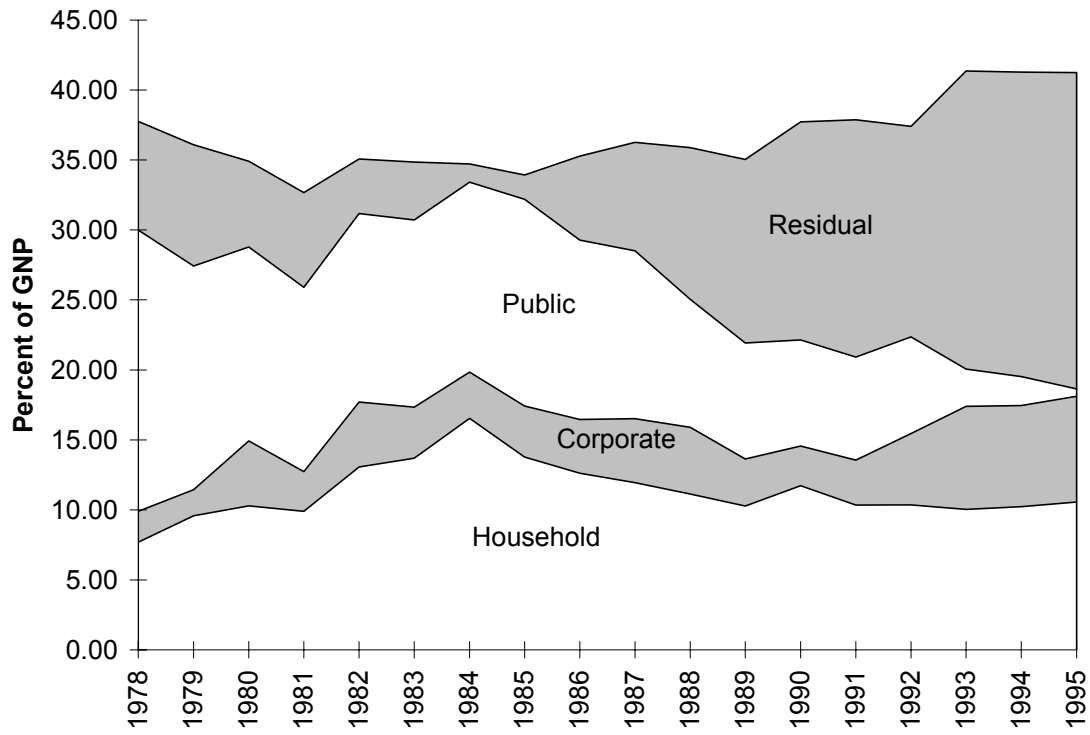


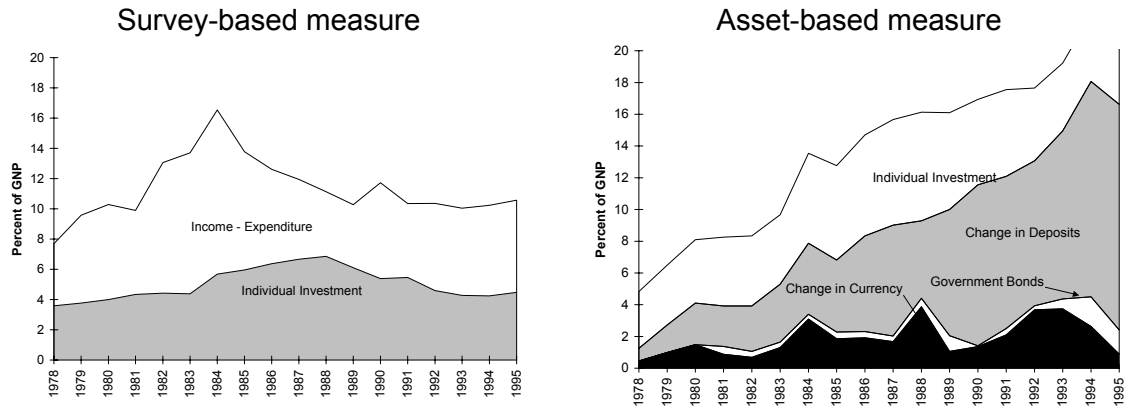
Figure plots the China's deviation from the mean for the entire sample of each of the indicated variables, multiplied by the estimated coefficient in a cross-country regression of gross national saving on these variables.

Figure 2: The Composition of National Saving



Source: Annex Table 1.

Figure 3 -- The Composition of Household Saving



Source: Annex Table 2.

Figure 4: Household Saving, Income and Growth

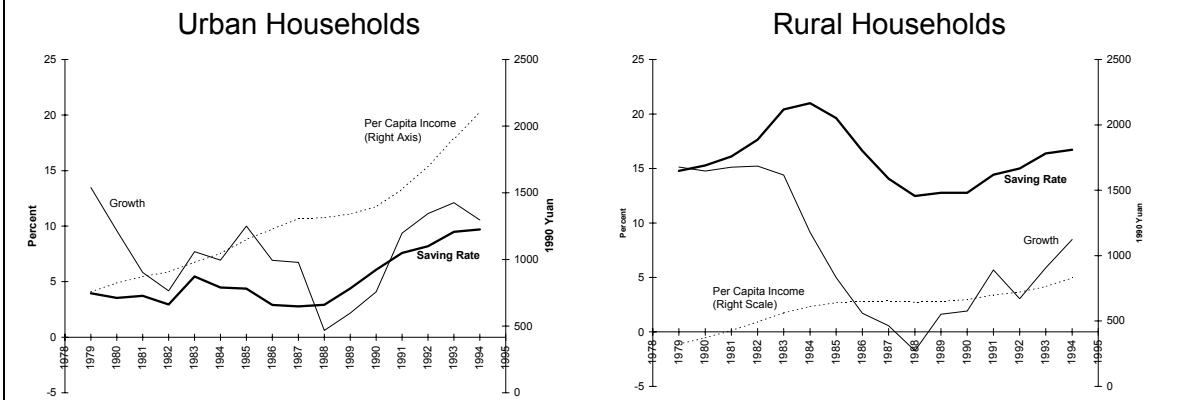


Figure plots averages over 1978-95 of household saving rates against real per capita household income (left panel) and real per capita household income growth (right panel).

Annex Table 1: Composition of National Saving, 1978-95

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
(Percent of GNP at Current Prices)																		
Gross National Savings	37.75	36.08	34.91	32.67	35.07	34.86	34.71	33.92	35.28	36.26	35.88	35.03	37.72	37.86	37.41	41.36	41.28	41.25
Changes in Stocks	8.39	8.00	6.02	6.75	5.03	4.97	4.76	8.29	7.33	4.85	5.84	10.38	9.21	7.28	4.95	5.84	3.73	5.29
GNS Net of Changes Stocks	29.36	28.09	28.89	25.92	30.04	29.89	29.95	25.63	27.95	31.41	30.04	24.65	28.52	30.58	32.46	35.52	37.55	35.95
of which:																		
Households (Survey Measure) <u>1/</u>	7.70	9.57	10.29	9.89	13.06	13.70	16.54	13.77	12.62	11.94	11.13	10.28	11.72	10.34	10.36	10.05	10.23	10.56
Households (Assets Measure) <u>2/</u>	4.83	6.49	8.10	8.25	8.34	9.67	13.55	12.77	14.70	15.67	16.13	16.10	16.94	17.55	17.65	19.23	22.30	21.10
Corporate Sector	2.19	1.87	4.63	2.84	4.65	3.65	3.31	3.64	3.84	4.58	4.77	3.37	2.85	3.22	5.10	7.35	7.24	7.56
Public Sector	20.11	15.99	13.86	13.16	13.47	13.37	13.56	14.78	12.81	12.00	9.16	8.29	7.57	7.35	6.89	2.68	2.06	0.53
Budgetary Government <u>3/</u>	14.92	9.92	7.19	6.47	5.29	5.54	6.30	6.70	5.60	4.23	2.86	2.26	2.59	1.79	1.08	1.49	0.43	0.53
Extrabudgetary Government <u>4/</u>	5.18	6.07	6.67	6.69	8.18	7.83	7.26	8.08	7.21	7.77	6.30	6.03	4.99	5.56	5.81	1.18	1.63	
Residual (Using HH Survey Measure)	7.76	8.66	6.13	6.77	3.89	4.15	1.30	1.73	6.01	7.75	10.82	13.10	15.58	16.95	15.06	21.29	21.76	22.60
Residual (Using HH Assets Measure)	10.62	11.74	8.31	8.41	8.62	8.18	4.29	2.73	3.93	4.02	5.82	7.28	10.37	9.74	7.76	12.11	9.69	12.06
(Percent of Gross National Savings)																		
Changes in Stocks	22.22	22.17	17.24	20.66	14.35	14.25	13.71	24.44	20.78	13.38	16.27	29.63	24.40	19.23	13.23	14.12	9.04	12.84
Public Sector	53.26	44.31	39.71	40.29	38.41	38.34	39.07	43.57	36.31	33.08	25.53	23.65	20.08	19.42	18.42	6.47	4.98	1.27
Corporate Sector	5.81	5.17	13.27	8.69	13.25	10.46	9.54	10.74	10.89	12.62	13.29	9.62	7.55	8.51	13.63	17.77	17.53	18.33
Households (Survey Measure)	20.39	26.53	29.46	30.29	37.25	39.30	47.65	40.60	35.77	32.93	31.02	29.33	31.07	27.31	27.69	24.29	24.78	25.61
Households (Assets Measure)	12.80	17.99	23.21	25.27	23.78	27.73	39.03	37.64	41.68	43.21	44.97	45.96	44.90	46.35	47.19	46.48	54.03	51.16
Residual (Using HH Survey Measure)	20.55	23.99	17.56	20.73	11.10	11.90	3.73	5.09	17.04	21.37	30.16	37.40	41.31	44.77	40.26	51.48	52.72	54.79
Residual (Using HH Assets Measure)	28.14	32.53	23.81	25.75	24.57	23.47	12.36	8.05	11.13	11.09	16.21	20.78	27.48	25.72	20.75	29.28	23.46	29.24
Memorandum Items:																		
GNP (Billions Current Yuan)	362.41	403.80	451.78	486.00	530.60	595.70	720.48	898.91	1020.14	1195.45	1492.23	1691.78	1859.84	2166.25	2665.19	3456.05	4653.29	5727.73
Current Account (Percent of GNP)	-0.27	-0.42	-0.28	0.14	1.90	1.21	0.45	-3.75	-2.42	0.11	-0.95	-0.99	3.08	3.16	1.25	-2.03	1.33	0.07

1/ See Appendix Table 2

2/ See Appendix Table 2

3/ Current budgetary surplus of central and local governments (World Bank (1997), Statistical Annex Tables 19 and 22)

4/ Current surplus on extrabudgetary accounts of central and local governments (CSY96, Table 7-16, revenue less non-fixed-asset investment)

Annex Table 2: Alternative Measures of Household Saving

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Household Survey Measure																	
National Per Capita: (Yuan)																	
Income <u>1/</u>	162.43	196.27	233.56	265.26	310.58	349.23	403.94	455.98	503.53	552.10	661.80	738.20	832.76	888.86	1008.98	1236.13	1672.54
Expenditure <u>1/</u>	146.93	172.23	204.80	238.23	265.46	295.32	328.92	389.61	444.20	494.30	604.28	675.55	729.68	797.60	877.66	1067.76	1439.86
Savings=Income-Expenditure	15.50	24.04	28.76	27.03	45.13	53.92	75.01	66.37	59.33	57.80	57.52	62.65	103.08	91.26	131.32	168.37	232.68
Population (Millions)	962.59	975.42	987.05	1000.72	1016.54	1030.08	1043.57	1058.51	1075.07	1093.00	1110.26	1127.04	1143.33	1158.23	1171.71	1185.17	1198.50
Total Income-Expenditure (Billions Current Yuan)	14.92	23.45	28.39	27.05	45.87	55.54	78.28	70.25	63.78	63.18	63.86	70.61	117.85	105.70	153.87	199.54	278.87
Individual Investment (Billions Current Yuan) <u>2/</u>	12.97	15.21	18.08	21.04	23.44	26.08	40.90	53.52	64.94	79.59	102.21	103.23	100.12	118.29	122.20	147.62	197.06
HH Savings (Billions Current Yuan) <u>3/</u>	27.89	38.66	46.47	48.08	69.31	81.61	119.18	123.78	128.72	142.76	166.07	173.83	217.97	223.99	276.07	347.16	475.93
Assets Measure																	
(Billions Current Yuan)																	
Currency in circulation <u>4/</u>		26.77	34.62	39.63	43.91	52.98	79.20	98.80	121.80	145.40	213.30	234.20	264.10	317.40	432.90	585.00	729.00
85% of change in currency in circulation	1.63	3.96	6.67	4.26	3.64	7.71	22.29	16.66	19.55	20.06	57.72	17.77	25.42	45.31	98.18	129.29	122.40
Household Deposits <u>5/</u>	21.06	28.10	39.95	52.37	67.54	89.25	121.47	162.26	223.76	307.33	380.15	514.69	703.42	911.03	1154.54	1520.35	2151.88
Change in Deposits	2.90	7.04	11.85	12.42	15.17	21.71	32.22	40.79	61.50	83.57	72.82	134.54	188.73	207.61	243.51	365.81	631.53
Net Subscriptions to Government Bonds <u>6/</u>	0.00	0.00	0.00	2.40	2.00	2.10	2.20	3.80	4.00	4.11	7.99	16.85	0.75	9.00	6.64	21.76	86.80
Subscriptions	0.00	0.00	0.00	2.40	2.00	2.10	2.20	3.80	4.00	4.50	8.80	18.10	9.30	19.94	29.60	31.48	106.74
Redemptions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.81	1.25	8.55	10.94	22.96	9.72	19.94
Individual Investment <u>2/</u>	12.97	15.21	18.08	21.04	23.44	26.08	40.90	53.52	64.94	79.59	102.21	103.23	100.12	118.29	122.20	147.62	197.06
HH Savings (Assets Measure) <u>7/</u>	17.51	26.21	36.61	40.12	44.25	57.59	97.61	114.77	149.99	187.33	240.74	272.38	315.01	380.20	470.52	664.48	1037.79
Memorandum Item																	
Retail Price Index	48.15	49.11	52.05	53.30	54.31	55.13	56.67	61.68	65.38	70.15	83.15	97.93	100.00	102.89	108.43	122.73	149.35

Shaded areas indicate estimates.

1/ Population-weighted average of urban and rural values. Urban measures are "income available for living" and "living expenditures" (CSY Table 9-5). Rural measures are "net income" and "living expenditures" Population weights are "non-agricultural" and "agricultural" shares of population.

2/ CSY Table 5-1.

3/ Income minus expenditure plus individual investment.

4/ World Bank (1997) Statistical Annex Table 14.

5/ CSY Table 9-3.

6/ World Bank (1997) Statistical Annex Table 12.

7/ Change in currency in circulation plus change in deposits plus net subscriptions to Government bonds plus individual investment.

