

**How Can China Solve its Old Age Security Problem? The Interaction Between Pension, SOE
and Financial Market Reform**

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Abstract

Like most countries, China faces a rapidly aging population. In fact, China is aging more rapidly than practically any other country. In 1990 only 9% of China's population was over the age of 65, but by 2030 this proportion will more than double, to 22%. More than a quarter of the world's old people will live in China by 2030. And the absolute number of workers will actually decline, as fertility rates are below replacement levels. While population aging is a long run phenomenon, it has become apparent even in the short run, as social security deficits become larger and more widespread every year. Moreover, these rapidly expanding pension obligations are especially troublesome in China because, until recently, they were a liability of state enterprises and a major obstacle to enterprise restructuring.

The Chinese government is well aware of the looming social security crisis and is determined to do something about it. Prefunding and unifying a fragmented system are at the heart of its projected reforms. The plan is to set up individual accounts for each worker, with funds that are productively invested. This is similar to reforms that have been sweeping Latin America, Eastern Europe and are now being considered in the United States. Besides making the system more fiscally sustainable and avoiding peak contribution rates, prefunding can be used to increase saving that is committed for long term investments and pension funds can be used as engines of financial market development and corporate governance.

However, in China these reforms are retarded by three key factors:

- 1) transition costs must be covered in any move toward prefunding, and the Chinese government is still trying to figure out how to accomplish this;
- 2) the current social security system is characterized by fragmentation and decentralized administration, which lead to principal-agent/ moral hazard issues that make it more difficult to cover transition costs, decrease early retirement and increase compliance;
- 3) the funds that have accumulated have not been invested in diversified portfolios by private competitive management and have not earned a high rate of return.

This paper focuses on these three problems as well as the complex interactions between pension, financial market and SOE reform.

Part I describes the historical background of old age security in China—how it was provided during the cultural revolution, how this became inappropriate as China moved toward a market economy, and the steps that were taken by the government during the 1980's and early 1990's to resolve this inconsistency. Part II describes the new multi-pillar system, including a large prefunded defined contribution component, which was adopted, in principle, in the mid-1990's. Part III analyzes three key implementation problems that remain to be solved—the transition cost conundrum, the tensions inherent in unifying a fragmented system, and the difficulty in as well as the critical importance of investing productively and earning a high rate of return on the funds. We summarize the bold steps that the government has announced during the past few months (2001) to link pension, financial market and SOE reform. How these plans will be effectuated remains to be seen.

How Can China Solve its Old Age Security Problem?

The Interaction Between Pension Reform, SOE and Financial Market Reform

Like most countries, China faces a rapidly aging population. In fact, China is aging more rapidly than practically any other country. In 1990 only 9% of China's population was over the age of 65, but by 2030 this proportion will more than double, to 22%. More than a quarter of the world's old people will live in China by 2030. And the absolute number of workers will actually decline, as fertility rates are below replacement levels. (World Bank 1994 and 1997). Additionally, the old family system is breaking down, as each child will have two parents and four grandparents to support due to the one-child policy. The Chinese government now spends only 2% of GDP on formal systems of old age support, but will spend over 10% in 30 years if it follows the same track as Western countries. This budgetary pressure will interfere with its ability to spend on other important public goods. While population aging is a long run phenomenon, it has become apparent even in the short run, as social security deficits become larger and more widespread every year. Moreover, these rapidly expanding pension obligations are especially troublesome in China because, until recently, they were a liability of state enterprises and a major obstacle to enterprise restructuring.

The Chinese government is well aware of the looming social security crisis and is determined to do something about it. Prefunding and unifying a fragmented system are at the heart of its projected reforms. The plan is to set up individual accounts for each worker, with funds that are productively invested. This is similar to reforms that have been sweeping Latin America, Eastern Europe and are now being considered in the United States. However, in China these reforms are retarded by three key factors:

- 1) transition costs must be covered in any move toward prefunding, and the Chinese government is still trying to figure out how to accomplish this;
- 2) the current social security system is characterized by fragmentation and decentralized administration, which leads to principal-agent issues that complicate the transition cost problem as well as the task of financing the on-going system; and
- 3) until now, the funds that have accumulated have not earned a high rate of return or been allocated to the most efficient uses.

This paper focuses on the transition cost problem, the political economy of unification, and the complex interactions between pension, financial market and SOE reform.

Pension reform will benefit from the financial market and SOE reforms that are currently taking place in China. These broader reforms will help the state to finance the transition and will enable the social security system to earn the high rate of return that is essential in prefunded systems. But pension reform can also play an important role in improving financial markets and fostering enterprise restructuring—the interaction is three-way. When the responsibility for the old pension debt is separated from the state enterprises, they will be able to attract new private investors and compete more effectively in the marketplace. In other countries, pension funds have become major institutional investors and

major sources of long-term capital. They have purchased shares of privatized state enterprises and played a role in corporate governance. They have stimulated the development of diversified financial institutions and instruments, demanded information disclosure, and become monitors of minority stockholder rights. All these developments are crucial to China today.

Part I of this paper describes the historical background of old age security in China—how it was provided during the cultural revolution, how this became inappropriate as China moved toward a market economy, and the steps that were taken by the government during the 1980's and 1990's to resolve this inconsistency. We describe the new multi-pillar system, including a large prefunded component, which was adopted, in principle, in the mid-1990's. Many other countries have also adopted this model during the past two decades, but this history explains the unique problems faced by China in trying to implement it. Part II analyzes a key implementation problem that remain to be solved—the transition costs conundrum. Until China finds a way to fund the accounts, the problems of a pay-as-you-go system will remain. Part III examines the tensions inherent in unifying a fragmented systems, and the difficulty in as well as the critical importance of investing productively and earning a high rate of return on the funds. We summarize the bold steps that the government has announced during the past few months (2001) to deal with the complex interactions between pension, financial market and SOE reform. How these plans will be effectuated remains to be seen.

I. Historical background

Current and recent historical data

Tables 1 provides data on the current and recent historical development of the Chinese pension system. We see there that social security is an urban phenomenon in China. In 2000 over 100 million workers were covered, financing the pensions of 32 million recipients—roughly one pensioner for every three covered workers. Covered workers comprised less than 10% of the total population but 50% of urban employees, mostly state enterprise (SOE) and government employees. Pensioners comprised almost one quarter of the population over age 60, again those living in urban areas, where they previously had state sector jobs. Covered workers increased considerably during the 1990's but pensioners increased far faster, as a result of population aging combined with a relative shift of employment to the private sector, which is largely not covered. Thus, the dependency ratio (pensioners/covered workers) increased by 50% over this period. It is now as large as in many industrialized countries—and producing even greater financial problems, as will be demonstrated below.

Table 2 shows that a pension spending as a percent of GDP has trebled over the past decade. This is partly due to the rising number of pensioners just described, and partly to the generous and rising pension levels relative to wages. The average pension now equals GDP per capita or $\frac{1}{3}$ of the average SOE wage—much higher than in most industrialized countries. The average pension has increased faster than the average wage, upon which revenues depend. Thus, spending has risen faster than revenues and a surplus at the beginning of the 1990's has turned into a deficit by the end—a

problem for the Ministry of Finance.

According to the basic arithmetic of a pay-as-you-go (PAYG) system, the contribution rate required for system solvency (CR) equals the average benefit (B) divided by the support ratio, that is, the number of workers who are covering each pensioner (#W/#P):

$$\text{CR/average wage} = (\text{B/average wage}) * (\#P/\#W)$$

where #P/#W = the dependency ratio = 1/support ratio

If the dependency ratio is high, i.e. there are many pensioners for each worker, a high contribution rate is required to pay the current bill. Thus, the 60% increase in contribution rate as a percentage of wages has not been enough to stave off the emerging deficit. The current high contribution rate means low take-home pay if borne by workers and high labor costs, hence less employment, if borne by employers. Moreover, this financial imbalance has occurred unevenly across China, a potential source of social unrest. And these trends are predicted to continue, unless policies change. The following pages trace how China got to this point and the next two sections analyze how the government has been struggling to alter this trajectory. (For additional data on China and comparisons with other countries see World Bank 1997 and Whiteford 2001).

Old age security during the cultural revolution

During the cultural revolution, the provision of old age security (and other forms of social service) became a responsibility of each state enterprise, financed out of current revenues. Workers in the formal sector stayed at the same enterprise throughout their working lives. The enterprise provided housing, medical care and old age security to its workers. The same services were provided to its pensioners, of whom there were very few since China still had a young population. Cash pensions equaled wages and both were extremely low since the country was poor and the biggest expenses were covered in kind. Agricultural workers—the vast majority of the population—did not have any formal old age security program, as is the case in virtually all developing countries

Problems with enterprise responsibility during the shift to a market economy

During the move toward a market economy that has occurred over the past two decades, this situation, based on unfunded employer-sponsored pensions, became unsustainable. In any competitive economy there is a basic instability when current workers or consumers are expected to finance a debt from the past; but the shock was particularly great given the sudden transition in China.

1. Many of the old industries lacked the resources to finance the expected pensions, as the structure of demand shifted due to market forces. New industries developed, often for export markets or stimulated by foreign capital, while old industries declined and were left with many pensioners but little capacity to pay.
2. Even within a given industry, older enterprises burdened with large social security obligations could not compete with new enterprises that started out with young workers and no pensioners. This added to their costs and decline.
3. An enterprise-based pension system, especially one that is unfunded, deters worker mobility, which is necessary in a market system.

4. Wages have risen rapidly over the past two decades, and pensions have risen even faster. Many goods and services, previously provided in kind, have become monetized and have risen in cost, adding to the burden posed by pensioners.
5. It became important for state enterprises to lay off redundant workers, but this was difficult given their responsibility for the housing, medical care and pensions of the workers. Early retirement was often used as an alternative to firing. But since pensions remained an enterprise responsibility this did not save much money; it simply increased social security costs that someone had to pay.
6. The burden of past liabilities also made it difficult to restructure state enterprises, which was necessary to increase capital and efficiency. Investors were reluctant to take over the large pension liabilities of older enterprises; and the price they were willing to pay was severely depressed by this cost.

Municipal pooling—how it worked and didn't work

Between 1980 and 1995 China went through a series of experiments and preliminary reforms. Experimentation with municipal pooling began tentatively in 1982. In 1986 State Council Document 77 officially encouraged the pooling of pension obligations at the municipal level, on a pay-as-you-go basis.

In principal, pooling would alleviate some of the above problems, as it would shift responsibility away from the enterprise to a much broader unit. Each enterprise would contribute according to its wage bill and all pension costs would be covered out of the broader municipal pool of funds. Flourishing young enterprises would help to subsidize failing older enterprises, all retirees would be paid and all enterprises within a given municipality would face a level playing field with similar social security costs. Worker mobility within a municipality would be facilitated and investors would not have to take on past pension obligations, as these would rest with the municipality.

In practice, however, problems immediately developed. Basically, the same issues emerged at the municipal level that previously existed at the enterprise level and added to these were moral hazard and principal-agent problems. Given the high and rising dependency rates, some municipalities lacked the resources needed to pay the pension bill; large deficits and arrears developed. This was particularly the case for municipalities in which declining industries were heavily concentrated. Such municipalities had to require high contribution rates, which put it at a disadvantage relative to new growth regions with young workers and few pensioners and led to non-compliance.

Jiamusi and other municipalities in Heilongjiang province were good examples. Previously the center of heavy industry, they now found themselves with many retirees and few worker, a dependency ratio greater than 1/3. In a PAYG system, if the average benefit is 80% of the average wage and the retiree/worker ratio is 1/3, a contribution rate of 27% is required. If only 85% of expected contributions are collected, a contribution rate of over 30% is required. If it isn't collected, the system will be in deficit and some pensions may go unpaid. This was a good description of most of Heilongjian in the early 1990's (and it is worse right now).

In contrast, many of the newer private enterprises in the growth regions were not even covered by a formal social security system, were not burdened by a pension debt, and had a young labor force. While these workers may have cause to worry about their income when they grow old, investors did not have to worry about a 25-30% payroll tax that could well grow higher. In the mid-1990's the national dependency rate was 25% (see Table 1), but a survey of 13 provinces and 12 municipalities revealed rates that varied from 3% in Shenzhen to 40% in Shanghai. Contribution rates ranged from 30% in Chonqing to 19% in Guangdong to 10-15% for special industries like aviation and electric power that had their own pension pools (World Bank 1997). So the competitive playing field was not leveled across municipalities and enterprises.¹

As a secondary problem, municipalities did not have the skills and capacity to administer the social security system so enterprises continued to keep most of the records, determine size of pension and eligibility for normal and early retirement, and deliver the pensions if they had the resources. Supposedly the net difference between pensions paid and contributions owed would be sent to the municipal office. This separation of administrative control from financing obligations led inexorably to principal-agent, moral hazard and compliance problems. Enterprises had little reason to deny eligibility to generous early retirement pensions, if someone else was ultimately responsible for paying them. Enterprises with relatively small pension obligations within their region were understandably reluctant to contribute large amounts toward the common pool, and the municipalities often lacked the capacity to compel them to do so. This in turn meant that enterprises with large pension obligations were pressured by their retirees to pay more—but sometimes lacked the capacity to pay even the average amount and fell into arrears. In 1997 payroll tax collection rates were only 80% of amounts due (Sun and Maxwell 2001). Moreover, wages were under-reported; by some estimates to the extent of 50% (Sun and Maxwell 2001). As a result, municipal pooling existed on paper but it was very limited in practice, compliance fell dramatically, and costs grew much faster than revenues—in part due to exogenous population aging and in part due to the endogenous moral hazard problems just described (World Bank 1997).

Gradually, over the past decade, the Chinese government has become increasingly aware that municipal action alone will not suffice and will not even work. The old pension system was conflicting with broader economic objectives such as enterprise restructuring, attracting foreign capital and using domestic capital and labor efficiently. The declining share of SOE's in the economy accelerated the rise in dependency rates for the social security system, which mainly served SOE's, while workers in newer forms of enterprises were largely unprotected. By 1998 SOE's were responsible for 77% of the system's retirees but only 32% of its formal sector workers (Sun and Maxwell 2001). If the dependency rate varies across localities due to differing concentrations of SOE's, then the contribution rate they need to finance a given benefit rate also varies. A fragmented system adds to inequalities across regions, accelerates the decline in depressed areas, and inhibits labor mobility. The possibility of social unrest among pensioners where enterprises and municipalities were unable to pay the bill was a further problem.

Additionally, the government foresaw that forthcoming population aging would only make matters worse. By the mid-1990's payroll taxes already exceeded 25% in many areas, to cover current

costs. With rapid population aging, payroll taxes would have to rise much further. A high payroll tax could interfere with international competitiveness and lead to unemployment if borne by employers, lower take-home pay if borne by workers—either of which would be problematic. It could increase evasion and informality of the labor market, as it has in other countries, and this would not be in the best interest of the system or the economy. Structural unification, prefunding and a shift to defined contribution (DC) plans were seen as the keys to the long run solution. Unification levels benefits and costs across localities, prefunding levels contribution rates across time and expands the capital base for supporting a high proportion of old people, and DC plans link benefits more closely to contributions that were actually paid.

The gradual move toward unification, pre-funding and DC

Therefore in 1995, with State Council Document 6, China adopted a multi-pillar system. In principle this was much like multi-pillar systems that have recently been adopted in other countries around the world. Multi-pillar systems basically include two mandatory parts instead of one: a publicly managed defined benefit that is tax or pay-as-you-go financed, to provide a social safety net, and a defined contribution funded part with the funds privately managed. The shift to defined contribution emphasizes individual responsibility and personal savings. The shift away from traditional PAYG is designed to avoid high payroll taxes as populations age, thereby making the systems more sustainable, and to increase national savings that are committed for the long term. Private management of the funds has been adopted in many countries to avoid political manipulation, increase the rate of return to the funds, enable a higher productivity of capital and help develop financial markets. So far 20 countries in Latin America, Europe and the Asia-Pacific region, have adopted multi-pillar systems and it is under consideration in many more (including the US). China will be the largest such country when this system has been implemented.

In 1995 a consensus had not yet been reached on exactly what form China's multi-pillar system should take. So State Council Document 6 gave municipalities two choices—one emphasizing the funded defined contribution pillar and the other allowing a greater role for the public defined benefit pillar. However, this led to further differentiation, multiple plans and confusion. So in 1997 with State Council Document 26 and in 2000 with Document 42, the government defined more narrowly what the outlines of the system should be. The new system would consist of two components: a basic (flat) benefit that equaled 20% of the average wage in the region for 15 years of work; and a contribution of 11% toward individual retirement accounts. (As discussed below, a reduction of the latter to 8% now seems to be under consideration). Pensioners would continue getting their old benefits and new workers would enter directly into the new system. Current workers, or “middlemen” would get a mixture of the new and old systems: the new system would apply from 1996 on but the old system, with an accrual rate of 1-1.4% per year of covered service, would apply for work prior to 1996. In 1998 a new ministry, the Ministry of Labor and Social Security (MOLSS) was established to oversee this new system.

The basic benefit is a lot like the flat public benefit in the UK, Denmark and, until recently, Argentina—uniform for all regardless of earnings. The object is to ensure a minimum living standard

above the poverty line for all old people. In the long run it would be financed on a pay-as-you go basis by a 13% contribution from the enterprise that goes into a municipal or provincial pooled fund. In the short run much more would be needed to cover the higher costs of middlemen pensions. While the poverty prevention objective of the basic benefit is laudable, workers and enterprises may have an incentive to evade after the 15-year eligibility point has been reached. This may not be a big problem in industrial countries with effective enforcement techniques, but in countries like China that lack such capacities, it is problematic to offer entitlements that contain incentives for evasion and informalization. If everyone contributed for only 15 years, retirees would collect benefits for more years than they contributed, the dependency ratio would exceed one, and a 13% contribution rate could not sustain a 20% benefit.

The individual accounts are supposed to be prefunded. That is, money is supposed to accumulate in them and to be productively invested, with assets that are sufficient to cover the pension liabilities when workers retire. The replacement rate that will be yielded by the accounts depends heavily on the rate of return. However, China is far from implementing this system at present. Currently, middlemen whose benefits were determined by the old defined benefit formula dominate, and their entitlements exceed current revenues in many areas. Three key problems have emerged—growing deficits and inability to cover transition costs and fund the accounts, moral hazard under decentralized administration, and inefficient investment of the funds.

II. Implementation Issues—Transition Costs

Most of the 20 countries that have shifted to multi-pillar systems have done so by diverting some of their contributions to individual accounts, and all of them have solved the transition cost problem—albeit with difficulty. Since previously these countries spent their entire contribution revenue on current pension expenditures, when part of that contribution is instead put into an individual account and “saved”, this creates a financing gap that has to be filled. This is never a simple matter.

The nature of the transition problem in China

Ironically, it should be easier for China to solve the transition problem than for most of the other countries. Transition costs are low in countries where the implicit pension debt (IPD) is small, and China has a relatively small implicit pension debt. The IPD is the present discounted value of all promised benefits to current pensioners and to workers, based on their accrued credits to date. While estimates of the IPD are highly sensitive to assumptions about appropriate discount rate and rate of future wage growth, it appears that the IPD in China the IPD is only about 70-80% of GDP, compared with 100-200% of GDP elsewhere.² The Chinese IPD is small primarily because only one quarter of its labor force (the urban state sector) is covered by social security. China’s high rate of economic growth should also facilitate the transition, as should its ample supply of state assets. However, financing the transition, as well as the on-going system, is complicated by the historical fragmentation of the Chinese system.

In China some coastal areas (with few pensioners and many young workers) can cover their current obligations with a low contribution rate and are accumulating a surplus, but most areas, especially the northeast or inland areas (with declining industries, old non-functioning state enterprises, many pensioners and few young workers) are struggling to cover their bills. While China's IPD for the country as a whole may be only 70%, the IPD relatively to local GDP is probably much more than 100% in areas that once flourished but are now in decline. Their contribution rates are already 30% of payroll, fully spent and many enterprises are in arrears. Stories abound of social unrest and demonstrations, as benefits go unpaid (Pritchard 2001; [Dow Jones Newswires](#), June 25, 2001).

Growing enterprise arrears and municipal deficits have been shifted upward to yet another level of government, the Ministry of Finance (MOF), which had hoped to sidestep this responsibility but was unable to do so. In 1997 MOF transferred money to help cover deficits in 5 municipalities. By 1999 it transferred more than 18 billion yuan (US\$2 billion) to help 21 municipalities make pension payments, and by 2000 this amount had almost doubled to 34 billion yuan (US\$4 billion) in 25 municipalities, or 17% of total pension spending (Wang et al, Pritchard 2001, [Dow Jones Newswires](#), June 25, 2001, Whiteford 2001). These deficits are projected to grow by leaps and bounds over the next few years, as the number of pensioners expands—a projection that undoubtedly has created a sense of urgency within the Ministry of Finance to find a long-term solution.

Most municipalities have not yet found a way to put the 8-11% worker contribution into the individual accounts, since they need the full payroll tax (and more) simply to cover current expenses. Thus, the accounts remain notional, “empty,” with no assets in them—merely a bookkeeping device that solves none of the problems (steeply rising payroll taxes, intergenerational transfers, greater need for long term capital to increase labor productivity) associated with population aging in PAYG systems.³ In 1995 many policy-makers in China did not fully understand the difference between notional and funded accounts, but most understand that difference now, which is the basic reason they are now moving constructively toward identifying ways to finance the transition. It seems unlikely that the transition can be financed without greater unification of finances, but this in turn leads to moral hazard problems if administration remains decentralized. China is now grappling with this tension.

Even if the 8-11% contribution were put into the accounts, they still would not be fully funded from an actuarial point of view. This anomaly stems from the way in which the accounts are converted into a pension at the end. In a true market annuity that is actuarially fair, the conversion of accumulation to pension is not pre-determined years in advance and independent of worker behavior. Instead, it reflects the interest rate that will be earned on the funds and the worker's expected future life span at retirement, which in turn depends on retirement age. Insurance companies set monthly annuity payouts to ensure that the promised benefit will, on average, be covered by the accumulation in the account. In contrast, the current policy in China assumes a life expectancy of about 10 years, and arbitrarily divides the accumulation by 120 to get the monthly pension. While this dictum stemmed in part from earlier data that yielded low life expectancies, it had the political effect of protecting workers from uncertainty and assuring them that the accounts would yield a high replacement rate. However, since the average covered

worker currently lives much more than 10 years after retirement it also ensures that, even if the full 8-11% contribution were put into the accounts, they would still run out of money long before the worker died. The conversion factor in effect turns the defined contribution accounts into an overly-generous defined benefit plan that is only partially funded, at best. The government will probably have to pay the difference. Moreover, this problem will grow worse for exogenous reasons as life expectancy expands and for endogenous reasons as it encourages early retirement without penalty. Political manipulation of the annuity formula is an inherent danger in notional defined contribution accounts. China will have to fix this formula and make the conversion actuarially fair in order to enable the transition to funded accounts to take place.

How other countries have financed the transition

It is difficult to ascertain exactly how other countries have financed the transition because of the fungibility of money and the ambiguity of the counterfactual. Most reforming countries in Latin America and Eastern Europe have utilized “parametric” changes that downsized bloated benefit obligations, to reduce the IPD and the financing gap. Beyond that, the following revenue sources appear to be common:

- Keeping part of the system PAYG, so contributions continue flowing into the PAYG pillar—as in Poland, Hungary, Uruguay and Sweden;
- Raising revenues from contributions by increasing the payroll tax or the compliance rate—an add-on was used in OECD countries and most other countries are trying to decrease evasion;
- Using other special revenue sources such as a lottery or a value added tax (Argentina);
- Using general revenues or social security surpluses that are available at the municipal, provincial or state level (Chile);
- Applying proceeds from the sale of SOE assets to cover pension liabilities (asset-debt swaps)—SOE and pension reform were linked in Peru, Bolivia and Poland;
- Borrowing in the short run and repaying with the surplus that the system would run in the longer run, as the individual accounts take on a greater portion of the total pension responsibility (most countries have used this method to smooth the burden of transition costs over many cohorts).

Most of these methods would be appropriate for China. China is now using proceeds from a national lottery, a tax on interest income and, as already discussed, direct allocations from the MOF. We concentrate here on a source that has just been tapped—proceeds from the sale of state assets—and another source that is essential but has yet to be seriously addressed—benefit reduction. These two sources, between them, could cover much of the transition costs.

Downsizing benefits

The “right” pension benefit level for a country depends, of course, on its willingness and ability to pay. While different countries have come to different conclusions on that trade-off, it seems clear that China’s benefits are too generous, given the high payroll tax and large deficits that it currently incurs, as well as the worse prognosis for the future if prefunding does not occur. Prefunding, in turn, depends in part on benefit cuts that would allow a surplus to accumulate. Benefit reductions could take the form

of cuts in replacement rates, changes in indexation method and increases in retirement age.

Replacement rate. The promised benefit rate to current pensioners and middlemen in China is about 70% of final year's wage, compared with 40% in the US and 50% in many other countries (World Bank 1997; Dorfman and Sin 2001).⁴ Since benefits are indexed partly to prices and partly to nominal wages, their real value continues to rise after retirement. In fact, we have seen that pensions have been rising faster than average SOE wages or per capita income in recent years (see Table 1). Some retirees receive more in pensions than they ever got in wages. While part of this can be justified as a social desire to share with the old the fruits of economic progress, the cost imposed on workers is high. The rapid growth of personal financial assets held by the average household, which now total almost 8 times the average annual wage, means that new pensioners should be able to provide part of their retirement income from their accumulated savings (Sun and Maxwell 2001, from China Statistical Yearbook 2000).

Indexation method. Moreover, these benefits and costs occur at an uneven pace across localities and sectors. The initial pension a retiree receives varies by region, and adjustments after retirement also vary. Specifically, regions are supposed to index pensions according to 40-60% of regional nominal wage growth. This means that indexation is somewhat different in different areas and bears an idiosyncratic relationship to inflation. In years when inflation is high, as was the case in the early 1990's, benefits do not even keep up with prices. But in years when inflation is low, as has been the case recently, benefits rise faster than prices. For example, suppose that nominal wage growth is 10%, made up of 2.5% price inflation and 7.5% real wage growth. In a region that indexes to 50% nominal wage growth, pensions would rise 5%, which is double the rate of inflation. This may be a fair representation of recent events. On the other hand, if inflation were 7.5% and real wage growth 2.5%, pensions would not have kept up with prices; this may be the case in the future. The first of these outcomes is expensive for the system while the second is difficult for pensioners to handle. In addition, ad hoc benefit increases are sometimes given without calculating costs, as happened in 1999 during the 50th anniversary of the nation. Indexing pensions to prices only, in a more systematic way, would probably be safer for pensioners and cheaper for the system.

Retirement age. Costs are also high because of low retirement ages. The legal retirement age in China is 60 for men, 55 for managerial and 50 for non-managerial women, with no actuarial penalty for early retirement. But 5 years' early retirement is possible in companies that are hazardous, bankrupt or restructuring. Thus, in reality, an average man retires at age 56 (after 32 years of work) and an average woman retires at age 50 after 26 years of work. Expected life span after retirement is 20-30 years. Much of the recent surge in deficits has been attributed to a flood of early retirements (Dow Jones Newswires, June 25, 2001). The ratio of working to retirement years is 1.5 for men and 1 for women and this will fall further as longevity increases (Dorfman and Sin 2001). If people work for only half of their adult lives, this places a large financial burden on the old age system and a large real burden on the economy, which will be felt increasingly as the labor force shrinks.

Conversion rate of accounts to annuities. The shift to funded defined contribution accounts was

supposed to relieve the pressures on the government stemming from high benefits and to create incentives for continued work. If the accumulation were converted into an annuity on an actuarially fair basis this would encourage workers to work longer—because their pensions would grow as the numerator (the accumulation) rises and the denominator (based on expected future life span) falls. However, as we have seen, the current policy in China assumes a life expectancy of about 10 years, and arbitrarily divides the accumulation by 120 to get the monthly pension. Holding the denominator constant rather than having it change with retirement age and longevity means that workers have little incentive to continue working, early retirement will not be discouraged, and this problem will grow worse as life expectancy expands. Possibly the best way to solve this problem and make the formula actuarially fair and responsive to retirement age (rather than to political pressures) is to fund the accounts and contract out the annuity stage to private insurance companies.

How much will benefit downsizing finance transition costs? The experience of most other countries shows that changes in the benefit formula must be very gradual and protect current pensioners rights—or they will organize in opposition to the reforms. For this reason, the IPD does not change very much when parametric reforms are introduced, but the financing gap and the required contribution rate change considerably. It has been estimated that without any parametric changes, China will require a long run contribution rate that exceeds 40%, but if China raises the retirement age to 65 both for men and women, switches to price indexation of pensions, changes the annuitization method to become actuarially fair and funds the individual accounts, the required long run contribution rate would be cut in half (Dorfman and Sin 2001; for earlier estimates of the savings from parametric reforms see Friedman et al 1996; World Bank 1997; Wang et al 2000). Of course, the replacement rate would also fall as a result of these reforms, and money would have to be found in the interim to fund the accounts during the transitional period when payouts were still high. Although calculations by Dorfman and Sin (2001) show that these transition costs would be quite modest if the above parametric reforms were carried out, it is politically very difficult to take these steps—in China as elsewhere. The process of downsizing benefits is barely beginning and the savings will accrue very slowly over time.

Using proceeds of SOE assets

China has many state enterprises that would benefit from being restructured and an explicit policy that favors doing so. It is logical to link SOE assets and pension liabilities, since they both originate from the same set of organizations: in effect, the assets of the past economic system would be used to offset its debt.

However, it is not always clear who owns the assets—is it the enterprise, the municipality in which it is located, or the central government? After much internal debate, the government has recently taken steps to resolve this question. It has decreed that companies raising money from IPO's or additional share placements would have to sell off state-owned shares equivalent to 10% of the proceeds and turn this revenue over to a newly created central entity, the National Social Security Fund. The NSSF, in turn, will transfer the funds to areas where they are most needed to pay pensions, unemployment insurance and other social security liabilities. In the past, state-owned shares, that constitute two-thirds

of all shares in listed companies, could not be sold, limiting market liquidity. The new rule applies to Chinese companies listing both overseas and on domestic markets and takes effect immediately. Several companies have already announced plans for such sales.

The state, in effect, is claiming ownership and transferability rights to the assets, and then assigning the market-determined value of these assets to finance pension reform. The proceeds from these asset sales are being allocated, not necessarily to the municipalities they originated from, but to the municipalities with the highest pension debts and least fiscal capacities of their own. And private ownership is being bolstered simultaneously. It is hoped that the dilution of state control will improve corporate management, strengthen the stock market and lead to additional inflows of foreign investment. Thus pension reform and SOE reform are explicitly tied together.

It is difficult to estimate the value of government assets that could be sold in this way, because no market value now exists, the absorptive capacity of equity investors is unclear, and net worth is probably negative for many state enterprises. Tying asset sales to IPO's ensures that only companies with growth prospects and effective demand for their securities will be involved. Some observers fear that the sudden large supply of state-owned assets for sale could depress the stock markets and therefore the price of these assets (Dow Jones Newswires, July 27, 2001). With these caveats firmly in mind, some estimates have placed this value at over \$1 trillion. (Asian Wall Street Journal, June 15, 2001; also see Pritchard 2001, China News, June 27, 2001; Dow Jones Newswires, June 27, 2001; China Daily-Business Weekly, June 26, 2001). This could go far toward covering the interim financing gap while a transition is made to a system of funded accounts that are run on a self-sustaining actuarially sound basis.

III. Other implementation issues

Fragmentation and moral hazard

The move toward partial unification of finances. The simple math of PAYG systems makes it clear that, without some degree of centralized responsibility for the implicit pension debt and the transition costs that it generates, widespread prefunding cannot be achieved, nor can a uniform basic benefit be paid without placing strains on the economy. Therefore, the government has been moving slowly but inexorably toward more centralized responsibility. While the State Council Documents of the mid 1990's originally called for provincial level pooling, in current practice most deficit finance is coming from the center. Central responsibility for covering local deficits in current obligations would equalize contribution rates across municipalities and would enable the accounts to be funded. But it faces two major political economy obstacles: First, the center must get the money and to do so it inevitably must transfer from high growth areas to slow growth areas. The losers are likely to resist. Second, administration remains a local responsibility and is likely to do so even if finances become more unified.

Continued decentralization of administration: moral hazard. Municipalities have gained some administrative experience since the 1980's, which the center still lacks in the social security arena. But moral hazard problems obviously arise if municipalities administer the system—setting benefit levels,

certifying eligibility for retirement and collecting revenues—while the central government bails out localities that are in financial arrears. Municipalities have little incentive to compel payments from enterprises in financial trouble, deny early retirement privileges or economize on indexation formulae, if the center will cover their deficits and take away their surpluses. This could lead to a downward spiral in which revenues decline while expenditures swirl upward, out of control. The recent swelling of early retirement rolls has been attributed in part to companies and municipalities that encouraged workers to retire early to reduce their labor costs (Dow Jones Newswires, June 25, 2001). The low and decreasing compliance is due in part to the fact that many enterprises and localities are in arrears because of financial difficulties, to a legal system that does not penalize non-payments, and to the pre-existing lack of capacity in most municipalities. But it is also due to strong incentives that enterprises have to evade high tax rates and low incentives that municipalities have to compel payments.⁵ The moral hazard (principal-agent) problem that exists today existed in a slightly different form much earlier, when enterprise managers had no incentive to generate a profit or to cooperate with municipalities in controlling costs. Thus, it is not surprising that benefits are too high, retirement too early, and compliance very weak.

The National Social Security Fund. Two steps have recently been taken to solve the fragmentation problem: First, as mentioned above, in September 2000 the National Social Security Fund (NSSF) was created, to receive revenues from the government, SOE sales and other sources, to cover municipal shortfalls (Dow Jones Newswires, July 5, 2001). On the one hand, this may be a constructive step toward unifying the finances of the system, enabling poorer regions to cover their obligations from the past and move toward prefunding for the future. On the other hand, if the NSSF is allowed to invest in the broad marketplace, which appears to be the plan, it could become the largest institutional investor in China. This immediately raises a whole series of new (as yet unresolved) issues regarding its investment policies and the role it will play in corporate governance. Will the NSSF act as a quasi-independent entity or as an arm of government? Will it be a pass-through mechanism for accepting the proceeds of state assets and quickly transferring them to areas where they are needed, or will it become a long term holder of investments throughout the country—another form of state ownership? Since government will select its officials, it is unlikely to be independent of government's fiscal needs. What criteria will the NSSF use for allocating funds to provinces and municipalities? How transparent and objective will these criteria be? How will they prevent strategic gaming from municipalities who try to overstate their needs and understate their own local resources? Other potential issues and dangers are discussed below.

The Liaoning experiment. Second, an experiment was undertaken in Liaoning, one of the most heavily burdened provinces, to see what kinds of resources were needed and could be generated to finance deficits and fund the accounts and how moral hazard problems could be contained. Liaoning has 7.5 million workers and 2.8 million retirees in its urban system—fewer than 3 workers for every pensioner. Since many enterprises are in arrears, the effective support ratio is lower, closer to 2.5 workers for every pensioner. These numbers are likely to get worse rather than better, as most of these are SOE workers and SOE's are in the process of laying off workers, not hiring. Part of the object of the

Liaoning experiment is to cover pension, medical and unemployment insurance in such a way that enables the state enterprises to restructure—by clearly shifting responsibility for administering social insurance to the municipality rather than the enterprise. The average contribution rate in the province is 30%, of which 8% is paid by workers, the rest by employers. While unification has been achieved within each municipality, large differences exist across municipalities. Thus, the total contribution rate varies from 27% to 37% of wages, depending on locality. Actual collections are only 73% of total expenditures—even before any funds are put into the accounts. Thus, Liaoning has been one of the major recipients of MOF transfers, to cover its deficits.

In the experiment, it is planned that benefits will be downsized by changing the indexation method and the accrual rate for prior service for middlemen—but the details of these sensitive changes have not yet been spelled out. At the same time, the basic benefit will be increased up to 30% for workers whose contributions exceed 15 years—an attempt to contain evasion. Specifically, workers will receive a flat benefit of 20% for their first 15 years of work, and an additional accrual rate of .6% per year for years 16-32, until 30% is reached.

Importantly, municipalities are supposed to separate the individual accounts from the rest of the system and fully fund them with 8 percentage points of the contribution, coming from workers—with possible private management of the funds. The remaining contribution—21-22% on average—is applied toward middlemen and basic benefits. It is planned that the resulting deficit will be made up by improved compliance efforts, reduced benefits for middlemen, municipal and provincial reallocations and, primarily, transfers from the central government and the NSSF.

After studying the results of this experiment, the government will then be in a better position to estimate how much it will cost to scale up these efforts to the entire country. One caveat is that solutions to the financing and attendant moral hazard problems that work in one carefully observed pilot program may not work as well when they are extended to a diverse, sprawling country with many conflicting interests, centers of power and incentives to conceal information.

Investment policy—diversification, competitive management and rate of return

How surpluses are invested—local or state control? Some municipalities, of course, are running surpluses. For example, the municipality of Jiamusi runs a large deficit while Qingdao runs a surplus. In Liaoning province, which runs a huge deficit over-all, Dalian is accumulating a reserve. When municipal pooling began in the 1980's, municipalities with surpluses tried to control their own investments. The funds were all invested locally, ignoring the possibility of higher returns elsewhere. Rumors of mismanagement and corruption were common (World Bank 1997).

More recently, the government has insisted that all such reserves should be invested in central government bonds. On the one hand, this improves safety and capital mobility within the country, which is efficient. On the other hand, the rate of return has been low, even negative at times (in real terms). Neither local nor central control of the funds avoids the political manipulation, misallocated capital and low returns commonly found in publicly managed pension funds (Iglesias and Palacios 2000). Investing pension funds primarily in government bonds may lead to excess government deficit

finance, to cover growing pension reserves. It means that the ultimate responsibility for paying pensions remains a government liability, which would have to be covered out of future taxes or borrowing, just as in a PAYG system. In this sense, the government has not accomplished one of the main objectives of funding—to reduce its future pension obligations. Moreover, since most government bonds are still short term, this policy rules out the matching of long term pension liabilities with long term assets—which yields better security as well as the possibility of higher returns. It does not allow resources to flow to the private sector, where its productivity may be greater, so the yield does not reflect the high marginal productivity in China today. It builds in a large amount of country-specific and political risk, which could be avoided by a more diversified portfolio, including international diversification. It does not encourage growth of private financial intermediaries and institutional investors, who have played a vital role in financial market development and corporate governance in other countries. Additionally, central government investment of funds poses another principal-agent problem in China—municipalities try to avoid revealing true information about their finances in order to maintain control—which in turn interferes with system administration. For all these reasons, reforming governments in other countries have increasingly been moving toward decentralized competitive control of pension funds in diversified portfolios.

The importance of a high rate of return. In general, it is essential for pension funds to earn a rate of return that exceeds the rate of wage growth. Otherwise the capital stock will grow slower than wages and workers will get a low replacement rate at the end. In China the rate of wage growth has been very high—5-10% real—over the last two decades, so this indeed presents a formidable challenge. At the same time, a high rate of return should be readily achievable, given the high marginal productivity of capital in China. This would substantially reduce the contribution rate needed to pay current or future pensions and free up more of the payroll tax for other uses, including financing the transition.

For example, let us assume the contribution rate = 8% of wages, real wage growth rate = 3%, people work for 40 years and collect pensions for 20 years. Then a real return of 2% (above the rate of inflation) would yield a replacement rate of only 16% of final wage, while a real return of 5% would yield a 38% replacement rate. A 5% real return is common in competitive financial markets that invest in diversified portfolios, while 2% is higher than government bonds have yielded over the past decade. Workers are likely to feel cheated if they contribute 8% each year for 40 years and at the end get a replacement rate of only 16%; they are likely to demand (and obtain) supplements from the government. After cashing in the bonds in the accounts the government would have to pay still more to avoid social unrest.

In contrast, a return of 5% would produce a much larger pension, financed in part by productive assets rather than taxes. This would be more acceptable to workers and would enable smaller public payments to middlemen for their past service, hence a reallocation of part of the contribution rate to finance the transition. As policy-makers have come to understand that notional accounts are not enough—they must be funded and the funds must be productively invested—we have seen several signs over the past few months that the government is coming to grips with this issue and is preparing to involve

private financial institutions and instruments in the investment process.

The obstacle here, of course, is the weak capital market in China currently and the absence of strong financial institutions that would exert political pressure on the government to move in this direction. Countries are more likely to adopt competitively managed prefunded accounts and earn a higher return if they have multiple financial instruments and pre-existing private financial institutions that serve as interest groups pushing for such reforms (James and Brooks 2001). But in China banks are state-owned and have been teetering on the verge of insolvency. Stock markets are thin, volatile, and rife with insider information. Few financial instruments are available. Mortgage-backed securities have not yet been developed. A market-determined yield curve still does not exist. On the one hand, it has been argued that under these circumstances investing outside of public and a few blue chip private bonds is too risky for a pension fund. On the other hand, pension funds can diversify across companies and securities (public and private bonds, equities, mortgages, real estate), they can hold for the long term and thereby avoid some of the volatility, and if good managers are chosen they can benefit from the private information and inefficient markets—all much better than individuals could. Risk can be further reduced by investing part of the assets internationally and by utilizing the experience of financial managers from Hong Kong and abroad. Additionally, it is essential that China improve its financial markets and its corporate governance, and pension funds can become one of the active agents in this process, as they have in Chile and other countries.

Recent moves toward a more competitive return. During the past few months several signs have appeared that China is moving in this direction. In June it was announced that the government would soon unveil regulations that would allow social security funds to invest part of their assets (possibly as much as 15%) in stock. In effect, pension funds would be allowed to increase the demand for the state-owned assets that companies with IPO's were being forced to sell. Moreover, the fund management business would be open to domestic and foreign private fund managers; joint ventures are expected to develop. (China Daily. June 21, 2001). In fact, this new policy was put into effect almost immediately, as the National Social Security Fund participated as an institutional and strategic investor in the Sinopec (China Petroleum and Chemical Corporation) IPO, the largest IPO ever in China. (China Daily. July 4, 2001; Dow Jones Newswires. July 3, 2001). The NSSF ordered 300 million class A shares, while other institutional investors ordered 57.6 billion shares, a total that was way above the total of 2.8 billion shares that are being offered (Dow Jones Newswires. July 13, 2001). It remains to be seen how many shares NSSF will be allocated in this excess-demand driven bidding process. Similarly, it is not yet known how much equity investment will be permitted for NSSF in the future, what kinds of regulations (over quality, diversification, disclosure) will apply to those investments, how many private managers will be allowed to enter the market or how they will be chosen.

Also, it is not clear whether NSSF will have the responsibility to choose the investment managers for funds in the individual accounts or whether each municipality will be permitted to select its own fund managers from among an approved list. As discussed above, centralizing control in the NSSF is problematic as it leads to political manipulation as well as monopoly and monopsony in the market. As

the country's biggest buyer and seller of securities NSSF could dominate the market, having a major price impact wherever it enters. This in turn would create both public and private pressures for it to buy to bolster price in some cases and to let price drop in other cases. The temptation for corruption would be great. But municipal control opens the door to cronyism and parochialism, as it did before. Other reforming countries have used direct worker or employer control to decentralize, enhance competition and align decision-making with those whose interests are at stake. China is still far from that point but one would hope that in the future workers would be given some control over investment managers and portfolios and their return would depend on these choices rather than being determined by the state.

Interaction of financial market and pension reforms. In June-August 2001 several steps were taken toward strengthening financial markets and making them safer for pension fund investments. For the first time, the government issued 15 and 20-year treasury bonds, an important move toward developing a yield curve (China Daily, August 1, 2001). The stock of tradable treasury bonds is scheduled to increase, enabling secondary bond markets to develop (most treasury bonds are now non-tradeable) (Dorfman 2001). It was announced that China is drafting laws that would allow foreign companies to sell shares in Chinese markets, either in local or foreign currencies (Herald Tribune, July 12, 2001). This would enhance the breadth and quality of Chinese stock markets. Furthermore, China's security regulator is drafting a set of corporate governance guidelines for listed companies that will be based on international (OECD) standards. This is designed to protect shareholders' rights, eliminate insider trading, reduce corruption, improve the transparency of decisions by companies' boards of directors, and facilitate assessment of managerial performance. It will require a clear separation between listed companies and controlling shareholders (in many cases, the state) and eliminate shuffling of assets and earnings between them (Dow Jones Newswires, July 5, 2001). At least 1/3 of the boards of all listed companies will be required to be "independent" directors and they will be given increased power to call shareholder meetings, hire accountants and auditors and exert other oversight regarding firm transactions and managerial remuneration (China Daily, August 22, 2001). To further deepen the stock market, the first open-end mutual funds in China will soon be permitted and created (Asian Wall Street Journal, July 5, 2001). Stock market indices are being developed, to enable passive investing both by mutual funds and pension funds (Financial Times, Sept 10, 2001).

A new trust law safeguarding supplementary pension funds of enterprises, is scheduled to take effect in October. This would allow enterprises to appoint trustees to hold pension funds for the companies, segregated from other assets and protected if the firm goes bankrupt (Dow Jones Newswires, July 14, 2001). While this would not directly help the mandatory system, it would facilitate the development of private plans that would eventually relieve some of the burden on the public system.

Supplementary plans are unlikely to develop in SOE's while public benefits remain so high—the latter crowd out the former. But most non-state companies, the most rapidly growing part of the economy, are not yet in the mandatory social security system or make only perfunctory contributions. They would prefer to develop their own plans, with funds that they controlled, rather than entering a public

system whose liabilities may exceed its assets. Municipalities, in contrast, would like to alleviate their financial burdens by bringing into the mandatory system the private ventures. And workers would probably like to have pension coverage of some sort. The development of supplementary plans may be a political compromise that will enable non-state enterprises to enter the public system at a lower rate (perhaps for the basic benefit only), and to simultaneously offer their own defined contribution pension plans, whose investment managers will be chosen by plan trustees and/or workers, regulated by the new law. This may eventually become the most competitive and efficient market for pension fund investments.

IV. Conclusion

Over the past two decades, many countries have been adopting reforms to their security schemes, changing them to include a mandatory funded defined contribution component as well as a social safety net. These reformed “multi-pillar schemes” are composed of two mandatory pillars—one publicly managed and tax or pay-as-you-go financed, with a redistributive or poverty-prevention objective, the other privately managed, with the object of building and managing retirement savings. The shift away from traditional pure pay-as-you-go systems is designed to avoid high payroll taxes as populations age, thereby making the systems more sustainable, and to increase national savings that are committed to the long term. Private management of the funds has been adopted to increase the rate of return to the funds, enable a higher productivity of capital and help develop financial markets.

China is also planning to adopt a multi-pillar system, for all these reasons. This is particularly important in China, given its extremely rapid rate of aging. If funds are not accumulated and well invested, it will be difficult for the declining group of workers to support the exploding group of old people in the future. The new system in China will consist of a basic benefit that is uniform for all, at 20% of the average regional wage, and the proceeds of an individual account that is funded with an 8-11% contribution rate.

However, this new system has yet to be implemented, except on a pilot basis, and even when implemented it will face a long transition period. In the meantime, the old social security system faces complications stemming from China’s history of communism and cultural revolution, which has left it with a legacy of unrealistic benefit levels and fragmentation that make it difficult to finance current expenditures, let alone fund the accounts. Additionally, incomplete financial markets and controls by central and local governments have led to weak investments and low returns on the few funds that have accumulated. Attempts to solve these problems began in the 1980’s and have accelerated during the past five years, especially the past five months. This illustrates the fact that pension reform is an on-going process, not a once-and-for-all event, as early solutions create new problems that must be addressed by later solutions.

Chinese pension reform has been characterized by bold pronouncements followed by cautious implementation as the new problems emerge. On a year-to-year basis it has sometimes been difficult to

see any change in reality, despite the great changes on paper. But over longer periods one sees that substantial progress has been made. The multi-pillar system promulgated in 1995, 1997 and 2000 is no exception to this rule and still has a long way to go. However, if one compares the situation in 1995 with the situation today, it is clear that large changes are in the works. Among these changes are:

- Financial integration—Pooling for the flat benefit is now established at the municipal level in most cases, with partial financial responsibility even moving beyond to the provincial and national levels.
- Growing understanding of the importance of funding the individual accounts, using central fund transfers to finance the transition, and investing in a diversified portfolio with private sector involvement to earn a high rate of return.
- And, just recently, decisions to use proceeds from sales of SOE assets in a flexible way to finance the transition, to allow pension funds to invest a portion of their resources in equities with private managers, and to strengthen the securities markets more generally.

Thus, pension reform, enterprise restructuring and financial market development have been joined. However, it will probably take many years fully to implement these commitments.

Among the remaining problems are:

- the simple reality that individual accounts have not yet been funded in most places and, where funded, they are still invested primarily in government bonds at low rates of return;
- the importance of reevaluating the benefit formula (replacement rate, indexation method, retirement age) to cut costs;
- the difficulties in managing monetary transfers and sales of SOE assets;
- the need to convert the individual accounts into pensions on an actuarially fair basis that does not imply a large contingent liability for government;
- the moral hazard issues raised by the separation of administration from financial responsibility
- the absence of a clear path toward competitive decentralized fund management and the danger that the National Social Security Fund, a new governmental entity, will become the country's largest institutional investor; and
- undeveloped financial markets that are not yet safe places to invest pension funds.

In the medium and longer run, China will face pressures to increase the coverage of its social security system. At present coverage is concentrated in state enterprise and only a minority of private sector workers are covered. This makes the cost of reform manageable. But it also means that the majority of old people, especially those in rural areas, will not get a pension and must rely on personal savings and a diminishing family system. If coverage were increased before the system reformed, revenues would increase in the short run but the implicit pension debt, a longer run obligation, would

increase at the same time. It would become much more difficult to finance the transition to a funded system, because PAYG benefits would soon have to begin for a larger number of retirees who have contributed for relatively few years. At the same time, a heavy current tax burden would be imposed on the newly covered enterprises to finance the pensions of middlemen who they never employed, and to generate a surplus that would be controlled by the national pension authority. The part of the economy that is growing most rapidly, in part because it faces low taxes, liabilities and regulations, would suddenly be hit with a heavy legacy of the past. The challenge for China is to find a way to implement a more funded system, that includes decentralized competitive management of the funds, quickly, before coverage increases become a social necessity and makes the transition much more difficult.

Table 1: Workers and Pensioners in China, 1990-2000

Year	Covered workers (millions)	Covered workers/ urban employment	Pensioners (millions)	Dependency ratio: (#P/#W)	Covered workers/ population	Covered workers/ Pensioners/ population > age 60
1990	104	19.2%	10	10%	52	4.6%
1992	78	6.6%	45%	17	NA	21.8%
1995	87	7.2%	46%	22	19.5%	25.3%
1997	87	7.0%	4.3%	25	NA	28.7%
1999	95	7.6%	45%	30	NA	31.6%
2000	104	8.2%	50%	32	23.5%	30.8%

Table 2: Pension spending, 1990-1999

Year	Pension spending/GDP	pension/average SOE wage	Revenue/GDP	Average pension/GDP per capita	Average contribution/average SOE wage
1990	.8%	1%	96%	68%	15%
1992	1.2%	1.4%	85%	67%	16%
1995	1.5%	1.6%	78%	67%	19%
1997	1.7%	1.8%	82%	73%	23%
1999	2.4%	2.4%	99%	76%	24%

Source: Whiteford (2001), based on China Social Insurance Year Book 2000 and China Statistical Year Book 2000.

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¹ In a perfectly competitive labor and capital market, wages would have fallen in Heilongjiang to compensate for the expected future pensions and investors might have been enticed by these lower wages. However, the labor and capital markets in China are far from perfect. In addition, it is not clear that current workers in Heilongjian will get these pensions when they grow old. The present high pension costs are a legacy of the past, while future benefits to current workers are uncertain. Thus, wages may not fall enough to attract new capital and jobs, or if they did it would require a large cut in take-home pay—keeping the area depressed from the vantage point of workers.

² Estimates range from 46-69% of GDP in World Bank 1997, to 71% of GDP in Wang et al. Dorfman and Sin 2001, who use a much lower discount rate, obtain an IPD that is 94% of GDP. See James and Brooks 2001 for the IPD in the rest of the world. In almost all reforming countries the IPD exceeded 100% of GDP and in some cases it exceeded 200%.

³ A few countries such as Sweden and Italy have deliberately shifted from PAYG defined benefit to PAYG (notional) defined contribution plans. They have done this because they wanted to establish a close link between benefits and contributions but faced large transition costs due to their huge IPD's that exceeded 200% of GDP. Their solution was to keep the accounts notional, the system largely PAYG. (Sweden also added small funded accounts). Their systems will therefore continue to face an increased cost rate as the dependency rate rises. China has a much smaller IPD and faces a much more sharply rising dependency ratio. Therefore, funded accounts are more feasible and desirable for China.

⁴ Since Chinese workers receive substantial non-wage income (such as a bonus) that is not included in the pensionable wage base, the total income replacement rate is lower than 70% in many cases. Of course, the exclusion of bonuses from the payroll tax base also reduces the funds available to pay the pensions.

⁵ For example, creative accounting may create the appearance of losses. Or “shell companies” may be held responsible for liabilities, while new companies are hived off to capture profits. Municipal officials may not have the authority, skills or desire to investigate such practices.