Editors' Summary

THE BROOKINGS PANEL ON Economic Activity held its eighty-second conference in Washington, D.C., on September 7 and 8, 2006. This issue of the Brookings Papers includes the papers and discussions presented at the conference. All three papers in this issue explore various aspects of the Chinese economy, which has grown rapidly in recent decades to become one of the world's largest. The first paper analyzes recent productivity growth in China and the prospects for China's economic catch-up with the international productivity frontier. The second paper estimates current rates of return on investment in China to gauge whether the country's high investment rate is sustainable. The third paper examines the state of China's banks and assesses the prospects for successful banking reform.

DURING THE PAST QUARTER century of market-based reform, China's economic performance has been extraordinary. In 1978, at the outset of reform, China was the world's tenth-largest economy, with a GDP less than 6 percent that of the United States. By 2005, after two decades of growth averaging about 9 percent a year, it had become the world's fourth-largest economy at current exchange rates, with a GDP roughly one fifth that of the United States. If China's growth advantage continues, in twenty-five years China's economy will rival the U.S. economy in absolute size, although it will still have only a fraction of U.S. income per capita. In the first article of this volume, Gary Jefferson, Albert Hu, and Jian Su examine the rapid productivity growth underlying this performance, both to understand its sources and to inform judgments about its sustainability. They calculate levels and growth rates of productivity by sector, industry, and region and analyze rates of productivity convergence both within China and between China and the advanced economies of the world. This analysis leads them to discuss the institutional reforms they believe are needed to sustain China's rapid productivity growth in the future.

The authors frame their analysis around the difference in productivity between a given industry in China and its counterpart on the international frontier, understood as the corresponding industry in either the United States or Japan, whichever has the higher productivity. The analysis utilizes a data set compiled by China's National Bureau of Statistics containing annual observations on more than 20,000 large and medium-size enterprises (the LME data set) over 1995 to 2004. Although this data set allows direct industry-by-industry comparisons both across regions in China and between China and the frontier, it has the disadvantage of excluding smaller enterprises, which probably leads it to overstate Chinese productivity and may bias estimates of convergence if the importance of small firms changes over time.

The authors first calculate labor productivity for twenty-seven manufacturing industries in each of China's four regions: coastal, northeastern, central, and western. As expected, productivity is found to have increased sharply relative to the frontier between 1995 and 2002, the latest year for which comparable frontier data are available, but it remains well below frontier productivity except in a few coastal industries. In China's leading coastal region, labor productivity for these manufacturing enterprises rose from only one ninth of frontier productivity in 1995 to one quarter in 2002. In 1995 productivity in the coastal region was roughly twice that in the northeastern region and more than three times that in the central and western regions. By 2002 the northeast's productivity gap with the coast had actually increased slightly, but the gaps between the coast and the other two regions had narrowed considerably.

Large productivity differences also exist between Chinese industry and the other sectors of the economy. To examine these differences and how they have changed over time, the authors turn to data disaggregated by province from China's national accounts. They compare output per worker in industry (manufacturing, mining, and construction) with that in agriculture (including forestry and fishing) for the whole country over 1980–2005, and with that in both agriculture and services, disaggregated by region, over 1995–2004. When official employment figures are used to measure labor inputs, agricultural productivity was one sixth of industrial productivity in 1980; it then gained ground to roughly a quarter of industrial productivity by 1990, but it has lost ground relative to industry since then. In 2005 output per worker in agriculture was less than a seventh that in industry. Regional data that include the services sector are available for 1995–2004. They show that the coast has a substantial productivity advantage over the

other regions in services, which has changed little over time. Productivity in services is much higher than that in agriculture both across regions and over time, and by 2004 services were more than twice as productive as agriculture in every region. Some analysts are concerned that the official data understate employment in industry and overstate it in agriculture. The authors adjust the data to allow for these concerns, but this adjustment results in changes over time that are qualitatively similar to those from the official data.

Turning to industrial productivity as measured in the national accounts, the authors report noticeable differences from their findings using the LME data set for manufacturing. The national accounts data show some convergence of the central and western regions with the coast from 1995 to 2004, although it is somewhat less dramatic than the convergence for manufacturing in the LME data. They also show very rapid productivity gains in the northeast, which fully converges to the coast by 2004. The authors suggest that the differences in results between these two sources in part reflect the exclusion of enterprises in mining, petroleum, and electric power generation from the subset of LME data used in table 2, as well as the absence of small firms, whose importance in the aggregate data may have changed over time.

Differences in the level and growth of labor productivity could arise from differences in levels and changes in a variety of factors, including capital intensity, technology, and industrial composition. Analysis of differences in labor, capital, and total factor productivity (TFP) could provide some clues as to the relative importance of these factors. Capital deepening by itself would be expected to raise labor productivity but reduce capital productivity, leaving TFP unchanged, whereas adoption of more-advanced technology would be expected to increase both. The LME data set provides a rich base for estimating regional and industry differences in these three different productivity measures. The authors run separate regressions of the logs of each productivity measure on regional and industry dummies for 1995 and 2004. Because individual enterprises are the units of observation in these regressions, the resulting averages are not comparable with the averages from either the national accounts data or the aggregated LME data for manufacturing.

The authors find that coastal enterprises, after adjusting for industry mix effects, enjoyed higher labor productivity than enterprises in other regions in 1995, but their advantage had been substantially reduced by 2004. The

coast's edge in capital productivity was less in 1995 than that in labor productivity. And after allowing for apparently significant changes in industry mix, there is essentially no change in these relative productivities by 2004. TFP is effectively an average of the logarithms of labor and capital productivities, but given the greater weight on labor and the more dramatic differences in labor productivity across regions and time, it behaves qualitatively like a dampened version of labor productivity. The convergence of labor productivity across regions, combined with relatively little convergence of capital productivity after controlling for industry, suggests that improvement in the allocation of labor, and capital deepening, rather than adoption of new technology, which would benefit both labor and capital productivity, played the major role in achieving the gains in industrial productivity during the period.

Differences in factor productivities, whether among firms or across sectors, presumably provide incentives for the reallocation of those factors and for the adoption of more-productive technology. How does the growth of labor productivity over a given period, for a given industry and region, depend on the initial gap between that industry-region's productivity and the international frontier? The authors address this question by regressing the growth in industry-region productivity on the gap between initial industry-region productivity and productivity in the corresponding frontier industry (both the logarithm of the gap and its square). As an additional explanatory variable, they include the growth in frontier industry productivity, to allow for the possibility that more-rapid frontier growth creates either less or more favorable opportunities for Chinese firms. They also allow the response of the productivity gaps to depend on the individual region. The regressions are estimated for the period 1995–2002. The size of the initial gap is found to have a substantial and highly statistically significant effect on productivity growth. For example, under the authors' preferred specification, for a ratio of frontier productivity to Chinese productivity of 10 (which is smaller than that for many coastal industries in 1995), the predicted annual rate of growth in productivity is 11 percent, implying a rapid reduction of such gaps even with substantial growth in frontier productivity. The predicted growth for a comparable gap in the other regions is about 3 percentage points lower. The authors suggest that this disparity may reflect the concentration of foreign direct investment and research and development (R&D) spending in the coastal region, along with better institutional arrangements and more abundant human

capital that enable coastal industry to take greater advantage of international technology.

All of the authors' specifications yield results that indicate, either by a significant positive coefficient on the squared gap or by a negative intercept, that a larger gap has a disproportionate effect on growth rates. Interestingly, industries with higher rates of growth in frontier productivity appear to have lower rates of productivity growth in China, other things equal. The authors suggest several possible explanations. It may simply reflect China's comparative advantage. Or incentives for investment in capital or technology in China may be greatest in industries where productivity growth in advanced countries is low, such as textiles, apparel, and footwear. Or rapid productivity growth in advanced economies may discourage Chinese firms from attempting to compete by modernizing.

The authors turn to a more explicit analysis of the importance of labor reallocation and capital accumulation to economic growth, looking for evidence of improvement in the efficiency with which these factors of production are allocated across sectors and within industry. The largest sectoral differences in labor productivity are between agriculture and industry. The authors use a simple two-sector model to show how, given this gap, reallocation of labor would be expected to raise the rate of growth of output, assuming that productivity within a sector is not significantly affected by the reallocation. The two crucial parameters are the difference in productivity levels between the two sectors and the fraction of labor in agriculture. Moving a unit of labor from agriculture to industry simply increases total output by the difference in sectoral productivities, but the effect on the rates of output and productivity growth depends not only on the rate of reallocation, but also on the relative size of the two sectors, with growth rates diminishing as the relative size of the industrial sector increases. The effect of moving labor from agriculture to industry is commonly cited. But the authors note that much of China's industrial sector is also quite backward. If 80 percent of employment is in agriculture and such backward industries, a 1 percent migration per year to industries with 2.5 times their average productivity would add nearly 1 percentage point to the GDP growth rate. If instead only half of employment is in the low-productivity sectors, the same reallocation would generate additional growth of less than 0.5 percentage point.

The LME data set provides an opportunity to examine the extent to which labor and capital have been reallocated from less to more produc-

tive industrial firms during the past decade. The authors use these data in two ways. First, for those "survivor" enterprises that are present in the sample through the whole data period, they examine how the growth in labor and capital, as well as growth in output and productivity, depends on the productivity of those factors at the beginning of the period. Second, they compare the productivity of enterprises that enter or exit the data set over the period with that of the survivors. Equations for each variable are separately estimated for survivors for the two periods 1995–2000 and 2000–04. Labor growth is specified to depend on initial labor productivity, capital growth on initial capital productivity, and growth in value added and in TFP on initial TFP. The effects of initial productivity on growth rates are allowed to vary by region. In both periods initial productivity has significant and substantial effects on growth of both labor and capital. For example, doubling the initial marginal productivity of labor adds about 10 percentage points to the annual rate of growth of labor in the central region in 2000–04.

The equations for value added and TFP both show that higher initial TFP results in slower output growth. It is not surprising that firms with higher initial TFP would have slower subsequent growth in TFP than firms that have more opportunity for catch-up. However, given the estimated responsiveness of labor and capital growth to their initial productivities, it is somewhat puzzling that firms with higher TFP have slower growth of output. Recognizing that high initial TFP need not mean high levels of both labor and capital productivity may resolve the puzzle. It may be that firms with relatively high initial labor productivity have relatively low initial capital productivity, or vice versa. Hence high initial TFP may not imply sufficiently high rates of growth of the combined factor inputs to offset the effects on output growth of the slower growth in TFP itself.

Given the wide dispersion of labor and capital productivity among Chinese enterprises, and given the changes set in motion by reform, very high rates of exit and entry of firms might be expected. In the LME sample, with an annual population of 22,000 to 27,000 firms, nearly 146,000 firms either entered or exited in the period 1996–2004. For each of three subperiods, 1996–98, 1999–2001, and 2002–04, the authors compare the productivity of entering firms in the year they enter and the productivity of exiting firms in the year they exit with the productivity of survivor firms. During 1996–98 the labor productivity of exiting firms was 35 percent lower, and that of entering firms 36 percent higher, than that of the survivors. In

the following three-year period the corresponding numbers were 57 and 41 percent. In 2002–04 the labor productivity of exiting firms was 47 percent lower that that of survivors, but entrants were marginally less productive than survivors. The differences in capital productivity between exiting and survivor firms were modest in all periods. But the capital productivity of entrants was 61 percent greater than that of survivors in 1996–98 and more than 150 percent greater in the two later periods. Since these differences in productivity are large, as are the numbers of exiting and entering firms, this process of birth and death of firms is clearly an important source of China's productivity growth.

The authors conclude that reallocation of capital and labor to more-productive sectors and firms and the diffusion of technology to relatively backward firms have been important sources of China's productivity growth and the narrowing of productivity gaps across its sectors and regions. However, they believe that the contribution of these mechanisms to growth is likely to diminish over time. They argue that whether China can continue to close the gap with the advanced economies depends broadly on two factors. The first, and in the authors' view critical, factor is China's ability to create new technology and to absorb new domestic or imported technology. The second factor, which is important to the achievement of the first, is China's ability to continue the institutional reforms that have provided the incentives to develop and employ new technologies and to accumulate capital and reallocate labor. The authors are optimistic on both fronts.

The authors review the varied mechanisms leading to technological advance, providing an extensive discussion of China's capacity for technological invention and innovation. Growth in R&D and patenting are two important measures of a science and technology takeoff. The authors cite earlier work showing a striking pattern in which R&D spending in developing countries typically accelerates once such spending reaches 1 percent of GDP. They believe that China, where R&D spending rose to 1.4 percent of GDP in 2005, is firmly embarked on its science and technology takeoff. If China follows the path of East Asia's recently industrialized economies, the intensity of its R&D effort will approach that of the major advanced economies sometime during the next decade. The authors also report a surge in patenting in China since 1991, which they believe reflects key changes in patent laws and increasing levels of foreign direct investment, particularly along the coast.

The authors argue that continuing institutional reforms to enhance incentives and opportunities to develop and employ new technologies, accumulate capital, and reallocate labor will be essential to China's future progress. Their list of important reforms is long, including reforms affecting land ownership and intellectual property, labor mobility, corporate ownership and governance, regional integration, banking, antitrust, and social insurance. They regard the clarification and reallocation of property rights, including corporate governance reform, as key. Expanding on their finding that the productivity of entering firms has greatly exceeded that of exiting firms, they report that during 1996–2003 the majority of exiting firms were state owned, followed by collectively owned and shareholding companies. In 2001–03 fewer than 23 percent of new entrants were state owned. Noting that entrants are far more likely to be private, shareholding, foreign, or overseas firms than their exiting counterparts ("overseas" firms are those with investment from residents of Hong Kong, Taiwan, or Macao), the authors reason that encouraging their entry and continuing the restructuring of state and collectively owned enterprises will be crucial to maintaining rapid productivity growth.

How likely is China to implement the institutional reforms that will be important to its future? The authors cite three reasons for optimism: the historical commitment of the political leadership to the reform process; the commitments, inherent in China's membership in the World Bank and the International Monetary Fund, and in its accession to the World Trade Organization and in particular its intellectual property rights agreement, that frame China's future legal and political choices; and the fast-emerging middle class and entrepreneurs (the latter now eligible to become Communist Party members), who expect their political leaders to do what is necessary to sustain economic growth. Even though China's Communist Party retains a monopoly over political power, it is now arguably a contestable monopoly, and the Party will therefore need to be responsive to demands for social and political reform. The authors recognize that serious challenges to China's economic and political systems remain, but they believe that China's leadership will continue to advance institutional reforms that support the underlying sources of productivity growth.

THE SUSTAINED AND RAPID economic growth that China has achieved since the start of its economic reforms has been accompanied by a remarkable

investment boom. The pace of that boom has quickened in recent years, with fixed investment exceeding 40 percent of GDP. Many observers are concerned that this high level of investment is unsustainable and that a correction is likely over the next few years, precipitating a sharp slowdown in China's economic expansion if and when it occurs. In the second article of this volume, Chong-En Bai, Chang-Tai Hsieh, and Yingyi Qian examine the merits of this argument by estimating the rate of return to capital and comparing it with rates of return in China itself in earlier years and in other developing and developed economies.

For their estimates of returns to capital, the authors draw on the latest official data from China's National Bureau of Statistics (NBS). Their estimates span the period from the late 1970s, when reforms began, through 2005, for which some data are still preliminary. The authors calculate annual rates of return from separate estimates of capital income and the capital stock. They estimate average nominal gross rate of return to capital as the ratio of the nominal return to capital to the current replacement cost of the capital stock, including in the numerator the capital gains that firms receive on their capital stock. This gross return can also be expressed as the ratio of capital's share of output to the capital-output ratio measured at current prices plus the capital gain per unit of capital. The net real rate of return is that ratio minus the rate of depreciation and the rate of change in output prices. The authors use various measures of the income share of capital to estimate real rates of return for the aggregate economy and for various regions and sectors.

For their base case the authors calculate the rate of return using the nonlabor share of aggregate income as the share of capital and the value of the aggregate stock of fixed capital as the measure of capital. They obtain the value of the capital stock by the perpetual inventory method, applied separately to investment in structures and investment in equipment. In this base case the annual rate of return to capital fluctuated around 25 percent through the 1980s and early 1990s, declined from the mid-1990s to 2001, and has rebounded to between 20 and 25 percent in the past several years. The authors note that such rates of return are not low relative to rates computed in the same way elsewhere in the world.

The authors recognize that the capital income used in these calculations includes returns to quite different types of capital and may not produce accurate estimates of the rates of return relevant for business decisions, and therefore for judgments about whether investment is unsustainably high. They therefore estimate several alternative measures of capital income.

The first alternative removes capital income in the housing sector. Residential construction has grown very rapidly in China and is a major part of the fixed capital stock. The returns on this residential capital may not be comparable with the returns to business capital, and furthermore, the flow of services generated by housing may well be mismeasured in the national accounts. Adjusting both the capital stock and the nonlabor share of income to remove the effects of the housing stock from their estimates, the authors find that the return to the nonhousing fixed capital stock is roughly 5 percentage points higher than their base case returns in recent years. In earlier years the difference was even greater, although the rise in the rate of return observed during the past several years is still present.

The other adjustment that makes a big difference is the inclusion of inventories in the capital stock. Although decisions about investing in inventories may not reflect the same calculations about profitability as decisions about fixed capital, in part because the former represent a much shorter-lived commitment, they require a similar commitment of financial resources and should be reflected in calculations of rates of return for that reason. When the stock of inventories is added to the fixed capital stock, the estimated rate of return to capital is reduced in recent years by about the same amount that removing the housing stock raised it. However, the inventory adjustment in these years is much less than in earlier years, perhaps reflecting improving inventory management as the economy modernized as well as economies of scale to holding inventories as output grew. Combining the adjustments for residential housing and inventory holdings removes virtually all the trend decline in the base case estimate of the rate of return and raises the rate of return in the most recent years to new highs.

As a third alternative, the authors convert returns to an after-tax basis. This reduces rates of return throughout the period by about 10 percentage points but has no effect on the trend in returns over time. They also compare their estimates based on the NBS national accounts data with estimates by the Organization for Economic Cooperation and Development using an industrial firm data base provided by the NBS. The firm data roughly corroborate the authors' estimates; they also support the finding that returns have risen in recent years.

The authors discuss a variety of other conceptual issues with their estimates. The returns to nonlabor income include rents to agricultural land and mineral resources, both of which should be excluded to obtain the returns

to reproducible capital. In the absence of information that would permit such rents to be removed from the aggregate data, they estimate the return to capital excluding first the agriculture sector and then, separately, the mining (and petroleum) sector, by subtracting output, capital income, and reproducible capital stock for each sector from the aggregates. However, they find that the returns estimated after either of these adjustments make little difference to the overall picture of returns. In the early years, returns excluding the mining sector are noticeably higher than in the base case, and so their exclusion produces an exaggerated downward trend relative to base case returns. Excluding agriculture has a similar but much smaller effect. In recent years neither adjustment makes a noticeable difference to the estimated rate of return.

The authors then turn from their aggregate estimates to examine the heterogeneity of returns to capital in China. Disaggregating the data into three sectors—primary (agriculture), secondary (construction, mining, and manufacturing), and tertiary (services)—they find changing patterns in the rate of return over time. Under their base case definitions and concepts, returns in the secondary sector have been relatively high, ranging between 27 and 33 percent, except for a period around 1990 when they fell noticeably. Returns in the primary sector rose steadily until the mid-1990s and have since declined to the mid-teens. Returns in the tertiary sector rose steadily to over 25 percent in the early 1990s and then declined steadily to around 10 percent in recent years. The authors suggest that many investments in the tertiary sector, such as schools and infrastructure, generate returns elsewhere than in the tertiary sector itself, and that much of that investment may contribute to output with a substantial lag.

Turning to the data by province, and again using base case definitions and concepts, the authors find, not surprisingly, that returns to capital are generally highest in the eastern, largely coastal region, followed by the central region, and are lowest in the western region. They also find that the dispersion of returns across provinces has diminished over time. These results are consistent with those of Gary Jefferson and his coauthors elsewhere in this issue. Breaking the data into six-year subperiods and assigning provinces to quartiles based on rates of return, the authors calculate a transition matrix that shows the probability of a province moving from one quartile to another between successive subperiods. There is little mobility before about 1990, but thereafter mobility across the top three quartiles

increases noticeably. However, provinces in the lowest quartile show little mobility at any time.

The authors conclude with an optimistic assessment of China's investment prospects. By most of their measures, including the conceptually most relevant ones, rates of return have not fallen despite high rates of investment. Nor are the estimated returns low by international standards. The authors offer two possible reasons for these persistently high returns. First, output growth, driven by growth in the labor force and in total factor productivity, has been rapid, so that the capital-output ratio cannot have risen by much even with high investment rates. Second, the capital share of aggregate income has increased steadily since 1998, the period when investment has grown most rapidly. That growth in the capital share, in turn, may reflect the gradual restructuring of China's industrial sector and its move to more capital-intensive industries requiring higher investment rates. The authors regard their results bearing on the efficiency of investment allocation as less informative. However, their geographic and sectoral disaggregations indicate continued misallocation of capital. And they note that even their finding of a reduction in the dispersion of returns across provinces may mask continued misallocation at the level of the firm.

THE ECONOMIC REFORMS THAT began in the 1980s shifted more than 20 percent of China's labor force out of its backward agricultural sector. In the last decade alone, over 42 million workers moved from state-owned enterprises (SOEs) into market-driven private firms. This movement of labor, together with strong productivity gains, has made China's industrial sector a formidable competitor in world markets for a wide and growing range of manufactured goods. By comparison, reform of China's banking sector has been slow. In large part this reflects the desire of authorities at all levels of government to make the transition to a market economy a gradual one, to avoid massive labor force disruptions that might threaten economic and social stability. China's largest banks, all of which are state owned, have been used to subsidize both the backward agricultural sector, in order to slow the migration of underemployed rural workers to the cities, and the many inefficient state-owned firms, to avoid the large-scale unemployment that would be expected if these unprofitable firms were allowed to fail. This use of the major banks, however, conflicts with the goal of reforming the banking system toward one that maximizes profits

and allocates credit efficiently across firms—a conflict first emphasized by Nicholas Lardy in the 1990s. In recent years the central government has made such reform a priority, and many observers believe it is needed to maintain the rapid development of China's economy. In the third article of this volume, Wendy Dobson and Anil Kashyap evaluate the prospects for successful bank reform in China in light of the system's conflicting goals, assess the risks should reform prove slow in coming, and propose how to reduce the conflict between developing a modern banking system and allowing other government priorities to intrude on bank lending.

Dobson and Kashyap first review how China's banking system reached its present state. The system is dominated by four state-owned banks that were created in the late 1970s and early 1980s: the Bank of China (BOC), the Chinese Construction Bank (CCB), the Industrial and Commercial Bank of China (ICBC), and the Agricultural Bank of China (ABC). Today these Big Four banks account for 55 percent of bank assets and loans and 60 percent of bank deposits. (A fifth bank, the Bank of Communications, or BoCom, is growing rapidly and accounts for about 4 percent of assets and deposits.) Dobson and Kashyap explain the unconventional role these banks played in their initial years of existence and how that role led to the reforms that started in 1995. All the Big Four except ABC developed close ties with nonfinancial SOEs and became responsible for their financing. Most of these SOEs were unprofitable and required government subsidies, which by the mid-1980s were provided as a matter of government policy through loans from the state-owned banks. This "policy lending" left the banks with growing portfolios of nonperforming loans (NPLs), which required government financial support of the banks themselves and provided little or no incentive for them to develop the risk assessment skills and lending criteria that would enable them to allocate capital efficiently.

Economic reforms starting in 1995 have addressed both the problem of unprofitable industrial SOEs and the problem of dysfunctional banks. The strategy for bank reform began with shoring up the banks' balance sheets. NPLs have been removed from the banks in several steps, at a cumulative cost estimated by the authors at between $240 billion and $430 billion, or between 10 and 19 percent of China's 2005 GDP. These costs include the transfer of NPLs to four newly created asset management companies (AMCs) in exchange for government-guaranteed bonds, and the direct injection of capital from the government into the banks. By the end of 2005, in three of the Big Four banks (ABC being the exception), NPLs had fallen

to between 3.5 and 5.5 percent of total loans, and bank capital adequacy ratios had been restored to 8 percent. What is more, the burden of supporting SOEs has been greatly reduced, because many unprofitable SOEs have been closed, restructured, or sold. By 2004 total employment of industrial SOEs had dropped nearly by half, to 21 million.

The other two features of China's bank reform strategy aim at bringing constructive foreign influences to bear. Thus the second feature has been to attract strategic foreign investors to existing banks, to provide not only capital but also expertise in bank management and governance. In 2004–05 global financial firms invested a total of $13.3 billion in the largest Chinese banks. Foreign ownership of domestic banks is limited, however, to 20 percent of total equity, and this limit has been reached in the fast-growing BoCom. The third feature of the strategy has been to get banks listed on foreign stock exchanges, in order to impose market pressures and subject the banks to international standards of reporting accuracy and transparency. The largest banks, including BoCom, have already been, or will soon be, listed on the Hong Kong or the Shanghai exchange, or both.

Although the authors concede that much progress has been made toward modernizing the banking system, they have reservations about whether that progress is yet sufficient. Their doubts, and the evidence for them, are of three sorts: first, that pressure for directed lending continues; second, that credit quality problems persist despite the declines in acknowledged NPLs; and third, that banks still lack the risk management expertise needed to guard against a sharp rise in losses.

The authors find abundant evidence that pressure for policy lending will continue. They report that the government's share of bank ownership is larger in China than in any other country, clearly indicating a determination to maintain at least the option of controlling credit. They also note that maintaining employment while modernizing the nonfinancial economy will remain a policy priority for many years to come. For the past decade and more, this has meant using policy lending to direct credit, both toward investment to create jobs in growth areas, and to sustain employment in unprofitable SOEs and in stagnant or declining sectors such as agriculture. Moreover, regional and local governments in China enjoy considerable independence from Beijing, and local bank branches have strong ties to the local economy and its SOEs, so that policy lending to protect employment reflects local as well as national priorities.

The authors provide a range of evidence suggesting that the need for directed credit will continue both for targeted growth and for protecting employment in declining areas. Although the number of SOEs and the size of their payrolls have been sharply reduced, SOEs remain a huge presence in the Chinese economy. China's 32,000 industrial SOEs account for roughly half of total industrial assets. The vast majority of China's 120,000 SOEs in all sectors are small enterprises, although the ten largest account for over half of total SOE revenue. Individual firm data on profitability and lending are hard to come by. But the authors calculate that, in the aggregate, losses as a share of SOE assets rose in 2005 and 2006 after declining steadily for several years. They also report on work by David Dollar and Shang-Jin Wei indicating that SOEs are more reliant than private firms on bank finance, and that less profitable SOEs are more reliant on bank finance than are the more profitable SOEs, which presumably rely more on retained earnings.

The authors argue that new national policy initiatives are likely to generate new pressures to direct bank credit to SOEs. The new Five Year Plan aims to redress the rural-urban imbalance in incomes and public services that has arisen from the concentrated growth of the past decade. The plan calls for both improving rural public services and accelerating urbanization by creating 45 million new urban jobs. From an analysis of past investment patterns, the authors infer that industrial SOEs will enjoy a large share of any future investment boom that arises under the new plan.

A key reason for modernizing the banking system is to allocate credit more efficiently throughout the economy. The authors provide direct evidence that lending by the state-owned banks is governed by factors other than profitability. They cite several studies showing that businesses owned by Communist Party members have historically received preferential loan treatment, and that the Big Four banks have had far lower profits than others after allowing for differences in costs and output mix. They also note that, since lending interest rates were deregulated in October 2004, the range of rates charged by the state-owned banks has remained about as compressed as in the United States (even though credit risk in China is much greater), and more compressed than among other financial institutions in China—evidence that the state-owned banks continue to give inadequate attention to risk.

The authors turn next to data at the level of individual banks, available mainly for the largest state-owned banks only, to assess how well these

banks have directed their lending in recent years. They cite a study by Richard Podpiera that found that the profitability of these banks' customers had no effect on the growth of loans at these banks during 1997–2004, and that they were losing market share to smaller banks in the provinces with more profitable corporate customers. Although this indicates that smaller, more efficient banks are already thriving in China, the large banks remain such a dominant factor in overall lending that their performance is still crucial to China's overall financial performance.

The authors are concerned that the large banks are continuing to lend to the same SOEs whose NPLs were written off in the earlier bank recapitalizations. At BoCom, which provides information on its largest borrowers, five of the ten largest are SOEs. The authors also report that the percentage of loans from large banks that are delinquent for over ninety days rose between 2004 and 2005, despite booming economic growth. Loans to local governments for infrastructure projects were of sufficient concern to the central government that, in 2006, it invalidated local government guarantees on such loans and called on the banks to cease granting them.

The authors also provide anecdotal evidence on how existing bank practices and incentives impede progress toward bank reform. Bank boards and upper management are still dominated by Party officials and other government appointees who have their own agendas and incentives. A quotation from a local branch manager illustrates the problem: "If I lend money to a SOE and it defaults, I will not be blamed. But if I make a loan to a privately-owned shoe factory and it defaults, I will be blamed."

From their analysis of recent bank lending, the authors conclude that many of the loans granted since the 2004–05 capital injections are vulnerable to negative shocks. They discuss the likelihood of such shocks arising from two sources: the entry of foreign banks, which will begin in 2007, and a sharp slowdown in economic growth. The authors suggest that large multinational banks are entering China because they see customers there being underserved and the potential to fill existing voids in high-margin activities such as credit cards, mortgages, and investment products. The authors do not, however, expect the foreign entrants to compete aggressively with the big Chinese banks for lending share or for deposit accounts, which would require large branch networks. Thus they do not see competition from foreign banks as a negative shock to China's large banks.

The authors are more concerned about the risks and effects of an economic slowdown. They note that recent growth has been unbalanced,

driven importantly by a surge in fixed investment. Especially given that much of this investment has been undertaken by state-owned or state-dominated companies, which lack the full discipline of profit-maximizing firms, they fear it has given rise to excess capacity that leaves the investment rate highly vulnerable to a slowdown in the economy. Although two other papers in this volume are relatively sanguine about investment prospects in China, Dobson and Kashyap cite reports by the Asian Development Bank and the Bank for International Settlements in support of this fear. They also question whether the Chinese authorities would respond effectively if they perceived the need to head off an unsustainable investment boom. They note that the authorities are reluctant to raise interest rates substantially, fearing it would trigger an inflow of funds from abroad, and are wary of currency appreciation that would slow export growth, putting further pressure on profits. Furthermore, whereas in a market-based economy the risk of overinvestment would slow borrowing, and bank lending terms would become more stringent to reflect any increasing risk of overinvestment, much lending and borrowing in China is largely divorced from such market discipline.

The authors thus see a substantial risk of an economic slowdown in the next several years arising from an end to the investment boom. And they provide two, admittedly very rough, estimates of how much damage a slowdown of 5 percentage points in GDP growth would do to the balance sheets of the state-owned banks. Using a calculation from Standard & Poor's that relates loan performance to macroeconomic variables, they calculate that NPLs would rise by an amount roughly equivalent to the NPLs that were moved out of banks in the 1999 bank bailout. Looking directly at loan conditions at the largest banks, they arrive at an estimate of similar magnitude by assuming that all loans currently in the "special mention" category (which indicates loans at risk) are pushed into nonperformance by the slowdown. They note that a bailout of the size indicated by these estimates would be substantial, amounting to about 7 percent of GDP.

Although such a bailout would be large by any standard, the Chinese government may regard it as an acceptable price to pay for continuing the present policies that maintain economic stability. The authors, however, argue that the stability objective could be met at much lower cost to bank reform and economic performance by totally separating policy lending from conventional lending. All policy lending, under such a scheme, would

come from banks designated as policy banks, and the level of that lending would be left to the Communist Party. Without profits from other activities, the policy banks would not be able to commingle good and bad lending results, and the subsidies involved in their policy lending would be transparent and accounted for. The present state-owned banks, freed of the conflicts inherent in their present dual mandate, would enjoy a greatly improved chance of developing the lending expertise required by bank reform and market competition.

The authors offer a detailed discussion of two alternative plans for achieving this separation of present bank functions. The first would assign them to separate banks within each existing state-owned bank, whereas the second would transform the existing banks into "narrow banks" that take deposits but do not lend, investing instead in a limited range of safe assets. The authors favor the narrow bank option if the political and institutional hurdles to isolating policy lending within existing banks are deemed too large to overcome.