

RESEARCHBUZZ

When Will China's Prosperity Catch up with the US?

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To read the press, one might think that China's economy would soon surpass in size and prosperity that of the world's remaining superpower. There is some basis for this speculation, though it is wildly premature at best, and, at worst, very unlikely for several decades, if ever. The correct factual basis is that China is a very large place with an even larger population. The other correct ingredient in such a story is that, for the past 28 years or so, China has exhibited extremely rapid growth. If its massive population had an average level of productivity for what the IMF calls a "middle income country" or that of some of their wealthier neighbors, China would already have the largest GDP in the world. That is not likely to happen for another 30 years or so, at the earliest. More importantly, even under the best of trends sustained for far longer than is likely, China will not reach the US standard of living, not to mention surpass it, until mid-century. More likely, even under very optimistic assumptions, China will not reach the US standard of living until late in this century. Nonetheless, due to the size of its economy and markets, it will have a relatively large share of production and consumption of most goods and services in a few decades.

The key facts that determine these possibilities are that China is a country that is almost identically the same size in land

area as the US and has over four times as many people (1.3 billion versus 300 million people). Its output or income have been growing at nearly 10 percent per year since reforms began in the late 1970s, but earlier the country's economy regressed for several decades due to its political turmoil and exploitation of its people by a political party and class backed by an economically and politically powerful army.. Economic reform has allowed the country to climb out of a very deep hole, but there remains far to go before reclaiming its earlier relative ranking in the world economy. Fortunately, the notion of convergence means that the further behind a country gets, the more likely it is, if allowed, to grow faster in order to catch up.

To take a long view, consider that in 1820 China produced about 28.7 percent of the world's GDP with about 35.7 percent of its population, which implies that it had a productivity level close to 80 percent of the world average. By 2005, despite incredible growth of near 10 percent per year over the past 28 years, China produced 5 percent of the world's GDP despite having a smaller, but still world-beating 20.2 percent of the world's population. By the same standard, China's productivity had fallen to about 25 percent of the world average. In contrast, the US rose from 1.8 percent of the world's output with about 0.9 percent of the world's population (already about twice the world average GDP per person) to claim almost the same share of output as China had in 1820, 28.1 percent, with only 4.6 percent of the world population, or about six times the world average GDP per person. Had China kept its relative level of productivity, just keeping pace with the world average, its GDP and standard of living would have

been over three times higher than today and it would already have a GDP level in excess of Japan's, or been the second largest in the world, and a standard of living approaching that of Chile instead of Morocco.

The basic facts about China's income and growth are summarized in Table 1. China is classified as a lower middle income country by the International Monetary Fund, but it has grown rapidly for the past 28 years since the transformation from a command to a market economy began, averaging about 9.6 percent per year from 1980 to 2005. The growth rate data in the table are for the period 1990-2005 and form the "best case" baseline scenario, where growth rates continue to hold steady. The past period chosen is somewhat arbitrary. The Chinese growth rate used here is a little slower than a shorter period at the end of the interval, but faster than the whole period of reform, which would include some initial years with slower growth and also some years of slow growth that followed a couple of highly inflationary periods. US growth is also faster than in the most recent five years at the end of the period, but slightly slower than for the past 25 years.

Table 1

Basic facts of China and US income and growth

	2005 Levels		1990-05 growth rate	
	China	US	China	US
GDP (\$ billions)	\$2278	\$1245 5	9.92%	2.98%
Population (billions)	1.304	0.298	1.08	1.02
GDP per person (\$)	1749	41765	8.97	1.93
PPP-based GDP per person	7198	41399	NA	NA

Source: GDP: Economic Insight
 Population: Asian Development Bank and UN
 PPP-based GDP per capita: International Monetary Fund

Best case scenario

In the best case scenario, China and the US would continue to grow at the same pace as over the 15 years from 1990 to 2005. For China, this is considered the best case because no economy has grown so fast for such a prolonged period over the past 50 years, if ever. Also, population growth is expected to continue to slow in both countries, more so in China. Finally, the US is expected to have slowing productivity growth according to the projections of the Social Security Trustees and most experts, and this is even more likely in China as it converges toward US productivity levels.

Extrapolating the Chinese and US growth rates shown in Table 1 implies that **China will catch up with the size of the US GDP in 26 years, or in 2031.** The power of compound interest is illustrated by the fact that it would take 18 years to catch up to the size of US GDP in 2005, but within another eight years China would expand its output enough to match over a quarter century of US growth.

Because of China's population size advantage, its GDP can grow to the same size as the US economy with little productivity growth. Just as low productivity holds down output, however, the expected convergence of productivity, output per worker, means that China's productivity will grow faster than that in the US, at least until it catches up. Since productivity determines the standard of living, this means that China's standard of living would continue to rise faster than that in the US well beyond the period when its GDP catches up to that in the US.

In the best case scenario, China's standard of living, measured by its GDP per person, would continue to improve relative to that in the US well beyond 2031. In 2031, for example, based on the continuation of conditions described in Table 1, China's GDP per capita would be about one-fourth that in the US, but it would have joined the

group of high-income countries, at least based on today's definition. **China would converge to the same GDP per capita as the US in 2053, under the "best case" assumptions.** The per capita GDP in both countries would be about \$105,000 per person, measured in 2005 prices, about 2.5 times the current US level.

Note that the table also provides data on PPP-based GDP per capita. These data are intended by the IMF to better capture comparable measures of the standard of living because they correct for distortions in exchange rates or prices that could bias comparisons based on market prices. These IMF measures suggest a much smaller gap in the current standard of living in China and, together with the "best case" growth rates, suggest convergence in the standard of living by 2032, about the same time as GDP convergence would occur. In China's case, at least until 2006, there is little reason to believe these distortions could lead to an understatement of Chinese GDP, not to mention an understatement by a factor of more than three. If they did however, separate calculations here for GDP and the standard of living would be unnecessary because PPP-based GDP per capita convergence would occur at about the same point as that for actual GDP.

Optimistic case scenario

China and the US are not expected to be able to continue the trends of the past 15 years, however. The UN projects that China's population will peak in about 2030 and then decline slightly, averaging about a 0.1 percent rate from 2005-50. Similarly, US population growth is expected to slow, though not as much, averaging about a 0.6 percent rate from 2005-50. If these trends are included, both countries' GDP will grow more slowly. For example, the US Social Security Trustees expect US real GDP to expand at a 2.1 percent rate from 2005-50, with much of the slowing coming around 2012 and beyond. A slowing in GDP growth in China due to slower growth of the population and labor force, and because of slowing productivity

growth as convergence occurs, easily could bring GDP growth to about 8 percent, in a still very optimistic case. Since the US is slowing too, however, this does not have much effect on the convergence results. **China would still, under these optimistic assumptions, reach the same GDP size as the US by 2035 and match its GDP per capita by 2057, both only four years later than in the "best case."**

Plausible case scenario

Convergence is typically expected to occur primarily because higher rates of return to investment are expected in China than in the US until convergence occurs, and this in turn is expected to lead to more rapid growth of the capital stock per worker in China. In addition, it occurs because China can take advantage of existing and more productive technologies until the country has exploited all the highest technology available in the world and it can do so relatively cheaply. Following convergence, however, the possibilities become limited as China's ability to develop new technology through importing it would be virtually eliminated and the country would have to rely on its ability to develop its own globally-competitive technology. In fact both processes will slow growth in productivity and GDP well before convergence actually occurs, actually pushing convergence further into the future. Thus, the optimistic case above is just that. Japan's slowing from the early 1970s to the 1990s is a classic example of this process, as are the more recent experiences of China's Asian Tiger neighbors and its own Special Administrative Region, Hong Kong.

More importantly, China faces four major trends that require close management to avoid major economic and political turmoil. The first is urbanization. Only about 43 percent of the population currently live in cities and is part of the modern labor force. Most of the population lives in rural areas where economic opportunities are much

more limited. There is strong pressure to move to cities because of huge differences in income possibilities. Second, nearly half of all enterprises are state-owned and the transition from highly inefficient state-owned firms to profitable ones, or more likely to private firms, results in major disruption and unemployment. Both of these trends put strong pressure on the central government to slow these processes and to find other ways to ameliorate the political pressures arising from relative income disparities.

The third trend is the slowing in population growth which, as noted above is expected to bring population expansion to a halt in about 2030 and then to reduce it. At about that time, China is expected to have a median age for its population that is about the same as in the US and subsequently its population will continue to age more rapidly. This will create pressures on the social safety net and especially on the retirement system. Fortunately, there will still be ample opportunity to develop both the employment possibilities of the still large rural population and the productivity of the state-industrial sector to continue to boost income growth.

The fourth trend is that such rapid growth in income per person, climbing to at least eight times its 1980 level today, creates strong demands for political rights as a large middle class begins to emerge. Managing the widening gap between greater economic rights and prosperity and a static political system with few rights and little self-determination will become increasingly difficult over time. There will be growing pressures for political liberalization and openness, but meeting those demands either too rapidly or too slowly risks political and economic instability. All of these risks potentially adversely affect GDP growth in China.

Faced with burgeoning risks and blessed by earlier rapid convergence, it is not likely that China will be able to continue the rapid economic growth assumed in the optimistic case. More likely China will begin to slow,

like its richer neighbors already have, so that its average growth rate will slow further. **A slowing to 6 percent real GDP growth over the post-2005 period, mainly achieved by slowing after the next couple of decades, would result in China matching the size of the US economy by mid-century and converging to a similar standard of living by 2080 or so. Only slightly slower growth could push the latter achievement off to the next century. No country in the world has ever achieved a growth rate as rapid as 6 percent per year over such a long period, in this case for over 75 years.** However, though understandable in geopolitical terms, China's growth for the past 28 years defies history by a much greater margin.

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Network's China Forum: "China: A two-way street"

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On Wednesday morning, January 24, 2007, Dr. Lloyd Benjamin, President of Indiana State University (ISU), stepped up to a podium in the Westin Hotel in downtown Indianapolis to welcome over two hundred registrants to a forum entitled China: A Two-Way Street. Dr. Benjamin was followed by Dr. Cheng Wei, President of Liaoning University, China; Liaoning University co-sponsored the event along with ISU and Networks Financial Institute (NFI). A delegation of university and provincial governmental representatives from Liaoning Province were honored guests at the summit. Drs. Benjamin and Cheng both spoke of the event as an exploration of China's economic growth and opportunities for economic development and cooperation between Indiana and China, particularly Liaoning. Dr. Cheng spoke poetically on this cold January morning about the relationship between two universities and two states and how seeds sown in winter and nurtured by summer sun can grow into a mighty oak.

The two-day event brought together renowned speakers from state government and the private and academic sectors for an exchange of ideas and information regarding the opportunities and benefits to Indiana of developing relationships and conducting business with the Chinese, especially related to capital investment flows from the US to China and from China to the US. Morning keynoter Ted C. Fishman, author of *China, Inc.: How the Rise of the Next Superpower Challenges America and the World*, spoke about the economic emergence of China and its impact on the lives of people in China, North America and around the world as consumers, workers, managers and citizens. Fishman spoke about the redundancies of production in the Chinese marketplace, since

most industries are not serving the national market in China but rather local markets, as 1.5 to 2 million Chinese move from rural to urban centers monthly, contributing to what Fishman claims to be the doubling of the urban labor force in the last ten years and creating an entrepreneurial imperative in China that results in nearly 3 times as many private businesses in China as there are in the US.

Liaoning University professor Xing Yuanyuan, who instructs in the areas of economics, business, trade, international markets, and technology and project management, is currently a visiting professor in ISU's Department of Economics. She delivered a paper entitled "China in Transition," in which she examined the positive effects of Chinese economic growth as paralleled with structural change, the transformation of China to a market economy, and its integration with world economies. She further examined the negative effects of Chinese economic transition, including corruption, income disparities, and environmental and public health degradation.

Audience inquiries drove much of the discussion during the day-and-a-half China event, since 3 panels on January 24th were largely driven by Q&A and all panels and speakers took questions. Following on the heels of Fishman's address, Gerry Dick of Inside Indiana Business and Grow Indiana Media Ventures hosted a panel of high-profile Indiana business leaders in a session called "Why China? What is the strategic value to your company of expanding to China?" The last morning panel focused on opportunities and minefields associated with doing business in China. This panel concluded with an economic development presentation by Sun Dagang, Deputy Director General of Liaoning Foreign Affairs Office, highlighting the facts, figures, status and major objectives and projects of Liaoning's current provincial industrial revitalization undertaking. The first afternoon panel, "Opportunities and Challenges of At-

tracting Chinese Investors to Indiana,” was moderated by Marjorie Lyles, OneAmerica Professor of Business Administration and Professor of International Strategic Management at Indiana University’s Kelley School of Business. Panelists presented overviews of their companies and professional experiences after Lyles set the stage by discussing Chinese motivations for outward foreign direct investment. Wednesday’s final panel addressed the related topic of Indiana’s attractiveness to foreign investors.

Conference attendees enjoyed the day’s second keynote over lunch. Jack Perkowski is the Chairman and CEO of ASIMCO Technologies, one of the largest Chinese foreign-invested manufacturing organizations, with 18 factories in China and three factories in the United States producing auto parts. He reiterated a theme that others had mentioned, which is the centrality of relationship-building in order to make Chinese investments work, and the wisdom of trusting that to senior members of an organization. Perkowski is known for developing local (Chinese) management in order to appropriately manage conflict resolution and capitalize on Chinese cost perspectives. Perkowski’s long-term presence in China has allowed him to penetrate beyond the foreign investment market to develop product for the Chinese local market as well, a market that tolerates everything from primitive to ultramodern technologies. He sees that local market as currently price-driven but anticipates that it is merging up technologically and that competition will evolve from price-driven to technology-driven as China’s reputation evolves from that of a copying to creating products in order to maximize growth.

The 2-day summit continued on Thursday, January 25, 2007, with the emphasis on day two being more specific to China’s financial systems. Day two was titled “China’s Changing Financial System: Can It Catch Up With, Or Even Drive, Growth?” NFI Director of Research Dr. John A. Tatom offered an overview of the topic and the day’s

activities and brought to the podium keynoter Paul Lo, CEO of SinoPac Holdings and Chairman, Bank SinoPac, Taiwan. Lo provided an overview of the current Chinese financial system, where 72% of total financial assets are bank deposits (as opposed to 19% in the US). The strengths of the sector include its strong support from the Chinese government, its vast network of branches and the fact that it is big enough to enjoy a scale economy. Weaknesses include a weak governance system, lack of a commercial mindset, overly lending-oriented with a lack of good internal credit assessment and poor risk management policies and a subsequent large number of non-performance loans (NPLs), a lack of innovative financial capabilities, a lack of managers with experience in the international financial services sector, and limited experience in the volatile foreign exchange and derivatives market. Lo criticized the Chinese banking sector due to excessive governmental intervention, poor capital allocation, inefficiencies and inadequate IT investment but also described reforms that promise to improve the sector’s status, including a recapitalization of state-owned banks, other capital injections, and new governance structures that strengthen corporate governance, put into place risk management and better internal controls, and bring into play external auditors and external supervision of bank management.

The 2-day summit concluded with one final panel examining the Chinese financial system, its pace of reform, and whether the financial system furthers or impairs growth in China. Moderated by Wei He, Assistant Professor, ISU College of Business, the panel consisted of research presentations by two eminent scholars. Dr. James Barth is Lowder Eminent Scholar in Finance at Auburn University and Senior Finance Fellow at the Milken Institute. Barth provided a detailed overview of China’s financial system, often providing Indian, American, Japanese, and European Union comparative benchmarks to assist

the audience in situating China's financial system in a world marketplace. Dr. Albert Keidel is a Senior Associate at the Carnegie Endowment. His paper, "China's Financial Sector: Contributions to Growth and Downside Risks," looks at China's two-part financial system with a competitive market-based component and a public government-directed component. China's newly articulated strategy for financial reforms going forward clearly intends to pursue gradual commercialization of the whole system—a process that can be expected to last twenty or thirty years. In the meantime, on-going improvements in government directed credit will continue to ensure adequate investments in the necessary underpinnings for competitive for-profit economic expansion.

The two-day event attracted 250 registrants from the business, government and policy, and academic sectors, indicating a high degree of interest in China in the Hoosier state. Papers and footage will be available from NFI upon request, so please visit [NFI's website](#) or contact Research Coordinator Martha McCormick at 800.603.7113 or martha.mccormick@isunetworks.org. NFI and ISU were delighted to co-sponsor this event with Liaoning University and to provide leadership and facilitate dialogue in Indiana to open trade and investment ties with China and to truly make the relationship between Indiana and China a two-way street.

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Article Summary: "Risk Transfer with CDOs and Systematic Risk in Banking"

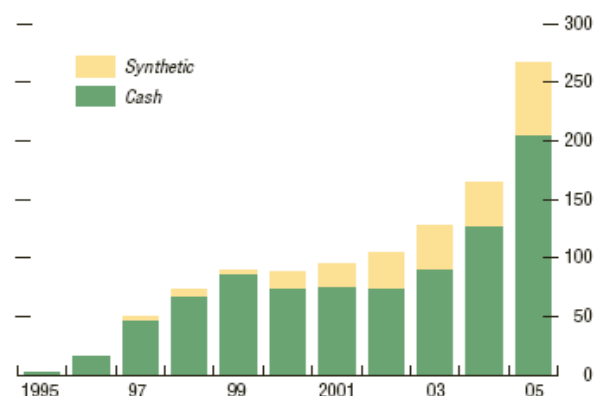
Jan Pieter Krahen and Christian Wilde,
Frankfurt University's Center for Financial Studies
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Collateralized Debt Obligations (CDO) helps banks to remove certain loans from their balance sheets by pooling them and then selling individual tranches with different maturity and risk characteristics. CDOs market have grown from virtually nothing in 1995 to close to \$260 bil. in 2005.

Global Issuance of Collateralized Debt Obligations: Cash Versus Synthetic (in \$ bil.)



Source: Global Financial Stability Report, International Monetary Fund, April 2006, Lehman Brothers

In a typical CDO transaction, the loans are sold to a Special Purpose Vehicle/Entity (SPV), which then issues various tranches of debt backed by loans with differing degrees of repayment risk. Usually, the first tier issued by a SPV consists of debt securities that have a high quality (over-collateralized) and low repayment risk. In contrast, the last tier consists of high risk securities that are backed by loans that contain most of the credit risk. The last tier is also the first to lose value in case of a credit event. Generally, the last tier is held by the issuing bank for several reasons, such as that it is hard to sell it and holding it could

increase the investors' confidence in buying other tranches.

In this paper, the authors indicate that under certain conditions of bank reinvestment behavior and capital structure choice, usage of CDOs may actually increase individual bank's systematic risk.

The authors investigate the risk position of a bank that issues a CDO based on the assumption that it will keep the last tranche, the most junior and risky tranche. How the proceeds from the sale are used has a big impact on the overall risk of a bank. If the proceeds are invested in less risky securities, overall bank risk will be lower. However, it is also possible that proceeds could be used to purchase similar securities or distributed to shareholders which could increase the bank overall risk. In addition, banks' capital requirement also will be affected by their decision of how to use proceeds. Usually, less risky decisions will lower the banks capital requirement and more risky ones will result in higher capital requirements.

The authors examine the risk position of a bank that repeatedly securitizes its loan portfolio, keeps the last or the most risky tranche and reinvests proceeds. This process results in an increase in the leverage of a bank. The authors found that the loss distribution of the portfolio with repeated securitization and reinvestment converges to that of the original first loss piece. This means that the mean loss rate of a portfolio will continually increase as the number of repeated securitizations increase and after a while it will be very close to the most risky tranche's mean loss rate. The bank's exposure to market risk is positively correlated with the size of the last tranche and the number of securitizations. Usually, the junior tranches are highly affected by the changes in the market and economy. The authors conclude that banks will be more vulnerable to movements in macro economic factors due to the fact that they usually keep junior tranche which poses a sector wide risk. The authors conduct Monte Carlo simulation

to see how individual tranches affected by macro economic factors. After running 50,000 iterations, they found out that the default rate of the tranche conditional on the default of the macro bond (a bond that only depends on the macroeconomic factor and does not exhibit any idiosyncratic risk) is highest for the most junior tranche (with 100%) and lowest for the most senior tranche (4.95%). The systematic risk of the most junior tranche is also considerable higher than senior tranches'.

The authors then examine the question of why an individual bank's securitization of its assets increases the systematic risk in banking sector. In order to capture system-wide default risks, they look at the relationship between systematic risk exposure on the level of the individual bank and its contribution to the risk of multiple bank failures. Through running Monte Carlo simulation, the authors find that securitization process increases the risk of a joint bank default. In the analysis that they provide, the probability of a joint default of all banks securitizing (a total of 5 bank given in the example) increases by 14.1 percent in comparison to the base case of no securitization.

The authors findings have important implications from a regulation perspective. In this paper, they show that it is possible to estimate the effect of credit risk transfer on banks' systematic risk using available data and financial models. Moreover, the authors findings point out to the possibility that usage of CDOs can increase the systematic risk for individual banks and for the banking sector since usage of CDOs could result in banks to be more vulnerable to the adverse movements of the macroeconomic factors.

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