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Can China Rise to High Income?

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Introduction

In 2014, China's GDP per capita reached US\$7,500. But its GDP growth decelerated further to 7.4 percent. The combination of these two indicators raises the question if China will be able to avoid the "middle-income trap" and become a high-income economy in the coming decade. Sustainability of China's rapid economic growth has always been a controversial subject, despite its extraordinary growth performance, averaging close to 10 percent a year during the past thirty-five years. But the challenge has never been more real than it is now since, historically, most other countries failed to graduate into high-income status after reaching similar stage of development. And, more alarmingly, Chinese growth is slowing quite persistently.

The issue of "middle-income trap" started to attract nationwide attention following publication of the report "China 2030" prepared jointly by the World Bank and the Development Research Center of the State Council in early 2012 (World Bank 2030). The report paints a rather challenging picture – of 101 middle-income economies in 1960, only 13 became high income by 2008. In the same year, the Asian Development Bank and the National School of Development of the Peking University jointly published a report "Growing beyond low-cost advantage" exploiting the same issue (Zhuang, Vandenberg and Huang 2012). Instead of explicitly judge China's success rate, the research teams of the above two reports outlined lists of needed reforms in order to sustain China's rapid economic growth.

Whether or not China is able to avoid the middle-income trap is probably one of the most important questions for not only China but also the world in the coming decade. Success can lift living standard of 1.4 billion people, and failure might lead to economic and social instability. If China succeeds, it will most likely replace the United States to become the world's largest economy, which should have important implications for global economic structure and international economic governance.

Economists are divided on this question. On the one hand, Justin Lin believes that the growth potential of the Chinese economy is probably still around 8 percent, given its large technological gap from the advanced economies, large-scale infrastructure investment and continuous structural readjustment. It is possible for China to achieve an average of above-7 percent growth in the

coming decade. He identifies at least four preconditions for sustaining China's long-term growth, including well-functioning markets, a minimum amount of investment, continuous structural upgrading and effective government (Lin and Zhang 2015). Conditional on these assumptions, Lin predicts that China will join the high-income club by around 2020.

On the other hand, in a recent joint paper, Larry Summers and his collaborator point out that the correlation across decades in national growth rates is surprisingly low, typically in the range of 0.2 to 0.3. It is also inconsistent with many prevailing theories of growth that seek to explain growth performance in terms of highly stable national features like culture, institutional quality, or the degree of openness. They suggest that the prevailing pattern of regression to the mean in growth rates should create substantial doubt about extrapolative forecasts of China's growth. They believe that there is a significant risk of a major growth slowdown in China at some point over the next decade (Pritchett and Summers 2014).

While Lin and Summers arrive at complete opposite conclusions about China's growth outlook, the logics of their analyses actually are not that different. For instance, on the surface, Lin makes an extrapolative prediction, while Summers emphasizes on mean reversion. But Lin's reasoning about "advantage of backwardness" can be viewed as a broad process of regression to the mean – China's growth potential is being lowered over time, although the growth rate can still be relatively high given its income level. Perhaps a more fundamental difference between Lin's and Summers' analyses is if one should make prediction for a single country's growth outlook purely based on experiences of a large group of countries. The fact that 13 out of 101 middle-income economies in 1960 actually rose to high income suggests that there are economy-specific stories.

Given that most countries will not be able to avoid the middle-income trap, the more relevant question is what makes an economy performing more like the above 13, not the remaining 88? In essence, the middle-income trap is about an economy's ability to continue to grow more rapidly than the most advanced economy of the world, the United States at the moment, after reaching the middle-income status. A low-income economy can successfully engineer a takeoff by taking advantages of its low cost, such as cheap labor. As it reaches the middle-income level, cost base rises rapidly. Therefore, a critical test for the middle-income challenge is if the economy is able to build new industries with higher levels of technology and value-added. All the 13 economies mentioned above succeeded in upgrading their industrial structure, while the other 88 economies were stuck in either resources or low value-added manufacturing and services.

Clearly the key words are technological innovation and industrial upgrading. Both the World Bank and the Asian Development Bank reports made some important policy recommendations (Table 1). The two sets of

recommendations have significant overlaps. Both highlight the importance of supporting innovation and industrial upgrading. They also focus on measures to structural reforms to improve functioning of markets, macroeconomic policy reforms, greening of the economy and maintaining good relations with the rest of the world. The World Bank also singles out social security for all, while the Asian Development Bank emphasizes importance of services, urbanization and equality.

Table 1. Some policy prescriptions for China’s middle-income transition

World Bank & Development Research Center	Asian Development Bank & Peking University
Accelerating the pace of innovation and creating an open innovation system	Stepping up innovation and industrial upgrading
Implementing structural reforms to strengthen the foundations for market-based economy	Deepening structural reform, especially reforms of enterprises, labor and land markets Developing services and scaling up urbanization Reducing income inequality
Expanding opportunities and promoting social security for all	
Strengthening the fiscal system	Maintaining macroeconomic and financial stability
Seizing the opportunity to “go green”	Promoting green growth to conserve resources and protect the environment
Seeking mutually beneficial relations with the world	Strengthening international and regional economic cooperation

Source: World Bank (2012); Zhuang, Vandenberg and Huang (2012).

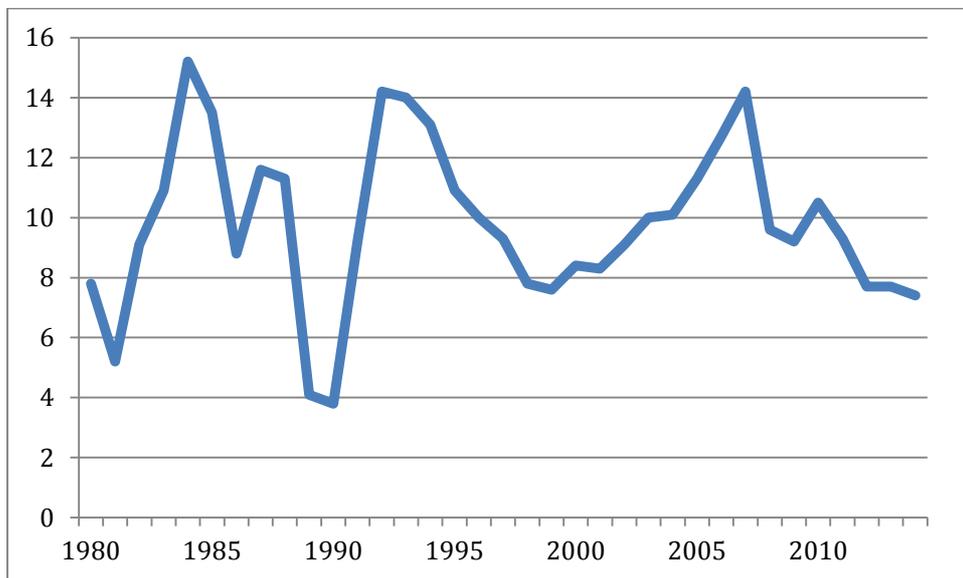
The central policy question of this paper is what are the critical reforms necessary for China to continue its relatively rapid, albeit slower than before, economic growth in the coming decade. Specifically, we address three issues. First, what are the key drivers behind recent slowing of Chinese economic growth? In particular, to what extent it is structural and to what extent it is cyclical? Second, what are the main obstacles for China to continue its rapid economic growth? China achieved extraordinary growth performance during the first thirty-five years of its reform period. Is this growth model sustainable? And, finally, while the government has put together a very comprehensive reform program, what are the most fundamental policy changes needed for supporting growth sustainability?

The remaining of the paper is organized as follows. Section two tries to explain the key reasons for the recent slowdown of Chinese economic growth. Section three analyzes the current growth model and difficulties for its continuation. And section four discusses the necessary policy actions in order to avoid the middle-income trap, followed with some concluding remarks in the final section.

Understanding recent slowing of Chinese growth

Between 1980 and 2014, China's real GDP grew by an average of 9.8 percent a year and its GDP per capita rose from US\$200 to US\$7,500 (Figure 1). Economic growth took downturns several times, especially in 1989-90 and 1998-99. In 2012, GDP growth slowed again, to 7.7 percent from 9.3 percent a year earlier. This time, however, growth slowdown looks more persistent, staying at 7.7 percent in 2013 and edging down to 7.4 percent in 2014. At the start of 2015, there was further evidence of weakening economic activities. The National Bureau of Statistics (NBS) put the first-quarter GDP growth at 7 percent, but several market institutions estimated it at only 5 percent or below.¹

Figure 1. China's annual GDP growth rate, 1980-2014 (%)



Source: National Bureau of Statistics of China and CEIC Data Company.

An important question is if the current growth slowdown is cyclical or structural. In a recent study, Dwight Perkins (2015) suggests that the reasons for the slowdown are not yet well understood. On the supply side, this is happening because total factor productivity (TFP) is slowing down. On the demand side, a low share of household income in GDP has required the country to maintain an unusually high rate of investment in transport infrastructure and housing, but the rapid growth in both of these areas is coming to an end. And, finally, China has reached the point where the

¹ According to a report compiled by wallstreetcn.com, Capital Economics, Citibank, Conference Board and Lombard Street, respectively, estimated China's first-quarter GDP growth in 2015 at 4.9 percent, 4.6 percent, 4.0 percent and 3.8 percent (<http://wallstreetcn.com/node/218370>).

manufacturing share of GDP has peaked and will begin to decline as the economy becomes increasingly service based, but services seldom grow at the double-digit rates that manufacturing is sometimes capable of.

Perkins is obviously of the view that current growth slowdown is mainly driven by structural factors, although some factors might be able to be overcome fully or partially. For instance, slowing investment in infrastructure projects might be replaced by investment in environmental protection. Most Chinese economists share the Perkins assessment that future growth will likely to be slower in the future than before. In addition to the reasons outlined by Perkins (2015), there is an important on-going demographic transition (Cai and Lu 2013). During the Asian financial crisis when the Chinese government first proposed that 8 percent GDP was necessary for maintaining full employment, the labor force was increasing by 8 million a year. Now it falls by 5 million a year.

Most forecasts of China's future growth potentials point to steadily lower levels over time. The World Bank and the Asian Development Bank reports expect growth to fall to 5-6 percent by 2030 (Table 2). It is interesting to notice that even the relatively more pessimistic predictions, such as those by the Asian Development Bank report (Zhuang, Vandenberg and Huang 2012) and by Cai and Lu (2013), assume that China should be able to achieve high-income status by 2020. Justin Lin's prediction is more upbeat, as he believes that current growth slowdown is mainly a cyclical phenomenon, driven down primarily by weakening external demand (Lin and Zhang 2015). Even Lin admits that the growth potential is coming down as its level of development reaches higher level.

Table 2. Some estimates of China's growth potential (%)

Economists/Institutions	Predictions
World Bank/Development Research Center	2011-15: 8.6%; 2016-20: 7%; 2021-20: 5.9%; 2026-30: 5.0%
Asian Development Bank and Peking University	2011-20: 8.0%; 2021-30: 6.0%
Fang Cai and Yang Lu	2011-20: 7.2%; 2016-20: 6.1%
Justin Lin and Fan Zhang	2011-30: 8.0% (actual performance: >7.0%)

Source: Compiled by the author.

Beyond the downward shift of trend growth, policymakers and market participants are also concerned about possible timing of bottoming of economic growth. It is important to understand that currently there are two economic cycles in the working, forcing down the growth rate. A shorter term cycle is a typical macroeconomic cycle – as external demand weakens, growth slows. This cycle can be affected by traditional macroeconomic policies, such as monetary and fiscal policies. There are signs that growth could

bottom during the second or the third quarter of 2015, such as improvement in production, bank lending and de-stocking, following repeated easing of monetary policies from the beginning of the year.

But this bottoming likely will be temporary and short-lived. For instance, when the government saw 7.4 percent growth record for the first quarter of 2014, it stepped efforts of the so-called “mini stimulus” and “target easing” in order to stabilize growth. Growth stabilized in the second quarter at 7.5 percent, but slipped to 7.3 percent again in the third and fourth quarter. The reason that bottoming of growth during the second quarter of 2014 and, again, possibly during the second/third quarter 2015 is temporary is that there exists another longer term cycle – transition of industrial structure. In short, while the old leading industries are rapidly losing competitiveness, the new leading industries are yet to take the stage to lead the economy forward.

Economists often divide the economy into three key parts – consumption, investment and export – according to expenditure side definition of GDP. Chinese economic growth for the past three decades was mainly powered by two engines, exports and investment. Consumption is relatively weak. Behind these two growth engines is a rapidly expanding manufacturing industry. One part of the manufacturing industry, mainly labor-intensive and low value-added, supported export growth. And the other part of the manufacturing industry, mainly heavy machinery and investment goods, facilitated investment expansion. Combination of these two underwrote the so-called “China miracle”.

But now both engines are losing steam. The export sector already weakened significantly. Chinese exports used to expand at 20-30 percent pace. But now basely increases by 5 percent. Obviously, export performance may improve if the global economy recovers more strongly. However, it is almost impossible for Chinese growth to repeat the 20-30% average growth. China has turned from a small economy country into a large country economy in the global market. Since it now accounts for 12 percent of world export market, any adjustment to its demand and supply is likely to trigger significant changes in the rest of the world, illustrated by the popular phrase of “whatever China buys, it becomes more expensive; and whatever China sells, it becomes cheaper”.

More importantly, the traditional Chinese export industries are all built on cheap costs. But production costs have risen rapidly for the past decade or two. Migrant workers’ wages have been growing by around 15 percent a year for more than 10 years. In many of the costal cities, a migrant worker was probably paid 1,000 yuan a month. Now wage rate is about 5,000 yuan. Such dramatic changes in costs of labor and many other inputs are quickly putting many industries out of business. The costal economy, which is more export-oriented, used to be the most dynamic part of the Chinese economy. Much of it is now in deep trouble. In a way, this is a result of past success – rapid

economic growth lifts cost of production, which erodes competitiveness of the existing industries.

The other part of the dynamic manufacturing industry is also in trouble. The heavy industries producing investment goods suffer from an average overcapacity rate of 40 percent or higher. China's investment rate was only around 30 percent at the start of economic reform. Over the following thirty years, it rose to close to 40 percent right before the global financial crisis. As a response to dramatic growth slowdown, the Chinese government adopted the so-called "4 trillion yuan stimulus package" focusing mainly on infrastructure projects. This quickly lifted the investment rate to 48.5 percent in 2009. The unusual investment boom not only underscored Chinese economic growth but also supported the supercycle of global commodity markets. But the boom is behind us permanently – moderating GDP growth and lowering investment rate point to secular weakening of demand for investment going forward.

Therefore, the cyclical downturn of the economy will continue, or bottoming of growth will likely to be temporary, until new leading industries are solidly established, replacing the labor-intensive manufacturing and heavy industries, to carry Chinese growth forward. Indeed, new industries are emerging in China already, such as online shopping, internet finance, express delivery, computer and telecom software and hardware, large machinery equipment, heavy trucks, electrical and construction machineries. These are all expanding rapidly, with some already taking significant roles in the world market. But it will take at least one to two years before these new industries can fill the gaps left by labor-intensive and heavy industries and become the cornerstone of Chinese growth.

Transforming the Chinese growth model

More worrying than growth slowdown is weakening productivity. Harry Wu (2014) demonstrates recently that total factor productivity (TFP) growth decelerated steadily from 1.5 percent a year during 1992-2001 to 1.2 percent during 2002-2007 and further to 0.2 percent during 2008-2010 (Table 3). His Domar estimates of TFP declined even more dramatically, from 5.0 percent to 2.3 percent and to -2.3 percent, during the same period. Recent weak productivity performance is probably related to the aftermath of the "4 trillion yuan" stimulus package. But the weakening trend clearly shows unsustainability of the growth model. Therefore, improvement of the growth model should be the first step toward avoiding the middle-income trap.

Table 3. Estimates of total factor productivity of Chinese industry (%)

	1980-1991	1992-2001	2002-2007	2008-2010
Output	8.6	12.7	18.8	13.3

Labor	0.3	0.0	0.3	0.1
Capital	2.4	1.8	2.2	2.5
Material	6.7	9.4	15.1	10.5
TFP	-0.8	1.5	1.2	0.2

Source: Wu (2014).

In order to change the growth model, one needs first to understand how it was formed. And one of the most important factor determining the growth model is China's reform strategy. Economists have developed diverse analytical frameworks to explain changes in the Chinese economy during the past decades. Justin Lin, Fang Cai and Zhou Li argue that the key to this success was the transition from the heavy industry-oriented to comparative advantage-oriented development strategy (Lin et al. 1995). Barry Naughton introduces the term 'growing out of the plan' to describe China's incremental growth of the market-oriented, private sector, while maintaining support for the old, state-owned enterprises (Naughton 1995). Jeffery Sachs and Wing Thye Woo, however, point out that Chinese economic success can be explained mainly by its convergence with the typical market system of East Asia (Sachs and Woo 2000).

Despite the differences in their perspectives, these economists all agree that the key aspect to the reform is the transition from a centrally planned system to a market system. This is certainly correct, but may only be part of the story. In fact, the Chinese reform strategy may be summarized by two dual-track reform approaches, the first is between state- and privately owned enterprises, while the second is between product and factor markets.

When economic reform started in the late 1970s, the Chinese government maintained its support to the state-owned enterprises (SOEs) but encouraged the private firms to grow. In contrast to the "shock therapy" later adopted by the former Soviet Union, this gradual dual-track approach ensures economic and social stability during the transition period, since no worker was fired and no firm was shut down. The intention was for the non-state sector to grow more rapidly, making the state sector increasingly less important (Naughton 1994).

This approach worked quite well for a while. Entering into the 1990s, however, the Chinese economy encountered three major crises. This first was the fiscal crisis, as government revenues as a share of GDP dropped from 36 percent at the start of reform to close to 10 percent at the beginning of the 1990s. The government had to implement a series of fiscal reforms in order to increase government revenues. The second was the SOE crisis, as the state sector as a whole made net losses in the mid-1990s. The government then adopted the drastic reform strategy of "grasping the big and letting go the small", essentially privatizing about half million SOEs with a couple of years. And the third is the banking crisis, as the average non-performing loan ratio (NPL

ratio) reached 30-40 percent amidst the height of the Asian financial crisis. The authorities then introduced a series of banking reform steps, including cleaning up the bad assets, inject state capital, introducing foreign strategic investors and listing in capital markets.

After reforms in the 1990s and especially after China's joining the WTO at the end of 2001, the state sector underwent further changes. The number of SOEs was reduced substantially, leaving only about 120 centrally controlled SOEs, while the average size ballooned astonishingly. Most of the SOEs are now in strategic industries, such as telecom, banking, airline, railways and hospitals. Many of them are incredibly profitable. However, most economists believe that these SOEs are profitable mainly because they are either in monopoly industries or they receive implicit subsidies. This is why the government's latest comprehensive reform program published in 2013 still identifies SOEs as a key reform area.

The "implicit subsidy" relates to the second dual-track approach adopted by the Chinese government. Since the government intended to continue to support SOEs, it had to intervene in factor markets in order to subsidize the inefficient SOEs. This gave rise to the dual-track strategy between product and factor markets. Free markets for products ensure that production decisions are based on demand and supply conditions in the economy, and resources are allocated efficiently. Distortions in factor markets are a way of providing incentives for economic entities and, sometimes, overcoming market failures (Huang 2010; Huang and Tao 2010; Huang and Wang 2010).

Factor market distortions include the household registration system that limits labor mobility between rural and urban areas; direct controls of bank deposit and lending rates; setting of energy, especially oil, prices by state agencies; and, offering discounted land-use fees to investors. In most cases, these distortions depress input costs. Labor is a special case, however, as it is unclear if labor market segmentation lowers or increases labor cost. But labor cost was low for a long time because of abundant agricultural labor or unlimited labor supply, in a typical Lewis dual-economy.

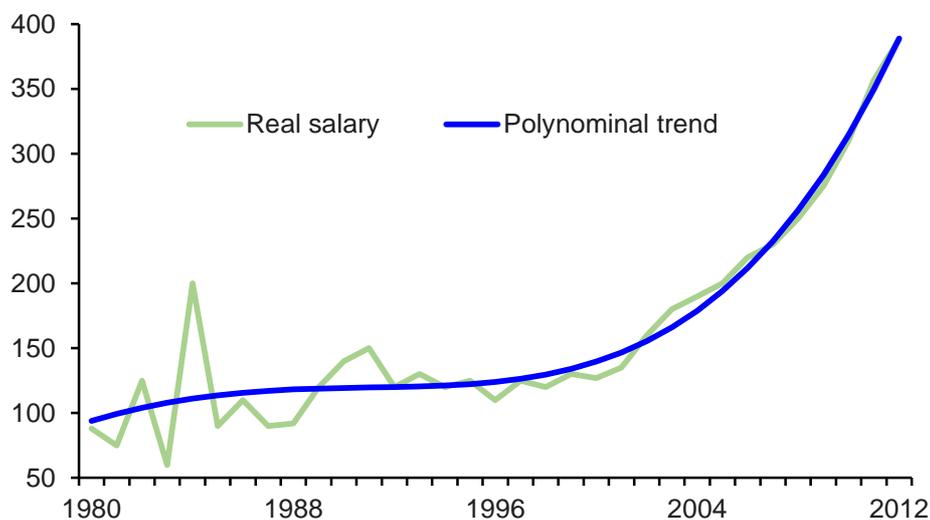
Low input costs, including low labor costs, are like subsidies to companies, but taxes on households. They boost production profits, increase returns to investment and improve the international competitiveness of Chinese exports. Low input costs also serve as a mechanism for the redistribution of income from households to the companies. Over the years, corporate profits grew much faster than household income, as household income was largely capped by stagnant wage rate.

Over time, low input costs also contribute to structural problems. Firstly, extraordinary incentives lead to a continuous rise in the shares of exports and investment in GDP. Secondly, a rise of the share of corporate profit in the national income increases the national saving rate, as corporate saving rate is

generally higher than household saving rate. Thirdly, income inequality among households deteriorates, as low-income households rely more on wage income while high-income households rely more on corporate profits and investment returns. Fourthly, the consumption share of GDP declines over time because household income grows more slowly than GDP. And, fifthly, the unusually low costs of energy, capital and other resources have also resulted in wasteful behavior on the part of producers.

The recent transition to the ‘new normal’ of Chinese economic development is primarily attributable to changes in factor markets. A recent study argues that the distorted factor costs have already started to change (Huang et al. 2011). The labor market shows clear signs of supply shortage, which is evidenced by accelerating wage increases in recent years (Figure 2).

Figure 2. Migrant workers’ monthly wage (yuan in 1978 price)



Source: National Bureau of Statistics of China and CEIC Data Company.

The so-called Lewis turning point (LTP) – the transition of the labor market from surplus to shortage – has important implications for China’s macroeconomy (Huang and Cai 2010). Rapid wage growth, especially that at the lower end of the market, cuts into profit margin. Therefore, it reverses past redistribution of income from households to corporates. As these implicit subsidies for Chinese companies are reduced, export and investment activities soften and, therefore, the economy rebalances.

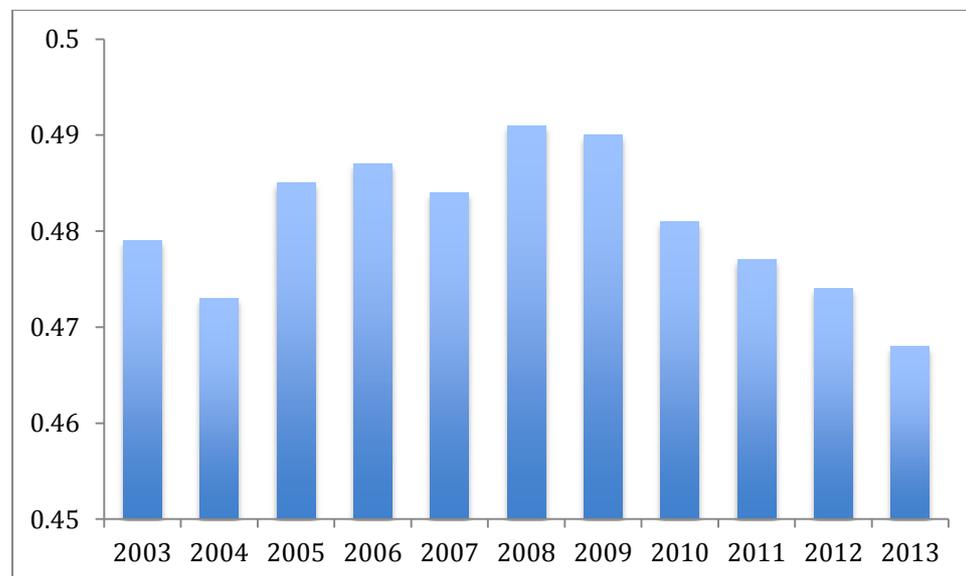
In a sense, it is relatively easy to understand why growth potential has declined in recent years. It is a universal phenomenon that growth slows as an economy develops; this is because the reduced distance from the technological frontier of the developed world means the economy can benefit less from backwardness (Lin 2012). But the growth slowdown is accelerated in China by changing demographics, including labor shortages and a diminishing working-age population. For the same reason, rapidly increasing

wages also create inflation pressure, as rising costs can only be absorbed by higher output price, narrower profit margin or faster productivity growth, or a combination of the above.

So, what has contributed to the rising consumption share of GDP in recent years? The answer is household income. When an 'unlimited labor supply' exists, rapid industrialization is accompanied by a stable wage rate and, therefore, a declining share of wage income in GDP. This is reversed when a labor shortage emerges: wages rise rapidly and the share of wage income in GDP starts to grow. In fact, labor income has also increased from 41 per cent in 2007 to 47.1 per cent in 2009, which, in turn, has boosted consumption relative to GDP. This was also what happened in Korea and Taiwan in the mid 1980s, when their consumption shares started to recover following their respective LTP.

Rapid wage growth was probably also behind the recent improvements in income distribution highlighted by the NBS, since low-income households rely more on wage income and high-income households rely on investment returns or corporate profits (Figure 3). If the past trend was households subsidizing corporations, then the new trend is redistribution of income from corporations to households, as rising labor costs increase wage income but squeeze corporate profits. This is probably why, in rapidly developing economies, the so-called Kuznetz turning point (when income distribution shifts from deteriorating to improving) often follows the Lewis turning point (Huang and Cai 2010).

Figure 3. Official estimates of Gini coefficient, 2003-2013



Source: National Bureau of Statistics of China and CEIC Data Company.

So far, changes in China's growth model is triggered mainly by evolution of the labor market condition. Further changes require implementation of more comprehensive reform agenda, such as the one announced at the Third Plenum of the Eighteenth Party Congress, which contains reform measures in 60 areas. But the key really is to complete the transition to the market economy or to eliminate the two dual-track reform approaches. And this means important changes in at least two areas, one is reform of the SOEs and the other is to removal distortions in factor markets, especially in labor, capital, land and resource markets.

Fostering China's innovation capability

Rebalancing of the economy is only the first step toward avoiding the middle-income trap. A more important step is how to move up the technological ladder and to continue steady economic growth. Most low-income countries are agrarian economies. Economic development often involves migration of farmers into the urban sector. This generates significant productivity gain but labor cost remains at very low level, given 'unlimited labor supply'. Therefore, by developing labor-intensive and low value-added urban sectors, the economy can grow rapidly. This process can continue until the countryside runs out of surplus labor. Then labor cost would start to rise sharply and the country would quickly lose competitiveness in labor-intensive industries.

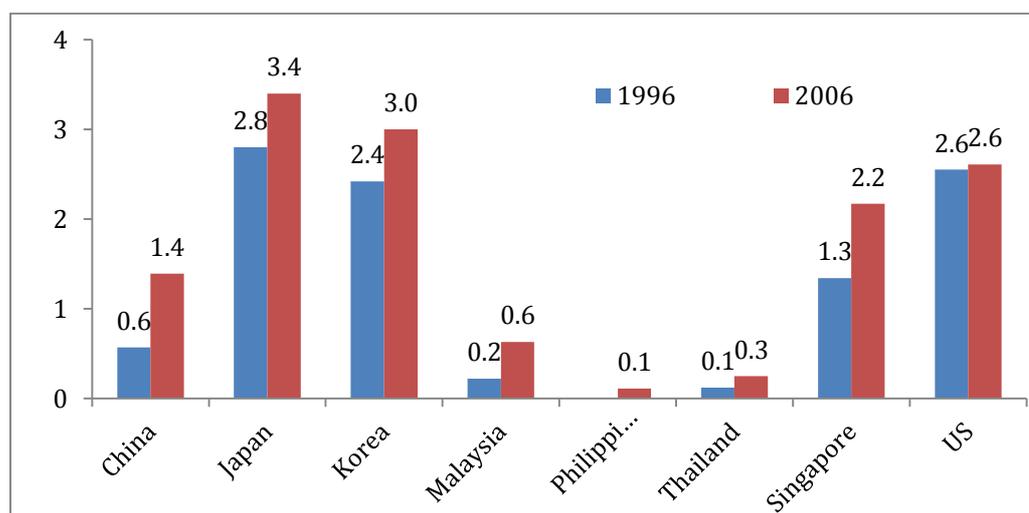
If an economy is able to climb up the industrial ladder, its new industries should be competitive in the market place even with higher labor cost. Then it likely will graduate into high-income status. If the economy fails to innovate, then it won't be able to develop new industries after losing competitiveness in traditional industries. It can compete with neither low-income nor high-income economies and is, thus, stuck in the middle-income range. Therefore, fundamental to avoiding the middle-income trap is a country's ability to constantly innovate and upgrade production, raise productivity, and climb the value chain.

So what does China need to do in order to avoid the middle-income trap? In a recent study, Yingjie Feng and Yang Yao (2014) review descriptive characteristics of a large group of economies. They find that economies successfully rising to high income are often characterized by high saving rates, robust manufacturing sectors, high levels of education, more advantageous demographic structures, a peaceful environment and more equal income distribution. China is quite similar to those successful economies in all of these aspects except for its rising inequality. Therefore, China still has great potential for growth, but some deliberate policies on income distribution are needed, especially in increasing the education levels of rural youth and providing adequate training to migrant workers.

China is often regarded as being only able to produce low-cost products and unable to innovate. Poor protection of intellectual property rights offers a further evidence that China does not do innovation. This is partly true. As a low-income economy, there is little need for China to create its own patents, since it can learn from more advanced economies. This Chinese experience is not unique. The same happened to Japan and the four Asian tigers before. Even the Americans copied or stole textile technologies from the United Kingdom in the 19th Century (Morris 2012).

However, the actual situation is probably not as bad as many people think. Data suggest that China is already experiencing a science and technology takeoff, which is happening at a much earlier development stage compared with international experiences. In 1996, R&D expenditure accounted for 0.6% of GDP. In 2006, it more than doubled to 1.4%. This was still lower than Japan's 3.0%, Korea's 3%, Singapore's 2.2% and America's 2.6%. However, it was already significantly ahead of many developing countries (Figure 4).

Figure 4. R&D intensity of China and selected countries, 1996 and 2006 (%)



Source: World Bank.

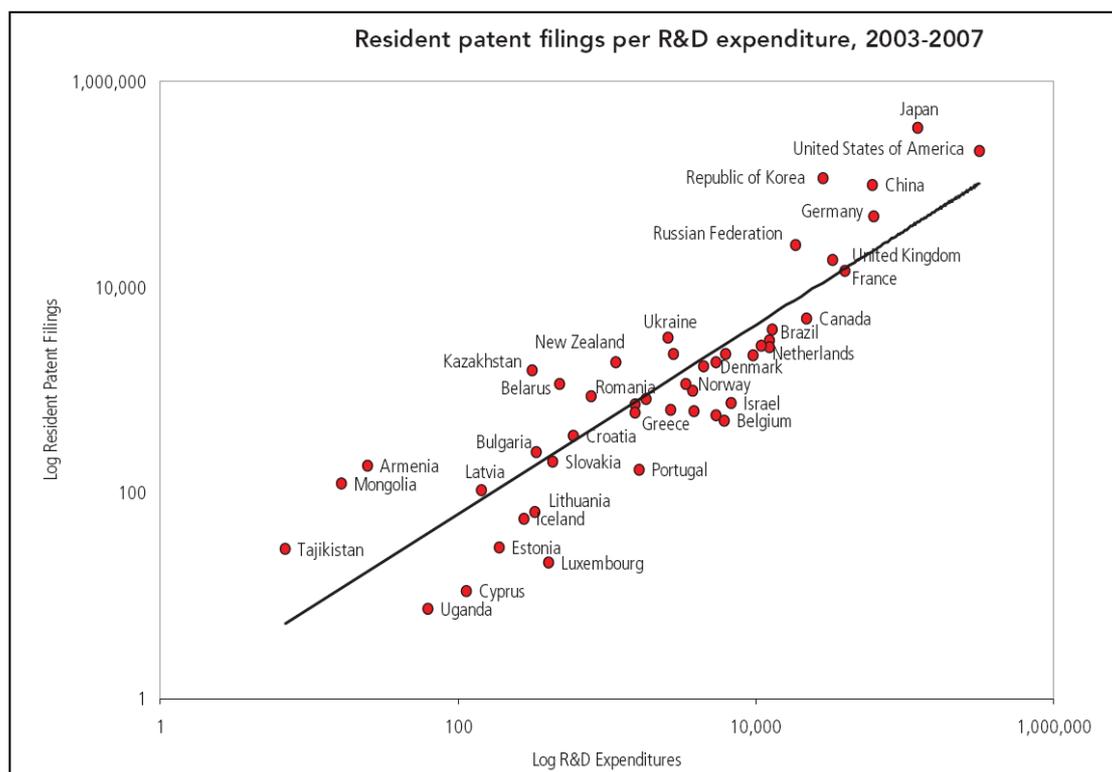
Jian Gao and Gary Jefferson (2007) examine cross-country behavior of R&D expenditure. They find that, on average, a country's R&D started to take off (or crossing the level of 1% of GDP) when its PPP measured income per capita at \$8,000 in 1999 prices. When this happened in China, its PPP measured per capita income was \$3,600 (Figure). They offer three potential explanations for this somewhat unusual phenomenon. The first is the relatively low illiteracy rate. At 16.5%, China's adult illiteracy rate in 1999 was similar to those of Brazil (15.1%) and Turkey (15.4%) with substantially higher incomes, and well below that of India (43.5%). The second is market size. And the third is proximity to dynamic economies. Arguably China's greatest asset is its close physical and cultural proximity to Hong Kong and Taiwan

and to a lesser, but still significant degree, to Korea, Japan, and Southeast Asia.

China is already one of the three largest R&D spenders in the world, alongside the US and Japan. Even if measured by resident patent filing per R&D expenditure, China is also among the top group (Figure 5). China is the only middle-income country in that top group. This is probably an even more important evidence of the early takeoff of China's science & technology.

It is probably wrong to conclude that Chinese do not know how to innovate. In the 1980s and the 1990s, millions of farmers in Pearl River Delta and Yangtze River Delta turned into entrepreneurs. China already created world-competitive companies like Huawei and Alibaba. Recently, many young and not-so-young people think about starting their own businesses or creating their own products. Governments at all levels make significant investment to facilitate innovation. Recently, the office of the State Council published a new policy, encouraging all universities to create their incubators on the campus. Students spending time innovating should be able to convert their experiences to course credit.

Figure 5. Resident patent filing per R&D expenditure, 2003-2007



Source: Compiled by Rio Tinto.

But China will need to do more to support industrial upgrading in order to continue its steady economic growth. First, it needs to better protect intellectual property rights. Incentive to innovate can be immediately

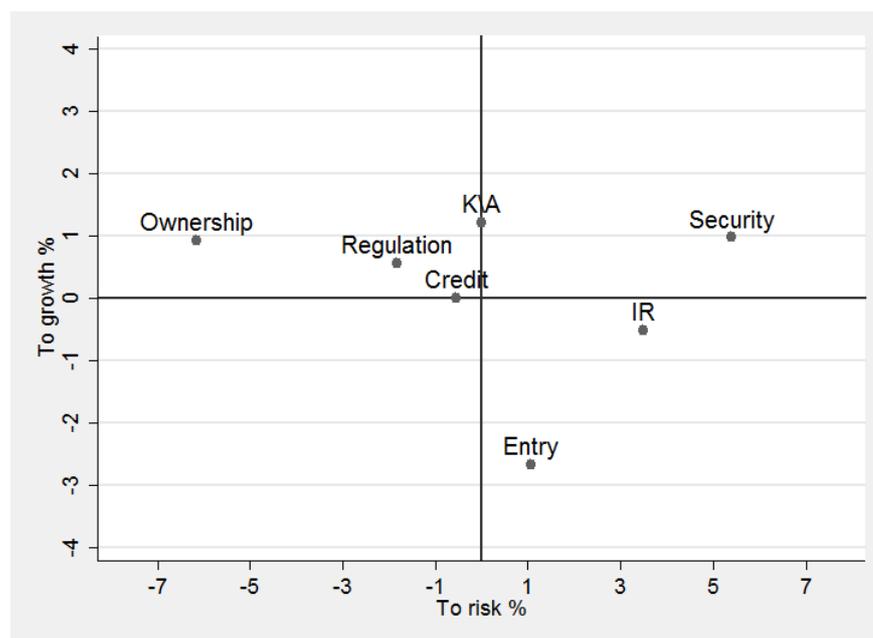
destroyed if intellectual property rights are not properly protected. We think this can happen. International experiences suggest that a developing country's intellectual property rights protection improves significantly when indigenous intellectual property rights become a dominant phenomenon. China is probably reaching that turning point. Also, China is negotiating with the United States on bilateral investment treaty, of which protection of intellectual property rights is an important subject for negotiation.

Second, the government needs to substantially liberalize the entry barriers in many industries such as telecom, energy, finance, etc. So far, Chinese innovation takes place in the least regulated industries, illustrated by experiences of online shopping and internet finance.

Third, China should free up its financial system. Although China built a very large financial sector during the reform period, it is dominated by the banking sector, on the one hand, and is subject to heavy policy intervention. This system worked fine in supporting manufacturing expansion during the early stage of economic development. However, a bank-dominated financial system is incompatible with innovation-based economic activities, which are more suitable for venture capital and private equity investment. In addition, the current repressive financial policies, such as government intervention in interest rate, exchange rate, bank credit, security market and capital account, significantly lower efficiency of resource allocation.

The government outlined a financial reform program covering three broad areas, lowering entry barriers, liberalizing the market mechanisms and improving financial regulation. The analyses by Huang and Ji (2015), however, suggest that there is an important gap in the reform program – ownership reform. Using data of a group of economies, they find that financial regulation and ownership reform are the only two policy steps that deliver both productivity gains and risk reduction (Figure 6). However, reform of ownership or corporate governance of the financial institutions is not a part of the current agenda.

Figure 6. Growth and risk effects of individual reform measures



Source: Huang and Ji (2015).

Related to this, the government does have an ambitious reform agenda for the SOEs, although detailed reform steps are yet to be announced. There is no question that successful restructuring of the SOEs, or at least hardening of their budget constraints, is an important precondition for financial reform. Otherwise, financial liberalization could easily lead to significant financial risks.

Fourth, the government should significantly step up its support to science and technology. Basic education, including primary school, high school and university education, and fundamental research should be the responsibility of the government. The greatest challenge is, however, training of 300 million migrant workers, whose average education level is junior high school. Most of these workers are employed in labor-intensive industries and services, many of which are losing competitiveness rapidly. These workers may be more vulnerable during industrial restructuring. In the meantime, These workers' skills will also determine if Chinese industries can upgrade. If migrant workers' skills cannot be improved quickly, they would lose jobs quickly but could not support future industrial upgrading.

And, finally, while China will probably not transit to a western-style political system in the perceivable future, some steps of political reform are quite possible. It is true that political measures are necessary to eradicate many social economic problems, such as corruption, disparity and monopoly. But we reject Acemoglu and Robinson's proposition that Chinese growth has been one under extractive political institutions and, therefore, it will likely run out of steam. First, experiences of East Asia suggest that there is probably more than just one form of political institutions that can support long-run

growth. This is particularly so if the economy is still in the mode of technological catch up. Second, although institutions are very important, economic policies under the same institutions can still make a huge difference in terms of economic growth, as illustrated by the comparison of Jamaica and Barbados. And, third, not only politics determines economic institutions and, therefore, growth, but economic activities can also influence politics.

The last point is the reason why we are optimistic that positive changes may take place. This is already evidenced by introduction of grassroots democracy in the countryside more than 10 years ago. A number of municipal governments in the coastal region scraped plans of constructing pollutant industrial projects after protests by local residents. Social media, such as weibo, is already an important informal channel of dialogue between the public and the government and played critical roles in purging of some corrupted senior officials.

Toward a high-income economy

Whether or not China can avoid the middle-income trap is dependent on many different factors. However, there are probably three most important tests for China's growth sustainability in the coming decade. First, can China break away from its old growth model, reducing the imbalance, inequality and inefficiency problems? Second, will the political system be flexible enough to contain social conflict and maintain political stability? And, third, does China have the capabilities to continuously push technological innovation and industrial upgrading? These are also the three issues addressed in this report.

Structural improvement, including narrowing external account surplus, rising consumption share of GDP and declining income inequality, is already underway, which, unfortunately, has been underappreciated by investors and analysts. And one key trigger of recent structural improvement was rapid growth of wages. It not only redistributes income from corporations back to the households but also improves income distribution among households, because low-income households depend more on labor income while high-income households often rely more on investment returns. The back-door liberalization of interest rates, in forms of growing shadow banking businesses, further increases household income and squeezes corporate profits.

Although rebalancing has so far been driven mainly by changes in factor market conditions, economic reforms will be critical for furthering structural improvement. These should include removing remaining factor cost distortions, liberalizing the financial sector and improving the social security systems. We do not think outright privatization of SOEs is feasible in the near term. But the government likely will move steadily toward creation of level-

playing field by removing input cost subsidy and breaking down monopoly power.

Surprisingly, takeoff of China's science & technology already occurred, much earlier than international experiences. This happened because of high literacy rate, large market size, proximity to dynamic economies and, probably, large FDI inflows. China is already one of the world leaders in R&D spending and research productivity, despite its middle-income status. Its number of patents dominates those of the US and Germany in the low-value segment and it is catching up very rapidly in the medium-value segment. Most importantly, private enterprises play a major role in China's R&D activities.

Of course, there are some important hurdle China has to overcome in order to further technological innovation and industrial upgrading. It needs better protection of intellectual property rights. Innovation also requires special financial services, not the typical bank loans. The government should probably also allocate more public funds to support education and basic research. In the meantime, it may like to review its current strategy of developing new strategic industries, especially direct involvement of local governments. Overall, the government should leave technological innovation and industrial upgrading decisions and activities to the private sector. Innovation is best done in decentralized fashion and cannot organized by central plans. But at the same time, the government may be able to provide supports, such as hard and soft infrastructure, in order to overcome problems of market failure or externality.

Making long-term forecasts are difficult by definition. So only time can tell if China will succeed in facing challenge of the middle-income trap. However, judging from likely evolution of the above three issues, we are reasonably confident to predict that China should be able to avoid the middle-income trap. While many economies failed in that test during the past half-century, China is surrounded by successful role models in its immediate neighborhood – Japan, Korea, Taiwan and Hong Kong. With these economies China shared not only similar culture but also the same model of economic takeoff.

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