

Date of the hearing: USCC, February 24, 2023

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“Testimony before the U.S.-China Economic and Security Review Commission: China’s Education System”

China’s economy has grown rapidly over the past 40 years; today it is the second largest in the world (Morrison 2019). Recent research (Gustafsson et al. 2020) has shown that in recent decades nearly 400 million of China’s people have moved into the global middle class. China today is classified as an upper middle-income country. While many observers have assumed that China’s continued growth and transition into a high income/high skill economy is a given, Figure 1 shows two things. First, as of 2015 China still has a significant way to go to become a high-income country. Second (and the subject of this testimony), I believe that by looking at the human capital of China’s current labor force (especially that part of the labor force that is from China’s rural areas—still accounting for more than 60% of the population in terms of residency permit status) that there are serious questions about whether this transition out of middle income can proceed smoothly. Although China has focused a great deal of attention in the past decade-plus on the rural population in terms of education (i.e., the government has invested a lot and made some positive changes), there are still hundreds of millions of poorly educated individuals in the labor force that do not have the skills to contribute to a high income/high skill economy; China’s education system also is still in need of additional massive investments and fundamental reforms, starting even when children are infants and toddlers.

The middle-income graduates and the trapped

According to the OECD (2016), there are three types of economies that exist in the world today. The first set of nations is comprised of countries that were high income in 1960 and are still high income today, such as the United States, Denmark, Japan and other OECD countries. The second group is made up of a small group of nations that have moved up from middle income (in the 1960s) to high income status today, like Ireland, Israel, South Korea, and Singapore. The third grouping are those nations that are “stuck in the middle-income trap.” These are countries, including Turkey, Thailand, Argentina, Brazil, Mexico and South Africa, that were middle income in 1960 and are still middle income today. Decade after decade, the members of this group have endured false starts and cycles of growth followed by contraction or collapse without ever managing to rise to high income status. When contraction or stagnation in these countries occurs, millions of people often are hurt and the livelihoods of families invariably fall.

While there are a number of different factors that may account for the difficulty of escaping from the middle-income trap, one underappreciated factor that may account for the disparate paths of these three groups of countries is education. Among wealthy countries, the average share of the labor force (all individuals between the ages of 18 and 65) with at least a high school education is 78% (Rozelle et al. 2020). Countries that have exited out of the middle-income status to join the ranks of the wealthy also had high levels of at least high school education even when they were still middle income (72%). Conversely, in countries that have failed to exit from middle-

income status, the share is much lower—only 36% of the labor force has a high school education, on average.

Education and economic upgrading

Why is it that the relatively low levels of human capital might be a key factor in keeping countries from transitioning from middle-income to high-income? In short, higher levels of secondary school education for its labor force are crucial for a country to make the transition to high income status. An educated labor force can more easily shift into higher value-added (or “white collar”) jobs, facilitating the national transition from a low skill, low wage economy to a high skill, high wage economy. A good example can be found in the experience of South Korea. After wages in that country rose steadily in the 1980s, firms began to globalize and automate to replace increasingly expensive workers. This caused demand for low skill, labor-intensive employment to fall sharply (Li et al. 2017). However, because education rates were already relatively high at this time, displaced workers were able to shift into higher skilled work, for example, becoming accountants, clerks and office staff (Kim et al. 2016). In essence, more schooling allowed these workers to “learn how to learn,” helping them reskill after leaving jobs on the factory floors or construction sites for new and higher paying employment (Khor et al. 2016).

As workers rise up the value chain their wages stay relatively high, as does their demand for services (Gustafsson et al. 2020; Kharas and Kohli 2011). High wage jobs with benefits encourage demand for high value services, creating a virtuous cycle that can sustain growth over the long term (Diacon and Maha 2015). By contrast, without sufficient education, too many unskilled workers are squeezed out of upgraded industries because they lack the skills to compete. Their wages can stagnate, curtailing demand and hampering growth, leading to serious social problems like crime, higher rates of unemployment, and social unrest. When unemployment and crime and social unrest rise, investors shift elsewhere, exacerbating the problem. The ensuing vicious cycle has ensnared many middle-income economies for decades.

So how does China measure up? In fact, China’s overall education rate is one of the lowest in the middle-income world, according to the OECD metric on high school attainment. When one looks at Figure 2, one can see that comparing China’s human capital with that of other countries, it is not only systemically lower than that in South Korea, Ireland, and other “graduates” out of middle-income status (Bai et al 2019; Li et al. 2017), the share of undereducated workers in China’s labor force is larger than that of virtually all trapped middle income countries. According to China’s own census data (in 2015), just 30% of the labor force between the ages of 18 and 65 had ever attended high school, which is less than the average of other middle-income countries (36%) and well below the OECD average (78%). Furthermore, China’s census shows that, in 2010, only 12.5% of the overall labor force was college educated, lower than that of most other middle-income countries (Li et al. 2017; NBSC 2010). In other words, China’s workers (mostly those from rural areas) lag behind not only the graduates in terms of secondary and tertiary education levels, but also that of their middle-income peers.

Locked out of the middle class

China's middle class has grown at a rapid pace in recent decades, but an examination of its composition further highlights the risks of stagnation due to the existence of a huge low-income class (more than 900 million—Gustafsson et al. 2020). It is also true that the rise in the middle class has been tremendous, from nearly zero in the 1990s to around 400 million people in China today who can be said to be living at middle-income levels comparable to those in OECD countries (Gustafsson et al. 2020). But there has been an important common denominator in the growth of those that reach middle-income: almost all entrants into the middle class over the past 20 years have been urban people with formal, salaried employment. More than three-fourths of the middle class hold an urban residence permit (or hukou). Only 12 percent of the middle class consists of rural-to-urban migrants, while rural people that have not moved to big cities account for only 9 percent of China's middle class.

What is it about rural status that so curtails entry into the middle class? Systemic shortfalls in human capital formation have rendered them unable to compete with urban peers. Only 10 percent of rural students from rural areas in Central and Western China (the largest part of the rural population) pass the college entrance exam and enter college (Li et al., 2017). The numbers for high school are similarly troubling: In 2015, according to census data, only 11.3 percent of rural adult workers in the 25–64 age bracket had attained at least high school education. Enrollment quotas in high school and college make performance on standardized tests a key gateway to higher schooling, and rural students pass at much lower rates than urban peers. As early as primary school, children from rural areas are more likely to suffer from learning impairments, with nearly 60 percent of China's elementary school children (ages 6 to 12) having at least one health or nutrition problem (Zhou et al. 2015). Education spending in rural areas is much lower on a per capita basis than in urban schools, with implications for many aspects of rural education, from school infrastructure to teacher quality (Wei 2016).

What is China doing about this?

Does China realize that people in rural areas are falling systematically behind? In fact, there is evidence that China recognizes the problem and has been making substantial efforts to address some of the problems described above. Among the most obvious efforts over the past 15 years has been the expansion of secondary school enrollment, mostly in rural areas. Between 2005 and 2015, the overall high school attainment rate increased sharply, from about 1 in 2 children to about 8 in 10 (Bai et al, 2019). The rise has been most pronounced in rural areas, where in 2005 only 43 percent of children attended high school. Today the rate exceeds 70 percent. In cities today, well over 90 percent of children with an urban residence permit attend high school. Taken together, over the past 15 years China has put tens of millions more children into high school—a remarkable feat.

While the quantitative expansion of high school enrollment is impressive (and needed), quality problems have emerged. Much of the expansion, for example, has been in vocational schools. In the 2010s China's leadership bet that a big fraction of new high schoolers in rural areas would benefit more from technical rather than general education and expanded vocational high school rather than academic high school. Other middle-income countries have pursued this path, including Brazil, Romania, and Indonesia, for example (Newhouse and Suryadarma 2011; National Congress of Brazil 2011; China State Council 2010). Unfortunately, there is little

evidence that these investments in vocational schooling have paid off. Cross-national studies using international standardized tests show that students in vocational high school vastly underperform their peers from academic high schools in terms of skills formation (Altinok 2011). China is no exception: studies have shown that vocational schooling has failed to instill either general learning or even specific vocational skills, and even induces drop out (Loyalka et al 2015). The promotion of vocational schooling, at least in its current form, as a substitute for academic high school, does not appear to be providing the boost in human capital that will help China's rural students compete. That is not to say that China's vocation high school program cannot be improved. However, to do so, there needs to be both more intensive investment into quality-improving aspects of the system, such as better teaching resources and a shift in focus to teaching basic skills—math, science, language, English and computers—rather than specific/narrow job skills that in many cases will become outdated in the near future.

So why are children not ready to attend academic high school? Is it a problem of the quality of schools (at the elementary and middle school levels)? Or do children have health and nutrition problems that reduce learning? In fact, if one looked at children in rural elementary schools a decade or so ago (between 2010 and 2015), there were many problems with both schools and the children themselves. The quality of schools used to be very poor, with old buildings, faulty lighting, insufficient desks, books and other materials. Many teachers were not being paid (or were being underpaid) and sometimes just stopped coming to class (Rozelle and Hell, 2021). Even when there were better classrooms, teachers and books, research showed that children were anemic; had intestinal worms; and were myopic, but, had no glasses.

But, while these problems still exist, most of these things are improving. In fact, China has invested enormously into improving school infrastructure; teachers are now paid by the central government on a timely basis; most schools have computer rooms and libraries and good quality equipment for teaching. A US\$5 billion per year national, free, nutritious lunch program serves more than 25 million children per day in rural schools. Today, anemia rates are at levels that compare to developed countries (Wang and Zhang, 2023). Many provinces are promoting the use of eyeglasses to overcome the high rates of myopia in rural schools. And health programs provide families with access to deworming care in nearly all counties. Clearly schools have improved physically and children are healthier and more nourished than they were 10 years ago (Rozelle and Hell, 2021).

But, China is NOT through with its human capital challenge for rural individuals. Over the past several years, researchers have identified an even deeper problem among rural youth that no amount of school expansion will address: cognitive skills that have failed to emerge in early childhood (Emmers et al., 2021). Almost 3 of 4 infants in China are growing up in rural villages and migrant communities. A review of research on infant development in China revealed that as many as 45 percent of rural babies were at risk for cognitive delays, slightly more than the rate in other middle-income countries (the rate in high income countries is closer to 15 percent). Low cognition in the first three years of life has been shown to lead to low schooling, employment, income, and health outcomes later in life (Heckman, 2006). The problem is not one of poor genes. Nutrition for infants and toddlers could be better, but, by 18 months old, nutrition is fine for most rural young children. The main problem is rooted in insufficient stimulation of infants from caregivers. Studies in China show that close to half of rural caregivers rarely read, sing, or

talk to their babies, either because they are out of the village working (as a migrant and have left their children behind with grandparents) or do not realize how important such engagement is (Emmers et al., 2021). While other middle-income countries, such as Brazil and Columbia and Peru and Mexico, have launched sweeping initiatives in recent years to address cognitive delay among infants through parental training programs, the issue has yet to find substantive traction among policymakers in China. No amount school expansion will compensate for poor outcomes in the critical first years of life.

So it seems as if there are no easy answers to the problem of China's massive rural labor force and their families of nearly 800 million individuals, a population that encompasses 1 in 9 humans. Even with the great effort of the government in recent years, education, health, productivity, and employment outcomes for this group are lower than people realize, and measures to address the problem are complex, expensive, politically fraught, and their pay off will not be felt for years. In the meantime, no analysis of China's growth prospects is complete without considering this rural human capital problem and the degree of success China has in mitigating it. To meet the challenges of simultaneously raising social benefits and adult retraining for rural adults as well as education, health and early childhood education for rural children will require a fundamental shift in priorities and massive transfer of resources.

Is China Doomed to Fall Into the Middle Income Trap?

I am a development economist and work on rural China. I am only an observer of China's macro policies and growth, so these comments must be "taken with a grain of salt."

On the one hand, there has never been a nation in past decades that has moved from middle income to high income (and stayed at high income) when their labor force has had such low levels of human capital. The three countries that were relatively low in terms of human capital in the 1970s and 1980s (around 50% of their labor forces had been to high school at that time) and were able to move from middle income to high income were Portugal, Spain and Greece. Of course, these countries had a tremendous amount of support from the EU after they joined and this invariably aided their transition to high income. Mexico, where only less than 40% of the labor force had been to high school, was admitted to the OECD in the 1990s as a high-income economy (they had just attained high income status in the early 1990s). Since the mid-1990s, however, the growth of Mexico has been near zero and they are currently classified as a middle-income country again. Therefore, from the perspective of the level of human capital of China's labor force, it would seem that China is facing an uphill battle. China's informal economy is large and growing; wage polarization has been documented to be beginning; and it is unclear what 100s of millions of low educated workers could do in a high skill/high wage economy (and if China would be able to manage the social and economic unrest that might emerge if a large share of these became un- or under-employed).

Of course, a nation's economy relies on many more elements than the labor force's overall human capital. In other dimensions, China is doing quite well: investment into infrastructure; health of the external economy (including last year when US-China trade reached its highest point ever); absolute number of engineers; creation and adoption of technologies in many (but of course not all) fields. It is possible that successes in other areas could offset the negative effects

of a labor force with a poor level of human capital (and the other impacts that this could have an economy).

Finally, economists that have predicted the downfall of China's economy in the past (at least 40 years) have invariably been wrong. I have been an economist studying China since the 1980s. During the past 40 years, economists have predicted major slowdowns or stagnations or collapses of the economy due to inflation and Tiananmen unrest in the 1980s; the reform of State-Owned Enterprises and the Asian Financial Crisis in the 1990s; WTO competition and the 2008 world recession in the 2000s. As seen from China's growth rates between 1980 and the early 2010s, none of the predictions were realized. China grew at an average of nearly 10 percent per year for almost 35 years in a row. It is true that growth has been slowing, but, it is possible that predictions that China is destined to stagnate or fall into negative growth (due to poor levels of human capital or anything else) may likewise not be realized.

One final word. We need to continue to monitor what is happening to the labor force in China. It is likely to put a lot of pressure on China's economy in the next 5 to 10 to 15 years. But, we also need to be prepared that China will find a way to keep growing. There are many positives and negatives to either a fall-into-the-middle-income-trap or a continued-growth-scenario. Understanding as much as we can about China's economy – in many dimensions – is an absolute MUST.

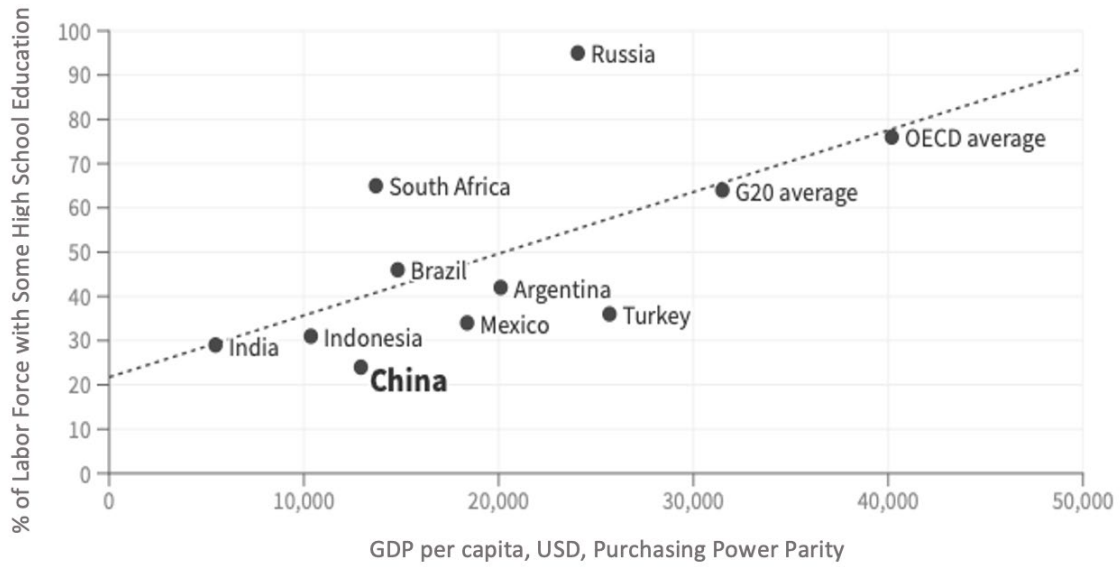


Figure 1. Relationship between GDP per Capita and Education in 2015

Source: IMF; Bai et al., “Past Successes and Future Challenges in Rural China’s Human Capital;” OECD; National Bureau of Statistics of China.

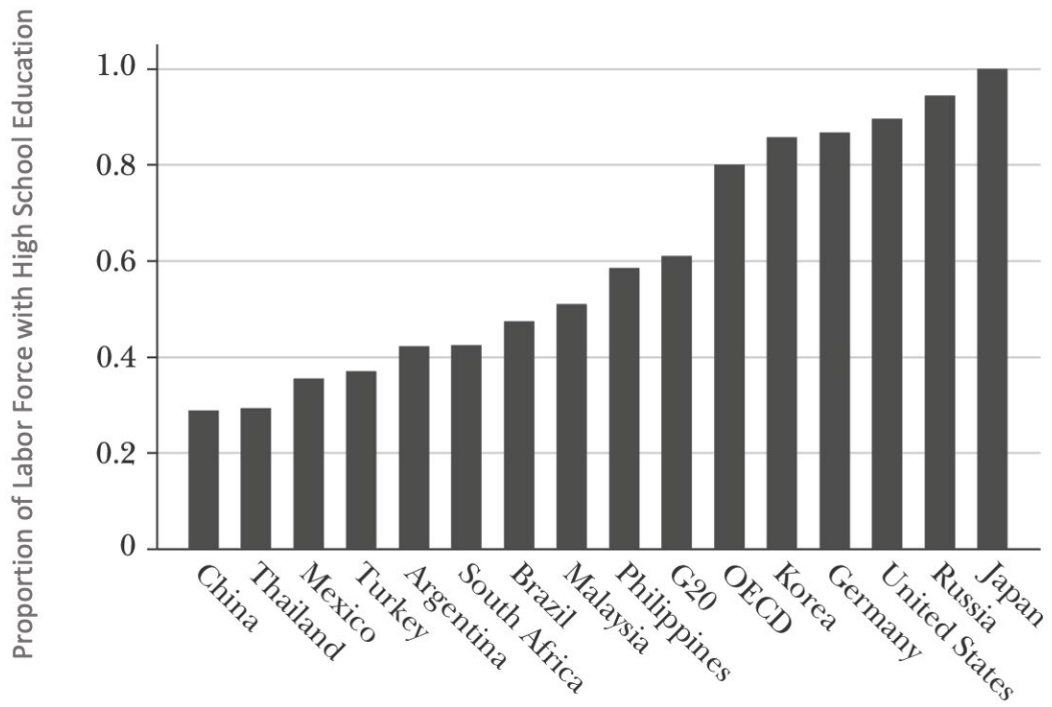


Figure 2. Proportion of the Labor Force Having High School Education in 2015

Source: Li et al. 2019. Journal of Economic Perspectives

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Sources of Data for Figures 1 and 2

Figures 1: GDP per capita data: World Bank, IMF. Educational attainment data for 2015: Yu Bai et al., “Past Successes and Future Challenges in Rural China’s Human Capital,” *Journal of Contemporary China* 28, no. 120 (November 2, 2019): 883–98. Educational attainment data for

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Figure 2: Hongbin Li, Prashant Loyalka, Scott Rozelle, and Binzhen Wu, "Human Capital and China's Future Growth," *Journal of Economic Perspectives* 31, no. 1 (2017): 25–48, The numbers for China are from Population Census 1982, 1990, 2000, and 2010 and the 1 percent population sample survey in 1995 and 2005. The numbers for other countries are from "Education at a Glance" by OECD, 2016, and UNESCO Institute of Statistics (UIS). The numbers for Malaysia, Thailand, and the Philippines refer to the proportion among the population above age 25, coming from UIS. The numbers in 2015 are not available for the following countries, and we use their information available in the latest year prior to 2010: Argentina (2003), Brazil (2014), Indonesia (2013), Malaysia (2010), the Philippines (2013), Russia (2013), South Africa (2014), and Thailand (2013).