

**Labor Market Imbalances:
Shortages, or Surpluses, or Fish Stories?**

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There are two competing narratives about the how the labor market in the US will develop over the next decade or two.

The *Impending Shortage* narrative, which has attracted attention from business and policy groups, is that the retirement of baby boomers will create a great labor shortage.¹ Slower growth of new entrants from colleges and universities, an increased proportion of young workers from minority groups, and inadequate training in science and math will produce a shortage of the skills the country needs to maintain itself as the leading economy in the world.² The message to policy makers is to forget about the sluggish real wage growth of the past three decades, the deterioration in pensions and employer provided health care, and fears of job loss from off shoring or low-wage imports. Instead policy should focus on helping business find workers in the coming shortage.

Shortage claims have focused on science and engineering. Many leaders of the scientific establishment and high-tech firms have complained that the US faces a shortfall of scientists and engineers and have asked for governmental policies to address this problem. The National Academy of Sciences (2006), the Association of American Universities (2005), and the Government, University, Industry Roundtable of the National Academy of Sciences (2003) have issued reports arguing for increases in the

¹ Economists try to avoid the words shortages and surpluses since in a well-functioning market, prices or wages adjust so that buyers and sellers are in equilibrium, with no one wanting to sell or buy more. I interpret the terms to include changes in prices from long-run equilibrium values that could have been avoided if market participants had foreseen the shifts in demand or supply better than they did.

²See Judy and D'Amico, 1997; the National Association of Manufacturing (2003); the U.S. Chamber of Commerce (2006); the Aspen Institute's Domestic Strategy Group (2004). Time Magazine on The Coming Job Boom: (Eisenberg, *Time*, 2002).

supply of scientific and engineering talent in the US. The heads of Intel, Microsoft, and other high tech firms have spoken out on this issue as well. Responding to the business community, President Bush announced in his 2006 State of the Union Address “the American Competitiveness Initiative” that stressed the importance of investing in our science and engineering workforce.

But the shortage claim goes beyond science and engineering. Demographic projections of the US labor supply that show a sharp reduction in the growth of the work force through 2050 (see table 1) have aroused concern in the business and policy community. Reporting the consensus from the Aspen Institute’s Domestic Strategy Group, David Ellwood stated that: “CEOs, labor leaders, community leaders, all came to the unanimous conclusion that we will have a worker gap that is a very serious one.” (cited by Overholt, 2004) A 2003 Fortune Magazine headline declared “Believe It or Not, a Labor Shortage Is Coming” for virtually all workers (Fisher, 2003).

Believers in the impending shortage story generally favor increased immigration, particularly of highly skilled workers through H1B and other visas; increased spending on education and technological innovation; and guest worker programs to keep a sizable flow of less skilled but legal immigrants coming to the country. They regard many of these immigrants as complements rather than substitutes for US workers. They also advocate greater education and training of US citizens, particularly of disadvantaged minorities.

The *Globalization Surplus* narrative, which has attracted attention as part of discussions of the current mode of globalization, takes the opposite tack. It holds that the spread of global capitalism around the world, particularly to China and India, has

generated a labor surplus that threatens wages in advanced and higher wage developing countries. Trade, off-shoring, global sourcing of jobs, and flows of capital to the low wage giants combine to reduce the demand for workers in manufacturing and tradable services in advanced countries and in moderate income developing countries.

At first, the advent of huge numbers of workers from India and China into the global capitalist system seemed to offer a boon to most workers in advanced countries. The labor force is less skilled in the global giants than in the advanced economies. According to the Heckscher-Ohlin model, skilled workers in the advanced countries would benefit from the new trading opportunities while only the relatively small number of unskilled workers would lose. If all workers in the North were sufficiently educated, they would avoid competing with low paid labor overseas and benefit from the low priced products produced there. Competition from low wage workers in China and India might create problems for apparel workers in Central and Latin America or for South Africa, but not for machinists in the advanced North. Similarly, the “North-South” trade model that analyzes how technology affects trade between advanced and developing countries implied that trade would benefit workers in the North, who had exclusive access to the most modern technology. More low wage workers in the developing world would lead to greater production of the goods in which the South specialized, driving down their prices.

Tell it to Lou Dobbs! The off shoring of computer jobs, the US’s trade deficits even in high technology sectors, and the global sourcing strategies of major firms have challenged this sanguine view. The advent of China, India, and the ex-Soviet Union shifted the global capital-labor ratio massively against workers. Expansion of higher

education in developing countries has increased the supply of highly educated workers and allowed the emerging giants to compete with the advanced countries even in the leading edge sectors that the North-South model assigned to the North as its birthright.

Which narrative better fits the labor market? On what demographic and economic factors do the competing stories hinge? Whichever way the supply-demand balance tilts, how well can we expect market forces to restore balances? What policy stances might best help American workers as globalization proceeds?

In this paper I assess the two competing visions and the demographic and economic projections on which they are based. I reject the notion that the retirement of baby boomers and slow growth of the US work force will create a future labor shortage in favor of the argument that the increased supplies of skilled labor in low-wage countries will squeeze highly skilled as well as less skilled US workers. I examine the problem of attracting native US talent in science and engineering in the face of increasing supplies of highly qualified students and workers from lower wage countries. Going beyond the US, I argue that the expansion of global capitalism to China, India, and the former Soviet bloc has initiated a critical transition period for workers around the world. Pressures of low wage competition from the new giants will battle with the growth of world productivity and the lower prices from those countries to determine the well being of workers in higher income economies as the low-income countries catch up with the advanced countries. While US wages will not be “set in Beijing” how workers fare in China and India and other rapidly developing low wage countries will become critical to the position of labor worldwide. .

1. A Great Labor Shortage – An Angler’s Tale

The most alarmist claims that the US labor market faces a great labor shortage in the foreseeable future begin with the notion that total gross domestic product (GDP) should increase in the future at a rate comparable to the growth rate in the recent past. From 1980 to 2005, US real GDP grew by 3.1 % annually, with 1.4% due to the growth of labor supply and 1.7% due to the growth of labor productivity. The growth of the labor force is projected to drop in half – to 0.7% per year, which makes the 3.1% growth of GDP unsustainable absent increases in labor productivity above historical levels.³ To maintain past growth of GDP with 1.7% growth of labor productivity from 2005 to 2030, the US would need 30 million workers more than the labor supply that the Bureau of Labor Statistics has projected for that year. The result: the cry of impending shortages.

Despite the attention given to calculations of this kind, they make little sense in terms of social welfare. Making a given growth rate of GDP the touchstone of economic policy is a cart-before-the-horse policy from the perspective of standard welfare analysis. As a wealthy country, the US can increase GDP whenever it wants by admitting more immigrants. A massively larger labor supply would increase GDP but would reduce GDP per capita and real wages. The standard metrics for assessing how well an economy performs, GDP per capita, or productivity per hour worked, are more appropriate indicators of economic success than the volume of GDP irrespective of population or work force.

Still, these analyses direct attention at two important demographic developments in the first half of the 21st century. The first is that, barring a huge change in immigration policy, the work force will grow more slowly than it had in the past half century or so.

³ The data on changes in GDP and employment are from the Council of Economic Advisors, Economic

The second is that the growth will be concentrated in minority groups that have historically obtained less education and skills than the majority population. Shortage analysts fear that as a results the growth of skilled labor will decline and produce bottlenecks in production that could reduce growth of GDP per capita. Many argue that the country could avoid these problems by investing in education and training in areas such as science and engineering and in the disadvantaged minority groups who may otherwise not gain sufficient skills to do well in the economy.

Table 1 shows the number of persons in the US labor force from 1950 to 2000 and the projected labor force from 2000 to 2050. From 1950 to 2000 the labor force grew by 78.7 million persons, or 127%. From 2000 to 2050, the projected growth of the labor force is 50.9 million persons, or 36%. This deceleration in the rate of growth is likely to be greatest from 2010 through 2030 when just 12.4 million additional persons are expected to join the labor force. The major reason for this reduced increase in the work force is the retirement of baby boomers (i.e., those born between 1946 and 1964). As the Chamber of Commerce's 2006 *State of American Business* report stated "We are staring right in the face of a severe worker shortage as 77 million baby boomers prepare to retire in the next few years— with a fewer number of younger workers available to replace them." (p 13).

The rapid growth of the work force in the 1950s and 1960s came largely from increased numbers of woman workers. In the 1970-1990s growth came from immigration as well as continued influx of women into the work force. In the 2000-2050 period growth of the work force is expected to come disproportionately from Hispanics

and blacks – groups with below average education levels. The share of the US population from disadvantaged minorities (black, Hispanic, American Indians, Alaska Natives) is projected to rise from 25% in 2000 to 37% in 2050.⁴ Some analysts worry that as a result the US workforce will become less skilled unless the country adopts new policies to help these groups improve their educational skills and attainment.

There are two problems with basing projections of labor market imbalances on demographic developments. First, demographic changes have not been consistently associated with changes in labor market conditions in the past, even for the young workers whose position is most sensitive to changing market realities. As a case in point, labor supply grew slowly in Europe in the 1980s-1990s without creating a labor shortage nor reducing high levels of youth unemployment. In the US, the wages of young persons fell relative to older workers when the baby boomers hit the job market in the 1970s (Freeman, 1979, Welch, 1979) but the wages of the young workers did not increase relative to older workers when smaller youth cohorts entered the market in the 1990s. The employment and earnings of young workers depends more on macro-economic conditions, wage-setting institutions, and technological developments than on demography. Second, the US is not a closed economy dependent only on domestic labor to produce goods and services. In the global economy, demographic and labor conditions in other countries affect the US labor market. Globalization gives US firms access to labor overseas through foreign direct investment, off shoring, or subcontracting and

⁴ <http://www.census.gov/ipc/www/usinterimproj/natprojtab01a.pdf>, table 1, where I estimate the disadvantaged minority group as 1 minus the proportion who are white non Hispanic, Asian, and all other races.

access to foreign-born labor that immigrates to the US. The claims of a coming labor shortage must be assessed in a global context

As a first step toward doing this, I examined UN data on the actual and projected change in the populations of persons in a broad working age group of 15-59 year olds (See table 2). Consistent with the BLS projections, the numbers in table 2 show that the *increase* in the US population in this age bracket drops from 44 million additional persons in 1975-2000 to 20 million in 2000-2025 and 21 million in 2025 to 2050. But the projected declines in this age group are much greater in Western Europe and Japan. As a result the US share of the population among these advanced countries rises from 50% to 62%. As for the two major highly populous developing countries, China's population aged 15-59 is projected to rise through 2025 and then to fall as the single child policy affects the size of cohorts; while India's population is expected to increase throughout the period. The ratio of the Chinese population to the US population will barely change from 2005 to 2050. For the world as whole, the UN projects that the number of persons aged 15-59 will increase massively, so that if enough of these persons gain appropriate labor skills, it would take a massive increase in demand for labor to generate labor shortages.

2. Doubling the global workforce: a real whale

Demographic trends aside, the global labor market changed greatly in the 1990s due to the advent of China, India, and the ex-Soviet bloc to the world economic system. During the Cold War era, these countries had trade barriers, self-contained capital markets, and little immigration to the advanced countries – all of which isolated their labor markets from those in the US and the rest of the capitalist global world. The collapse of Soviet communism, China's decision to “marketize” its economy, and India's

rejection of autarky, greatly increased the supply of labor available to the global capitalist system. I estimate that if China, India, and the ex-Soviet bloc had remained outside of the global economy, there would be about 1.46 billion workers in the global economy in 2000 (figure 1). Because those countries joined the rest of the world, there were 2.93 billion workers in the global economy in 2000. Since twice 1.46 billion is 2.92 billion, I have called this “The Great Doubling” (Freeman, 2005b).

The effect of this huge increase in the work force changed the balance between labor and capital in the global economy. Multinational firms could suddenly hire or subcontract work to low wage workers in China, India, and the ex-Soviet bloc instead of hiring workers in the advanced countries or in other developing countries. I estimate that as result of the doubling of the global work force the ratio of capital to labor in the world economy in 2000 fell to 61 percent of what it would have been in 2000 before China, India, and the ex-Soviet bloc joined the world economy.⁵ The reason the global capital labor ratio fell was that China, India, and the ex-Soviet bloc did not bring much capital with them when they joined the global economy. India had little capital because it was one of the lowest income countries in the world. China was also very poor and destroyed some of its capital stock during the Maoist period. The ex Soviet Empire had a high investment rate and was wealthier than China or India but invested in military goods and heavy industry instead of in computer-driven technologies or in the production and

⁵ Using data on yearly investments from the Penn World tables, I applied the perpetual inventory method of cumulating investments per year into capital stocks for each country with sufficient information and summed the estimates to obtain the capital stock in the global economy for 1990 and 2000. I used two different depreciation rates, a 5% rate and a 10% rate. The 5% rate gives investments a longer life and thus produces a higher amount of capital than does the 10% depreciation rate. I also made some adjustments for the estimated lower productivity of capital in communist countries.

delivery of consumer products. One lesson from German reunification was that much of the civilian capital in the old Soviet Bloc was either outmoded or so polluting as to be basically worthless.

Gaining access to the capital stock and technology in the advanced countries has greatly benefited workers in China, India, and to a lesser extent in the ex-Soviet bloc. Firms in advanced countries off shore jobs to India, fund joint ventures in China, import manufactured goods from China, set up research facilities in India and China; and subcontract production to them and to other low wage countries. In Europe, German manufacturers set up plants in Eastern Europe, where wages are far below those in Germany, and look longingly at the Ukraine, where wages are even lower than in Eastern Europe. By giving firms a new supply of low wage labor, the doubling of the global work force has weakened the bargaining position of workers in the advanced countries and in many developing countries as well. Firms threaten to move facilities to lower wage settings or to import products made by low wage workers if their current work force does not accept lower wages or working conditions, to which there is no strong labor response. The result is a very different globalization than the IMF, World Bank, and other international trade and financial organizations envisaged two decades or so ago when they developed their policy recommendations for the world economy.

What about skills and technology?

The difference between the skills of workers in the US and those in low wage countries was in the forefront of the debate over the impact of the NAFTA treaty with Mexico on US workers. Proponents of the treaty argued that the US would gain high-

skilled jobs from increased trade with Mexico while exporting low-wage less-skilled jobs. All US workers had to do to benefit from globalization was to invest more in human capital. The proponents also promised that the ensuing boom in Mexico would reduce the flow of illegal immigrants to the US and thus lessen labor competition at the bottom of the US job market. The argument that the US/other advanced countries should gain skilled jobs while losing less skilled jobs would seem to apply even more strongly to China and India than it did to Mexico. The average worker in China and India has lower skills than the average Mexican worker because so many are peasants with limited education and relatively few have university training. Perhaps the right way to consider these workers is as *complements* rather than *substitutes* for American workers, who will increase US demand for educated labor relative to less-educated labor, and thus create a greater potential shortage of skills in the US.

The current global labor market has not developed according to this scenario. Countries around the world, including the new giants, have invested heavily in higher education, so that the number of college and university students and graduates outside the US has grown rapidly relative to the number in the US. Table 3 shows that the US share of enrolments in higher education declined dramatically from the 1970s through the 2000s. In 1970 approximately 30% of university enrolments worldwide were in the US. In 2000, the US proportion of university enrolments worldwide was 14%. Similarly, at the PhD level, the US share of doctorates produced around the world has fallen from about 50% in the early 1970s to a projected level of 15% in 2010. Some of the growth of higher education overseas has been the result of European countries rebuilding their university systems following the destruction of World War II, and of Japan and Korea

investing in university education. By the mid 2000s several EU countries and Korea were sending a larger proportion of their young citizens to university than the US (OECD, 2005).

But highly populous low wage countries have also invested heavily in higher education. Indonesia, Brazil, China, India – name the country – have more than doubled university student enrolments in the 1980s and 1990s (Freeman, 2006). China has made a particularly large investment in science and engineering, so that by 2010 it will graduate more PhDs in science and engineering than the US. While the quality of graduate training is higher in the US than in China, China will surely improve quality over time. India has produced many computer programmers and engineers.

To find out how well graduates in developing countries can compete with those from advanced countries in the global labor market, in 2005 the McKinsey Global Institute asked recruiters for multinational firms the proportion of graduates from developing and transition economies that they viewed as good candidates for jobs. The recruiters came up with numbers ranging from 10 percent to 20 percent, depending on the occupation and country. Strong English-skills were a key factor in this assessment, so that and many of the workers that the multinationals did not feel met their requirements could undoubtedly do world class work for firms in their own countries and languages. But even ten to twenty percent of an increasing number of graduates from developing countries adds immensely to the supply pool from which multinationals fill vacancies.

In sum, the notion that US skilled workers need not worry about competition from equally skilled workers in low income countries because developing countries have fewer graduates per capita does not fit with reality. With an increased supply of highly educated

persons from low wage developing countries, multinational firms can off-shore high-skilled work and hire graduates from universities world wide; while large numbers of highly educated immigrants can come to the US to work.

3. Scientists and Engineers as a special case?

As noted, the scientific and technological establishment proclaimed that the US has a shortfall of science and engineering workers in the early to mid 2000s. Past experience with shortages of scientists and engineers suggests that we view such claims skeptically. The first time the US troubled over shortfalls in the science and engineering work force was in the late 1950s-1960s, prompted by the surprise launch of Sputnik by the Soviet Union in 1957. Congress responded by enacting the National Defense Education Act of 1958 and by increasing federal R and D and development of missiles. The immediate result of the R&D increase was a rapid rise in the earnings of scientists and engineers, so the labor market confirmed the shortage claim. Given the time required for the new fellowships and higher wages to increase supply, the supply/demand balance had indeed shifted in favor of workers.

The next two claims of shortages failed, however, to reflect reality. In the early 1980s, NSF announced a scientists and engineers' shortage that turned out to be unjustified. The shortage was based on policy-makers' erroneous use of data, which produced angry articles and editorials in Science and Nature, among other places. As best one can tell, the claimed shortage came from a desire to reduce the cost of scientists and engineers to large firms (Weinstein). In the early 1990s, leaders of the scientific community again proclaimed an incipient shortage of scientists and engineers. Richard C. Atkinson, then president of the American Association for the Advancement of Science

predicted that by the year 2000, demand for scientists in the U.S. would outstrip supply by almost 400,000 persons (1990). But throughout the decade, indicators of the state of the S&E labor market (salaries; unemployment rates; the number of graduates and post docs relative to tenure track job in academic institutions, etc) showed no evidence of a shortage. From 1990 to 2000 earnings rose more slowly in science and engineering than in law, medicine, and related professions. While the booming 1990s did produce a shortfall of computer programmers and related specialist, this disappeared in ensuing years as firms off-shored work to the lower wage countries, notably India. The BLS reduced its projected increases in employment for computer and mathematical scientists over the next decade by half million (Freeman, 2006). From the perspective of young persons choosing a career, prospects in science and engineering seemed highly uncertain and less lucrative than prospects in business, finance, law, or medicine.

During the 1990s boom the US increased the employment of scientists and engineers greatly. It did this despite fairly constant numbers of graduates in science and engineering among citizens or permanent residents. Much of the increased S&E employment took the form of “importing” large numbers of foreign-born students and workers in these disciplines. Table 4 shows how the share of foreign trained workers in the S&E labor market grew in the period. The most telling statistics are that by 2000 over half of PhD scientists and engineers below the age of 45 and postdoctoral workers, who were foreign born. The large increase in the proportion of bachelor’s degree scientists and engineers from overseas is also striking, however, since there are many more BS workers than PhD or master’s degree workers. Some of the foreign born obtained their education in the US and stayed to work in the country. But most of those with BS

degrees and roughly half of those with higher degrees graduated overseas and came to fill jobs.

The lesson from the 1990s increased employment of S&E workers is clear: if the US economy demands more highly skilled workers in the period of projected slow labor force growth, it can increase supplies by admitting more immigrants in areas with rising labor demand, as it did in the 1990s.⁶ The rising supply of highly educated persons overseas, many of whom major in science and engineering, suggests that as long as the US is an attractive place to work and is open to immigration, it *cannot* experience a shortage in the S&E workforce.

This does not mean that the US does not have a potential problem in the supply of citizens into science and engineering work. It is possible that the country relies excessively on foreign-born talent in this area. This could risk a sudden decline in supply due to political problems, visa restrictions (as occurred for international graduate students post 9/11), or other factors outside the job market. To the extent, moreover, that the native born are more attuned to American economic and social realities, reduced numbers of US born scientists and engineers could weaken the connection between S&E and business that has made the country a paragon in turning scientific knowledge into technological and business innovation. I would recast concern about shortages of S&E workers in the US from supposed shortages of overall supply, which find no support in labor market data, to the balance between native and foreign-born scientists and

⁶ From the mid-1990s through early-2000s the US doubled the budget of the National Institute of Health. This had little positive impact on the careers of new US bio-scientists, whose pay remained among the lowest among scientists and who had limited career prospects. One reason was the huge supply of “post-docs” and graduate students from foreign countries willing to work at low wages in US labs.

engineers in the work force. If the problem is this balance, there are clear policies that could make S&E careers more lucrative and attractive to Americans. More spending on research and development would raise demand and wages relative to opportunities in other occupations. Provision of more and higher valued scholarships and fellowships would increase the supply of Americans (Freeman, Chiang, Chang, 2005). Allocation of a larger share of research grants to young researchers as opposed to senior researchers would make the fields more attractive to young Americans. But as in the 1950s, this would require government spending as opposed to moral suasion.

4. The Challenge of Human Resource Leapfrogging

*Comparative advantage, comparative advantage, wherefore art thou,
oh comparative advantage?*

In the North-South model that trade economists use to analyze how technology affects trade between the advanced North and the developing South, the advanced countries monopolize cutting edge innovative sectors while developing countries end up producing traditional products. The greater the rate of technological advance and the slower the spread of the newest technology to low wage countries, the higher paid are workers in the North relative to workers in the South. The comparative advantage of advanced countries in high tech sectors is rooted in those countries having more scientists and engineers and other highly educated workers relative to the overall work force than developing countries.

In these sorts of analyses, the spread of higher education and modern technology to low wage countries can reduce advanced countries' comparative advantage in high-tech sectors and adversely affect workers in the advanced countries as a result. Any country with a comparative advantage in a given sector can lose when another country

can compete successfully in that sector. The increase in supply reduces the price of the exports, with a potential loss of income for the original dominant exporter. If a foreign competitor gains comparative advantage in industries that have particularly desirable attributes— that employ large numbers of highly educated workers and offer great opportunities for rapid technological advance – the country with the initial advantage has to shift resources to less desirable sectors – those with lower chance for productivity growth, with fewer good jobs, and so on.

The usual assumption regarding high tech sectors is that only advanced countries have the educated work force necessary for competing in them. In the 1980s, Americans got worked up when Japan seemed to be producing better high tech products than the US. In the 1990s the US worried about the competition between Airbus and Boeing in the manufacturing of aircraft. No one entertained the notion that China or India would become major players in high technology leading edge industries. In Global Trade and Conflicting National Interest (2001) Gomory and Baumol argued that trade between low wage and high wage countries invariably benefited both groups while one country's advance could harm another through trade between countries with similar levels of development.

The advance of China and India into high tech has obsolesced these analyses. China has moved rapidly up the technological ladder; has greatly increased its high tech exports, and has achieved a significant position in research in what is purported to be the next big industrial technology – nanotechnology. Over 750 multinational firms have set up R&D facilities in China. China's share of scientific research papers has risen greatly. While India has not invested as much in science and engineering as China, it has

achieved a strong international position in information technology, also attracting major R&D investments, particularly in Bangalore.

How can low income countries with few scientists and engineers relative to their work forces compete in high tech?

These countries have moved to the technological frontier because success in high tech depends on the absolute number of scientists and engineers rather than on the relative number of S&E workers to the work force. It isn't how many engineers per person that produces a technological breakthrough as much as the total number of engineers working on the problem. Put differently, there is an economy of scale in R&D and innovation that enables large populous countries to reach the scientific and technological frontier. China and India can have a large footprint in high tech because they will have many highly educated scientists and engineers, not because they approach the advanced countries in S&E workers per capita. I have called the process of moving up the technological ladder by educating large numbers as "human resource leapfrogging" since it uses human resources to leapfrog comparative advantage from low tech to high tech sectors, contrary to the assumption of the North-South model. The low wages in these large populous countries, moreover, makes them formidable competitors for an advanced country because it gives them a potentially large cost advantage in attracting R&D.

The bottom line is that the spread of modern technology and education to China and India will undo some of the advanced countries' monopoly in high tech innovation and production. The North no longer has a lock on high tech that lies at the heart of the North-South model.

5. Transition to the New Global Labor Market

The triumph of global capitalism has brought modern technology and business practices to most of humanity. Barring disaster, the world is on an historic transition to a truly global economy and labor market that should produce rough income parity among nations and “make poverty history”. The way the transition proceeds will have immense consequences for workers throughout the world. Workers in the new entrants to the global economy should do better since capital will flow to them, raising wages and modern sector employment. Developing countries where wages exceed those in China and India face a big problem as these countries will have find their place in the global economy without engaging in head on competition with the giants in low wage industries. Workers in the US and other advanced countries will benefit from the low prices of goods from China and India but will suffer from enhanced labor market competition.

Joining the global capitalist system has improved the economic position of **workers in China and India**. The two countries have been leaders in economic growth and in the reduction of poverty. Poverty fell sharply in China from the 1980s to the present despite China having one of the largest rises of inequality in the history of the world, which makes China arguably the best case for trickle down economics in the world. The earnings of Chinese workers in the urban sector have increased greatly. Estimated rates of change in real earnings vary across surveys and groups, but invariably show increases in real wages for virtually all groups of workers. Using data from the Chinese Labor Statistical Yearbook, Bannister (2005) estimated that the real earnings of urban manufacturing staff and workers more than doubled between 1990 and 2002. The annual rate of increase of real earnings was 6.7%. Data on the structure of wages shows

that increases in wages have been greater for the more educated and skilled workers than for others.

But the 1990s growth in China has done little to advance the economic position of peasants. The rising inequality and lack of political freedom and of legitimate channels of protest presents a challenge to China and to the transition process. There is a danger that if/when the economy runs into economic problems, this will create social disorder that will reduce growth prospects. The Chinese government has developed some policies to address the inequality problem, but it continues to outlaw independent unions that it fears would threaten the communist party monopoly on power.

Inequality, which has been moderately high in India, did not grow during the 1990s and 2000s. Wages appear to have risen overall, also at a rapid pace. One World Bank study estimates that real wages grew by 29% from 1993-94 to 1999-2000 – an increase of 4.3% a year (Glinskaya and Lokshin) – which is lower than in China but still sizeable. The structure of wages has also shifted in India in favor of more skilled and educated labor.

Workers in many of the **developing countries** in Latin America, Africa, and Asia have not done well in the 1990s-early 2000s. Employment in Latin America, South Africa and in parts of Asia has shifted from the formal sectors historically associated with economic advancement to informal sectors, where work is precarious, wages and productivity low, and occupational risks and hazards great. The backlash against the current model of globalization in Latin America reflects this failure. No advanced country obtained high income by shifting labor from industry to the informal sector.

Research has not begun to explore in depth the causes of the growing informalization of labor in developing countries. I suspect that China and India's entry to the world economy has contributed to the informalization and failure of the Washington Consensus style policies in many countries. Their entry has transformed many developing countries from low wage competitors with advanced countries to high wage competitors with China and India. Wages in Peru or El Salvador are three times those in China or India. Mexico is more expensive site for production of blue jeans than China. Labor costs in South Africa are also far above those in China and India. Producing generic low wage goods and services for the global market place that might have given these developing countries a place in the world economy in the 1980s will not succeed in the face of competition from China and India in the 1990s/2000s.

How workers in the **advanced countries** will fare in the transition depends upon a race between the improvements in global productivity and reductions in prices that the new giants will bring to the world economy vs the labor market pressure for wage concessions to compete with them. Ideally, the increased number of scientists and engineers and spread of high tech worldwide will accelerate the rate of technological advance enough to raise living standards in all countries; the US and other advanced countries will retain comparative advantage in enough leading sectors to remain hubs in the global development of technology; and the world savings rate will rise so that the global capital labor ratio increases rapidly. In the US, increased social services and social infrastructure – national health insurance, for instance – may be needed to improve living standards if workers cannot gain real wage increases. As GDP will continue to

grow, a key policy issue should be to find ways to distribute that growth beyond the super-wealthy who have benefited most from the past two or so decades of growth.

6. Conclusion

I conclude that the forces of globalization associated with the doubling of the global work force will trump demographic developments associated with slower population growth in determining supply/demand balances in the labor market. Because the transition to a global labor market will be lengthy, the economic and labor market policies that countries, the international community, unions, and firms can help determine whether it proceeds smoothly, or bumpily, or – invisible hand forbid – aborts.

How long might it take the global economy “absorb” the huge work forces of China, India, and potentially other developing countries? The recovery of Western Europe and Japan after World War II and Korea after the Korean War provide some historical guideposts. The US sent capital to Europe under the Marshall Plan that helped those countries reconstruct their economies rapidly. Recovery of Europe in turn created markets for American products while rapid increases in European wages kept US workers from facing low wage competition. Similarly, the US helped Japan develop into a market democracy with the capability of challenging the US in many technically advanced sectors. The progress of Korea from one of the poorest economies in the world to an advanced economy in about fifty years is even more remarkable since that country had never before been among the leading global economies. If China maintains its successful development and wages double every decade, as they did in the 1990s, Chinese wages would approach levels in the advanced countries today in about 30 years. India would take longer. My assessment is thus that the transition will take 40 to 50 years.

There are examples of unsuccessful transitions as well, of which the reunification of East Germany with West Germany is the most recent. The German government acted as if low income East Germany would meld seamlessly with the wealthier capitalist West despite the legacy of nearly half a century of communism. It offered extensive welfare programs to keep workers in the East, but did not raise taxes to fund a massive Marshall plan style program to rebuild the East's economy. German unions sought wage parity between East and West rather than allowing wage differences to reflect productivity differences. The healthiest economy in Europe was transformed into one of the sickest, with high unemployment and sluggish growth. Reconstruction of the US South after the Civil War was an even greater failure. It took over a century for the South to achieve something akin to economic parity with the rest of the country. The southern whites spent the better part of the 20th century oppressing the blacks, limiting their schooling and economic opportunities rather than joining with them to try to move the southern states' economies forward.

If I am right, the overriding goal of labor market policy around the world in the next decade or so should be to assure that the absorption of China, India, and the ex-Soviet bloc into world capitalism goes as smoothly as possible. The bent of policy in the US and elsewhere should be in the direction of favoring labor rather than capital, which ought to be able to take care of itself in a global economy with twice as many workers, many available at low wages. There should be sustained international pressure on developing countries to raise their labor standards and to distribute the benefits of growth to workers. And there should be efforts to maintain or improve living standards if not

wages of all workers in the advanced countries so that even the less skilled gain some from the movement to a global labor market.

I am not sure what policies would enable the developing countries that cannot compete with China and India in low wage goods to improve the conditions for their workers. Some may expand through sale of natural resources but mining and other resource industries employ few people. Some may be able to expand their domestic markets. I suspect that there is no simple answer about what to do in the face of the doubling of the global workforce and that each country will have to craft a strategy dependent on its own unique circumstances

Finally, if I am wrong and there is to be a great labor shortage in the foreseeable future, I believe that it will come not from demography but from events that the shortage soothsayers ignore – a global pandemic that kills millions of people; climate change that destroys parts of economies; political insanity that produces barriers to trade, migration, and capital flows around the world. With reasonable policies and a bit of luck, however, none of these events will upend the movement toward a single and more egalitarian world economy.

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Table 1: Labor supply, 1950 to 2000 and Projected Labor supply, 2000-2050

	Labor Supply in millions	Change In millions
1950	62.2	--
1960	69.6	7.4
1970	82.8	13.2
1980	106.9	24.1
1990	125.8	18.9
2000	140.9	15.1
2010	157.7	16.8
2020	164.7	7.0
2030	170.1	5.4
2040	180.5	10.4
2050	191.8	11.3

Source, 2000 to 2050, Toossi, MLR, May 2002, table 5;
1950-1990, <http://www.census.gov/statab/hist/02HS0029.xls>

Table 2: Trends in population aged 15-59

country	1975	2000	2025	2050
US	132	176	196	217
Western Europe	99	113	100	86
Japan	71	79	65	49
US share of	44%	48%	54%	62%
China	497	829	913	787
India	335	594	869	939
World	2223	3636	4818	5404

Source. UN Population Division, DESA, World Population Ageing 1950-2050
<http://www.un.org/esa/population/publications/worldageing19502050/index.htm>

Table 3: US share of highly educated workers, 1970 -2000 and 2010

US share of college enrollments

1970	30%
2000	14%

US share of science and engineering PhDs

1975	40%
2010	15%

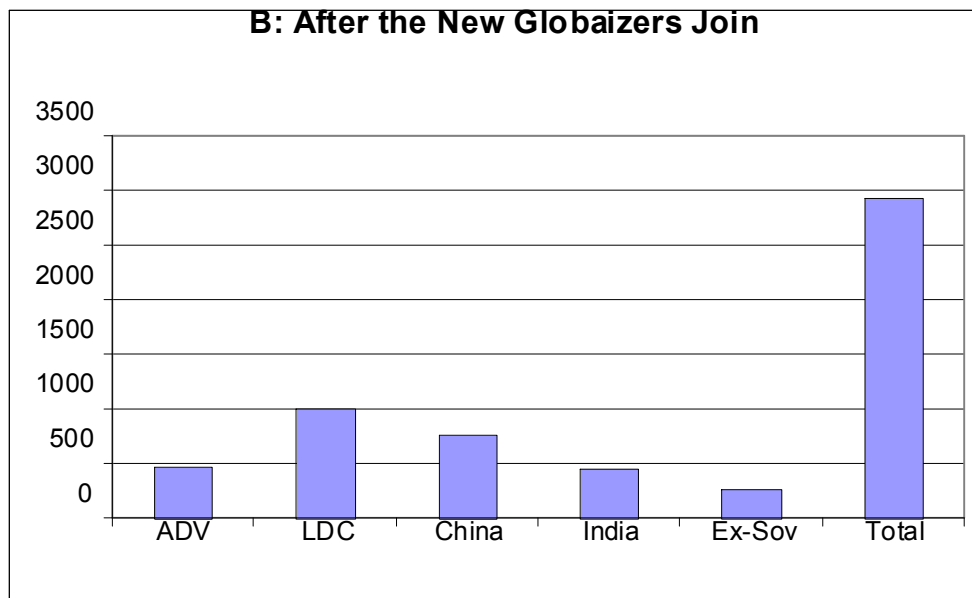
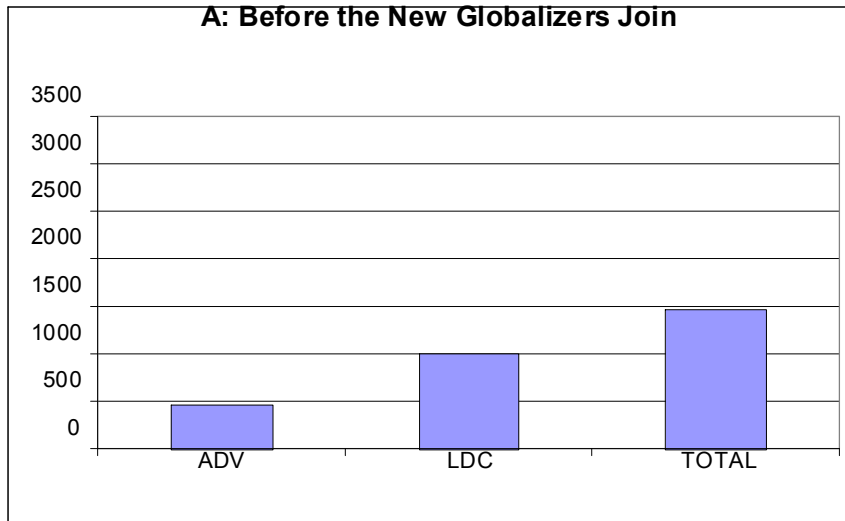
Source: Freeman, 2006

Table 4: Huge Supplies Outside US Raise Foreign-born shares of Scientists and Engineers

	1990	2000
Bachelor's	11%	17%
Master's	19%	29%
PhD	24%	38%
PhDs <45	27%	52%
Post-docs	51%	60%

Source: Freeman, 2005

Figure 1: The Number of Workers in the Global Labor Supply Before and After the New Globalizers Join, circa 2000, measured in millions of workers



Source: Tabulated from ILO data, laborsta.ilo.org/