

**Global Demographic Outlook to 2025:
Risks and Opportunities for the World Economy**

**Nicholas Eberstadt
Henry Wendt Chair in Political Economy
American Enterprise Institute**

**Lecture for the Economic Conference on Demography, Growth and Wellbeing
The Progress Foundation
Zurich, Switzerland
30 November 2006**

[In German: Ladies and Gentlemen, I am delighted once again to visit your beautiful city, and it gives me great pleasure to be able to deliver my lecture for the Progress Foundation before such a distinguished audience. Although my name is 'Eberstadt', German is not my mother tongue, as you perhaps have already suspected. Therefore, with your indulgence, I will now make, so to speak, a little 'linguistic adjustment'.]

Ladies and Gentlemen: The 20th century saw an absolutely unprecedented historical event in demographic terms. Between 1900 and 2000, the human population almost quadrupled, under the sway of the so-called world population explosion. In absolute and in relative terms, nothing so rapid or dramatic had ever happened before in human history. This population explosion was driven entirely by a reduction in mortality.

At the beginning of the 21st century, we are about to see another absolutely revolutionary demographic transformation. This one is due to a dramatic drop in fertility rates, a relentless march towards sub-fertility levels. Over a still-increasing sweep of the global map, the world's population is not replacing itself. Although this is not widely appreciated, more than half of the world's population at this point in time probably lives in countries that are at the sub-replacement level. That is to say: more than half the world's population today lives in places characterized by patterns of childbearing that, if left unchanged, would eventually result in population stabilization, and then in an indefinite demographic decline, absent immigration. In addition to an eventual population decline, the inexorable consequences of sub-replacement fertility are population aging and labor force peaking, absent compensating immigration inflows.

Economists cannot necessarily predict well over a 20-year horizon. Back in the 1980s, very few anticipated the stagnation of Japan, for example. Political scientists certainly cannot look very well over a 20-year horizon. Back in the 1980s, how many people anticipated the end of the Soviet Union? But with demographic studies, we have one important advantage. The overwhelming majority of people who will be living in the world 20 years from now are already born. Barring catastrophe, we can have a fairly good assessment of demographic profiles 20 years from now.

Over the next 20 years, there is going to be a deceleration in the global labor force, the potential labor force for the world as a whole. Demographers predict an absolute increase in

total numbers for the global pool of manpower between the ages of 15 and 65 of a little bit less than one billion for the period 2005-2025. In absolute terms, that would be a smaller increase than over the previous 20 years—and of course the pace of growth would be distinctly slower. [SEE SLIDE 3]

Over the next two decades, slightly more than a quarter of the increase in working-age manpower is expected to accrue in Sub-Saharan Africa. If we consider India and Sub-Saharan Africa together, we will account for more than half of the world's prospective increase in potential labor force. Throw in the rest of the Indian subcontinent—Bangladesh, Pakistan, and so on—and we will have accounted for over three-fifths, almost two-thirds, of the world's potential growth in conventionally defined labor force. On the other hand, Europe, the former Soviet Area, and Japan are all slated to experience negative growth in conventionally defined manpower. As for China, the prospective increase in labor force is strikingly—perhaps surprisingly—modest.

Over the past several generations, younger workers have played a critical role in the global process of economic growth, not least because they have tended to be better educated and more highly trained than the workforce entrants before them. Over the next 20 years, however, there will likely be very little increase at all in the size of the world's younger potential work force. [SEE SLIDE 4] All of that increase, furthermore, will occur in Sub-Saharan Africa. Interestingly enough, China's younger workforce is certain to decrease—and to do so very sharply. There will also be marked decreases in the availability of younger manpower in Europe and Japan.

There is one age range where there looks to be significant increases in potential working age population for the world as a whole over the coming twenty years. This group, however, is for the world's workforce of older ages—those 55 through 69 years of age. [SEE SLIDE 5]

On a global basis, much of the overall growth in older prospective workforce of older ages will be occurring in China. For its part, nearly all of China's increases in working-age population will be taking place in the groups age 50 and older—the supply of manpower under the age of 45 is projected actually to shrink between now and the year 2025..

China

Let us look at the Chinese situation more closely. As of now, China's fertility level may have been below replacement for a decade-and-a-half; the consensus among demographic specialists today is that China's current birth levels may be 25% below the replacement level today, although some argue the true level may be even lower. Thanks to relatively low mortality and very low fertility, China's population structure is going to age very dramatically over the next two decades. [SEE SLIDE 6] Indeed, the country's population is slated to age at an almost unprecedented historical pace.

The only country in history to have aged as fast in the past as China stands to age in the future is Japan. But in the case of Japan, the Japanese society got rich before it got old. China,

on the other hand, will do just the opposite, and this promises to be a very much less pleasant arrangement.

Over the next two decades, China will face a veritable old-age tsunami. By 2025, there may be 200 million or more senior citizens in China, people past their 65th birthday. That would be nearly two and a half times as many Chinese 65 years of age or older as today.

The circumstances of senior citizens in China today are not terribly good—they are disadvantaged by comparison with the rest of the population. [SEE SLIDE 7] China's seniors do not have as much education as the rest of society, and seniors are likely to live in rural areas. Old people in China who have to work by and large have to support themselves with their muscles, since they have enjoyed much less in the way of human capital investment than subsequent cohorts.

Unfortunately, despite China's rising levels of educational attainment, the educational status of China's seniors is also likely to be quite unfavorable. We can see this by looking at the educational profile for persons who were 35 and older as of the year 2000—these will be the 60-plus groups in 2025. [SEE SLIDE 8] For person 35 and 39 years old in 2000—the 60-64 group for 2025—nearly 30 percent in China fell into the low educational attainment category, as opposed to 16 percent for the United States and just 6 percent for Japan. But circumstances for China's seniors are even less favorable than this comparison might suggest. For Japan and for the United States, “low educational attainment” refers to people who do not have high school degrees. For China, it refers to people who have not completed primary school.

We might hope that labor-saving equipment might spare China's seniors some of the hard physical work they would otherwise face. However, on a per capita basis, China today possesses has nowhere near the amounts of non-residential capital that the United States and Japan can rely upon. Estimates for the late 1990s suggest a per capita capital stock of something over \$6,000 in China—as against about \$150,000 in the United States and over \$200,000 in Japan. [SEE SLIDE 9] Simply put, this means there is precious little scope for labor-saving innovations in the Chinese workplace today. Even with the rapidly advances in the Chinese economy since the late 1990s, even with further advances over the coming years, the scope for labor-saving mechanization over the next two decades will be limited. As a result, even two decades from now, even in the so-called service industries, people who work in China will likely to have to earn their living in large measure with their muscles and their sweat.

So what is the possibility of retirement for these older people in China? In the United States, we worry out loud all the time about our social security system: specifically, about the under funding of our social security system. Current estimates suggest the unfunded net present liability of the U.S. Social Security System amount to about one-third of a year's GDP. In China today, what passes as a national social security system clearly covers only a tiny minority of workers, maybe as little as one-sixth of the work force, and yet some estimates suggest its unfunded liabilities may run to 125 or 150 percent of current GDP. [SEE SLIDE 10] One does not require a background in actuarial sciences to see that such a program is unsustainable—that it will cease to exist as we know it today in China 20 years from now.

And what of the alternatives? The traditional system of social security in China is known as the Chinese family. But here, China's population control program is bringing about unexpected consequences. The proportion of women by birth cohort who complete childbearing without bearing a son is particularly illustrative. [SEE SLIDE 11] Currently, about 10 percent of the Chinese women hitting retirement age have never borne a son. By 2025, thanks to the rapid and steep decline of national fertility in the 1980s and 1990s, the proportion of Chinese women at age 60 with no son will approach 30 percent. And since not all of the children born will survive, this may mean that about one out of three Chinese women heading towards retirement age will have no living son. In a Confucian society where the duty to protect their parents falls in the first case on sons, this will necessarily make a huge and growing gap in China's social safety net. The Chinese government has somewhat recognized this problem but as of yet has not really addressed it. It is not difficult to imagine how this slow-motion humanitarian catastrophe could also have social, economic, and possibly even political reverberations for the world's largest country.

Russia

And China may be the "good news" story! At least, by comparison with the outlook for the Russian Federation. Russia's population is already in absolute decline because of very low fertility and catastrophically high mortality. Steep population decline—on the order of 500,000 or more each and every year—is Russia's demographic prospect as far as the eye can see.

In any dynamic economy, as already noted, it is the younger people who come in with the newest educational standards, the newest training, and offer the possibility of improving overall standards in the labor force. Yet the youth group 15 to 24 years of age is slated to decline by almost half between now and the year 2025 in Russia. [SEE SLIDE 12]

And that is not the worst of the story. Throughout the world, health and wealth are tightly interwoven. There is a robust correspondence—both internationally, and in any given country over time—between health improvement and improvement in economic potential. Of course, this is not a one-way street, but rather a complex and robust inter-relationship. [SEE SLIDE 13] Therefore, the troubling trends in life expectancy and mortality for women and men in Russia speak to the magnitude of the economic risk that the country is now facing.

Russia today is living proof that it is possible for an industrial society during peace time to suffer a health reversal over four decades. Life expectancy for both women and men happen to be lower in Russia today than four decades ago. [SEE SLIDE 14] And to make the story even sadder, the retrogression in health, that is, the increase in mortality, is most intensely concentrated in the working age population. [SEE SLIDE 15] For example, when comparing the death rate ratio for 1965 versus 2005 for women between 20 and 65 (that is, the death rate in 2005 divided by the death rate in 1965 for the same working age groups), we see an upsurge in death rates that reach or exceed 50 percent for many cohorts. Think of it: over a forty year period, mortality rates in Russia for women between their late 20s and their late 50s have typically risen by about 50 percent! And the situation is even worse for men: for Russian men in their 40s, in fact, death rates doubled over those same decades.

Russia health disaster looks even more striking when we compare current survival schedules for working age men with those from counterparts from affluent European societies. Look at the contrasts in survival chances for Russian men and Swiss men as of 2001. [SEE SLIDE 16] On more or less current schedules, a man from Switzerland has about five chances out of six of surviving from age 20 to age 65. In Russia, on current survival schedules, a man age 20 has less than even odds of making it to 65. This is not just a humanitarian tragedy: but it has very real economic implications for Russia as well. By foreshortening life expectancy in such a dramatic manner, Russia's health crisis also forces a dramatic shift in the calculus of causes and benefits for investing in human capital, for investing in higher education, in training, and skills. Human capital deepening has been a critical aspect of the overall process of modern economic growth—but the pervasive surge in working-age mortality that Russia is suffering through does not augur well for human capital investment. To the contrary: it is easy to appreciate the devastating impact that Russia's new mortality patterns could have on calculations about training and productivity enhancement.

Because the situation in Russia looks so unnatural, it is tempting to suggest that it may change quickly and revert to more a familiar pattern. Alas: it seems in Russia that the abnormal has become the "new norm". Comparing Russian mortality patterns to those of Japan makes the point. [SEE SLIDES 17 AND 18] In Japan, at any given age of life, each birth cohort reports a lower death rate than the cohort born a generation, or even a few years, earlier. But Russia has experienced a grim reversal in such health trends. For example, in Russia the male cohort born in 1960—the cohort now entering its mid-forties registers a death rate that is almost twice as high as did the 1930 birth cohort when it was in its forties. The contraposition is especially alarming when one remembers that Russia's 1930 birth cohort also went through the cataclysm of World War II. Even so, as adults those men experienced much lower death rates than their sons born thirty years later.

Given all the "negative momentum" in the current Russian mortality structure, it is going to be difficult for the younger generation of men in Russia today to return to their parent's patterns of health, a generation earlier. Simply re-attaining their parent's levels of health, it is worth emphasize, will qualify as something of an achievement for Russia under the present adverse environment. But even if Russian men do manage to achieve the goal of returning to their parents' general levels of health, this would signify a life expectancy at birth of only about 63 years—a level of male life expectancy lower than those currently prevailing in either Pakistan or Bangladesh.

India

India is both a relatively high fertility and a relatively high population growth country, and the country is expected to experience continuing population and labor force growth over the coming generation, while its population structure remains quite youthful. [SEE SLIDE 19] This overall outlook has lead a number of demographers and economists to declare that India is about to reap a "demographic dividend" that should stimulate economic development over the coming decade or so. But as a country, India is an arithmetic expression, an average concealing vast local differences. At a local level, there are huge disparities not just in economic terms but in fertility trends as well. Much of India is already sub-replacement, including major cities such as

Mumbai, Calcutta, New Delhi, and Bangalore, as well as much of the rural area in the Indian south. [SEE SLIDE 20]

Demographically, with respect to childbearing patterns, there are two very different Indias today: one in the north, the other to the south. The population profiles of these two Indias promise to be strikingly different in just a few decades [SEE SLIDES 21 AND 22] In north India 20 years from now, we can expect to see a population structure that is like a traditional Third World population pyramid, very similar to India's today, almost like Afghanistan's. Southern India, however, will have a population structure more similar to that of contemporary Western Europe; that is, rather than has a pyramid shape with a wide base, the pyramid "bulges" in the older age groups. In 2025, for example, the bulge is expected to occur around the thirties and forties. However, unlike Western Europe, southern India has a per capita income (at least at current exchange rates) that is 10 times lower than it was in Western Europe when similar patterns of fertility and population aging began to emerge there. Therefore, southern India will have to make this transition to older age on a vastly lower income level than did Western Europe.

The demographic differences between north and south India today are not limited to fertility levels. It also holds for education. India has an extremely talented and highly educated elite but it is also home to an enormous pool of uneducated or even illiterate workers and young people. Indeed: India's overall level of adult illiteracy is not so different from Sub-Saharan Africa's today. That often comes as a surprise to European audiences, because many of us know so many highly skilled and technically sophisticated people from India. But India's highly skilled cadre only makes up a very small part of the overall work force.

In northern India, low education and illiteracy are still much too prevalent—on the whole, levels of educational are substantially higher for India in the south. And this makes for a problem as one contemplates Indian economic growth over the coming decade. The problem here is that much of the growth engine in India is in southern India, in the IT sectors and other internationally famous areas—but southern India's labor pool will be peaking and then declining in size in the years immediately ahead, absent migration from the north. Yet southern India cannot simply take illiterate workers from the north and plug them into their growth machine. The Indian economy therefore faces a demographic mismatch—a mismatch that may well become much more apparent in the years immediately ahead.

Western Europe

We are all familiar, I think, with the main story about Western Europe's demographic outlook: pronounced population aging, stagnation and impending decline in labor supplies, looming pension burdens, and so on. I thought it might be worthwhile therefore to touch upon some facets of the situation that may not be quite so well known.

Recent economic research examining the ages of innovators and inventors suggests that the age of "great invention" does not adhere to an utterly fixed biological fixed formula—yet there is nevertheless a clear social pattern to the age of innovators and discoverers. [SEE SLIDE 23] Although that age distribution has shifted a little bit over the last century (fortunately, toward older ages!), significant innovations and big discoveries tend to be made between the

ages of 30 and 50, with the peak period of creativity coming somewhere between 35 and 40 years of age.

We can compare the age distribution of “great discovery” with the impending changes in Western Europe’s population of working age. Western Europe should expect substantial changes in its potential workforce over the next 20 years. [SEE SLIDE 24] The workforce between 20 and 49 years old will decrease between 2005 and 2025, while the workforce over 50 years old will increase. Therefore, the critical groups of those of “innovative age” will decline in size in Western Europe. Of course we live in a virtual economy and discoveries may be local but can be globalized, but this may still have a bearing on the quality of work and workforce.

Western Europe’s big potential increase in available manpower is in these older age groups. But guess what? As the life expectancy of European populations has increased, the average age of retirement has steadily decreased. [SEE SLIDE 25] You do not have to be a demographer to tell what some of the economic implications of this growing divergence will be for the economies of contemporary European states.

This growing divergence is by no means an immutable process. The OECD has shown that those OECD societies which do the best at retaining workers in the 55-64 year group, that is to say workers on the older side, are also the societies which have the highest average age of retirement. [SEE SLIDE 26] But perversely, at the moment, in many OECD societies and many European countries, there are heavy penalties on workers for staying in the workforce after age 55. [SEE SLIDE 27] Not surprisingly, workers respond to these economic penalties—by withdrawing from the labor force. There is surely opportunity here for a public discussion, a political conversation in the societies in question about whether they might wish to rectify these peculiar, inequitable, and economically unproductive disincentives. Certainly in principle there is plenty of potential in Europe over the coming generation for economic growth through “healthy aging”—if Europeans wish to choose it.

United States

Alexis de Tocqueville was probably the first person to talk about “American exceptionalism” back in the 1830’s, when he visited the United States, and wrote his classic treatise *De la Démocratie en Amérique*. But it is appropriate now to talk as well about “American demographic exceptionalism” because the United States seems to be an exception to the general rules of seemingly inexorable fertility decline in developed countries. This exceptionalism can be illustrated most vividly if we compare Canada and the United States. [SEE SLIDE 28] Canada almost seems like a socio-demographic twin of the United States, as no two big countries may be as similar to one another as is Canada to the United States. But there has been a major demographic divergence since the 1970’s, when Canada’s fertility trends began to follow a European trajectory. The United States, however, has gone in the other direction, and for the last decade and a half, U.S. fertility levels have been almost consistent with complete population replacement.

To be sure, the United States is a famously multi-ethnic society, and some may think America’s strangely high fertility level can be explained by reference to its multi-ethnic profile.

In particular, it is widely known that America's Hispanic population, and especially the Mexican-American population, report what are now extremely high levels of fertility for any affluent or developed society. Ethnic differences in the United States do explain some of the difference between say US and Western European fertility levels today—but they only explain part of the difference, and not even the main part. Most of the difference between Europe and the United States in terms of fertility is due to the fertility rates of the non-Hispanic whites, the so called “Anglos” in the United States. If we limit the comparison to the total fertility rates for non-Hispanic whites of the 50 U.S. states and Washington, D.C. and the corresponding TFRs for Europe's various countries, the TFRs are clearly higher for the United States than for Europe, without even that much overlap between the regions. [SEE SLIDE 29]

The fertility divide between the United States and Western Europe, compounded by differences in prospective immigration patterns, will mean very different demographic profiles in just two decades, as we can see from the dissimilar population pyramids projected for the two regions for the year 2025. [SEE SLIDE 30] While the prospective population structure of the United States looks more like a true pyramid, with a wider base than peak, Western Europe shows the bulge and inversions characteristic of aging sub-replacement societies. These demographic divergences will no doubt carry with them important economic implications. There may also be some geopolitical implications, although this is much more speculative.

Long-term population projections are highly speculative, as they require assumptions about the numbers of children that will be conceived by the currently unborn. For what it is worth, however, long-range population projections for Western Europe, Russia, and the United States paint a global picture of the possible economic and geopolitical implications of Europe's low and declining fertility levels, conjoined with US “demographic exceptionalism”. From 1950 to the year 2000, Western Europe's and Russias proportion of the total world population declined sharply—and are expected to continue to decline through 2050. The situation is different for the United States: although America's proportion of the world population declined from 1950 until 1990, for the last decade and a half, it has held steady. Demographic projections anticipate that it will continue to hold steady for the coming half century. While it is difficult to make any confident projections beyond 2025, it is safe to suggest that the unusual demographic phenomena that we manifest in the United States could extend the unusual influence that the United States enjoys today, both in the world's economy and in the world's situation.

1

**Global Demographic Outlook to 2025:
Risks and Opportunities for the World
Economy**

Nicholas Eberstadt
American Enterprise Institute
eberstadt@aei.org

Progress Foundation
Zürich
30 November 2006

2

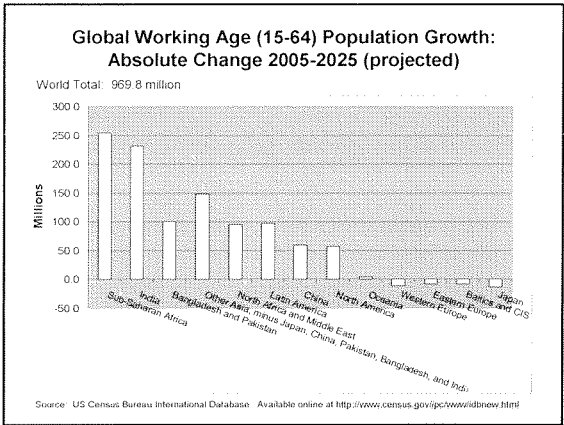
Outline of presentation

- World Overview

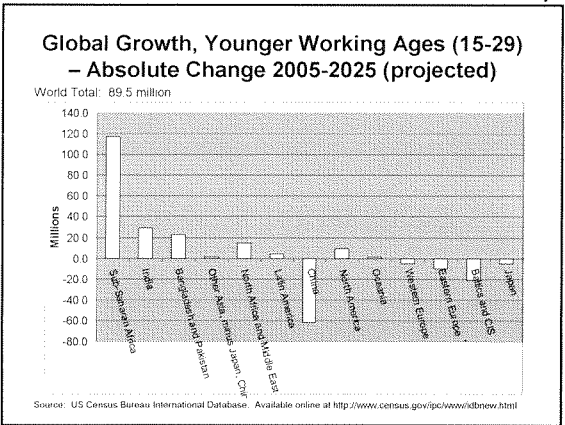
with breakouts for:

- China
- Russia
- India
- OECD Europe/Japan
- USA

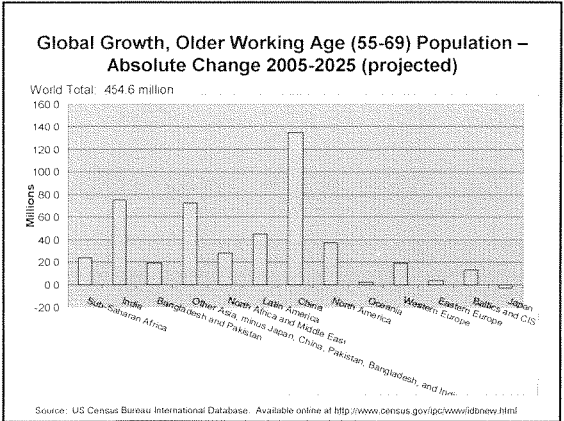
3



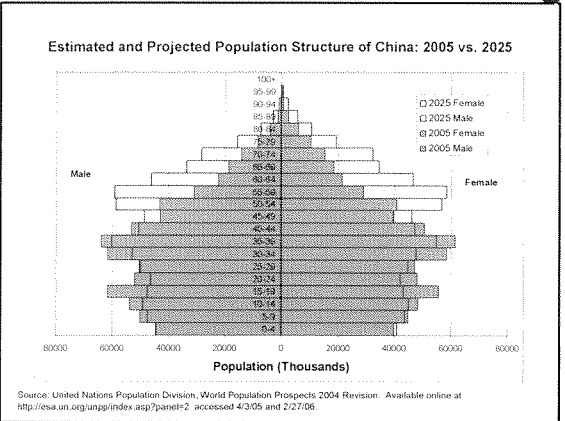
4



5



6



7

Conditions for China's Older (65+) Workers Today

Compared to China's Overall Labor Force,
Today's Elderly Workers are:

- Six times as likely to be illiterate or semi-literate
- Almost 50% more likely to have only primary schooling
- Only a tenth as likely to have a high school or college diploma
- Much more likely (87% vs. 66%) to be in agricultural sector work
- In sum, much more limited earning opportunities—and much greater dependence upon physical labor

Sources: China Ministry of Labor and Social Security, China Labour Statistical Yearbook 2003, Tables 1-43, 1-51, China National Bureau of Statistics, Tabulation on the 2000 Population Census of the People's Republic of China, Vol. 2, Tables 4-4, 4-4c

8

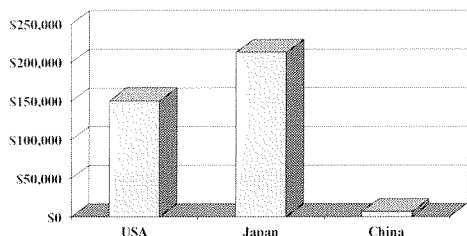
Proportion of Population with Low Educational Attainment: By Age Cohort as of 2000 (60+ Population of 2025)

Age (years)	USA	Japan	China
35-39	15.8	5.9	29.1
40-44	14.6	7.9	32.5
45-49	13.6	14.9	49.0
50-54	14.6	21.3	64.9
55-60	18.9	31.3	72.0
64-64	23.9	38.9	82.8
65-69	27.9	44.6	91.3 ¹
70-74	32.7	47.7	--

Note: "Low Educational Attainment" defined as less than high school diploma for Japan and USA, less than primary school or less for China.
Sources: Kurt J. Hauman and Nikki L. Graf, "Educational Attainment, 2000: Census 2000 Brief," August 2003, p. 5 (<http://www.census.gov/prod/2003pubs/c2kbr-24.pdf>); Japan Statistical Yearbook 2004, Table 2-13 (http://www.stat.go.jp/english/data/renkan/saijyo/y2003/saijyo_china_labour_statistics_yearbook_2003_table_2-13)

9

Indicators of the Mechanization of Work: Estimated Non-Residential Capital Stock Per Member of the Labor Force (1998 Dollars)



Note: Non-Residential Capital Stock Estimate are PPP adjusted.
Sources: Derived from: Burke Wolf et al., Long-Term Economic and Military Trends, 1954-2015 (Asia Monitor, U.S. RAND 1995); Charles Wolf et al., Asian Security Trends and Their Security Implications (Asia Monitor, U.S. RAND, 2000); Statistical Ministry of the United States 2002, Table 101; Japan Statistical Yearbook 2004, Table 20-7; China Labour Statistical Yearbook 2003, Table 1-4.

10

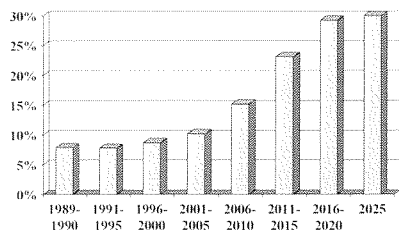
Coverage and Actuarial Balances of Current Public Pension System: USA, Japan, China (percent)

	Coverage	Net Present Value Unfunded /GDP
USA 2004	87 ¹	32
Japan 2001	c. 100 ²	60-70 ³
China 2003	c. 16	125-150

Note: 1. Proportion of fully insured persons 20+ in 1953/2001. 2. Mandatory participation of persons 20+ in basic plan. 3. Estimate of burden past 20th round of reform.
Sources: China: Lorenz A. Weir and Harold Goldstein, "Population Aging and Social Security: Asia's Labor and Transfer-Matching Policy Trade-Offs," U.S. Census Bureau, International Programs Center, April 2007 (unpublished paper); Japan: Harumi Hara and Martin Vandenberg, "Population Aging in Japan: Demographic and Fiscal Sustainability," IMF Working Paper, WP/07/06, April 2007 (<http://www.imf.org/external/pubs/ft/wp/2007/wp0706.pdf>); USA: Social Security Administration, Annual Statistical Supplement 2005 (March 2006), Table 4-5 (<http://www.ssa.gov/policy/docs/supplement/2005-4.pdf>); UNCTAD, Transfer Report March 24, 2004, Table 3.1.1% and 7. Super H.D. (<http://www.unctad.org/Docs/2004/2004trr.pdf>)

11

Percentage of Age-60 Chinese Women with No Born Sons by Year of Her 60th Birthday: Illustrative Calculation

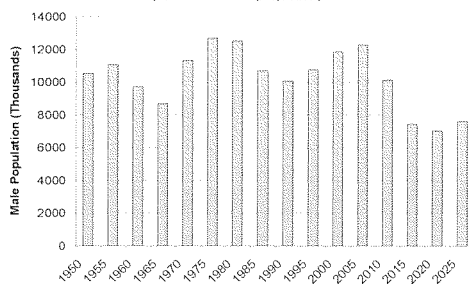


Note: Calculations are illustrative, based upon simplifying assumptions. 1. Reported birth distributions in 1990 census are accurate. 2. SRB as in previous graphic. 3. SRB not partner-specific. 4. Fertility starting completed by age 15 for the 2025 cohort of 60-year-old women. 5. Posits the following distribution of children born to the 2025 cohort of 60-year-old women: no children, 1%, one child, 15%, two children, 60%, three or more children, 17%.

Sources: Derived from: Fomby et al. 1993, esp. on China National Bureau of Statistics 2002, pp. 69

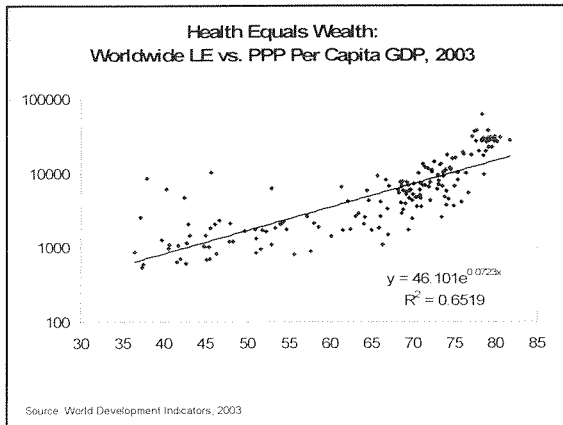
12

Russian Federation: Male Population Age 15-24, 1950-2025 (medium variant projection)

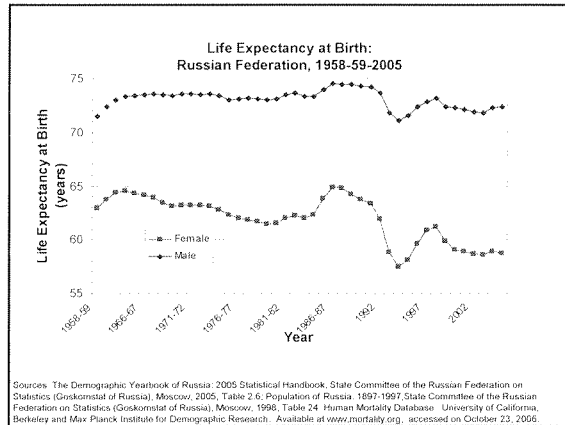


Source: United Nations Population Division, World Population Prospects: The 2004 Revision

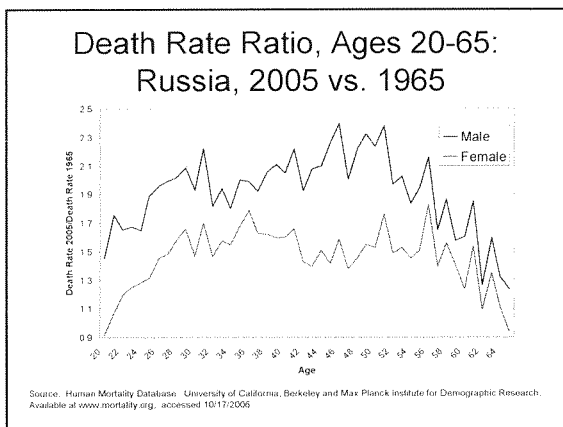
13



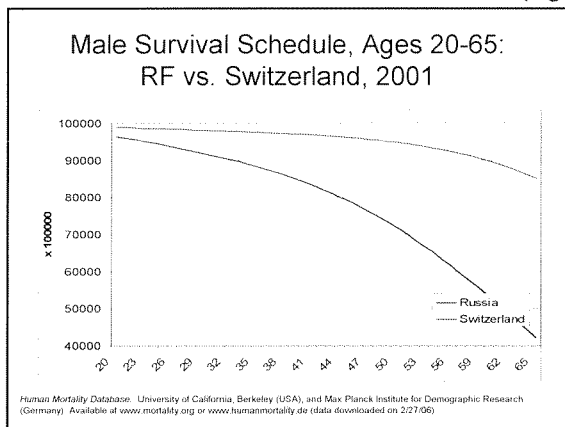
14



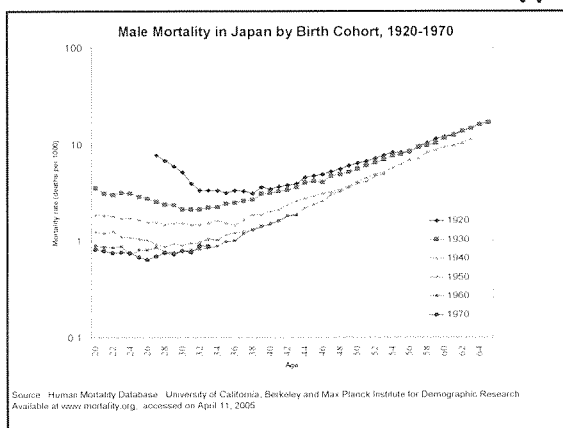
15



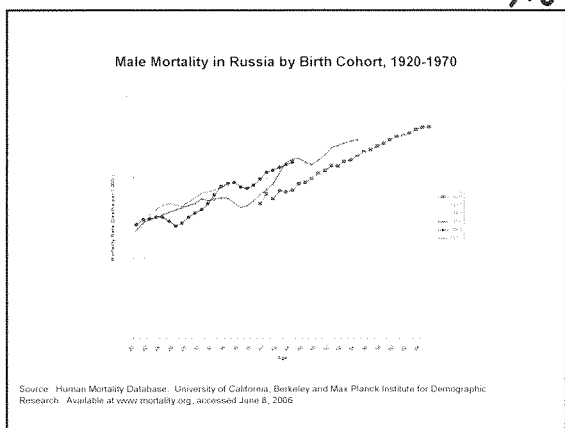
16



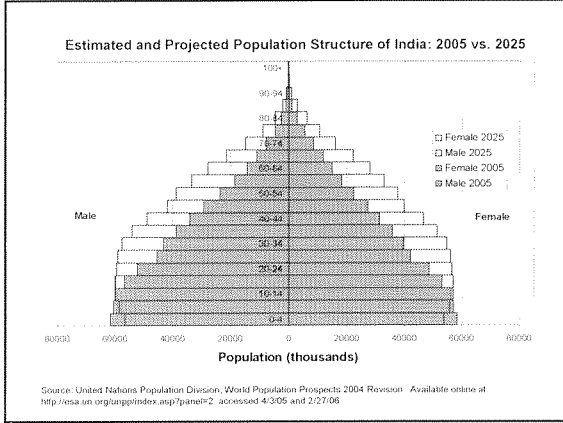
17



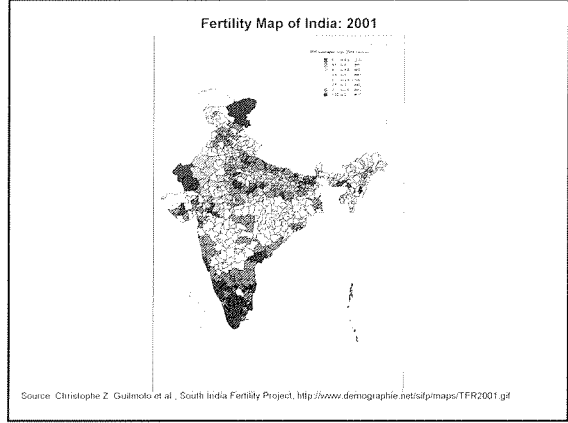
18



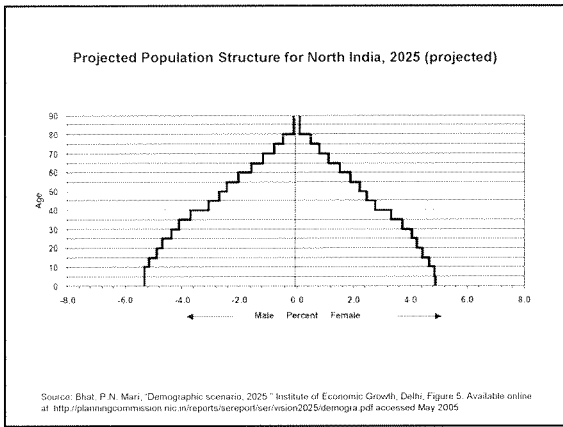
19



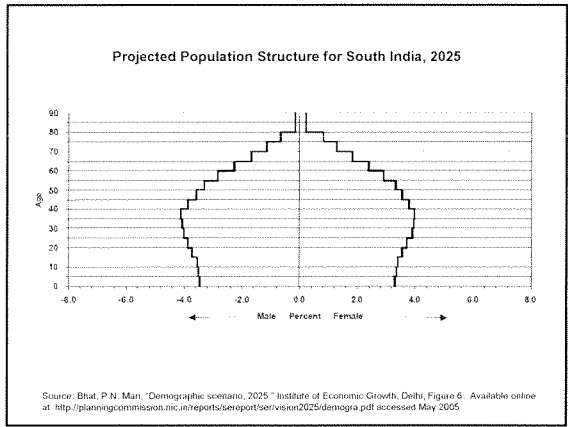
20



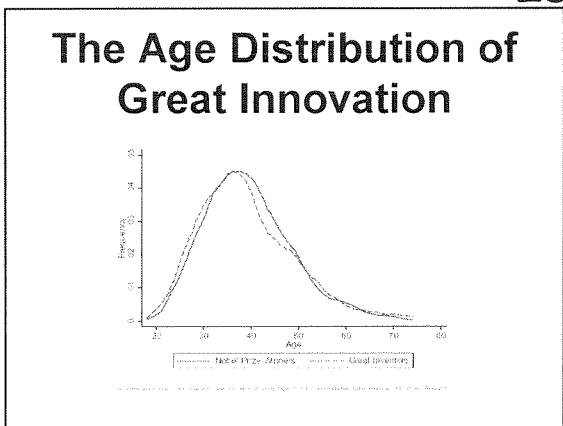
21



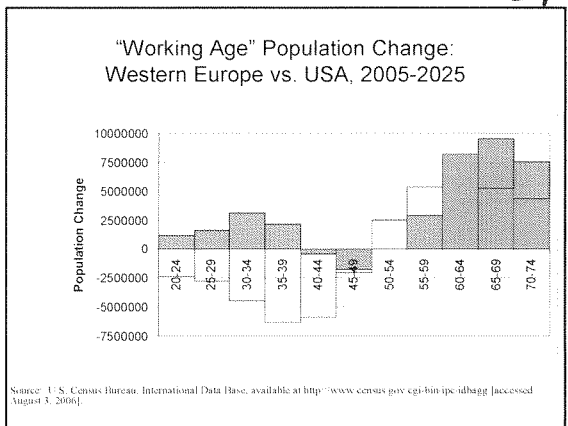
22



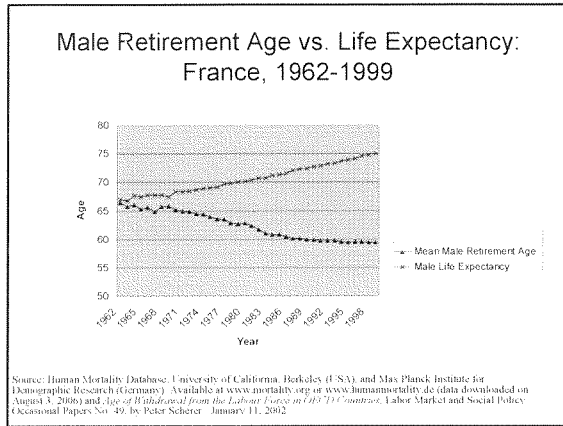
23



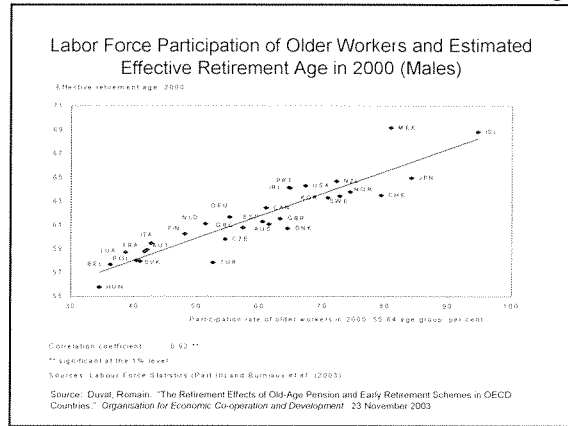
24



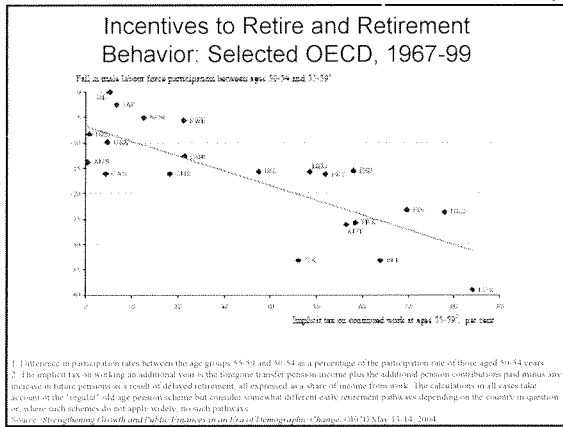
25



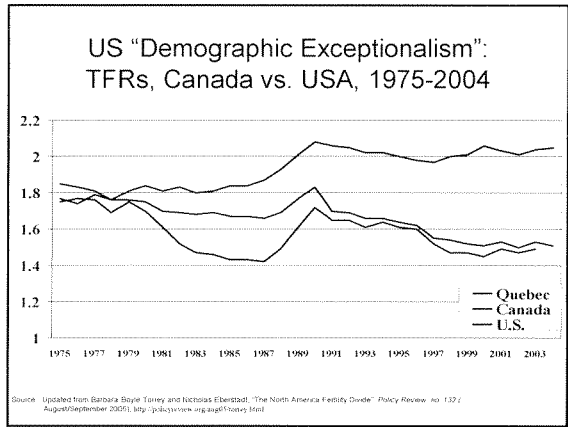
26



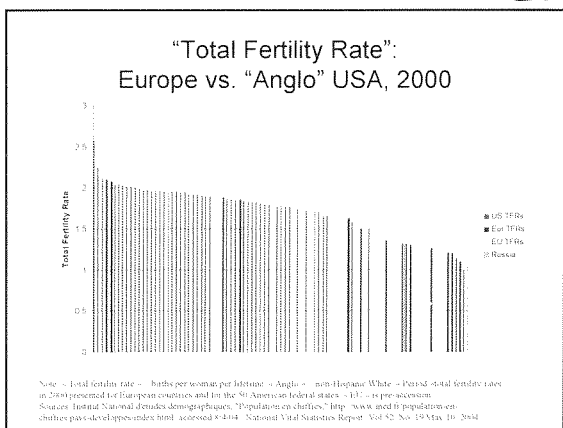
27



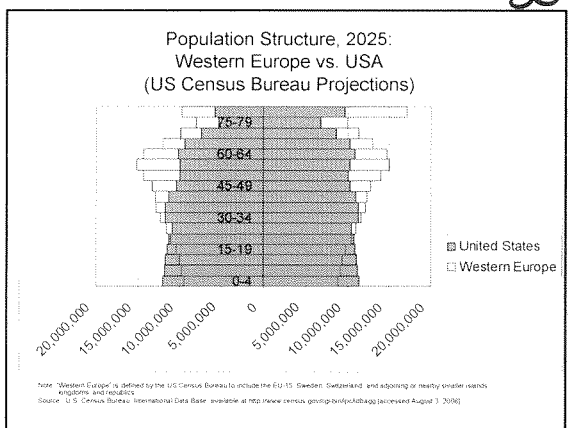
28



29



30



31

