

## ***Beyond Workforce 2020:* The coming (and present) international market for labor**

*by Justin A. Heet*

### **Key Findings**

- 1) An international labor market, enabled by migration and technology, is upon us.**
- 2) The tidal wave of immigration to the United States in the 1990's has affected almost the entire nation, from large city to small town.**
- 3) The slowdown in population and labor force growth throughout the developed world will intensify the need to take advantage of different sources of international labor from the less developed world.**
- 4) The fiscal impacts of aging, along with its demographic effects on declining population and workforce growth, will further heighten the need for foreign labor in the advanced economies of the world.**
- 5) The United States is the world's most significant destination for the world's migrant labor and claims an above average share of its most educated and skilled members.**

### **Introduction**

In 1987, Hudson Institute published *Workforce 2000*, which melded demography and economic analysis to produce an accessible guide to the major workforce challenges of the day. It became one of the bestselling books ever published by a think tank largely because of two demographic claims. First, the American workforce was rapidly diversifying, particularly in terms of new entrants. Second, the combination of employer demand and worker supply would produce a “skills gap” that threatened to dampen economic growth.

Eight years later, the continuing demand for *Workforce 2000* prompted Hudson to research a sequel, *Workforce 2020*. A little less than a decade had produced incredible change in the American workforce and economy. The PC had gone from rare to commonplace. PCs themselves had been networked together to transform the American office and shop floor. And the United States had emerged from the Cold War to lead the world economy in ways that few could have imagined a decade before.

Despite the changes, two of our *Workforce 2000* projections remained valid as we wrote *Workforce 2020*. The

American workforce was diversifying rapidly. The skills gap had, fortunately, resulted in the import of large amounts of highly educated foreign labor to offset domestic shortages, thereby helping to fuel strong economic growth.

So, in 1997, we reiterated our claims about diversity and shortages of skilled domestic labor as likely conditions of the foreseeable future. To this we added a third looming demographic challenge: rapid aging of the workforce as Baby Boomers approached and then reached retirement.

Hudson Institute is now in the process of writing another follow-up to *Workforce 2000*, titled *Beyond Workforce 2020*, which will be available in 2004. As before, demographic change will be treated as a major “shaping force” on the American workforce in our new volume. Diversity, the size of educational cohorts, and aging are still first-order challenges. This White Paper will provide a brief reappraisal and update of these trends.

This White Paper will also introduce what we now consider the most important demographic theme that confronts our workforce, employers, and policymakers as we enter a new century: a growing mismatch between the location of the world’s new workers and the historical location of the world’s best jobs. The long-term implications of this widening gap cannot be understated and will create the most important labor and economic dynamic of the first half of the 21<sup>st</sup> century. No other significant population trend that affects the workforce—racial and ethnic diversification, educational attainment, or aging—can be divorced from the issue of the changing sources of new international labor supply.

## 1. Change in Focus

Understanding American labor force issues in the context of international labor markets requires taking stock of global demographic trends. That reality coincides with a major change in focus for the *Beyond Workforce 2020* effort. Instead of examining domestic developments and offering projections solely for the U.S., *Beyond Workforce 2020* will look at the economy and workforce from a global perspective.

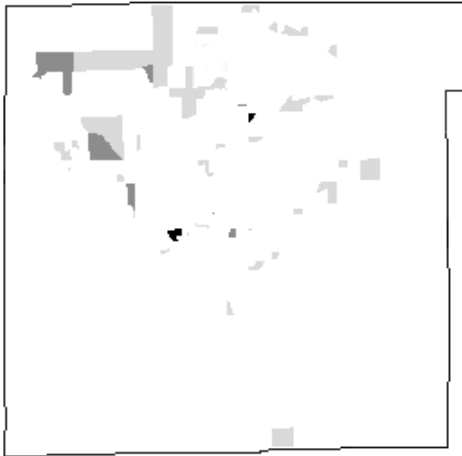
In many ways, the economic expansion of the 1990’s became synonymous with globalization. Trade, multinational brands and companies, and international finance were as much symbols of the perceived new economic order as computers and fiber optics. The role of technology in globalization is much more than symbolic. New, more robust, and cheaper communications technologies both facilitate global production and trade and increase the economic rewards to them.

People are as much a part of this transformation as the goods we buy or the companies we work for. This is really a rather plain observation but one that is easily ignored. Just as the wise manager or policymaker must now behave as if an interdependent global economy now exists, he or she must also behave as if an interdependent global workforce now exists.

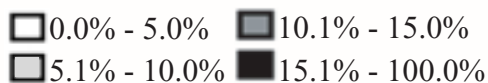
The signs of this global workforce are omnipresent. Employment in foreign-owned or affiliated companies grew by 32% between 1991 and 2000, to almost six and half million workers.<sup>i</sup> In the five years between 1998 and 2002, 157,000 workers were reported separated from their work because of layoffs due to import competition or establishments relocating to overseas.<sup>ii</sup> Most tangibly, a little more than 13 million members of our current population entered the United States between 1990 and March of 2000.<sup>iii</sup> These millions put a human face on the international labor market for most American states, cities, and even small towns.

## Graphic 1: Indianapolis Census Blocs by percent foreign born, 1990 & 2000

1990



2000



Source: See endnote iv.

Consider the changes to Indianapolis, Indiana that occurred over the 1990's, as pictured in Graphic 1. The areas of the city that came to be populated by significant amounts of immigrants exploded. While

we typically look to the Southwest or California when we think about modern immigration, the landscape, look, and labor base of Midwestern cities are undergoing extreme change.

The extent of that change is made even clearer in Table 1 on the following page. While Indianapolis's urban scape has been altered, its transformation toward a more international population pales in comparison to, say, San Francisco. Immigrants contributed well over four-fifths of the population growth in the San Francisco metropolitan area over the 1990's.

The small town impact of immigration is a less discussed phenomenon but is just as important. Table 1 on the following page shows the example of what happened in the 1990's to a small Indiana town, Plymouth. Immigrants contributed a large majority to the area's growth; immigration proved as important to rural Plymouth as it was to international city San Francisco, 715 times the size of Plymouth. The international workforce is not just a metropolitan phenomenon.

The cumulative impact of both new immigration and the family behavior of former immigrants and their descendants results, literally, in a different face for the population. Absolute growth between the Hispanic and Asian cohorts accounted for almost all of the San Francisco area's growth. For the City of Indianapolis, these two groups' contribution amounted to nearly half of total growth. And roughly two out of every three additional residents of the small town of Plymouth were Hispanic or Asian.

Thus, a consistent demographic theme in Hudson's workforce research, diversification from growth among Hispanics and Asians, is more properly thought of in an *international* demographic context. One need only walk around downtown Cambridge, Massachusetts or Columbus, Ohio to understand the connection between international demographics and the education and skills gap. The aging discussion is equally impossible to remove from any consideration of the international population and workforce, as this White Paper will later show.

**Table 1: Population change and contributions to growth in San Francisco, Indianapolis, and a small Indiana town: 1990 & 2000**

	2000 population	1990-2000 growth	Share of total growth accounted for by growth in:	
			Foreign born	Hispanics & Asians
San Francisco-Oakland-San Jose CMSA	7,039,362	786,051	83%	95%
Indianapolis (Marion County)	860,454	63,295	38%	45%
Plymouth, IN	9,840	1,537	64%	67%

Source: See endnote v. Note: See footnote 1.

The future will do nothing to loosen the ties between demographic trends that shape the world and the demographic trends transforming America. Instead, the ties will become ever stronger. The United States will find itself in competition against other developed nations to lure the world's best and brightest workers and in competition against less developed nations to

keep America's best employers and jobs. To lose one competition is almost certainly to lose the other. This will be the challenge of the workforce of 2020 and beyond.

## 2. Terms of Discussion

Hudson Institute analyzed the major international demographic trends that will affect the size and face of the American workforce over the next several decades. This White Paper is a primer on the themes and data concerning demography that will be covered in *Beyond Workforce 2020*.

As this book's name suggests, Hudson Institute is changing some of its approach to workforce futurism. Instead of forecasting out to a definite endpoint like the years 2000 or 2020, time horizons will be relaxed. This White Paper follows that approach. Most often, the year 2050 will form the maximum limit to projection. In some cases, our forecasts will go out much later and in some cases, the endpoint will be much sooner. The nature of the specific discussion or challenge and the availability of robust data all influence

**Graphic 2: The twelve *Beyond Workforce 2020* global regions**



our decision-making about how far into the future we should try to see.

The change from an almost purely U.S.-focused view toward an international one has meant developing a system of geographic regions that help clarify the most important themes and changes. To reflect the various economic, cultural, political, historical, and proximate considerations that affect the workforce, our system is a sort of hybrid from those used by most international organizations (see Graphic 2 on the previous page and Appendix A). Throughout this White Paper, we will consistently use this geographic breakdown to examine the major population and workforce demographic themes confronting the United States. Hudson Institute will also highlight the experience and future of specific nations that are undergoing extreme change.

Much of this data will be interesting in their own right. While the purpose of *Beyond Workforce 2020* is to show the data's importance to the United States, it will still be a book about the American workforce. Likewise, this White Paper is about the American workforce. As such, we will provide more detailed data for the U.S. than we will for the rest of the world. The additional level of detail will help prove the case that America's workforce will be increasingly dependent on the direction of change in the global workforce.

To make that case, this White Paper will first explore the population and workforce in total. It will then discuss the component parts of the population and workforce as much as is possible: age structure, immigration, race and ethnicity, and education and skills.

## The Global Workforce

The first key to understanding the dynamics of a global workforce is to realize the extent to which global income is concentrated in what is commonly called “the developed world,” as shown in Table 2.

Over half of the world's ability to buy goods and services is held by the United States, Western Europe, and the handful of developed or rapidly developing nations of the Pacific Rim. The jobs that pay the most are still located where they have been for most of recent history: the “West” and small pockets of the “East.”

The unevenness of this situation is further illustrated by Table 3 on the following page showing the share of the world's non-agricultural “laborers” and total population in each region. While the more advanced areas of the world command a large majority of the world's income, they possess only slightly less than half of the world's non-agricultural workers. The clear implication is a significant disparity in wages and job type. At the present time, roughly one out of every five people *live* in more advanced regions, while roughly two out of every five non-agricultural laborers *work* in more advanced regions and two-thirds of every dollar is *earned* in more advanced regions.

**Table 2: Share of 2001 Global GDP, by Region**

World Total	45.2 tril
More Advanced	62%
U.S.	22%
Canada	2%
Western Europe	21%
Eastern Europe	5%
Pac-Rim Dynamos	12%
Less Advanced	38%
Mexico	2%
Central America & the Caribbean	1%
South America	6%
North Africa & the Middle East	5%
Sub-Saharan Africa	3%
Asian & Oceanian Interior	4%
Asian Reservoirs	18%

*Source:* See endnote vi. *Note:* See footnote 2.

**Table 3: Share of 1990 non-agricultural economically active population & 2003 total population, by region**

	Non-Ag. Active	Total Pop.
World Total	1.3 bil	6.3 bil
More Advanced	43%	23%
U.S.	10%	5%
Canada	1%	1%
Western Europe	13%	6%
Eastern Europe	11%	5%
Pac-Rim Dynamos	9%	6%
Less Advanced	57%	77%
Mexico	2%	2%
Central America & the Caribbean	3%	1%
South America	7%	6%
North Africa & the Middle East	5%	7%
Sub-Saharan Africa	5%	11%
Asian & Oceanian Interior	10%	14%
Asian Reservoirs	25%	38%

Source: See endnote vii. Note: See footnotes 3 and 4.

While this is all a different, data-driven means to show the disparity between the developed and less developed world, it also shows the extent of those disparities. And it drives home the most critical point with respect to the global workforce. The differences between the advanced and less advanced regions of the world can be discussed in terms of GDP per capita, as is common. They can also be personalized, discussed in terms of the fate of tens of millions of individual workers.

In an economic regime that favors trade liberalization and the globalization of production, migration and employment flows that respond to international differences cannot be excluded from consideration. Comparative advantage is as important

in the international exchange of labor as it is in the exchange of the products of labor. Personal preferences such as family and cultural affinity may create transactions costs to international migration and significant legal barriers may exist to it but, over time, natural economic pressures will gnaw at unnatural legal restrictions.

These natural economic pressures are easy to demonstrate. Compared to the United States, for instance, similar jobs elsewhere pay much less. While evidence clearly shows that the tendency to migrate declines before average wages in a worker's home country reach 100% of a potential destination country's, the evidence is equally clear that any such levels of equilibration are a long way off. Nor is the elasticity between wages and the willingness to migrate equal in all situations. To take two factors, we know that the presence of ethnic or multi-cultural communities makes a country more attractive to immigrant labor flows and that multi-generational considerations have a strong influence in the decision whether and where to migrate. As the world, or at least the advanced world, becomes more friendly to non-Western immigrants and their

**Table 4: Most recently available earnings in selected nations as a percentage of U.S. earnings, by economic activity**

	Mining	Manuf.	Utilities	Constr.
Egypt	4%	13%	4%	5%
Mexico			11%	9%
Peru	12%	10%		12%
Barbados	24%	28%	24%	25%
Sri Lanka		2%		2%
India		1%		
Sudan	4%	1%		1%

Source: See endnote ix.

Notes: See footnotes 5, 6, and 7.

expectations for opportunity, non-Western immigrants may become increasingly willing to move at a given wage trade-off level.

The calculus behind these trade-offs may also be different for different types of workers. We may expect that the low-skill or poorly educated migrant is motivated primarily by the wage-related opportunity costs of *leaving*: the pittance earnings he or she foregoes when leaving home. We might also expect that the high-skill or highly educated migrant is motivated by the wage-related opportunity costs of *staying*: the much higher wages he or she could earn abroad. In other words, the former group moves to escape destitution; the latter group, while still earning relatively good wages in its home nations, moves to craft an even better opportunity for itself. If these motivations are, in fact, accurate, then the highly-educated may stay much more mobile than the poorly-educated if international wage rates begin to approach each other in the medium- and far-term future.

This is not to say that we should expect the low-skilled or less-educated to remove themselves from the pool of potential migrants, however. The combination of necessity and desire to escape destitution may remain well into the distant future. There is growing evidence that some wage equilibration occurred in the 1990's, as economic theory would predict, particularly in manufacturing. There are equally compelling reasons to worry that the supply-side of domestic labor markets in much of the lesser developed world will put strong downward pressure on any wage increases over the medium- and long-term.

One of the most commonly understood stories in economic history concerns the relationship between the industrial revolution and the changes to agricultural practice that shortly preceded it. The steam engine and the factory created a demand for urban labor pools. Factories, in turn, were able to satisfy their demand because of the surplus of farm workers that resulted from agricultural improvements. Growing more food with less people meant that farms needed fewer workers. And so away to the Birminghams and the Nottinghams they went.

Technological change in farming has never stopped but it has failed to affect farming practice in most areas of the world to the degree it has in the West. The result is an incredible differential between the portions of the labor force employed in agriculture between the developed and less developed worlds. For instance, while slightly less than 3% of America's workforce was involved in agriculture in 1990, slightly less than 65% of China's workforce was involved in agriculture.

The fact that so many millions of Chinese can compete with an American laborer for a manufacturing job is a dramatic example of our new age. But these millions do not appear from nowhere. They move from small, rural villages to China's new urban meccas, from an agricultural work life to an industrial one.

Given the size of the world's agricultural workforce, even small improvements will unleash vast numbers of people into the industrial and service labor markets. Every 1% of the global workforce that can move from farming to other sectors adds an additional 10 million new industrial and service workers. There are also reasons to think about this labor transfer from the standpoint of a much larger tidal wave of new labor.

The price of information technology is plummeting. The genetic modification of seeds promises to transform agriculture and the ability to adapt soils and climates to best use. If change were to occur quickly enough, then we might best think of the excess agricultural labor force as just that: surplus. Table 5 on the following page details such a consideration. If it were possible for the less developed world to employ 5% of its economically active population in agriculture and still meet its needs (roughly the share in politically subsidized Western Europe and almost twice the rate in the U.S. and Canada), then almost one billion agricultural laborers would be unnecessary.

Real life is rarely as dramatic as the hypothetical, yet changes are coming in the way the world grows its food. And that means phenomenal changes to how the world apportions its labor resources.

The world's new workers will obviously come from more places than just newly modern farms. The world's population is growing and so is its workforce. But these

**Table 5: Estimate of a technology driven theoretical surplus in the economically active population, at which 5% are devoted to agriculture, 2000**

	<u>2000 estimate</u>	<u>Theoretical surplus</u>
Mexico	7.3 mil.	5.3 mil.
Central America & the Caribbean	14.8 mil.	11.2 mil.
South America	19.1 mil.	11.5 mil.
North Africa & the Middle East	41.5 mil.	33.7 mil.
South Africa	167.8 mil.	154.0 mil.
Asian & Oceanian Interior	199.5 mil.	180.6 mil.
Asian Reservoirs	555.4 mil.	495.0 mil.
Pac Rim Dynamios	44.1 mil.	34.8 mil.
Total	1,049.6 mil.	926.2 mil.

Source: See endnote x.

new people and new workers will not come from here, either.

### 1. The population & workforce overall

The world's population, according to best estimates, consists of 6,259,239,364 people.<sup>xi</sup> In a rough sense, this is relatively well known. A global population figure of 6 billion or so is frequently cited.

There is much less common understanding about where population goes from here: the future of world growth. One frequently hears claims that the global population will continue to increase at historic rates, leading to impossible levels of overpopulation. The opposite prediction is also popular, that the world is soon to stop adding people in any appreciable way and may, in fact, begin to shrink in numbers.

Both beliefs are myths. The reality is actually the continuation of a fairly long-standing trend. For the

foreseeable future, the world will continue to add large numbers of people. The *rate* at which it does so, however, will begin to decline. Positive but slower global population growth has two culprits. The first is radically reduced growth in the advanced areas of the world, including outright decline in some cases. The second is the slowing rate of natural increase among the world's poorer regions.

The first important conclusion to make about the overall global population and workforce is that it will continue to increase. There will still be more people to shop and buy the global market's products and more people to produce them as time rolls on. We may be even more accustomed to our population future than we know. *Absolute* population growth should actually be about what we have experienced in the recent past: roughly three and a half billion additional people over the course of a half-century. The U.N. gives a range to these projections. Population growth may be about 1.5 billion less than expected in 2050, it may be about 1.5 billion more. But the "best guess" estimate puts absolute population growth at about that of recent history. However, as Hudson Institute's Max Singer has demonstrated, the U.N.'s assumptions about fertility may overestimate the true fertility floor.

As referred to earlier, what will be increasingly different is where the additional 3.5 billion come from. As the decennial rate of world population growth slows—from 19.9% in the 1960's to 13.5% in the present decade to a projected 4.7% between 2041 and 2050—the contribution of the more and less advanced regions of the world to that

**Table 6: World population**

1950	2.5 billion
2000	6.1 billion
2050 (low)	7.9 billion
	<b>(med.) 9.3 billion</b>
	(high) 10.9 billion

1950-2000 difference: 3.5 bil.

2000-2050 difference: 3.3 bil.

Source: See endnote xii.

population growth will shift mightily.<sup>xiv</sup> Family behavior throughout the post-World War II era has always resulted in a small contribution by the West. Throughout the first half of this century, the cumulative effect of that behavioral dynamic will be massive.

While Graphic 3 demonstrates just how little the developed regions of the world will contribute to population growth, even it masks the full drama of the trend. In our present, 1990-2010 period, Eastern Europe is actually expected to see reduced overall population levels. By the 2030-2050 period, the populations of both Eastern *and* Western Europe are projected to decline.

As a result, the share of net growth contributed by Africa and Asia is much higher than what the graphic suggests. In the two decades prior to mid-century, almost all, 99%, of net global population growth will come from Africa and what we term the Asian & Oceanian Interior and the Asian Reservoirs.<sup>xv</sup> Sixty-five percent of the world's net new people will come into the world on the continent of Africa, with 51% coming from just Sub-Saharan Africa.<sup>xvi</sup>

The effect will be stunning. With a little over one billion people currently, Africa will double its projected 2010 population of 1.3 billion in the 40 years between 2010 and 2050.<sup>xvii</sup> At a much slower rate of growth, the Asian & Oceanian Interior and the Asian Reservoirs will have roughly doubled their combined 1979 population by mid-century.<sup>xviii</sup> Europe, on the other hand, is projected to *fall back* to its outright 1959 population by mid-century.<sup>xix</sup>

### The workforce

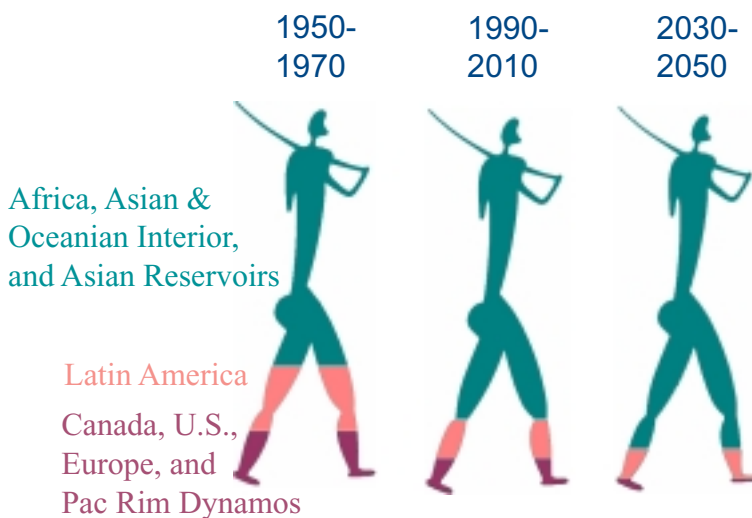
The influence of the world's population trends on its workforce growth is predictable. The advanced regions are contributing an ever dwindling share of the world's workers. The most difficult effect of population trends on workforce growth (as well as the impact of declining participation rate behavior) expresses itself in the relative decline of absolute growth. In other words, the number of workers added to the labor force in the world's advanced regions in a given period of time is shrinking. Indeed, projections for our present decade are

for a smaller number of additional workers than was added in the 1990's for every advanced region. Western Europe is actually facing absolute declines; its labor force is expected to be 151,000 workers smaller in 2010 than it was in 2000.

These data are arguably the most important aggregate trends facing the West and the developed world. Economic growth is a product of productivity increases and the number of workers. As the marginal number of additional labor inputs declines over time, economic growth axiomatically declines absent increases in productivity large enough to offset the labor shortfall. All large economies depend on labor force growth for economic growth. The decline in labor force additions will require unprecedented, and almost certainly impossible, productivity gains to maintain historic rates of economic growth.

Depending on economic structure and public expectation, an argument could be made (and

**Graphic 3: Contribution to World Population Growth by Broad Region, 1950-70, 1990-2010, & 2030-50**



Source: See endnote *xiii*.

**Table 7: Growth behavior of the global workforce, by region, 1950-2010**

	Absolute Level	Growth				Absolute Level
	1950	1950-1970	1970-1990	1990-2000	2000-2010	2010
Total	1,215.2					3,461.4
Advanced Share of Growth		25%	16%	12%	7%	
Canada		3.4	5.8	1.9	1.2	
U.S.		22.1	39.0	16.8	14.6	
Western Europe		12.9	25.4	8.7	-0.2	
Eastern Europe		37.6	18.8	2.1	0.4	
Pac Rim Dynamos		37.8	50.8	26.2	18.7	
Less Advanced Share of Growth		75%	84%	88%	93%	
Mexico		5.9	15.7	10.1	11.1	
Central America & the Caribbean		10.4	25.4	17.0	17.9	
South America		25.0	54.7	30.0	29.8	
North Africa & the Middle East		20.2	49.3	39.8	52.6	
Sub-Saharan Africa			42.0	85.9	63.9	77.3
Asian & Oceanian						
Interior		52.2	116.1	79.1	94.1	
Asian Reservoirs		185.0	371.6	164.8	155.3	

Projected 2010 Workforce, *Advanced Regions*: 740.2 million

Projected 2010 Workforce, *Less Advanced Regions*: 2,712.2 million

Source: See endnote xx.

sometimes is) that slower economic growth need not present an overly worrisome situation, let alone a crisis. This argument stresses the difference between GDP and GDP per capita. If there are fewer members of the population, then lower GDP may not imply reduced income per person. The difficulty with this response is that it misanalyses the relationship between the expected behavior of the population and the workforce. The absolute, relative, and rate declines at issue are not reflective of people exiting the workforce and the

population at the same time. They are reflective of people exiting the workforce to enter the non-working population.

As we will explore later, the shrinking pool of new workers comes at a disastrous time for most of the advanced world. Exiting the workforce to enter the non-working population is of course another way of saying retirement. This gets close to the root of the difficulty facing the advanced world. Not only is life expectancy much longer, the tendency to retire occurs at a much earlier age than in the less developed world, meaning that historically unprecedented numbers of former workers will remain in the population but be economically inactive. Not coincidentally, the advanced regions of the world are also made up of the publics who expect retirement behavior and needs to be subsidized by the state.

This is why the challenge facing the West and developed areas of the Pacific Rim is so extreme. Facing untold billions of dollars in social security and healthcare commitments, the governments of the advanced world are entirely dependent on total economic growth to help offset the cost through improved tax rolls. Per capita growth is an almost irrelevant consideration.

The darkest days of this challenge lie in the second decade through about mid-century for most of the developed nations, though Continental Europe and Japan

will enter this period slightly earlier than the rest and will confront a degree of difficulty not shared by the United States, the United Kingdom, and Australia. A fuller extent of the problem will be covered in detail in *Beyond Workforce 2020*, but our conclusion is straightforward. The level of productivity gains that would be necessary to alleviate workforce growth declines will be too high to be relied on as a public solution to the triangle of retirement/healthcare/workforce considerations. Governments in the advanced world will turn to immigration to augment their native workforces.

While there is almost certainly no way for Continental Europe and Japan to completely return to historical rates of labor force growth through the manipulation of hard (legal) and soft (social and cultural) immigration policies, the economic pressure to incentivize immigration is certain to be keen. This is not to ignore the cultural hurdles associated with large amounts of immigration. A political backlash to existing immigration patterns appears to have begun in Europe already. Japan would have to significantly alter cultural practice. But the economic, and ultimately the political, costs to resistance would be such that all nations will likely try to increase immigration flows at some level.

The most obvious course will be to pursue policies designed to attract the most productive, skilled, or educated international populations. These workers would produce greater output in a knowledge economy than the unskilled, and thus greater tax base, than would lower educated and skilled workers. As discussed previously, the less developed world will supply increasing amounts of new labor that could be available to the international labor market absent political constraints. As should be expected, a relatively smaller share of the additional workers supplied will be of the educated and skilled variety. This will create a competitive market for skilled and educated international labor.

The lecture halls of Harvard and the office corridors of the Bay Area demonstrate the extent

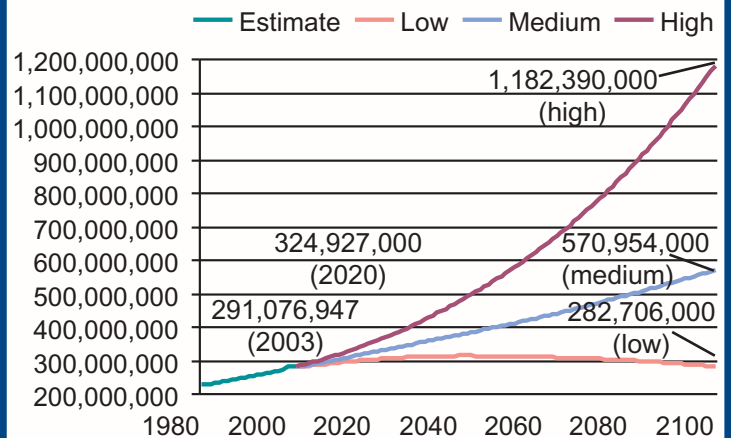
to which an international market already exists for these workers, the world's best and brightest. Overall international population and workforce trends and projections suggest that this market will become far more competitive in the decades ahead.

### The United States

As mentioned previously, the United States escapes relatively lightly from the twin vice of shrinking new labor pools and retirement commitments that will squeeze so many of our economic peers. The reason is that the U.S. is projected to enjoy much higher rates of population growth over the course of the century. The rate of population growth will slow, as has been its long-term trend, but to nowhere near the depths that will be common in Europe and elsewhere in the developed world. The result will be fairly steady absolute increases of around two and a half million people per year between now and mid-century.<sup>xxii</sup> However, during the second half of the century, slow increases in growth rates will produce climbing annual absolute growth in the second half of the century.

This future is the Census Bureau's "best" forecast of what will occur. The Bureau also offers two other

**Graphic 4: U.S. population, estimates and projections**



Source: See endnote *xxi*.

projection series that require consideration. Each would represent an extreme kind of future.

The low series would be a U.S. that parallels Europe, though at a later date. By 2041, shortly after the last of the baby boomers would have left the labor force, population would begin to decline. By 2050, population levels would have receded to about what they are now. This series, really, represents the bleakest of the three futures. All the problems we associate with population decline in a nation publicly responsible for retirement and some measure of retiree healthcare would come into being.

The high series, on the other hand, would be an America we would scarcely recognize. Total population would roughly mirror that of modern India or China (though the country would hopefully be far more prosperous). Most Americans would likely object to this future and, to be sure, it would involve rapid cultural and social change. Depending on the structure and productive potential of the resultant workforce, it may also circumvent the economic stresses of the low series.

By 2041, when the most extreme effects of Baby Boomer aging will have worked their way through, the U.S. will have 24 million, 89 million, or 192 million more people compared to the present day, according to the series.<sup>xviii</sup> Since each America would be so different, the likelihood associated with each is critical to how we consider the future. The best method to determine which, if any, of the series is likely to be correct is to consider the effect of immigration.

As observed by the Census Bureau, the amount of uncertainty surrounding the question of immigration

is, of necessity, relatively wider for international migration than for births and deaths. The exogenous character of this component, and its reliance on unpredictable external factors such as the internal policy environment and world events, as well as the lack of demographic determinism in its

projection, ensure a comparatively high level of uncertainty for this component.<sup>xxiv</sup>

This potential for unavoidable error makes immigration appropriate for a kind of rough scenario analysis, in which one can question or explore expectations divorced from time-series statistical models. In other words, while robust statistics should always be our anchor, we do not have to rely on them exclusively for our expectations about the future.

The importance of immigration to population projections reflects itself in the degree to which it accounts for the difference among the three series, contributing roughly 70% of the differential on either side of the middle forecast in the near term, a little over 40% in 2025, and around 30% in 2050.<sup>xxv</sup> Immigration also takes on a different burden for driving growth in each series.<sup>8</sup> Not surprisingly, the high series assumes the largest immigration levels.

While the Census Bureau does its best, and its best is always admirable, grounding our expectations about immigration in past trends could well lead to an under-prediction of its true magnitude. The last two decades have seen immigration at or beyond the highest historical levels. The height of this tide could be unsustainable, certainly, and so will come back down to earth over the next two decades and beyond.

The height of this tide could also be symptomatic of larger global structural realities that will foster an even more robust migrant labor market than what we have recently witnessed. We could very plausibly be looking only at the iceberg's tip. Given the population and aggregate workforce dynamics in the less advanced regions of the world, the tip of the iceberg may not be a bad place to stake one's claim about the future. That would suggest that the low series, a European-style recession by demographic constriction, is unlikely. It would also suggest that if the middle series is to prove inaccurate, the cause will likely be overly timid expectations about immigration. And that suggests absolute population growth at about the levels we have become

accustomed to or a bit higher. In other words, the U.S. population is in no danger of slowing its absolute growth or declining to critical levels.

### *The workforce*

The same is true for the labor force. We now add slightly fewer 25-and-older workers to the labor force each year than we did through the 1980's. But the levels of addition associated with the 1990's should stay fairly constant until the latter half of the next decade: somewhere around six to seven million more 25-and-older workers every half decade.<sup>xxvii</sup> Not until the latter part of the next decade, when the middle segments of the Baby Boomer generation begin to retire, will absolute growth really fall off. Then, when the last of the Boomers have retired around the year 2030, growth picks up again to almost what we associate with the present day.

This is not to say that the growth structure of the American labor force is ideal, only that our future is likely to be much less painful than in other parts of the developed world. The rate of growth in the labor

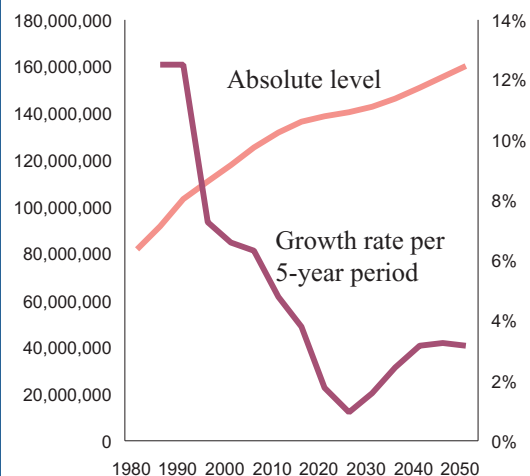
force has and will continue to decelerate. Baby boomer retirement will only steepen that deceleration, to as low as 1% annual growth (in the 2020-2025 period).<sup>xxviii</sup> Without historically atypical increases in productivity, the slowing growth in the workforce will translate into slowing economic growth. The challenge will be particularly keen in the Boomer retirement era.

Take a hypothetical example or, rather, examples, as depicted in Table 8 on the following page. If workforce growth occurs exactly as projected by the Bureau of Labor Statistics, the rate of growth will be slower than that to which the economy is accustomed, all else being equal. Imagine there are three "tools" available to us to offset the shortfall—output per worker, immigration, and labor force participation among those 65 and older. Remember, however, that this analysis is exceedingly simplified and is in no way a projection of the complex effects of economic and demographic change.

If immigration and retirement behavior were to stay consistent with official projections in our simplified hypothetical, but we nonetheless desire to keep annual economic growth humming along at the roughly 3.2% it did during the '90's, output per worker would have to increase at historically significant rates. For the next few years, average worker output could increase by around 2.2% and allow us to meet the economic growth target.<sup>xxx,xxxi</sup> By the end of the decade, output per worker would need to grow by about 2.4%.<sup>xxxi</sup> Once the Baby Boomers begin to retire, average output would need to increase even more substantially, to around 2.6% per year.<sup>xxxiii</sup>

This is not totally impossible. Rates of growth in output per worker hovered in the 2.8% to 3.0% range in the late 1990's, for instance.<sup>xxxiv</sup> However, sustained rates of growth at such heights would be unprecedented. Output per worker increased by 2.4% or higher only eight times in the 20 years between 1981 and 2000.<sup>xxxv</sup> Moreover, in our hypothetical, 2.4% is the minimum acceptable growth rate after 2010 and even this would occur only twice.

**Graphic 5: U.S. labor force levels and percentage growth by decade, 1980-2050**



Source: See endnote xxvi.

**Table 8: Some hypothetical scenarios for output per worker, immigration, and aging necessary to compensate for slowing workforce growth, 2000-2015**

avg. growth in output/worker, '91-'00: **2.1%**  
 avg. net immigration/year, '93-'00: **907,000**  
 avg. 65+ labor force participation, '93-'00: **12.0%**

	output/ worker growth	immigration per year	65+ part. rate
2003	2.1%	1,079,000	14%
2004	2.1%	994,000	14%
2005	2.0%	792,000	14%
2006	2.1%	897,000	14%
2007	2.2%	1,112,000	15%
2008	2.2%	1,146,000	16%
2009	2.3%	1,382,000	17%
2010	2.4%	1,419,000	19%
2011	2.4%	1,518,000	20%
2012	2.6%	1,901,000	23%
2013	2.6%	1,985,000	25%
2014	2.6%	2,063,000	27%
2015	2.6%	2,171,000	29%

Source: See endnote xxix. Note: See footnotes 9-12.

So, looking solely to productivity to compensate for slowing workforce growth would present a serious challenge.

Similarly, absent the expected changes to productivity and older worker behavior, the pressure on immigration would be extreme if it were the only means of responding to slower workforce growth. The Census Bureau's medium projection forecasts an additional 10 million immigrants between now and 2015.<sup>xxxv</sup> The cumulative total of immigrants we would need in our hypothetical future would be around 18 million, almost twice the official "best" projection.<sup>xxxvi</sup> In fact, our hypothetical total needs

would come very close to those of the Census Bureau's *high* projection.<sup>xxxvii</sup> So, as with productivity, immigration levels would have to be well beyond historical experience if other demographic or economic factors do not change.

Finally, the same hypothetical lessons apply to older workers. Absent changes to traditional productivity growth or immigration levels, behavior and attitudes toward retirement would have to change significantly for the economy to grow at desirable rates. By the middle of the next decade, when we are only barely into the era of Boomer retirement, nearly one in three people who are 65 and older would need to remain in the labor force.<sup>xxxviii</sup> This is much higher than present and past behavior and, one suspects, is higher than the future expectations of many who are in the middle or latter phases of their working careers.<sup>xxxix</sup>

To be sure, increases in older workers' labor force participation are already forecast and they will almost certainly happen. The Bureau of Labor Statistics projects a participation rate of a little over 16% in 2015, or just under one in six members of the older population.<sup>xl</sup> Unless other changes occur, however, there are strong reasons to suspect that labor force behavior will not be able to keep pace with the labor force growth to which we are accustomed.

The real world will very fortunately not necessitate choosing one of these three variables and leaving the others aside. All will act in concert with each other to affect our fate, hopefully for the better. But if we ignore any of them, the problems that lie ahead will be much more difficult to overcome. Demography is destiny but not a single one. There will be policy choices we can make that affect both America's demographic future and the implications. And that is very fortunate, because the combination of demographics and our present public policies are about to create an unprecedented set of challenges.

## 2. Global aging

Recently, reports arose about an internal study that was eventually left out of the government budget which predicted “a future of chronic federal budget deficits totaling at least \$44,200bn [44.2 trillion] in current U.S. dollars.”<sup>xli</sup> To be sure, the history of government budget deficit forecasting is a history of misprediction (although many may take credit for the late 1990’s surpluses, for example, almost no one saw them coming until they were right on top of us). But the size of the figure is startling—roughly four times total current GDP and about equal to 96% of present total U.S. household wealth—and evidently prompted a conclusion that “the equivalent of an immediate and permanent 66 per cent across-the-board income tax increase” would be required to put the budget in balance.<sup>xlii</sup>

While one should ignore the specific numbers which are almost certain to end up wrong, one should still consider their general magnitude and how we ever even got in range of that kind of gargantuan, depressing ballpark. The source of the problem is aging. Western governments long ago committed themselves to sweeping commitments to publicly assisted retirement and quality of life maintenance for older members of their populations.

Unfortunately, much longer life expectancies, changed social and cultural expectations, the size of the Baby Boom generations, and gradual expansions of the original commitments have made social security and publicly subsidized healthcare the biggest long-term fiscal worry faced by the West. The price of these commitments now appears to be so large that almost no developed nation has come up with a popular and adequate answer for how to deal with them. Perhaps the most singular achievement of the 20<sup>th</sup> century welfare state and quasi-welfare state model sometimes seems in hindsight like it was a bit short of sight.

Still, the difficulty facing the United States pales in comparison to Europe and other areas of the developed world. The recent French strikes that paralyzed the European air transportation system were over proposed changes to the public employees’ pension system, which by itself commits the French government to 78 billion

Euros, or about 92 billion dollars, in a nation with an economy about 15% the size of the United States’.<sup>xliii, xliv</sup> By 2040, after taxes for other government needs are taken out, France’s total commitments to its older population will consume 36% of the income of its non-older population.<sup>13, xlv</sup> And that level of expected private income absorption does not even rank France first. Spain takes the top spot, where the rate of consumption is projected to be 43%.<sup>xlvi</sup> America, in comparison, breezes through with only 27% of its “after other tax” income going to benefits for the older population.<sup>xlvii</sup>

The effects of public commitments to the older population are future total tax burdens that are shocking in their scale. Unless these commitments are paid through public borrowing (i.e., large budget deficits), the tax burden in the U.S. is projected to rise from its present 33% to 44% in 2040.<sup>ii</sup> Of the twelve developed countries analyzed in the *Aging Vulnerability Index* cited in the prior paragraph, only Australia, at 39%, and the United Kingdom, at 42%, are projected to require lower total tax burdens than the U.S. to keep its commitments to their older populations unless debt financing is used.<sup>l</sup> Of the remaining nine nations, only Japan is forecasted to have a tax burden of less than 50% of GDP.<sup>li</sup> Six of the remaining eight projected burdens are between 50% and 60% and two, for France and Sweden, are over 60%.<sup>lii</sup> To put it mildly, without major changes on a number of policy fronts, public assistance to older populations will be a dominant force in the economics of the developed world for most of the first half of the century.

Analysis of the fiscal policy choices will be an important theme of *Beyond Workforce 2020* but is outside the scope of this White Paper. This White Paper instead stresses two demographic conclusions about aging. The first conclusion is simply a presentation of the facts, that the structure of the population and workforce in the world’s advanced regions is about to change radically. Second, to the extent that governments can affect the demographics of aging either through manipulating immigration levels (i.e., increasing them) or retirement behavior (i.e., reducing it), they would be wise to do so. Because the wisdom of a changed policy

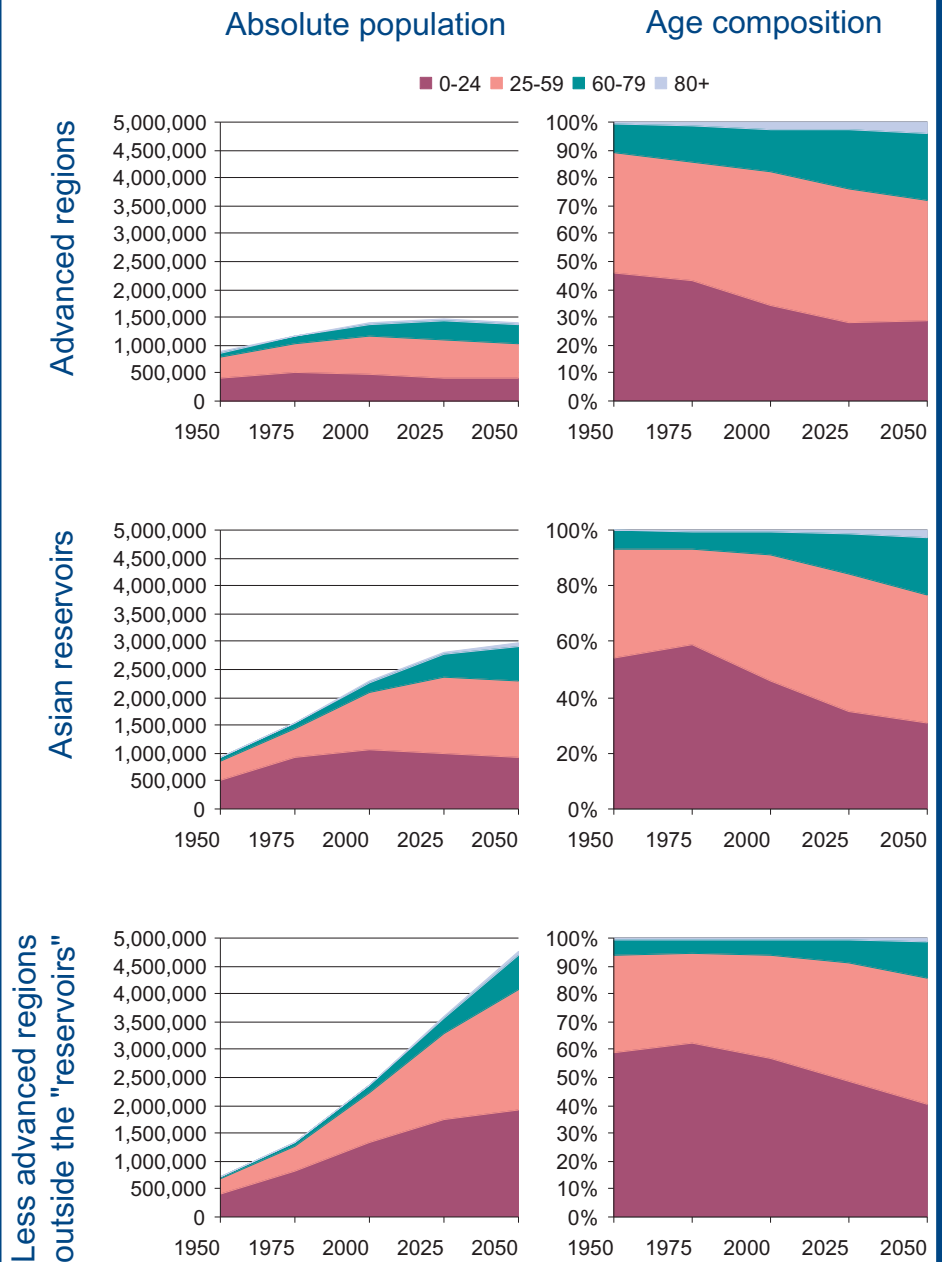
stance will become so manifestly obvious, the indirect translation of this conclusion is perhaps more important: the need to slow the overall aging of the population, which cannot be accomplished solely through changed behavior by older workers, will accelerate the integration of a global market for talent and labor. Moreover, because governments in the developed world face different degrees of the same problem and similar political risks in addressing it through immigration, the demand side of the global market is likely to be keenly competitive, especially for highly educated or skilled workers. These workers are the ones who will be most likely to swell tax rolls without diluting per capita GDP or creating unacceptable social and cultural friction.

But the first step toward appreciating this future is understanding the magnitude of population and workforce change that will soon occur. A demonstration of these dynamics follows.

### *The population*

So far, we have discussed global and U.S. population dynamics chiefly from the perspective of their slowing rates of growth. Except under extreme circumstances, slowing rates of growth are coincident with an aging population. The series of charts in Graphic 6 on the absolute populations and relative age

**Graphic 6: Absolute population by age group and age composition of the population for the advanced regions, Asian reservoirs, and less advanced regions outside the "reservoirs": 1950, 1975, 2000, 2025 & 2050**



Source: See endnote *liii*.

structures of the various regions makes that point clearly as it relates to our own circumstance. Population has nearly crested for the advanced regions of the world, is slowing dramatically in China and India, and is still growing rapidly in the remainder of the developing regions. These conditions are symptomatic of aging that goes from more to less extreme as we move from advanced to less advanced. (China and India's population behavior has different sources beyond economic transition, however.)

Aside from the visual evidence of actual population decline among the advanced regions, the most important implication for the developed world is the growth of the top two shaded regions—the 60 and older cohort—relative to the whole population. This population is projected to expand from 99 million in 1950 to 248 million at the turn of the century to 398 million in the year 2050.<sup>liii</sup> That amounts to a 2000-2050 rate of growth for the 50 and older population that is *68 times* faster than the rate of growth for the total population.<sup>liv</sup>

This incredibly rapid aging is what creates the most important pressures facing the developed world. The workplace will become vastly different, as will the expectations of both young and old with respect to education, career-oriented training, and the career cycle. Ideally, this transformation will occur more quickly than is projected. A workforce older than what we expect will be synonymous with the increased labor force participation by older members of the population that can help offset the macroeconomic costs of aging.

The charts also help to define the importance of immigration in both curbing the hemorrhage of labor force numbers and paying for the costs of public retirement and healthcare commitments. Suffering through that rapid and extreme a change would be exceptionally difficult unless policymakers look to augment the native population growth. The real-world experience of what the charts visually represent is what will drive the global market for talent and labor.

China and India, on the other hand, are likely to experience the difficulties associated with aging without the acute pressure faced by the developed world to come up with non-native population solutions. The number of

older people in the Reservoirs' population will be staggering. By 2050, they will number over 702 million with an 80 and older population of roughly 86 million.<sup>lv</sup> Still, the two countries will be populated by over 2.3 billion people under the age of 60.<sup>lvi</sup> Their sheer size will ensure that they remain a source of the world's labor, much of it highly educated, and a certain draw to the world's employers due to the combination of labor opportunity and perceived relative stability.

The final group, the world's smaller less advanced nations, will become an even more potent potential supply of global labor and jobs than China and India. By 2050, 4.8 billion people will reside in these regions. Their age structure will look remarkably identical to the age structure of the West and advanced regions of the world a hundred years prior.<sup>lvii</sup> China and India are special cases because small policy changes in only two nations so directly effect such a large percentage of the world's people. No country in the remainder of the developing world can have such singularly grand influence.

But if the overall climate we associate with developing regions changes significantly, the impacts on the global workforce will be tremendous. A new age of stability, for instance, would open a combined labor market to the world's multi-nationals and manufacturers that would dwarf China and India. A new age of even greater instability and barriers to the flow of people will rob the developed world of its largest raw source of potential immigrant labor.

The almost certain reality is that the demographics are too stark to not have their own effect in a world of cheaper and quicker communications, services exchange, and travel. No developed nation is going to eliminate immigration caps. The entirety of the world's manufacturing sector is not going to locate in the developing nations. But an increasing transfer will occur. In places like Miami and London and Manchester and even Indianapolis, the evidence for the certainty walks among us.

**Table 9: Economically active rates, 1950 & 2010, for the 55-59, 60-64, and 65+ age cohorts**

	55-59		60-64		65+	
	'50	'10	'50	'10	'50	'10
France	59%	53%	56%	14%	23%	1%
Germany	58%	59%	46%	18%	18%	2%
Italy	50%	41%	40%	18%	25%	3%
Spain	51%	45%	48%	25%	32%	2%
U.K.	57%	62%	50%	34%	18%	4%
U.S.	61%	68%	52%	39%	26%	9%

Source: See endnote lviii

### The workforce

Again, the critical role of immigration in balancing the relative labor supply mismatch and ameliorating the global age imbalance does not mean that it is or can be the only demographic target for dealing with the costs and consequences of aging. Changing the attitudes toward older adult labor force participation is equally key.

The amenability of labor force participation to policy change is made clear by just how sharply participation has fallen off in the developed world among the older population. Throughout the West, the willingness of older populations to stay in the workforce has dwindled. Moreover, this is generally true even for “younger” members of the older cohorts. Participation has fallen significantly in France, Italy, and Spain for those who have not yet reached the age of 60. And for those nearing or past the culturally “official” retirement of 65, participation is almost non-existent compared to past behavior.

Discovering the root of our changed attitudes is not difficult. The post-World War II period coincides with the final cementing of the Welfare State’s redefinition of the public responsibility to older populations. Increased standards of living have allowed developed populations to save wealth for delayed consumption in older years. Those older populations have responded entirely rationally to the offer of public subsidy and increased

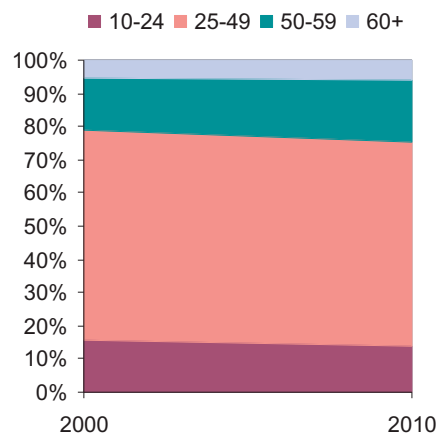
private lifetime savings; they have retired at unprecedented rates.

As a result, the notion of an aging workforce really has two dimensions. The first is the extent to which it is true. Ever larger shares of the developed world’s workers are within the 50-65 year old age cohort. As employers look to add to their roles, the need to appeal to applicants that are typically older will grow.

The second dimension comes closer to the extent to which the concept of an aging workforce is untrue. In the more advanced regions of the world, the aging of the workforce does not reflect the scope of aging within the entire population because of the effect of public policy and savings

behavior. The age of the workforce is, in a sense, unnaturally capped whereas the cap to the population’s aging is the ultimate natural. The gap between the two is growing increasingly larger. Cultural and social expectations have resulted in shorter working lives while science and health improvements have resulted in longer natural lives.

**Graphic 7: Age structure of the economically active population in the advanced regions, 2000 & 2010**



Source: See endnote lix.

Such notions are rather obvious but under-appreciated in their implications for the workforce. Unless behavior changes, the share of the workforce occupied by the upper ranges of the older cohorts may change slowly. Aging will occur through the increasing share of the workforce consumed by the younger older cohorts. Aside from the fiscal effects, the practical effects for employers will be considerable. An unprecedentedly large portion of their workforces will be of the age associated with the “best jobs” in the career cycle. Best jobs are partly that way because they are fewer. Matching traditional career expectations with demographic reality will be a serious challenge. At the same time, employers will find themselves walking a thirty-plus year tightrope as large shares of their workforces are already eligible or are approaching eligibility for retirement. For multi-nationals, the labyrinth of different public policies aimed at retirement (and often significantly different cultural attitudes) will exacerbate these difficulties.

The combinatory effect of public policy, economic opportunity, and personal behavior can have a large impact, as stressed throughout this paper. Simply reversing the trend in participation behavior by older cohorts, such that the 2020 economically active rate is equal to the 2000 economically active rate and the 2030 rate is equal to the 1990 rate, would result in a 60 and older active population 37 million greater at mid-century in the advanced regions than if the behavior projected for them in 2010 remains constant.<sup>14, 15, lx</sup> But the prospect for much behavioral change in the advanced regions may be slim, particularly outside the United States. Social Security may be known as the third rail of American politics but it sometimes appears to be the whole track in Continental Europe. Every initiative to change public policy about retirement or public retirement benefits that comes down the pike tends to be met with overwhelming resistance.

### The United States

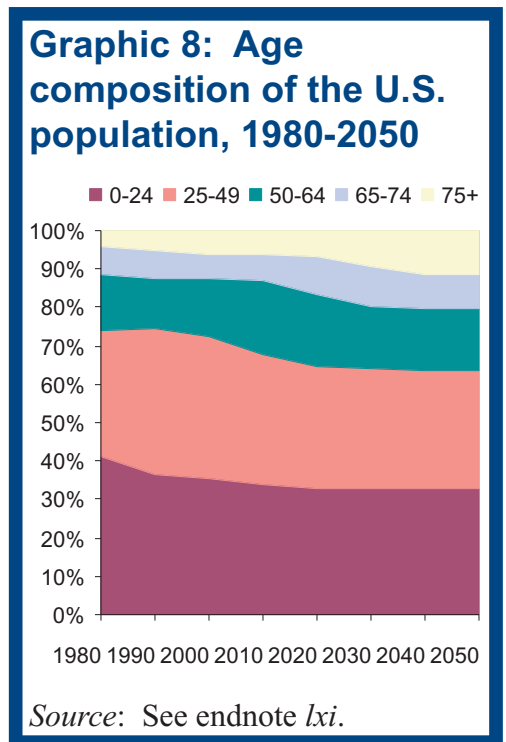
The aging that confronts America is less challenging than that facing Japan and Europe but it will nonetheless bring massive change to the face of the American

population and workforce. The population has technically been aging for some time but the change will become impossible to ignore as the present decade ends. In 2011, the head of the Baby Boom generation reaches the age of 65.

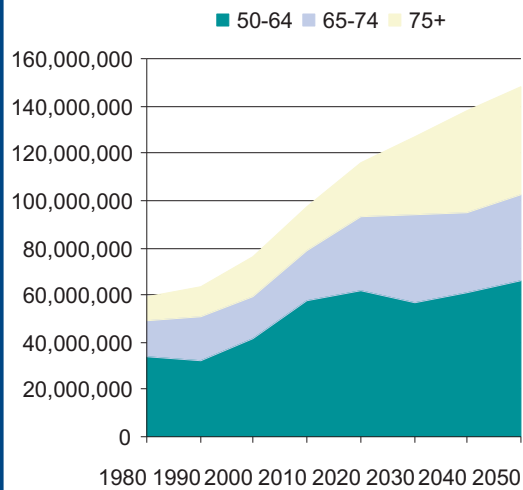
In graphical form, the impact of the Baby Boom is easy to see. It causes clear inflection points as it moves into and out of different age cohorts, as shown in Graphic 8. The percentage of the population between the ages of 50 and 64 jumps from 15% in 2000 to 19% in 2010.<sup>lxii</sup> As the Baby Boom moves on, the share of the American populace between 65 and 74 leaps from 7% in 2010 to 11% in 2030.<sup>lxiii</sup> Then, as the Baby Boom works its way into the far older cohorts, the portion of the population age 75 and over shoots from 7% in 2020 to 11% in 2040.<sup>lxiv</sup> When all is said and done, well over one in three Americans will be over the age of 50 and one in five will be past the late 20<sup>th</sup> century’s official age of retirement.<sup>lxv</sup>

The actual size of these populations is equally important. Between now and 2040, the American population will add 56 million people 50 years old and older, another 42 million age 65 and over, and another 26 million 75 years old and over.<sup>lxvii</sup> The latter case represents a total growth rate of 148%.<sup>lxviii</sup>

From the standpoint of the public responsibility toward retirement and



**Graphic 9: Size of the older cohorts of the U.S. population, 1980-2050**



Source: See endnote *lxvi*.

healthcare, the fantastic growth of the very old populations is critical. These are the fastest growing segments of the population. They are also the populations whose retirement is likely to be nearly total. The combination of their coming explosion in size and public commitments could have enormous fiscal implications. By the time the responsibility for public retirement benefits and healthcare falls almost totally on the post-Baby Boomer generations, at around 2040, there will be about as many Americans 80 and older as

**Table 10: Size and growth of the very old populations, 2003 & 2040**

Age	2003	2040	Growth rate
80+	10,018,421	27,103,593	171%
90+	1,795,720	6,399,530	256%
100+	81,791	551,308	574%

Source: See endnote *lxix*.

there are Californians today. There will be as many Americans then who have reached the century mark as the individual year 2000 population of all but the 28 largest American cities.

In thinking about the future of the very old and the public’s commitment to them, health and healthcare present two key considerations. The first is quality of life. If octogenarian status or beyond is associated with intensive healthcare needs, then the public costs for supporting them through Medicare like programs could be extreme. If, on the other hand, old age regularly involves a high quality of life, the healthcare costs of these demographic shifts would consume far less of the national income.

The second consideration is whether the explosion of the very old populations might be even grander than what is projected. As Table 10 shows, the population drops dramatically with each additional decade of life. If official expectations for mortality under predict the ultimate effect of healthcare improvements, then these populations could be much larger. One of the more interesting scenarios for the future is a phenomenon we might term “hyper-aging,” in which extremely long life becomes the norm due to advances in healthcare and biotechnology. Were 100 years and beyond the expectation rather than the exception, the size of America’s population, its structure, and its effects on economic activity would be wholly different than the quite different America that is already predicted.

*The workforce*

The impact of aging on the workforce, however, does not depend on the long-term effects of the frequency of the very old. Nor do they begin only when the Baby Boomers start to retire. Through the next decade and a half, the only real source of workforce growth are the pre-30 and post-49 year old cohorts. The size of the workforce between 30 and 44 is projected to shrink by over three million workers by 2010.<sup>lxxi</sup> Between 2011 and 2015, the number of workers in the 35-49 year age range will decline by almost one and half million.<sup>lxxii</sup> By the middle of the next decade, the workforce will have roughly 3.5 million fewer workers between the ages of

**Table 11: Workforce growth by 5-year age cohort and direction of change from prior year, 2004-2015**

year:	04	05	06	07	08	09	10	11	12	13	14	15
16-19	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
20-24	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
25-29	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
30-34	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
35-39	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
40-44	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
45-49	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
50-54	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
55-59	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
60-64	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
65-69	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
70-74	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
75-79	↗	↗	↗	↗	↔	↗	↗	↗	↗	↗	↗	↗
80+	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗

Source: See endnote *lxx*.

30 and 49 than it does today.<sup>lxxiii</sup> Fortunately, this is almost entirely offset by the 3.2 million worker growth in the 25-29 cohort, thereby injecting cutting-edge literacies into the economy.<sup>lxxiv</sup>

The immediate future facing employers is thus one of a kind of bifurcation. Young workers will be growing in number as will older workers. The number of workers in early middle-age will not. Finding ways to attract and appeal to both sources of workforce growth will be a key challenge. It will also exacerbate the extent to which many large employers manage workforces from which large shares could suddenly be peeled away through retirement.

By about 2015, that challenge will shift. The number of 50 and older workers will have shot up by 16 million compared to the year 2000.<sup>lxxv</sup> In the following decade and a half, the number

will remain approximately constant, hovering around 48-50 million workers.<sup>lxxvi</sup>

These are the years in which the variable of Boomer retirement propensity will become a perpetually dominant policy concern. Of the twenty million net workers 25 and older who are projected to join the workforce from now through 2030, only 6 million of them will do so after 2015.<sup>lxxviii</sup> However, the pool of those in the age range when retirement is an option but probably not a necessity will mushroom.

In the first years of Baby Boomer retirement eligibility, relatively minor changes in the propensity to retire can alleviate significant amounts of the decline in the rate of workforce growth. As the years roll by, however, increased labor force participation will have an ever reduced affect on the ability to reach desirable cumulative labor force growth levels. This reality creates a policy irony. Changes to the behavior of the oldest Boomers would have a greater cumulative effect than changes that only affect the younger Boomers. Yet, the older the Boomer, the more unfair would be any induced behavioral change.

Perhaps most importantly, however, no practical degree of change to retirement activity can completely offset the slowdown in labor force growth. In 2030, that level of older labor force participation would require 84% of the 55-75 year old population to stay working. We might suspect that that rate of participation would be

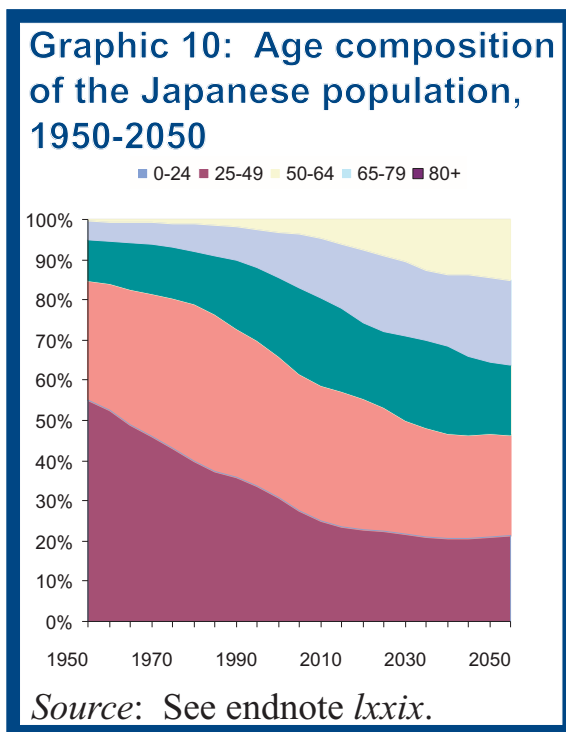
**Table 12: The potential for older workers to compensate for slowing workforce growth, 2003-2040**

	2003	2010	2015	2020	2030
25+ workforce					
shortfall:	3 mil	7 mil	14 mil	23 mil	30 mil
55-75 population					
not in workforce:	27 mil	32 mil	37 mil	40 mil	41 mil
shortfall as a % of					
untapped 55-75 cohort:	11%	22%	38%	58%	72%

Note: See footnote 16. Source: See endnote *lxxvii*.

undesirable. We would certainly expect it to be infeasible.

To keep the workforce growing at healthy rates, we will instead have to literally look outside. Intentioned and effective policies toward immigration will be a necessity. The challenge to crafting effectiveness will come from just how necessary immigration will be for everybody else.



### 3. The global market for labor and talent

The postwar Baby Boom and post-Boom slack are not just an American phenomenon. To understand just how extreme the labor shortfall and fiscal pressures due to aging will be in other parts of the world, consider Japan. It is undergoing an extreme aging within its population. By 2050, about one in two Japanese will be over 50, about one in three over the age 65, and roughly one in six will be over the age of 80. This is the age-related meaning of absolute population decline, a phenomenon

about to be experienced by Japan and both Eastern and Western Europe.

Under such pressures from aging, there is simply no way to substantively offset declining rates of labor force growth through altered retirement behavior. Unless these nations are willing to endure decades of anemic economic growth at best and perpetual recession at worst, they will be forced into importing large amounts of labor. This strategy may not be politically sustainable in all countries, but the economic consequences of a totally closed immigration policy are clear.

The truth is that this strategy is at work already. And while it has fueled political backlash in some places and some times—the U.S. in the early ‘90’s and Europe in the last few years—the general course has not been reversed. Nor should we expect it to be for most of our lifetimes. The need for labor in the advanced regions is now and will remain too great for it to be otherwise.

One of the chief themes of *Beyond Workforce 2020* is that a geographic perspective suggests a global supply and demand imbalance in the international labor market. The less advanced regions are now almost the sole source of net global population growth, the stock from which the world’s workers can be drawn. The advanced regions are on the other side of the birth equation; they account for almost none of net global population growth. As a result, their demographic fate is to be in permanent need of labor infusion from the outside so long as they desire their economies to grow at traditional (and politically viable) rates. The magnitude of this need can be lessened through productivity gains or improved labor force participation by their aging populations but neither tact can fully solve the problem.

Though largely outside the scope of this White Paper, the political and economic benefits of exporting labor can be generally as compelling to the lesser developed world as are the benefits to the developed world of importing labor. These benefits are at the heart of the largest issue facing the U.S.-Mexico relationship (at least from the viewpoint of Mexico), for example. For countries that have a shortage of jobs but a surplus of potential workers, exporting surplus labor reduces pressure on the economy. It can also have indirect

**Table 13: Average annual net migration by region, 1995-2000**

More Advanced	+2,187,000
U.S.	+1,250,000
Canada	+164,000
Western Europe	+633,000
Eastern Europe	+130,000
Pac-Rim Dynamos	+29,000
Less Advanced	-2,187,000
Mexico	-310,000
Central America & the Caribbean	-108,000
South America	-75,000
North Africa & the Middle East	-197,000
Sub-Saharan Africa	-184,000
Asian & Oceanian Interior	-559,000
Asian Reservoirs	-754,000

Source: See endnote lxxx.

benefit in the form of remittances, or money sent by the exported worker back to families or towns in his or her home country, which now amount to over 62 billion dollars annually worldwide.<sup>lxxxi</sup> Remittances account for over 1% of Mexican

GDP, which would be the rough equivalent of pumping 100 billion dollars into the American economy from outside.<sup>lxxxii</sup> Remittances contribute 3% of GDP or more in 28 nations and, in nine nations, the share is actually over 10%.<sup>lxxxiii</sup> All these reasons are why the Mexican government is so dedicated to protecting the flow of Mexican labor to the United States. They are also why the less developed world as a whole is likely to continue freely exporting their populations and labor overseas.

This is not to say that exporting labor is the only role the less developed regions will play in the global labor market. The *maquilladoras* of Mexico and the new urban industrial complexes of China attest to the fact that importing jobs is a critical focus for the less developed world. Over time, the international supply imbalance will right itself. But the exchange of labor from ready supply areas to ready demand areas will be a central part of that correction.

Table 13 shows the degree to which theory matches current reality. Every single advanced region is a net

importer of global labor. Every single less advanced region is a net exporter of global labor. Again, our future expectations should be that this flow will be a feature of the next several decades. We should actually expect the rate of flow to increase. The developed world has yet to hit the era of its most extreme population and labor force slowdown. As it does, its demand for international labor will grow, absent economically destructive political constraints.

While Europe and Japan are experiencing the most rapid rates of growth declines—if not outright decline—the table at left also demonstrates another key element of the international labor market: the world’s largest consumer of international labor is the United States.

With just over 20% of the advanced regions’ population, the U.S. absorbs over 50% of the flow of international labor to the advanced regions.<sup>lxxxiv</sup> Part of the above average share consumed by America is due to policy differences. In general, the U.S. approach is to be less restrictive about both the size, skill, education, and qualifications of its immigrant populations, relying instead on a complex and often informal set of market signalling to potential immigrants. Much of the rest of the developed world takes a prescribed approach to the skill or education levels of immigrants, very frequently barring less skilled or educated peoples from entry.

As discussed previously, the understandable desire on the part of many countries is to attract global talent as much as global labor. Immigrants capable of supplying skills or knowledge highly sought in the global knowledge economy are more likely to provide, literally, better bang for the buck. This offers the fiscal benefits of immigration without the cultural backlash or GDP dilution that would come with larger numbers of unskilled foreign workers. The targeted strategy used by much of the rest of the developed world is reflective of this political and economic calculus.

The irony is that America, with her more open approach, enjoys an even greater advantage in attracting highly educated international labor than it does in attracting international labor as a whole. America absorbed about three in four immigrants with at least some college education that migrated to the group of

**Table 14: Share of total and tertiary educated immigrants to select OECD nations, 1998**

	<u>Total</u>	<u>with Tertiary education</u>
U.S.	57%	76%
Germany	16%	7%
Canada	11%	8%
France	8%	3%
United Kingdom	5%	3%
Italy	3%	1%
Sweden	1%	1%

*Note:* See footnote 17.

*Source:* See endnote lxxv.

nations shown in the table. She was the only nation among those listed in the table at right to consume a greater share of college educated immigrants to the group than she absorbed in immigrants of all education levels.

Much of America's advantage in attracting the highly skilled and educated stems from the dominance of her higher education system. Over half of the foreign students within the OECD countries for which data is available for Table 15 are educated in the United States. Moreover, these students come from all parts of the globe: 21,000 each from Africa and South America, 48,000 from North America, 60,000 from Europe, and a truly astonishing 294,000 from Asia.<sup>lxxvii</sup> The cosmopolitan chic of towns like Austin and Berkeley represents a tremendous practical advantage in the competition for the world's most productive workers.

Overall, the flow of immigrants and highly educated stock to America's borders suggests that their numbers will be limited only by policy determinations. As we experience the supply produced by the international labor market, we face no shortage of potential workers who would desire to come. Unless the opportunities perceived here dwindle, or our inbuilt advantages like

higher education diminish in quality, we should expect the demand for entry to the U.S. to grow in the next several decades. However, the competition for the world's best and brightest will not go uncontested. Like America, the rest of the advanced world is just now entering the era of its greatest demographic challenge.

So long as our present strengths remain, the limits to immigration should fortunately be of our own making.

And the choices we make will go a long way to

determining the

future size of

America and the

changing face of the

American worker.

#### 4. The diversification of America

As mentioned earlier, except under extreme circumstances, slowing population growth is synonymous with an aging population. Expanding the flow of immigration, and thus increasing the rate of population growth, has the effect of slowing the rate of aging. The flip side is that in an international labor market where supply comes from the less developed world, faster immigration results in faster racial and ethnic diversification.

The diversification of the U.S. population and labor force has received much attention in recent years. African Americans have been entering more occupations previously taken by whites at record rates. Hispanic population growth has affected just about every corner of the country. Asian growth has been more limited but

**Table 15: Share of foreign university students educated by select nations, 1992**

United States	52%
France	16%
United Kingdom	11%
Australia	5%
Canada	4%
Austria	3%
Switzerland	3%
Italy	2%
Denmark	1%
Netherlands	1%
Turkey	1%
Finland	<1%
New Zealand	<1%

*Source:* See endnote lxxvi.

**Table 16: Share of the population by non-Hispanic racial and Hispanic cohort, 2003-2050**

	White	Black	Native Amer.	Asian	Hispanic
2003	70%	12%	1%	4%	13%
2010	67%	13%	1%	5%	15%
2020	64%	13%	1%	6%	17%
2030	60%	13%	1%	7%	19%
2040	56%	13%	1%	8%	22%
2050	53%	13%	1%	9%	24%

Source: See endnote lxxviii.

has had extreme effects in certain regions. Given the increase in the latter two populations, the diversification story that has received surprising little emphasis is the role of a global labor market in determining the scope of our diversity.

The most stunning example of the effect of growth rate on diversity is what occurs under the Census Bureau’s high series projection, as shown in the graphic at right. In that scenario, white non-Hispanics would claim a true minority share of the population in the year 2050, 47% (the point of minority status would actually occur earlier, in 2043).<sup>xc</sup> In the high series projection, Hispanics and Asians would together claim almost as large a share as whites: 27% of the population would be Hispanic and 13% would be non-Hispanic Asians.<sup>xcii</sup> Even under the middle series, white non-Hispanics claim a much smaller portion of the total population than now: 53% compared to 70%.<sup>xciii</sup>

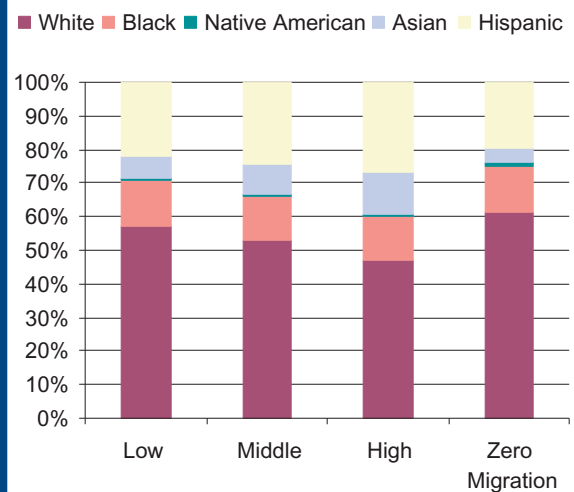
Given the Hispanic and Asian growth rates and the structure of the “zero migration” series column, the effect of immigration on diversity is relatively easy to intuit. Of course, expectations about fertility and mortality affect each series but the effect of immigration is large. Between the four series, our assumptions about immigration go a long way toward projecting whether there will be 31 million (zero migration), 42 million

(low), 86 million (middle), or 169 million (high) more Hispanics and Asians between now and mid-century.<sup>xciii</sup>

The diversification of the population has its expected effect on the workforce. As *Workforce 2000* pointed out 15 years ago, the American workforce is becoming rapidly more racially and ethnically diverse. Projections point to future changes in the 25 and older workforce from 73% white non-Hispanic and 17% Hispanic and Asian today, to 68% white non-Hispanic and 21% Hispanic and Asian in 2015, to 54% white non-Hispanic and 34% Hispanic and Asian in 2050.<sup>xciv</sup> Even more dramatic is the share of workforce growth contributed by Hispanic and Asians. Between now and 2015, over half of net workforce growth will come from Hispanic and Asians. Between 2020 and 2050, they account for all of net workforce growth.<sup>xcv</sup> There is also reason to suspect that even this degree of long-term diversification may fall short of the mark, given the potential underestimation of migration levels in the Census Bureau’s middle series.

The reduced role of whites in the future American workforce can be measured in simpler terms than share contributions to growth. Between 2015 and 2050, the

**Graphic 11: Non-hispanic racial and Hispanic composition of the U.S. population, 2050**



Source: See endnote lxxxix.

**Table 17: Educational attainment as a percentage of appropriate age population & change by 10 year cohort, 2002**

	White, nh	Black, nh	Asian & Other	Hispanic
Associate's (% of age 22)	5%	2%	2%	2%
Bachelor's (% of age 24)	29%	13%	46%	6%
Master's (% of age 27)	5%	1%	9%	1%
First-prof. (% of age 28)	2%	1%	2%	0%
Doctoral (% of age 31)	1%	1%	2%	0%
Associate's (pt chng from age 52-32)	0%	1%	3%	-1%
Bachelor's (pt chng from age 54-34)	8%	5%	13%	2%
Master's (pt chng from age 57-37)	-1%	-1%	12%	2%
First-prof. (pt chng from age 58-38)	0%	0%	-2%	1%
Doctoral (pt chng from age 61-41)	0%	0%	1%	0%

Source: See endnote *ci*.

absolute number of white non-Hispanics in the labor force will drop by 6 million workers.<sup>xcvi</sup> Such is the effect of retirement behavior and declining labor force participation levels for nearly all white non-Hispanic age cohorts.<sup>xcvii</sup>

In the past two decades, demographic diversity has been impossible to divorce from the diversity “movement” in American companies. These trends above form, in a sense, the final chapter in the American corporation’s transformation to a diversity friendly workplace. Attracting women and “minorities” will become less an issue of fairness, though it will remain so, of course, and more a strategy to maintain a high-skill, high-knowledge workforce. Properly construed, diversity policies are aimed at this goal already. As the middle of the next decade approaches, however, and the number of white workers begins to decline in absolute levels, any inability to attract or retain racial and ethnic minorities will bar employers from attracting or retaining the only source of workforce growth in the American economy.

In an America that is itself the engine of the global

knowledge economy, the absorption of responsibility for workforce growth by non-whites shifts the racial and ethnic source of new skills and knowledge. The unprecedented rates of college attendance among whites make it unlikely that marginal attendance gains can fully compensate for the effect of their reduced growth.

Filling the gap will partly rely on foreign students in American higher education, as it does already, particularly at the graduate levels. But to continue the strong gains in educational attainment that are at the heart of America’s pre-eminence in the global knowledge economy, Hispanics and African Americans will have to occupy a far larger share of college and university lecture halls. The degree of change required will pose a serious challenge to American education at all levels. The

urban primary and secondary schools that form the educational environment for a large share of Hispanics and African Americans places them at a disadvantage relative to their white peers. Correcting the imbalance will be a public policy challenge of the highest order and, likely, controversy.

Leaving aside the K-12 question for the remainder of this White Paper, a summary of educational completion data demonstrates the difficulty ahead. Before college is even a consideration, non-Hispanic blacks and Hispanics are much less likely to earn a high school diploma. In 2000, the drop-out rate for the 16-24 year old white non-Hispanic population was 6.9%.<sup>xcviii</sup> The rate for non-Hispanic blacks was almost twice that, 13.1%.<sup>ic</sup> And the rate for Hispanics was more than four times the white non-Hispanic rate.<sup>c</sup>

This pattern repeats itself in post-secondary completion. Blacks and Hispanics complete degrees of most levels at a fraction of the rate that whites and Asians do. The data for Hispanics, as the largest growing share of the population and workforce, are

particularly worrying. Moreover, in absolute terms, the gap between white and Hispanic degree conferral is growing. For every degree level but first-professional degrees, the numeric gap between degrees conferred to non-Hispanic whites and degrees conferred to Hispanics grew between 1989 and 2000.<sup>ci</sup>

## Conclusion

Our world is about to become a very different one and so is both America and America's place. Slowing population and labor force growth throughout the developed nations will create a demand for new sources of labor. At the same time, the less developed world will provide an ever growing share of the world's population.

The result will be an international labor market. The global economy will become a global workforce. There will be no clear tipping point and, indeed, the global workforce is really already here. The implications for national policy and corporate practice are enormous.

The *Beyond Workforce 2020* effort is dedicated to exploring this global labor market, its implications, and the future of the American workforce that results from both.

## Appendix A: Nations comprising the twelve *Beyond Workforce 2020* geographic regions.

### Region 1: Canada

### Region 2: United States

### Region 3: Mexico

### Region 4: Central America & the Caribbean

Anguilla

Antigua and Barbuda

Aruba

Bahamas

Barbados

Belize

Bermuda

British Virgin Islands

Cayman Islands

Costa Rica

Cuba

Dominica

Dominican Republic

El Salvador

Grenada

Guadeloupe

Guatemala

Haiti

Honduras

Jamaica

Martinique

Montserrat

Netherlands Antilles

Nicaragua

Panama

Puerto Rico

Saint Kitts and Nevis

Saint Lucia

Saint Vincent and the Grenadines

Trinidad and Tobago

Turks and Caicos Islands

United States Virgin Islands

### Region 5: South America

Argentina

Bolivia

### Region 5: South America (cont.)

Brazil

Chile

Colombia

Ecuador

Falkland Islands (Malvinas)

French Guiana

Guyana

Paraguay

Peru

Suriname

Uruguay

Venezuela

### Region 6: Western Europe

Andorra

Austria

Belgium

Channel Islands

Denmark

Faeroe Islands

Finland

France

Germany

Gibraltar

Greece

Holy See

Iceland

Ireland

Isle of Man

Italy

Liechtenstein

Luxembourg

Malta

Monaco

Netherlands

Norway

Portugal

San Marino

Spain

**Region 6: Western Europe (cont.)**

Sweden  
Switzerland  
United Kingdom

**Region 7: Eastern Europe**

Albania  
Belarus  
Bosnia and Herzegovina  
Bulgaria  
Croatia  
Czech Republic  
Estonia  
Hungary  
Latvia  
Lithuania  
Poland  
Republic of Moldova  
Romania  
Russian Federation  
Slovakia  
Slovenia  
Macedonia  
Ukraine  
Yugoslavia

**Region 8: North Africa & the Middle East**

Algeria  
Bahrain  
Cyprus  
Egypt  
Iraq  
Israel  
Jordan  
Kuwait  
Lebanon  
Libyan Arab Jamahiriya  
Morocco  
Occupied Palestinian Territory  
Oman  
Qatar  
Saudi Arabia  
Sudan  
Syrian Arab Republic  
Tunisia

**Region 8: North Africa & the Middle East (cont.)**

Turkey  
United Arab Emirates  
Western Sahara  
Yemen

**Region 9: Sub-Saharan Africa**

Angola  
Benin  
Botswana  
Burkina Faso  
Burundi  
Cameroon  
Cape Verde  
Central African Republic  
Chad  
Comoros  
Congo  
Côte d'Ivoire  
Democratic Republic of the Congo  
Djibouti  
Equatorial Guinea  
Eritrea  
Ethiopia  
Gabon  
Gambia  
Ghana  
Guinea  
Guinea-Bissau  
Kenya  
Lesotho  
Liberia  
Madagascar  
Malawi  
Mali  
Mauritania  
Mauritius  
Mozambique  
Namibia  
Niger  
Nigeria  
Réunion  
Rwanda  
Sao Tome and Principe

**Region 9: Sub-Saharan Africa (cont.)**

Senegal  
Seychelles  
Sierra Leone  
Somalia  
South Africa  
St. Helena  
Swaziland  
Togo  
Uganda  
United Republic of Tanzania  
Zambia  
Zimbabwe

**Region 10: Asian & Oceanian Interior**

Afghanistan  
American Samoa  
Armenia  
Azerbaijan  
Bangladesh  
Bhutan  
Cambodia  
Cook Islands  
Democratic People's Republic of Korea  
East Timor  
Fiji  
French Polynesia  
Georgia  
Guam  
Indonesia  
Iran (Islamic Republic of)  
Kazakhstan  
Kiribati  
Kyrgyzstan  
Lao People's Democratic Republic  
Maldives  
Marshall Islands  
Micronesia (Federated States of)  
Mongolia

**Region 10: Asian & Oceanian Interior (cont.)**

Myanmar  
Nauru  
Nepal  
New Caledonia  
Niue  
Northern Mariana Islands  
Pakistan  
Palau  
Papua New Guinea  
Pitcairn  
Samoa  
Solomon Islands  
Sri Lanka  
Tajikistan  
Tokelau  
Tonga  
Turkmenistan  
Tuvalu  
Uzbekistan  
Vanuatu  
Viet Nam  
Wallis and Futuna Islands

**Region 11: Asian Reservoirs**

China  
China, Hong Kong SAR  
China, Macao SAR  
India

**Region 12: Pacific Rim Dynamos**

Australia  
Brunei Darussalam  
Japan  
Republic of Korea  
Philippines  
Malaysia  
New Zealand  
Singapore  
Thailand

## Footnotes: Notations

- <sup>1</sup> Beginning with the 2000 Census, the Census Bureau now allows individuals to identify themselves by more than one race. The change creates a difficult problem when trying to compare race trends: either one *certainly* excludes people of a given race for the year 2000, by ignoring those who identified themselves as belonging to more than one race, or one *probably* excludes people from a given race for prior census years, by ignoring those who likely would have identified themselves as belonging to more than one race had they had the opportunity. This paper reflects the latter choice, meaning there is very likely an inherent overcount of Hispanics and Asians in comparison to 1990.
- To minimize the resultant bias, this paper uses two different total population counts. For the “2000 population” and “1990-2000 growth” figures as reported, the true census count is shown. In other words, the 2000 census actually reported 7,039,362 residents of the San Francisco-Oakland-San Jose CMSA. For the “share of total growth accounted for by growth in” figures, a count known as “Total Races Tallied” was used. This figure represents the sum of the count in each race cohort. In other words, each person who identified themselves as belonging to two races was counted twice, belonging to three races was counted thrice, etc. This figure is into what the count for each race cohort or ethnicity was divided
- The differences for each geography are such that the total races tally results in an additional 373,993 people in the San Francisco-Oakland-San Jose CMSA over the true count, 15,394 additional people in Indianapolis (Marion County), and 146 additional people in Plymouth, IN.
- <sup>2</sup> The GDP figure used here is known as “Purchasing Power Parity”, or “PPP,” GDP and may not match with measures that use other approaches. PPP data was used to give a better accounting of the true nature of income power held by different regions.
- <sup>3</sup> The non-agricultural economically active population refers to those segments of the population who neither hold nor seek agricultural work (which includes fishing as well as farming). These data were created by summing the total of the “industrial” and “service” economically active populations.
- <sup>4</sup> 2003 population data are forecast data, not actual counts.
- <sup>5</sup> Earnings data are for a category of workers known as “wage earners.”
- <sup>6</sup> The data necessitated some assumptions about the structure of work. Some earnings were reported by week while some were reported by month. A U.S. work month was assumed to consist of 4.3 work weeks.
- <sup>7</sup> International earnings data are inconsistently reported so the most recently available year is shown in this table. These years are: Sri Lanka, 2001; Egypt, 1999; India, 1999; Peru, 1998; Mexico, 1996; Barbados, 1991; and Sudan, 1990 (mining) or 1992 (all other categories). The appropriate U.S. data was compared to in each case.
- <sup>8</sup> The actual role of immigration is much bigger. Immigrants who remain in the country have children, just as the non-foreign born population does. By the end of the century, today’s young adult immigrant could easily be the source of five to six generations of immigrant descendants. Over time, family behavior will contribute millions to the population through this indirect, cumulative effect of immigration.
- <sup>9</sup> Please note that this table should not be considered, cited, or used as an accurate projection of the factors contributing to economic growth, due to the simplifications made in its assumptions. It presents hypothetical figures only.

- <sup>10</sup> Output per worker growth was based on the quotient of consistent 3.21% increases in constant GDP and the Bureau of Labor Statistics' total labor force projections for the 16 and older population.
- <sup>11</sup> The immigration per year figures make an assumption that 69.22% of net immigration in a given year contributes directly to the labor force in that year. This figure was derived from the labor force participation rates of immigrants who came to the United States during the 1990's. This relationship was then used in conjunction with a labor force "shortfall" figure for each year between 2003-2015, in which the shortfall was calculated by determining the difference between official labor force projections for the 25 and older population and the labor force level that would have resulted if the 1991-2000 average labor force growth rate, 1.13%, were consistently maintained in the 2003-2015 period. The family behavior of the resultant immigrants was not considered due to the shortness of timeframe and to help with simplicity.
- <sup>12</sup> The target participation rate was derived by calculating the difference between the officially projected labor force levels between 2003-2015 and the level that would result if average labor force growth rate from 1991-2000 held consistently. The participation rate was then adjusted to match that shortfall.
- <sup>13</sup> For a clearer explanation of this calculation, imagine a 15-59 year old person who earns 100,000 francs (or dollars or pesos) per year. Now imagine, hypothetically, that the taxes per person the government requires for all expenditures aside from those associated with assisting the older population, amount to 20%. This leaves 80,000 francs. This is the amount against which, in the case of France, a tax rate of 36% will be levied to pay for those government services that are associated with assisting the older population. For a further explanation, please see the cited report.
- <sup>14</sup> Assumes the United Nations' medium projection series.
- <sup>15</sup> In cases where the trend of economically active rates was historically increasing, the highest rate was used from that point on.
- <sup>16</sup> The "shortfall" was based on "ideal" labor force growth of 1.89% per year, beginning with the 2003 labor force projection.
- <sup>17</sup> These data are a combination of 1995-98 averages for educational attainment distribution within each nation and 1998 data for total populations across nations.



## Endnotes: References

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- <sup>iii</sup> U.S. Department of Commerce, Bureau of the Census. American Fact Finder, Census 2000 Summary File 3 (SF 3), Detailed Tables, “P22. Year of Entry for the Foreign Born Population [9] - Universe: Foreign-born population.” Downloaded from [http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds\\_name=DEC\\_2000\\_SF3\\_U&\\_lang=en&\\_ts=70982906297](http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000_SF3_U&_lang=en&_ts=70982906297). Downloaded on 05/14/03.
- <sup>iv</sup> U.S. Department of Commerce, Bureau of the Census. American Fact Finder, 1990 Summary Tape File 3 (SF 3), Thematic Maps, “TM-P068. Percent of Persons who are Foreign Born: 1990.” Downloaded from [http://factfinder.census.gov/servlet/TMGeoSearchByListServlet?ds\\_name=DEC\\_1990\\_STF3\\_&\\_lang=en&\\_ts=71073601268](http://factfinder.census.gov/servlet/TMGeoSearchByListServlet?ds_name=DEC_1990_STF3_&_lang=en&_ts=71073601268). Downloaded on 5/14/03.
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