

PRACTICES FOR ENGAGING THE 21ST-CENTURY WORKFORCE

CHALLENGES OF
TALENT MANAGEMENT
IN A CHANGING WORKPLACE

WILLIAM G. CASTELLANO

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the 21st Century
Workforce

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Changing Workplace

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*I dedicate this book to my parents,
Anthony and Gladys,
and to my wife, MaryAnn, and son, Kevin.*

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Welcome to the New Normal

You truly live in interesting times. Change has been a constant in your life for some time now, and the pace of change is increasing at a dizzying rate. You are entering a new and challenging way of working as a result of unprecedented technological, global, economic, and demographic trends. Unlike previous tumultuous business cycles, you can now witness structural shifts in labor markets and the economy that are fundamentally changing the world of work. Many economists, business leaders, and commentators are describing this trend as the new normal.

This is a new era in which dazzling technological advances, new global competitors, and a new generation of workers can change the direction and fortunes of the old economic order. Every day new companies creating innovative products or services replace established, yet rapidly becoming obsolete, companies in a continuing process of creative destruction. In the United States and much of the developed world, the long-term trend is slower economic growth and higher unemployment, whereas in much of the developing world, it's faster economic growth and rising employment. Furthermore, you can witness dramatic labor force trends. In the United States, the workforce is growing at a much slower rate due to slower population growth and lower workforce participation rates. Even more alarming, there is a growing unsustainable gap between the supply and demand of high-skilled U.S. workers.

The world of work as a result of these trends has become increasingly more complex. An amazing amount of new information exists that must transform into knowledge, a greater degree of global interdependencies, and a need for much faster response times, all resulting in a much less predictable and chaotic workplace (see Table 1.1).

Table 1.1 Welcome to the New Normal**Seismic converging trends:**

Technological

Globalization

Labor force

Economic

Creating:

Increasing complexity

Structural shifts

Technological Trends

Many people describe the new normal purely as a phenomenon of the impact of technological advances on every dimension of your life. Indeed, advances in computer and communication technologies transform how you work, live, and play (see Table 1.2).

Table 1.2 Technological Trends

Increasingly faster, powerful, and less expensive technologies

Transforming how you live and work

Reducing barriers of entry

Creating new industries

Increasingly Faster, Powerful, and Less Expensive Technologies

One reason why technology has been so ubiquitous is the seemingly impossible trend of simultaneously getting faster and more powerful while getting cheaper. In the 1960s, Gordon Moore, one of the cofounders of Intel, accurately predicted that the power and speed of computers would double approximately every 2 years. Unlike many predictions, this one was accurate, and today it is known as Moore's Law. You may be amazed about the stories that today's average home

computer has more speed and power than the technology used to put a man on the moon.

Not too long ago you measured computer-generated information in kilobytes that equaled 1,000 bytes of information. Today, most home computers store gigabytes of information, which is the equivalent of billions of bytes of information, and have backup drives holding terabytes of information that equal 1,000 gigabytes. In 1 year, the entire world produces more than 800,000 petabytes of information. A petabyte is 1,000,000 gigabytes. To put this in perspective, the entire written works of mankind in recorded history in all languages equal 20 petabytes, which is equal to the amount of data processed by Google in one day. This is a true example of Parkinson's Law, which states that whatever information capacity you supply to humans, they will use it.

The competition for creating the world's most powerful computers is increasing more than ever. The United States, which was knocked from its top position by China in 2010 and Japan in 2011, once again is home to the world's most powerful computer according to the Top 500 list. Actually, the United States now holds the top two spots. The Department of Energy's Cray XK7, named Titan, has clocked in at 17.6 sustained petaflops or quadrillion floating-point operations per second (Top500, 2012).

You can witness a similar trend in the communications sector. The global mobile phone industry was launched on September 7, 1987, when 15 phone companies signed an agreement to build mobile networks based on the Global System for Mobile Communications (GSM). It took 12 years to reach 1 billion mobile connections, and only 30 months later there were more than 3.5 billion subscriptions globally. Today, there is an estimated 4.5 billion mobile subscriptions (Meister and Willyerd, 2010). The first commercial text message was sent in 1992; today, the number of text messages sent every day exceeds the total population of the planet. In addition to phone calls and text messages, advances in communication technologies enable massive amounts of digital data to be sent at light speed.

For example, fiber optic cables can now push 14 trillion bits of data per second, which is the equivalent of 2,660 CDs or 210 million phone calls.

Unlike any other industry, the fantastic advances in computer and communication technologies were accompanied by equally dramatic price decreases. Since the turn of the century, the cost of moving data across a network has dropped more than 90 percent, while over that same time period, data storage costs per unit fell from more than \$500 to slightly more than 10 cents. Computing power measured in costs per 1 million transistors dropped from \$222 in 1992 to \$0.27 in 2008. Perhaps if the automobile industry advanced at a similar rate, everyone would drive cars that get 1,000 miles to the gallon and cost \$500 (Benko and Anderson, 2010d).

At the dawn of the technology revolution, the costs to purchase and power a computer were so prohibitive only the government used the power of technology. As the speed of computers increased with a correspondingly decrease in price and the need for power, the transformative power of technology spread from governments to corporations to individuals. Actually, the average individual today has access to virtually an unlimited amount of information and computer power. In the past, companies spent millions of dollars on infrastructure and developing computer applications for their businesses. Today, individuals with a laptop computer literally have the world at their fingertips via search portals such as Google and Bing, have access to many free applications such as Gmail, Google Docs, and Picasa, and enjoy free online content from newspapers, magazines, and blogs.

More transformational than the power of technology is the impact on behavior that it engenders. Today, more than 65 percent of adults in Organization for Economic Cooperation and Development (OECD) countries use the Internet to send more than 9 trillion emails a year; perform more than 1 billion Google searches a day; and form countless communities and relationships that were previously unimaginable (OECD, 2011). Today, technology is a ubiquitous and integral part of our lives, and the pace of innovation and its scope is increasing at an accelerating rate. It took 75 years for the telephone to reach 50 million, 38 years for the radio, 13 years for television, 4 years for the World Wide Web, 3 years for the iPod, and only 2 years for Facebook.

Transforming How You Live and Work

Technology has been transforming how you live and work for decades. When access to technology is equalized, technology becomes a commodity, and companies can no longer differentiate by just having technology. Companies need to start viewing innovation as the true enabler and technology as the means to drive innovation. “In the last twenty years, becoming digital was a competitive advantage. In the next twenty years, in the New Normal, we have to focus on how to be clever with digital” (Hinssen, 2010 pg. 174). Companies use technology such as social media and digital marketing to improve their communication and collaboration within and beyond their boundaries.

In addition to fostering better collaboration among employees and gathering invaluable market intelligence from a significantly expanded audience, companies are doing so in faster and more efficient ways. Social media is shifting the older one-to-one communication channels via emails and phone calls to many-to-many communication channels via an array of social media platforms. These social channels enable employees to find information more readily within the organization and have access to communities of experts that facilitate knowledge sharing. As a result, they can connect with suppliers and customers and gain insights for improving customer service, as well as marketing and product development.

For example, innovative companies such as Inuit use technology to forge stronger customer relationships by creating online customer support communities to help monitor and resolve customer issues that enable more experienced customers to give their personal advice to those who need it. They monitor the questions and responses to help drive product upgrades and fixes without paying for costly customer surveys (Bughin et al., 2010). Procter & Gamble (P&G) created a customer network called Vocalpoint where mothers share their experiences using P&G’s products with other members of their social circle. In markets in which Vocalpoint influencers are active, product revenues have significantly outpaced those markets without online customer networks.

Technology also transforms customer intimacy companies such as Nordstrom. In an interview published in *USA Today*, Blake Nordstrom noted how technology changes customers’ shopping experiences

(Malcolm, 2012). Think digital fitting rooms, where parametric technology simulates a shopper's body type to show how a garment might look or fit. Soon 3-D printers will enable consumers to make products in their own homes. Intel has recently designed a mirror that shows shoppers how clothes look on them, enabling them to avoid having to use fitting rooms. Increasingly, where customers shop will not matter. People could shop from their homes, cars, or wherever they have access to mobile networks using a multitude of mobile devices. According to a 2012 survey of C-level executives conducted by McKinsey & Company, the top digital trends transforming business are big data and analytics, digital marketing and social media, and cloud computing (McKinsey & Co., 2012b).

Advances in technology have long been transforming where, when, and how work gets done. The idea of a workplace that is a fixed, physical location is obsolete. Today, there are millions of individuals working remotely from home and distributive workplaces. Going to work for many employees means walking to a home office where they are instantly connected to their managers and coworkers or can join a videoconference with team members around the globe. It's estimated that there are more than 13 million workers in the United States who work outside a traditional office space almost daily and another 10 million who telecommute at least one day per week (Benko and Anderson, 2010d).

Social networks such as Facebook, LinkedIn, and Twitter create new ways for employees to collaborate, share information, and get to know each other better. There is now a "virtual water cooler" at the workplace where employees spread out across vast distances can converse with one another. Companies such as Cisco and IBM utilize social networks as well as videoconferencing technology to help dismantle silos and increase collaboration and knowledge sharing across their organizations (Bisson et al., 2010). These new technologies transform and reduce the costs of how knowledge is created and shared, as well as increase the speed to access external experts.

Venture capitalist firms in Silicon Valley use advances in mobile technology to create what is often called the distributed workforce. Companies such as TaskRabbit have taken the on-demand workforce to a new level by organizing and auctioning tedious and

time-consuming chores. According to Rob Coneybeer, managing director of Shasta Ventures, which has invested in several of these new companies, the goal is to build a new kind of labor market “where people end up getting paid more per hour than they would have otherwise and find it easier to do jobs they are good at” (Stone, 2012 pg. 1). What makes these companies different than the traditional job boards is the innovative use of smartphones and the supervisory services they provide.

Workers can load an app on their phone and can bid on jobs any time of day. Employers can monitor the whereabouts of workers, evaluate each job after it’s completed, and make payments on their phones or via the Internet. In an interview with *Bloomberg Businessweek*, Leah Busque, the founder of TaskRabbit, says thousands of workers make a living (up to \$60,000 a year) on her site. She goes on to say, “We are enabling micro-entrepreneurs to build their own business on top of TaskRabbit, set their own schedule, specify how much they want to get paid, say what they are good at, and then incorporate the work into their lifestyle” (Stone, 2012 pg. 2).

Crowdsourcing is another example of how advances in technology can transform how work is done. This innovation provides companies access to a potentially unlimited pool of talent in which Internet users over a common platform contribute to a project without necessarily getting paid. For example, in 2006, Netflix famously offered a \$1 million prize to anyone who could increase the accuracy of its movie recommendation system by 10 percent. It openly provided access to its data set of more than 100 million customer movie ratings. In September 2009, it awarded \$1 million in equity to the best-submitted recommendation. Meanwhile, social networking sites, blogs, and wikis offer many ways to tap the wisdom of many experts. Facebook regularly taps into its growing number of power users to translate its site into different languages, which for example took only 1 day to translate into French.

Reducing Barriers of Entry

Technological advances significantly lower the cost of entry for many businesses. One of the most revolutionary technological

developments for start-up businesses is *cloud computing*. Today, companies have access to sophisticated business applications they can run over the Internet and pay only for what they use. Instead of investing large sums of money to buy hardware and servers and employ highly skilled and expensive teams of technologists to manage their business systems, they now have better and more economical options provided by specialized providers in the cloud. The shift to the cloud has also fundamentally transformed corporate information technology (IT) departments. Today, companies need people with technical skills who understand business and customer needs and focus on innovating with technology instead of managing technology.

Cloud computing also increases the computing capacity for many organizations while reducing costs, which is having a significant, positive impact on productivity. In a hypercompetitive work environment with an ever-growing number of new competitors entering markets due to reduced barriers of entry, it is imperative for organizations to continue increasing productivity to remain competitive. This is particularly the case in Western economies where there is slow workforce growth and thus a reliance on productivity increases to fuel future growth.

The reduction of barriers has also enabled more companies to compete on a global scale. You can now witness organizations that are literally “born global.” These firms have the capabilities to virtually manage all their functional operations. They electronically access and link an array of offshore partners for their design, research and development (R&D), manufacturing, marketing, selling, financial, and human capital needs.

Creating New Industries

Not only is technology lowering the cost of entry and increasing business competition, but it is also radically changing entire industries. Through a relentless process of creative destruction, entire industries have been altered or have vanished while new totally different ones have taken their place. Just when I finally replaced all my old albums with shiny new CDs, I replaced all of them on my iPod I can carry in my pocket. Overnight, the music industry was transformed when

people could download, copy, and play music on an array of devices. Other industries such as print media are rapidly being replaced with online alternatives.

In a similar fashion, the travel industry had to quickly adapt to remain relevant. People no longer have to go to a travel agent for research or make their travel arrangements. All these options are available online. At one time, the travel industry produced two glossy print catalogs a year, one in the summer and one in winter. Today, it must constantly update its online content. According to Peter Hinssen, “Once the industry hit the New Normal, the rhythm of two releases per year evaporated and the operations of the companies became a 24/7, 365 days a year operation” (pg. 23).

These technological advances also impact the manufacturing industry, which for decades has been the one area in which a blue-collar worker could make a decent living. You can see this trend in the automobile industry in which robotics and computer-controlled lathes have altered production so significantly that fewer but more highly skilled workers are needed to produce a fixed number of automobiles. Today, nearly 90 percent of U.S. and European automotive original-equipment manufacturers (OEMs) use robots for welding and car assembly (Agrawal et al., 2003).

Globalization

The second trend that is often cited when describing the “new normal” is globalization (see Table 1.3). Massive global population and economic trends are fundamentally altering the world of business and work. On one hand, there are phenomenal opportunities for U.S. businesses and workers as the developing world advances economically, creating new markets for your products and services. On the other hand, the rapidly growing number of new global workers and businesses are major threats for U.S. businesses and workers as the competitive landscape significantly increases.

Table 1.3 Globalization Trends

Growing population/labor force trends
More global talent/offshoring
Growing markets
Increasing competition

Globalization is truly a double-edged sword for the U.S. economy. The cheap imports from developing countries have helped to keep inflation and interest rates down, benefiting consumers and businesses. At the same time, countries such as China, India, and Brazil create huge markets for U.S. multinationals. However, low-cost imports have put significant downward pressures on U.S. workers' wages and have put significant competitive pressure on manufacturers operating with higher costs. Furthermore, the global workforce is growing and getting much more educated, putting pressure on white-collar workers' wages and incentivizing many U.S. businesses to move operations overseas and offshore back office and IT functions.

Growing Population/Labor Force Trends

The seismic population trends sweeping across the globe will shape global labor markets for decades to come. The developed economies of the world are experiencing slowing and declining population growth rates, whereas the emerging economies are seeing their populations significantly grow. According to a United Nations (UN) population research report, the world population surpassed 7 billion in 2011 and is projected to reach 9 billion people by 2050 and exceed 10 billion in 2100 (UN, 2011). However, there is a huge divergence in population growth rates between the developed and developing regions of the world. The developing countries are on track to see their populations increase from 5.7 billion in 2011 to 8.8 billion in 2100. In contrast, the population of the developed world is expected to change minimally, rising from 1.24 billion in 2011 to 1.34 billion in 2100. Significantly, the developed nations' populations would have declined to 1.11 billion during this time period if it were not for the projected net migrations from developing to developed countries,

which is expected to average 2.2 million people annually from 2011 to 2050 and 0.8 million from 2050 to 2100 (UN, 2011).

Europe and Japan are facing a devastating combination of rapidly aging populations and declining fertility rates. Over the next 40 years, countries like Germany, Italy, Spain, and Japan are projected to see population declines ranging from 15 to 25 percent (U.S. Census Bureau, 2008b). Other developed countries including the United States, Great Britain, Canada, and Australia, due to growth in immigration, will not experience declining populations but will have much slower population growth rates.

Growing populations present many unique challenges for developing countries. The population of the developing countries is young, with children under 15 accounting for 29 percent of the population and young persons aged 15 to 24 accounting for an additional 18 percent. The number of children and young people is at an all-time high (1.6 billion children and 1.0 billion young people). Typically having such a young population bodes well for a region because their labor force grows and dependency ratio falls. However, it also poses a major challenge for developing countries, which are faced with the necessity of providing education and employment to large cohorts of individuals.

The situation is quite different in the developed regions in which the issue is a rapidly aging population in which the population aged 60 and over is increasing at the fastest pace ever. Over the next 4 decades, the number of people 60 and over in developed nations will increase by more than 50 percent, rising from 274 million in 2011 to 418 million in 2050 and to 433 million in 2100. The percent of the population 60 years of age and older in developed nations will increase from 22 percent in 2011 to 32 percent in 2050. In time, the developing nations' older populations will also increase. The rate of growth is faster than the developed nations (3 percent and 2.4 percent annually, respectively); however, as a percentage of the population, it will increase from 9 percent in 2011 to 20 percent in 2050, which is significantly less than the developed nations. Globally, the median age of the population is projected to increase from 29 to 38 years between 2011 and 2050 and to 42 years by 2100. Europe has today the oldest population, with a median age of nearly 40 years, which is projected

to reach 46 years in 2050 and slightly decline to 45 years by 2100 (UN, 2011).

Within the developing world, there has also been a significant movement toward urbanization as large segments of the population migrate from the countryside to the cities where there are greater economic opportunities. China has been witnessing the largest migration of people moving to cities with roughly 40 percent of its population now living in urban areas, which is projected to increase to 73 percent by 2050. India, which is less than 30 percent urbanized today, is expected to be 55 percent urbanized by 2050 (Goldstone, 2010). Large migrations of people in these countries put severe strains on infrastructure and resources as well as on the capability of the economy to provide housing and work.

Not surprisingly, as the world's population continues to grow, so too does the global workforce. One look at global population trends is all you need to see to understand where most of the world's talent will come from. In both the developed and developing regions of the world, the number of working people aged 25 to 50 years of age is at an all-time high: 606 million and 2.5 billion, respectively. However, whereas in the developed regions that number is projected to peak over the next decade and decline thereafter reaching 531 million in 2050 and 525 million in 2100, in the developing regions it will continue rising, reaching 3.6 billion in 2050 and 3.7 billion in 2100. Significantly, the developing countries labor force is projected to add nearly one-half billion workers over the next decade.

The rapid growth in world population beacons the age-old concern, going back to Thomas Malthus's famous 1798 "Essay on the Principle of Population," of whether rapid population growth will outstrip the world's resources creating widespread poverty and famine. These concerns were echoed in the 1972 Club of Rome's report on the limits of growth. However, the continued advancements in agricultural technology and the increased productivity and discovery of new energy sources have dampened these concerns. Nonetheless, the continued increase in demand for critical commodities including food, water, energy, and minerals has created shortages and huge price fluctuations.

More Global Talent/Offshoring

As the developing countries' populations and economies grow, the educational attainment of the global workforce has been significantly improving. As a result, the competition for the developed world worker has never been higher, particularly in the highly in-demand fields of science and engineering. When many people think about U.S. companies' offshoring work, they typically think of the millions of factory jobs and other low-cost work that was sent overseas so that companies can hire cheap labor. A more startling trend for U.S. workers is the offshoring of white-collar work. As the world becomes increasingly more connected and more educated, it is both feasible and economically prudent to have work performed where wages and benefit costs are much lower than in the United States.

Jobs that are not candidates for offshoring typically require customer contact or extensive interactions with colleagues, such as many retail, managerial, support staff, and generalists' type of work. The types of white-collar jobs amenable to offshoring include IT, engineering, finance, and accounting. The two largest sectors for offshoring are IT outsourcing (ITO) and business process outsourcing (BPO), which encompass a wide range of jobs including low-skilled back office operation positions to high-skilled IT positions. Many of these offshored jobs were previously filled by college graduates.

Nearly 50 percent of the Fortune Global 250 had offshored IT and business processes activities. In 2009, IT and business process outsourcing revenues exceeded \$250 billion and \$140 billion, respectively. India has dominated these markets, capturing 65 percent of the ITO and 43 percent of the BPO markets (Willcocks and Lacity, 2009). Forrester Research estimates that the number of U.S. legal jobs moved offshore will increase from 35,000 in 2010 to 79,000 by 2015 (Meister and Willyerd, 2010).

Today, India has more technology workers than any other country, and China is on track to pass the United States as the country with the largest number of R&D workers (Bisson et al., 2010). As the demand for high-skilled labor exceeds the supply in the United States, many U.S.-based multinationals have no choice but to tap into the growing number of educated workers globally. However, there is a significant variance in the quality of workers' education within developing

nations. For example, for entry-level corporate positions spanning a number of occupations including engineers, finance, accounting, and healthcare, there is a growing mismatch between the sort of graduates many Chinese universities turn out and the type of candidates who would interest local and multinational companies doing business in China. There is also a growing Chinese managerial and executive talent gap (Lane and Pollner, 2008). In a study conducted by McKinsey, researchers found that although nearly 50 percent of the engineers in Eastern European countries such as Hungary and Poland are suitable to work for multinational companies, only 10 percent and 25 percent of those in China and India, respectively, could do so (Farrell and Grant, 2005).

For many multinational firms, setting up operations around the world is not just about gaining access to lower cost and needed talent. Given the slowing population and economic trends in the developed world, many organizations want to be closer to the economies that are growing the fastest and hire local talent who understand the culture and intricacies of doing business in these countries. Expanding into new markets also gives these multinational organizations access to local supply chains enabling them to efficiently distribute their products and services.

Growing Markets

As emerging-market economies grow, they will shift primarily from an export-driven economy to a more consumption-driven economy, making them prime markets for multinationals striving to increase revenues. As workers in India and China advance economically, their demand for U.S. products and services increases. By the end of this decade, China is expected to have 595 million middle-income consumers and 82 million upper-middle-income consumers (Laudicina, 2005). In a report by McKinsey and Company titled “The Great Rebalancing,” it’s projected that more than 70 million people mostly from emerging economies are moving into the middle class each year (Bisson et al., 2010). Middle-class consumers across a dozen emerging countries now number almost 2 billion people and spend an estimated \$6.9 trillion annually.

These global trends are both a threat and an opportunity for U.S. companies. Clearly, there is more competition; however, there are many opportunities for U.S. companies to reach a growing number of consumers in maturing developing countries. In a global survey conducted by PricewaterhouseCoopers (PWC), nearly two-thirds of the CEOs surveyed were positive about the impact that globalization will have on their organizations in the upcoming years (PWC, 2006). These CEOs' primary motivation for going global was not to reduce costs but to access new customers and better service their existing ones. Over the next decade, nearly 80 percent of the world's middle-income consumers will reside in emerging economies. Not surprisingly, 71 percent of the CEOs surveyed by PWC indicated that they plan to do business in at least one of the BRIC (Brazil, Russia, India, and China) countries within the next few years.

Increasing Competition

There are tectonic shifts altering the global competitive landscape. Although the United States has the largest economy, 50 years ago the U.S. economy accounted for 53 percent of global gross domestic product (GDP), whereas today it accounts for less than 28 percent, or less than 20 percent in terms of global purchasing power parity (Central Intelligence Agency [CIA], 2010). The biggest competition has been from the BRICs, with China and India posing the greatest competitive threats. The headquarters' locations of the *Financial Times* Global 500 rankings highlight these global business trends. From 2005 to 2009, the number of U.S.-based multinationals showed a sharp decline with a net loss of 38 companies, whereas companies located in the BRICs witnessed a dramatic increase. Brazil saw a net gain of four companies; Russia had a net gain of two companies; India had a net gain of five; and China had the largest increase with a gain of 35 companies (Meister and Willyerd, 2010).

The UN estimates that in 2010 there were more than 82,000 large multinational companies employing more than 77 million people worldwide (UN, 2010). The rising number of multinational firms located outside the United States is not just competing with U.S. firms on cost, but a growing number are making significant advances in innovation. In particular, there has been an explosion of R&D

expenditures in Asia. The 10 largest economies in Asia (China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand) in 2011 spent an estimated \$399 billion on R&D, slightly less than the \$400 billion spent in the United States, but well ahead of Europe's \$300 billion (National Science Board, 2012).

The *Bloomberg Businessweek* ranking of the 50 most innovative global companies highlights just how quickly the rest of the world is catching up with the United States. In 2006, there were only 5 companies in the top 50 that were located in Asia; by 2010, the number of firms had grown to 15. For the first time since the rankings began in 2005, the majority of the top innovative companies on the list were based outside the United States. The pace of change in this competitive space is also accelerating, as more than one-half of these companies were not on the list in 2009 (Society for Human Resource Management, 2011).

Today there is an interdependent global economy that is getting larger and more sophisticated by the day. In the coming decades, emerging-market economies will rapidly evolve from being minor players on the global stage into economic powerhouses. No longer will they be viewed as the world's factory producing low-cost goods and services as they become large-scale providers of human capital and innovation.

U.S. Labor Force Trends

Since the 1950s, a critical driver of the United States' competitive advantage has been its growing and highly educated labor force. Immediately following the end of World War II, millions of servicemen returned home to start anew. The result was a rapid increase in births now referred to as the baby boom. Indeed, between 1946 and 1964, nearly 80 million babies were born. Growing up in an era of uncontested prosperity, the baby boomers became the most educated and affluent generation of its time. Significantly, during this time, the role of women was rapidly changing. Female baby boomers were well educated and highly independent. As a result, they entered the workforce at an unprecedented rate. The female participation rate, a

measure of the percentage of working age women in the labor force, increased from 34 percent in 1950 to 60 percent by the year 2000 (Toossi, 2012).

Slowing Labor Force Growth

For decades, U.S. businesses had a growing pipeline of available talent that helped fuel their rapid economic growth. However, since 2000, there have been significant headwinds slowing the labor force growth rate that will have a negative impact on economic growth well into the foreseeable future. There are two forces negatively impacting the U.S. labor force growth rate: slowing population growth and declining labor force participation rates. Population growth is a product of fertility rates, which is the average number of children born to a woman over the course of her life and immigration. In the 1950s, the average number of births per woman was 3.5. Using the most recent U.S. Census Bureau data, the Bureau of Labor Statistics (BLS) projects the future fertility rate will remain close to the present level of 2.1, which is roughly the replacement level of the population (Toossi, 2012).

Thus, if it weren't for net immigration growth, the U.S. population, like most of the developed world, would decline over the next few decades. Thankfully, net immigration has had a positive impact on population growth and is expected to add 1.5 million persons annually to the U.S. resident population from 2010 to 2020. However, even with a net positive immigration rate, the U.S. population grew at an anemic 1.1 percent annual rate from 2000 to 2010 and is projected to grow at an even slower 0.98 annual growth rate from 2010 to 2020 (Toossi, 2012).

In addition to slowing population growth, the overall U.S. labor force participation rate (the percentage of the working age population in the labor force) for men and women is declining. After peaking at 67.1 percent in 2000, the overall labor force participation rate declined to 64.7 percent by 2010. Furthermore, as the labor force continues to get older due to aging baby boomers, the labor force participation rate is projected to decline even more. The prime age work group, those between the ages of 25 and 54 years old, has the

highest labor force participation rate, which in 2010 stood at 82.2 percent, whereas the 55-years-and-older work group has a much lower participation rate, which in 2010 equaled 40.2 percent. The oldest of the baby boomers reached the age of 55 in 2001, and for each passing year thereafter, there has been downward pressure on the overall participation rate. Looking forward, the BLS estimates that during the 2010 to 2020 time period, the participation rate will keep falling, reaching 62.5 percent in 2020 (Toossi, 2012).

The one silver lining to this negative trend is aging baby boomers are expected to have a higher participation rate compared to previous generations, which is expected to keep the rate from declining further in the future. In 2000, the participation rate for the 55 and older work group was 32.4 percent. A decade later, the rate rose significantly to 40.2 percent and is projected to keep increasing to 43.0 percent by 2020. However, the result of a combined slowing population and declining overall labor force participation rate has been a dramatic slowing of the U.S. labor force growth rate. Between 1990 and 2000, the U.S. labor force grew only at a 1.3 percent annual rate, followed by an even slower growth rate of 0.8 percent from 2000 to 2010. Based on current projections, the labor force growth rate will continue to slow well into the future. It's projected to grow at a 0.7 percent annual rate during the 2010–2020 time period (Toossi, 2012) and an even slower 0.4 percent annual rate during the 2020–2050 time period (Toossi, 2002).

These massive population shifts impacting U.S. labor force trends portend difficult times for businesses trying to compete in a global economy. As their pipeline of talent continues to slow, U.S. businesses are simultaneously facing the fact that 80 million or so baby boomers (those born between 1946 and 1964) are rapidly approaching retirement. More than one-half of those aged 62 and older are already moving into retirement. Over the next 10 years, approximately 40 percent of the U.S. labor force will be eligible for retirement. Generation X (those born between 1965 and 1979) is only slightly more than one-half of the number of the baby boomers. Thus, from 2008 to 2018, the percentage of 25–54-year-olds in the labor force will decrease from 67.7 percent to 63.5 percent, whereas the percent of 55 plus year olds will increase from 18.1 percent to 23.9 percent (BLS, 2009).

The BLS is projecting that from 2008 to 2018, the number of job openings resulting from individuals retiring and leaving their jobs will be more than double the number of new job openings due to economic growth. The key question is whether there will be enough of a supply of talent with the range of skills necessary to both replace these workers and fill new positions (BLS, 2009).

Workforce Education Trends

The United States is witnessing a significant decline in the labor force growth rate, just when companies need human capital more than ever due to demands brought about by both technological and global trends. To make matters worse, the quality of the U.S. labor force is also declining. High school graduation rates peaked at 77 percent in 1969, declined to 70 percent in 1995, and have not improved since this time. A study conducted by the OECD ranked the United States 16th out of 21 OECD countries for high school graduation rates. The United States was ranked 24th out of 30 countries in science and 25th in math. National surveys of working age adults in the United States age 16 years of age and older indicate a large number lack sufficient literacy and numerical skills needed to fully participate in an increasingly competitive work environment (Kirsch et al., 2007, Educational Testing Service [ETS], 2007).

The U.S. Department of Education estimates that 60 percent of all new jobs created over the next two decades will require skills that only 20 percent of the current workforce possesses (Augustine, 2007). Yet the current educational system in the United States is ill prepared to meet this challenge. A 2011 report issued by American College Testing (ACT) Inc. shows only 45 percent of U.S. high-school graduates who took the ACT assessment exam were considered prepared for college-level math. Only 30 percent were prepared for college-level science. It is the deficiency of early education for U.S. students that has led high school graduates to be unprepared for highly quantitative majors in scientific, technological, mathematic, and engineering fields. As a result, a trend exists of students initially opting-out and dropping out of these highly in-demand majors (Light and Silverman, 2011).

In addition to being ill-prepared, students entering college are not putting in the time and effort needed to be successful. A study conducted by Richard Arum and Josipa Roska of New York University and the University of Virginia, respectively, discovered that American students study, on average, 12 to 13 hours per week. This is approximately one-half the time that students in 1960 spent studying (Light and Silverman, 2011). In a research paper sponsored by the ETS, the authors predict that by 2030 the average literacy and numeracy levels of the U.S. working-age population will decrease by approximately 7 percent (Kirsch et al., 2007).

In other words, over the next 20 years or so, as better educated individuals leave the workplace, they will be replaced by those who on average are expected to have lower levels of skills. During this same period of time, nearly one-half of the projected job growth will be in occupations that require complex skills (Kirsch et al., 2007, ETS, 2007). According to a 2008 study by the Society for Human Resource Management, 58 percent of HR professionals reported that a growing number of workers lack competencies needed to perform their jobs, up from 54 percent in 2005. Further, more than one-half of the respondents predicted that workers entering the job market in the next 10 years will lack the competencies necessary for them to be successful in the workplace (Society for Human Resource Management, 2008a). According to a 2009 McKinsey report, the growing educational achievement gap is the equivalent of a permanent recession. It continues that the U.S. GDP would have been approximately \$2.3 trillion higher in 2008 had the United States succeeded in closing the international achievement gap 25 years earlier (McKinsey, April 2009).

If these trends continue, the outcome will be a continuing divide between the haves and have-nots based on skill level and job prospects. There will also be continuing upward pressure on wages for high-skilled jobs as the demand for talent for these jobs exceeds the supply. Conversely, there will be continuing downward pressure on wages for low-skilled jobs as the supply of immigrants and workers in low-wage economies exceeds the demand for this type of work. It is estimated that a worker with a bachelor's degree today will earn 1.73 times more in lifetime earnings than a high-school graduate. This

ratio of lifetime earnings increases to 3.36 for individuals with a professional degree (Baum and Payea, 2004).

Economic Trends

The convergence of the tumultuous technological, global, and demographic trends is creating many challenges for the U.S. economy (see Table 1.4). An important driver of the United States' dominant position as the world's leading economic power for decades has been its growing and well-educated labor force. However, as the U.S. labor force growth rate continues to fall and as the imbalances of supply and demand of needed skills increase, the United States is facing severe pressures in maintaining its lofty position. To make matters even more difficult, the United States is dealing with these negative labor force trends at a time when the demand for high-skilled talent and global competition is intensifying.

Table 1.4 Economic Trends

Evolving knowledge economy
Slower consumption
New global economy

Evolving Knowledge Economy

Technological advances are fundamentally changing the economy and the underlying drivers of growth. Since the 1950s, the United States has been evolving from an industrial-based to a knowledge-based economy. From 1950 to 2003, manufacturing's share of total employment in the United States fell from 33.1 percent to 10.7 percent (ETS, 2007). Authors Pine and Gilmore say we are witnessing the beginning of a new economy following the service and knowledge economies called *The Experience Economy*, the title of their 1999 book on the subject. Products like the iPod, iPhone, and iPad that provide an intense experience for the end user and generate an enormous amount of consumer loyalty are prime examples of what is

needed to succeed in this new economy (Pine and Gilmore, 1999). Amazon.com's desire to constantly improve the user experience and Google's "perpetual beta" site that is never finished because it is constantly being tested, improved, and fine-tuned for optimal user experience are other examples (Hinssen, 2010). As we compete in a knowledge-based and experience economy, the demand for tacit work that requires knowledge workers who possess complex skills will continue to increase. It's estimated that by 2015, knowledge workers will account for 44 percent of the U.S. workforce.

Throughout the 1990s and 2000s, the U.S. economy has been a beneficiary of strong productivity growth mainly as a result of large investments in computer and communication technologies. Labor productivity is a critical contributing factor to GDP growth resulting in greater output for a given level of employment. Higher output per worker in turn results in higher wages and more profits, which collectively contribute to overall improvements in living standards. During the 2000 to 2010 period, labor's productivity, as measured by output per hour, grew at a 2.5 percent annual growth rate nearly 25 percent higher than the historical average. Productivity growth actually spiked immediately after the 2007–2009 recession as businesses grew output with fewer workers. However, even with continued technology investments, the structural shifts in the labor force are putting a damper on labor productivity growth, which is projected to decline over the 2010 to 2020 period back to its historical average at a 2.0 percent annual growth rate (Byun and Frey, 2012).

Slower Consumption

Slowing labor force growth and participation rates as well as declining incomes for many workers are negatively impacting personal consumption growth rates. Baby boomers are also experiencing greater financial challenges. Due to low savings rates and increasing debt, nearly two-thirds of the oldest baby boomers have insufficient funds saved for retirement (Beinhocker et al., 2009). As a result, it's expected that there will be a significant increase in savings and a reduction in spending for a cohort that has been a huge driver of consumption until now. When the baby boomers start to retire and begin drawing down on their savings, the negative impact on consumption

will be significant. Given the smaller cohort waiting in the wings to replace the boomers, worker productivity will have to substantially increase to make up for this anticipated shortfall in GDP.

Median household income has been under pressure and actually declined from 2000 to 2010. Indeed, for the first time since World War II, incomes for middle-class families during the first decade of the 21st century are lower than what they were 10 years earlier. The median household income in 2010 was \$50,046, down 8.9 percent from 2000 (Berube et al., 2011). By 2011, just more than one-half of the U.S. population was classified as middle class, defined as having annual incomes between \$39,000 and \$118,000 for a three-member household, which is down from 61 percent in the early 1970s (Pew Research Center, 2012).

As a result of these trends, personal consumption expenditures (PCE) are projected to grow at much slower rates compared to previous decades. Consumers were increasing their expenditures at a robust 3.6 percent annual growth rate from 1990 to 2000. During the 2000–2010 time period, the average PCE continued to grow at a high rate during the first several years and then fell dramatically during the recession resulting in a low 1.9 percent average annual rate. Looking forward to the 2010–2020 time period, the BLS predicts an average annual PCE growth rate of 2.7 percent, a modest increase but well below the growth rates of previous decades (Byun and Frey, 2012). Given that PCE comprise approximately 70 percent of the U.S. nominal gross national product (GNP), the impact on the future economic growth rate will be negative.

New Global Economy

The evidence is quite compelling that the United States' economy is experiencing a structural economic shift that will impact businesses' and workers' opportunities for many years to come. Following World War II, the United States was the uncontested largest economy. As Europe and Japan rebuilt and as the developing world invested in its institutions and infrastructure, it was only a matter of time before the rest of the world would catch up with the United States economically.

In just one generation, the United States went from being the world's largest creditor to the largest debtor. The U.S. trade deficit ballooned from \$35.2 billion in 1992 to a peak of \$729.4 billion in 2006. By 2010, the trade deficit stood at \$658 billion. Most of the deficit was attributable to the trade of manufactured goods rising from \$79 billion to \$509 billion. The only sector that generated a trade surplus was in services, which saw a modest increase from \$78 billion to \$88 billion. It is estimated that the rising deficit translated to a net loss of approximately 3.8 million jobs in 2006 (McKinsey Global Institute, 2009b). Over the coming decade, export growth is expected to be larger than import growth, which will narrow an albeit high trade deficit from \$421.8 billion in 2010 to \$193.3 billion in 2020 (Byun and Frey, 2012).

It is impossible to talk about global economic trends without considering the BRIC countries. The prediction of the rise of the BRICs was quite accurate, as their combined annual growth rate over the past 20 years of 5.8% far exceeded the 2.5% annual growth rate of the developed countries. The growing emerging economies are often referred to as the E7, which in addition to the BRICs include Indonesia, Mexico, and Turkey (Hawksworth, 2006). By 2050, the E7 collectively is projected to have a larger economy than the current largest developed economies of the world called the G7, which includes the United States, Japan, Germany, United Kingdom, France, Italy, and Canada.

Today, the United States continues to have the undisputed largest economy in the world with a nominal GDP approaching \$16 trillion as of the second quarter in 2012 (Bureau of Economic Analysis, 2012). However, its contribution to global output and its dominance dictating global economic affairs will continue to get smaller as the rest of the world continues to grow. Looking toward the future, the only country that is projected to challenge the U.S. position as the largest economy is China. Depending on how you measure GDP (using market exchange rates or purchasing power parity), there is debate on when China will eclipse the United States as the largest in the world. However, there are many risks in making long-term predictions because many unpredictable events can occur between now and then.

During the late 1980s, many people were predicting that Japan would overtake the United States as the largest economy; however, it's 2013, and Japan has not only failed to overtake the United States but also is now the third largest economy having fallen behind the United States and China. Though long-term forecasting is a dangerous profession, demographic trends are the most predictable, and it's indisputable that China's large and talented population will be an economic force to reckon with for many decades to come. Thus, many economists are predicting that China will have the largest economy in the world surpassing the United States sometime around 2050. However, in 2050, the United States is projected to still have the highest GDP per capita by far than any other country in the world at more than twice China's GDP per capita, which is projected to be 15th in the world.

This unprecedented situation, whereby a country has the second largest economy in the world but with a low GDP per capita, is likely to create an enormous amount of policy and business challenges for China well into the future. China is also witnessing a demographic crisis that may derail its hot growth rate in the near future. China's low fertility rates, rapidly aging population, and slowing population growth rate are creating significant supply and demand imbalances of young working-age people. Coupled with wage inflation and comparatively low productivity levels, China's dominant position as one of the world's lower-cost manufacturers is in jeopardy.

The other dominant emerging market, India, is on a quite different trajectory. By 2030, India is expected to replace China as the world's most populous country. India also has a much younger and growing population that will yield economic benefits for decades to come. By 2020, the average age in India is estimated to be 29 years, compared to 37 years in both China and the United States. The economic impact of projected demographic trends in Europe and Japan are much more negative as their populations get smaller and reach an average of 45 and 48, respectively, by 2020 (Mitchell et al., 2012).

The United States' other dominant partner in the developed world is the European Union (EU), which is also facing deep economic problems that are further diminishing the developed countries' slice of the global economic pie. The sovereign debt crisis

infecting many European countries has dramatically increased borrowing costs resulting in draconian cuts in government expenditures and commercial lending. There is concern of another banking crisis as many of these institutions holding government debt are fearful of defaults, which can result in €billions of losses and create a collapse of the global financial system. Making matters worse, Europe must respond to these challenges while facing a demographic crisis of epic proportions.

Due to a declining population, the median age in the EU is projected to rise from 40.4 years in 2008 to 47.0 years in 2060 when the number of people age 65 and over will almost double. Critically, during this time, the working-age population is projected to decline by 15 percent, and the dependency ratio (ratio of people age 65 and above to working-age population) will double. As a result, the EU will move from having four workers to support every retiree to only two. Given that most European countries spend more on public pension benefits than other advanced countries, these negative demographic trends are creating an unfunded pension crisis that will put enormous stress on government treasuries (Lannquist, 2012).

The continuing decline of the United States' leading global economic standing is both a cause and a result of the structural shift in its labor force. The United States is facing hypercompetition at a time when its labor force growth rate is declining and skills gap is widening, creating significant headwinds for economic growth. At the same time, American workers are experiencing the effects of globalization. A large segment of the labor force finds itself in direct competition for jobs with lower-wage workers around the globe, and leading-edge scientific and engineering work is taking place in many parts of the world. As a result of advances in computer and communication technologies and a highly interdependent global economy, workers in virtually every sector must now face competitors who live just a plane ride or mouse-click away.

Increasing Complexity

Each of the technological, global, demographic, and economic trends reviewed has contributed to this sense of a new normal that seems to permeate every aspect of our lives. We seem to be at a tipping point within each of these trends that is fundamentally different than a normal extrapolation. What is also different is the greater interdependency of these trends and the resulting increase in complexity. Increasing complexity is a fact of life in the new normal, as shown in Table 1.5. It characterizes the world you live in, the jobs you perform, your relationships, and the decisions you make. You manage complexity all the time, even if you are unaware of doing so. You communicate with multiple sources of technology, pay your bills electronically, install software to protect your identity and computers, and shop online to avoid traffic jams. You are a master of multitasking.

Complexity also enriches your life. Pursuing an education, advancing in your career, and raising a family all increase complexity in positive ways. Being part of a global community increases complexity in both positive and negative ways. Living and working with diverse people enriches your life.

Table 1.5 Increasing Complexity

Greater interdependencies
More data, more information, more knowledge
Faster and faster response times
More intangibles
Less predictability

In a study conducted by PWC, 41 percent of the global CEOs that were surveyed agree strongly that complexity is an inevitable byproduct of doing business today (PWC, 2006). Furthermore, 77 percent of these CEOs noted that the level of complexity in their organizations is higher than it was 3 years ago. The challenges of managing global businesses were noted as contributing factors of business complexity. Entering new markets, meeting customers' needs, and developing new products and services that result from globalizing add layers of complexity that must be managed if the benefits of globalization are to

be realized. Respondents cited overregulation as the chief challenge of globalization (64 percent), followed by trade barriers/protectionism (63 percent), and social issues (56 percent). Surprisingly, terrorism and the antiglobalization movement, two topics that dominate media headlines, were near the bottom of the list of perceived challenges at 48 and 21 percent, respectively. Other chief causes of increasing complexity were extending operations to new territories, forming strategic alliances, and outsourcing functions to third parties.

The capability to effectively manage complexity is an important strategic need for many organizations. The CEOs surveyed by PWC ranked employing highly capable people as the single most important way for managing complexity followed by effective communication. Other factors ranked highly included the ability to identify activities that are creating value, the ability to identify activities that are destroying value, the alignment of IT with business processes, the ability to measure complexity, and having a corporate-wide framework for managing complexity.

What's amazing is this PWC survey was in 2006. Predicting that the level of complexity is increasing was quite accurate. In the following years, the world experienced a financial collapse that resulted in a global recession. There has been the sovereign debt and banking crisis that swept across Europe that is increasing the probability of another recession. There has been a series of political upheavals throughout the resource-rich Middle East, and there is now a fear of slowing growth and structural challenges in the once hot economies of China, India, and Brazil.

According to the CEOs who responded to the 2012 edition of "The Conference Board CEO Challenge" survey, today's business environment is characterized by the race to innovate, the war for talent, "black swans," bad debts, the hunt for new markets, and increasing regulations and oversight. When you add to this the need for speed, an overwhelming flow of information and data (not all of it reliable), along with increased risk and uncertainty, the overall leadership challenge facing CEOs is managing complexity (Mitchell et al., 2012). The huge disparities of economic growth, the growing skills gap in many regions, and the peculiarities of regional cultures, customers, and government policies mean that organizations around the

world face unique challenges that reflect the business realities they face both locally and globally.

Structural Shifts

Unlike previous business cycles, there have been significant structural changes in the economy due to technological advances, increased globalization, and unfavorable demographic trends (see Table 1.6). Aided by advances in computer and communication technologies, organizations have automated, reengineered, and outsourced numerous jobs that were once filled by onsite full-time employees. As a result, many standardized and transaction-based jobs have either been automated or sent overseas to low-wage countries. All this is occurring at a time when the global economic environment is creating significant competitive pressures for U.S. companies.

Furthermore, advances in technology are fundamentally changing how firms compete. There is pressure to be more innovative, more responsive to customer preferences, and more efficient. The result is a significantly greater need for highly skilled human capital at a time when there are severe constraints. The slow growth of the U.S. labor market due to a decline in birth rates and a plateauing of worker participation rates, coupled with a lackluster educational system, are creating a structural economic shift that will transform how we conduct business and the lives of workers for decades to come.

Table 1.6 Structural Shift: This Is Not Your Typical Business Cycle

Growing skills gap
Slower economic growth
Structural unemployment

Growing Skills Gap

A large part of the structural shift constraining economic growth is the growing skills gap due to the imbalance between the current supply of highly skilled workers and increasing demand for these

types of workers. Most of the developed world economies are optimized for 20th century industrial-based economies, whereas new jobs being created are for 21st century knowledge-based economies. This negative structural shift in the labor market is creating difficulties for companies that require highly skilled workers to remain competitive as well as immense difficulties for the millions of workers unable to find work. Exacerbating this war for talent is an aging workforce soon to be retiring and a rise of rapidly developing economies' increasing demand for talent.

The demand for highly skilled labor is expected to increase significantly over the next decade. The BLS projects total employment in the United States will rise 20.5 million (14.3 percent) between 2010 and 2020 from about 143.1 million to 163.5 million jobs. All the occupations that require a college degree are projected to grow at an above-average rate throughout this time period. Occupations that require a master's degree will see the largest percent increase (21.7), followed by those that require a doctoral or professional degree (19.9 percent), associate degree (18.0 percent), and bachelor's degree (16.5 percent). In terms of typical on-the-job training, occupations that typically require apprenticeships are projected to grow the fastest (22.5 percent). The occupations that will grow at a below-average rate include those that require a high school diploma (12.2 percent) and those that require less than a high school diploma (14.1 percent) (Lockard and Wolf, 2012).

According to a study conducted by the National Science Foundation (NSF), the number of graduates entering the workforce trained in science and engineering is declining, whereas the number of jobs requiring these skills is increasing. As predicted in the 2004 study, the number of science and engineering jobs increased approximately three times as fast as all other occupations from 2001 to 2010. The rate of growth in these highly skilled jobs is expected to increase over the next decade. Exacerbating this imbalance in supply and demand is the projected retirement of large numbers of scientists and engineers (S&E). S&E workers who are part of the baby boom generation that entered the workforce in the 1960s and 1970s will be retiring over the next 20 years. The study also predicts that other supply and demand imbalances are projected in the jobs within the health science, math, and computer science fields (National Science Board, 2004).

The growing imbalance of the supply and demand for highly skilled workers is not just endemic to the United States, but is a global phenomenon. Research by the McKinsey Global Institute conducted in 2012 found that employers in advanced economies might soon be unable to find as many college-educated workers as they require. The gap in the United States could reach 1.5 million graduates by the end of the decade. In the rapidly growing economy in China, the shortfall can be as high as 23 million college-educated workers by 2020 (Lund et al., 2012).

Companies are not only concerned about finding new talent that have the complex skills in high demand, but are also concerned about the skills and capabilities of existing employees. A study conducted by IBM noted that more than one-third of companies thought their employees' skills were not aligned with current demand (Benko and Anderson, 2010a). These companies reported that "the inability to rapidly develop skills is the primary workforce challenge" (IBM, 2008). In a worldwide survey conducted by the Manpower Group, one in three (34 percent) employers experienced difficulties filling positions due to a lack of available talent, a nearly 10 percent increase from 2010. When asked why, over one-quarter of the respondents said candidates' lack of experience necessary for the position; another 22 percent cited a lack of technical competencies or "hard" skills; whereas 15 percent noted candidates' lack of business knowledge or formal qualifications (Manpower Group, 2011).

In the past, companies have relied on a flow of highly skilled talent who emigrated to the United States to pursue higher education and the many job opportunities at companies in need of their skills. In 2010, foreign students received 17 percent of bachelor's degrees, 29 percent of master's degrees, and 38 percent of Ph.D. degrees awarded in science and engineering (National Science Board, 2012). However, as the demand for highly skilled talent increases globally, the flow into the United States is expected to slow. Indeed, the number of science and engineering positions has increased by 23 percent over the last decade in OECD nations compared to an 11 percent increase in the United States (National Science Board, 2012). According to an OECD report on the mobility of highly skilled workers, as opportunities for these workers increase along with advances in information and communication technologies, a growing class of global in-demand

workers is evolving that is highly mobile. These workers, many of whom are educated in the United States, are now returning to their home countries or to other developing countries where the demand for their skills continues to increase at a rapid pace (OECD, 2008).

To make matters worse, U.S. immigration policies desperately need to be updated to reflect the realities of the 21st century workplace. All too often, brilliant foreign students who are trained at our top research universities are forced to leave the country due to their inability to obtain permanent work visas. The need to hire these well-trained students has prompted more than 130 corporations, trade organizations, and chambers of commerce to send a letter to the U.S. Congress urging lawmakers to establish a program to make it easier for foreign-born students who receive advanced degrees in science, technology, engineering, and mathematics (STEM) fields to stay and work in the United States (Heyn, 2012). The letter, which has been signed by such noteworthy firms as Apple and Microsoft, stated that such a policy would enable American companies to retain many foreign students with advanced degrees in STEM fields to work in the United States, which in turn will spur the creation and retention of high-paying manufacturing and research jobs in America.

A number of industries are also facing the prospect of having to replace large numbers of retirees in professional and managerial positions. In a survey of managers at Fortune 1000 companies conducted by Ernst & Young, 27 percent anticipate an upcoming knowledge and skills gap in their organizations due to difficulty in replacing retiring talent. The talent deficit will primarily be in middle management, professional, and technical positions (Ernst & Young, 2010). It's also forecasted that nearly 60 percent of all government employees will be eligible to retire over the next decade (Barford and Hester, 2011).

Slower Economic Growth

The United States has a consumer-driven economy that for decades has benefited tremendously by a growing and well-educated population and worker participation rates that positively impacted income growth and consequently consumption and economic growth. Today, these engines of economic growth are beginning to stall. The

slowing population growth rates and declining worker participation rates have negatively impacted the labor force and income growth rates. Furthermore, there are an unprecedented number of workers expected to leave the workforce over the next two decades.

The retiring baby boomers present a large economic problem for this country. During their working years, baby boomers were a huge force in economic output and consumption. Their exit from the workforce will negatively impact future growth. In addition to these headwinds, there is a tremendous amount of deleveraging at the consumer sector of the economy and pressure to reduce government debt that is further dampening growth. Lastly, though the United States has the largest economy in the world, its global economic dominance is declining, and it continues to generate large trade imbalances with the rest of the world.

As the U.S. population continues to get older, government spending on social security and healthcare has been increasing at an alarming rate. The leading edge of the baby-boom generation became eligible for limited Social Security benefits in 2008 and Medicare benefits in 2010. By 2011, total healthcare expenditures consumed 8.2 percent of GNP, a 600 percent increase from 50 years ago. Total Social Security and Medicare expenditures are projected to outpace GNP growth as this large cohort continues to get older and as the costs of sophisticated medical care, including new technologies, continue to rise. As a share of nominal federal government spending, these two programs grew from 27.9 percent in 1990 to 32.6 percent in 2010. Social Security and Medicare costs are expected to continue rising to approximately 40 percent of nominal federal government expenditures in 2021 (Byun and Frey, 2012). These rising costs will limit the amount of money the government has to invest in education, R&D, and infrastructure.

The *en masse* retirement of the baby boomers will also put severe economic pressure on the workers who will have to offset the societal financial drain of these retirees. Labor economists measure this support using the BLS's *economic dependency ratio*, defined as the number of people in the total population who are not working per 100 of those who are. As large numbers of baby boomers retire and live longer, this ratio is increasing from 90.3 in 2010 to a projected

106.4 in the year 2030 when the youngest of the baby boom generation reach 66 years of age (Toossi, 2002). As a result, either the payroll taxes for workers will be dramatically increased or benefits will need to be reduced.

In addition to growing government entitlement deficits impeding economic growth, many private pension funds are severely underfunded, requiring massive new capital that otherwise could be put to more productive use. In 2012, as noted in *The New York Times*, companies in the Standard & Poor's (S&P) 500 reported that their pension plans had obligations of \$1.68 trillion and assets of only \$1.32 trillion. The \$355 billion shortfall was the largest unfunded amount ever reported according to the S&P. A number of companies reported that their plans were underfunded by more than \$10 billion, with General Electric having the largest shortfall at \$21.6 billion (Norris, 2012). The main cause of these shortfalls is the lackluster performance of investment markets that have not performed well for a sustained period of time. Over the last 15 years, the S&P stock index rose at an annual rate of less than 5 percent even when including dividend reinvestments. Not since 1945 had a 15-year period been so bleak for the stock market.

The United States and much of the developed world experienced a severe economic downturn as a result of the 2008 global financial crisis. Though the stock market has recouped much of its losses, the continued weakness in real estate and labor markets has wiped out the positive wealth effect that fueled much of the economic growth leading up to the recession. As of the end of 2012, the bull market in stocks that began in 2010 along with modest gains in home prices have helped Americans to regain the estimated \$16 trillion they lost during the recession (Federal Reserve, 2013). However, most of the gains that resulted in higher stock prices have been flowing mainly to the wealthy. By contrast, middle class wealth that is mostly in the form of home equity has risen much less.

The disproportional gains to the wealthy will dampen the positive wealth effect on future economic growth. The wealthy are more likely to save these gains rather than increase spending that could help spur growth. In addition, any future gains in home equity are unlikely to result in the type of home equity loans bonanza that fueled

consumer spending in the past. Much of the euphoria associated with continuing rising home prices has dissipated. The good news is the U.S. economy is slowly improving, albeit at a much slower rate compared to historical norms.

After experiencing the worst downturn since the Great Depression, the U.S. economy is experiencing a slower-than-average recovery more than 3 years later. Significantly, the recovery coming out of the recession is the lowest on record. It seems that this is not a typical downturn, but something that is fundamentally different than other recessions experienced in recent decades. There is a structural shift in the economy that is a restructuring of the old economic order.

In years past, the average GDP quarterly growth rate immediately following a recession averaged more than 4 percent. However, in 2011 there was no quarter in which GDP grew at a 4 percent rate, and the entire year averaged a 3.1 percent growth rate. Even worse, GDP fell in 2011, growing at an anemic 1.6 annual growth rate. During the first quarter of 2012, the GDP fell back to a 2.2 percent growth rate (it was 3.0 percent in the fourth quarter 2011) and fell further to a mere 0.1 percent growth rate in the fourth quarter of 2012 (Bureau of Economic Analysis, 2013). According to the U.S. Congressional Budget Office and the Bureau of Economic Analysis, the U.S. GDP is projected to grow at an annual rate of 2.7 percent during the 2010 to 2020 time period, which is higher than the 1.6 percent annual growth rate over the 2000 to 2010 period, but slower than the 3.4 percent growth rate from 1990 to 2000 (Bureau of Economic Analysis, 2012).

Another indicator of the structural changes of the economy is the growing divide between the haves and have-nots. These growing inequities have given rise and visibility to many groups around the world that are expressing concern about the future of the global economic and social fabric. The widening inequity within many countries is hindering the prospect of future economic growth. At issue is not only the huge disparity between the wealthiest and the poor, but also the weak growth in median income. Between 1979 and 2007, the average U.S. real pretax income per household grew at a 1.2 percent annual rate. However, during this time period, the bottom 99 percent saw their income grow at one-half that annual rate, at only 0.6 percent, whereas the top 1 percent's income grew at 4.4 percent annually, more than three times the average growth rate (van Ark, 2011).

Though the concentration of income at the top is a concern and the growing number of people falling into poverty distressing, the weak growth of middle-income earners creates the biggest problem for sustainable economic growth. For example, between 1979 and 2007, the median hourly compensation in the United States increased at a dismal 0.3 percent annual rate (van Ark, 2011). Given the size of this cohort, an income growth rate that fails to at least stay even with inflation significantly diminishes their purchasing power and overall economic demand.

Structural Unemployment

Compared to previous recessions, in terms of employment loss, the 2007–2009 recession was both severe and long. Regarding the 1973, 1981, and 1990 recessions, employment recovered to the level it had at the beginning of the recession in 25, 28, and 31 months, respectively, after the recession began. The 2001 recession took 47 months to recover all job losses. In sharp contrast to all these recessions, 5 years since the beginning of the 2007–2009 recession, employment has still not fully recovered and remains 5 percent below the level it had at the start of the recession (Sommers and Franklin, 2012).

Although the economy has been growing, albeit at a slow rate since 2010, there are still large numbers of unemployed individuals. From December 2007 to June 2009, the U.S. unemployment rate doubled from 5 percent to a peak of 10 percent. Since the Great Recession ended in the third quarter of 2009, the unemployment rate has remained at more than 8 percent for the longest period of time since the Great Depression. It wasn't until October 2012 that the unemployment rate finally fell below 8 percent. As of March 2013, the unemployment rate stood at 7.7 percent (BLS, 2013).

The concern is many of those jobs eliminated during the economic recession are not expected to return. Many positions have been lost due to technology, offshoring, and squeezing more productivity out of existing workers. The slow recovery in employment has also been accompanied by a severe decline in the labor force participation rate, with many long-term unemployed workers having grown discouraged and dropping out of the labor force. As of 2012, the labor

force participation rate stood at 64 percent, the lowest rate since January 1984. The BLS posits that this is a structural decline and expects it will persist over the coming decade falling further to 62.5 percent in 2020 (Byun and Frey, 2012).

Labor economists debate whether the slow employment recovery is the result of structural changes in the economy or due to a severely slow recovery in cyclical demand. *Cyclical unemployment* typically results in workers being laid off due to weak demand, but who expect to be hired again in their same occupation either by their previous firm or within the same industry when demand picks up. *Structural unemployment* is the result of weak demand rooted in other causes that hinder a worker's ability to return to work as demand revives. For example, weak demand may motivate firms to outsource or offshore nonstrategic work or accelerate the adoption of new technologies and practices that result in work being eliminated or transformed (Somers and Franklin, 2012).

Workers who are unemployed due to structural causes are likely to be out of work for a longer period of time than someone who is unemployed due to cyclical reasons. Some workers who lose their job due to structural causes might have to completely change occupations and might require retraining. Though there is some debate, we are experiencing significant structural changes in the labor force and economy that may result in a natural unemployment rate that is much higher than recent decades.

In addition to high unemployment, the United States is also witnessing high underemployment. *Underemployment* is defined as working in a job that is below one's full working capacity, such as a full-time worker who is forced to work in a part-time or temporary job or in a job that does not fully utilize the individual's skills and consequently pays a lower wage. In 2012, the BLS reported approximately 17% of the labor force (26 million workers) was underemployed (BLS, 2012).

As the economy starts to grow, more jobs become available and more workers enter the labor force, which ironically will temporarily increase the unemployment rate, but also increase worker participation rate. However, the continuing technological advances and interdependency of global markets are creating many difficulties

for low-skilled workers. For example, many jobs in the manufacturing sector have been permanently eliminated due to technological advances, and many of the newly created manufacturing jobs require higher skills. If the United States cannot enhance the skills of the bottom half of the workforce soon, then those lower-skilled workers must accept the prevailing global wage levels. The result can be a massive decline in the standard of living. Echoing this sentiment, the National Academy of Sciences issued a report warning that the United States is “on a losing path” competing in the global economy if it does not start strengthening the national commitment to education and research (Galama and Hosek, 2008).

Indeed, in the 2012 World Economic report, the United States’ global ranking among the most competitive economies fell for the fourth year in a row, from fifth to seventh. It listed government bureaucracy, high taxes, and an inadequately educated workforce among the biggest deterrents of doing business in the United States. Other factors contributing to the decline of U.S. competitiveness include the millions of manufacturing jobs outsourced to countries that have lower wages, the spread of capitalism to formerly closed economies, and advances in technology that have enabled companies to do business almost anywhere in the world. The nation’s \$16 trillion debt is also a deterrent to U.S. competitiveness because it diminishes government investments in education and infrastructure and increases uncertainty among businesses about taxes and interest rates (Schwab, 2012).

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