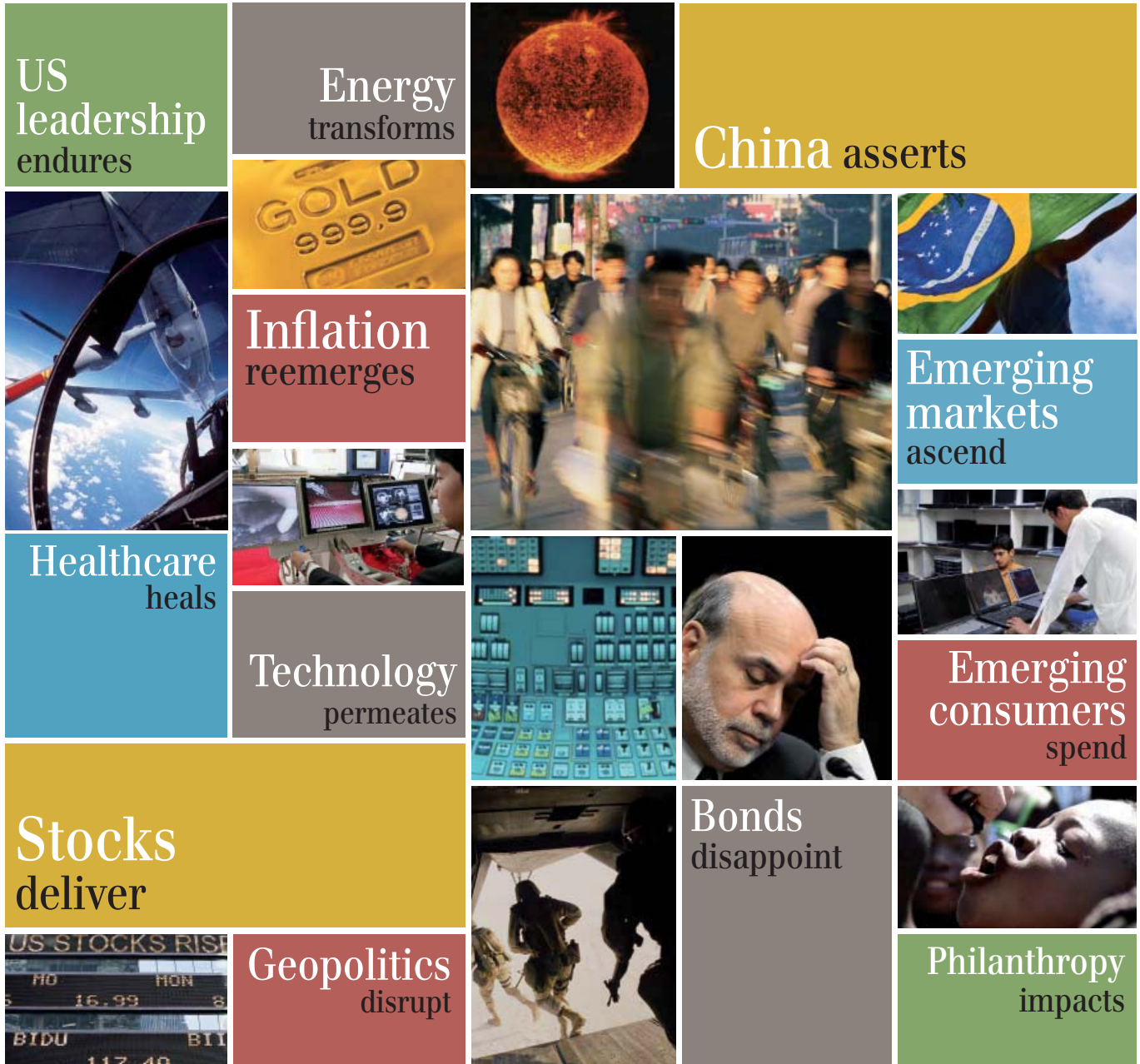


The Decade Ahead

Wealth Management Research



Our views on important trends that will impact your investments over the next ten years

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Video feature: To watch Kurt Reiman, Head of Thematic Research, give a summary of the Decade Ahead report, please click here.



Mike Ryan



Kurt E. Reiman

Dear readers,

Since the global financial crisis came to a fitful and uneasy conclusion, the economy has undergone a broad-based recovery and financial markets rebounded amid one of the most aggressive policy responses in modern history. Yet despite the commitment of policymakers to ensure a more sustainable expansion, many investors remain deeply apprehensive about the future.

This anxiety is certainly understandable given the events that have transpired over the past three and one-half years. But it is also a function of current structural problems that range from unsustainably high public and private debt burdens in developed nations, to escalating inflation pressures in the developing world, to rising social tensions from the widening of income inequality within many nations. It's no wonder then that so many look to tomorrow with a certain sense of dread.

But to view the future with trepidation alone would be a mistake. Despite challenges that likely lie before us, extraordinary opportunities abound as well. The world is changing rapidly. As it does, new industries are emerging, living standards are rising and wealth is being created. In this report, we map out the key trends that we believe will drive that change and transform our world in the decade ahead. To be sure, not all of these trends will be so warmly received. What might be seen as a benefit to one nation, industry or socio-economic group could be viewed more warily by others. But understanding how these trends may play out will be critical to leveraging the investment opportunities that will emerge as a result. So as you read on, think of the glass as neither half full nor half empty, but rather see the water in the glass as a way to make crops grow, a nuclear system cool or a hydroelectric power plant run.

Mike Ryan, CFA

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The decade ahead

The dawn of a new decade

Ten years from now when historians, cultural critics, economists and the rest of the world look back on the decade spanning 2011 through 2020, how will they choose to categorize it?

Will this be a replay of the explosive growth – but also wasteful decadence – that marked the Roaring 20s, or will we see a return to the depressingly dark days of economic collapse that defined the Dirty 30s? Will we see the sort of sweeping social changes that were ushered in during the Turbulent 60s, or the economic stagnation and financial market volatility that marked the Unsettled 70s? Will we witness another rebirth of productivity and a downsizing of government that helped to define the Great 80s, or will we simply hit the rewind button and experience another lost decade amid unsustainable economic imbalances and an expansive public sector similar to the Aughties?

To be fair, no decade is as easily defined and categorized as these labels might suggest. There are often many conflicting social, economic, technological and cultural crosscurrents that are impossible to capture in any single descriptive word or phrase. Each period is marked instead by a confluence of events and trends that defy such overly simplistic classifications. Even the decade itself is an arbitrary timeframe, meant to conform more to the way people chronicle their lives rather than the manner in which history chooses to influence them. Yet the beginnings and endings of decades afford an opportunity to reflect upon what has happened, assess the impact of these changes on society at large, and ponder the trends and innovations that may emerge over the next 10 years to transform the world yet again.

So with a new decade now upon us, we thought it timely to offer our own take on what the future may hold for investors. In this report, we highlight the critical developments that we believe will have a material impact on the real economy, financial markets and public policy decisions in the decade

ahead. To be sure, none of us possesses a crystal ball. Some of the forecasts we present here are likely to fall wide of the mark, while others will fail to go far enough in conceptualizing how radically the world will change. The last decade, for example, began with widespread optimism about the Internet's untapped potential to transform our

// The beginnings and endings of decades afford an opportunity to reflect upon what has happened...and ponder the trends and innovations that may emerge. //

lives but was temporarily short-circuited by the implosion of the tech bubble and the 9/11 terrorist attacks. Moreover, few would have predicted a financial crisis and global recession on the scale of the one that began in 2008, to say nothing of the lasting impact these events would have on the years ahead. So it is with a full understanding of these limitations that we embark upon our forecast for the next decade.

Trend extenders, trend breakers and paradigm shifts

There is a natural tendency to view the future as a mere continuation of the present and to assume that the trends that dominate today will remain uninterrupted in the years ahead. Yet for periods as long as a decade, the world changes – often dramatically – thereby disrupting the status quo. Again, think back to the end of 2000: the US stood as the sole and unchallenged global superpower; the government had recorded a string of record budget surpluses generating fears of a Treasury bond “shortage”; Asia was still reeling from the currency crisis and required the support of the International Monetary Fund; most Americans in the US had never heard of Osama bin Laden or Al-Qaeda; and cell phones – far bulkier than today's sleek models – were used to

make phone calls. Who could have foreseen just how profoundly the world would change?

So while some existing trends will undoubtedly continue or perhaps even accelerate over the next decade (trend extenders), others will be disrupted by events or shocks that alter the status quo (trend breakers). Meanwhile, new trends will certainly emerge amid disruptive innovations that unleash a radically different world view (paradigm shifts). Of course, it is difficult to know how long a trend will continue or precisely when it has run its course – or from where the next major “game-changing” developments will one day materialize. It is therefore essential to reflect upon the sources of the events that will likely shape the world in the decade ahead. While there are many drivers of change, they tend to fall into several broad categories that include: demographics; technology; natural resources; geopolitics; the environment; and societal/cultural shifts.

Understanding how demographic shifts, such as an aging population and rising urbanization, will impact personal income growth and consumer demand, for example, offers valuable insight into economic drivers in both the developed and developing worlds. Likewise, the sources and uses of natural resources may highlight potential supply bottlenecks, environmental hot spots and even future points of conflict as nations compete for access to the raw materials needed to sustain growing populations. Technology, of course, has the ability to transform everything from commerce to education and entertainment to warfare. Finally, societal and cultural shifts driven by changing norms and evolving consumer tastes will not only impact the types of products that people are willing to buy but also the manner in which they choose to buy them.

The defining trends of the next decade

But these trends by themselves are unlikely to yield anything meaningful for investors. To make the jump to actual investment implications, there must be an additional set of catalysts coming from domestic policy and geopolitical developments; business investment and product innovations; consumer adoption and buyer preferences. Consider, for example, how the decision to privatize tele-

communications, the spread of globalization, the expansion of mobile technology and the demand for device convergence all shaped the development of the smartphone market during the past decade. It was a combination of many forces and needs, rather than a single trend development that created the investment opportunity. It is here that there is the most room for debate about whether a trend will become relevant for investors. However, it is also here where investors must make some assumptions about how the world is likely to evolve if they are to take a long-term view when making investment decisions.

It is with this interplay between trends and catalysts that we explore 12 themes that we believe are most likely to impact economic growth prospects, drive financial market performance and shape public policy choices over the course of the next 10 years (see Fig. 1 for detailed chapter descriptions). These include:

United States: still the leader of the pack
China: flexing its muscles
Geopolitics: the blind side
Emerging markets: the next big allocation shift
Emerging consumers: more people, more money
Energy: alternatives threaten oil’s dominance
Technology: productivity *and* vulnerability
Healthcare: from healing to fixing
Inflation: the next wave takes shape
Stocks: no repeat of the lost decade
Bonds: the elusive quest for a safe haven
Philanthropy: makes an impact

As we consider these developments, we will focus on what they will likely mean for consumers, business owners, policymakers and investors alike. We will discuss the changes that are likely to occur in consumption patterns and how producers will seek to adapt to the new appetites and preferences as consumer tastes change. We will also offer some perspective on the difficult choices that both elected officials and taxpayers will have to grapple with as they seek to sustain growth

Fig. 1: Our views on the decade ahead

Topic	Page	Abstract
United States	8	The US will remain the dominant power in the world – despite the need for fiscal, regulatory and educational reform. While its relative strength will continue to slip over the coming decade, the US will retain its strong culture of innovation, entrepreneurialism and economic freedom.
China	16	China, now the world's second-largest economy, will increasingly challenge US economic leadership. Along with newfound prosperity comes increased assertiveness in world affairs and the potential for disruption as China's thirst for resources strains relations with competing countries.
Geopolitics	23	Geopolitical conflict will become more important in shaping investment outcomes during the next decade. Such conflict will likely keep risk premiums elevated – primarily for stocks but also for bonds – and may induce bouts of weakness in risk assets, as well as demand for safe havens.
Emerging markets	28	Numerous structural catalysts, such as a lasting economic growth advantage over developed markets, growing market capitalization and improving corporate governance standards, will prompt a strategic asset allocation shift into emerging markets over the next decade.
Emerging consumers	35	Consumption in emerging market countries is poised to expand over the next decade as personal incomes rise. This may be a consensus view, but the untapped potential of a prolonged expansion in global consumption may offer a broader set of opportunities than investors anticipate.
Energy	41	High oil prices, rising energy security concerns and environmental awareness are encouraging businesses and consumers to embrace alternatives to oil. Natural gas stands out as the prime beneficiary, but batteries and solar also have potential.
Technology	46	Technological advances will continue to improve and transform society, but our reliance on technology has also left us vulnerable. While cloud computing will likely unlock numerous advantages, we also expect greater investment in safeguards against security breaches and system failures.
Healthcare	52	During the next decade, the US healthcare system will undergo considerable change. These changes, not solely driven by legislation, could affect nearly every aspect of health delivery, from the person we consider our primary care physician to the type of care we receive.
Inflation	57	After a quarter of a century of disinflation – and a more recent brush with outright deflation – we believe inflation will reemerge during the decade ahead. However, we do not expect a reprise of the 1970s-style stagflation that crippled the economy and weighed heavily upon financial markets.
Stocks	63	With valuation excesses wrung out, we expect stocks to deliver more “normal” returns, trumping bonds in the coming decade. Historically, it is quite rare for stocks to underperform bonds over a 10-year stretch, particularly after prolonged periods of equity market underperformance.
Bonds	68	We expect interest rates in advanced economies to rise amid structural deficits, growing debt burdens and the prospect of higher inflation. Erosion in the perceived credit quality of government bonds will challenge the notion that sovereign debt is a risk-free asset, leading to an increase in risk premiums.
Philanthropy	76	People will increasingly judge philanthropy on results. Large donors demand accountability, while smaller donors use social networks to pool resources and raise awareness. Socially responsible investing is broadening, prompting more companies to embrace sustainable business practices.

rates, while protecting the environment and caring for the most vulnerable members of society. This suggests that both opportunities and risks will abound over the next decade – and that it is critical to understand from where they are most likely to emerge.

A brighter future awaits but will take work

Before we embark on our discussion, we thought it important to offer some perspective on the future in general. If you were to walk into almost any bookstore today, you would encounter a surplus of works fraught with tales of impending doom and gloom. These futuristic horror stories might range from environmental crisis and moral decay to economic catastrophe and coarsening of the culture. But the one thing they would all share in common is the sense that the world will be worse in the future, not better. We beg to differ.

We in no way seek to minimize the fact that 1.8 billion people are mired in poverty and lack basic sanitation, access to medicine and essen-

tial nutrition – a number equal to the entire world population just before World War I. We also acknowledge that a growing world population, rising atmospheric concentrations of carbon dioxide and increasingly scarce water resources may also pose threats to greater prosperity in the years ahead.

However, the path of human development is neither downward sloping nor static – it is ever ascending. While humanity has stagnated and even regressed periodically, the historical norm is for higher living standards, greater wealth, longer lives, more leisure time, lower mortality rates, better diets and greater human creativity.¹ The very things that have accelerated over the past several decades – greater specialization, increased trade flows, more widespread interpersonal connectivity – will continue to offer the greatest promise for the future. This accumulation of knowledge and pooling of skills is what differentiates humankind from every other species on the planet and is also what makes the future so exciting.

Investment *conclusions*

Position for equities to deliver higher risk-adjusted returns than bonds: While the financial crisis rightly focused attention on the need to properly diversify portfolios and manage risks more diligently, it would be a mistake to structurally underweight equities as a result. In our view, US stocks will provide “normalized” annual returns of between 8.5 and 9% over the coming decade as price-to-earnings multiples converge toward their longer-term historical average of 14.7x and corporate profits trend toward USD 165 per share for the S&P 500 by 2020. Meanwhile, interest rates will likely move higher throughout the decade, as monetary policy becomes less accommodative, inflation pressures accelerate, private sector credit demand rebounds and federal budget deficits persist. Therefore, bonds are likely to trail stocks on a risk-adjusted basis during the next decade.

► *Stocks p. 63; Bonds p. 68; Inflation p. 57*

Retain a preference for emerging markets: Despite concerns that emerging markets may have become a “crowded trade” amid the extensive media hype and elevated flows into the sector, it remains our view that emerging market equities will outperform those of the developed world. Better growth prospects and fewer structural constraints offer a better performance outlook, while improvements in transparency and liquidity will help to broaden access. Consumer-oriented domestic stocks also stand to benefit from rising per capita incomes in emerging markets over the coming decade. Finally, a deeper “tiering” within emerging markets assures that investors will be able to leverage new opportunities as frontier markets evolve and expand.

► *Emerging markets p. 28; Emerging consumers p. 35*

Maintain a presence in US markets: Although emerging markets likely offer better absolute return prospects over the next decade, US dollar-based investors should still maintain a sizable weighting in domestic equity markets. US companies remain well positioned to exploit global oppor-

tunities through powerful brand names and strong presence within faster growth regions. Meanwhile, the culture of innovation and entrepreneurialism suggests that many of the next great companies to dominate industries – ranging from information technology and healthcare to agriculture and alternative energy – will hail from the US.

► *Stocks p. 63; United States p. 8; Emerging consumers p. 35*

Include commodities for price appreciation and portfolio diversification: The prospects for continued strong demand from emerging markets, coupled with a rekindling of inflation pressures, suggest that continued exposure to commodities is also warranted. While broad economic cycles, weather conditions, supply constraints, technological changes and shifts in consumer preferences will periodically weigh upon commodity prices, the demand for raw materials will continue to rise along with the shift in growth toward emerging markets. Although natural gas is currently in the doldrums, the outlook over the next decade is quite strong.

► *China p. 16; Energy p. 41; Emerging consumers p. 35; Inflation p. 57; Geopolitics, pg. 23*

Actively manage bond portfolios: Rising concerns over sovereign default risks, emerging challenges in municipal credit and rising inflation pressures require a more active approach toward the management of fixed income holdings. The three-decade-long decline in rates has drawn to a close, and while rates are unlikely to surge in the decade ahead, greater scrutiny must be given to selecting, monitoring and periodically rebalancing fixed income assets. Passive buy-and-hold strategies for bond holdings are simply no longer appropriate.

► *Bonds p. 68; Inflation p. 57*

Incorporate strategies to protect against inflation: Although US inflation is dormant and not an immediate threat, we believe inflation will reemerge and average 5% during the decade. As inflation accelerates, this should benefit hard assets, such as property and gold, as well as real

(inflation-adjusted) assets like Treasury inflation-protected securities (TIPS) and equities. While TIPS are presently expensive because of low real yields, they provide strong protection against erosion of purchasing power and a rise in inflation. We also note that the Basic Materials and Energy sectors have historically done well during periods of high headline inflation and rising commodity prices.

▶ *Inflation p. 57; Energy p. 41; Emerging markets p. 28; Bonds p. 68*

Diversify within energy companies: While oil will remain the dominant source of energy in the world over the coming decade, other sources will emerge to compete with petroleum – and in certain commercial applications even replace it. In addition to maintaining exposure to integrated oils, investors should also gain exposure to both traditional energy sources – such as natural gas and unregulated power generation – as well as emerging sectors, which include solar, wind and batteries.

▶ *Energy p. 41; China p. 16*

Exploit broad opportunities in technology:

Much of the focus on technology has centered on those companies that make products and applications that allow us to enjoy better, longer, healthier and more fulfilled lives. But there will also be opportunities in industry sectors and companies within the technology universe that protect us against system failures, security breaches, property damage and loss of life. While the potential future application of new technology is limited only by our imagination, the investment opportunities in technology will flow both from productivity and lifestyle enhancements, as well as advances to limit threats and vulnerabilities.

▶ *Technology p. 46; Healthcare p. 52*

Embrace changes in healthcare: The healthcare industry is rapidly evolving, with changes that range from the way healthcare providers are compensated to the way patients access critical services. Moreover, medicine will continue to shift its efforts away from treating illness and toward prevention and repairing genetic flaws. This suggests that the investment focus needs to broaden from traditional pharmaceutical companies to managed care, genetic engineering and medical device companies.

▶ *Healthcare p. 52; Emerging consumers p. 35*

Deploy portfolio hedges: The likely rise in geopolitical risk over the coming decade indicates a need to monitor sources of conflict and hedge against extreme outcomes and liquidity events. Hedges could range from exposure to such natural risk hedges as precious metals, particularly gold, to structured investment vehicles that limit downside risks at the individual security, asset class or market level, like options and structured products.

▶ *Geopolitics p. 23*

Consider nontraditional assets: Despite difficulties faced by a number of university endowments, charitable organizations and individuals during the financial crisis, nontraditional assets have emerged as an effective way to enhance returns and limit risks. The limited absolute return prospects for bonds and cash over the next decade argue for an increased weighting in non-traditional assets.

▶ *Philanthropy p. 76; Bonds p. 68*

Consider multi-currency strategies: Given the many structural economic challenges facing the US, particularly its large and increasing public debt burden, we expect the US dollar will steadily lose value against many emerging market and commodity-exporting countries. However, we do not expect the US dollar to lose its status as the primary international reserve currency. Persistent institutional instability limits the euro's prospects as a core central bank reserve holding, and China's yuan is many years from being freely convertible.

▶ *Bonds p. 68; Inflation p. 57; Emerging markets p. 28; United States p. 8; China p. 16*

Selectively utilize socially responsible investing strategies:

Once viewed as a niche segment, socially responsible investing will likely become more mainstream due to competitive investment results and increased demand for this type of investment approach among philanthropic organizations, endowments and individuals. Greater scrutiny on corporate governance and sustainability has opened an entirely new frontier and will provide additional criteria for evaluating corporations. Others outside the philanthropic domain will also be drawn to the opportunity both to do good (values-based and impact investing) and do well (competitive performance prospects).

▶ *Philanthropy p. 76*

United States: *still the leader* of the pack

The US will remain the dominant power in the world – despite the need for fiscal, regulatory and educational reform. While its relative strength will continue to slip over the coming decade, the US will retain its strong culture of innovation, entrepreneurialism and economic freedom.

Mike Ryan, CFA, Chief Investment Strategist

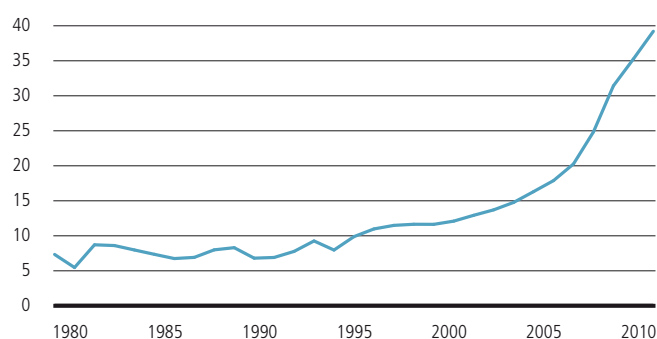
A position of strength

There is a growing belief that the US is in the midst of a long-term structural decline that will render it, at best, one of a group of nations that share global leadership and, at worst, a second-rate power. This view is certainly understandable given the challenges the US currently faces ranging from economic competitiveness and fiscal imbalances to aging infrastructure and financial instability. The impressive emergence of China on the world stage, which began in earnest with the liberalization of economic policies by Communist Party leader Deng Xiaoping in 1978, is generally seen as the most immediate and serious threat to US dominance. After all, in less than a decade China has risen from the sixth-largest economy in the world to the second-largest. China's economy, which in 1990 was just 7% of the American economy in size, is now almost 40% of US GDP (see Fig. 1). But the US faces other leadership challenges as well. In the most recent world education ranking report conducted by the OECD, the US ranked just 25th in math and 17th in science for secondary school students.¹ This means the US ranks behind not only expected names like South Korea and Japan, but also behind some more surprising ones, such as Estonia and Poland. Given the importance of education to remaining competitive in today's information-based world, these rankings would seem to confirm the view that the US is in a steady and inexorable state of decline (see Fig. 2).

But not only are such assessments superficial, they are also largely misleading. While the US admittedly faces a number of serious challenges in the coming years, it also possesses myriad sources of strength that will enable the nation to not only cope with such difficulties in the next decade but to continue to flourish. In his thoughtfully provocative book entitled, *The Next 100 Years: A Forecast for the 21st Century*, political scientist George Friedman likens the US not so much to an aged and infirmed adult, but rather to a still immature yet energetic adolescent.² He argues that US power is overwhelming and rooted in economic, technological and cultural realities. But understanding the sources of that power is key to identifying in what ways the US will be challenged in the years ahead, who will emerge as its primary competitors

Fig. 1: China's economy has grown much faster than the US

China's GDP as a share of US GDP, in %



Source: International Monetary Fund

and how the nation will evolve to retain its leadership position. In our view, the primary sources of US strength can be categorized as follows:

Power drivers

- Military supremacy
- Geopolitical uniqueness
- Resource accessibility

Productivity drivers

- Technological innovation
- Demographic elasticity
- Labor force flexibility
- Excellence in higher education

Entrepreneurial drivers

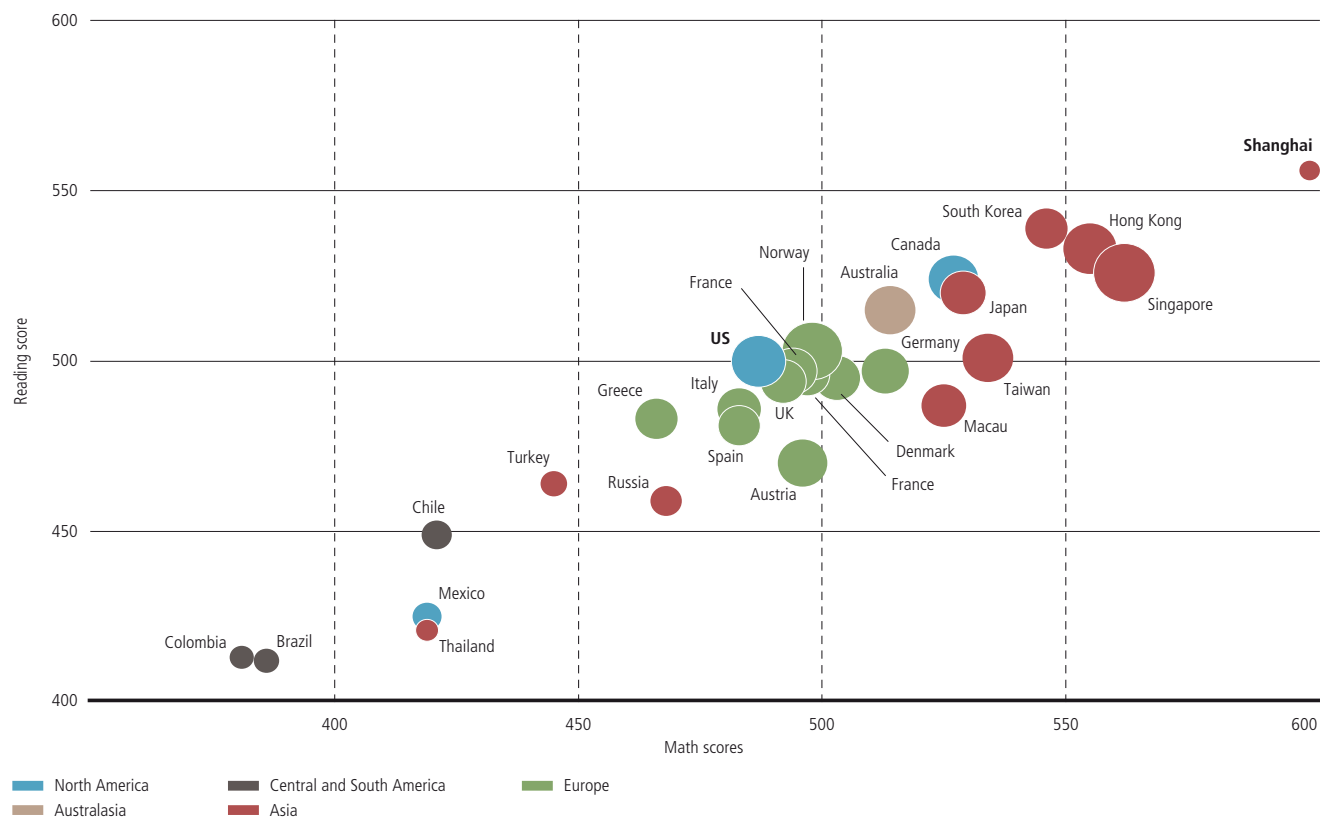
- Economic resiliency
- Legal clarity
- Capital adequacy
- Entrepreneurial dynamism

Taken together, power drivers, productivity drivers and entrepreneurial drivers comprise something known as “American exceptionalism.”³ The way in which these drivers combine and play out over the next 10 years will help to ensure that the US retains its leadership position in an increasingly competitive world.

Power drivers

The first two factors mean that the US effectively goes unchallenged in the world today from a military perspective, while the third suggests a lower level of vulnerability to resource disruptions than other nations might periodically face. In the aftermath of the Cold War and collapse of the Soviet Union, the US emerged as the sole global military superpower. Despite increasing assertiveness on the part of China, the US retains both a significant military advantage and the ability to project that power globally. Currently, the US defense budget

Fig. 2: US secondary education falls short
 Test scores of 15-year-olds in reading and math in selected countries



Note: Size of circles is proportional to per capita GDP for each country or region.
 Source: OECD's Programme for International Assessment

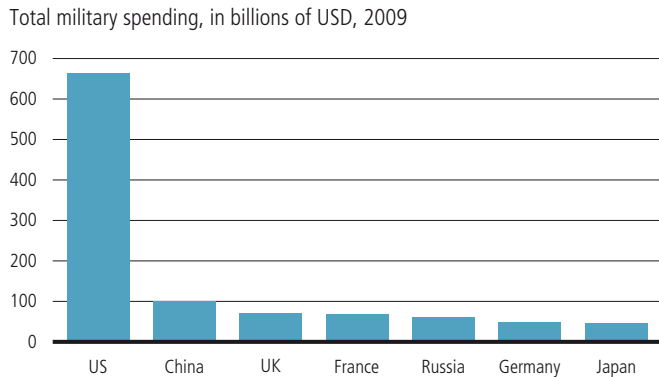
is about 10 times larger than China's, which is the second-largest (see Fig. 3). But even if other nations do manage to narrow America's numerical and technological military advantages, as evidenced by China's recent development of stealth fighter aircraft, geopolitical uniqueness will still offer the US advantages that others simply lack. Consider for a moment that the US is protected by two oceans and is bordered by two friendly and significantly less powerful neighbors. This means the US needs to devote fewer resources to border defense but can mobilize to project power in two theaters – the Atlantic and the Pacific.

Although the US is highly dependent on certain critical commodities such as oil, it is still a resource-rich nation that is able to satisfy a fair portion of its own needs for energy, industrial metals and, perhaps most important, drinkable water. Keep in mind that the US is the second-largest energy producer in the world, with significant reserves of oil and gas in Alaska, the Dakotas and the Gulf of Mexico, as well as enormous coal deposits (see Fig. 4). The US also shares access to the largest body of fresh water on the planet in the form of the Great Lakes. This could well become the most important resource advantage, as a growing global population searches for reliable access to clean, drinkable water. The nation's access to other essential resources is still secured by a military profile that spans the globe and represents a five-decade commitment to establishing a presence in regions that are deemed to be in its strategic national interest. So while regional players will emerge to test the US periodically, these strategic advantages suggest America will remain the dominant global power in the decade ahead.

Productivity drivers

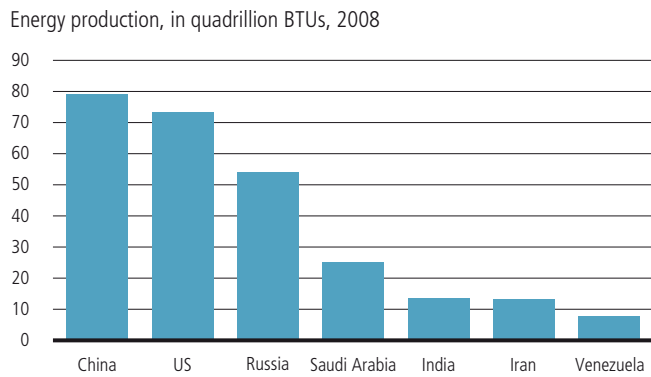
If the first three sources of strength listed above represent the essential building blocks behind the geopolitical power of the US, then the next four largely define the nation's economic might. The US has traditionally been a world leader in all sorts of technologies ranging from computers and nuclear power to the development of composite materials. While others have taken the lead in the industries America once dominated, the US remains a leader in such critical high-tech fields as biomedical engineering, agricultural engineer-

Fig. 3: The US spends far more on defense than any other nation



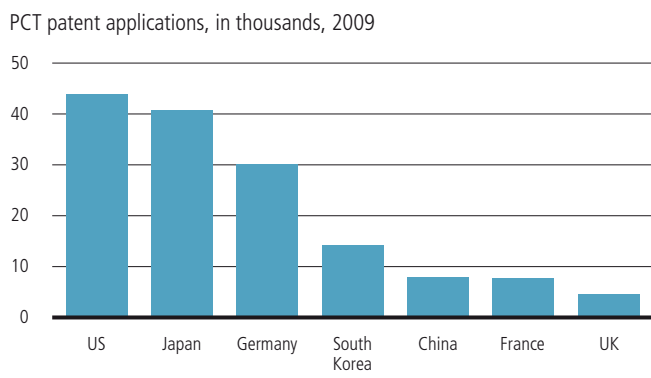
Source: Stockholm International Peace Research Institute

Fig. 4: The US is the second-largest energy producer in the world



Source: US Energy Information Administration

Fig. 5: The US leads in internationally recognized patents



Note: PCT = Patent Cooperation Treaty.
Source: World Intellectual Property Organization

Economic leadership

The concept of US leadership, even when focusing narrowly on economic dimensions, is often poorly defined in the popular media. It is useful to distinguish among economic size, economic well-being and growth leadership.

As far as economic size is concerned, the US is the world's uncontested economic heavyweight. Although China is catching up, it is unlikely to exceed the US in terms of economic output over the next decade. Regarding economic well-being, as loosely represented by GDP per capita, the US has been among the top 10 countries for the last three decades. It currently ranks sixth behind small wealthy countries, such as Qatar, Luxembourg and Singapore, but ahead of other large developed economies, such as Germany, Japan and the UK. Even under the most extreme scenarios, it appears highly unlikely that fast-growing emerging market countries will significantly alter this ranking over the next 10 years. Keep in mind that China's per capita GDP is presently only 16% that of the US.

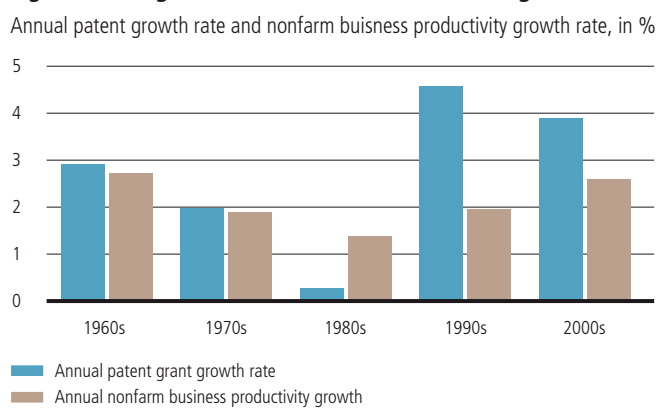
Growth leadership is the one area where the balance has already shifted away from the US. In 2000, the US accounted for nearly a quarter of global growth in economic output, more than double China's contribution. However, in 2009, the US accounted for a mere 20% of global economic growth, while China had a 26% share. This matters because such a shift in growth contribution means that a large share of new global investment and business opportunities is progressively tilting away from the US.

ing, nanotechnology and applied optics.⁴ Despite a fairly sharp decline in research and development spending over the past decade, the US still ranks highest in the filing and granting of Patent Cooperation Treaty international patents, which are recognized in 177 different countries (see Fig. 5). Keep in mind that patent grants actually represent the application of technological innovation to enhance productivity. As Fig. 6 illustrates, there is a strong historical correlation between patent grants and economic growth. At the same time, the US continues to benefit from a superior higher education system. While primary and secondary education ranks low against other nations, the American university system is still considered among the finest in the world in many fields, including math, science and engineering.

But it still requires a skilled, well-educated and productive work force to ensure that the US will remain competitive. While some structural rigidities exist, particularly now that many Americans

have negative equity in their homes, the US labor force is still the most flexible in the world and able to adapt fairly rapidly to changing labor needs.⁵ An open immigration policy for highly skilled, foreign-born workers has also afforded the US a significant demographic advantage enjoyed by

Fig. 6: Patent growth correlated with economic growth



Source: Patent and Trademark Office, Bureau of Labor Statistics



In the aftermath of the Cold War and collapse of the Soviet Union, the US emerged as the sole global military superpower. Despite increasing assertiveness on the part of China, the US retains both a significant military advantage and the ability to project that power globally.

few others. This means that the US suffers less from an aging population than other developed nations that do not have the benefit of immigration. However, amid tightening of visa restrictions following the 9/11 terror attacks and growing opportunities on their respective home fronts, the number of foreign-born engineers working in the US has dropped markedly.⁶ Still, the output of American universities places the US within the top three globally – and the highest on a per capita basis – of technical graduates. It would therefore appear that the drivers accounting for much improvement in US economic productivity are still intact and will continue to yield significant benefits over the next decade.

Entrepreneurial drivers

It is perhaps the last four variables that have been most critical to the ongoing competitiveness of the US economy – yet may pose the biggest obstacle in the future. The depth and efficiency of the US capital markets has historically enabled entrepreneurs to access available capital around the globe to build their businesses. Meanwhile, the US legal framework (well-defined property rights, granting and honoring of patents, robust adjudication process and consistent enforcement of regulation) has allowed corporations to flourish within a well-established set of operating principles. Entrepreneurs need to be provided a fertile environment for deploying capital *and* taking business risks without the threat of arbitrary

or punitive litigation. But the orderly liquidation of failed enterprises is also necessary for the effective reallocation of capital into more productive and efficient uses. It is this combination that has enabled the US economy to not only adapt to harsh business environments, but also to reinvent itself periodically to serve the changing needs and preferences of consumers.

Some argue however, that the capitalist system is no longer functioning properly within the US and point to the following: the misallocation of resources during the 1990s and 2000s into the Financial Services sector; the heavy-handed role the government played in bailing out banks and selective industries during the recent financial crisis; the refusal to honor the legal precedent of the Bankruptcy Code during the failure of several high profile companies; the impact of the US as a debtor nation on capital formation; and an increasingly burdensome and intrusive regulatory backdrop. After all, this process of “creative destruction,” as Austrian-American economist and political scientist Joseph Schumpeter described it, is an essential feature of a vibrant, resilient and adaptive economy. If businesses are not permitted to both succeed *and* fail, confidence in free enterprise system erodes.

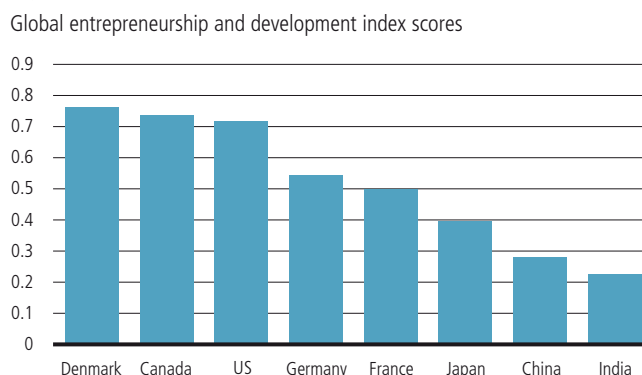
However, episodes of capital misallocation are not uncommon (recall the massive overinvestment in railroads in the US during the 1860s), and temporary state intervention following economic and financial dislocations are sometimes necessary (the Great Depression remains the most enduring example). That does not mean that capitalism is no longer workable. Despite both the enormous US fiscal deficit and large consumer debt burdens, there is little evidence that the flow of capital available to entrepreneurs in the US has diminished in any way. Moreover, while the unorthodox treatment of creditors during the General Motors bankruptcy raised concerns over a tendency to reward favored political constituencies, this has proven the exception rather than the rule.

However, policies that distort the efficient reallocation of capital or prohibit the orderly liquidation of bankrupt businesses do pose a threat to the sustainable long-term competitiveness of the

US. While it is difficult to assess exactly what the environment will look like over the next 10 years for US business with regard to an entrepreneurial culture, there is still reason for optimism. The most recent release of the Global Entrepreneurship and Development Index ranks the US third in the world overall, but first on the entrepreneurial aspirations sub-index. According to the study findings reported in the release, “the US is among the world leaders in startup skills; it is a leader in competition; and it is first in developing new technologies.”⁷ By way of comparison, Japan was ranked 29th overall, China 40th and India 54th in the study (see Fig. 7). This suggests that America’s position as an incubator for entrepreneurs will remain robust well into the next decade.

But there is also an intangible and unquantifiable aspect of entrepreneurialism that goes beyond mere natural resource endowments, productivity measures, the capital base and even military might – and it is this aspect that has been most critical to US leadership. Assorted studies have sought to determine what the primary drivers are that account for the accumulation of wealth and improvements in prosperity. Perhaps the most famous and influential effort on this front is *The Wealth of Nations* by 18th century Scottish economist and philosopher Adam Smith. Smith argues that economic freedom, rather than mineral wealth or large pools of cheap labor, is chiefly responsible for prosperity. A recent study by economists Art Carden and Joshua Hall appears to validate Smith’s views by providing evidence

Fig. 7: The US ranks third in entrepreneurial culture and activity



Source: Small Business Administration

that countries with greater economic freedom tend to enjoy both higher per capita GDP and higher growth in GDP.⁸ Although its competitive position has slipped as a result of the aftershocks from the global financial crisis, the US is still one of the top-ranked nations in terms of economic freedom, according to the Heritage Foundation's 2011 Index of Economic Freedom (the US ranked 9th, Japan 20th, Germany 23rd, India 124th and China 135th).⁹ The US remains one of the most adaptive, open and resilient economies in the world. In his most recently published book entitled, *Uprising*,¹⁰ UBS's own senior economic advisor, George Magnus, cleverly offers that the abbreviation "RIP" should stand for "renewal in progress" rather than "rest in peace," when used in relation to the US. It is this economic resiliency – and continued cultural adaptability – that will allow the US to retain its dominance in the coming decade.

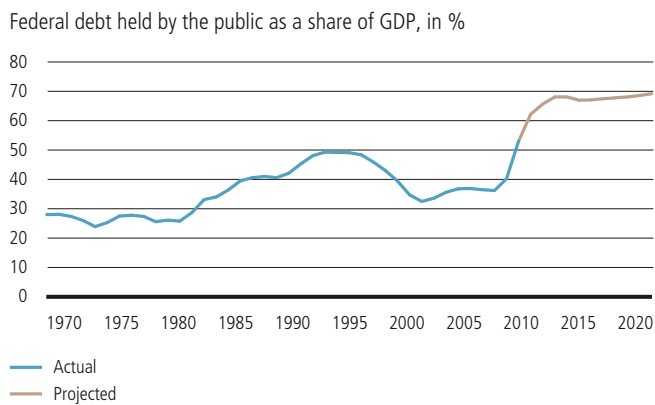
Structural challenges

Of course, the US does face a number of significant economic, political, fiscal and social challenges that, if left unaddressed, could still materially compromise America's global standing in the years ahead. Some of these issues are: a substandard primary and secondary educational system (grades K-12); an increasingly burdensome regulatory scheme; unsustainably large fiscal imbalances; and a deeply corrosive political culture. Consider the following:

- According to the Hoover Institute's *Koret Task force on K-12 Education*, the ongoing failure of the US primary educational system now poses a significant strategic risk.¹¹ Chester Finn, the chair of the task force and former Assistant Secretary of Education, likens the stellar showing of both Shanghai and Hong Kong in the OECD's most recent PISA (Programme for International Student Assessment) rankings to the Soviet Union's launching of Sputnik half a century ago.¹² Failure to respond with meaningful educational reforms could leave the US at a competitive disadvantage longer term – and even more dependent on foreign-born engineers and scientists at a time when the competition for those skilled professionals is rising.

- Susan Dudley, the Director of the Regulatory Studies Center at George Washington University, has warned that overly burdensome and inefficient regulatory schemes can inflate costs, stifle innovation and entrepreneurship and encourage "rent-seeking behavior" on the part of entrenched special interests. In a January 20th article published in *The Economist*, she notes that the federal government has issued 132 "economically significant" regulations over the past two years versus an average of 47 per year during the Clinton administration and 48 per year during the Bush administration.¹³ Were this trend to continue, it could lead to a material erosion in US competitiveness.
- The Congressional Budget Office estimates that the federal debt held by the public will soar from just 32.5% of GDP in 2001 to 70% of GDP by 2020 (see Fig. 8).¹⁴ Keep in mind that state and local governments also have incurred large structural imbalances over the past decade and a half due to expanded services and unfunded pension liabilities. For example, economists Robert Novy-Marx from the University of Rochester and Joshua Rauh from Northwestern University estimate that Chicago will need to remit 53% of all tax revenue to retirees by 2023 – even under an optimistic scenario – to meet pension commitments.¹⁵ Large budget deficits by themselves are troubling enough, but when combined with sizable trade imbalances they contribute to a dangerously high dependence on foreign capital and even the prospects for

Fig. 8: The US faces an increasing federal debt burden



Source: Congressional Budget Office

selective defaults. This leaves the US vulnerable to higher rates, slower economic growth and currency weakness if foreign investors begin to withhold capital (see page 68 for a more detailed discussion of bonds and currencies).

- An increasingly bitter partisan atmosphere in Washington has made it difficult to deal with longer-term structural challenges. This means that each political party seeks to use such issues for tactical electoral advantage rather than as a starting point for serious discussion. The President's National Commission on Fiscal Responsibility and Reform offered up a grab bag of measures that is projected to cut the deficit by as much as USD 200 billion per year by 2015.¹⁶ But the Commission failed to include any specific recommendations on entitlement reform in the proposal, which would certainly need to be included in any meaningful effort to reduce structural deficits. It would therefore appear that there is little political will to work in the sort of bipartisan manner that is necessary to address these and other critical issues.

While none of these issues by themselves will necessarily compromise America's standing in the world, taken together they do represent a significant challenge for business leaders, policy-makers and elected officials. This suggests that the US economy is in for a period of below-trend growth in the years ahead as precious resources are diverted to address these needs. That does not mean that the US will cede its spot as the global leader. The US will almost certainly remain the world's largest and most important economy through the next decade. What it does mean, however, is that the gap between the US and such rapidly growing economic powers as China and India will continue to narrow (see Fig. 9).

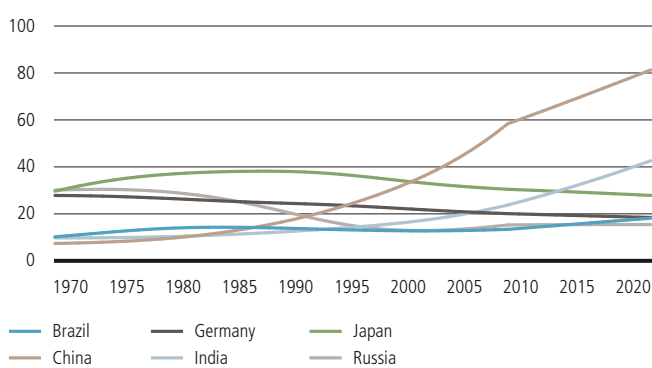
The leader of the pack

The view that the US is in decline has become so widely held that it needs to be challenged on several fronts. The US has periodically appeared to be on the brink of forfeiting its position as a global leader – due both to its own missteps as well as the rising fortunes of others. Recall that the Soviet Union was destined to unseat the US militarily in the late 1960s, while Japan was set to eclipse the

US economically in the 1980s. Neither happened. Instead, the US adapted and thrived by allowing free enterprise and enlightened self-interest to guide that change – as opposed to an entrenched bureaucracy and a heavy-handed government. There have been, and will continue to be, mistakes made and setbacks experienced along the way. But the notion that the US will cede its leadership position over the next decade is premature. As we will see in the next section, China faces its own set of challenges in the years ahead that will impact its development as well. In short, the US will remain the leader of the pack through the decade.

Fig. 9: Gap between US and emerging markets to narrow

Selected country GDP as a share of US GDP, in %



Source: UBS WMR estimates based on Penn World Table 6.3 data

China: *flexing* its muscles

China, now the world's second-largest economy, will increasingly challenge US economic leadership. Along with newfound prosperity comes increased assertiveness in world affairs and the potential for disruption as China's thirst for resources strains relations with competing countries.

Mike Ryan, CFA, Chief Investment Strategist

China rises

China's emergence as a major economic player in the post-Cold War world has been nothing short of spectacular. An economy that just two decades ago was similar in size to Poland's, has now soared past every other nation in the world with the exception of one (see Fig. 1). The rise of China thus far has been mostly beneficial to the global economy. East Asian factories have played a vital role in supplying Western consumers with low-cost goods, while emerging market central banks recycled surplus funds back into bonds and helped keep global interest rates low to spur investment spending. China's emergence also has been critical in driving growth within Asia Pacific (APAC), as other nations within the region have played some role in the broader Chinese manufacturing supply chain. Finally, China's more stable economy also helped the world overcome the most severe economic downturn since the Great Depression by supplanting developed nations, such as the US, as the locomotive for growth. Clearly, the reintegration of China into the global economy has been an extraordinarily positive development over the past decade and a half.

But with China's appetite for raw materials growing more ravenous every day, and with a renewed sense of national pride that rivals its expanding economy, China is now also poised to become an increasingly assertive, and potentially even disruptive, global force. This means that China will not only assume a more visible and vocal presence

on the world stage, but there is a greater risk for more frequent clashes with nations, such as the US, when strategic interests are in conflict. This new wave of Sino-assertiveness will manifest itself in five principal ways:

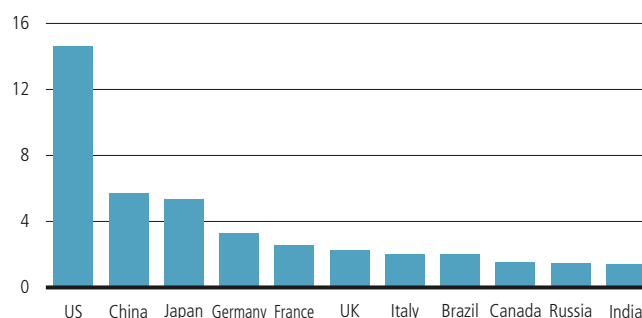
- Procurement of resources
- Projection of military power
- Trade policy
- Technological innovation
- Political engagement

It's a small world after all...for resources

As recently as 1993, China was not only energy self-sufficient, but was actually a net exporter of coal and oil. China also enjoyed surpluses in all sorts of minerals, ranging from aluminum and

Fig. 1: China is now the world's second-largest economy

Size of major world economies in trillions of USD, 2010



Note: Measured at market exchange rates.
Source: International Monetary Fund

molybdenum to zinc. But the economic reforms implemented under Deng Xiaoping in the 1970s unleashed an expansion that led to a four-fold increase in China's economy over a period of fewer than 15 years. Alongside this rapid industrialization has come a voracious appetite for raw materials of every kind, including energy, industrial metals, agricultural products, clean water and even precious metals (see Fig. 2). In 2009, China passed the US to become the single largest consumer of energy in the world, as estimated by the International Energy Agency (see Fig. 3). According to Elizabeth C. Economy, Director of Asia Studies at the Council on Foreign Relations, the need to secure raw materials will only continue to rise as China plans to "urbanize" 400 mn people between now and 2030. Ms. Economy observes that the resource demands of rapid urbanization will be substantial, with about half the world's new building construction occurring in China and the need to build between 20,000 and 50,000 skyscrapers over the next several decades.¹ Chinese leaders are also concerned about access to sufficient supplies of usable water, given that the amount of water available per person in China is only about one-fourth the global average due to geography, population shifts and pollution.

China is already moving aggressively into alternative energy sources, including nuclear, wind power, photovoltaic and hydroelectric (where it is already the world's largest producer) as a way to ease energy dependence (see page 41 for a more detailed discussion of the outlook for

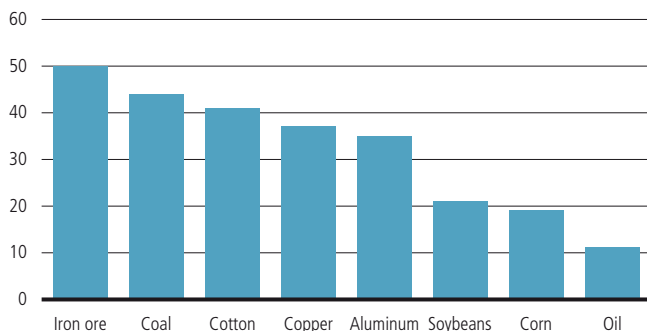
energy). But even if China is able to fully exploit alternatives to fossil fuels, its need for all types of raw materials will continue to rise over the next decade as the economy expands at a rapid pace. This means that China, along with the rest of emerging Asia, will be competing for the same pool of scarce resources as the developed world. China has already staked out an aggressive stance in resource procurement, as evidenced by its expanded relationships with resource-rich nations in the APAC region, Africa and the Americas.² In addition to expanded trade ties, China has also sought to partner with leaders in these nations through direct investment, technical support, infrastructure spending and joint business initiatives in an effort to expand the development and exploitation of natural resources and mineral wealth. These projects may be either too large or too risky for private sector companies to pursue on their own, leaving them as ideal targets for state-controlled entities within China seeking to secure stable and reliable access to raw materials. This growing share of resource consumption will likely lead to increased competition with the West and even potential shortages, as these new players become more aggressive in securing sources of supply. So as China expands into parts of the world outside its current sphere of influence, the prospects for conflict – possibly even military conflict – will rise as well (see page 23 for a more detailed discussion of geopolitics).

Playing catch-up

According to GlobalFirepower.com, China already

Fig. 2: A voracious appetite for resources

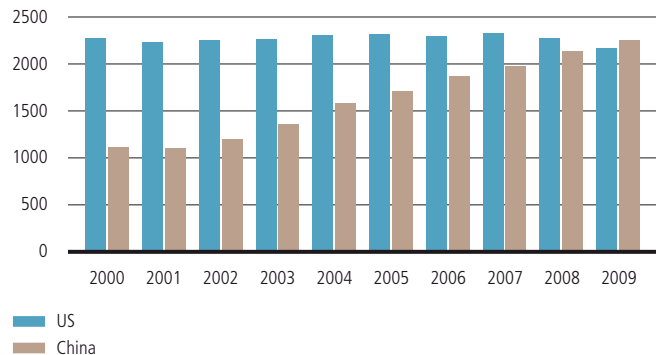
China's share of global commodity demand, in %, 2010



Source: Bloomberg, Thomson Financial

Fig. 3: China eclipsed the US as the largest energy consumer

Energy consumption, in million tons of oil equivalent



Source: International Energy Agency

ranks second in the world to the US in terms of military strength. The Chinese army is the largest in the world numerically with over two million active service personnel currently under arms, and it also ranks second in such strategically important areas as naval vessels. However, the current strength of China's military is greatly exaggerated by these statistics. Despite a sharp increase in defense spending, China's military budget is still only about one-seventh of what the US spends (see Fig. 4). Moreover, much of the military is dedicated to border and coastal operations (China shares borders with traditional rivals, India and Russia, and sea lanes with its historic enemy Japan). While the US currently has 11 aircraft carriers in operation around the world and one in reserve, it is estimated that China will not be able to deploy a serviceable carrier until about 2015. The ability to commission, deploy and service an aircraft carrier is critical because it both allows for a broader projection of military power beyond the coastal region and also offers greater protection to critical maritime trade routes. In the absence of such capabilities, China is vulnerable to potential disruptions in raw materials and crude oil supplies which are critical to economic growth.

But while China may currently lack the heft and reach of the US military, it is devoting a disproportionate level of funding to building its military capabilities in an effort to protect its expanding global interests. They are, in essence, playing "catch-up." China's military leaders have already stated their ambition to transform their naval

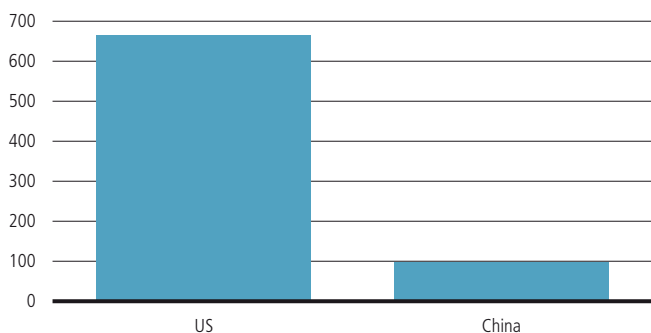
forces from a coastal defense guard to a true "blue-water" maritime force that navigates across the world's oceans.³ The Chinese want to be able to operate not only within the first island chain surrounding the mainland, but also to extend that naval footprint to protect critical transportation routes in major sea lanes. Toward that goal, China has already secured deep-water ports on the Indian subcontinent and now is looking to expand into Africa as well. While China does not currently have a carrier-based force and represents little immediate threat to the US, it is expected that as many as three serviceable carriers will be operational by the end of this decade. Moreover, China's unexpectedly rapid development of stealth aircraft suggests the gap may be narrowing on several fronts simultaneously. Although the US and China will still find common ground on which to operate jointly as they do now in the hunt for Somali pirates, for example, the potential for clashes will undoubtedly increase over the course of the next decade, as China seeks to extend its sphere of influence and defend its newly established strategic trade routes. But these potential flash points will not be limited to just the US. China will also find its interests increasingly conflicting with some of its most powerful neighbors including India, Russia and Japan.

Trade becomes more contentious

One area where China has already surpassed the US is in the total amount of exports. According to the most recent data made available by the World Trade Organization, China is currently the largest

Fig. 4: China's growing military budget still a fraction of the US

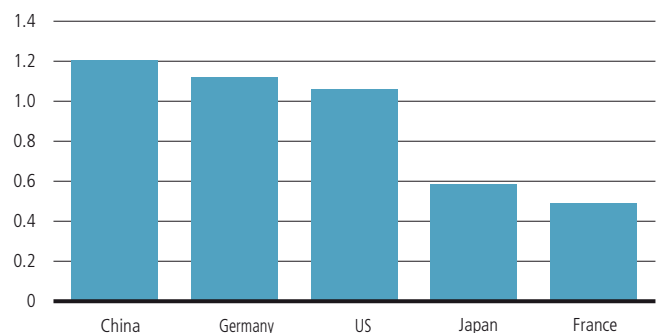
Total military spending, in billions of USD, 2009



Source: Stockholm International Peace Research Institute

Fig. 5: China is the world's largest goods exporter

Merchandise exports, in trillions of USD, 2009



Source: World Trade Organization

exporter by volume, with Germany, the US, Japan and France rounding out the top five (see Fig. 5). Given China's continued reliance on trade to maintain growth, which in turn is critical to preserving social stability, Chinese policymakers will continue to push aggressively to expand exports. While elected officials, union leaders and small business owners in the US have railed against unfair trade practices, the issue had failed to gain traction amid the ongoing push for an expansion in global trade and the mutual benefits that accrue to all parties. However, with both the trade and current account deficits at persistently high levels, there is a backlash within the US against the surge in imports from countries such as China. Keep in mind that the Obama administration has made increasing US exports a critical component of its strategy to seek a more balanced growth model that is less dependent upon consumer spending. This in turn has prompted calls for more tariffs and protectionist measures within the US to preserve American jobs and promote homegrown companies.

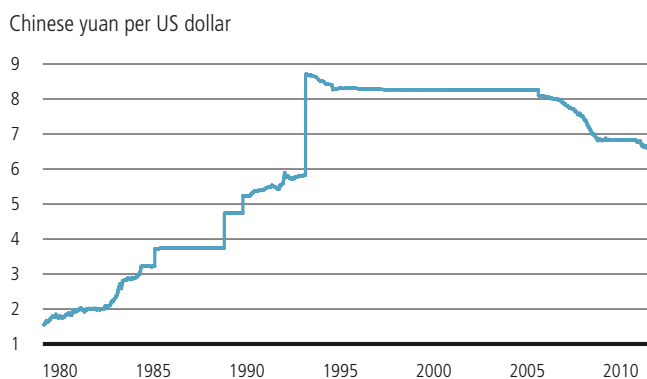
The Chinese, meanwhile, have bristled against US demands to revalue the yuan, as well as US efforts to reflate assets by pumping more dollars into the system through quantitative easing (see Fig. 6). With China now the single largest foreign holder of US Treasury debt, efforts to devalue the US dollar will have a direct impact on Chinese assets. China's central bank governor, Zhou Xiaochuan, has raised the prospects for replacing the dollar with a new international reserve currency based on a broader basket of currencies. While the notion was quickly dismissed, it does suggest that the issue of trade and foreign exchange levels will be closely linked, as the Chinese look to continue to promote export growth and the US seeks fairer trade terms. This dispute could lead to periodic flash points over the next decade as both parties jockey for advantage. Were trade tensions to rise to the point of an open trade conflict, it would represent the most serious threat to global growth besides an actual shooting war. Keep in mind that it was the collapse in global trade in the aftermath of the most recent credit crisis that triggered the worst global recession since the Depression. The bilateral relationship between the US and China will therefore not only be the most important one,

but perhaps also an increasingly contentious one over the next decade.

Tilting the playing field

There is more at stake on the competitive landscape besides concerns over currency targeting, trade tariffs and protectionist measures.⁴ China has embarked on a campaign to make the country one of the world's leading knowledge-based economies over the next decade through a practice most refer to as "indigenous innovation." The program, formally known as "The National Medium- and Long-Term Plan for the Development of Science and Technology" (MLP) defines indigenous innovation as "enhancing original innovation through co-innovation and re-innovation based on the assimilation of imported technologies." In short, Chinese officials have required foreign companies to partner up with local entities in order to gain a presence in the local market. While these partnerships have clearly benefited foreign businesses in the short term, the policy has also facilitated the transfer of sophisticated, high-end technology and manufacturing capabilities to Chinese partners in the process. The US Chamber of Commerce has charged the Chinese with using this practice to unfairly compete against non-domestic companies by allowing for industrial espionage, failing to honor intellectual property rights and awarding preferential treatment to Chinese companies during the government procurement process.⁵ This policy would appear to tilt the playing field against non-domestic companies who refuse to share critical

Fig. 6: China's yuan to strengthen further



Source: Bloomberg



China's rising economic power, growing appetite for raw materials and expanding footprint in international relations will have an increasingly transformative effect globally.

proprietary technology and in favor of Chinese companies.

Since the Chinese government spent USD 130 billion on technology and science projects this past year – an amount that will only continue to increase in the years ahead – the stakes for Western companies are indeed substantial. But the impact of this policy goes well beyond just government procurement policies. By employing this uniquely aggressive form of indigenous innovation that some have dubbed “techno-nationalism,” Chinese companies are now making inroads into export markets and therefore competing head to head with many of the same companies who made these technologies available to the Chinese in the first place. This has already manifested itself in the form of high-speed trains and sophisticated jet fighters but also more subtly in software, where Microsoft’s Chairman, Steve Ballmer, has claimed that as much as 90% of all applications within China are pirated. This will become an even

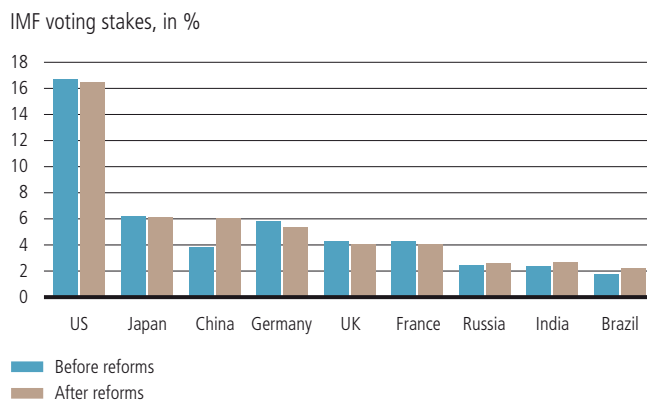
greater source of conflict in the decade ahead as Chinese companies look to move beyond low-end manufacturing and place greater emphasis on high-end manufacturing and information technology leadership. In the absence of clearer rules-based technology sharing agreements, the impact on technology companies and manufacturers of sophisticated industrial equipment in the US, Germany and Japan could be material.

How will China lead?

For the past several decades, the Chinese have played a mostly passive political role on the world stage, but that is poised to change as well. Under Deng’s leadership, China had adopted a policy of detachment from most global debates and chose to engage only when an issue

was directly related to national interests, such as the conflicts over Taiwan and Tibet. However, this extended period of self-seclusion has ended now that China’s interests are truly global in nature. China therefore seeks to play a much more active and engaged role in helping shape international

Fig. 7: China’s growing influence in the IMF



Source: International Monetary Fund

standards on issues ranging from technology and trade to financial stability. In December, the IMF passed reforms that will increase China’s voting stake in the organization from 3.8% to 6.1%, giving it increased leverage over a host of critical issues. Once the reforms are enacted, China will be the third-largest stakeholder behind only the US and Japan, but ahead of the UK, Germany and France (see Fig. 7). The shift in emphasis away from a G7 global leadership structure to a broader G20 approach also affords the Chinese a bigger seat at the table. No longer content to engage the Western world in a deferential or junior role on economic issues, China’s leaders are now pushing more aggressively to advance the nation’s interests in strategically important areas as an equal.

But along with this expanded global leadership role comes increased responsibilities. Chinese leaders have sought to engage other nations as a peer on economic issues, yet remain deeply suspicious of Western motivations and continue to protect favored domestic industries. China may well elect to use this enhanced leadership position within the IMF to undermine certain provisions they find objectionable, including the annual review of currency practices and transparency requirements for loan recipients. An increasingly combative approach to bilateral disputes could make the world less stable, but a more liberal and engaged China can also be a source of strength and security for the world in the decade ahead. As George Gilboy and Eric Heginbotham point out in *Foreign Affairs*, “a politically reformed China would be an

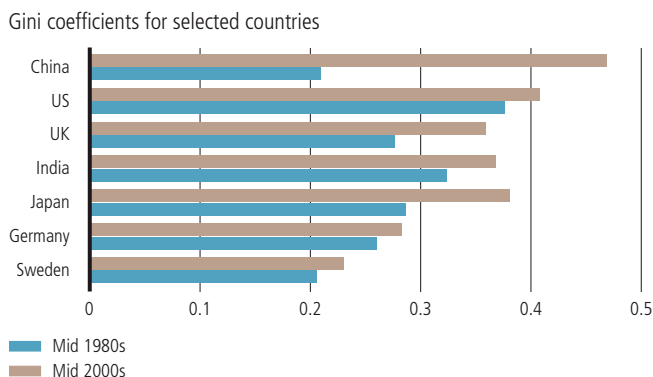
encouraging example for other states in Asia and beyond. If consolidated, a liberal Chinese regime would be more prosperous and stable, and its political system might be better able to correct foreign policy mistakes if they do occur.”⁶ In short, China’s increased political engagement can be a source for good over the next decade, depending on how both Chinese and Western leaders choose to engage one another.

Contending with challenges

Keep in mind of course that China’s role in the world will not be defined exclusively by its desire to become more engaged and assertive globally. China has defined its core interests to include economic growth and political stability. But toward these ends China faces a host of domestic issues that will occupy the attention of its leaders and require an enormous commitment of resources. While some see China purely as a rising power, it is easy to overlook both the internal and external challenges it will need to confront in the decade ahead if it is to emerge and remain a global leader. Consider the following:

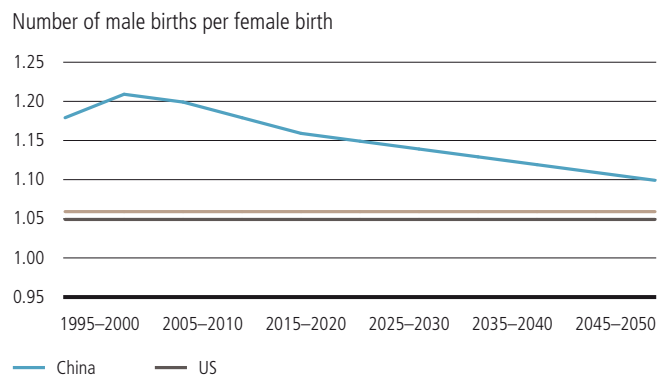
- China will seek to evolve its economy from a largely export- and infrastructure-led growth model into a more dynamic and diversified one. This economic transition will also require tackling entrenched special interests and the transition of power to consumers (see page 35 for a more detailed discussion of emerging consumers). It is still uncertain whether centrally planned economies in general have the ability to adapt and

Fig. 8: China’s growing income inequality



Note: Gini coefficient is an index of income inequality (0 = perfect equality and 1 = perfect inequality). Source: United Nations University, CIA World Factbook

Fig. 9: China’s surplus of boys



Source: United Nations Population Division

reallocate capital quickly enough to respond to changing economic needs and realities.

- Chinese leadership must also face the challenges emanating from growing income inequality and rising social unrest.⁷ China's GINI coefficient, a measure of income inequality, has now risen to levels that rival those in Latin America (see Fig. 8). Were this trend to continue to deepen, it could well stifle domestic demand and even inhibit the emergence of middle class consumers.
- Perhaps the biggest problem China will face over the next decade will be balancing the desire for rapid growth with the threat of rising inflation.⁸ By pegging the yuan to a basket of currencies at what many consider to be undervalued levels, China is effectively importing inflation. While some attribute rising price pressures to the surge in food costs, there is a risk that these problems could become structural in nature as shortages of skilled workers begin to push wages higher.
- The potential shortage of skilled workers is partly a function of a demographic profile that looks more like Western Europe than southeast Asia. But China must not only deal with issues such as limited pension assets for an aging population, but also significant gender issues as well, given the large disparity between male and female populations (see Fig. 9).
- China is focused on controlling the flow of information both within its borders as well as from external sources. But the expansion of the Internet and the chaotic nature of the revolution in information technology in general make such control a practical impossibility. This poses a potential threat to the government leadership structure as broader access to information encourages grassroots political movements and greater demands for personal freedoms.
- China's human rights record will also continue to be an issue and potentially even a source of risk in the decade ahead. Both Amnesty International and Human Rights Watch have labeled China as an abuser of human rights.

Thus far, China has managed to avoid the sort of condemnation and boycotts that ultimately crippled South Africa's economy. To be fair, other nations, including the US, have also been cited for abuses by human rights organizations with little economic impact. However, as China plays a more assertive role on the world stage and exports its own style of economic engagement, its human rights practices are likely to come under greater focus and become a potentially heightened risk.

- The transition to new Chinese leadership gets underway in 2012 when five of the seven top leaders in the Standing Committee of the Politburo retire. This is a source of both risk and opportunity as the current inward-looking leadership gives way to a potentially more open, confident and globally savvy group of leaders. While this could lead to more engagement with the West, it also could lead to a more aggressive posture toward securing national interests. But the real key will be how these unproven leaders handle the domestic challenges we have already outlined.

Conclusion

There is a mistaken belief that China's rise must come at the expense of others – especially the US – but that is not necessarily the case. Economic growth is not a “zero-sum” game. Even as China continues to close the gap with the US in terms of economic leadership, both parties can continue to benefit from increased global trade, joint initiatives to advance technology and the open exchange of ideas. However, it is clear that China's rising economic power, growing appetite for raw materials and expanding global footprint in international relations will have an increasingly transformative effect on the rest of the world. The emergence of the US as a global superpower in the early part of the 20th century resulted in a fundamental realignment of strategic alliances, trading patterns and capital formation that endure to this day. The ascendance of China will likely have a similar impact. For example, just as exporting nations sought access to the growing affluence of the US consumer in the post-war era, they will increasingly seek similar access to the growing consumer sector within China and the broader emerging markets.

Geopolitics: *the blind side*

We believe geopolitical conflict will become more important in shaping investment outcomes during the next decade. Such conflict will likely keep risk premiums elevated – primarily for stocks but also for bonds – and may induce bouts of weakness in risk assets, as well as demand for safe havens.

Kurt E. Reiman, Head, Thematic Research WMR-Americas

Geopolitical risk exists on a spectrum

The end of the Cold War fundamentally altered the course of history as the 20th century drew to a close. The relaxation of geopolitical tension in the 1990s coincided with the spread of globalization, quantum leaps in technology and privatization of state-owned industries, all of which encouraged a further moderation of inflation and growing economic prosperity. In addition, the global economy accrued a “peace dividend” as the threat of mutually assured destruction subsided and defense spending shifted to more productive uses.

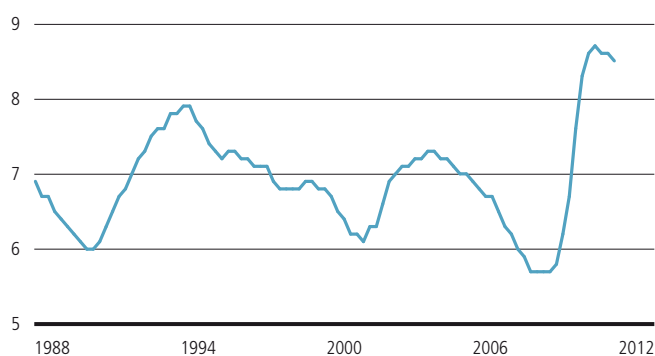
In recent years, however, economic activity and financial market performance have grown increasingly turbulent, in part due to imploding asset bubbles – first technology and then housing.

But renewed geopolitical upheaval – such as the 9/11 terrorist attacks, the proliferation of nuclear weapons capabilities in Asia, the threat of the Eurozone’s breakup and the recent political unrest in the Middle East – also left their mark.

Definitions of geopolitics in academic literature vary widely and, as such, the concept is highly fluid and heavily influenced by the principal developments in world affairs. In this report, we are primarily concerned with how domestic economic and political decisions influence prevailing regional and international alliances through shifts in the global balance of power, as well as how this influences the potential for conflict arising from natural resources demands, national strategic ambitions, non-state ideological objec-

Fig. 1: Swollen ranks of the unemployed

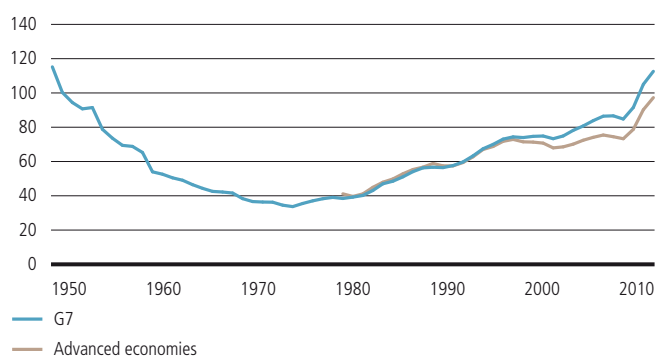
Unemployment rate in OECD member countries, in %



Source: Organization for Economic Cooperation and Development

Fig. 2: Increased government role in the economy

Public debt as a share of GDP, in %



Source: International Monetary Fund

tives and income inequality both within and among states.

We believe geopolitics will become much more important in determining economic and financial market outcomes than in the recent past.¹ Widespread economic dislocations, such as higher unemployment, pervasive income inequality² and more government intervention in economic affairs tend to corrode domestic political stability (see Fig. 1 and Fig. 2). Heavily indebted governments the world over are struggling to bring budgets back into balance before having fixed the core of the problem: people feel poorer and many have been unemployed for an extended period. How countries address these concerns and whether they are successful in doing so matters critically in an era when the global economy is highly interconnected. The risk is that efforts to appeal to domestic interests may disrupt preexisting alliances, either directly or indirectly, through the use of protectionism, currency and asset devaluation, capital controls, resource embargos and, in certain extreme cases, perhaps even military measures.

Persistent stress between domestic labor and international capital

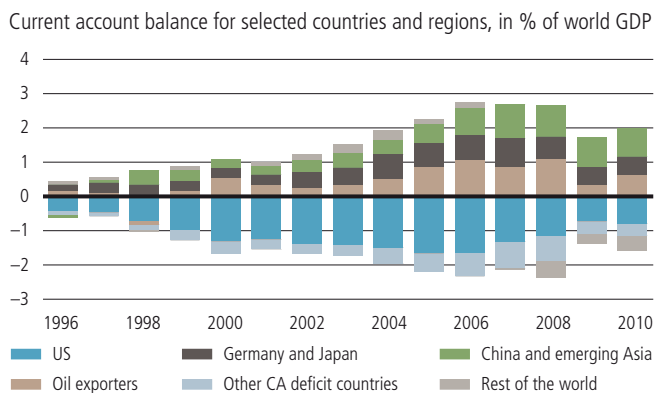
In the absence of widespread geopolitical upheaval or internal conflict, global economic activity is projected to remain strong for the foreseeable future, powered by strong growth in many highly populated emerging markets, such as China and India (see page 28 for a more detailed discussion of emerging market growth). Meanwhile, many

developed countries will likely alternate between the slow lane and the breakdown lane. Economic divergences may have been perfectly acceptable in the past when unemployment was low and declining, however, rich countries may feel pressure to enact protectionist measures to encourage job growth at home, especially as long as unemployment remains high. This dichotomy could also foster animosity among countries over their differing fiscal and monetary policy choices, not to mention jealousy over the vibrancy of certain fast-growing emerging economies.

Global imbalances in international trade and capital flows make matters worse (see Fig. 3), particularly as it concerns the increasingly important relationship between China and the US (see page 16 for a more detailed discussion of China’s role in the world). Since the financial crisis, China has been slow to let its currency, the yuan, appreciate versus the US dollar, mindful that such a move could curb its export competitiveness. But US policymakers – deeply concerned about America’s still wide trade deficit, not to mention China’s buildup of US dollar-denominated foreign exchange reserves – would prefer to see the dollar weaken modestly to improve US competitiveness overseas and restore its trade balance.

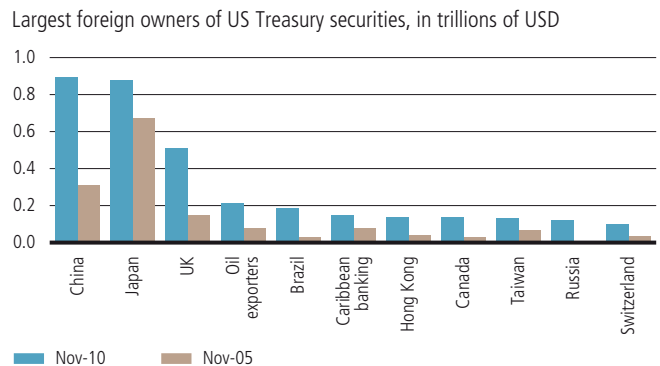
The Federal Reserve’s highly accommodative monetary policy stance and massive balance sheet expansion, while intended to encourage bank lending, reduce unemployment and stave off deflationary pressures at home, could pose

Fig. 3: Global imbalances continue



Source: International Monetary Fund

Fig. 4: China is the largest foreign owner of US Treasuries



Note: Data unavailable for Russia in November 2005.
Source: US Treasury Department

longer-term inflation risks to the US economy and undermine the integrity of the US dollar (see page 57 for a more detailed discussion of inflation). But these domestic US policies also serve to complicate China's efforts to rein in inflation at home as long as the yuan remains tied to the dollar. These policies could also erode the value of the People's Bank of China's roughly USD 900 billion holdings of US Treasury bonds – the largest foreign ownership stake in the world (see Fig. 4). Ultimately, this demonstrates how policies to address domestic concerns often have far-reaching implications and may periodically conflict with the interests of other countries, as well as those of the established regional alliances and multinational business interests that were formed in recent years.

Even when policies are tightly coordinated among countries, as is the case with the sovereign debt crisis in Europe, there are rarely obvious or straight-forward solutions (see page 68 for a more detailed discussion of sovereign debt concerns). The Eurozone's sovereign debt woes are firmly rooted in differences in competitiveness among member states, highly varied fiscal and social policy objectives and an insufficient commitment among government officials to equalize them. Over many years, these characteristics undermine the viability of a single currency and common monetary policy.

As the financial crisis has revealed, some countries within the Eurozone are economically uncompetitive (Greece, Italy), some are burdened by an insolvent banking sector (Ireland), and some

have heavily indebted households and businesses (Spain, Portugal). Of the available potential fixes, neither currency devaluation nor a fiscal transfer system nor wage and price controls nor massive austerity measures would appear plausible for long. Therefore, the euro seems destined to be reshaped, at first through the introduction of new institutional arrangements, such as a Eurozone bond market or even elements of a fiscal transfer system. If these measures fail to appease all member states, then countries may be forced to withdraw from the union and introduce new currencies, with serious implications for economic growth and global financial markets.

Ultimately, weak advanced economies may be tempted to encourage domestic employment growth and investment by embracing policies that are clearly incompatible with the objectives of highly populated, export-oriented economies. These measures could well extend beyond traditional trade protectionism and could include currency devaluation, industry subsidies, capital controls and inflationary fiscal and monetary policies.

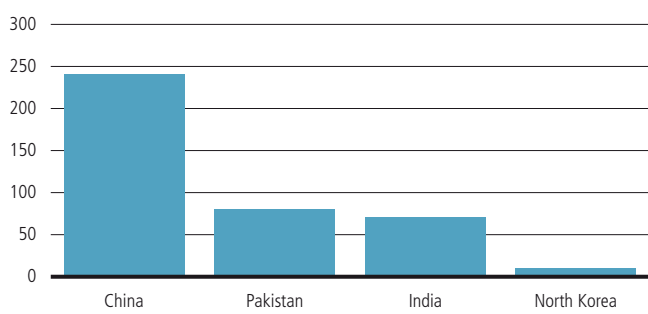
Risks of a traditional geopolitical flare up

Nations will also continue to confront more traditional geopolitical threats, such as natural resource scarcity, development of military and nuclear weapons capabilities, and fundamental clashes over ideology in the decade ahead.

- Unpredictable weather patterns and rising global food and energy demand have already fueled

Fig. 5: Nuclear weapons inventory in Asia

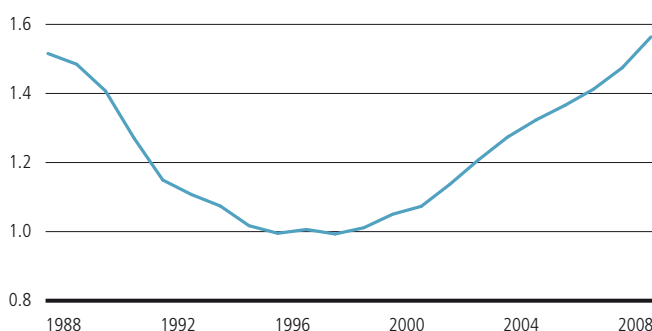
Range of estimated nuclear warheads, April 2010



Note: Despite two well-publicized nuclear tests in 2006 and 2009, there is no publicly available evidence that North Korea has nuclear warheads in operation.
Source: Federation of American Scientists

Fig. 6: Sharp rise in post-Cold War military spending

World military expenditures, in trillions of USD



Note: Data for 1991 are unavailable. Measured at constant 2008 prices and exchange rates.
Source: Stockholm International Peace Research Institute

high food prices, which have then sparked domestic unrest in recent years. Countries have so far failed to successfully map out a plan to control the rise of greenhouse gas emissions, which raises the potential for cross-border clashes to secure access to precious water and food supplies. Efforts to restrict the availability of scarce food resources through various protectionist measures would only serve to worsen existing water stresses through a decline in “virtual” water trade.

- The international community and the United Nations Security Council have been unsuccessful in clamping down on states that are aggressively pursuing nuclear aspirations (see Fig. 5). Meanwhile, defense spending globally has risen steadily since the turn of the century (see Fig. 6).³
- Oil, natural gas and “rare earth” resources are increasingly concentrated in the hands of a few countries, and the biggest consumers are now dependent on imports from unpredictable suppliers to meet demand (see Fig. 7).
- And terrorism threats will never be entirely eliminated, no matter what countries do to reduce the risk, because of deeply entrenched ideological views aimed at destabilizing the current world order.

In our view, these stress points could escalate into full-blown conflict over the next 10 years without a coordinated international effort to control them, especially given the high level of economic hardship and instability that exists today. In a globally integrated world, countries have an incentive to cooperate and coordinate efforts, but the recent track record leaves considerable room for doubt.

Knowing when and how to react

The defining geopolitical events of the past 100 years – the two World Wars, the Cuban Missile Crisis, the OPEC oil embargo, the end of the Cold War and the 9/11 terrorist attacks, to name a few – produced highly varied financial market outcomes (see Fig. 8).⁴ Some were long-lasting, some were short-lived. Certain events had a localized impact, while others were truly global. And some destroyed entire countries and disrupted economic activity, while others were less severe.



Nations will continue to confront more traditional geopolitical threats, such as natural resource scarcity, development of military and nuclear weapons capabilities, and fundamental clashes over ideology in the decade ahead.

Geopolitics, therefore, must be understood as a type of risk that interacts with other sources of risk in an investment portfolio. A negative geopolitical event will tend to increase the risk premium and alter the direction of asset prices. Diversification and ongoing risk assessment are important precautionary measures to limit losses, but how one reacts to the shock of a geopolitical event can be just as important as advance planning, if not more so. Even the most astute observers of geopolitical events will not be able to completely insulate their portfolios from geopolitical risk, since the events often arrive in the form of unanticipated shocks. Hence, it is just as important that investors consider the possible economic and financial market outcomes of the various hot spots were they to erupt into a major crisis.

When there is little transmission of a geopolitical shock to the broader economy, as is often the case with smaller-scale terrorist attacks, the effect on financial markets may be only temporary. As a result, the cost of hedging these fleeting risks would likely outweigh the benefit. However, when a geopolitical event also depresses economic growth and changes the course of infla-

tion, then the effect on financial markets is likely to be more sustained. The direction of the impact will depend on the asset in question, and the magnitude will depend on the severity and resolution of the incident.

Incorporate geopolitics into an investment process

All too often, investors spend the vast majority of their time attempting to incorporate quantifiable variables into their investment process when deciding which assets to own in a portfolio and in which proportion. Macroeconomic data, financial market statistics, sentiment indicators, valuation models and polling results all feature prominently in this decision because they can be tracked over time and help to both quantify and qualify the risks. Geopolitical risk, on the other hand, typically enters the discussion toward the end of the process, as a sort of catch-call caveat or reference to all the things that can go wrong when investing in risky assets. Rarely do investors reflect upon geopolitical risk at the outset of the investment process, along with all the other quantifiable variables, to craft a view of the investment environment and the associated level of risk that is priced into financial markets.

Geopolitical events often appear unpredictable and uncertain before they take place. As a result, market participants frequently treat the subject as an afterthought. However, we think this is a mistake. Geopolitics can heavily influence economic growth and asset returns and can blindside an

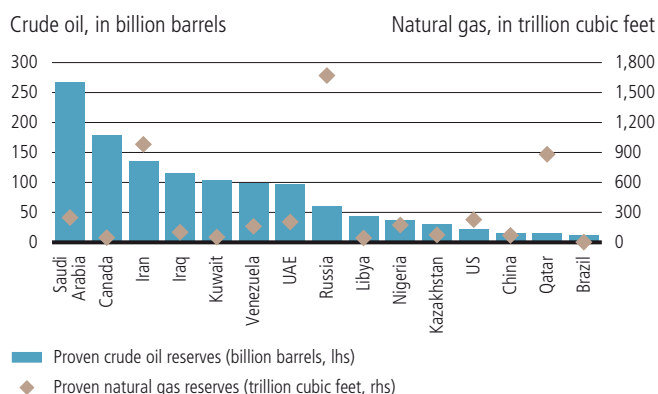
investment portfolio. An outburst of geopolitical conflict will typically prove negative for stocks and, with the exception of a natural resource supply shock and an international liquidation of US Treasury securities, would tend to support government bond prices. Heightened geopolitical risk would also imply periodic and significant bouts of weakness in stocks, and perhaps even episodes of sustained high volatility.

That said, our view that geopolitical risk will increase over the coming decade does not preclude a material advance in stocks, nor does it imply that our portfolio should be heavily skewed in the direction of government bonds. If evaluated from the outset as part of an investment process, the acknowledgement that geopolitical risk will likely increase can have the effect of simply moderating an otherwise overtly optimistic outlook for risk assets, such as stocks, when the macroeconomic outlook and valuation case are both favorable.

Paramount over the next decade, however, is that investors remain aware of the critical and ever-changing geopolitical landscape, understand how these shocks can impact various assets within a portfolio and regard geopolitics as central to the investment case, rather than simply as an afterthought.

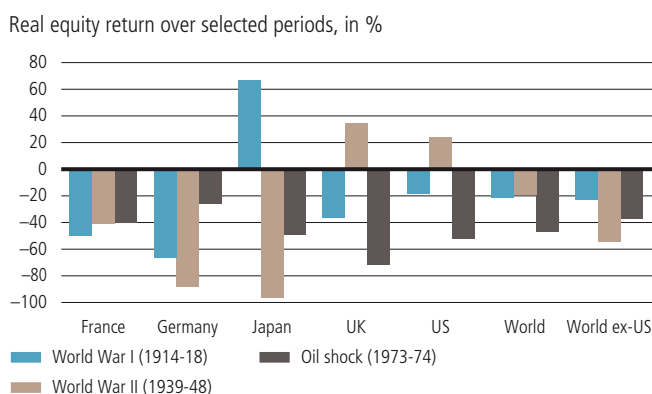
For more information on this subject, please see the UBS research focus entitled "Geopolitics: the blind side" dated June 2010.

Fig. 7: Proven energy reserves



Source: Energy Information Administration

Fig. 8: Different events, countries and outcomes



Source: Dimson, Marsh and Staunton (2008)

Emerging markets: the next big *allocation shift*

We believe numerous structural catalysts, such as a lasting economic growth advantage over developed markets, growing market capitalization and improving corporate governance standards, will prompt a strategic asset allocation shift into emerging markets over the next decade.

Stephen R. Freedman, PhD, CFA, Strategist; **Mike Ryan**, CFA, Chief Investment Strategist

Nearing a tipping point

The growing appeal of emerging markets represents more than just a fad or a passing fancy. Investors worldwide are increasingly channeling their investments toward emerging market nations to take advantage of the combination of stronger economic growth and superior performance prospects. Thus far, the allocation to the emerging world has been modest and largely tactical, or opportunistic, in nature. That is, investors have tended to gravitate toward emerging markets whenever return prospects appear most favorable over short-term horizons. It is our view, however, that emerging market investing has now reached a critical tipping point. Rapid growth, still-surging populations, rising affluence and a convergence of capital market and regulatory standards are prompting a tectonic shift away from the developed world and toward the emerging market world. As a result, the investment community is in the early stages of a broader and more sustained shift into emerging market equities that will materially alter the way portfolios are allocated and managed over the next decade. This shift will, of course, come with some challenges along the way, but it will also provide a broader set of opportunities for investors to enhance return and manage risk.

From an investment standpoint, what has set developed countries apart from emerging mar-

kets – in addition to the disparities in wealth and economic development – have been differences in market capitalization, liquidity, transparency and volatility. These issues have become less critical, however, as emerging markets have improved their policy framework and financial market infrastructure. As emerging markets have evolved into more appealing candidates for broader investment portfolios, investors have looked with interest to emerging market countries for new ways to diversify portfolios, enhance returns and reduce exposure to their home markets.

Past disappointments and future opportunities

Just over a decade ago it appeared as if emerging markets had lost their luster and were destined to become irrelevant to asset allocation decisions. The Asian currency crisis had just exposed the flaws in many of the so-called “Asian Tigers” and triggered a broader sell-off in financial markets that rippled across the entire globe. Despite the appearance of attractive growth prospects, financial performance kept falling short of expectations.

The Asian crisis notwithstanding, we believe that emerging markets will remain in favor. In our view, the following five factors will prompt a material and sustained shift toward emerging markets over the next decade:

- Persistent growth advantage
- Growing market capitalization
- Greater ease of access
- Expanding investable frontier
- Structural headwinds in the developed world

Persistent growth advantage

Perhaps the most compelling catalyst to prompt a reallocation of assets into the emerging markets over the next decade stems from their continued strong growth prospects. While emerging markets have periodically enjoyed superior growth rates compared with developed countries, the advance has been volatile and uneven. As Fig. 1 illustrates, while growth in the emerging market world has outpaced growth in advanced economies over the past 30 years, this growth has also been highly variable.

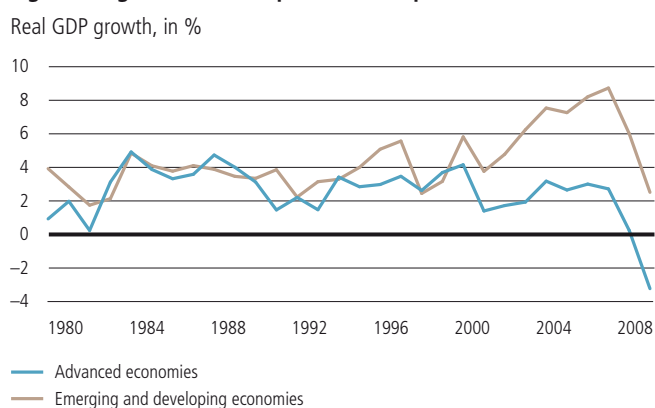
Optimism for emerging market investments on account of attractive growth prospects is nothing new. Yet, in the past, disappointing investment outcomes have deflated such optimism. For instance, the Latin American debt crisis in the 1980s or the Mexican and Asian financial crises in the 1990s were all preceded by phases of great hopes and high expectations that were ultimately dashed. In other instances, phases of strong economic growth in emerging economies failed to translate into meaningful investment returns. This was the case in China until the mid-2000s.

However, emerging markets now seem to have reached an inflection point. Not only are the emerging markets contributing a larger portion to global growth than ever before, this growth also appears more sustainable and the underlying economies less crisis-prone than in the past. Many of these countries have improved their macroeconomic policymaking framework and improved their resilience to economic and financial crises. This becomes immediately clear when one looks at the marked improvement in sovereign credit ratings in recent years (see Fig. 2).

More important, we believe that improvements within emerging economies and their financial market architecture now make it more likely that positive growth outcomes will translate into financial performance. The key is the improvements in

economic policy and investor protection that have been made over the last decade. Fig. 3 tracks the average compliance with international financial standards (principles of economic transparency, financial regulation, corporate governance and financial reporting) for emerging market countries and for the G7 since 2002. While compliance is greater in developed economies, the gap in compliance has been narrowing. So while emerging markets still have some catching up to do, we

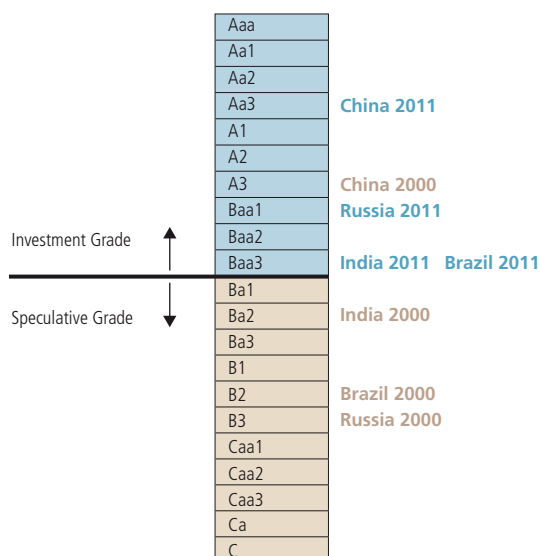
Fig. 1: EM growth has outpaced developed markets since 1980



Source: International Monetary Fund

Fig. 2: Higher debt ratings reflect greater stability

Moody's foreign-currency long-term debt rating



Source: Bloomberg, Moody's, UBS WMR

believe further progress will continue to prompt increased international interest in their markets. In particular, the increased shareholder focus has also meant that profitability measures have improved. We expect these trends to continue, and in combination with the growth advantage, to elevate the profile of emerging market investments.

Growing market capitalization

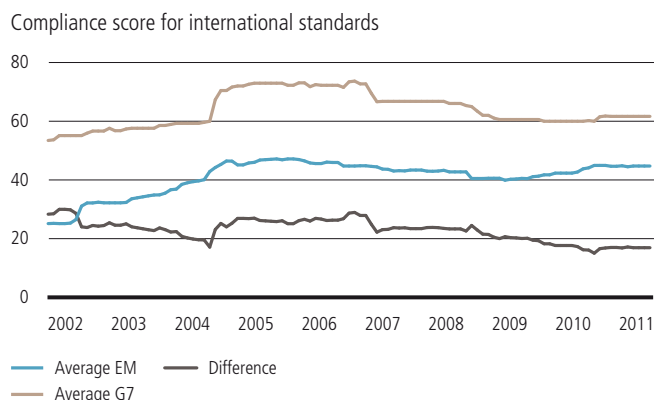
While the investment experience with emerging markets during the 1990s is remembered for the Mexican peso crisis (1994) and the Asian financial crisis (1997-98), ironically it is during this decade that a significant trend was set in motion – and is still ongoing. During the last two decades, emerging markets have experienced a significant maturing and a steady deepening of their capital markets. As Fig. 4 illustrates, there has been a meaningful shift in relative market capitalization between developed and emerging markets over this time period.

The increased share of emerging market equities in the global investable equity universe is a result of two factors. First, emerging markets have outperformed developed markets in recent years, a fact that is reflected in shifts in relative market capitalization. Second, and perhaps more important, the depth of stock markets in the emerging world has expanded thanks to a significant pickup in equity issuance activity. While emerging markets accounted for a mere 12% of global IPOs from 2001 to 2005, this share rose to 35% during the second half of the last decade (see Fig. 5).

As emerging markets take on a greater share of global equity market capitalization, a greater proportion of invested assets is likely to flow toward emerging markets over time. Yet, while there have clearly been major inflows into emerging markets, many investors have not significantly adjusted their strategic benchmark allocations to emerging markets, leaving their allotted exposures still well short of emerging markets' actual share of global stock market capitalization (see Fig. 6).

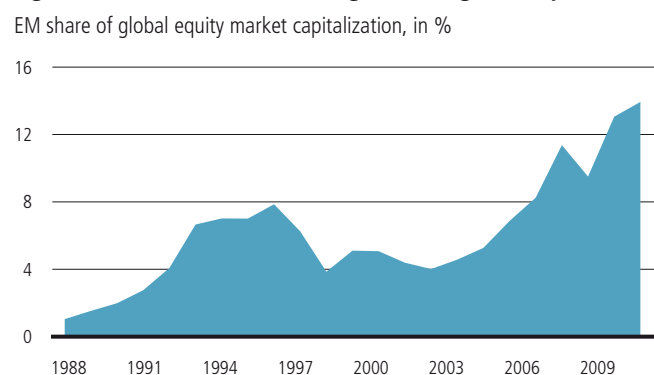
So as this market capitalization trend continues over the next decade, we believe there will be a continued asset shift toward emerging markets, as investors rebalance portfolios to a new baseline.

Fig. 3: International standards slowly converging



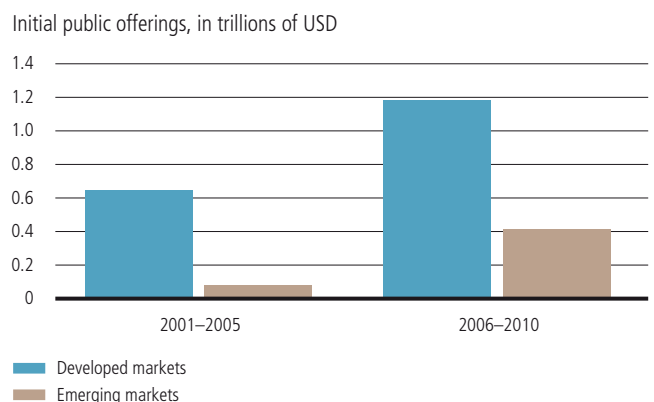
Source: eStandards Forum Financial Standards Foundation, UBS WMR

Fig. 4: EM accounts for increasing share of global equities



Source: MSCI

Fig. 5: IPO growth in emerging markets



Source: Bloomberg

Greater ease of access

One of the factors that has served to discourage participation in emerging markets in the past has been the inability to position within the asset class in a targeted, liquid and cost-effective manner. Those wishing to gain direct access to an individual market have, until recently, found a limited range of investment options. Moreover, the ability to tactically reposition portfolios within emerging markets has often been hindered by liquidity constraints. Even when a vehicle could be found and liquidity was adequate, fund managers and plan sponsors often discovered that the cost of shifting portfolios to take advantage of opportunities was prohibitive. This often required that emerging market investments be undertaken in a diversified manner, with a broad view on selected regions or even the entire asset class rather than through individual positions. This likely further discouraged the broader investment public from building exposure to emerging markets.

However, the proliferation of investment vehicles in recent years that permit not only broad asset class exposure but also intra-asset allocation will continue to transform the emerging market investment landscape in the decade ahead. Exchange-traded funds (ETFs) are perhaps the most obvious innovation to enable broader access to emerging markets. Initially, emerging market ETFs were limited to either aggregate indexes or some of the larger benchmark countries such as the BRICs (Brazil, Russia, India and China). However, the continued expansion of ETFs into non-core markets has enabled a much richer level of emerging market penetration and therefore enabled views to be expressed across emerging markets in a more cost-effective manner. According to the Investment Company Institute, there are currently 113 ETFs dedicated to emerging markets – more than double that of two years ago – representing net assets of \$154 billion (see Fig. 7).

Beyond ETFs, we expect financial globalization to continue over the next decade, allowing easier access to emerging markets for developed country investors. Barriers to capital flows still remain in place in many areas. However, we expect further reforms will open the door to broader investor participation in emerging market investments.

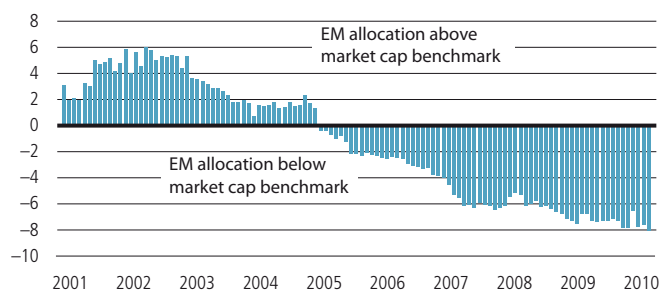
Expanding frontier

As individual emerging markets mature, one may be tempted to think that investment opportunities will accordingly wane. We believe it is important to acknowledge the wide variety of emerging markets, in particular in terms of their degree of development. As some of these countries mature, others are entering the universe of investable nations. This is important because, as some emerging market countries have matured and converged closer to developed market standards, their often touted diversification benefits have been reduced. Yet, in the expanding frontier of newly emerging economies, diversification benefits are alive and well. We believe this dynamism should contribute to maintaining and even increasing investor interest in broadly defined emerging markets.

To understand the shifts that are taking place, it is worth highlighting the type of heterogeneity and tiering that characterizes emerging markets. A review of the countries that comprise emerging market indexes reveals a remarkably diverse group that varies significantly by region, wealth, industrial activity, governmental structure, culture and economic development. This means that performance can differ greatly across countries. We look for even greater differentiation within the emerging markets over the coming decade. Rather than breaking down emerging market nations along geographic or political blocs, we continue to see them categorized by a variety of economic and capital market criteria.

Fig. 6: Institutional investors lagging in EM reallocation

Global mutual fund EM equity allocation relative to market capitalization benchmark, in %



Source: EPFR, MSCI, UBS IB

The top tier includes South Korea and Taiwan, which are already considered developed markets in most bond indexes and will likely be included in developed equity market indexes within a decade. The BRICs are often seen as forming the next tier, but they may eventually go their separate ways in investors' minds, as they are very different countries with little in common other than their large size. China may need a category all of its own, as it is already among the world's largest economies and equity markets, yet is still far from fully developed (see page 16 for a more detailed discussion of the outlook for China). OECD members, such as Mexico, Turkey and Chile, might be considered as a group: countries that are smaller than the BRICs but rank higher in terms of per capita income.

The next tier, often referred to as "frontier markets," include a wide assortment of nations, such as Argentina, Bahrain, Nigeria, Pakistan and Vietnam. These countries have potential but would have to show further development to attract widespread interest from global equity investors. Over the next decade, there is likely to be continued mobility within the tiers, as well as the emergence of new players, as China's reach for resources triggers development within Africa. This continued increase in segmentation and broadening of these tiers will only further encourage expansion of a strategic allocation shift into emerging markets.

Structural headwind shift toward developed world

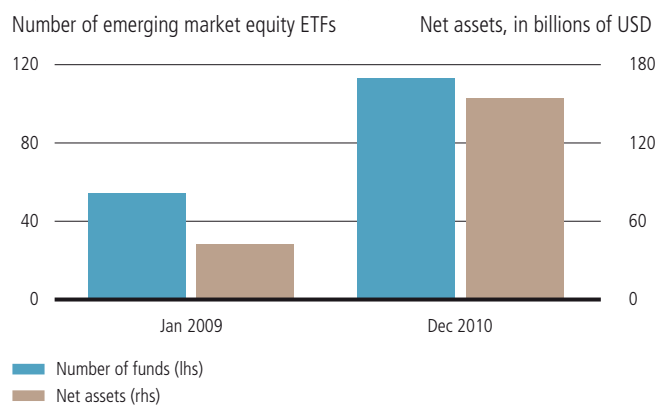
The emerging market reallocation process will not be driven exclusively by the positive attributes the emerging market nations now possess, but also by the negative attributes they lack. As George Magnus¹ points out in his 2010 book, *Uprising*, the global financial crisis has the potential to radically reshape the world in the decade ahead. This is in part due to the structural damage caused by – or perhaps merely revealed by – the crisis itself. Keep in mind that the US will face three material structural challenges in coming years, which together portend an extended period of suboptimal growth: 1) the continued deleveraging of the consumer sector; 2) ongoing recapitalization of the financial system; and 3) prospects for

broad-based fiscal consolidation. Moreover, these structural challenges are not exclusive to the US. Similar headwinds confront most of the developed world, including the Eurozone, the UK and Japan. In other words, these challenges represent something of a millstone for most of the major players in the developed world.

Emerging markets, in contrast, face few of the structural roadblocks mentioned above and appear to exhibit fewer systemic weaknesses than they have in the past. Instead of a debt-burdened consumer sector, many emerging markets are contending with a surplus in savings, and national balance sheets that are overall much more solid than they were in the past. Besides making the underlying economies less vulnerable, the large pool of savings and massive foreign exchange reserves represent a source of potential future investment growth without the need to rely on foreign sources of financing (see Fig. 8).

Moreover, although the financial crisis impacted financial institutions within emerging markets, most exited the crisis in much better shape than their counterparts in the developed world, having avoided many of the problem areas that continue to weigh heavily upon Western banks. Finally, the fiscal positions in a great many emerging market nations are in far better shape than those in developed countries. According to the International Monetary Fund (IMF), both current budget deficits and debt-to-GDP ratios for BRIC countries are materially lower than for the traditional G7 bloc.

Fig. 7: EM equity ETFs increasing in number and size



Source: Investment Company Institute

Emerging markets to outperform during the decade

We believe that the described allocation shift into emerging market equities will lead to outperformance versus developed market equities during the decade. Using a framework similar to the one we employ to calculate the average return for US equities (8.5 to 9%) on page 67, we conclude that average annual emerging market returns could outpace those of the US and other developed markets by up to 6%. This is the result of expected differences in earnings growth, dividend yield and multiple expansion. We factor in a 4 percentage point earnings growth advantage and a 0.5 percentage point dividend yield disadvantage for emerging markets. Finally, while we assume no multiple expansion in the US for the decade ahead, we assume that emerging market price-to-earnings multiples will converge to the average value observed in developed economies over the last 23 years. This suggests that multiple expansion in emerging markets will contribute 2.5 percentage point annually in excess of US equity returns.

Not without risks

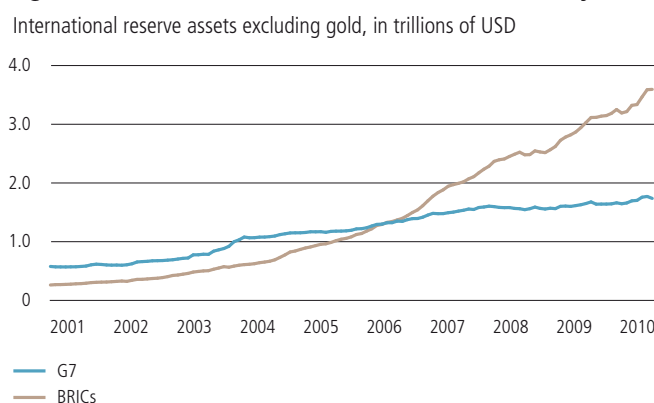
While the decade ahead will be marked by a continued shift into emerging markets, as investors seek to enhance returns and diversify their country exposures, the process will not be without risks or periodic setbacks. Emerging markets still possess certain risk characteristics that set them apart from the developed world. Investors must be cognizant of the risks and limitations of emerging market investing. Consider the following:

- **Emerging markets are crisis-prone due to a number of factors**, including the lack of market depth and lack of institutional structure. A large increase in capital inflows can overwhelm markets that lack the capacity to effectively absorb and deploy such capital. This can lead to asset bubbles, market mispricings and political corruption. Moreover, the business cycle in emerging markets is still very much alive. They will continue to experience periodic recessions despite a positive structural outlook.
- **A risk of complacency exists.** Policy makers and elected officials in some emerging market nations

are beginning to take their solid fundamentals for granted. After years of tough fiscal choices, there are signs that policy discipline is diminishing. Examples include Brazil's considerable increase in public spending or Turkey's sudden monetary policy loosening. To achieve their growth potential during the next decade, these emerging market economies will have to keep the responsible policies they have adopted in past years.

- **Liquidity has improved markedly within most emerging market segments** amid a continued deepening of capital markets, broadening of the investor base and the emergence of more stable and consistent intermediaries. However, liquidity is uneven, and "gaps" emerge during periods of heightened market volatility, geopolitical turmoil and localized events.
- **The level of transparency within emerging market countries is also typically lower than that of the developed world**, despite improvements stemming from the application of information technology and global push for improved governance. This suggests that greater care is needed when selecting investments and greater skepticism when relying on data and statistics.
- **Property rights and the rule of law also tend to lag developed market standards.** The adjudication of disputes, ability to exploit innovations and honoring of business contracts are hardly uniform either within countries or across the entire spectrum of emerging markets.

Fig. 8: FX reserve accumulation reduces EM vulnerability



Source: Bloomberg

Emerging markets

This can lead to financial returns that lag economic growth.

- *Certain areas still bear significant exposure to potentially dangerous influences*, such as terror threats, illegal enterprises, black market competitors and an underdeveloped political culture and infrastructure. Return expectations can shift with changes in leadership, revisions of existing laws or merely the reinterpretation of existing regulation.

The shift goes on

Emerging markets will still face periods of elevated volatility and are apt to underperform developed

markets intermittently over the next decade.

While certain countries and even entire regions will continue to prosper from rising affluence and expanding trade, others will suffer from both structural limitations and self-inflicted injuries due to poor leadership. However, there is likely to be a sustained strategic shift into emerging market equities throughout the decade. Many emerging markets have already emerged and will continue to do so, but positioning within those markets will still require great care and judgment. This will demand greater diligence and heightened market surveillance on the part of investors but, in return, will yield improved return prospects and select opportunities for broader portfolio diversification.



Emerging markets have emerged—and will continue to do so. They have earned a newfound respect from global investors who are increasingly being drawn to strong growth prospects and superior returns offered by developing nations.

Emerging consumers: *more people, more money*

We believe consumption in emerging market countries is poised to expand over the next decade as personal incomes rise. This may be a consensus view, but the potential of a prolonged expansion in global consumption may offer a broader set of opportunities than investors anticipate.

Sally Dessloch, Analyst

Beyond the basics

As emerging markets continue to develop, we believe the resulting growth in the middle class will fuel demand for a variety of consumer products and services, from the most basic human needs of food, clothing and shelter, to healthcare, education and more discretionary items, such as household appliances, autos, luxury goods and travel. We expect urban populations to increase as the middle class expands, and the growing number of city residents to spark a shift in consumption toward more value-added goods. Rising consumer expenditures in emerging markets may be expected to buoy local firms, as well as multinational companies with an established presence in these countries.

The focal point of emerging markets growth has been the “BRIC” countries – Brazil, Russia, India and China – and we continue to expect these countries to generate an outsized contribution to global growth over the next 10 years. As the decade matures, however, we believe other countries may begin to play an increasingly important role in driving growth, including countries such as Indonesia and a number of those on the African continent.

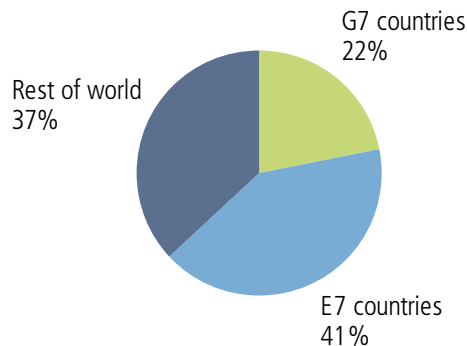
Driving global growth

We project¹ global GDP will expand by more than

USD 30 trillion to nearly USD 110 trillion by 2020, and the “E7” emerging markets – China, India, Brazil, Russia, Mexico, Indonesia and Turkey – should account for over 40% of that increase (see Fig. 1). Although emerging market countries may grow more slowly than in the previous decade, especially China and Russia, we expect the E7’s projected USD 14 trillion contribution to global GDP growth will be nearly double that of the G7 countries: US, Japan, Germany, UK, France, Italy and Canada. Moreover, parts of the world that have been cut off from global institutions and economic development will likely begin to see an acceleration of growth, particularly some of the

Fig. 1: Emerging markets are the engine of global GDP growth

Contribution to global GDP growth, in %, 2010–20



Source: UBS WMR estimates based on Penn World Table 6.3 data

Russia – developed or emerging?

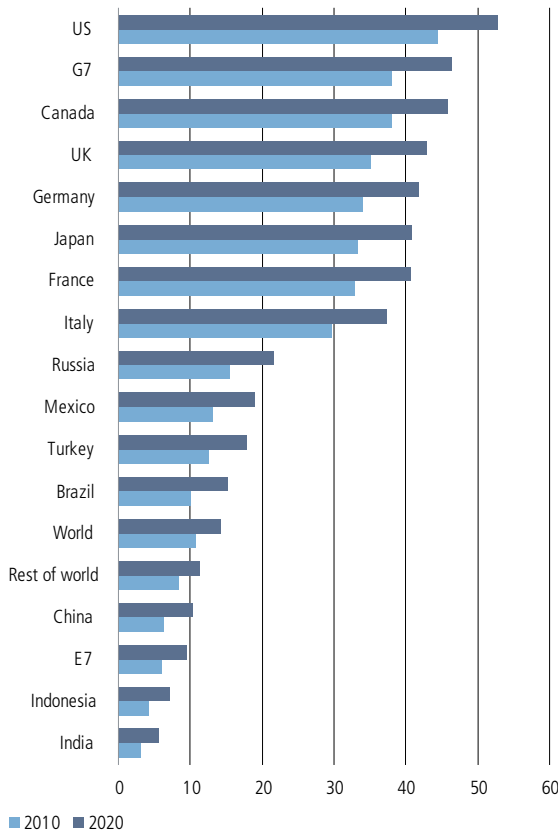
Russia’s population is shrinking and we expect the decline to continue over the next decade. In this respect, Russia looks more like some developed markets. However, per capita incomes are rising and the middle class is growing, a function of the economy’s reliance on oil and natural gas exports. Household penetration of consumer-branded goods is still relatively low, thus there remains a growth opportunity despite the population trends.

lesser-developed economies. As a result, countries not included in the G7 and E7 – the so-called “rest of the world” – may account for the roughly 40% remaining increase in global GDP.

The drivers of increasing emerging markets consumption are, quite simply put, *more people* and *more money*. Population growth in emerging markets should outpace the developed world, even taking into account declining fertility rates in countries like China and Russia. A number of nations outside the E7 markets should continue to see comparatively strong population growth, for instance, some on the African continent, where birth rates are still high by world standards.

On top of population growth, we foresee sustained expansion in per capita GDP, supported by continued rising participation of emerging markets in the global economy (see Fig. 2). And rising per capita GDP should lead to increasing personal incomes and consumption expenditures, assuming that savings rates in these economies remain relatively stable. In short, the emerging market’s middle class appears destined to grow.

Fig. 2: Per capita incomes in E7 have room to grow
GDP per capita, in thousands of USD



Source: UBS WMR estimate based on Penn World Table 6.3 data

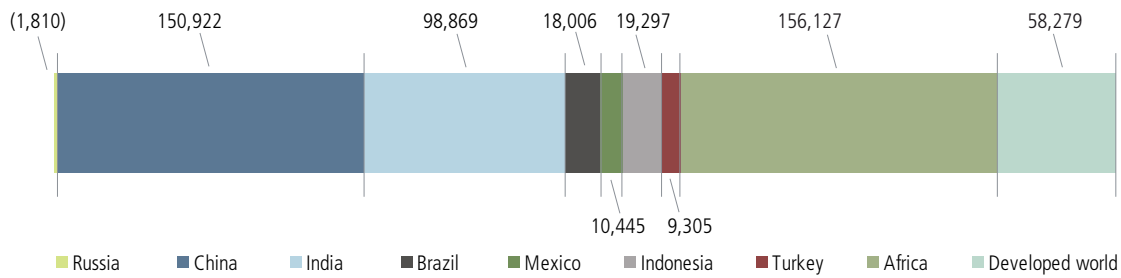
Urbanization supports increased consumption

As emerging markets mature, we foresee an increase in the percentage of people living in cities, since these economies will grow less reliant on agriculture and more dependent on manufacturing and global trade. Urbanization is made possible by increased investment in infrastructure, including roads, transportation, energy and refrigeration, among other necessities. Based on forecasts prepared by the United Nations Population Division,² the global urban population could expand by almost 700 million people in the next 10 years, with nearly half of the increase coming from the E7 countries and an additional 20% occurring on the African continent (see Fig. 3).

PricewaterhouseCoopers³ projects that the 25 fastest-growing cities from 2008 to 2025 (based on GDP) are likely to be in emerging markets (see Fig. 4). Of these, ten are in India and nine are in China. With urbanization comes the potential for an increased standard of living and a shift in consumption toward more value-added goods. For example, urban dwellers may be more likely

Fig. 3: Expect 700mn more people in cities by 2020

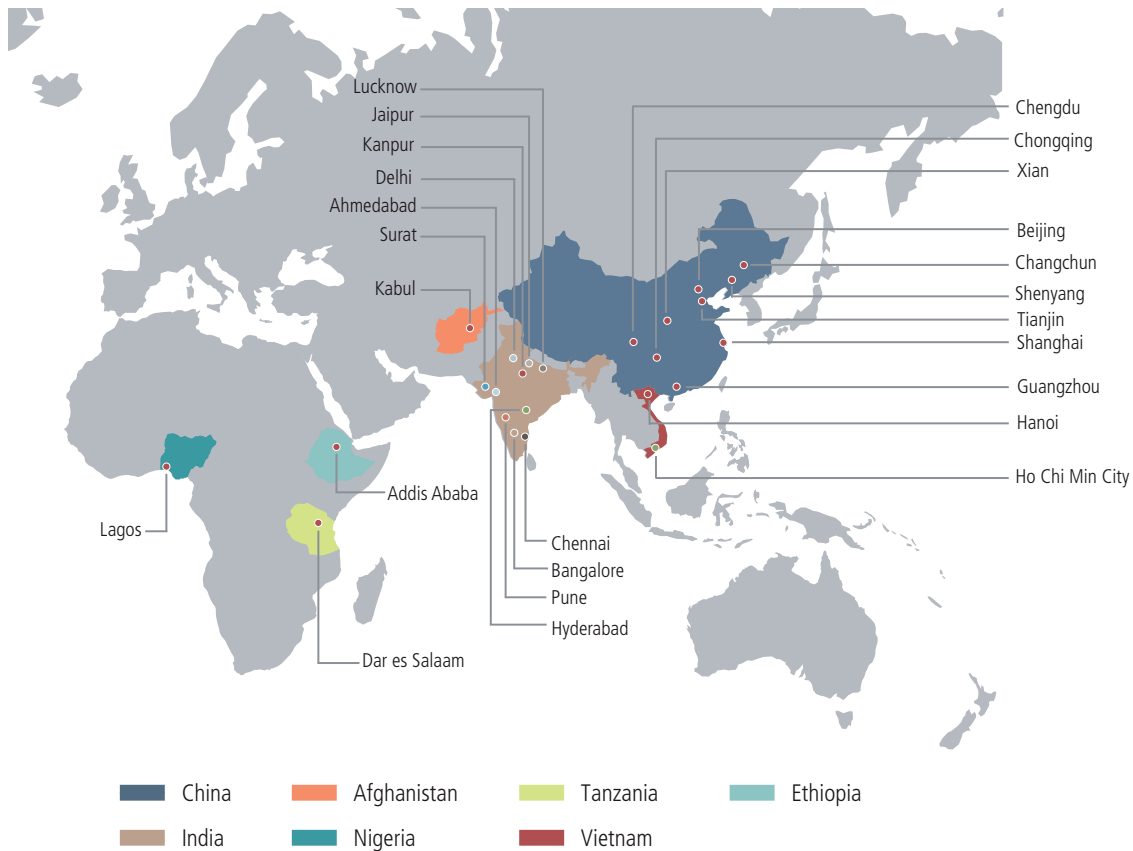
Source of incremental urban population, in millions



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision and World Urbanization Prospects: The 2009 Revision

Fig. 4: Emerging markets cities will grow rapidly

25 fastest growing cities by GDP 2008-2025



Source: PricewaterhouseCoopers UK Economic Outlook, November 2009

Emerging consumers

to consume packaged beverages, convenient processed foods and restaurant meals, as well as other consumer services.

A hierarchy of spending

Consumption of consumer goods and services is closely tied to rising personal income. As per capita incomes increase, emerging market consumers first address their most immediate needs: basic foodstuffs, clothing and shelter. When consumers move beyond subsistence living, their choices become more discretionary but still skew to the more affordable pleasures, typically including packaged beverages and foods, basic household and personal care items and tobacco. Growth initially is driven by increased penetration, but thereafter may be stimulated by greater frequency of purchase. Along with the increase in personal incomes comes an increase in demand for more costly and discretionary consumer goods, such as appliances, media, autos, apparel, luxury goods and leisure pursuits.

Per capita consumption of consumer goods tends to rise rapidly with increasing levels of per capita personal income but, at some point, unit growth moderates as needs are met. When growth in per capita unit consumption begins to level off, consumer goods companies will typically attempt to “trade up” the consumer to higher value-added products in order to capitalize on the growing wallet of middle income consumers, thereby driving sales and profit growth. And as consumer goods companies begin to achieve scale in emerging markets, profit margins should expand, increasing investment returns.

Who stands to benefit?

In general, a broad range of consumer-oriented companies, both local and multinational, stand to benefit from rising emerging market consumer incomes over the coming decade. A detailed discussion of each of these sectors and industries is beyond the scope of this report, but here are two worth highlighting:

Consumer staples. Packaged goods companies are well-positioned to benefit from increased consumer spending, as more people attain middle class status, and as urbanization pushes forward.

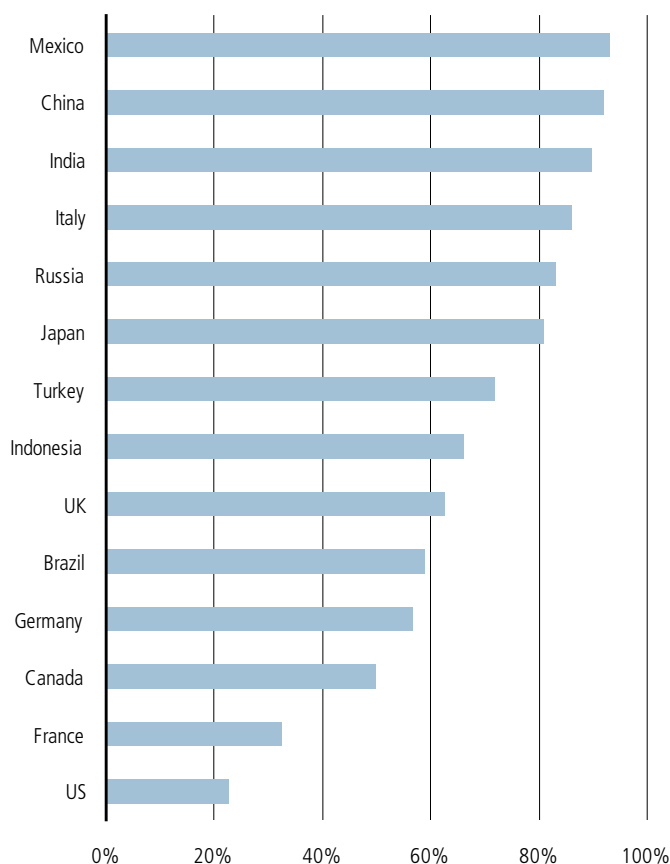
The competitive dynamics vary by country and by sector; in some markets, the local competition is formidable, but in others, multinational companies are well-established and their brands enjoy strong recognition.

Restaurants. A number of fast food restaurant chains have invested heavily in emerging markets, and are enjoying good growth.

In these two areas, the global players that compete most successfully in these countries are those that have invested consistently over time – attaining “first mover” advantage vs. other developed market peers. The successful global competitors also have been adroit at tailoring their products to appeal to local tastes and affordability. It cannot

Fig. 5: Most emerging markets consumers pay more of their healthcare costs out of pocket

Out-of-pocket healthcare costs as a share of private expenditure on health, in %



Source: World Health Organization, World Health Statistics 2010 Report. Data as of 2007.

be overemphasized – what works in a developed market may not work in a developing one, and even among developing markets, consumer tastes vary. This places a premium on having an in-depth understanding of the local consumer, a skill that a number of multinational marketers are bringing to bear in these countries.

Healthcare. Currently, healthcare expenditures in emerging markets are modest as a share of GDP, constrained by the lack of public healthcare coverage. However, spending on healthcare may grow alongside increases in per capita incomes. Consumer out-of-pocket costs are high, placing greater importance on cheaper traditional medicines, as well as over-the-counter and generic drugs (see Fig. 5). Emerging pharmaceutical markets tend to be highly fragmented now, and large-cap multinationals have relatively modest market share. Of course, this presents a longer-term opportunity for companies that are willing to adapt to the requirements of local markets. Over time, aging populations and rising incidence of chronic disease should support increasing demand. Similarly, private health insurance – as well as other types of insurance products – may see good growth in emerging markets such as China, where there is limited government-sponsored coverage. To date, these markets are in the very early stages of development.

Beyond the above-mentioned sectors and industries, there are a number of others that should grow over the coming decade – due to rising per capita incomes in emerging markets – including consumer discretionary industries such as auto, apparel and luxury goods manufacturers, among others.

What could derail the emerging market consumer?

Our constructive view of emerging markets consumption growth is not without risks. Although each market is unique, adequacy of infrastructure and healthcare, availability of water, demographics, education and the role of government are issues that many countries have in common. Additionally, inequality of income distribution may become more pronounced in some countries as incomes rise, possibly leading to social

Fig. 6: Consumption is comparatively low in China

Private consumption as a share of GDP, in %



Source: World Bank (www.worldbank.org)

China – increased consumption is key

China will continue to be a major part of the emerging markets growth story. (Refer to the chapter beginning on page 16 for a more detailed discussion on China and its role in world affairs). Chinese consumers do not spend as much of their incomes as do other emerging markets consumers (see Fig. 6), and sparking consumption growth in China is one key to restoring better balance to its international trade flows. We think there are cultural factors at play in the Chinese propensity to save, but also believe government policies can influence behavior. The steep savings rate can be explained in part by the relative lack of publicly funded healthcare and retirement plans, as well as the need for Chinese families to save for education (schooling is often only free through middle school). China's one-child policy may also influence savings behavior: its population is aging rapidly, and there will be fewer children supporting their aging relatives. Moreover, China's gender imbalance will grow in the decade ahead. A relaxation of the one-child policy could help, although the benefits would take much longer than a decade to materialize.

The government has taken some steps to broaden healthcare coverage in China, and could further modify policy to lighten the savings burden on individuals. Many observers expect that a new five-year plan to be released this year may reflect an increased emphasis on improving the quality of life in China, which may also address the building inequalities in income distribution.



In general, a broad range of consumer-oriented companies, both local and multinational, stand to benefit from rising emerging market consumer incomes over the coming decade.

unrest. Also, if inflation in emerging markets rises sharply, a greater share of consumer income may be required to cover necessities, limiting more discretionary purchases. Finally, international trade imbalances could give rise to protectionism in developed markets, suppressing potential growth in emerging markets.

India – the next decade

We view India as one of the key emerging market opportunities over the next decade. Its population is growing more quickly than other E7 members, and it is a young country: According to World Bank estimates, half of its population is under the age of 25. To fully capitalize on its growth potential, India has to address its lack of infrastructure and need for better education and healthcare. Also, it must create more jobs for its growing population. We believe that, over the next 10 years, India will devote attention to these issues and play a greater role in global growth. India's youthful population makes it an attractive market for a number of consumer goods manufacturers.

Energy: *Alternatives* threaten oil's dominance

High oil prices, rising energy security concerns and environmental awareness are encouraging businesses and consumers to embrace alternatives to oil. Natural gas stands out as the prime beneficiary, but batteries and solar also have potential.

Nicole Decker, Analyst; David Lefkowitz, CFA, Strategist

The search for alternatives

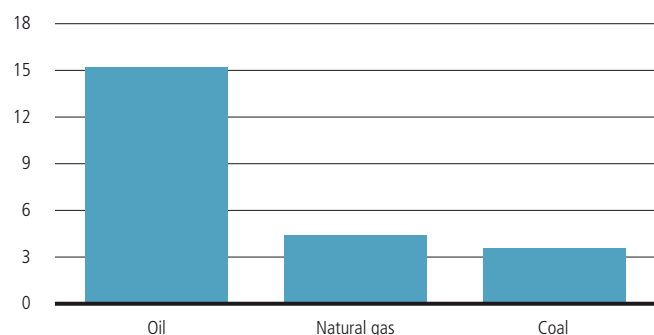
As the 2010 Gulf of Mexico oil spill made tragically clear, the seemingly unquenchable thirst for crude oil has sent the oil industry in search of increasingly complex and technologically challenging deposits. Whether in ultra-deepwater, arctic regions or oil sands, the development of large new oil basins is both costly and risky. Compounding these supply constraints, global oil demand is projected to expand as a result of continued strong growth in emerging markets (see page 28 for a more detailed discussion of emerging markets). In addition, concerns that overly accommodative US monetary and fiscal policies will one day lead to inflation and further weakness in the US dol-

lar have increased demand for hard assets, such as crude oil, which tend to adjust over time to changes in the price level (see page 57 for a more detailed discussion of inflation). Taken together, there are many factors that explain today's high oil prices and the potential for even higher prices in the future.

However, high oil prices are unleashing sizable financial and intellectual resources to take advantage of cheaper energy sources that exist today, such as natural gas, as well as to improve the cost competitiveness of renewable energy sources. Oil therefore faces significant competition at current price levels, and the race is on to develop lower-

Fig. 1: Crude oil is one of the most expensive fuel sources

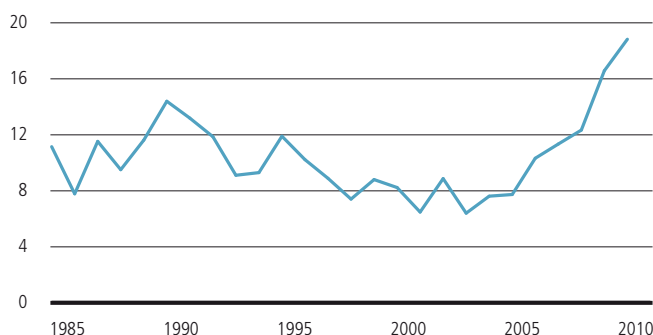
Price, in USD per British thermal unit



Source: Bloomberg

Fig. 2: Sharp increase in oil price relative to natural gas

Crude oil price relative to US natural gas prices, in USD



Source: Bloomberg, US Department of Energy

cost alternatives. This will result in a transformation not only in the types of fuels used to power industry and heat homes, but also in the sources of energy employed to propel our vehicles and light our cities. While renewable energy sources will gain share, more traditional domestic energy sources, such as natural gas, will play a crucial role in reducing dependence on imported energy in the decade ahead.

The trillion dollar opportunity

The most striking feature in energy markets, and one that we think has the greatest potential to transform the energy resource base over the next decade, is the high cost of oil relative to both natural gas and coal (see Fig 1). This is a relatively recent phenomenon. Fig. 2 and Fig. 3 show that this price discrepancy has rarely, if ever, been so high. This gap results from different supply and demand dynamics in various segments of the energy market and the inability to quickly substitute fuels other than oil byproducts to power global transportation networks. After all, oil is primarily a transportation fuel, for which infrastructure is well-entrenched.

Natural gas prices have been in a steady decline since 2008 primarily as a result of new drilling techniques in North America (called “hydraulic fracturing” or simply “fracking”) that enable drillers to tap gas reserves in shale rock, where it was formerly inefficient and uneconomic to drill.¹ In addition, the ability to transport natural gas globally as a result of liquefied natural gas technology has allowed producers to develop large natural gas reserves that were previously considered stranded, due to the lack of proximity to end markets. Meanwhile, oil markets have tightened, as growth in supply has failed to keep pace with demand. This is primarily due to the surge in demand for transportation fuels in emerging markets, which has, in turn, boosted the increase in worldwide oil demand.

Consequently, the traditional oil-to-natural gas price relationship has broken down as current market prices adjust to reflect these forces.² With oil prices well above historical parity levels, it is fair to say that oil producers are reaping over USD 1 trillion of excess revenues annually as a

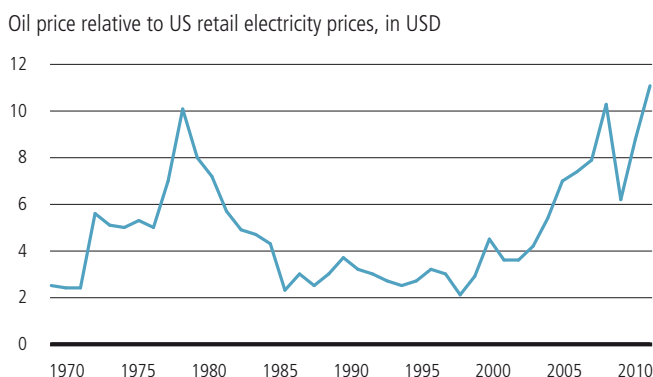
result of the scale of this price divergence between oil and natural gas.

The price gap between oil and electricity is also somewhat a function of low natural gas prices. Electricity prices generally move in sync with natural gas prices because natural gas-fired power plants, which generate about 20% of US electricity needs, are the marginal producers of electricity. Consumers also have a hard time switching to electricity and away from oil products because there are hardly any vehicles that run on electricity. However, as we will soon show, businesses are rushing to facilitate a shift from relatively expensive oil to other alternatives.

Energy security concerns on the rise

In addition to the financial incentives to develop oil substitutes, evolving government priorities to enhance energy security are also encouraging the development of alternative energy sources. China’s growing thirst for oil has forced the Western world to compete for oil resources for the first time in 60 years.³ This new dynamic, combined with the long-term reality that oil supplies are concentrated in politically unstable regions of the world, is driving efforts to secure supplies, reduce dependence on imports and develop domestic sources of supply to meet expected future energy needs. The combination of structurally higher prices, demands for energy security and heightened environmental awareness have raised the profile and importance of improving energy efficiency. Global fuel economy standards,

Fig. 3: Oil cost relative to electricity rivals 1970s peak



Source: Bloomberg, US Department of Energy

for example, are scheduled to rise substantially during the next 10 years. In the US, new car fuel economy standards are scheduled to increase at least 30% by 2020, which could reduce US oil demand by approximately 5% over the next decade.

Environmental policy shifting focus

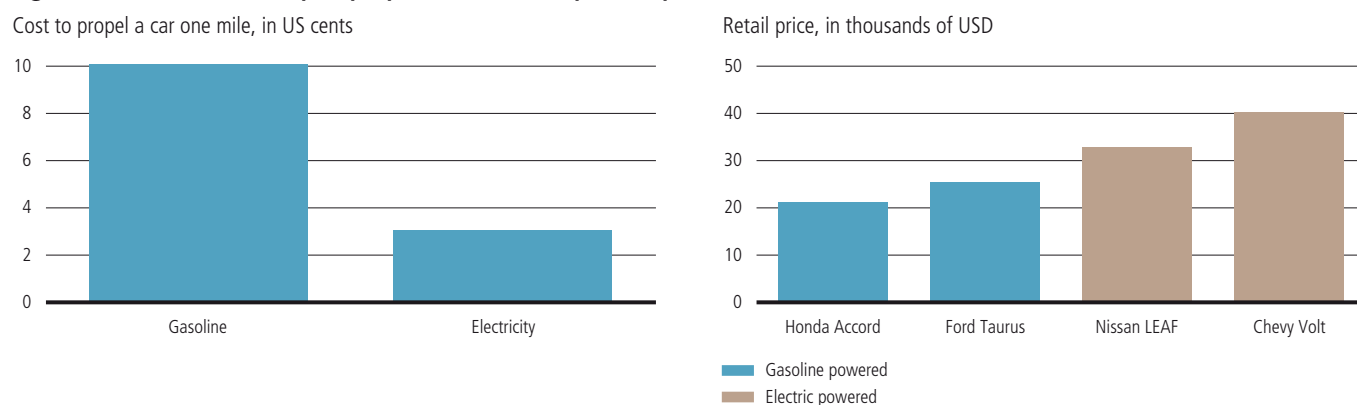
Failure to pass a carbon dioxide “cap and trade” regime in the US when both the executive and legislative branches of the federal government were controlled by the Democratic Party suggests to us that this initiative has a low probability of ever succeeding. The abandonment of the Chicago Climate Exchange’s emissions trading operations in 2010 also speaks volumes about the outlook for US carbon legislation. As a result, we think environmental initiatives will move away from attempts to impose a tax on fossil fuels, and will instead focus on efforts to commercialize green technology by harnessing both private and government resources. Wind and solar power subsidies are already in place in the US and enjoy broad bipartisan support. Clean energy subsidies appeal to many politicians because they often create jobs and help address energy security concerns. As a result, we believe many of these programs will survive any deficit reduction initiatives that may be undertaken in the coming years. A greater focus on commercializing green technology could make many of these clean energy initiatives more cost-competitive.

Plug-in vehicles could be the missing link

As a result of both the high cost of oil relative to other energy sources and the evolution of government policies to support environmental goals, plug-in electric vehicles are becoming viable alternatives and will likely gain traction throughout the decade. Based on current gasoline prices and the fuel economy of an average new car, the cost to propel the average car on gasoline in the US is currently about USD 0.10 per mile. If cars could run on electricity from the grid, it would only cost USD 0.03 per mile (see Fig. 4a). The key to take advantage of this arbitrage is in the cost of batteries.⁴ After accounting for tax incentives, a new plug-in electric Nissan LEAF still costs Americans about USD 4,000 more than a conventional gasoline-powered new Honda Accord, for example (see Fig 4b). However, by the end of the decade, the cost differential between cars powered by electric and internal combustion engines will likely narrow substantially.

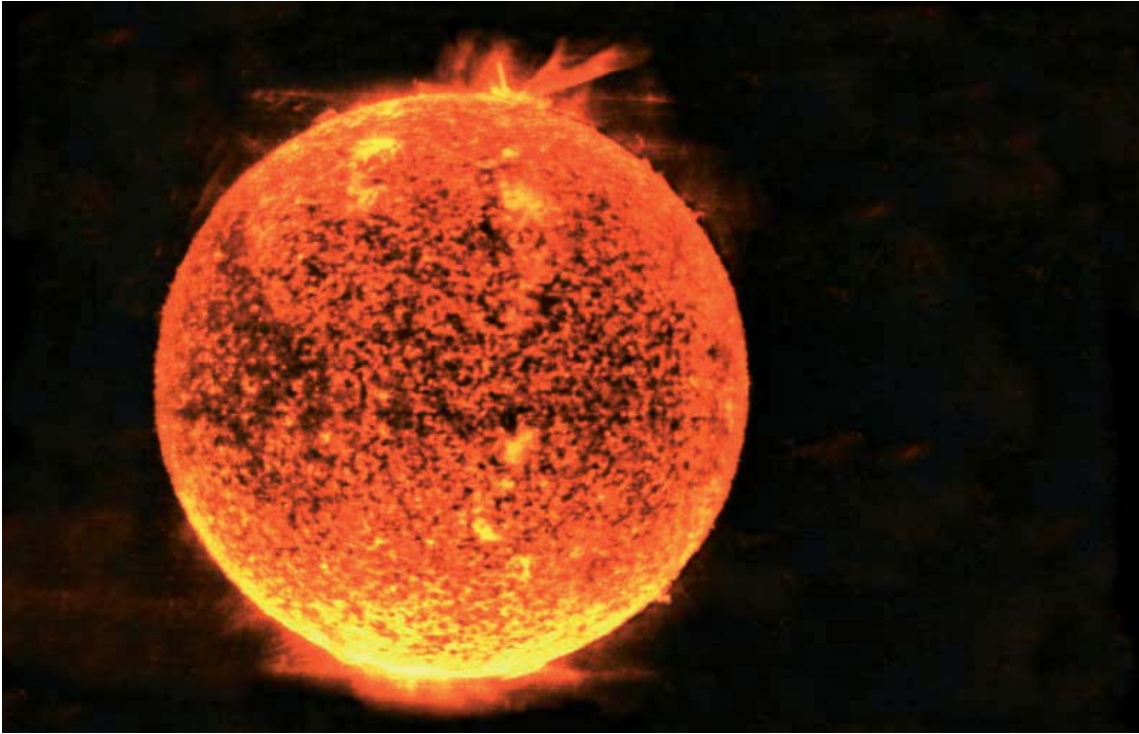
Battery technology continues to progress. By way of example, laptop computer battery costs per watt have declined by roughly 90% over the last 15 years. And unlike previous attempts to commercialize electric vehicles to pursue environmental objectives, recent decisions to devote significant resources to this goal – as many as eight new models will be on the road by the end of 2011 – are a reaction to price incentives. While initial market penetration is likely to be limited, falling costs could result in electric vehi-

Fig. 4: Electric cars are cheap to propel but a more expensive purchase



Source: UBS WMR

Source: Honda, Ford, Nissan, GM



Continued advancements in solar power have the potential to alter the energy marketplace during this decade. Clean and abundant, it is the increasing cost-competitiveness of solar power that is stoking demand.

cles taking a 5% share of new cars sold by the end of the decade – a significant percentage relative to expected global oil consumption growth of 1%-2% per year.

While we acknowledge that pure electric vehicles may still suffer from a limited range, plug-in hybrids, which also have a small internal combustion engine, mitigate this constraint. In addition, some startups are rolling out entirely new business models in an effort to minimize some of the current drawbacks of electric vehicles. For example, a company called Better Place is launching a subscription service in Israel that provides owners of electric cars with batteries. Subscribers do not own the batteries, but instead, lease them from Better Place. So in addition to recharging their cars at home or work, subscribers will also have the option of swapping an empty battery pack for one that is fully charged at any number of new Better Place service stations being deployed throughout the country. Better Place also plans to roll out this service in Hawaii and Denmark.

These types of business plans may work for small, compact geographies but improvements in battery technologies will have to lead to shorter charging times to mitigate concerns about range. A whole host of battery technology companies are trying to tackle this challenge from small venture capital-funded startups to the large automobile manufacturers. For example, a California startup company named CODA Automotive is introducing its own branded electric vehicle, with proprietary technology embedded in various parts of its offering.

Here comes the sun

Continued advancements in solar power also have the potential to alter the energy marketplace during this decade. Solar power has the advantages of being clean and abundant and can also function without necessarily being connected to a distribution network. However, it is the increasing cost-competitiveness of solar power that is stoking demand. Between 2008 and 2011, photovoltaic module costs declined

by more than 25% (see Fig. 5). If over the next 10 years solar costs decline by 7% annually (a slower rate of cost improvement than the period since 2008), solar power could become one of the cheaper sources of new power generation (see Fig. 6). The cost improvements in solar technologies over the next decade will likely result in substantial growth in grid-connected solar power, which could lead to reduced demand for coal – the source of 41% of the world’s electricity and one of the dirtiest sources of energy.

In addition, as grid-connected solar power displaces coal-fired power generation, the environmental and security advantages of plug-in electric cars become even more compelling. Economical solar power not only reduces the need for fossil fuels in power generation but also has the potential to improve the environmental footprint of transportation if improved battery technology materializes, as we expect. Imagine a solar panel on the roof of every plug-in hybrid electric car. If one could simultaneously drive a plug-in electric car and collect the sun’s energy to recharge the car’s battery, the range limitations of electric cars could be substantially reduced. Ultimately, the development of economical solar and battery technologies will likely yield profound changes to how we consume and supply energy by the end of the decade.

The race is on

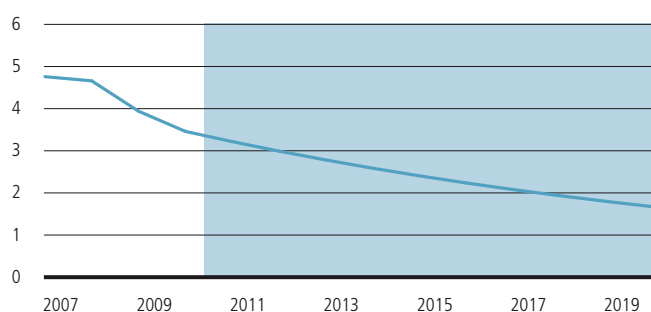
We believe there are significant financial, security and environmental incentives that are driv-

ing the effort to take advantage of lower-cost alternatives to oil. The low price, abundance and relatively favorable environmental profile of natural gas, suggest it could be a prime beneficiary of these trends. However, we acknowledge that the natural gas industry has to ensure that it can access the new shale gas reservoirs without contaminating drinking water, a goal that we believe is very achievable. While the natural gas market is over-supplied in the near term, prices should move higher by the end of the decade as demand increases.⁵

Businesses that can help consumers switch from oil could also be well positioned. Given the cost improvements we expect in battery and solar technologies, these industries could see substantial increases in demand over the next 10 years. Other renewables, such as wind power, will also gain market share but we believe the rate of change will be more dramatic in the areas we have identified. And as usual, the oil industry itself is not standing still. High oil prices are also spurring the search for cheaper ways to exploit existing oil reserves as well as those that will be developed in the decades ahead. But while oil will continue to play an important role in powering the world’s transportation networks, viable alternatives, such as solar and natural gas, will expand their share of the overall energy supply, limit the environmental impact of energy consumption and reduce dependency on imported energy sources.

Fig. 5: Photovoltaic modules becoming much less expensive

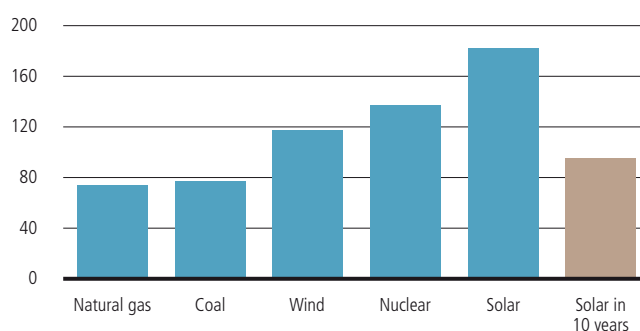
Average retail price of 125-watt and higher modules, in USD per watt



Note: Shaded area represents projected retail prices.
Source: Solarbuzz Research and Consulting

Fig. 6: Solar photovoltaic is cost competitive by end of decade

Long-run cost of electricity generation by fuel source, in USD per megawatt hour



Note: Assumes no cost for CO₂ emissions.
Source: Bloomberg, UBS WMR estimates

Technology: productivity *and* vulnerability

Technological advances will continue to improve and transform society, but our reliance on technology has also left us vulnerable. While cloud computing will likely unlock numerous advantages, we also expect greater investment in safeguards against security breaches and system failures.

Robert Faulkner, Analyst

Tool, tank or toy?

The productivity and efficiency gains that go along with technological innovations are simply staggering, particularly when the advances have broad application across many industries and also affect our professional and personal lives (see Fig. 1).

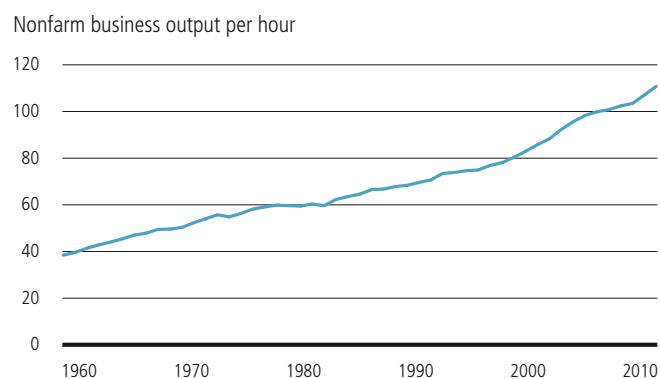
Think for a moment what can now be done with the simple touch on a smartphone: lights can be turned on and off at a home hundreds of miles away; children's whereabouts can be monitored and tracked to within a few feet; patient information can be analyzed and sent on to colleagues for medical consultation; client presentations can be sent ahead of meetings and printed out on demand; and airline tickets can be ordered, purchased and downloaded in a few simple clicks. In short, the advances in information technology have such broad implications that they influence almost every aspect of human enterprise. This progress will not only continue but will likely accelerate over the next decade as applications penetrate new territory and devices become even more closely interconnected.

But along with this massive improvement in productivity comes a comparable increase in dependency and, therefore, an elevated vulnerability to service disruptions, vandalism or even terrorism. Some events are unintentional and temporary,

such as server crashes and network overloads, while others are largely the result of simple human error, as with software design glitches and incorrect data entry. However, many are more maliciously intended, ranging all the way from annoying software viruses and denial of service attacks to cyber spying and even actual terror attacks.

Think of that same smartphone, but now – instead of being used to purchase a ticket or turn on a car – it is used to cripple the power grid or detonate an explosive device. While an electric power loss in the 1970s may have blacked out a

Fig. 1: Dramatic improvements in productivity



Source: Bureau of Labor Statistics, UBS WMR

city, that same sort of system-wide power failure today could be catastrophic. As our professional and personal lives become increasingly dependent upon technology – and many of those technologies are interconnected – the risk of such disruptions grows geometrically. So in addition to harnessing the productivity-improving potential of technology, we must also look to put in place safeguards against more malevolent uses.

The bright “cloud” on the horizon

Technology changes at an accelerating pace and what had been viewed as cutting edge just a decade ago is now quaint or archaic. The changes come in all sizes but few have the ability to fundamentally transform business models and our daily lives. We do see one exciting development with such potential for fundamental change in the way businesses work. That development is “cloud computing” and part of its promise is its applicability across almost every industry.

What makes the potential for change so profound is the very nature of the concept. In cloud computing, individuals or organizations utilize necessary services and resources on an “as-needed” basis from providers rather than purchasing assets (hardware and software) and operating a system on their own with all of the attendant maintenance and support requirements. As it stands now, cloud computing is still small in scale and limited in scope. It is responsible for a great deal of clever advertising as the next new thing, but, at its most fundamental level, it is a return to the time-sharing architecture of the 1960s.

Perhaps the best way to understand the potential impact of cloud computing is to use an existing industrial enterprise as an example – the electric power grid. Prior to the grid, electric generation and usage was “siloeed,” which meant that each standalone power source needed to be large enough to provide for peak power needs yet still small enough to be economically efficient. This tradeoff between capacity and efficiency often led to suboptimal power generation infrastructure, which served to restrain growth. But the advent of the grid allowed users to tap into power sources that exceeded their own standalone capacity during periods of peak usage. Assuming not everyone

had identical power needs at the same time, this pooling of resources meant that the functional capacity could be significantly greater than the sum of the standalone power sources. What’s more, since the grid needed to provide for many users, there needed to be backup sources in the event a generator went down – thus providing

“Cloud computing has the same potential to impact today’s world that the electric power grid had when it was first introduced at the end of the 19th century.”

safer, more reliable and consistent service. This led to massive improvements in productivity across virtually every industry that relied on electric power.

Transforming our world

Cloud computing has the same potential to impact today’s world that the electric power grid had when it was first introduced at the end of the 19th century. The electric grid burst onto the scene midway through the industrial revolution and represented a transformative process. Likewise, cloud computing may have a similar impact on the way individuals and organizations meet their information technology needs. For years, management gurus have preached the philosophy of focusing on our core competencies. In all but a few companies, core competency does not include processing payroll, so businesses hire firms like ADP and Paychex to do the task. The promise of cloud computing is no different. While the hype is well ahead of the reality at this point, the next several years will require the continued development of a number of building blocks for the cloud. These include increased server and storage virtualization, network acceleration, self-provisioning capabilities, a demonstrable record on safety and security and, most important, a clear return on investment.

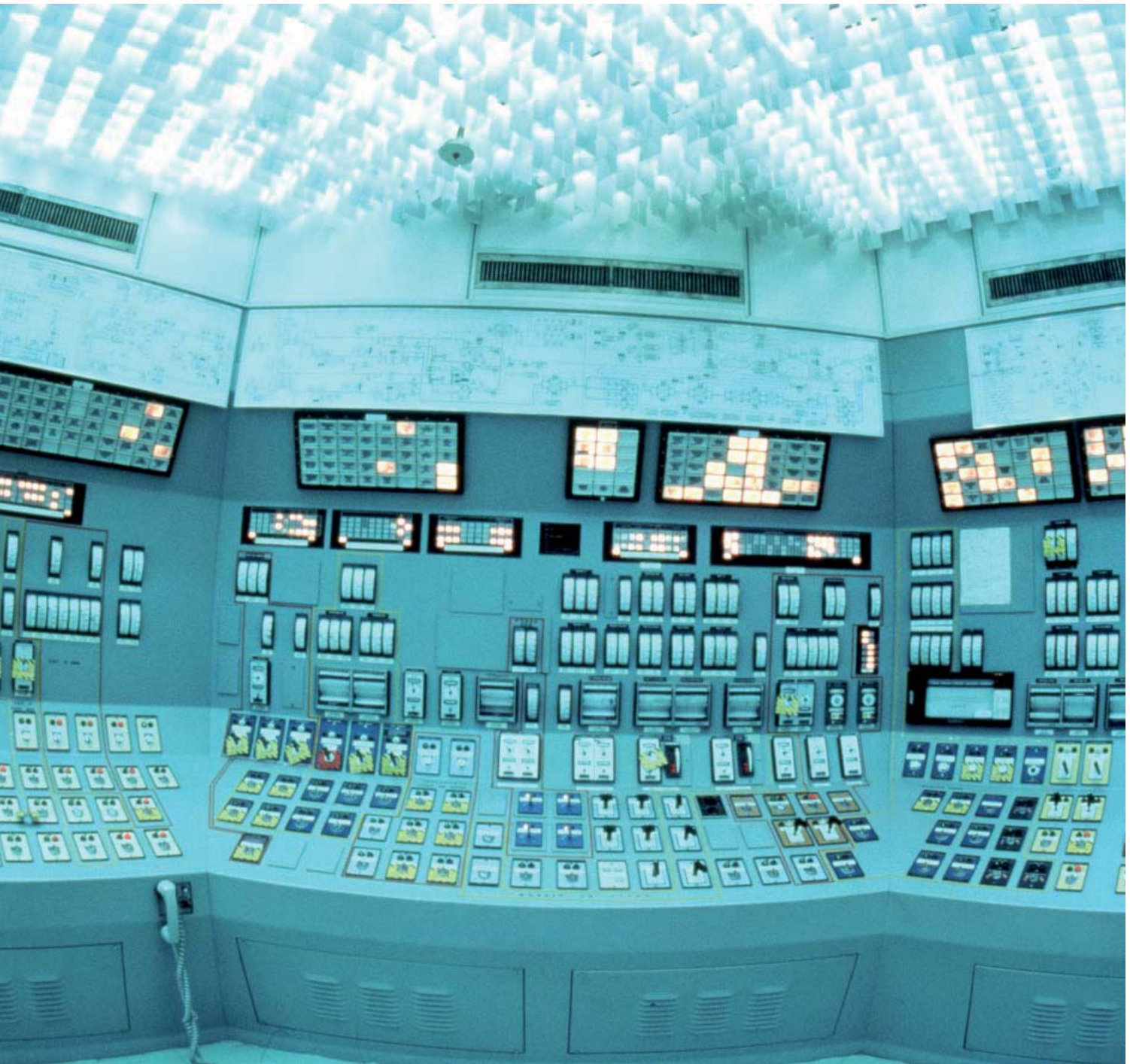
We believe that it is only after a successful first phase that the cloud will be able to move en

Technology

masse beyond the migration of generic, nonessential functions, such as e-mail and office productivity. It is at this point when the cloud will become the much-hoped-for transformational tool. After it has demonstrated its strengths and resolved its weaknesses, we will see it hosting custom and

mission-critical functionality on an as-needed basis and, thereby, delivering significant benefits to businesses, consumers and public entities alike. If the process plays out as envisioned, we should experience:

Technology changes at an accelerating pace and what had been viewed as cutting edge just a decade ago is now quaint or archaic.



- Lower costs through the reduced need to acquire hardware, software and other assets along with reduced expenses associated with supporting these resources
- Increased efficiency as expenses are directly proportional to the required services and resources (that is, there are no peak load requirements)
- Greater flexibility with the ability to trial new functions and features as available without a capital commitment
- Obtain quality of service commitments from service providers and leverage their investment in scarce technical talent
- Separate out service requirements from the underlying infrastructure, thereby enabling it to operate on the most cost-effective solution

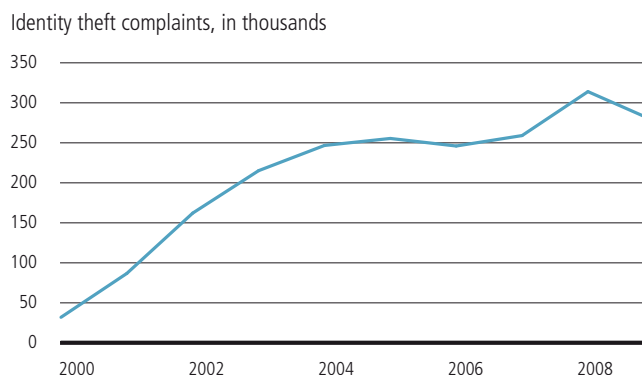
While the cloud offers great potential, it also will increase our dependency on technology. And along with that increased dependency comes greater risk.

Some dark clouds loom as well

Information technology has pushed its way from its original “glass house” into the hands of our children. As such, the risks have been discovered, more often than not, the hard way. As we ponder the decade ahead, we have to understand that the world we created through our reliance on technology comes with threats and some are the proverbial game-changer.

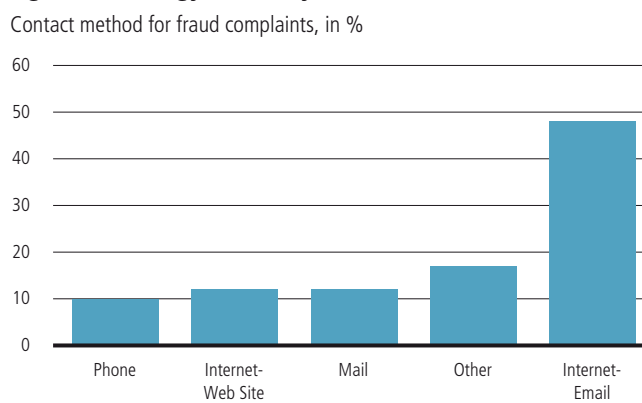
We see threats existing on three levels: individual; group or organizational; and societal. Many of the threats at the individual level are well documented, particularly as they relate to the dangers of identity theft (see Fig. 2 and Fig. 3). Groups and organizations tend to be at greater risk, in part because they have more to protect, and the targets are not only financial (see Fig. 4). In both of these instances, people are the weakest link in the security blanket. It is not that we are all ill-intentioned, but we are the ones who let our defenses down, trust someone or something we should not, or lose the laptop at the industry conference. Beyond the individual or group threat, there is a

Fig. 2: A new crime explodes onto the scene



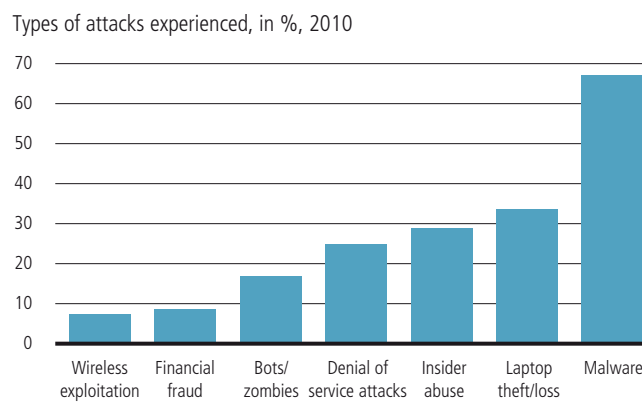
Source: Federal Trade Commission, Consumer Sentinel Network, UBS WMR

Fig. 3: Technology is a catalyst for abuse



Source: Federal Trade Commission, Consumer Sentinel Network, UBS WMR

Fig. 4: Organizational attacks are broadening



Source: Computer Security Institute, UBS WMR

far greater risk at the societal level. Our magnetic attraction – some may say, even addiction – to technology has brought us to a point at which we are so totally dependent on it that to be without it for a period of time could be very destabilizing. There is the very real possibility that an event, pre-meditated or coincidental, could negatively affect our society for an extended period of time.

Cyber threats on critical infrastructure

Critical infrastructure in the US has evolved rather dramatically in recent decades and has been impacted by technology in much the same way our lives have been. By critical infrastructure, we mean:

- Electric power generation and distribution
- Telecommunications and satellites
- Petroleum and natural gas production and distribution
- Transportation
- Water
- Banking and finance
- Food production and distribution
- Emergency services

Much of this infrastructure is monitored and controlled by Supervisory Control and Data Acquisition (SCADA) systems. These are special purpose computer systems that monitor operations and take appropriate action if a device strays beyond required performance metrics.

Suppose a person or group with an understanding of industrial control systems created malicious software known as “malware” that attacked our infrastructure and damaged its ability to generate electricity, distribute natural gas, transfer funds or some other essential process? We have seen what happens when the lights go out in a large metropolitan area for just a few hours. What if it were for weeks, months or longer?

Unfortunately, these are not “what if” questions anymore. Last summer, security specialists discovered Stuxnet, a worm (malware so named because it “crawls” from device to device) characterized as a “milestone” and a “wake-up call” by Dean Turner, Director of the Global Intelligence Network at Symantec.¹ He noted that it “demonstrates

the vulnerability of critical national infrastructure industrial control systems.”

If a Stuxnet-like worm were unleashed on some segment of our infrastructure, just how long would those systems remain functional? More important, would they be recoverable?

// In addition to harnessing the productivity-improving potential of technology, we must also look to put in place safeguards against more malevolent uses. //

Malware is not the only threat we face due to our heavy reliance on technology. For some time, scientists have also been concerned about the destructive potential of an electromagnetic pulse (EMP).

The day the earth stands still

An EMP can occur naturally as a result of a solar flare and can also be generated through a high-altitude detonation of a nuclear weapon. On a smaller scale, a device to create an electromagnetic pulse could one day be built by those with too much time on their hands. Most of us already have such a device in our home: a microwave oven.

While the probability of an electromagnetic pulse occurring in the US is admittedly low, such an event could easily disable critical infrastructure. The SCADA systems controlling the nation’s infrastructure would be physically damaged and rendered inoperable because, for the most part, they are not shielded from EMPs. Simple shielding in our microwave ovens keeps the energy in and the same type of shielding could keep it out. Beyond the SCADA systems, all of the off-the-shelf commercial computing and communications equipment that we use would suffer the same fate for the same reason. Most likely, computer records, like the ones that tell the bank how much money is in our account, would be gone as well. What might this look like? In the 1951 science fiction

classic, *The Day the Earth Stood Still*, an alien and his robot essentially cripple the world by disabling all electric-powered motors. The sci-fi depiction may be more benign than an actual EMP attack today: in the movie, the alien disrupted all power, with the exception of those sources necessary to maintain life and safety. It is quite possible that the modern day version of such an attack would not be so charitably deployed.

The US Congress formed a commission to evaluate the threat that EMP poses to critical national infrastructure. The commission's 2004 report highlights a very real problem, noting: "EMP is one of a small number of threats that can hold our society at risk of catastrophic consequences."² Although there has been some criticism of the report as partisan and tied to the defense industry – and politicians and their supporters will continue to argue about the likelihood of a nuclear attack – another major solar flare seems inevitable. What we cannot know is the timing or strength. The vulnerability of our infrastructure to EMP should be the focus of our discussion, not its source.

Opportunity is the flip-side of risk

Now that we have pointed out the doomsday scenario, the logical question is what can we do about the risks we have created? As is always the case, recognizing and understanding the risks are the first steps; next, we consider the solutions to these potential problems.

Cyber security threats are created when software does something other than what it was designed to do. The resulting vulnerabilities are exploited like a door left unlocked. In no other aspect of our lives do we tolerate products that expose us to such profound risks, but we are apparently willing to do so with software. The software industry must perform much more system-level simulation in the future to identify those vulnerabilities before products become commercially available. Individuals and organizations must demand it.

However, nothing is ever perfect, and we will always have a need to monitor our systems for security breaches. Much more powerful processors should enable individuals and organizations to operate security tools that are far less intrusive,

more flexible and substantially more intelligent than today's brute strength-based alternatives.

The EMP threat presents a different problem in that the best solution may have to come from regulations that require new hardware and shielding. Estimates point to an additional impact on new equipment prices of as little as 1%-5%, if these precautions were incorporated into the initial designs.³ Clearly, if the cost were prohibitive, microwave ovens would not be so inexpensive. Much (not all) of our commercial communications and computing hardware has a fairly short useful life due to its functional obsolescence, so replacement takes place at relatively short intervals. Consequently, if remediation were required over a 10-year period, the impact would be minimal. Any infrastructure that is not subject to turnover could be addressed on a case-by-case basis. The point here is that we would have a program in place to address the issue.

As we noted at the opening, technology has had a profound impact on us from an economic and lifestyle perspective. We know of few who would forego the benefits that have accrued over the decades, so there is really no way to put the genie back in the bottle. However, an understanding that there are risks associated with our reliance on technology makes us better equipped to work toward a solution. More important, when we pick up our smartphone to use it as a tool or a toy, entrepreneurs who understand the risks inherent in the activity will view any problems as opportunities. The creative cycle that has enabled us to benefit so much from information technology will help ensure that we can continue to enjoy the benefits over the current decade and the decades to come.

Healthcare: from healing to *fixing*

During the next decade, the US healthcare system will undergo considerable change. These changes, not solely driven by legislation, could affect nearly every aspect of health delivery, from the person we consider our primary care physician to the type of care we receive.

Jerry Brimeyer, Analyst

Transformational change in healthcare is afoot

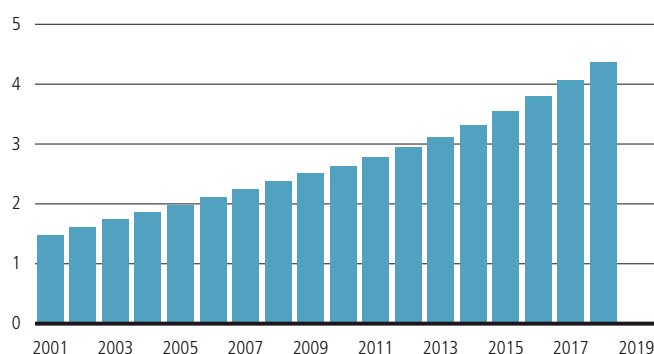
Seemingly all at once, a multitude of forces have converged to create a dynamic of change that will gradually reshape the US healthcare system over the course of this decade. While some might argue that these changes are being driven by recently legislated healthcare reform, many were already well under way before President Obama signed the bill into law in early 2010. Some of the most important developments include:

- Behavioral changes: higher patient deductibles and copayments leading to lower discretionary healthcare consumption and more price shopping
- Decision maker changes: more physicians directly employed by hospitals, shifting more healthcare decisions from doctors to cost-conscious hospitals
- Reform changes: insurance company and coverage reform represents the first phase of legislative change and will likely be followed by additional measures, such as tort/malpractice reform

The common theme prompting change is runaway expenditures on healthcare, which in 2010 are expected to total USD 2.6 trillion or 17% of US GDP, and could rise to 20% of US GDP by 2018, according to the Centers for Medicare & Medicaid Services¹ (see Fig. 1). Based on OECD

Fig. 1: US healthcare spending will steadily increase

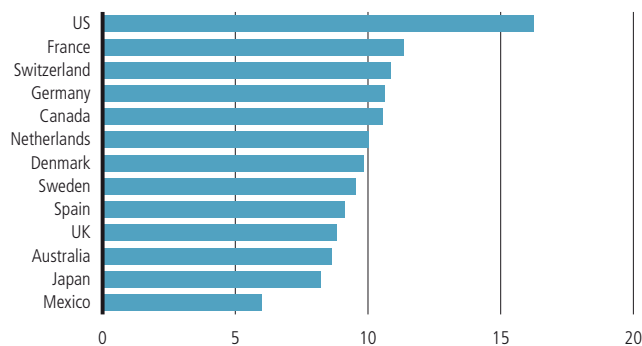
US healthcare expenditures, in trillions of USD



Source: Centers for Medicare & Medicaid Services

Fig. 2: US spends more on healthcare than any other country

Healthcare spending as a share of GDP, in %, 2008



Source: Organization for Economic Cooperation and Development

data,² the US spends, by far, the largest portion of GDP on healthcare in both absolute and per capita terms (see Fig. 2). It is this potentially economy-crippling reality that is causing so many ostensibly diverse arrows to aim at the same target – cutting healthcare costs while improving or at least maintaining the quality of care.

Most important, it is not one’s analysis of the ultimate potential for success or failure of these efforts that should determine healthcare investment decisions this decade, but rather the interim triumphs that gradually alter the cost trajectory while meeting increased demands for care and improving patient outcomes. Such victories could come by way of new technology, new cost-saving health delivery paradigms or new innovative products and services.

Below we expound upon major themes driving change over the next decade – coordinated care, physician shortages, personalized medicine and political influences – and offer suggestions as to how innovative solutions can help address the demands of our evolving healthcare system, including:

- Comprehensive electronic health records (EHR) for all patients
- Cures for previously incurable diseases
- Robotics and order-entry systems to leverage scarce physician resources

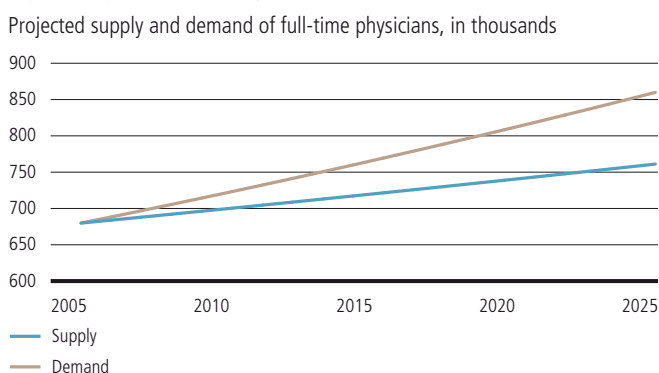
- Powerful genetic analysis to determine disease potential and drug selection
- New vertically integrated healthcare delivery paradigms

Coordinated care

There are many reasons for the high cost of care in the US. High on the list are healthcare providers’ fee-for-service payments, unnecessary medical tests and uncoordinated care, namely among hospitals and physicians. The fragmentation of health services today is like the airline industry 20 years ago – significant costs and waste due to uncoordinated systems and inefficient use of technology. Over this decade, patient care will almost undoubtedly become better coordinated among various providers and the number of unnecessary tests and procedures will be substantially reduced, thanks largely to improved technology and changes in the way providers are incentivized to make change happen.

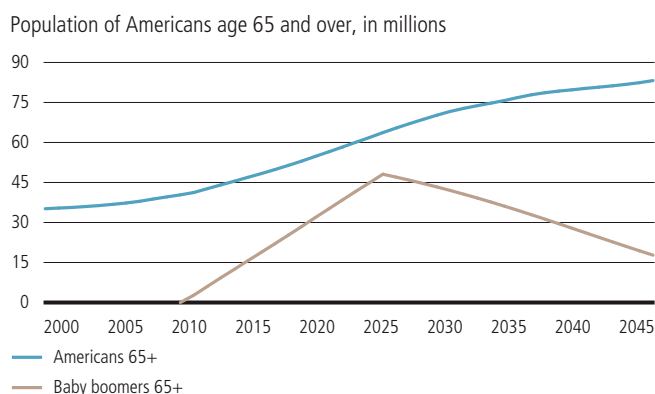
Already today, but currently limited to only a handful of medical conditions, payers such as Medicare, Medicaid and managed care organizations reimburse providers with a bundled payment – one payment for the entire episode of care – not for each component of care, or fee-for-service. New payment schemes should encourage much better coordination among providers as well as new vertically integrated healthcare delivery paradigms, where all healthcare services for an individual are managed by one entity. However, oftentimes

Fig. 3: Physician shortage will increase in the decade ahead



Note: Excludes residents.
Source: Association of American Medical Colleges

Fig. 4: Number of Americans age 65+ will double by 2030



Source: US Census Bureau

seemingly unnecessary tests are conducted to protect against malpractice, which will require tort reform to be more fully addressed.

To further encourage coordinated care, all Americans will have an electronic health record (EHR), which will hold their entire medical history. In years past, this may have sounded like a pipe-dream because of the cost of implementing new IT systems and the unwillingness of many providers to move away from traditional handwritten records. But today, aided by the stimulus package (American Recovery and Reinvestment Act of 2009), the mechanics of this change are already under way, which provides USD 18 billion in incentives to physicians and hospitals to adopt EHRs.

A host of other technological innovations, such as electronic physician order entry, better capture healthcare data and standardize provider processes, leading to process improvements and fewer medical errors. According to the Society of Actuaries,³ medical errors, such as preventable infections and complications, cost the US healthcare system nearly USD 20 billion in 2008.

By 2020, patient care will be far more efficient, with much better continuity of care as providers adopt EHRs and other robust IT solutions to better coordinate services, streamline care delivery and manage resources. If executed properly, the benefits will go far beyond greater efficiency and lower costs, and will achieve superior patient outcomes.

The looming physician shortage

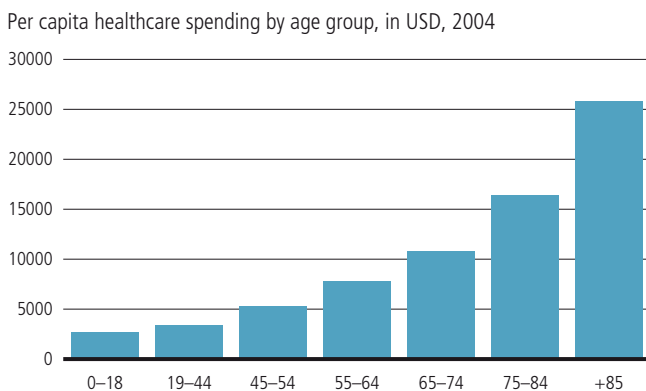
By the end of this decade, the US will face a severe shortage of physicians, both primary care physicians (PCPs) and specialists. According to the Association of American Medical Colleges⁴ (AAMC), the physician shortage could surpass 90,000 by 2020 and 125,000 by 2025 (see Fig. 3).

The problem is mostly the ever-growing demand for healthcare, accentuated by population aging, as the baby boomers turn 65 beginning in 2011 (see Fig. 4). As people age, they use more healthcare services, and Americans age 65 and over already account for 35% of the spending on healthcare (see Fig. 5). This inexorable force will not just result in inadequate physician numbers but will also place tremendous strain on the healthcare system and become a weighty financial burden on Medicare.

As the mechanics of healthcare reform begin to take hold, demand for care will further increase, potentially quite sharply. Between 2014 and 2019, the Congressional Budget Office⁵ estimates that new state insurance exchanges will enroll 32 million Americans, most of whom were previously uninsured or underinsured and many who have pre-existing conditions that are very costly to treat.

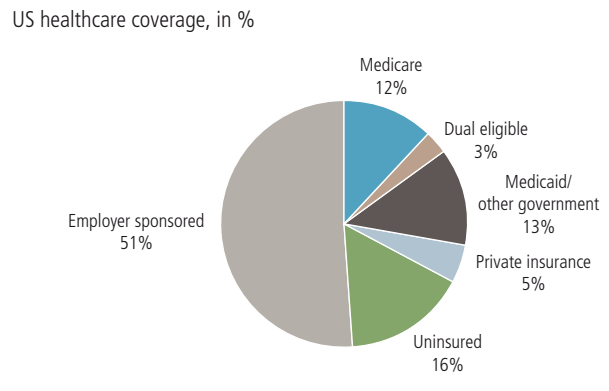
With demand for healthcare growing at such a fast clip, the supply of physicians will hardly be able to keep pace. In spite of over 18,000 new students entering US medical schools each year, the AAMC⁶ estimates that the US will be

Fig. 5: Healthcare costs rise significantly with age



Source: Centers for Medicare and Medicaid Services

Fig. 6: US government funds a large share of healthcare



Source: Kaiser Family Foundation, UBS estimates

shy 45,000 PCPs by 2020. The problem is compounded by the fact that nearly one-third of all physicians today are over age 55: the number of physicians retiring will be just slightly less than those entering the profession. This is not only becoming evident with PCPs, but the same trends, in virtually equal numbers, will sharply affect the supply of specialists as well.

The implications are far-reaching. In the future (already apparent in certain geographic regions today), your “primary” physician is unlikely to be the primary or first healthcare professional you will see when seeking healthcare services, given the mounting demands on PCPs. Filling the void will be perfectly competent physician assistants (PAs) and nurse practitioners (NPs), although the supply/demand imbalance of both PCPs and specialists will almost undoubtedly lead to longer wait times and hinder access to care.

Clearly, innovative solutions are needed to close the gap between healthcare demands and limited physician resources. PCPs will play more of a consulting role to the growing numbers of PAs and NPs – tightly coordinated by EHRs and other IT solutions – to improve efficiency and meet patient demands. Specialists will play a similar role, with surgeons making greater use of robotics for many common operating procedures, such as appendectomies and hysterectomies, some of which could be conducted from miles away. Despite these changes and advances, still more efficiencies and innovation will be necessary to meet the mounting demands by 2020.

Personalized medicine

In the future, and not at all out of reach, the medicines we use will become increasingly personalized to our specific genetic makeup. Genetic analysis, through better understanding of the human genome and advances in genetic diagnostics, will become commonplace with annual doctor visits or periodic “physicals.” These tests will permit physicians to predict disease predispositions and tailor healthcare to our individual genetics, rather than simply use therapeutic regimens that broadly assume all treatments affect everyone in the same fashion.

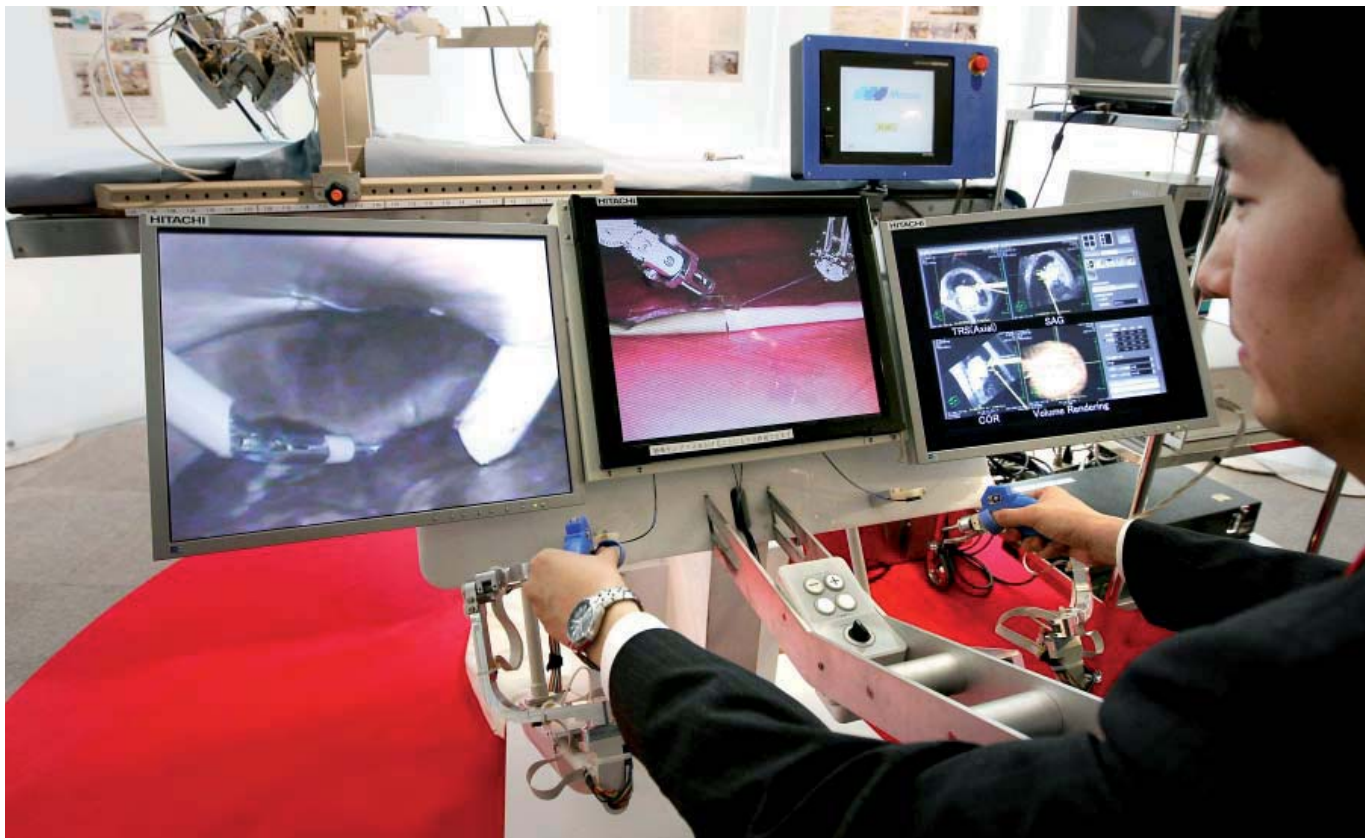
Given the considerable advances in understanding the human genome and the developments of targeted drug therapies, broad scale personalized medicine is not at all a whimsical notion. In fact, although in its infancy, early examples of personalized treatments exist today. For instance, in breast cancer, patients with overexpression of the HER2 gene, commonly associated with aggressive forms of cancer, can be predicted to have a better response with the biologic Herceptin than patients without the gene. The same is true for other drugs and biologics as well.

Researchers are also investigating ways to alter and even remove genes that cause disease, known as gene therapy. Another novel approach to disease prevention is RNA interference or RNAi, which blocks production of disease proteins produced by specific genes types. RNAi is currently in early stages of investigation for Huntington’s disease and various viral diseases, such as hepatitis and HIV infection, but with strong prospects for successful products and procedures by 2020.

Though such targeted therapies are few in number today, over this decade personalized medicine will be the focal point of drug research for many diseases, such as cancer, Alzheimer’s disease, heart attacks and depression, to name just a few. These new therapies are not only aimed at treating disease, but at curing previously incurable diseases, including various types of cancer and viral infections, like hepatitis C and AIDS. Such advances will not only improve the outcomes of medical care, but could significantly reduce healthcare costs.

Winds of political change

What happens in Washington will also necessarily impact our healthcare system, given the changes from healthcare reform and the growing number of Americans with healthcare coverage through federal and state government programs. Currently, about 28% of the US population is covered via Medicare, Medicaid and other government healthcare programs (see Fig. 6). And that figure will likely be over 33% by the end of the decade, as the over-65 population continues to expand and 16 million more Americans enter Medicaid through health reform.



New therapies will be aimed not only at treating disease, but at curing previously incurable diseases, including types of cancer and viral infections, like hepatitis C and AIDS.

The most recent round of healthcare “reform” did not actually reform the system in a structural way: it dealt mostly with regulating insurers and increasing insurance coverage. Given that the recent legislation could bring millions of people into a system that already costs 17% of GDP, we fully expect future healthcare initiatives to address Medicare funding, structural reform and tort reform.

Longer term, the political winds of change will, in no small way, influence the structure and cost trajectory of our healthcare system. In the simplest terms, future healthcare legislation will be geared toward market-driven mechanisms or command-and government-driven mechanisms. Republicans are generally viewed as more favorable to healthcare companies because they believe competitive markets will control costs, whereas Democratic-led reforms would likely lead to increased government control. Another major tenet of Republican-led plans is tort reform, which would seem to be essential to reduce the cost of unnecessary tests

and malpractice insurance.

In our opinion, because of the urgency with which additional reform is necessary, the administration in power during the next term could have the most profound impact on the future of healthcare in the US and, for that reason, the long-term performance of healthcare investments.

The decade of change

So we end as we began, that this decade will likely experience the most significant changes to our healthcare system in our lifetime. While no amount of credible analysis can portend the ultimate outcome of the multiple changes under way and those that are likely to follow, we surmise that, given the aim of reducing healthcare expenses and the desire to maintain quality care, cost-saving products and services that actually improve healthcare outcomes will lead to numerous healthcare investment opportunities throughout this decade.

Inflation: the next wave *takes shape*

After a quarter of a century of disinflation – and a more recent brush with outright deflation – we believe inflation will reemerge during the decade ahead. However, we do not expect a reprise of the 1970s-style stagflation that crippled the economy and weighed heavily upon financial markets.

Thomas Berner, CFA, Economist

Inflation versus deflation

The currently weak state of the US housing market, ongoing reductions in household debt burdens and high rates of unemployment continue to prompt a massive fiscal and monetary policy response aimed at guarding against the risk of deflation and avoiding the deflationary trap Japan fell into when its housing and equity market bubbles burst in the early 1990s. The opposing deflationary and inflationary forces are gargantuan. We need superlative adjectives to be able to describe the magnitude of the past banking crisis and the ongoing deleveraging cycle, as well as the monetary and fiscal response. The size of these forces alone portends a clash between deflationary and inflationary pressures of unprecedented magnitude. The result of that clash will be a wave, not a ripple. We expect that wave to be inflation, not deflation. With the threat of deflation ever so real, the thought of inflation may seem a remote possibility. Although we think it could be several years off before broad-based inflation pressures emerge in the US, we believe the policies implemented today will give rise to the next wave of inflation during this decade.

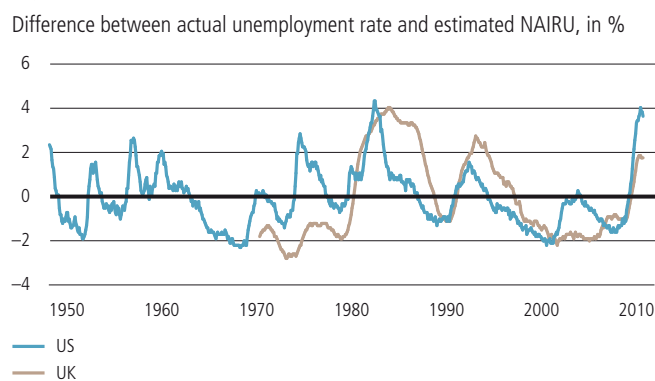
Ample resource slack contains inflation at first

There is currently an enormous amount of resource slack, or underutilized productive capacity, in many advanced economies. In some countries, idle capacity is the highest since the double-dip recessions of the early 1980s. The

most comprehensive measure of resource slack in an economy is the so-called output gap, which measures actual GDP relative to potential GDP. Potential GDP represents the highest level of output that an economy can sustain over a long period of time without generating inflation, given the existing capital stock, labor force and technology. A less comprehensive but more accurate resource slack indicator is the difference between the actual unemployment rate and the unemployment rate associated with long-run sustainable full employment. Fig. 1 shows this metric for the US and the UK.

Theoretically and empirically, narrow and wide output gaps are associated with inflation and disinflation, respectively. To see why, consider an

Fig. 1: Labor resource slack is massive



Note: NAIURU = non-accelerating inflation rate of unemployment.
Source: Bloomberg, UBS WMR

economy with substantial resource slack. If firms try to raise prices in this environment, competitors will rush to hire unemployed workers to increase their production and gain market share. Therefore, fierce price competition will tend to moderate inflation. For an extremely wide output gap, prices can fall and trip an economy into deflation. In the opposite environment, when the output gap closes, inflation tends to rise, since aggregate production cannot be increased further and, consequently, businesses have the power to raise prices. Fig. 2 depicts US labor market slack and the annual change in core CPI inflation. A tight/loose labor market has historically been followed by rising/falling inflation, although that link has broken down somewhat since the early 1980s.

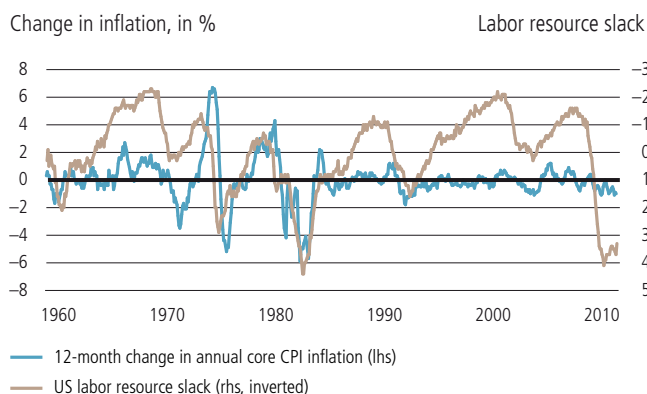
In the aftermath of the Lehman Brothers collapse, policymakers implemented a wide array of measures to prop up aggregate demand. The US, UK and Eurozone central banks decided to increase the money supply via quantitative easing measures, which spurred aggregate demand through lower interest rates and tighter credit spreads (see Fig. 3). The Federal Reserve's expansionary monetary policy spread to countries in Asia, the Middle East and Latin America, whose currencies were pegged to the US dollar. The worldwide passage of fiscal stimulus measures supported demand through lower taxes and higher government spending. Finally, some countries pursued weaker currencies in an attempt to boost exports. Some of these currency moves likely also created even easier monetary conditions than would have

Forces that shape consumer price changes and monetary policy

Economic theory and history point to five key drivers of consumer price changes: resource slack, inflation expectations, labor costs, commodity prices and currencies.* Monetary policy affects these five variables through several channels. Expansionary monetary policy (an increase in the money supply), lowers interest rates, which spurs aggregate demand through lower borrowing costs. It also positively impacts business and household balance sheets through higher asset prices, as economic agents positively adjust their expectations for future growth and prices. An increase in the money supply, lower borrowing costs and an improvement in balance sheets help to support bank lending. Thus, the money supply is extremely important for dictating consumer price changes but only if it impacts the above-mentioned five factors via the monetary transmission channels. A central bank could expand its money supply by a factor of 100 and not create inflation if banks hoarded the cash as reserves and did not loan the money to borrowers.

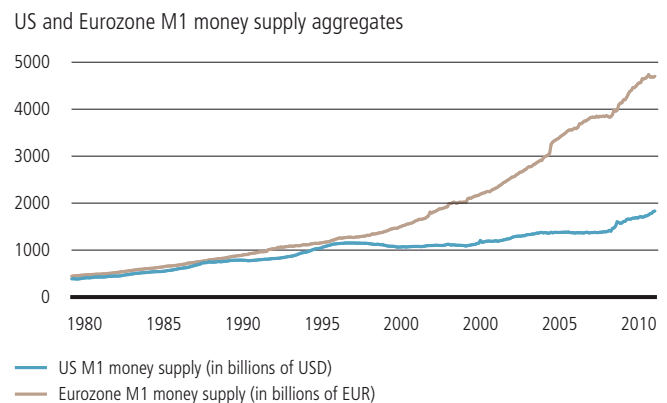
*The last two factors are only relevant for small, open economies.

Fig. 2: Ample labor resource slack suggests disinflation



Source: Bloomberg, UBS WMR

Fig. 3: Faster money supply growth since late 2008



Source: Bloomberg, UBS WMR

otherwise prevailed. All of these forces helped stabilize the degree of resource slack in the global economy.

On the opposite end of the spectrum, household balance sheet deleveraging (a reduction in debt relative to income), an impaired and slow-to-heal bank credit channel and an ongoing rapid increase in China's productive capacity all served to keep resource slack elevated. The US housing-induced credit implosion, which followed a massive run-up in household debt-to-income ratios beginning in the early 1980s, is not over and, in our view, will take many more years to normalize (see Fig. 4). Banks are still absorbing debt losses on their balance sheet, and we believe US total bank lending likely will remain flat for a year or two after it stops contracting. These deflationary pressures weigh on aggregate demand.

Taken together, we think that current inflationary and deflationary forces are roughly offsetting each other, given the stabilization in resource slack as evidenced by the high but stable US unemployment rate.

Inflation expectations matter

Nevertheless, inflation expectations can still short-circuit the standard relationship between output gaps and inflation. This was the painful lesson of the 1970s in the US, when high unemployment and high inflation coexisted for about a decade. Even though ample resource slack meant that businesses had little pricing power and workers

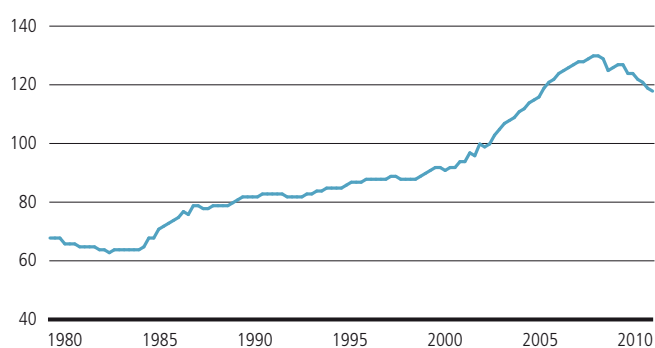
had little wage bargaining power, the oil price shocks, the implementation of capital controls and the disintegration of Bretton Woods (money ceased being backed by gold) together pushed inflation expectations higher. When central banks failed to rein in inflation out of fear that economies would slip into a severe recession, the wage-price inflation spiral was set in motion. Businesses agreed to pay higher wages, since they expected to pass on the rising labor costs to consumers in the form of higher retail prices.

The crux of the matter is that higher inflation expectations, once widely held and deeply entrenched, can lead to rising inflation even when there is considerable slack in the economy. In an extreme case when people flee cash for hard assets and gold, an acceleration in the so-called velocity of money portends an eventual increase in inflation expectations. The velocity of money measures the pace at which economic transactions take place. The monetarist mantra is that in the long run, an increase in the money supply will show up in higher prices, not in higher real economic activity. Or, put differently, too much money will chase too few goods. Thus, inflation expectations and the velocity of money are important factors in gauging the risk of inflation when there is ample resource slack.

Even though the monetarist school of thought had theories for controlling a rise in inflation expectations when the problem was in its early stages, it took Fed Chairman Paul Volcker's actions

Fig. 4: US household debt burden is normalizing

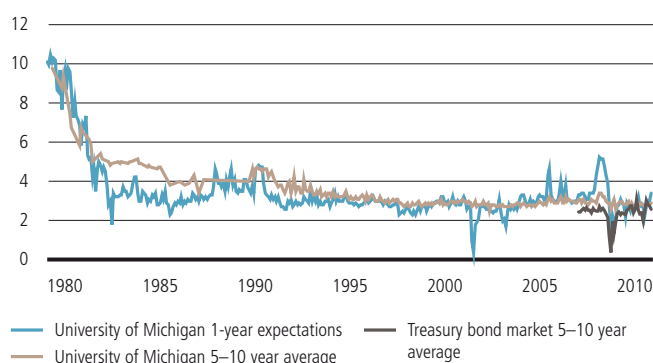
US household debt to disposable income ratio, in %



Source: Bloomberg, UBS WMR

Fig. 5: Inflation expectations are well-anchored

Selected measures of inflation expectations, in %



Source: Bloomberg

in the early 1980s to sharply raise short-term interest rates to reverse the trend. The outcome was a fairly deep recession, but not as deep as feared, followed by a prolonged moderation in inflation. It is important to note that until Volcker stepped up, the Fed had operated pursuant to a different model, one where inflation expectations did not matter. This is a hard lesson learned, but learned nonetheless. Nowadays, central bankers routinely try to manage inflation expectations with their actions and speeches, having successfully anchored them at a low level for the better part of the past 15 years (see Fig. 5).

The interplay among resource slack, inflation expectations and labor costs

When inflation expectations are well-anchored at a low rate, substantial resource slack dampens labor costs as workers have little wage bargaining power. In the US, labor costs represent about two-thirds of total production costs. Since the end of 2008, unit labor costs – labor costs per unit of GDP – have fallen by 3.5%. However, when inflation expectations become unhinged and the wage-price spiral is set in motion, labor costs can rise even with ample spare capacity.

Commodities and currencies

Commodity prices affect inflation through the same channel as wages. Rising prices of commodities used in production raise total costs, and businesses will try to pass on these higher costs to consumers. Pricing power is a necessary condition for rising commodity prices to feed into inflation. In our view, the impact of commodity prices on inflation is often overstated in developed countries. In order to raise inflation on an ongoing basis, commodity prices would have to keep rising unabated. However, as commodities get more expensive, they reach a price that tempers demand and stops the price ascent. Hence, the impact on inflation subsides. We estimate that in the US, a 10% permanent increase in the price of oil in one month raises CPI inflation by 0.4 percentage points above the existing trend after 12 months. In the last expansion, West Texas intermediate crude oil prices rose from about USD 20/barrel in 2002 to nearly USD 150/barrel in 2008. Despite this surge, headline CPI inflation did not get out of control, peaking at 5.6% year-over-year (y/y) in mid-2008. Moreover, the feared pass-

through into other prices did not materialize. Core CPI inflation, which excludes energy and food prices, peaked at 2.9% y/y in late 2006.

There is understandably greater sensitivity to rising commodity prices in countries that have: more energy-intensive production in relation to the size of their economies; higher trade sectors; and higher food shares in their consumption baskets. But even in these instances, commodity prices would have to increase unabated and aggregate demand growth would have to be very strong in order for commodity inflation to morph into a broad inflation problem.

A weaker currency cheapens exports and makes imports more expensive for a given set of export and import prices. Therefore, currencies affect inflation through two channels. First, a weaker currency lowers resource slack by boosting net exports. Second, a weaker currency makes imports more expensive and thus “imports” inflation. The effect of a weaker currency on inflation is stronger for a sharper devaluation, as well as for a smaller and more open economy. In the US, the effect of a weaker dollar is fairly muted, as exports and imports comprise only about 12% and 15% of GDP, respectively. The USD would have to depreciate a lot in order to have a significant impact on inflation. The almost 40% devaluation of the trade-weighted USD from 2002 to 2008 and the accompanying surge in import prices – also due to the surge in the oil price – did not lead to a massive inflation bout over that time period.

Not déjà vu all over again

The current ample resource slack in the economy should forestall a rapid rise in inflation from its rather low levels in the US and its moderate level in Europe for the next two years or so. Even if growth were to accelerate noticeably, which we do not expect, it would take many years to reach potential output. A convenient rule of thumb in the US is that for every one percentage point of above-trend real GDP growth, the unemployment rate falls by half a percentage point (Okun’s law). We estimate that in the next decade, potential real GDP growth in the US will likely average around 2.5% or less. Our moderate recovery scenario thus implies that it could take up to 10 years for the unemployment rate to fall back to 5%, a level



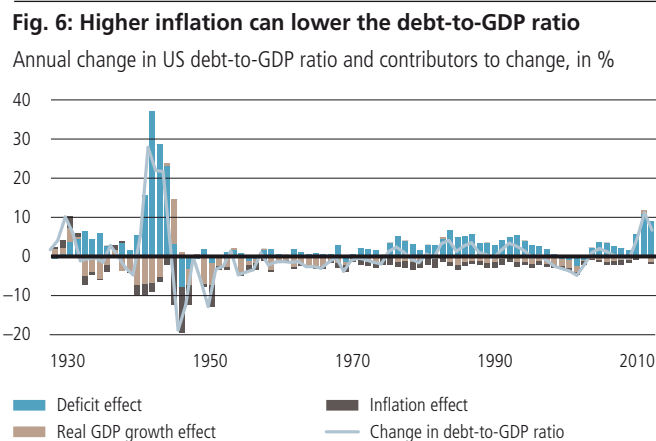
In the wake of the financial crisis lie clashing deflationary and inflationary pressures of unprecedented magnitude. The result of that clash will be a wave – not a ripple – and that wave will be inflation, but any serious pressures are several years away.

which we consider to be consistent with long-run sustainable full employment.

However, in the middle and latter years of this decade, we think global inflation will rise for three reasons:

- Most important, the Fed is engaged in an all-out fight against deflation and, in our view, would prefer to remain overly expansive for longer rather than risk choking off a fragile expansion with policy tightening. The Fed's forceful monetary response, Fed Chairman Ben Bernanke's expertise on lessons learned from the Great Depression and Japan's vivid example of the costs of deflation support this view.
- Moreover, the projected increase in government debt-to-GDP ratios in developed nations is a strong incentive for politicians to seek higher inflation in an effort to erode the real value of debt (see Fig. 6). The independence of central

banks will likely be hotly contested and the pressure to try to lower unemployment with even looser monetary policies will likely be high. Assuming average real GDP growth of 3% and average US federal deficits of 5% between 2012 and 2020, we estimate that 5% average



Source: Federal Reserve Bank of St. Louis, Thomson Reuters, UBS WMR

Inflation

CPI inflation would be sufficient to stabilize the US debt-to-GDP ratio.

- Economic outcomes rarely develop gradually or linearly. When inflationary forces finally gain the upper hand over deflationary pressures, as we expect, global central banks will have little time to react. Consistent with shrinking resource slack, we expect unit labor cost growth to eventually turn positive again, but we are not looking for an uncontrolled ascent in wage inflation. Given our expectation for monetary policy to remain tilted toward expansion, we expect inflation expectations to rise above the long-term trend of about 3%.

So while commodity prices will likely rise in tandem with an ongoing expansion and the relentless rise of China, we do not foresee a spike in prices so massive that it could lead to an explosive inflation spiral in all prices. Similarly, while countries will likely continue to engage in efforts to devalue their currencies, such tactics are a zero-sum game, and not every country can devalue its way to prosperity. We also do not expect a collapse of the USD or the emergence of a contender to the greenback's principal reserve currency status, but merely a dent in its sheen (see page 68 for a more detailed discussion of the outlook for bonds and currencies). Therefore, we also only see limited inflation risk arising on the currency front.

Overall, we do not expect a repeat of the 1970s-style stagflation that occurred in the US. The key reasons are the continued diligence of central banks and the expansion in capacity within the emerging markets. Unlike the situation in the early 1970s, central banks across the globe are acutely aware of the damage that runaway inflation expectations can cause. Therefore, we believe the Fed and other central banks will react steadfastly to rein in inflation expectations once they begin to rise. Officials might be too late but, in our view, will not stay behind the curve for an entire decade like they did in the 1970s. Instead, central banks will continue to fight inflation expectations with both talk and actions. While there is always a risk that wage and consumer price inflation will spiral out of control once the genie is let out of the bottle, we believe central banks will aim to

contain inflation at a structurally higher level than exists today. Specifically, we expect US inflation will average approximately 5% starting in 2013 and extending through 2020.

Keep in mind that the inflation problems encountered during the 1970s were not exclusively a result of central bank policies but also the result of supply constraints. Shortages of skilled workers, artificial constraints on oil supplies and limited productive industrial capacity also contributed to the increase in price pressures. However, the emergence of the developing countries as a source of incremental supply suggests that the bottlenecks that surfaced during the 1970s are less likely over the next decade. The reintegration of both China and India are tantamount to "beaming" hundreds of millions of productive working-age adults onto the planet. This suggests that the sort of runaway inflation that crippled the global economy and wrought havoc in financial markets is unlikely in the decade ahead.

Stocks: *no repeat* of the lost decade

With valuation excesses wrung out, we expect stocks to deliver more “normal” returns, trumping bonds in the coming decade. Historically, it is quite rare for stocks to underperform bonds over a 10-year stretch, particularly after prolonged periods of equity market underperformance.

Jeremy Zirin, CFA, Strategist

An understanding of the past

Before we tackle the daunting task of predicting what return the equity markets will deliver over the next 10 years, it is important to reflect upon the last 10 years. A decade ago on December 31, 2000, the S&P 500 stood at 1320 – after already falling nearly 20% from its March 2000 peak – and few if any could have predicted that over the next 10 years, large-cap US equities would generate an annualized total return (price appreciation plus dividends) of a paltry 1%. As a result, that time period earned the sobering moniker of “The Lost Decade.” And in order to not experience another one, it is essential to understand what went wrong. After all, to paraphrase philosopher George Santayana,¹ those who cannot learn from the past are destined to repeat it.

Causes of the lost decade: economics, valuation, concentration

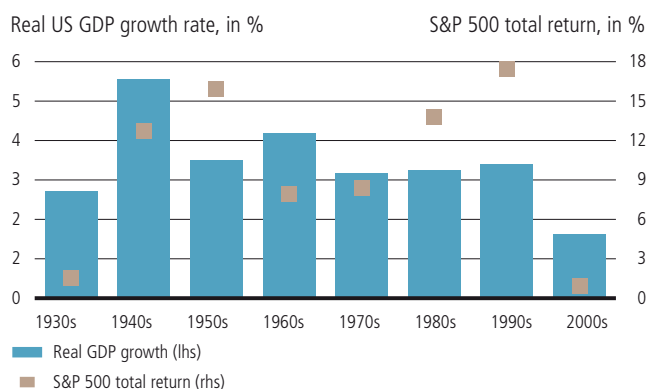
We look closely at three factors to better understand the potential causes of the lost decade: economics, valuation and index concentration. First, we discuss the economic growth environment over the past 10 years and the historical relationship between the economy and the stock market. Next, we examine the relationship between valuation and future market returns. And finally, we note the higher risk that greater index concentration can have on broad market indexes.

The economy

Over the past 10 years, the US economy grew at

a slower pace than in any other decade since the 1930s because of two recessions – one short and shallow setback in 2001 and the more significant contraction during the Great Recession in 2008-2009. But it would be inaccurate to fully attribute the abysmal equity market performance over the last 10 years entirely to sub-trend US economic growth. After all, US real GDP growth was “only” average during the 1980s and 1990s yet the average annualized rate of return for stocks during those decades was 13.8% and 17.4%, respectively. Fig. 1 shows that the economy and the stock market are related, but the magnitude of changes to stock prices cannot be fully explained simply by the growth path of the domestic economy. Over the last 10 years, US real GDP grew at a 1.7% annualized rate, or half the rate of growth

Fig. 1: GDP growth is not the only driver of stock returns



Source: Bureau of Economic Analysis, Standard and Poor's

of the prior two decades. But instead of generating half of the return of the 1980-2000 period, on a total return basis (including reinvested dividends), stocks barely eked out any return at all.

Valuation

When examining historical long-run stock market relationships, we find that valuation plays a greater role. At the end of 2000, on nearly every valuation metric that we analyze, stocks were incredibly expensive. On the traditional price-to-earnings (P/E) valuation metric, the S&P 500 was trading at 28 times one-year forward consensus earnings estimates (which never materialized, incidentally) at its peak in March 2000 and at a still-high 22 times by December 2000 (compared to the long-run average of roughly 15). On our preferred metric of cyclically adjusted or “normalized” earnings, stocks were trading at a whopping 39 times earnings² (see Fig. 2). We have long argued that valuation alone is not a very good short-term predictor of equity markets, but over a 10-year span, the data suggests that there is a strong correlation between valuation and decade-ahead returns (see Fig. 3).

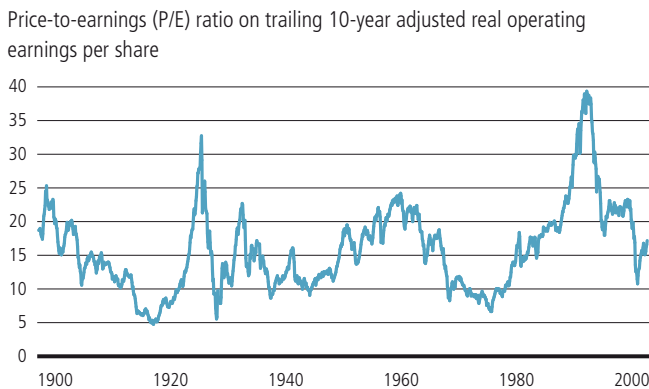
Sector concentration

Another factor that made equity markets increasingly susceptible to a meaningful decline was the fact that the S&P 500 index itself became highly concentrated – first during the tech bubble and then again during the financial crisis. At its peak in early 2000, the Information Technology sector represented 35% of the S&P 500 index market

capitalization, compared to the second-largest sector at the time, Financials, with just 12%. This gulf was the result of the wildly excessive valuations attributed to anything “dot com” and significant additions of technology stocks to the S&P 500 by its index committee. From 1990 to 2000, the number of technology stocks increased from 44 to 71. By comparison, there were net declines in index representation in the Industrials (from 88 to 56 companies), Basic Materials (from 61 to 41) and Consumer Staples (from 37 to 27) sectors over the same period. This dynamic feature of the composition of the S&P 500 index itself – influenced by what Standard & Poor’s labels as “sector representation” – creates greater concentration risk when index changes are extreme. Said differently, as bubbles are being formed, the S&P 500 tends to add stocks from these new “growth sectors,” often after they have meaningfully appreciated and become quite expensive. That was certainly the case in the late 1990s, which exacerbated market volatility both on the upside and downside.

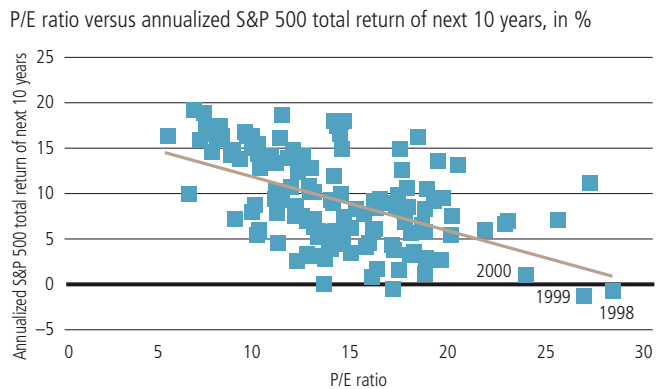
A similar but less exaggerated experience occurred in the years leading up to the financial crisis when the Financial sector’s lead over the next-largest sector grew to nearly 8% (see Fig. 4). Clearly, when market indexes become less diversified and have greater sector concentration, market risks rise since meaningful declines in those large sectors have a greater impact on the overall index.

Fig. 2: Stocks were extremely expensive ten years ago



Source: Shiller (2011), Standard and Poor’s, UBS WMR estimates

Fig. 3: Valuation negatively correlated with decade returns



Source: Shiller (2011), Standard and Poor’s, UBS WMR estimates

All was not lost then, all is not lost now

Over the past 10 years, many non-US equity markets and small- and mid-cap US stocks performed much better than the large-cap S&P 500 index. Within the S&P 500, there were some pockets of strong performance, notably in the commodities-related sectors. But while the average S&P 500 sector earned nearly 40% over the past 10 years, the index barely budged since Financials, Technology and Healthcare – which collectively represented 53% of the entire index in December 2000 – all posted negative returns. In fact, although the S&P 500 (a market-value-weighted index) generated an annualized total return of just 1.4% from 2000-2010, the S&P 500 equal-weighted total return index produced an annualized gain of 6.3%.

Looking back, looking ahead

Ten years ago, investors in either the S&P 500 or a portfolio that closely tracked the index were actually holding a very expensive, highly concentrated basket of stocks. In addition, the economy was at the precipice of an initial short and shallow recession in 2001 and a terrorist attack that exacerbated that downturn, only to be followed seven years later by the deepest peacetime recession since the 1930s. While the economic outlook remains challenging today, we propose that future equity returns appear far more attractive for investors than they did at the outset of the last decade.

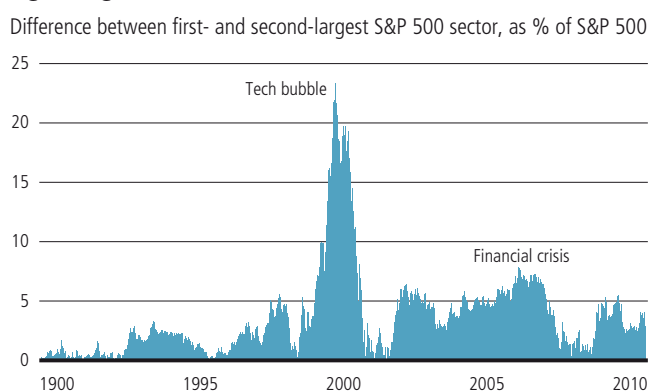
Admittedly, economic growth may fall short of long-run averages as the US economy faces the ongoing structural challenges of household sector deleveraging and inevitable fiscal consolidation. Despite this trend US GDP growth over the next 10 years should manage to exceed last decade's historically low growth rate of just 1.7% (see page 8 for a more detailed discussion of US leadership). Current GDP is depressed – still slightly below its 2007 peak – providing a low base effect to lift growth rates while gains in population, labor productivity and innovation should continue to support economic growth rates. But keep in mind investors buy shares of companies, not shares of GDP. Corporate profits for US companies benefit not only from the domestic economy, but are increasingly global. Stronger structural growth in many emerging market countries should increas-

ingly boost US corporate profit growth as domestic companies have become more exposed to these faster-growing end markets. Note, however, that profits derived in emerging markets may ultimately embed greater volatility, since these fast-growing but less-established markets are more prone to boom-bust cycles.

But the most dramatic difference between 10 years ago and today is the stark contrast in market valuation levels. Sky-high market S&P 500 valuation levels in the late 1990s and early 2000s were predicated on investors extrapolating robust, technology-driven productivity (and ultimately earnings) that failed to materialize. Using an adjustment to smooth out or “normalize” corporate earnings, stocks traded at their all-time high valuation levels relative to trend earnings (by a wide margin) 10 years ago. On the same metric today, the S&P 500 trades roughly in line with historical averages.

Industry-specific, or index concentration, risk has also diminished markedly in recent years. No one sector in the S&P 500 comprises more than 19% of the market capitalization of the index. Perhaps even more important, the largest sector weights, Information Technology and Financials, are each trading at below-average valuations – both on an absolute basis and relative to the market. With little industry concentration and no obvious valuation or earnings bubbles, the probability of an adverse shock to market indexes appears low, compared to history.

Fig. 4: Higher sector concentration increases market risk



Source: FactSet, UBS WMR



Our expectation that equities will outperform bonds during the decade ahead is predicated at least as much on a bleak outlook for fixed income investments as it is on overall constructive prospects for equities.

Our 2020 S&P 500 “target” or fair-value estimate

Recognizing that forecasting equity prices 10 years into the future is fraught with peril, we nonetheless lay out a framework for how investors should be thinking about long-term equity market returns. Equity prices are a function of earnings and the price investors are willing to pay for those earnings, known as the price-to-earnings (P/E) multiple. Even though earnings fell sharply in both the 2001 and 2008-2009 recessions, over the last 10 years S&P 500 operating earnings actually rose a respectable 50%. As previously discussed, the primary culprit behind the paltry equity market performance during the lost decade was the sharp contraction of the S&P 500’s P/E multiple.

Imagine the date is December 31, 2000. Any stock market strategist who had predicted that the S&P 500 would be lower in 10 years would have been ridiculed. But a relatively simple forecasting technique of valuing stocks based on normalized, or cyclically adjusted, earnings and applying a long-

term average P/E multiple to those earnings would have yielded that very conclusion. At the end of 2000, a strategist armed only with the observed market price and earnings data over the prior 60-year period and a fundamental belief in mean reversion could have determined the following: extrapolating 1940-2000 S&P 500 earnings over the upcoming decade would have yielded a 2010 S&P 500 earnings per share (EPS) estimate of USD 87. Applying the average 1940-2000 P/E multiple of 14.2 to those earnings would have resulted in an S&P 500 price target for the end of 2010 of 1250 – what remarkable accuracy!

Of course, the reason this “works” is because it assumed that P/E multiples would revert back to the long-run average. At the time, the abnormally robust equity market valuation multiples were defended by investors and strategists as the result of higher secular growth resulting from the tech-inspired “e-economy,” low and stable inflation and the muting of the business cycle. Unfortunately, we all know how this movie ended.

But fast forwarding to today, market returns over the next 10 years are likely to be more “normal” due to the very fact that the valuation excess witnessed earlier this decade have been painfully wrung out. Assuming that the S&P 500 will again gravitate toward its intrinsic value, we conclude that over the next 10 years, the S&P 500 should generate a total return of approximately 9%. Trend S&P 500 earnings should reach USD 165 per share by the end of 2020. Applying the average P/E multiple since 1940 on trailing EPS of 14.7x would imply an S&P 500 target for the end of 2020 of 2450, which roughly translates to a 7% annualized gain in the index. Adding a 2% dividend yield would push the annualized total return for stocks to 9% over the next 10 years.

Reversal of fortunes

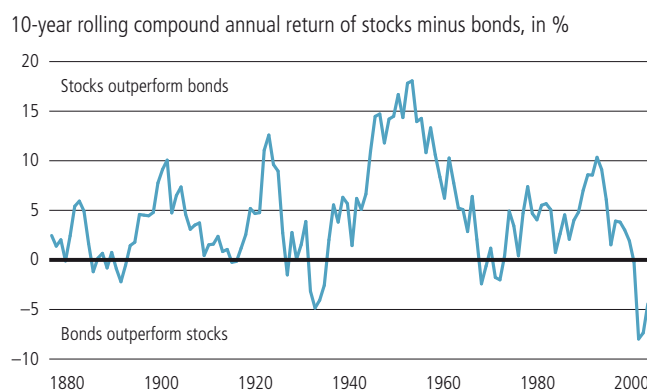
Our expectation that equities will outperform bonds during the decade ahead is predicated at least as much on a bleak outlook for fixed income investments as it is on overall constructive prospects for equities. As discussed in more detail on page 57, we expect inflation to rise over the next couple of years and to average 5% during the decade. Together with mounting concerns about public debt sustainability, the implication is that yields for the broad bond market are likely to shift into the 5-7% range and remain elevated for a protracted period. We would expect average bond returns in the low single digits. Adjusted for inflation, bonds will have a hard time posting a positive return.

For additional historical perspective, annual returns from equities have exceeded bonds 63% of the time since 1871. However, looking at cumulative 10-year returns, bonds have outperformed stocks just 15% of the time. Moreover, in those 10-year periods when bonds outperformed stocks, the average annualized stock market return has been just 2.1%. So it appears that there is significant room for our equity market forecast of 9% annualized market gains to fall short and for stocks to still outperform bonds. Even if we assumed that earnings growth over the next 10 years would match the sub-trend growth of the past decade, stocks would still generate an annualized return of over 6%, assuming an average P/E multiple at the end of the period.

Another method to gauge the relative attractiveness of stocks versus bonds is to compare the current equity risk premium (ERP) to the long-run average. The ERP is essentially a measure of relative yield between stocks and bonds, namely the earnings yield on stocks minus the real bond yield. Based on our estimates, the current ERP falls in the 60th percentile. Historically, the higher the ERP, the stronger the outperformance of stocks relative to bonds in the subsequent 10 years. Keep in mind that between 1997 and 2001, the ERP was consistently between the 8th and 19th percentile, and subsequent 10-year relative returns favored bonds by the widest margin in history.

In sum, we expect that after a decade in which bonds outperformed stocks by one of the widest margins on record (see Fig. 5), the fortunes of these two asset classes will reverse. Bonds will come under severe pressure, while stocks should post reasonably attractive returns.

Fig. 5: Stocks likely to rebound after pronounced weakness



Source: Shiller (2011), Standard and Poor's, UBS WMR estimates

Bonds: the elusive quest for a *safe haven*

We expect interest rates in advanced economies to rise amid structural deficits, growing debt burdens and the prospect of higher inflation. Erosion in the perceived credit quality of government bonds will challenge the notion that sovereign debt is a risk-free asset, leading to an increase in risk premiums.

Anne Briglia, CFA, Strategist; Katherine Klingensmith, Strategist; Thomas McLoughlin, Analyst

The downside of leverage: eventually the piper has to be paid

US Treasuries have long been considered a “risk-free” asset, with a zero probability of default. However, the financial condition of the US federal government has been subjected to increased scrutiny, and with it, the notion of Treasuries as a risk-free asset. Until recently, the credit quality of the government debt of European Monetary Union (EMU) members was also considered to have minimal, if any, risk of default. However, the European debt crisis has sparked a reassessment of credit quality, prompting ratings downgrades of several countries (see Fig. 1). We expect Treasury securities, as well as the sovereign debt of Japan and certain Eurozone countries, not to mention their respective currencies, will come under grow-

ing pressure in the decade ahead (although the prospects for actual sovereign defaults remain remote for most countries). This development represents a paradigm shift brought about by the enormous debt loads these countries accumulated leading up to, and as a result of, the financial crisis (see Fig. 2).

Managing these debt burdens poses several structural challenges:

- The risk of “crowding out” private borrowers increases as government debt takes on a larger share of the overall bond market. In this environment, interest rates rise for both individuals and corporations as they are forced to compete with the government for the same pool of sav-

Fig. 1: Sovereign debt ratings are unstable

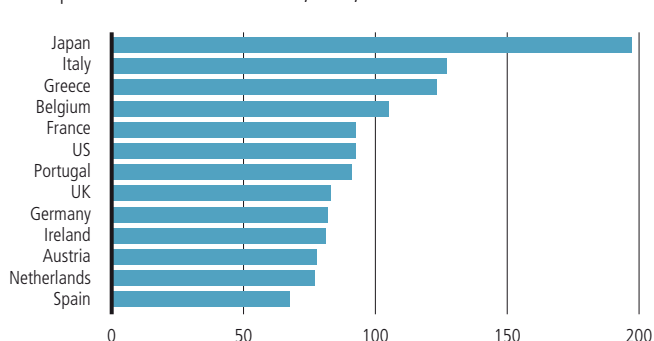
Changes in long-term sovereign debt ratings, local currency, last 10 years

Stable	Upgraded	Downgraded
US	China	Greece
France	Brazil	Ireland
Germany	India	Portugal
Canada	Japan	Spain
UK		Italy

Source: Moody's, S&P, Fitch

Fig. 2: Government debt threatens sovereign credit ratings

Gross public debt as a share of GDP, in %, 2010



Source: OECD

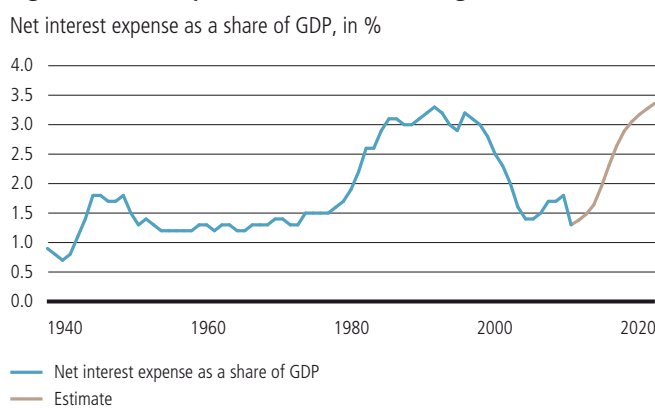
ings. This dynamic also restrains productivity and economic growth. Academic research suggests that once a country's debt-to-GDP ratio reaches approximately 90%, the overall growth rate of the economy starts to slow.¹ In many developed economies, debt ratios have already crossed this threshold and are likely to increase in the years to come.²

- The cost of debt service is likely to increase significantly. Up to this point, interest costs have actually fallen for many countries even as the amount of debt outstanding grew rapidly. For example, while US government borrowing increased by USD 3 trillion over the last two years, interest expense dropped from USD 253 billion to USD 197 billion, or just 1.4% of GDP (see Fig. 3). Debt service costs have been low because strong demand for government bonds, easy monetary policy and decelerating inflation have pushed yields to historically low levels. The Federal Reserve (Fed) and the European Central Bank (ECB) have kept monetary policy rates extraordinarily accommodative in order to ward off deflation and stimulate economic growth. As the financial crisis recedes, deflation fears will ebb, and growth will accelerate. We expect the demand for government debt will fade and central bankers will begin to normalize monetary policy. As interest rates rise, the interest expense on outstanding debt will grow rapidly. The Congressional Budget Office (CBO) projects that the interest expense for the US federal government will climb to USD 778 billion per

year by 2020, or 3.4% of GDP.³ As government debt increases and becomes a larger share of GDP, we expect the rate of interest that investors demand to hold US Treasuries will likewise increase.

- When chronic fiscal and current account deficits coincide, the resulting dependence on foreign savings can create political and economic friction. In the US, the federal government has grown more reliant on global investors for debt financing. Foreign ownership of US Treasury securities increased from 35% in the early 1990s to 47% presently (see Fig. 4). Three countries – China, Japan and the UK – account for nearly 25% of the foreign ownership of US government bonds. Although difficult to quantify, we can infer that foreign buying has had the significant effect of lowering borrowing costs for the US government.⁴ Highly indebted advanced economies vary in terms of the degree of domestic savings available to finance government overruns, with countries such as the UK and some peripheral European nations also highly dependent on foreign savings. Should foreign investors choose to redeploy their capital elsewhere, domestic investors in these countries would need to shoulder more of the financing, sending bond yields higher.
- The most heavily indebted countries will most likely be unable to grow their way out of their problems, given the magnitude of government debt outstanding. Government debt burdens

Fig. 3: Interest expense on US debt set to grow



Source: Congressional Budget Office, Office of Management and Budget

Fig. 4: Outstanding debt and foreign ownership have increased



Source: Bloomberg, US Treasury Department

are increasingly structural in nature rather than cyclical, making it much harder to automatically pare back on borrowing when the economy

// While outright default is an option in principle, we find it unlikely, especially for those countries that control their own printing presses. //

revives. Structural problems include: an aging population and increased spending on old-age entitlements, such as healthcare and pensions; a workforce with obsolete skills or limited mobility; and the politics of special interest groups, which make cutting services and subsidies extremely difficult. While austerity is the traditional policy prescription, there are limits on how much a government can cut spending and hike taxes, since at some point higher taxes produce disincentives to work. And voters can reject spending cuts if they cause too much pain. Austerity can be critical for regaining the market's confidence, but historically it is rare that austerity alone actually brings down a country's absolute level of debt.

A pact with the devil: rising inflation

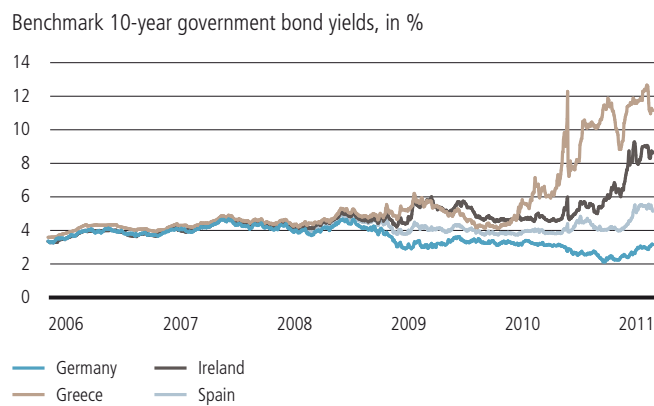
What can a country possibly do to get out from under a crushing debt burden? While outright default is an option in principle, we find it unlikely, especially for those countries that control their own printing presses. Countries running external deficits would be shooting themselves in the foot by defaulting, as they would find it especially painful when they eventually return to international capital markets to seek new loans. Instead, we expect central bankers will tolerate higher levels of inflation, although to different degrees (see page 57 for a more detailed discussion on our outlook for inflation). Because debt is fixed in nominal terms and most governments borrow in their domestic currency – a value over which they have some control – there is a strong temptation to allow inflation to rise. To lower the value of the debt, all policymakers need to do is devalue the money in which the debt is repaid through an

increase in inflation and an erosion of purchasing power. To do this, a government could ask – or even compel - its central bank to buy its sovereign debt with newly printed money, a process known as “debt monetization.” The result will be higher inflation and an erosion of the debt's value in real, or inflation-adjusted, terms. Those countries that do not have their own currency cannot inflate away debt. This puts countries that use the euro at lower risk of monetization but at higher risk of default than the US or the UK.

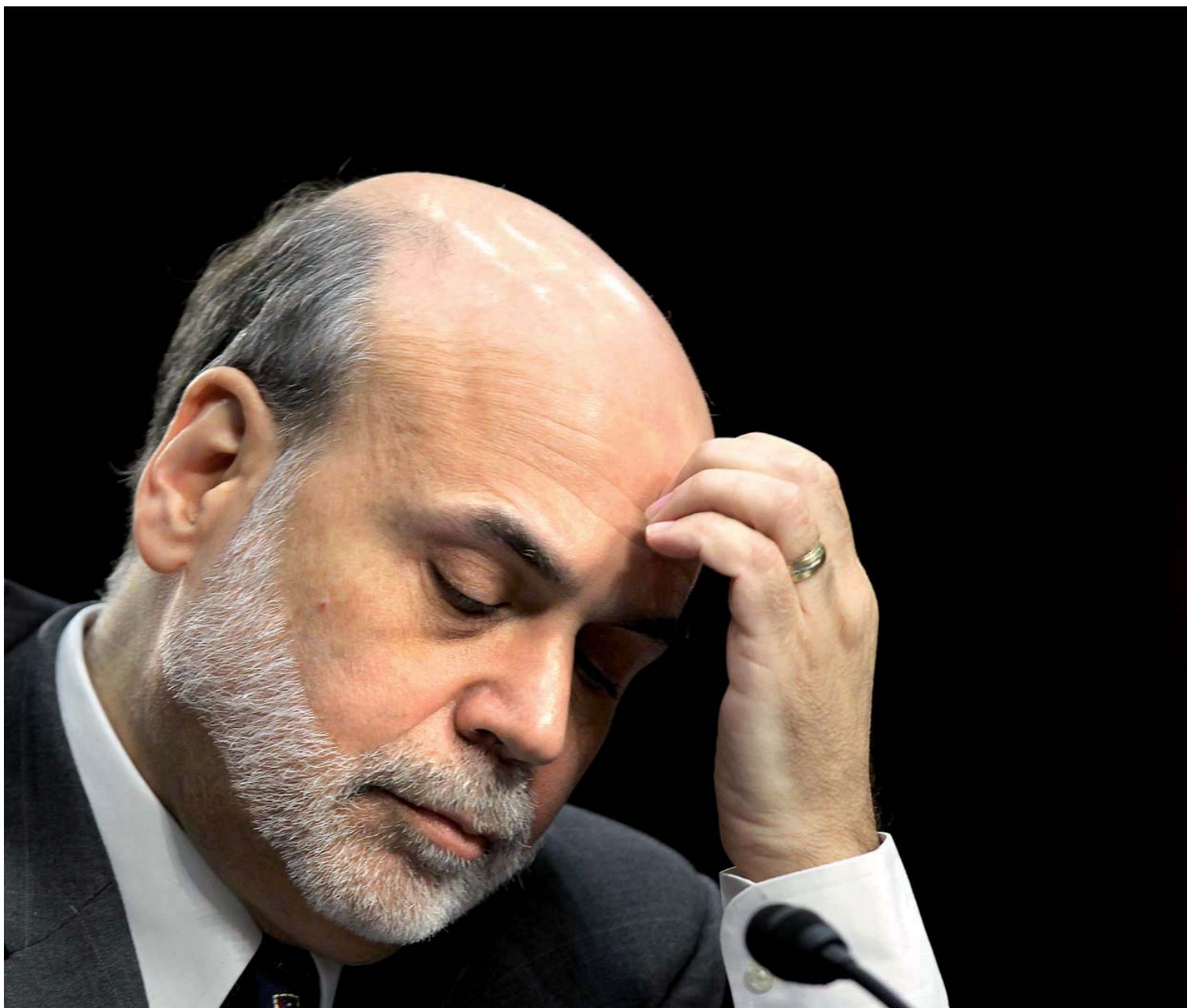
Sovereign debt: the thrill is gone

We believe default risk, which is the ultimate threat to bondholders, is higher for Eurozone countries than the US. Because monetary policy is conducted by the ECB, individual governments no longer have their own currency to debase through inflation. Instead, governments of those countries facing high debt burdens within the Eurozone will be forced to rely more on austerity measures than the US. We do not think there will be widespread sovereign defaults, but the threat that the EMU might permit the restructuring of an individual government's debt and force losses on private bondholders will cause substantial market volatility. Those countries with better fundamentals and a higher likelihood of growth and successful austerity programs are less likely to experience difficulties raising money in inter-

Fig. 5: Financing costs will continue to diverge



Source: Factset



We expect the US to experience higher inflation than other developed countries, further burdening the dollar, as the Fed struggles to reduce its large balance sheet and is tempted to employ some degree of debt monetization.

national capital markets. Investors have already begun to differentiate among Eurozone countries, a trend we believe will deepen. Credit risk premiums have been applied to most European sovereign debt, and yields on bonds from Greece, Ireland, Portugal and Spain have increased compared with Germany (see Fig. 5).

In contrast, US Treasuries are still considered a

risk-free asset. Although we believe there is little chance that US Treasuries will actually default, the overall creditworthiness of the federal government debt will deteriorate in the eyes of lenders if Congress fails to adopt fiscally sustainable tax and spending policies. A downgrade of US Treasuries will not, in our view, mean a material risk of default but will result in considerable interest rate risk and a substantial increase in volatility.

Trouble ahead: higher US government bond yields

We believe the 30-year decline in Treasury yields has run its course. Although a sustained period of higher bond yields is unlikely in 2011, due to lingering deflationary pressures and still modest private sector borrowing needs, a number of structural factors point to higher Treasury yields in the years ahead. The Fed’s aggressively accommodative monetary policy response to the financial crisis and the ensuing Great Recession was a key factor in lowering Treasury yields to generational lows. During the acute phase of the financial crisis, Treasury yields fell to levels last seen in the 1950s as investors dumped riskier assets and snapped up Treasury securities (see Fig. 6). Constrained by the zero lower bound on interest rates and anxious to avert a Japanese-style bout of deflation, the Fed implemented several asset purchase programs, buying agency and Treasury securities, among other assets, in an effort to lower yields on intermediate- and longer-maturity bonds. The asset purchase program, known as “quantitative easing” (QE), provided essential support for the housing and banking sectors during the recession (see Fig. 7).

A second round of quantitative easing, commonly referred to as QE2, has been more controversial in the US and abroad. By adding more reserves to the banking industry, the Fed is attempting to stimulate loan demand and encourage credit expansion. Critics assert that rates are already so low that further monetary stimulus is unlikely to

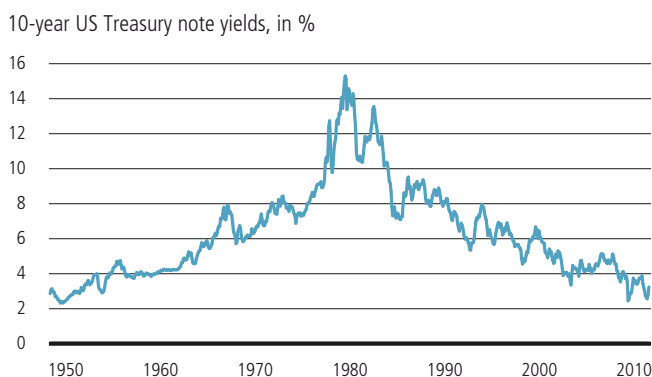
encourage businesses and consumers to borrow more aggressively. In their view, the American economy is caught in a liquidity trap whereby loan demand is diminished because consumers and businesses cannot identify profitable investment opportunities. Some foreign central banks have also criticized QE2 as a thinly disguised attempt to depreciate the value of the dollar at the expense of other currencies. By driving the dollar lower in value, US exports may become more attractive to purchasers outside the US. Critics argue, however, that such a policy will reduce global growth by hampering economic activity in developing countries and simply drive up the prices of imported goods in the US, thereby further contributing to higher inflation.

Low inflation and falling inflation expectations have been a critical element of low overall yields. As the economy finds a firmer footing in the years ahead, the Fed will need to reverse an extraordinary amount of monetary stimulus. Should the Fed fail to unwind its easy monetary policy in a timely fashion, it risks overheating the economy and triggering inflation pressures. Perhaps an even bigger risk is that of deliberate monetization by the Fed in order to help the Treasury Department maintain demand for its bonds (see page 57 for a more detailed discussion of inflation).

Where do we go from here?

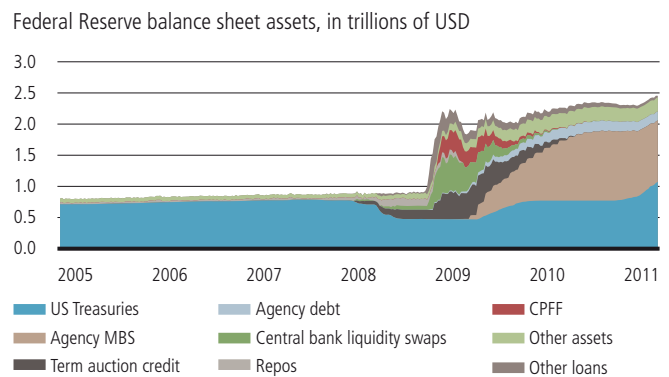
We expect that due to both heightened credit and inflation concerns, bond yields on the sovereign debt of many of the advanced economies

Fig. 6: Treasury yields are low from a historical perspective



Source: Federal Reserve

Fig 7: The Fed expands its balance sheet



Note: MBS = Mortgage-backed securities. CPFF = Commercial Paper Funding Facility.
Source: Federal Reserve

will rise and become more volatile over the next several years. The concept of risk-free assets and a passive “no risk” portion of a portfolio is, in our view, obsolete. This represents an overall shift in the way investors approach and manage fixed income portfolios. We expect such rate volatility will demand much more intensive management of bond portfolios.

Bond yields can be decomposed into the real yield plus a premium to compensate for inflation risk and credit risk. Historically, bond investors have not demanded a credit risk premium to hold Treasury securities but we believe this will change in the decade ahead. Assuming a real yield of 2%, a credit risk premium of 1% and an inflation premium of 3% to 5%, we believe that the 10-year Treasury yield could rise to somewhere between 6% and 8% over the next 10 years – up substantially from current levels near 3.50%.

Using a simple model to calculate projected nominal and real (i.e., after inflation) returns, we estimate that bonds would offer investors a low nominal return, ranging between 3.0% and 3.50%, while inflation-adjusted returns would range between minus 0.5% to plus 0.75%. (Note: The projections for these return ranges refer to average annual returns over the decade.) Bear in mind that these calculations are rough estimates and that the outcome is significantly influenced by the path of forecasts for inflation, the real yield and the credit risk premium. Returns in individual years during which the yield increase happens are likely to be abysmal. Still, the analysis suggests two conclusions. First, it seems unlikely that the absolute return on bonds will match the favorable experience of the last 10 years. Second, bond returns are likely to lag those on stocks (see page 63 for a more detailed discussion of stocks versus bonds).

Toward a multi-currency framework

In large part because of its risk-free status over the years, Treasury securities and the US dollar have been the world’s reserve asset and currency, respectively, since before World War II.⁵ As the reserve currency, the dollar is the primary means of exchange and a store of value in global markets. Ironically, the depth of the Treasury market

The European debt crisis

The EMU was founded with the idea that the countries within the union would eventually “converge” to similar levels of GDP per capita, as well as savings and spending behavior. However, since the introduction of a common currency in 1999, some countries have run persistent current account deficits (especially those poorer countries on the “periphery” of Europe, such as Greece, Spain, Portugal and Ireland), while others have run surpluses (principally Germany). Markets were asking for similar interest rates to lend to different countries, facilitating the run-up in debt among those peripheral countries with current account deficits, such as Greece and Portugal, and to those with highly leveraged banking sectors, such as Ireland. With the onset of the financial crisis and widespread stress in the banking industry, those countries with large banking industries saw these liabilities at least partially transferred to the state, elevating government indebtedness. While the risk of monetizing debt (and therefore inflation) is lower with an independent supranational central bank, the costs of implementing harsh austerity measures are daunting. We expect that the structural heterogeneity in Europe will not improve and that eventually the union will have to change form or membership. Such a transition will cause substantial volatility in debt and currency markets, if national currencies are reintroduced.

is partly what has made it an attractive place to park assets. This gives the US an unrivaled ability to sell bonds to investors around the world. We expect that America’s worrisome public balance sheet – its high and increasing level of debt and its large current account and budget deficits – will weigh on the dollar for the foreseeable future.

Additionally, we expect the US to experience higher inflation than other developed countries, further burdening the dollar, as the Fed struggles to reduce its large balance sheet and is tempted to employ some degree of debt monetization. However, because there is no ready substitute for the dollar and given that so many countries have their savings in the US currency, we do not expect a collapse in the dollar.

At present, we believe only a major geopolitical or economic upheaval could ultimately unseat the US dollar as the world's reserve currency. First, although its share of the global economy will slip over the next decade, we believe the US will retain its leadership role in world affairs (see page 8 for a more detailed discussion of US leadership). Second, despite its myriad problems, the dollar has a strong grip as the principal reserve currency because of network effects (that is, the cumulative benefits of having a single, dominant reserve currency). Given America's fiscal challenges and the demand among official and private investors for diversified currency portfolios, we expect the share of dollars held in international portfolios to decline gradually over time (see Fig. 8). However, in the absence of alternatives, we expect the dollar to retain its dominant role in foreign exchange markets.

A large part of the dollar's staying power is that there is currently no viable alternative. Hard assets, such as gold, are too scarce and provide limited monetary flexibility. The British pound and the Japanese yen were at one time serious contenders, but have been shrinking in international portfolios because both the British and Japanese economies face slow growth and a smaller global role. It will likely take many years and profound institutional change for the euro to regain appeal as a safe and liquid currency. China's currency, the yuan, is not freely traded outside China, and the country still imposes high barriers to foreign investment and shows little inclination to expand its government debt market. We expect that China will reduce its capital controls and continue to increase the convertibility of the yuan, but even as the currency grows in global importance and value we do not think it will challenge the dollar's role this decade. In sum, we think the dollar is likely to slowly lose

its absolute dominance, leading to a gradual shift in foreign exchange reserve holdings, but will not be overtaken by another currency as a primary reserve currency.

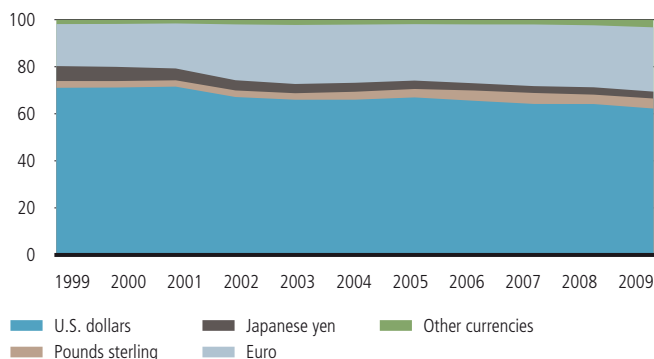
Emerging markets will continue to shine

Many emerging market countries have been on the opposite side of these growing global imbalances, as they accumulate savings and lend to other countries. As such, emerging market currencies have benefited from the strong performance of their economies and from substantial improvements in policies and governance (see page 28 for a more detailed discussion of emerging markets). We expect further improvement in the macro-economic environment, including high economic growth rates and well-managed inflation, to raise productivity, encourage investment, increase domestic consumption and lower interest rates. While we expect a steep appreciation path for many emerging market currencies over the next decade, the large imbalances among blocks of countries also can be destabilizing. Some emerging markets still have unstable governments, a high reliance on exports and uncertain investment environments. Changes in relative economic power can cause political friction, with widespread ramifications (see page 23 for a more detailed discussion of geopolitics).

We do not believe emerging market currencies will form a major part of central bank reserves for at least a decade; nor will they compete directly with the currencies of advanced economies as stores of

Fig. 8: US dollar remains the largest reserve currency

Composition of reported official foreign exchange reserves, in %



Source: International Monetary Fund COFER database

Municipals: focus shifts to pension reform and infrastructure

For many years, the US municipal market exhibited little volatility. State and local government ratings were generally stable and bond insurance was plentiful. For individuals – the single largest part of the municipal market’s investor base – the relative stability of the municipal market was a welcome attribute.

Much has changed. The Build America Bonds program broadened the universe of municipal investors, and with it, forced greater scrutiny of state and local government finances. Antiquated disclosure practices are now subject to widespread criticism; investors can expect more direct federal regulation in the decade ahead. The recent recession has placed a significant amount of strain on state and local government finances across the country through lower tax revenues, sometimes severely so, and corresponding spending cuts. Critical media coverage has exacerbated the problem by increasing the anxiety of individual investors, who together constitute 36% of the market. Not surprisingly, volatility has increased.

Even so, the revenue available to state and local governments is sufficient to pay principal and interest on amortizing debt. And unlike many other asset classes, the municipal market employs long-term amortiz-

ing debt almost exclusively. We believe the potential for a liquidity crisis is muted by the absence of debt structures reliant on periodic bullet maturities. As the U.S. economy recovers, albeit slowly, investors are likely to shift their focus to longer-term challenges.

Three states – Alaska, Michigan and Utah – have already transitioned from defined benefit plans toward defined contribution plans for new employees. As this decade unfolds, more states will follow their lead as the only rational approach to the growing financial burden posed by traditional public pension programs. Persistent budget constraints also will compel states and local governments to rely more heavily on private sector investment in transportation and utility infrastructure. Resistance from public employee unions has been a stumbling block in the past to privatization. We believe governments will be compelled to proceed despite such opposition in the years ahead.

We expect a consensus of sorts to emerge among investors eager to reward state and local governments that proactively address these two most important and pressing issues for the municipal bond market – pension liabilities and infrastructure investment. And these same investors will reduce their credit exposure to governments that fail to adopt meaningful reform.

value or mediums of exchange. We expect central banks will seek to diversify their foreign exchange reserves, and a multi-currency reserve framework may slowly emerge. With the euro’s credentials diminished, Japan’s towering debt-to-GDP ratio hindering the yen and the limited convertibility of the Chinese yuan, the dollar is left as the best among the options. We therefore think a multi-currency reserve framework, with the US dollar playing a central role, seems the most likely devel-

opment over the coming decade. While it is our view that US Treasuries and the dollar will remain dominant in global financial markets, investors would be wise to seek global diversification and hold bonds and currencies of those countries not facing severe debt burdens.

Philanthropy: *makes an impact*

People will increasingly judge philanthropy on results. Large donors demand accountability, while smaller donors use social networks to pool resources and raise awareness. Socially responsible investing is broadening, prompting more companies to embrace sustainable business practices.

Alexandra Mahoney, Analyst; Kurt E. Reiman, Head, Thematic Research WMR Americas

The promise that lies ahead

There are many reasons to expect philanthropy and charitable giving to grow during the next decade:

- The population of potentially large donors is growing. According to *Forbes* magazine,¹ the number of billionaires has risen from just 300 at the start of the new millennium to over 1,000 in 2010 (see Fig. 1).
- An aging world also portends an increase in giving, since people are more likely to donate to charity as they age and leave money in bequests (see Fig. 2). Given historical donation rates at various estate size levels, Havens and Schervish² forecast that Americans may bequeath USD 6 trillion (based on USD 1998) to charities over the next half century.

- Technology is transforming philanthropy by generating social networks to raise awareness of important social issues, as well as new channels for microgiving.

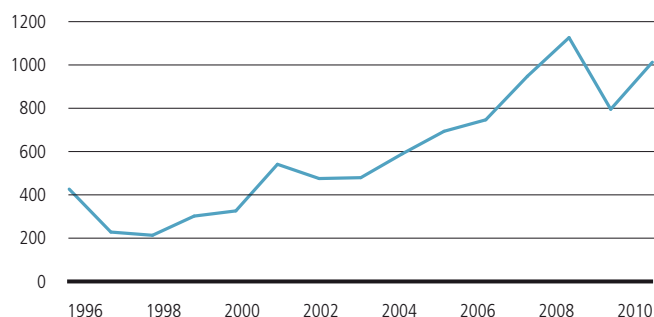
While the potential for charitable giving is enormous, there is also massive need:

- Nearly 1 billion people worldwide are undernourished, and one child dies every six seconds from hunger-related causes.³
- More than 2 billion people lack access to basic water sanitation.⁴
- An estimated 33.3 million people live with HIV/AIDS, and 16.6 million children were orphaned due to AIDS in 2009.⁵

These and many other problems are clearly enor-

Fig. 1: Number of billionaires increases to 1,000

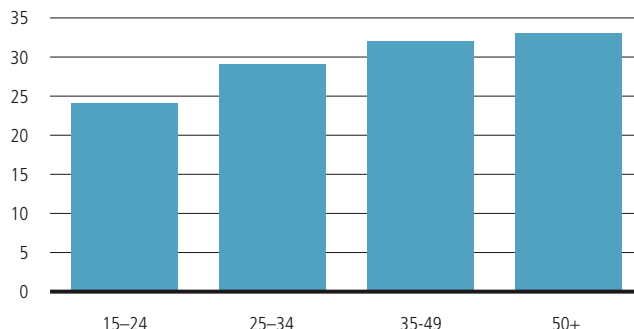
Number of billionaires worldwide



Source: *Forbes*

Fig. 2: Frequency of giving increases with age

Share of respondents who had given money to charity in the previous month, in %



Source: Charities Aid Foundation

mous, and donors have high hopes that their efforts will make a difference. As governments are forced to pare back spending on important social programs, gifts of time and money will become more important for achieving social change. Therefore, donors and philanthropic organizations will work ever harder to ensure that every dollar has the greatest possible impact. Additionally, numerous corporations are embedding environmental, social and governance objectives into their business culture at a time when investors – both individuals and large foundations – are looking to apply their values to their portfolio. Socially responsible investing and impact investing provide the interface between the investors who expect their assets to generate a “sustainable” return and the companies and investments that achieve strong financial and social performance.

The size of charitable giving is impressive. In the US alone, charitable contributions exceeded USD 300 billion in 2009, or 2.1% of GDP (see Fig. 3).⁶ This represents nearly USD 2,000 per American household per year. It is the collective action of these donors, both large and small, as well as the efforts of investors, businesses, foundations and volunteers, that we believe will leave a lasting imprint on the world over the next 10 years.

The whole becomes more than the sum of its parts

The scope and objectives of philanthropic activities – whether through charitable giving or private investing – are also evolving. While impossible to

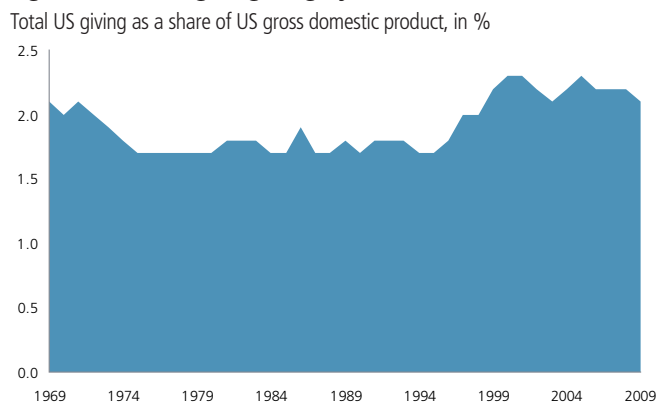
pinpoint all, we identified a number of trends that we believe will shape the world of philanthropy over the next decade.

Colossal pledges of wealth

Individual donations represent the majority of charitable gifts each year (see Fig. 4). But this past decade may yet be defined by the monumental pledges that the world’s wealthiest individuals made to philanthropic organizations, not to mention the formation of massive new foundations. As of 2007, Bill and Melinda Gates had given or pledged over an estimated USD 28 billion, or about 50% of their net worth, which is administered in part through the Bill & Melinda Gates Foundation. In 2006, Warren Buffett pledged USD 30 billion of his assets over 20 years to the Bill & Melinda Gates Foundation, which represented the largest charitable gift in history.⁷

The challenge that Warren Buffett and Bill and Melinda Gates made to America’s billionaires to pledge the majority of their wealth to charity within their lifetime or upon death resulted in the Giving Pledge in August 2010 and 58 commitments by February 2010. These gifts from newly minted millionaires and billionaires have become increasingly important to funding philanthropic efforts because, according to *The Economist*,⁸ “The richest 1% of the world’s adults control 43% of the world’s assets; the wealthiest 10% have 83%.”

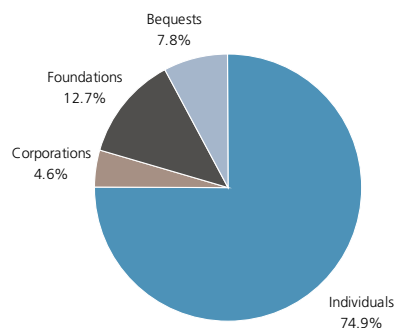
Fig. 3: Charitable giving roughly constant as a share of GDP



Source: Giving USA Foundation

Fig. 4: Individuals are far and away the largest donors

Sources of contributions, in %, 2009



Source: Giving USA Foundation

Corporate involvement to ramp up

Corporations were the fourth-largest donor in 2009, trailing contributions from individuals, foundations and bequests. However, the biggest philanthropic impact from businesses may not necessarily flow from the money they donate but rather from the values they embrace. We anticipate corporations becoming increas-

Socially responsible investing and impact investing

Traditional socially responsible investing (SRI) strategies apply “negative screens” to a portfolio to remove companies with poor environmental or social track records. Quakers were the first to apply this investment approach as far back as a century ago. However, foundations and endowments also use this exclusion method to rid portfolios of investments that do not align with their social missions. A modern-day manifestation of SRI is the FTSE KLD 400 Social Index of US equities that measures the impact of social and environmental screening on investment portfolios. Since its inception in May 1990, the FTSE KLD 400 Social Index had compounded annual growth rates of 7.8%, compared to the S&P 500’s annualized returns of 6.8% over the same period (see Fig. 5).

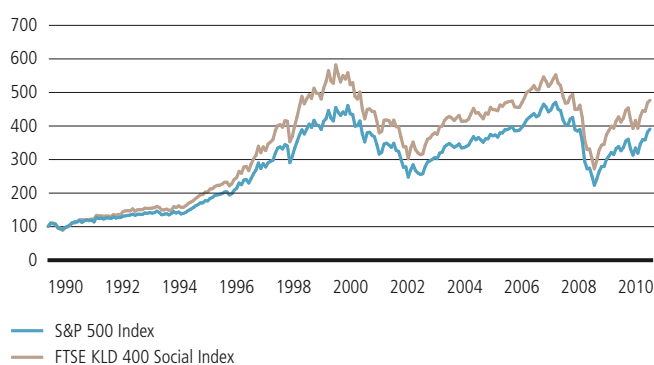
A close relative to SRI – “impact investing” – takes a different tack. According to a report by Harvard University, impact investing (II) is defined as “investments intended to create positive impact beyond financial return” that seek to “actively deploy capital in businesses and projects that can provide solutions at scale.”¹⁰ Impact investing is particularly applicable to endowments and foundations because it enables them to further invest in their missions while also growing the asset base. It is where “philanthropy meets wealth management” as the organization attempts to “maximize its social impact,” according to Wayne Farmer of Arabella Advisors.¹¹ The Rockefeller Philanthropy Advisors describes impact investing as a way to bridge “the sharp dichotomy between profit-maximizing financial investment and “give-it-away” charity [which] is gradually losing its edge.”¹²

ingly more value-aligned for economic and social reasons. Matthew Bishop, co-author of *Philanthrocapitalism: How Giving Can Save the World*, identifies multiple motivations for corporate social involvement that go well beyond publicity stunts and government pressure. Particularly important to companies is being identified as an employer with core social values that inspire people. Bishop also believes that corporations recognize the importance of being a strong corporate citizen, especially when entering emerging markets. “Being more philanthropic is becoming part of corporations’ strategies...the DNA of a company,” according to Bishop.⁹

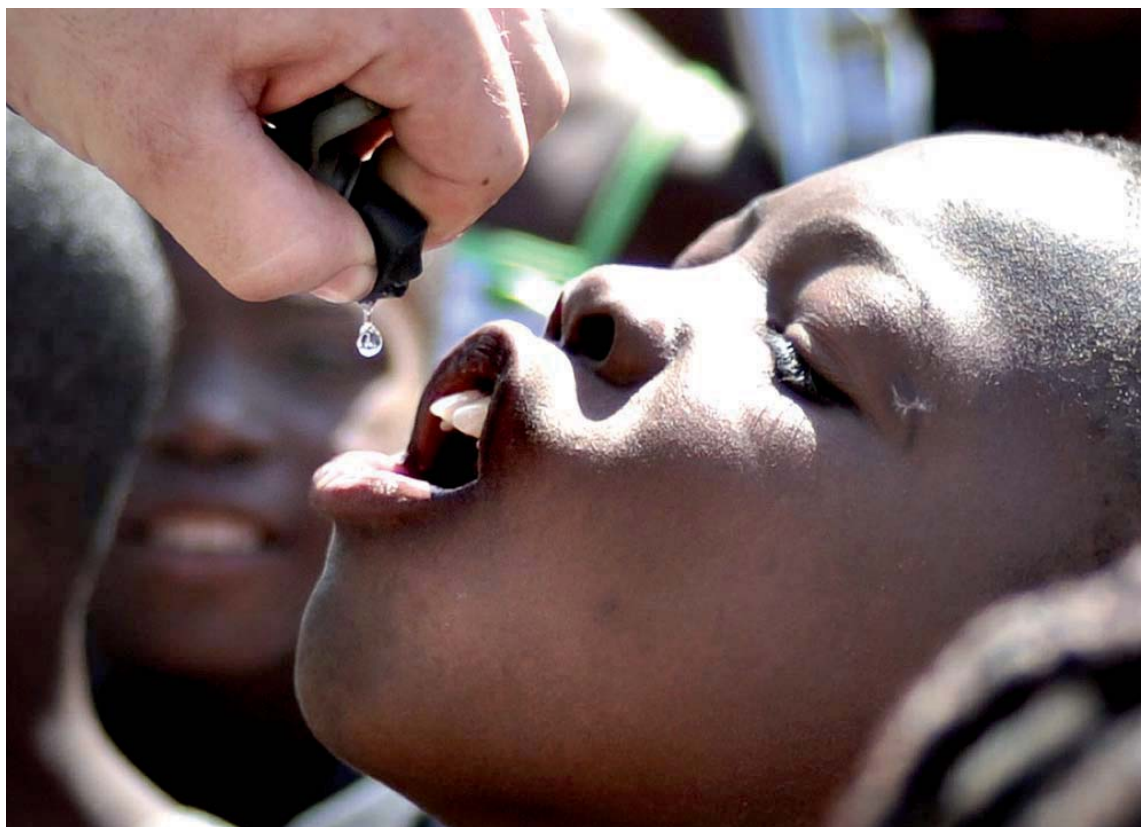
SRI broadens its reach

Both socially responsible investing (SRI) and impact investing (II) will continue to grow throughout the decade as the business of philanthropy becomes both more institutionalized and values-based. Moreover, greater scrutiny of corporate governance has opened an entirely new frontier that will widen the scope of SRI investing and provide additional criteria for evaluating corporations. The need for endowments and trusts to both “do good” and “do well” means that more resources will be allocated to managing SRI and II assets as investor demand grows. What had once been viewed as a niche market or satellite strategy will become increasingly mainstream, due to the more aggressive positioning by philanthropic organizations and continued strong investment results. Moreover, this may lead to spillovers, helping to popularize SRI and II in other parts of the investment community.

Fig. 5: SRI has outperformed the broad market since 1990
FTSE KLD 400 Social Index versus S&P 500 Index (April 1990 = 100)



Source: Bloomberg



While the potential for charitable giving is enormous, the social issues that need to be addressed are even more massive: Nearly 1 billion people worldwide are undernourished, and one child dies every six seconds from hunger-related causes.

Technology connects

We believe charitable organizations and donors can benefit from existing technology, especially when it involves responding rapidly to tragic developments, like a natural disaster. We anticipate more Internet-enabled organizations will use technology to educate, connect and report results to foundations and individuals. Nicole Sexton of The FEED Foundation believes that nonprofit organizations must use social media to prosper. She sees social media as a natural progression to connect with younger generations, now and in the future. Social networks may also pave the way for growth in charitable giving over the next 10 years as more organizations use the Internet as a marketing and fundraising tool. These social networks connect people with similar interests and enable organizations to communicate quickly with their followers. There are even Facebook applications, like *Good Samaritan*, *Social Vibe* and *Charity Trivia*, that target a certain social issue and facilitate donations.

Springing to action: strong underpinning brings results

The factors we mentioned above shape the

operations and strategies of charitable giving and values-based investing over the next 10 years. However, the impetus behind these investments is to create social change by involving more people and raising more funds. We believe these philanthropic efforts will define the decade ahead and leave a lasting and positive impact for the decades beyond.

Individuals identify goals

American history is dotted with transformational donations by some of the country's wealthiest citizens. For example, Scottish-American industrialist Andrew Carnegie donated USD 350 million, almost all of his wealth, during his retirement years on the belief that he could help others help themselves.¹³ To this end, Carnegie focused his efforts on building over 2,500 public libraries and other academic institutions. Many credit his vision with furthering literacy at the beginning of the 20th century.

The guiding principle behind the Bill & Melinda Gates Foundation is "that every life has equal value." The foundation creates grants target-

ing global health, development and education. In 2010, the foundation launched a decade-long initiative pledging USD 10 billion to research, develop and deliver vaccines for the world's poorest countries. The foundation hopes its grants, together with additional gifts, will increase vaccine coverage in developing countries to 90%. If the goal is reached, projections suggest it "could prevent the deaths of some 7.6 million children under age five from 2010-2019. The foundation also estimates that an additional 1.1 million children could be saved with the rapid introduction of a malaria vaccine beginning in 2014, bringing the total number of potential lives saved to 8.7 million."¹⁴

While foundations are able to deploy massive gifts to achieve their mission, individuals are increasingly joining forces to achieve social change. The availability of information online enables individuals to pinpoint their cause and spring to action. A great example of redistributing wealth through technology is the organization, Kiva, whose mission, according to its website, is to "connect people through lending to alleviate poverty." Profiles of entrepreneurs in impoverished regions, many of them women, are posted on Kiva's website. Donors then invest in the growth of the entrepreneur's business with small loans that are transferred to an affiliated local micro-finance organization and delivered to the entrepreneur. The loan can be small, starting at USD 25. Accountability is placed on the entrepreneurs, who are required to pay the interest and repay the loan over time. The entrepreneurs can then post photos or commentary at repayment to display the results of the loan. Since inception in 2007, Kiva has made over 250,000 loans with an estimated total value of USD 190 million to almost half a million entrepreneurs.

This heralds a fundamental shift in the nature of giving. In the past, a fair portion of charitable gifts was made with little collaboration or coordination. So while each gift had an impact, the cumulative effects were more limited due to potential for "overgiving" to certain favored causes and an inability to align gifts with needs. The next generation will be more about "purpose-driven" gifting but with an eye toward allocating those funds more efficiently and effectively.

Corporations adopt sustainable beliefs

Corporations are increasingly adopting environmental, social and governance criteria in the pursuit of a more sustainable business model. This increased awareness of the wider world within which companies operate has yielded numerous positive social benefits. P&G is committed to being a corporation focused on its environment and social responsibilities by instigating change around the world. One example of P&G's progress is through the P&G Children's Safe Drinking Water Program. On a not-for-profit basis, the corporation and its program partners distribute "PUR" packets to purify water. One packet can clean up to 10 liters of dirty water. Since inception, this project has purified more than 2.5 billion liters of drinking water in more than 60 countries, helping to save more than 13,000 lives."¹⁵

Investors align assets with values

In addition to SRI, different investment vehicles are enabling foundations and investors to collect a return, while also fulfilling their philanthropic agenda. Many are doing this by tapping into the knowledge and expertise of others. For example, the Calvert Social Investment Foundation, a non-profit organization founded in 1988, offers the Community Investment Note – a diversified mix of high-impact organizations whose missions cover a range of issues. "Our investors are looking for a way to have their investment portfolio impact the world they live in and strengthen their local communities," says Calvert Foundation's Art Stevens. "We direct their investment to over 250 organizations working in all 50 states and over 100 countries to provide that first critical loan for a small entrepreneur, or help build a day care center that allows a single parent to work. Since inception, our investors and supporters have helped us build or rehabilitate over 17,000 homes, create 430,000 jobs in the U.S. and in developing countries, and finance over 25,000 cooperatives, social enterprises, and community facilities, all while returning interest and principal. We believe it is a real 'win-win'."

Building a sustainable endowment

To grow and remain relevant, foundations must ensure that their social investments have an impact, but they must also manage their portfo-

lio of assets for sustainable growth. The so-called “endowment model” championed by Harvard, Yale and other leading universities was seen as a template for the future evolution in using asset management to achieve long-term investment goals. The ability to both diversify more broadly using nontraditional assets and the shift toward absolute return vehicles were considered more in line with the long-term goals of the institutions. However, the poor returns and liquidity difficulties that surfaced during the financial crisis prompted many to rethink the expansion into the alternative investment space. A report by the Tellus Institute and Center for Social Philanthropy¹⁶ even called for “a transformation of the Endowment Model of Investing” in the aftermath of the crisis. Mandatory annual disbursement requirements also pose a challenge for investments that do not provide consistent and predictable cash flows.

Despite these limitations, it is our view that endowments and other charitable organizations will expand their holdings of alternative investments, such as hedge funds, private equity, commodities and real estate, in the decade ahead. While annual disbursements and short-term liquidity requirements still have to be managed, these funds also need to achieve more consistent and balanced long-term growth. Alternative investments may offer a means for protecting fund assets against the impact of extreme events through greater diversification. Moreover, with bond yields still hovering near generational lows, bonds are likely to generate substandard returns in the decade ahead as monetary policy is normalized, inflation re-emerges, private capital demands recover and government debt burdens remain high (see page 68 for a more detailed discussion of our outlook on bonds). This suggests that endowments will need to continue moving beyond traditional asset allocation approaches to meet their investment goals.

Making an impact

In our view, people will increasingly judge philanthropic efforts by the results they achieve. Large donors demand greater accountability, while smaller donors are able to use social networks to pool resources and raise awareness. Socially responsible investing is broadening as an accepted

and integral investment approach, which has prompted more companies to embrace sustainable business practices. While there will not be one predominant trend that will shape philanthropic institutions over the next 10 years, many opportunities will flow from an increased awareness and focus on accountability.

Leading the charge

Experts on philanthropy are seeing a shift in the guidance and expectations of these charitable efforts. The current examples of philanthropic leadership, in our opinion, may facilitate more change in the next 10 years than in the decade before. Today’s philanthropists are adamant about creating more with what they have been given and displaying their results. The desire to illustrate the changes may be from the influence of today’s donors, who are results driven.

How foundations and individuals approach philanthropy is evolving, according to Sharon Schneider of Foundation Source, into a holistic philosophy or an “Integrated Life.” She states, “Instead of treating philanthropy as a holiday check writing exercise divorced from the rest of our lives, we are striving to integrate personal passions, professional expertise, consumer habits, vacation time and even household buying decisions into a single identity that expresses a consistent set of values.”

The FEED Foundation’s Nicole Sexton believes that organizations should be readily accountable and transparent to their donors. The Internet provides effective ways to illustrate results. Bishop says technology allows the “voice of the recipients” to be heard. Both Sexton and Bishop notice younger generations are leading the demand for organizations to show and track their results. “Giving is not enough, people want impact,” comments Matthew Bishop.

Reflecting on the next decade, Robin Ganzert, CEO of the American Humane Association, recognizes the seismic shift occurring in the world of philanthropy and charitable giving. She notices a stark difference between today’s philanthropists and those of the last 10 years – “a new set of energized philanthropists are emerging who are speaking about change in real terms, asking for measurable impact and creating real economic value from their efforts.”

Endnotes

Intro

¹ Matt Ridley, *The Rational Optimist: How Prosperity Evolves*, New York, Harper, 2010. Print.

United States

¹ Programme for International Student Assessment (PISA) rankings within OECD, December 2010.

² George Friedman, *The Next 100 Years: A Forecast for the 21st Century*, New York, Doubleday, 2009. Print.

³ Saunders and Otley, First noted in: Tocqueville, Alexis De, *Democracy in America*, London, 1835. Print.

⁴ Jonathan Eaton and Samuel Kortum, "National Security in a Knowledge-Based Global Economy," *Perspectives on U.S. Competitiveness in Science and Technology*. Washington D.C., RAND Corporation, 2007. 53-73. Print.

⁵ Richard B. Freeman, *America Works: The Exceptional U.S. Labor Market*, New York, Russell Sage Foundation, 2007. Print.

⁶ Committee on a New Government-University Partnership for Science and Security, National Research Council, *Science and Security in a Post 9/11 World: A Report Based on Regional Discussions Between the Science and Security Communities*, Washington, D.C., National Academies, 2007. Print.

⁷ Zoltán J Acs and László Szerb, *The Global Entrepreneurship and Development Index (GEDI)*, Imperial College London Business School, June 18 2010. Web.

⁸ Art Carden, and Joshua Hall, "Why Are Some Places Rich While Others Are Poor? The Institutional Necessity of Economic Freedom," *Social Science Research Network Economic Growth eJournal*, July 2009. Web.

⁹ "Index of Economic Freedom," The Heritage Foundation, 2011. Web. <<http://www.heritage.org/index/ranking>>.

¹⁰ George Magnus, *Uprising: Will Emerging Markets Shape or Shake the World Economy?* Chichester, Wiley, 2011. Print.

¹¹ "Koret Task Force on K-12 Education," Hoover Institution, 2011. Web. <<http://www.hoover.org/taskforces/education>>.

¹² Chester E Finn Jr, "A Sputnik Moment for U.S. Education," *The Wall Street Journal*, New York, December 8 2010. Print.

¹³ "Red Tape Rising," *The Economist* January 20 2011. Web.

¹⁴ US Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2011 to 2021*, Vol. 4236, Washington DC, January 2011. Print.

¹⁵ Daniel Fisher, "Capital Crunch," *Forbes.com*, *Forbes Magazine*, January 26, 2011. Web.

¹⁶ US National Commission on Fiscal Responsibility and Reform, *The Moment of Truth*, Washington: White House, 2010. Print.

China

¹ Elizabeth C Economy, "The Game Changer," *Foreign Affairs* (November/December 2010). Web.

² Deborah Brautigam, "Africa's Eastern Promise: What the West Can Learn From Chinese Investment in Africa," *Foreign Affairs*, January 2010. Web.

³ Robert S Ross, "China's Naval Nationalism: Sources, Prospects, and the U. S. Response," *International Security* 34.2 (Fall 2009): 46-81. Print.

⁴ David Leonhardt, "The Real Problem With China," *New York Times*, January 11, 2011.

⁵ James McGregor, *China's Drive for 'Indigenous Innovation'*, Washington DC: U.S. Chamber of Commerce, 2010.

⁶ George J Gilboy and Eric Heginbotham, "China's Dilemma: Social Change and Political Reform," *Foreign Affairs*, October 14 2010. Web.

⁷ Patrick Douglass, "Income Inequality and Fiscal Policy Reform in China," *SAIS Review* 29.1 (Winter-Spring 2009): 129-39.

⁸ Sudeep Reddy, "Bernanke: China 'Risking Inflation' With Currency Policy" *Wall Street Journal*, December 6, 2010.

Geopolitics

¹ UBS, *Geopolitics: the blind side*, Zurich: UBS Wealth Management, 2010.

² Emmanuel Saez and Thomas Piketty, "Striking It Richer," *Pathways Magazine*, Stanford Center for the Study of Poverty and Inequality, August 5, 2009. <elsa.berkeley.edu/~saez/saez-USstopincomes-2007.pdf>.

³ SIPRI Military Expenditure Database, "Stockholm International Peace Research Institute Yearbook 2010," 2010. <<http://www.sipri.org/research/armaments/milex/resultoutput>>

⁴ Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2010*, Zurich: Credit Suisse Research Institute, 2010.

Emerging markets

¹ George Magnus, *Uprising: Will Emerging Markets Shape or Shake the World Economy?*, Chichester, West Sussex, U.K., Wiley, 2011. Print.

Emerging consumers

¹ UBS WMR estimates based on Alan Heston, Robert Summers and Bettina Aten, *Penn World Table Version 6.3*, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, August 2009.

² United Nations Population Division, 2011. <<http://www.un.org/popin/data.html>>

³ PricewaterhouseCoopers LLP. "UK Economics Outlook," November 2010. <http://www.pwcwebcast.co.uk/ukeyo_nov2010_complete.pdf>

Energy

¹ Myra P Saefong, "Natural Gas: The Commodity World's 'Ugly Duckling,'" *MarketWatch*, 28 Jan. 2011.

² Donald Marron, "Revisiting Oil and Natural Gas Prices," *CSMonitor.com*, *The Christian Science Monitor*, April 12, 2010.

³ Brian Baskin, "Commodities: China's Oil Demand Is Poised to Push Up Prices," *WSJ.com*, *The Wall Street Journal*, November 8, 2011.

⁴ Jonathan Fahey, "The Search for Cheaper, Lighter Car Batteries," *Forbes.com*, *Forbes Magazine*, June 6, 2010.

⁵ Eric Reguly, "IEA Sees End to Natural Gas Glut," *The Globe and Mail*, November 9, 2010.

Technology

¹ Hearing on Securing Critical Infrastructure in the Age of Stuxnet, Before the United States Senate Committee on Homeland Security and Governmental Affairs, pp. 4 (2010) (testimony of Dean Turner). Print.

² United States, Cong. US EMP Commission. "Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack: Critical National Infrastructures," Volume 1: Executive Report, Washington, D.C., 2004. Print.

³ Jack Spencer, "America's Vulnerability to a Different Nuclear Threat: An Electromagnetic Pulse," *Heritage Foundation*, Backgrounder #1372, May 26, 2000.

Healthcare

¹ Center for Medicare & Medicaid Services, "National Health Expenditures Database." <<https://www.cms.gov/NationalHealthExpendData/downloads/proj2009.pdf>>

² Organization for Economic Cooperation and Development. <<http://www.oecd.org>>

³ Jon Shreve, "The Economic Measurement of Medical Errors," *Society of Actuaries*, June 2010. <<http://www.soa.org/files/pdf/research-econ-measurement.pdf>>

⁴ Association of American Medical Colleges, "Physician Shortages to Worsen Without Increases in Residency Training," September 30, 2010.

⁵ Congressional Budget Office, "An Analysis of Health Insurance Premiums Under the Patient Protection and Affordable Care Act," November 30, 2009.

⁶ Association of American Medical Colleges, "Physician Shortages to Worsen Without Increases in Residency Training," September 30, 2010.

Stocks

¹ George Santayana, "The Life of Reason; Or, The Phases of Human Progress," Vol. 1. New York, C. Scribner's Sons, 1905. Print.

² R. Shiller, (2011), Updated data set from *Market Volatility* (1989), Cambridge: MIT Press, Retrieved March 3, 2009. <<http://www.econ.yale.edu/~shiller/data.htm>>

Bonds

¹ Mehmet Caner, Thomas Grennes, and Fritz Koehler-Geib, "Finding the Tipping Point When Sovereign Debt Turns Bad" Washington, D.C., World Bank Paper No 5391, 2010. Print.

² Carmen M Reinhart and Kenneth Rogoff. "Growth in a Time of Debt." London: Centre for Economic Policy Research, NBER Working Paper No 15639, 2010. Print.

³ United States, "A CBO Study: Federal Debt and Interest Costs," The Congress of the United States, Congressional Budget Office, December 2010.

⁴ Francis E. Warnock and Veronica Caccad Warnock, "International Capital Flows and U.S. Interest Rates," National Bureau of Economic Research Working Paper Series, 2006. <<http://www.nber.org/papers/w12560.pdf>>

⁵ Barry Eichengreen and Marc Flandreau, "The Rise and Fall of the Dollar, or When Did the Dollar Replace Sterling as the Leading International Currency?" National Bureau of Economic Research Working Paper Series, No. 14154, 2008. <<http://www.nber.org/papers/w14154.pdf>>

Philanthropy

¹ Nikola Krastev, "Forbes Rich List: Number of New Billionaires Reflect Global Recovery," Forbes Magazine, March 11, 2010.

² John J. Havens and Paul G. Schervish, "Wealth Transfer and Philanthropy," Interview by Investment & Wealth Monitor, Investment & Wealth Monitor Sept.-Oct. 2009: pp. 6-8. Print.

³ The State of Food Insecurity in the World 2006, Food and Agriculture Organization of the United Nations and FAOSAT, 2007. <www.wfp.org/hunger>

⁴ UNSECO, "UN World Water Redevelopment Report: Water in a Changing World," UNSECO Publishing, London, 2009. <http://www.unesco.org/water/wwap/facts_figures/basic_needs.shtml>

⁵ UNAIDS, "AIDS Scorecards: Overview: UNAIDS report on the Global AIDS Epidemic," November 2010.

⁶ Giving USA Foundation, Giving USA 2010: The Annual Report on Philanthropy for the Year 2009, research and written by The Center on Philanthropy at Indiana University, 2010.

⁷ National Philanthropic Trust, History of Philanthropy, National Philanthropic Trust, 2007. <http://www.npt.org/philanthropy/history_philanthropy.asp>

⁸ "A special report on global leaders: The few," The Economist, January 22, 2011.

⁹ Matthew Bishop, "UBS Wealth Management Decade Ahead – Philanthropy," Telephone interview, January 21, 2011. The Economist

¹⁰ Insight at Community Ventures & The Initiative For Responsible Investment, Harvard University, January 2011. <<http://www.thegiin.org/cgi-bin/iowa/resources/research/173.html>>

¹¹ Wayne Farmer, "UBS Wealth Management Decade Ahead – Philanthropy," Telephone interview, January 19, 2011. Arabella Advisors

¹² Solutions for Impact Investors: From Strategy to Implementation, The Rockefeller Philanthropy Advisors, 2009.

¹³ PBS Online, "People & Events: Andrew Carnegie," 1999. <<http://www.pbs.org/wgbh/amex/carnegie/peopleevents/pande01.html>>

¹⁴ "Bill and Melinda Gates Pledge USD 10 Billion in Call for Decade of Vaccines," January 29, 2010. <<http://www.gatesfoundation.org/press-releases/Pages/decade-of-vaccines-wec-announcement-100129.aspx>>

¹⁵ P&G Children's Safe Drinking Water Program, Proctor & Gamble, 2011. <http://www.pg.com/en_US/sustainability/social_responsibility/childrens_safe_water.shtml>

¹⁶ "Educational Endowments and the Financial Crisis: Social Costs and the Systemic Risk in the Shadow Banking System," Tellus Institute, Center for Social Philanthropy, May 27, 2007.

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