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New Waves of Growth

Unlocking opportunity in the multi-polar world

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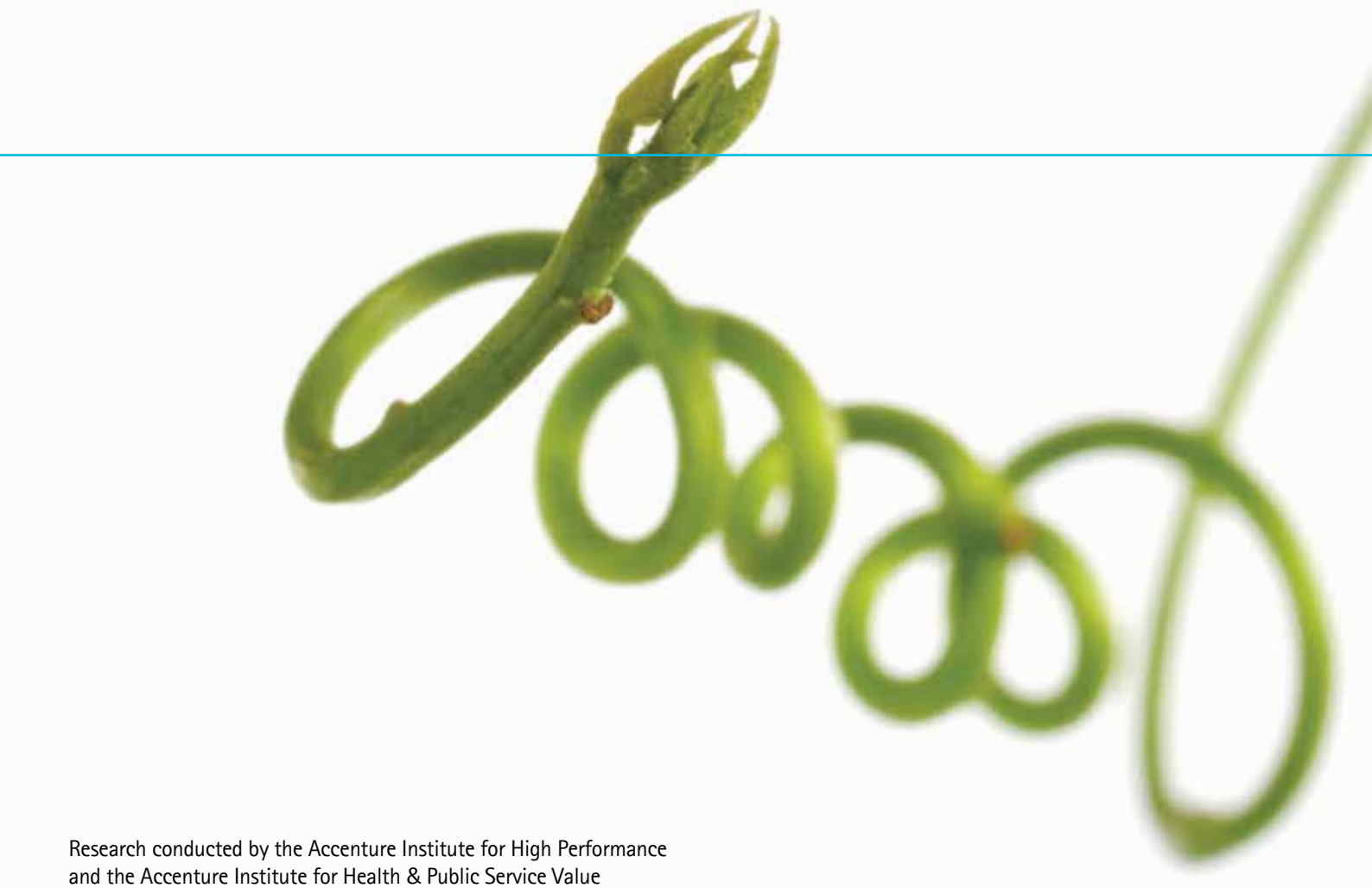

Research conducted by the Accenture Institute for High Performance
and the Accenture Institute for Health & Public Service Value
with economic modeling contributions from Oxford Economics.

OXFORD
ECONOMICS

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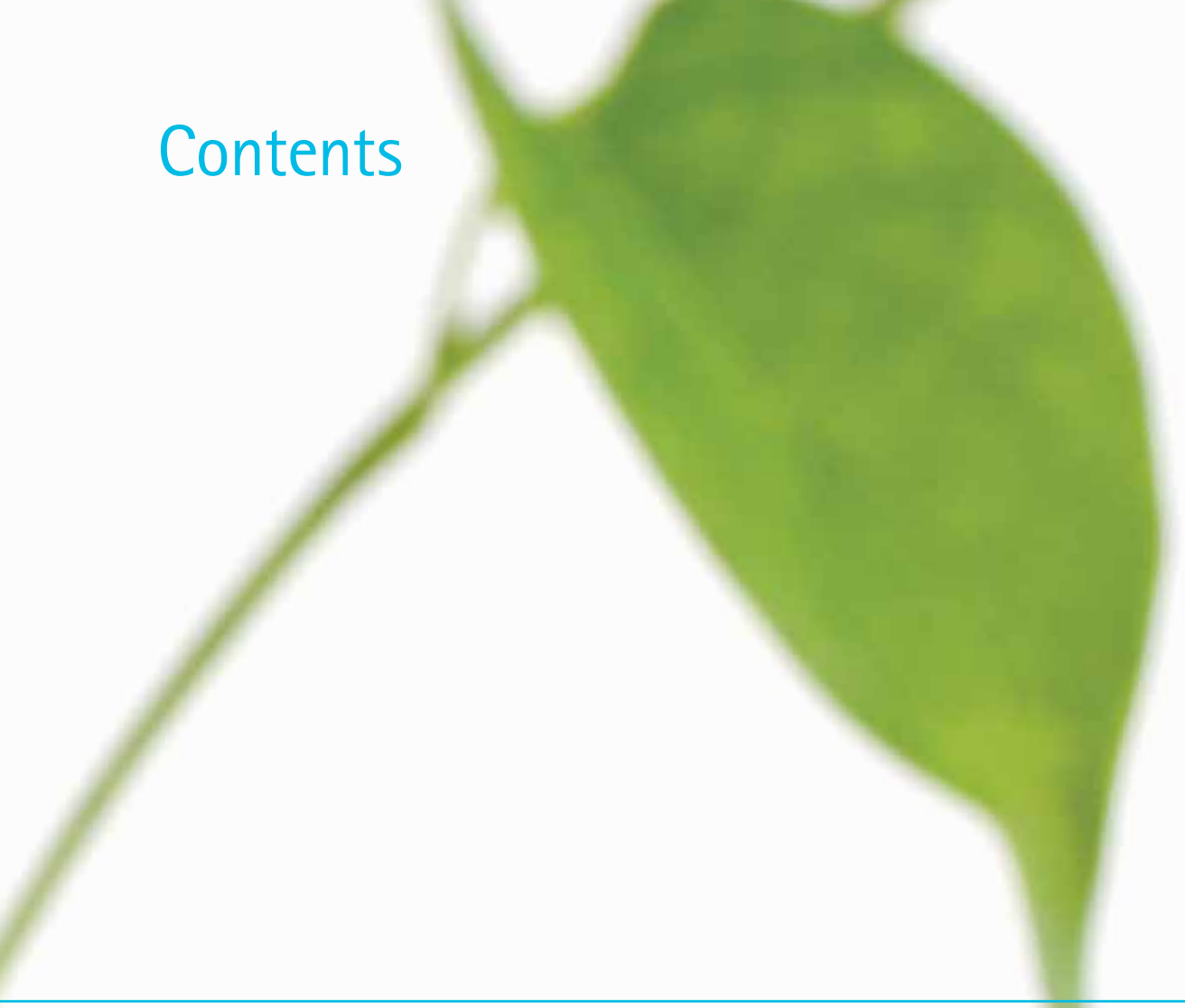


Foreword

Mark Foster
Group Chief Executive
Global Markets and
Management Consulting

Ask business leaders today for their assessment of global economic prospects, or sample the headlines proffered by leading economic commentators across the world, and the pervading sense one gets is some degree of optimism tempered with a large dose of uncertainty. Optimism, because the world economy has pulled back from the brink and is now growing again; uncertainty, because risk and volatility continue to cloud the horizon and obscure our potential path to future growth. Such uncertainty is only amplified by the growing realization that many of the sources of growth that powered our economies in the past are no longer available to us, and a perception that the sizable business opportunities of tomorrow lie only in emerging economies.

This leads us to ask: Amid continued volatility, what are the new avenues of growth that major economies can pursue to raise economic performance and living standards? Are there alternative economic futures that we have overlooked or simply neglected? What new market potential and cost efficiency might spring from durable longer-term trends, especially in developed economies? And what new routes to profitable business expansion now present themselves?

This report, the fifth annual study in our Multi-Polar World research program, is our attempt to cut through the current pervasive uncertainty and map out the future contours of growth for several major economies across the world. It marshals compelling evidence from our expert panelists and extensive economic analysis to paint a detailed picture of the new growth opportunities open to business and governments over the next decade. Our starting point was the idea that sustainable economic growth must be firmly rooted in an analysis of our true wants and needs—as citizens, consumers and employees. If economic growth can be said to come from innovative responses to the reality of how we live, it follows that we need as good an understanding of it as possible.

To help us understand that new reality, we asked our expert panelists to contribute their time and insights on the way the world lives and works. With them, we have looked across trends in demography, the natural environment, technology and international economics. They helped us portray a world in which aging populations, natural resource scarcity, pervasive technology and the rise of emerging markets play an ever greater role in people's lives. More importantly, they invited us to see beyond the challenges these trends present and to recognize three things.

First, much faster growth is possible. A key conclusion of this study is that economies can significantly raise their growth rates, boost average incomes and create much-needed employment by systematically harvesting the potential of these new growth sectors. By how much? A startling conclusion is that, with key supply-side conditions put in place, the United States could add economic output and jobs equivalent to the entire current size of the automotive industry through a comprehensive pursuit of the four new waves identified in this report. For the UK economy, the additional growth would be equivalent to the size of the financial services sector.

Second, there are key business opportunities to be seized. In my conversations with business leaders around the world, I find that many are indeed alive to the possibilities presented by tomorrow's growth sectors—from cloud computing and intelligent energy to connected health and emerging consumer markets—and are already setting in train the strategies and business models to bring that potential to fruition. Equipping our workforces with the skills to succeed in tomorrow's markets must lie at the heart of these strategies for future growth.

Third, to capitalize fully on these new waves of growth, a number of conditions can be put in place. Tomorrow's growth opportunities stand to be earned by countries willing to build new and smarter infrastructure, invest in their workforces and open up new bridges to the emerging world.

Who should lead in this endeavor? Creating tomorrow's economy is not just the business of business, nor can it be ascribed solely to government. The non-profit sector, too, can bring important insights and expertise. More joined-up thinking and approaches will also be called for. The scale, complexity and overlapping nature of the growth opportunities will in many cases warrant a collective and coordinated effort, marshaling critical thinking, expertise, and models of delivery across the different sectors.

This study does not seek to pick winners but rather to narrow today's uncertainty by pointing to where and how economies and companies can thrive against tomorrow's backdrop. It also seeks to illuminate the actions necessary to ignite such new growth. My hope is that it will stimulate debate on the new economic futures open to us and provide a reliable guide for how businesses and governments can—with pace, agility and efficiency—chart new paths to growth in uncertain times.

Mark Foster

Group Chief Executive
Global Markets and
Management Consulting

Executive summary

The world economy has stabilized and is at last showing signs of renewed growth. But governments and businesses around the globe face an uphill struggle—not simply to restore growth and jobs lost during the recent recession, but to identify the new economic motors that can drive accelerated expansion in output, incomes and jobs over the next decade.

For economies in the developed world, the crisis brought job destruction and output losses on a massive scale, highlighting the unbalanced nature of previous growth models and underlining the need to kindle new growth for the future. Yet confronted with crippling levels of public and household debt domestically, and growing competition from emerging markets externally, developed economies are struggling to generate the growth and new jobs so desperately needed.

Developing economies largely escaped the worst ravages of the recession and have since rebounded strongly. But they, too, face a challenge: to sustain their impressive growth rates for years to come, diversify that growth across a broader range of sectors and make it more inclusive across their populations.

While the circumstances for renewed global growth may seem far from auspicious, the evidence tells a far more promising story. Our research marshals evidence from expert panels, secondary data and extensive economic modeling to paint a detailed picture of new growth opportunities in four major economies: the United States, Germany, the United Kingdom and India. Contrary to more pessimistic views, our research points conclusively to the existence of numerous opportunities for accelerated economic growth and job creation in both developed and emerging economies over the next decade. But these opportunities are by no means guaranteed. These economies currently lack many of the essential supply-side elements—such as the right type and mix of skills, infrastructure, networks and innovation systems—critical for igniting sustained growth. Our report points to the actions that governments and businesses can take to unlock that growth.

Our research applies two distinct lenses through which to view future growth opportunities:

- **A sectoral view**: Panels of leading experts from different disciplines and backgrounds—business, academia, government and the non-profit sector—in each of the four case-study countries were convened to highlight key growth areas for their economies and to pinpoint measures businesses and governments can take to unlock that growth.

- **A macroeconomic view**: Oxford Economics adapted its global model to provide a top-down view of the economic output and employment implications of novel supply-side responses to trends in population aging, the low-carbon economy, high-technology and the rise of emerging markets for these four major economies over the period 2010 to 2020.

What are the new waves of growth for economies?

Drawing on our research and input from our panelists, Accenture has identified four:

the silver economy

the resource economy

the multi-technology future

the emerging-markets surge

The silver economy

The global population is aging, owing to declining birth rates and increasing longevity in many parts of the world. In the United Kingdom, the number of people aged 60 and above is expected to increase by 17 percent by 2020, while the number of under-16s is expected to increase by just 7 percent. Similarly, in the United States, the over-60 age group is expected to increase by 32 percent by 2020, in sharp contrast to a 7 percent increase in those aged 16 or under. And in Germany, the over-60 age group is expected to increase by 14 percent in that same time frame. Contrary to conventional wisdom, which often views the aging trend as a problem, the graying of the population represents a massive untapped growth opportunity.

Areas to watch

Our expert panels highlighted key areas that stand to benefit from the surge in age-related demand. These include:

- **Third-age learning**: Tailored education that enables growing numbers of older people to refresh skills and seek mental stimulation over a longer working life.
- **Experiential goods and services**: Increasing demand for varied leisure opportunities, entertainment, travel and tourism.
- **Health services and wellness products**: Health spending including long-term care for the elderly and pharmaceutical products.
- **Connected health**: Holistic and seamless healthcare provision, encompassing a range of information technologies such as health analytics, the electronic management of patient information and diagnostics, wellness and self-help tools, and mobile and home-based delivery of healthcare services.
- **Lifelong finance**: Financial products and services that cater to the needs of a longer lifespan, such as tailored equity release products, health insurance and biometric ATMs.
- **Age-inclusive consumer goods**: Increased demand for products designed to adapt to the changing physiological condition of older people.

Conditions for success

The growth possibilities afforded by aging populations will not materialize automatically. Efforts to unlock demographic shifts in demand will need to be undertaken in tandem with supply-side efforts to widen effective labor pools and productivity among older age cohorts. Businesses, governments and third-sector providers such as nongovernmental organizations (NGOs) will need to adopt better long-range skills planning and better techniques to analyze demographic demand shifts. To unlock the growth potential of the silver economy, businesses and policymakers together can take a number of actions:

- **Widening the net**: Retaining older workers in the workforce will be critical to preventing a human-capital crunch in coming years and unlocking

the growth opportunities presented by older consumers. Widening the net requires action on several fronts, including recruitment practices, incentive structures created by tax and benefit systems, and organizational flexibility to accommodate portfolio working where workers are not dependent on any one client or company.

• **Ensuring future supply of "hands and minds"**: Many future growth sectors—in areas such as healthcare and social care, tourism and travel—will require a distinctive blend of knowledge and manual skills; for example, the ability to use the latest e-health technology. This imperative puts a premium on new forms of vocational education, training in new technology and business-educational linkages.

• **Promoting productive aging:** Enhancing older age groups' skills can help increase the productivity of older workers and sustain their engagement. The key is to assess whether current learning programs focus on critical skills needed for the future and whether the delivery systems are designed to provide training in ways that meet age-specific learning needs. Technology can also be harnessed, as it evolves from a tool for capturing and imparting knowledge to a learning medium, blurring the boundaries between formal and informal training.

Organizational imperatives

For their part, organizations (whether businesses or government agencies) can turn population aging from a perceived Achilles' heel to an advantage in both consumer and talent markets through the following actions:

• **Age-proof your human capital**: Adapt the workplace environment to the needs of an aging workforce; for instance, by reforming company operations so that older workers are able to retain their productivity.

• **Recycle experience**: Introduce schemes that promote the exchange of knowledge and experience between older and younger workers, thus retaining critical skills.

• **Develop your silver radar**: Use advanced analytics to anticipate talent-management needs and forecast age-related demand, and extend the power of analytics to a wider set of variables including gender, ethnicity and generational characteristics.

• **Exploit cross-market offerings**: Be alert to the growth opportunities presented by repositioning your brand for changing demographics, by exploiting cross-market transfers such as taking products designed for one target market to another.

The resource economy

The world's resources are getting scarcer. On one hand, there is growing competition for resources of all kinds—land, water, energy, food, minerals. On the other hand, the supply of resources is limited by both geopolitical factors and greater regulation to address externalities such as climate change. Yet the way in which the world responds to this resource squeeze can also present fertile terrain for growth and new jobs.

Areas to watch

Our panel of international experts identified several important growth sectors that stand to benefit from the burgeoning resource economy. These include:

- **Intelligent energy**: The advent of a low-carbon economy will accelerate the growth in smart grids, carbon capture and storage, smart buildings, remote sensors and meters.
- **Green infrastructure**: The shift to a resource-efficient economy will spawn demand for a host of green capital goods and infrastructure, such as photovoltaic systems and wind turbines.
- **Food and agribusiness**: Growing populations, coupled with changing diets and lifestyles, will drive demand for food and higher-value agribusinesses in areas such as processing, handling, packaging, transporting, marketing and distribution of food products. This will be especially true in emerging markets.
- **Alternative energy sources**: Nuclear power and renewable energy sources such as wind, solar, hydropower and geo-thermal can reduce environmental cost, bridge the energy gap and help transform manufacturing and other industries.
- **Eco-ethical products**: Consumers are increasingly choosing to buy goods and services that have been produced in ethically, socially and environmentally responsible ways. European sales of green products are expected to double in value, from €56 billion in 2009 to €114 billion by 2015.
- **Waste, water and land management**: Land degradation, climate change and water scarcity will put a premium on efficient land and water use. The global market for desalination technologies, for example, is expected to reach approximately US$30 billion by 2015.
- **Eco-consultancy**: Adoption of sustainable business models will open up a host of green business solutions including carbon advisory and management, energy mapping and carbon modeling, selling offsets, and environmental and behavioral research and policy analysis, as well as business

opportunities from wider sustainable business practices such as brand, reputation, ethics and integrity.

• **Carbon finance and investment**: Increased regulation and pricing of carbon will create demand for carbon finance, derivatives and green investment funds, along with ancillary services such as legal and regulatory expertise, to support these activities.

Conditions for success

Yet the growth possibilities of the resource economy could easily be squandered. Supply-side gaps persist in many economies. These gaps include a lack of appropriate complementary infrastructure (such as inadequate power grids to support renewable sources including solar, limited facilities for electro-vehicles and embryonic battery technology). Inadequate technical skills and planning barriers constitute additional gaps. Realizing the growth potential of the resource economy will require coordinated actions on several fronts, including:

• **Building green skills**: Organizations must sharpen their focus on addressing emerging-skills needs in areas such as bioenergy and wind technologies. This requires businesses and governments to collaborate in creating sufficient vocational training courses and certifications for emerging sectors.

• **Enabling complementary infrastructure**: Promoting new technologies such as fuel-cell technologies, battery, and cloud computing can help enhance infrastructure. To cope with the increasing capacity pressures on existing grids, economies or regions can build large-scale interconnections of networks and grids beyond their domestic borders.

Organizational imperatives

For their part, organizations can capitalize on the opportunities of the resource economy through the following actions:

• **Develop new products and services to serve the resource economy:** Use analytics to identify how patterns in consumer behavior, resource scarcity, climate and regulation create opportunities for marketplace innovation.

• **Shape pro-growth approaches to resource scarcity:** Engage with the community—academia, policymakers and regulators—to create a more certain regulatory environment for resource management.

• **Integrate a carbon price**: Promote resource efficiency by including a shadow carbon price in investment decisions.

• **Find new skills in traditional industries**: Locate and transfer valuable green skills in declining or traditional industries such as shipbuilding or oil and gas.

• **Turn scarcity into abundance**: Seek out creative ways to transform waste into profit, such as turning agricultural or plastic waste into fuel.

The multi-technology future

Technology is central to economic progress and the improvement of living standards. It also offers opportunities for transforming public-service delivery—a sector that accounts for approximately 40 percent of the economy as a whole in most developed economies. Within these developed economies, technology is also a significant economic sector in itself. But technology's key contribution to economic growth is its ability to spur productivity improvements and product and service innovation across an economy. Initiatives to improve high-tech skills and adoption of new communications technologies could boost growth further.

Areas to watch

Our research has identified the key sectors shaping the multi-technology revolution. These are:

- **Core technologies**: The growth possibilities embodied in a series of scientific breakthroughs centered on innovations in information and communication (such as superfast broadband and cloud computing), living things (genomics and biotechnology), materials (nanotechnology) and mobility (for example, robotics, mobile and remote sensors).

- **Ancillary technologies and services**: Growth possibilities springing out of the core technologies, such as analytics based on the extensive use of data and statistical analysis to guide management decision making, and cyber security to safeguard increasingly complex information flows across networks.

- **Convergent technologies**: The convergence of research and innovations from different fields to yield entirely new technologies, such as the application of computing to problems in biology and medicine, known as bioinformatics, and biometrics, which uses information technology to track an individual's identity based on biological characteristics.

- **Technology-enabled business models**: Explosive growth when new technologies reach a critical mass of users, unleashing a wave of creativity across the general economy. Witness the technology-led innovation in governance and public-service delivery and the explosion in creativity made possible by applications for retailing, information search and location services; the advent of cloud-enabled business models in areas as diverse as education, healthcare, music, logistics and transport; new models of co-production of goods and services between firms and consumers; and the use of mobile technologies to reach new and previously inaccessible customers in areas such as microfinance.

Conditions for success

Unleashing the full potential of these growth sectors, as well as the wider productivity gains for a country's overall economy, will require business and government to put in place the appropriate supply-side initiatives. The imperative ingredients for success include:

- **Honing digital literacy and skills**: Businesses and governments around the world can act together to improve digital literacy by equipping workforces with the advanced technical skills vital to the workplace of tomorrow.
- **Building technological arteries**: Stakeholders will need to provide universal and reliable access to a well-governed Internet infrastructure, as well as improving connectivity speed in both wired and wireless environments.
- **Setting smart regulatory standards**: The introduction of transparent standards can facilitate the uptake of a new technology and address public concerns about data sharing and access.
- **Moving from inspiration to marketable products**: Strengthening the links between scientific research and entrepreneurs can boost commercialization possibilities. The availability of venture capital can also support the entrepreneurial sector.

Organizational imperatives

To exploit opportunities now, organizations can take the following actions:

- **Anticipate the devolution of technology**: Manage the spillover of consumer computing platforms into the workplace to allow for productivity improvements, but minimize data security conflicts.
- **Embrace the cloud**: Explore the cloud's potential for lowering costs and for creating new business models.
- **Use technology to pursue polycentric innovation**: Search for innovative ideas around the world, and make full use of modern communications technology to coordinate the global innovation value chain.
- **Create open innovation networks:** Support digital customer communities and crowd sourcing, to make full use of your stakeholders' creative potential.
- **Harness technology to customer needs**: Adopt a systematic and disciplined approach to anticipate customer needs using new technologies such as analytics.
- **Share your digital literacy:** Use knowledge-sharing initiatives to bridge generation gaps and spread technical skills at all levels of the workforce.

The emerging-markets surge

The rise of a multi-polar world—in which economic activity increasingly gravitates toward the powerhouse economies of Asia and Latin America—is dramatically expanding the vista of trade and investment opportunities for multinational businesses over the next decade. Africa's untapped growth potential is also becoming more prominent in discussions of emerging economic players. Spurred by a burgeoning middle class and rapid urbanization, emerging market demand is opening up opportunities in exports of services, consumer and intermediate goods, and capital goods such as machinery. Increased trade integration can drive economic growth directly through export opportunities and indirectly through stimulation of higher productivity and innovation among export-competing firms.

Areas to watch

Our research has identified the following key growth opportunities presented by the surge in emerging-market demand:

- **Low-cost business models**: Growing aspirations among emerging-market households to enjoy better lifestyles on limited means is fueling demand for affordable cars, telecommunications, medicines, healthcare and consumer products. This demand is creating growth opportunities for indigenous and overseas companies that can respond with appropriate business models.

- **The "southern surge" in financial services**: Stellar growth rates and an emerging middle class are propelling demand for mobile banking, micro-finance and insurance in places such as South Asia and Southeast Asia.

- **Infrastructure**: The physical infrastructure requirements of emerging markets present both a challenge and a major growth opportunity for businesses. Suffering from poor investment, the infrastructure of many rapidly expanding cities remains inadequate, and rural areas are largely overlooked.

- **Citizen services**: After basic necessities, the key concern for most emerging-market citizens is access to vital services—healthcare, education, public safety, housing and transport. These needs and wants are creating market opportunities for enhanced public services at both the local and national levels.

- **International knowledge exchange**: Growth in emerging-market workforces is typically outstripping local educational and training capacity, leading to significant shortfalls in human capital. These shortfalls have created opportunities around the transfer of education and human-capital services; for example, through distance learning or the establishment of satellite campuses.

- **The global middle class**: The emerging-market middle class is expected to increase by 1.4 billion people within the next decade, creating a critical mass of demand for

cars, luxury goods and services such as overseas tourism.

Conditions for success

While emerging markets represent a tantalizing growth opportunity, success is not guaranteed—threats are posed by trade and investment barriers, complex and unfamiliar operating environments, fragmented demand and issues of accessibility. Our research and experience highlight two actions critical to opening up the emerging-market opportunity:

- **Building new bridges to the emerging world**: Economies can open up to trade and investment through global, regional and bilateral trade agreements. They can also harness the potential of new technologies—such as cloud computing, mobile and social networking media—to reach customers, employees and investors in emerging markets in new and imaginative ways.

- **Uncovering and strengthening comparative advantage**: Economies can reinforce existing comparative advantage through continual innovation and upgrading of skills in key sectors. But they can also take advantage of evolutions in technology to carve out new distinctive areas of export advantage. For example, education services are now more tradable across countries, thanks to the spread of the Internet and communications technology.

Organizational imperatives

Organizations can kick-start the emerging-market opportunity through the following actions:

- **Create geographic options**: Build a geographically diversified portfolio of growth markets across the world, to drive future growth and mitigate risk.

- **Be authentically local**: Take local approaches to selling, talent development and innovation to unlock profitable opportunities.

- **Network the organization**: Create structured channels to allow rapid diffusion of ideas and know-how across geographic regions.

- **Foster multi-polar world leadership**: Inculcate a global mindset across the organization's leadership and create leadership teams that reflect the current and future global footprint of the company.

- **Design an appropriate international operating model**: Blend local leadership with the benefits of greater scale and standardization.

How could harnessing new waves of growth affect national economic growth and employment?

Accenture research in collaboration with Oxford Economics shows that significant untapped opportunity for further economic growth and job creation lies within the reach of mature and emerging economies alike. These opportunities arise from trends affecting us all: people living longer, natural resources becoming scarcer, the manifold possibilities of new technologies and the growing prominence of emerging markets.

To provide a more concrete view of these potential growth opportunities, Accenture asked Oxford Economics, the world-renowned economic research organization, to model the potential future impact on GDP and employment levels of these trends in each of the four case-study economies.

The modeling conducted by Oxford Economics maps two paths for each of our case-study economies. The first path represents the current trajectory of economic output based on the existing trends of the four new waves, without any interventions in the policy and business environment. The second, alternative, path tracks economic output based on the impact of the actions that business and government take to accommodate the new waves trends. The Oxford Economics analysis finds that, with essential interventions such as investing in a mix of skills and smarter infrastructure to harness the new waves, economies can collectively lift themselves onto a higher growth path and create the following opportunities:

- The US economy has the potential to grow by 3.8 percent per year, compared with 3.1 percent in the current trajectory, over the next decade. This equates to an extra US$1.6 trillion of GDP by 2020 and 8.7 million additional jobs, over and above what would otherwise be achieved. Nearly 80 percent of the new jobs would stem from the country's responses to an aging population and from increasing trade with emerging markets. By 2020, this growth would translate to an increase in US GDP per capita of US$4,700.

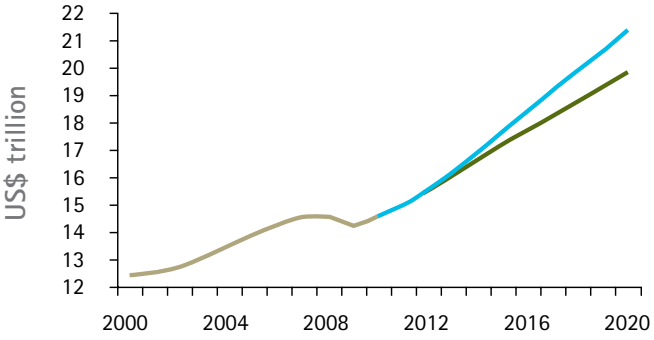
- The German economy has the potential to grow by 2.8 percent per year, instead of 1.9 percent in the current trajectory, over the next decade. This equates to an extra €283 billion of GDP by 2020 and 3 million additional jobs, over and above what would otherwise be achieved. Half of those jobs would emerge from the country's aging population, 37 percent from opportunities related to trade with emerging markets and 13 percent from the green and high-tech sectors. By 2020, this growth would translate to an increase in Germany's GDP per capita of €3,400.

- The UK economy has the potential to grow by 3.1 percent per year, instead of 2.5 percent in the current trajectory, over the next decade. This equates to an extra £134 billion of GDP by 2020 and 2.6 million additional jobs, over and above what would otherwise be achieved. Around half of these new jobs are expected to emerge from the country's aging population, 27 percent from trade with emerging markets and around a quarter from high-tech sectors. By 2020, this growth would be equivalent to increasing UK GDP per capita by £2,000.

- The Indian economy has the potential to grow by 8.7 percent per year, instead of 8.0 percent in the current trajectory, over the next decade. This equates to an extra Rs11 trillion of GDP by 2020 and 37.5 million additional jobs, over and above what would otherwise be achieved. Three-quarters of these jobs would arise from India's exports to other emerging markets and 25 percent from the green and high-tech sectors. By 2020, this growth would translate to an increase in India's GDP per capita of Rs7,700.

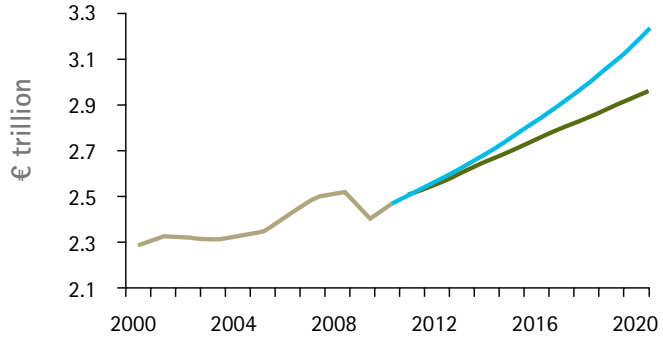
GDP: Current and alternative trajectories (constant 2010 prices)

Figure 1: United States



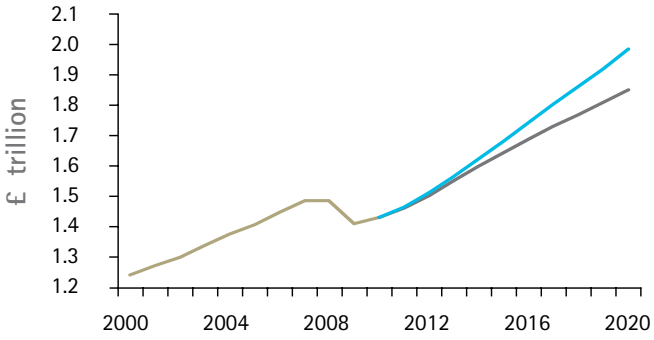
Source: Oxford Economics

Figure 2: Germany



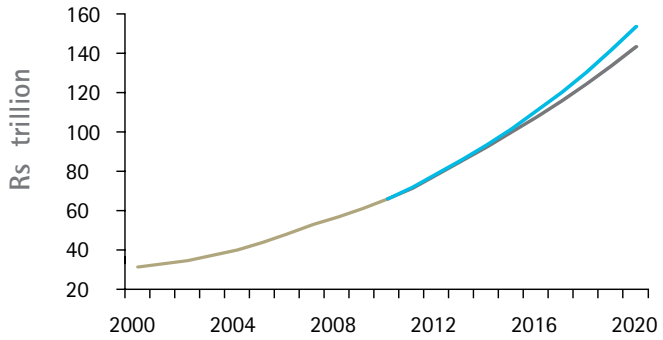
Source: Oxford Economics

Figure 3: United Kingdom



Source: Oxford Economics

Figure 4: India



Source: Oxford Economics

The country aggregates are a sum of the impact of the four trends: aging population, green-sector growth, high-tech sector growth and trade with emerging markets. A discount factor has been applied to account for the overlap between sectors, specifically for the green and high-tech sectors.

Making it happen

This growth potential is by no means guaranteed. So how can economies plant seeds today to yield growth tomorrow? A strong strategic direction is crucial. For an economy, this means having a clear-eyed view of comparative advantage (both existing and potential)—put simply, what do economies want to be famous for? For organizations, it means being able to anticipate trends and distinguish "big enough market insights" from mere sparks of ideas (see Accenture's report "Jumping the S-Curve: How to beat the growth cycle, get on top, and stay there").

A fertile growth environment must be put in place. New growth sectors must be built on firm supply-side foundations: enough workers with the right skills, sufficient complementary infrastructure, smart use of technology and clear channels to new markets. Differences between current capabilities and those needed in the future must be understood and planned for.

In the more tightly knit and interdependent economy of the next decade, coordination among the three sectors—business, government and non-profit—will no longer be a bonus, but a necessity. The sheer scale of the challenge and the requirement for diverse expertise make it unlikely that any one sector can harness the new waves of growth single-handedly. Each sector has a part to play, individually and collectively. But cross-sector collaboration should not be limited to national domains. As cities become increasingly important nodes of economic activity and decision making, they will often become the starting point for stakeholders seeking to execute a national strategy. IT and social network platforms provide important tools to deepen such collaboration.

The quest for growth

In the wake of the biggest economic upheaval of the past 50 years, economies across the world are scrambling to regain their economic momentum and establish a stronger footing for new growth and job creation in the years ahead.

For developed economies such as the United States and the United Kingdom, that task seems far from easy. Externally, these economies increasingly confront the realities of a multi-polar world, in which economic power and activity are gravitating toward the powerhouse economies of the East. Domestically, the developed economies are weighed down by the legacies of recession and financial crisis—including constrained public finances and indebted households—as well as the longer-term realities of rapidly aging populations, energy scarcity and climate change. Against this backdrop, many commentators predict a dismal decade of low growth looming for these economies.

The backdrop appears more promising for developing economies. Yet they, too, face a growth challenge. To be sure, many boast impressive rates of economic growth. However, they face a formidable task in sustaining those growth rates for years to come. In many cases, developing economies will also need to ensure that growth is more broadly based across sectors and that all populations within those economies benefit from it.

Mapping future growth opportunities: Our method

To map the contours of tomorrow's economy, Accenture has undertaken one of the largest-ever research projects on future sources of economic growth in the United States, Germany, the United Kingdom and India. Each of these countries typifies a particular economic model and set of structural characteristics. Specifically, the United States and the United Kingdom are broadly consumption-led economies with an emphasis on free-market models of competition. Germany is an exemplar of an export-led growth model with significant emphasis on manufacturing industry. And India is one of the world's foremost emerging economies with a large internal market of consumers as well as world-class export capabilities in certain industries. Many of the lessons learned from these markets are broadly applicable to similar economies around the world.

Our approach was to examine future economic growth for each of the four economies through two distinct lenses:

- **A sectoral view**: Panels of leading experts from different disciplines and backgrounds—business, academia, government and the non-profit sector—in each of the four case-study countries provided a bottom-up view of new growth opportunities and their enablers (see "Our panels: Asking the experts").

- **A macroeconomic view**: Oxford Economics adapted its global model to provide a top-down view of the economic output and employment implications of novel supply-side responses to trends in population aging, the low-carbon economy, high-technology and the rise of emerging markets over the period 2010 to 2020 (see "How could harnessing new waves of growth affect national economic growth and employment?").

Our panels: Asking the experts

To guide our analysis of future growth opportunities for the four countries, Accenture convened a series of panel discussions with senior leaders, opinion formers and experts in each of the four countries. These panels, conducted by Harris Interactive via online forums over the period July to October 2010, brought together leading experts from a wide array of sectors and disciplines—business, academia, public policy, media and the non-profit sector. Each panel shared perspectives on: (1) the most promising sources of untapped growth for the economy over the next decade; and (2) the conditions or actions needed on the supply side of the economy—for example, in relation to skills or innovation—to ignite these growth opportunities on a larger scale. Panel members also had the opportunity to debate and respond to each other's comments and suggestions. The members of the panels are listed on page 97.

Drawing on the input from our panelists and our research, we have identified four new waves of growth for economies:

- the silver economy
- the resource economy
- the multi-technology future
- the emerging-markets surge

The input from the panels in turn helped shape the formal modeling of economic growth trajectories conducted by Oxford Economics. The nature of these growth opportunities and their implications for business and policymakers are explored more fully in the chapters that follow.

How could harnessing new waves of growth affect national economic growth and employment?

Our panels suggested that significant untapped opportunity for further economic growth and job creation lies within reach for mature and emerging economies alike. These opportunities arise from trends affecting us all: people living longer, natural resources becoming scarcer, the manifold possibilities of new technologies and the growing prominence of emerging markets.

To provide a more concrete view of these potential growth opportunities, Accenture asked Oxford Economics, the world-renowned economic research organization, to model the potential future impact on GDP and employment levels of these trends in each of the four case-study economies.

Oxford Economics began by using its global macro-econometric model to generate a baseline outlook, or "current trajectory," for GDP growth and employment for each of the four economies for the period 2010 to 2020. The current trajectory is based on the likely evolution of the four trends, assuming no significant policy or business interventions to bolster the supply side of the economy. For each trend, Oxford Economics then modeled an alternative whole-economy trajectory, in which various supply-side factors were adjusted to capture additional output and employment potential from the relevant trend. For example, in the case of demographic aging, Oxford Economics assessed the effect of increasing labor-force participation or productivity rates; for the low-carbon economy, it looked at the effects of better regulation, enhanced skills development and greater levels of investment.

This analysis provides a unique insight into the alternative growth trajectories open to these economies, the size of the potential market opportunity for business, and the policy and organizational actions that can help ignite that growth. It also underlines the fact that while the four trends are largely inevitable, the benefits in terms of future growth are not. The four economies we studied currently lack many of the essential supply-side elements—such as the right type and mix of skills, infrastructure, innovation systems and market access—that are needed for igniting sustained growth on the back of these trends. This report therefore highlights some of the key actions that policymakers and business leaders can take to address these gaps and stimulate renewed growth in their economies. With these essential interventions, the four case-study countries could considerably increase economic growth and levels of employment (see individual country profiles, which set out the results of the four trends aggregated, on the following pages).

United States

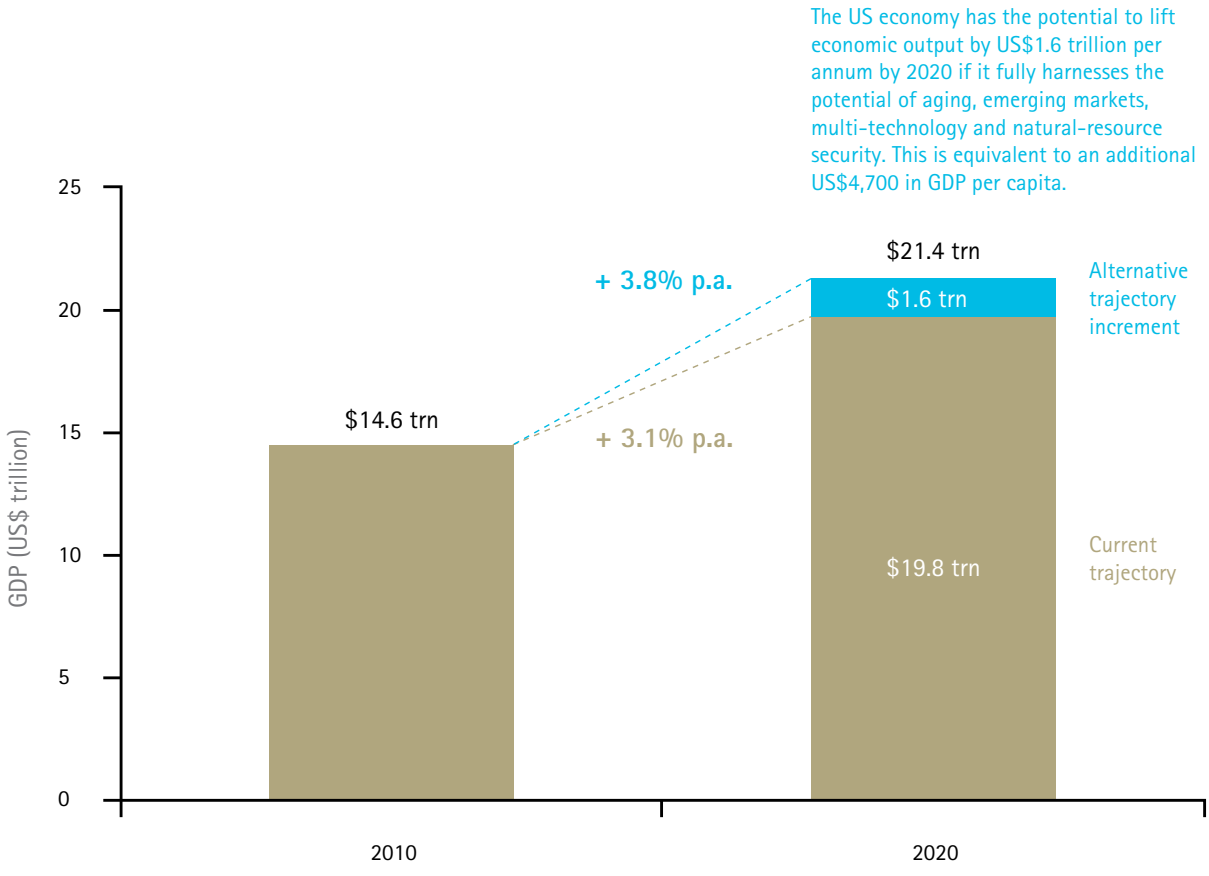
On the current trajectory, US economic output is expected to grow from US$14.6 trillion in 2010 to US$19.8 trillion in 2020 (Figure 5). But economic output could be increased further by putting in place the necessary supply-side conditions to harness the new waves of growth, such as enough workers with the right skills, sufficient complementary infrastructure, intelligent use of technology and clear channels to new markets. These interventions could push the US economy onto an alternative trajectory, with economic output reaching US$21.4 trillion by 2020, representing US$1.6 trillion over and above what would otherwise be achieved. This translates to an additional US$4,700 of GDP per capita by 2020. The interventions would also have a significant impact on jobs, lifting employment levels over the next decade by 19 percent, compared with a 13 percent increase in the current trajectory. The difference amounts to 8.7 million additional jobs by 2020 (Figure 6).

Of these, a majority—nearly 60 percent—would stem from the economic response to an aging population (Figure 7), reflecting the United States' stronger potential to convert higher labor-force participation into increase in output and employment. Two areas of potential growth that our panelists identified are healthcare and health support services, as well as the production of low-cost products tailored for older consumers.

Around 20 percent of the additional new jobs would arise from trade with emerging markets, as the United States benefits from a relatively high exposure to emerging markets in its exports. The United States is also poised to benefit from its comparative advantage in the services sector, as technological change enables more services to be traded and a burgeoning global middle class consumes non-essentials, such as travel and tourism.

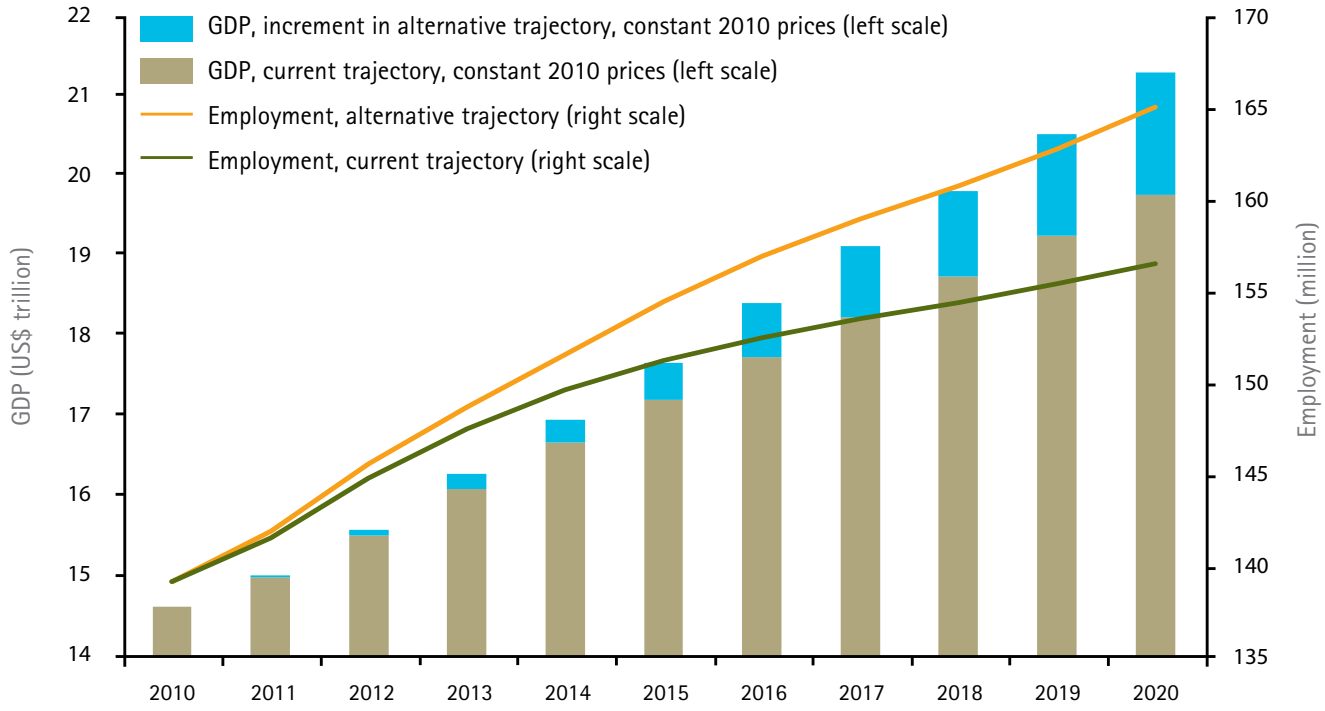
The high-tech sector would account for 14 percent of the new jobs; the green sector, 7 percent. Technological innovation can play a major role in boosting demand for green and high-tech goods and services, encouraging investment and job creation.

Figure 5: US output: 2010 and 2020



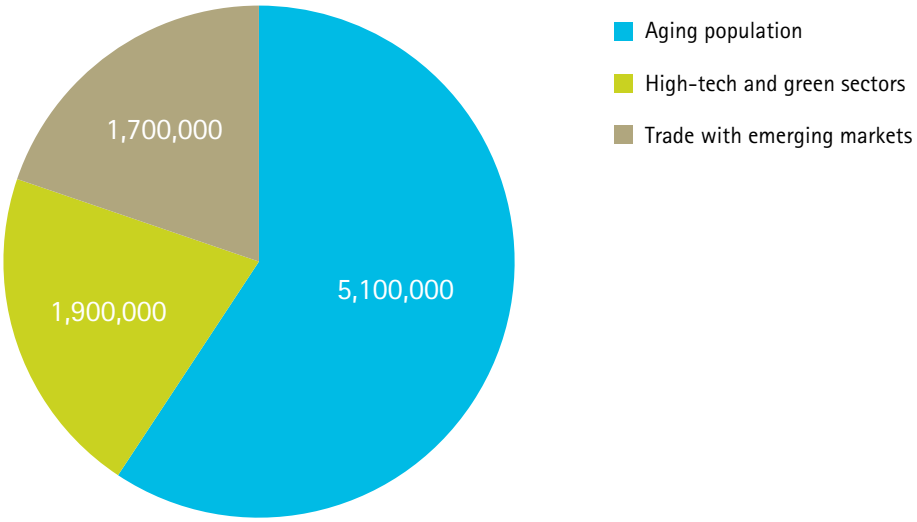
Source: Oxford Economics

Figure 6: US GDP: current and alternative trajectories



Source: Oxford Economics

Figure 7: Additional US employment in 2020 in alternative trajectory



Note: Totals may be affected by rounding.
Source: Oxford Economics

Germany

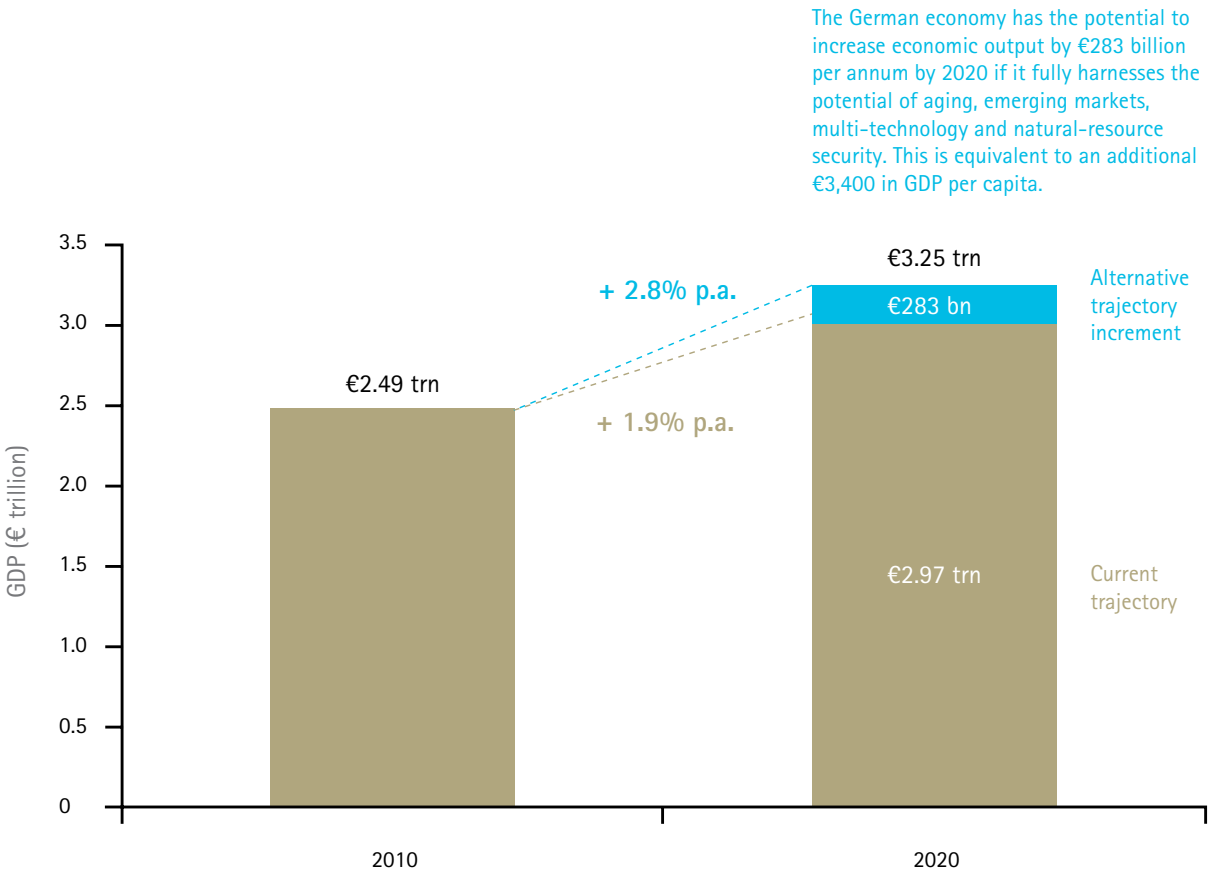
On the current trajectory, German economic output is expected to grow from €2.49 trillion in 2010 to €3 trillion in 2020 (Figure 8). But economic output could be increased further by putting in place the necessary supply-side conditions to harness the new waves of growth, such as new technology adoption, a sufficient labor supply, the necessary digital infrastructure and stronger links to emerging markets. These interventions could push the German economy onto an alternative trajectory, with economic output reaching €3.3 trillion by 2020, an additional €283 billion of economic output over and above what would otherwise be achieved. This translates to increasing Germany's GDP per capita by €3,400 by 2020. The supply-side levers would also have a significant impact on jobs, increasing employment levels over the next decade by 8 percent, compared with a 1 percent increase in the current trajectory. This represents nearly an additional 3 million jobs by 2020 (Figure 9). The German economy produces relatively lower additional levels of employment, compared with India for instance. Economic growth stems from highly productive sectors, such as the green sector, rather than labor-intensive sectors.

Fifty percent of Germany's additional employment in the alternative trajectory would originate from responding to the challenges of an aging population (Figure 10). These consumers tend to generate demand in labor-intensive service sectors of the economy, such as personal care, healthcare services and tourism.

The high-tech and green sectors would account for 13 percent of the increase in employment. The relative contribution of the green sector would be the highest across the four case-study countries, contributing 9 percent of new jobs. Our panelists commented on the potential for growth in branding and design for Germany's high-tech products, highlighting that creative skills will be in demand.

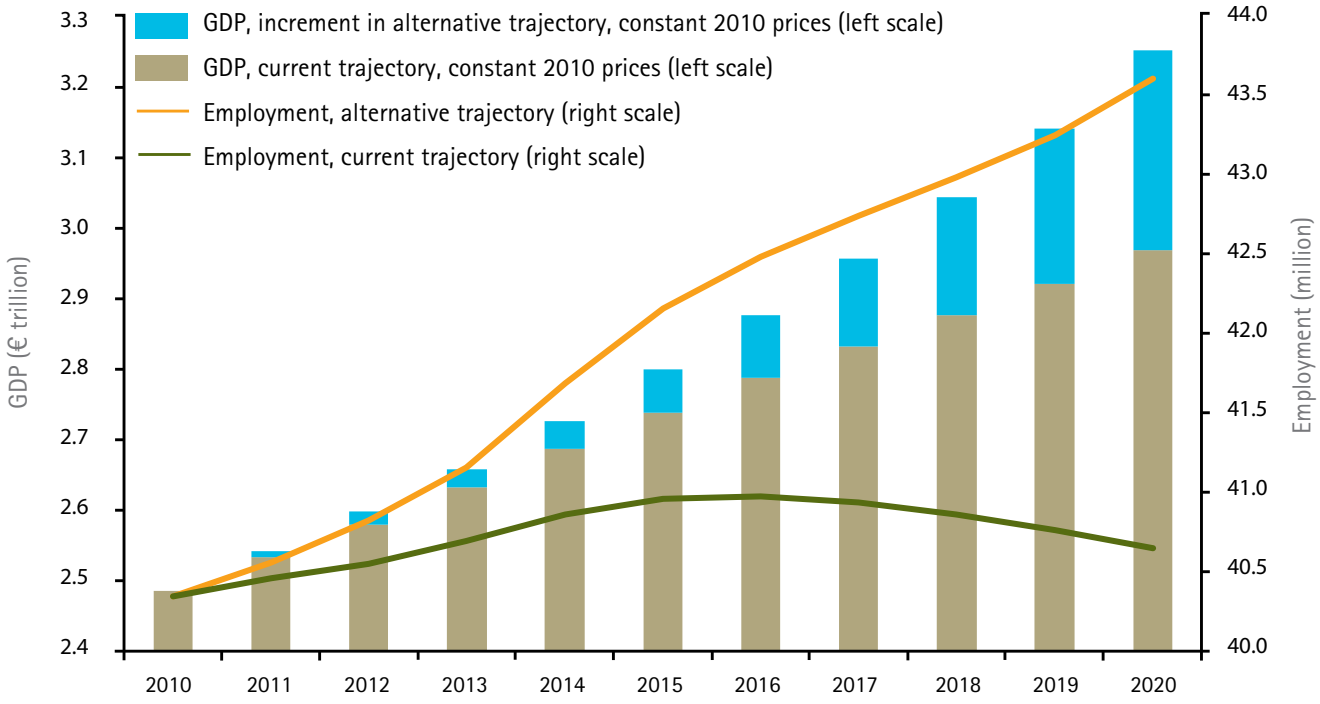
In Germany, 37 percent of new jobs would arise from growing trade with emerging markets. The German economy is markedly externally focused, and a large share of exports is already directed to emerging markets. Germany's existing excellence in the production of capital goods can also provide the opportunity to exploit the growing demand for such goods arising from the rapid economic transformation of emerging markets.

Figure 8: Germany output: 2010 and 2020



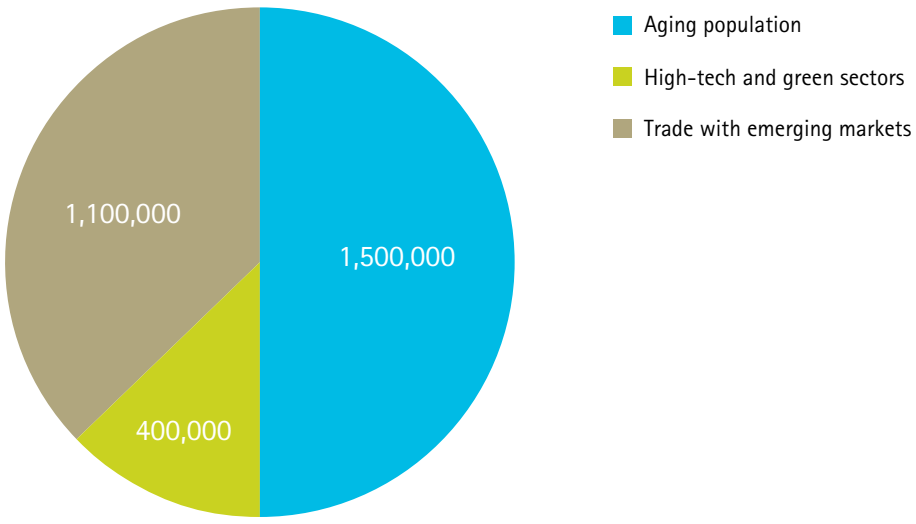
Source: Oxford Economics

Figure 9: Germany GDP: current and alternative trajectories



Source: Oxford Economics

Figure 10: Additional Germany employment in 2020 in alternative trajectory



Note: Totals may be affected by rounding.
Source: Oxford Economics

United Kingdom

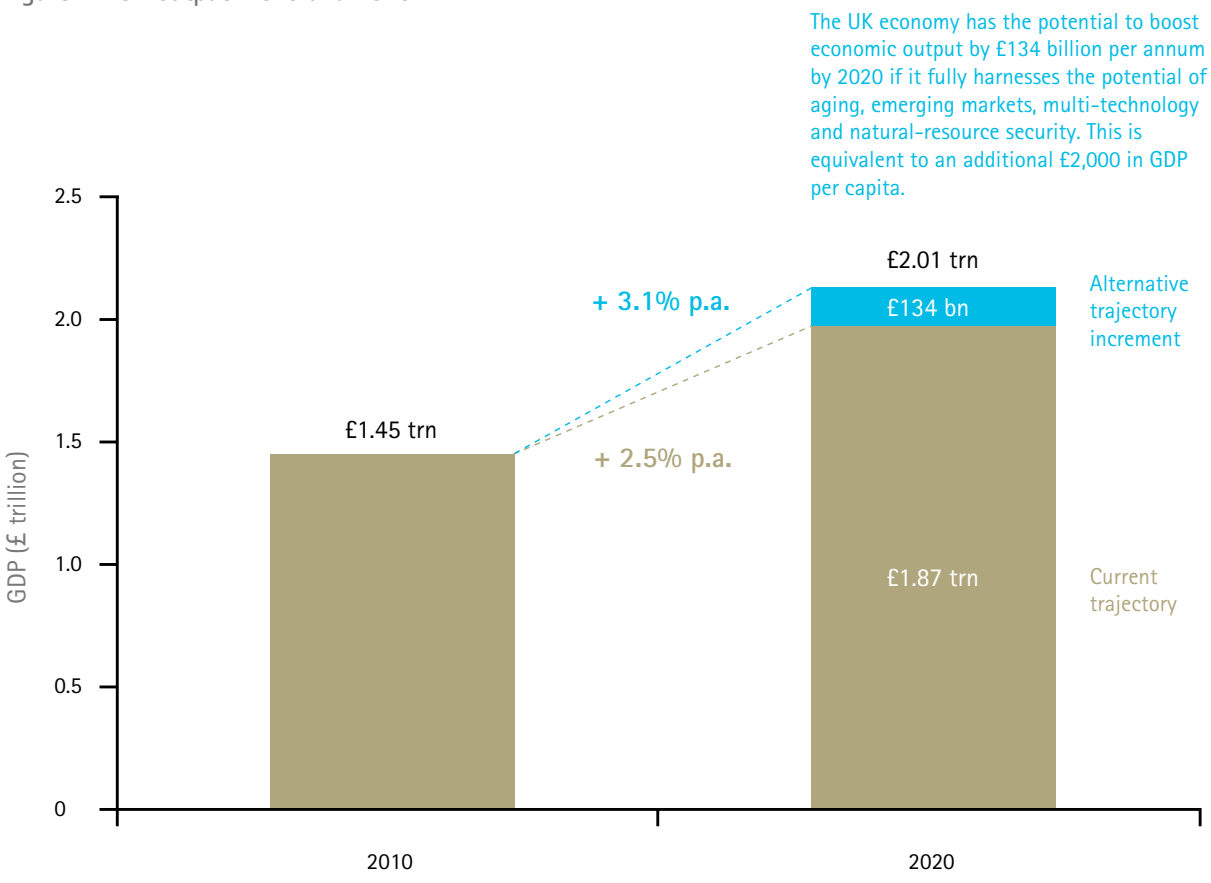
On the current trajectory, UK economic output is expected to grow from £1.45 trillion in 2010 to £1.87 trillion in 2020 (Figure 11). But economic output could be increased further by putting in place the necessary supply-side conditions to harness the new waves of growth, such as new bridges to emerging markets, widespread take-up of technology, sufficient complementary infrastructure and future workforce planning. These interventions could push the UK economy onto an alternative trajectory, with economic output reaching £2 trillion by 2020, an additional £134 billion of economic output over and above what would otherwise be achieved. This would be equivalent to increasing UK GDP per capita by £2,000 by 2020. These interventions would also have a significant impact on jobs, boosting employment levels over the next decade by 16 percent, compared with a 7 percent increase in the current trajectory. The difference amounts to 2.6 million additional jobs by 2020 (Figure 12).

Half of these new jobs would emanate from higher labor-participation rates and productivity improvements among the UK's older age groups (Figure 13). Our panel suggested that there will be significant demand for home-care assistants and tutors to "third-age" students.

Twenty-two percent of new jobs would arise from the high-tech sector. The improvement in skills necessary to harness the growth of the sector would create new employment not only in high-tech goods and services but also in other sectors of the economy, such as genetics and biotechnology, as identified by our panel.

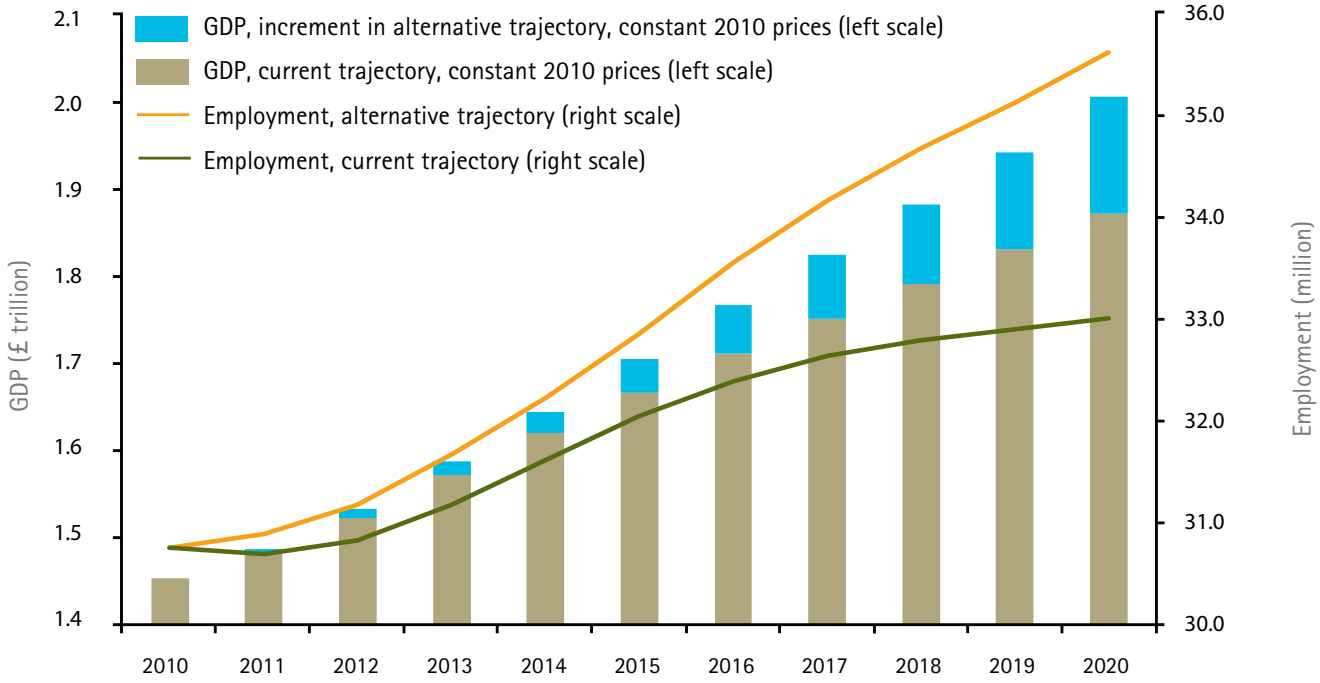
UK trade with emerging markets would account for more than a quarter of new jobs. The United Kingdom has a comparative advantage in financial services and consumer goods, so it is well positioned to exploit the opportunities that spring from rising emerging-market household incomes and consumption. In particular, our panel expected demand for legal and accounting skills to increase.

Figure 11: UK output: 2010 and 2020



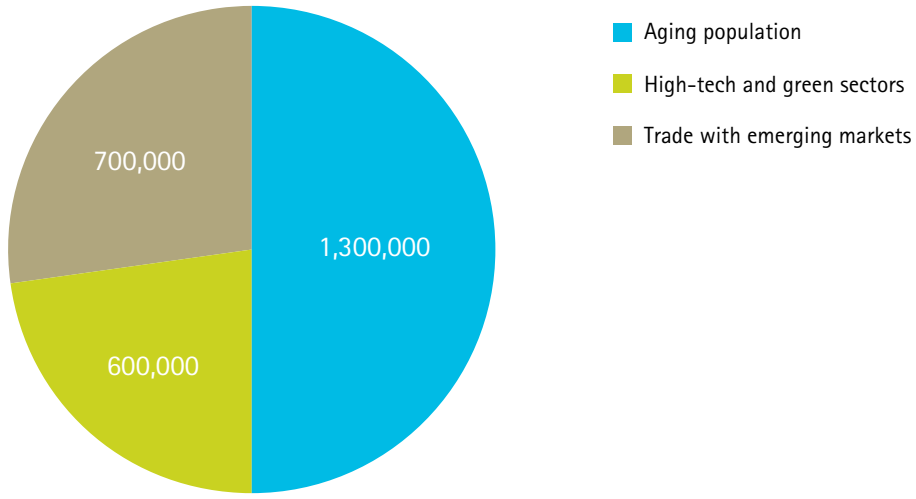
Source: Oxford Economics

Figure 12: UK GDP: current and alternative trajectories



Source: Oxford Economics

Figure 13: Additional UK employment in 2020 in alternative trajectory



Note: Totals may be affected by rounding.
Source: Oxford Economics

India

On the current trajectory, Indian economic output is expected to grow from Rs67 trillion in 2010 to Rs144 trillion in 2020 (Figure 14). But economic output could be increased further by putting in place the necessary supply-side conditions to harness the new waves of growth, such as enough workers with the right skills, sufficient complementary infrastructure, smart use of technology and clear channels to new markets. These interventions could push the Indian economy onto an alternative trajectory, with economic output reaching Rs154 trillion by 2020, an additional Rs11 trillion of economic output. It would also have a significant impact on employment, boosting employment levels over the next decade by 25 percent, compared with a 17 percent increase in the current trajectory, representing nearly an additional 37.5 million jobs by 2020 (Figure 15). This growth would be equivalent to increasing India's GDP per capita by Rs7,700 by 2020.

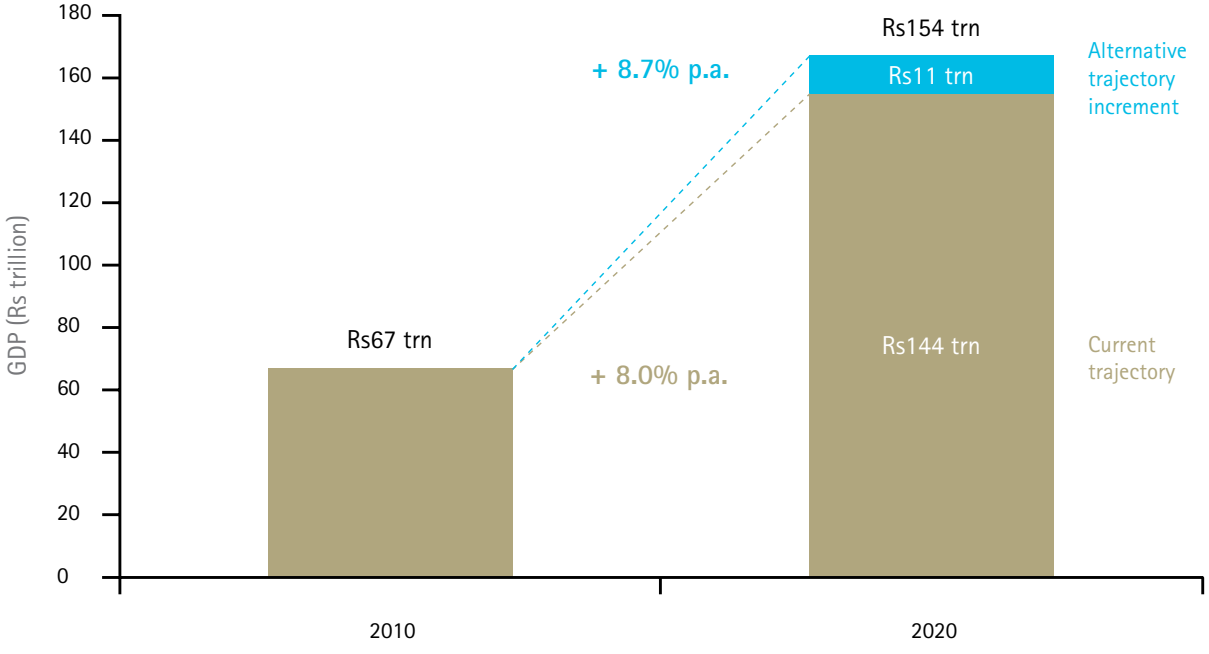
Seventy-five percent of the potential additional jobs would originate from India's trade with other emerging markets, the highest across our four case-study countries (Figure 16). India is well positioned to reap the rewards of emerging-market growth, owing to its relatively high degree of trade integration with other emerging markets and its existing comparative advantage, driven by cost-competitiveness, in consumer and intermediary goods.

The remaining 25 percent of new jobs would be in the high-tech and green sectors. India's technology sector is known for its software exports and business process outsourcing activities. Our panel suggested that the growth in mobile banking and micro-financial products, combined with the country's strategy of moving up the value chain, point to significant employment growth in technologies that support these sectors.

A key distinction between India and the other three case-study countries is that we have not included aging in our analysis for India. Half of India's population is under 25 years old, and our panel identified the country's main challenge as educating and productively employing its large segment of young people.

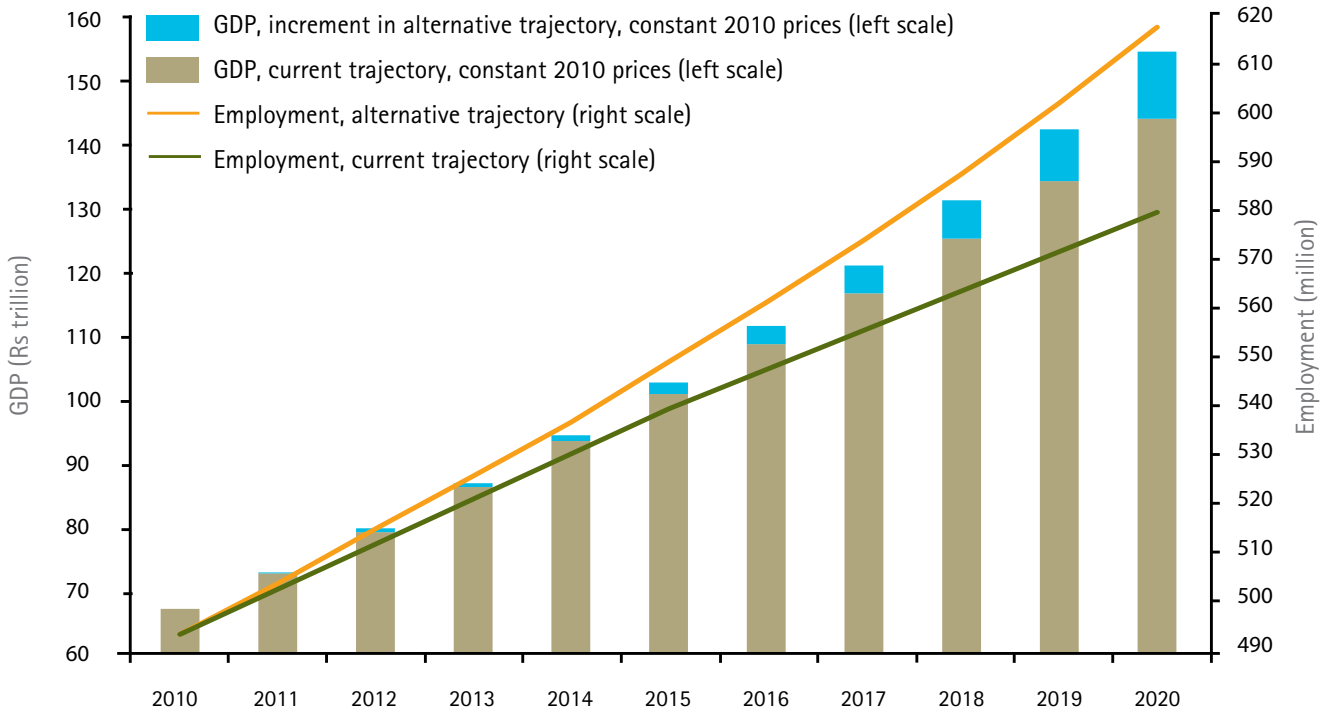
Figure 14: India output: 2010 and 2020

The Indian economy has the potential to increase economic output by Rs11 trillion per annum by 2020 if it fully harnesses the potential of the rise of other emerging markets, multi-technology and natural-resource security. This is equivalent to an additional Rs7,700 in GDP per capita.



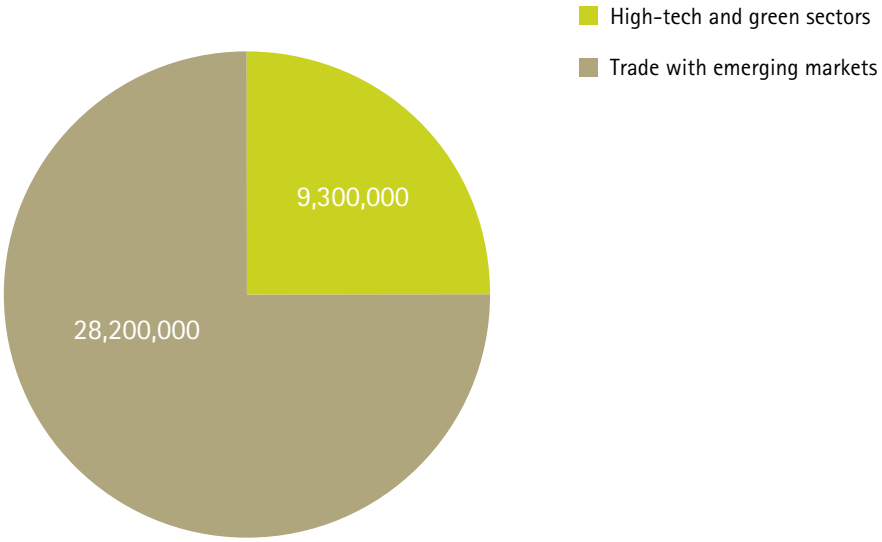
Source: Oxford Economics

Figure 15: India GDP: current and alternative trajectories



Source: Oxford Economics

Figure 16: Additional India employment in 2020 in alternative trajectory



Note: Totals may be affected by rounding.
Source: Oxford Economics

The silver economy

The silver economy

Chapter summary

Assessing the trend: The age pyramid is being inverted

The world's population is aging, as birth rates fall and people live longer. The global median age is projected to increase from 29 today to 38 in 2050.[1] The postwar baby boom in the United States and Europe has further enlarged the age cohort that is approaching retirement.

There are several dimensions of the aging population that merit attention. The first is the increased number of older people relative to younger people owing to a combination of falling fertility rates and longer life expectancy. Population projections indicate that within the next 10 years:

- In the United States, the over-60 age group will increase 32 percent, in sharp contrast with a 7 percent increase in those aged 16 or under (Figure 17).[2]
- In Germany, the over-60 age group will increase by 14 percent, to 24.5 million, compared with 14 million people aged 16 or below (Figure 18).[3]
- In the United Kingdom, the number of people aged 60 and above will increase by 17 percent, from 14 million to 16.4 million, while the share of under-16s will increase by 7 percent, from 12.3 million to 13.2 million (Figure 19).[4]

The second dimension is the growing number of the "oldest old" (those 80 years old or above) that is extending the tail end of the population distribution. According to population projections:

- In the United States, this age group will increase from 11.5 million to 12.8 million by 2020.
- In Germany, there will be more than 6 million people aged 80 and above by 2020, a 40 percent increase.
- In the United Kingdom, the "oldest old" will increase to around 3.7 million by 2020, or 6 percent of the expected population.

Conventional wisdom dictates that an aging population will be a burden on economic growth. As people retire, the workforce decreases, and the older employees left in the workforce are less productive. At the same time, their demand for healthcare and social care increases, and they put further pressure on the public purse by drawing down pensions. The decline in income that is usually associated with older age makes these age groups less attractive to businesses looking for fast-spending, trend-conscious consumers. However, as one of our panelists put it, economies can spur economic growth by retaining older workers and catalyzing their consumption power.

Figure 17: US population pyramid (thousand)

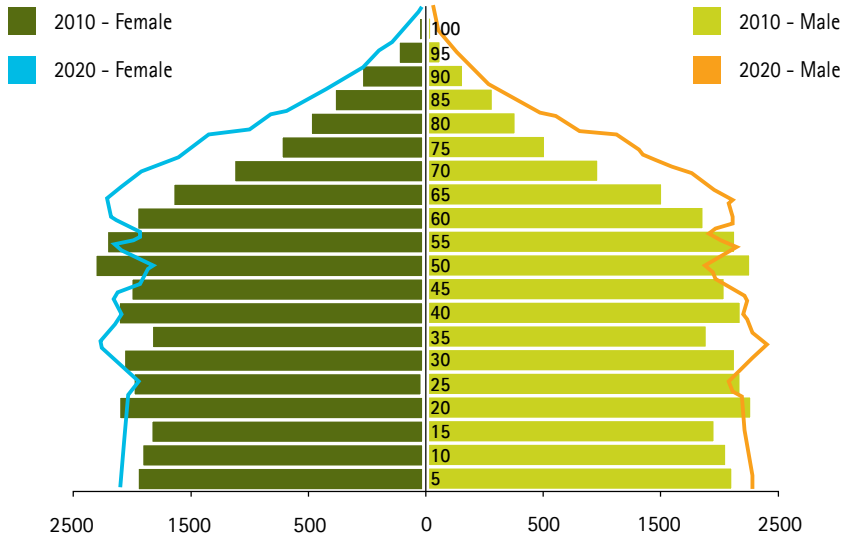


Figure 18: Germany population pyramid (thousand)

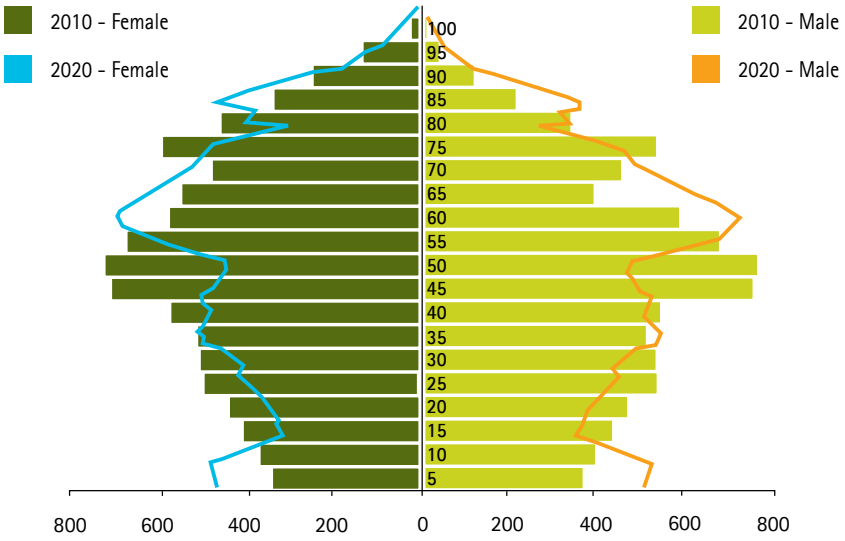


Figure 19: UK population pyramid (thousand)

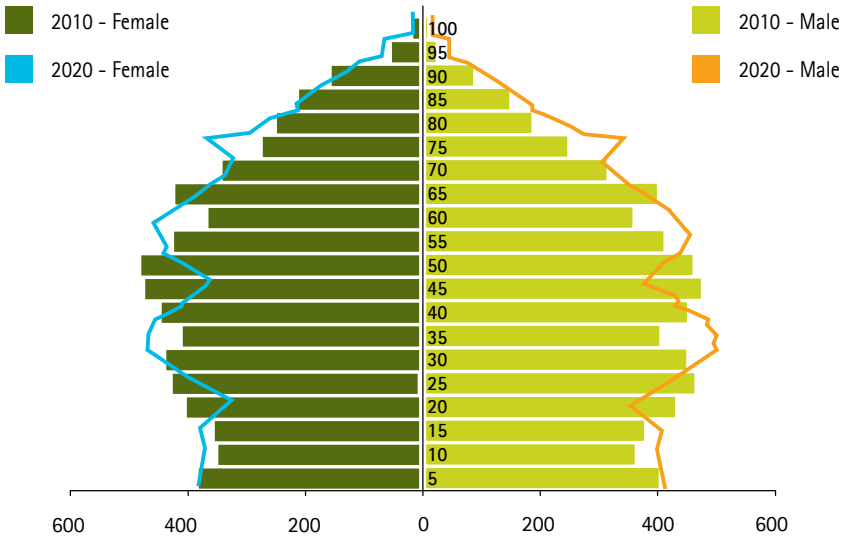


Figure 17–19 Source: US Census Bureau, German Federal Statistical Office, UK Office for National Statistics, Accenture analysis

India's population

Improvements in healthcare and living standards are also pushing up the average life expectancy in emerging markets. For example, India's average life expectancy has risen from 59 to 65 in the last two decades and is expected to rise to 68 by 2020.[5] As a result, the number of older people is increasing, with the proportion of those aged over 60 expected to rise from 7.5 percent to nearly 10 percent in the next 10 years.[6] But India's population is not aging; it is predominantly young. Half of India's population is under 25 years old.[7] As our panel identified, the country's main challenge lies in educating and productively employing this large segment of young people.

Given that India's demographic situation differs markedly from the other three case-study countries, we have not included aging in our analysis of the silver economy for India. However, some sectors in India can benefit from a larger cohort of older people. Demand for private healthcare can be expected to increase as coverage of public health services is currently low. The **Indian government** extended the "New Pension System" (NPS) from the public to the private sector in 2009,[8] based on individual defined contribution retirement accounts through bank and post-office networks.[9] For example, **ICICI Bank** is offering NPS accounts.[10] Participation in the scheme is likely to increase as incomes rise and individuals start planning for retirement.

Areas to watch

As populations age, the profile of demand shifts toward products and services consumed later in the household life cycle, such as financial services and leisure products, and away from products and services consumed by younger households, such as durables and electronics. Our panels helped to identify specific sectors that stand to benefit from the needs of an older population, as set out below.

> "Aging of the population should not simply be regarded as a 'problem'; it can open up many possibilities that the innovative and entrepreneurial can take advantage of."
>
> Rob Wilson, Institute for Employment Research, University of Warwick

Third-age learning

Remaining competitive in the marketplace during a longer working life, pursuing new interests, seeking mental stimulation and valuing lifelong learning—these factors all point to a growth in demand for education services among older cohorts. However, current education services are targeted to young people. A survey by the American Council on Education found that more than 40 percent of education institutions did not identify older adults as potential students for their outreach of financial aid programs.[11] This leaves a significant gap in the market for education designed to address older people's learning needs and preferences. For example, research indicates that older age groups are likely to prefer courses attended by smaller groups and those with an element of social interaction. The model used by the University of the Third Age (U3A) in the United Kingdom, which has nearly 250,000 members, points to the potential growth in tailored education.[12] There could be additional growth potential in exporting such services to other countries as well, particularly given the growth of technology-enabled distance learning.

Experiential goods and services

Older age groups will be increasingly wooed by the leisure and entertainment sector. The reason: Many older people are healthier, financially better off, better educated and have a greater desire for novelty than previous cohorts of retirees. For instance, in the United Kingdom, people aged 50-64 spend nearly twice as much on recreation and culture as the under-30s.[13] Businesses geared toward the "experience economy" will see a new wave of demand from older groups seeking adventurous forms of leisure and opting for more physically challenging activities. The key offering that would enable businesses in this sector to widen their reach would be variety of choice. There will be more variation in the circumstances of older people than younger people, and new services must be able to cater to this differentiation.

Health services and wellness products

Older people are the main users of healthcare and social care. Overall health spending, including long-term care for the elderly, already accounts for around 9 percent of GDP in OECD countries—a figure that is projected to increase up until 2050 by around 3 to 3.5 percentage points of GDP.[14] In the United States alone, healthcare expenditure as a share of GDP, which is 15 percent today, is projected to double in 20 years and triple in 40 years.[15]

The global pharmaceutical sector is forecast to grow between 5 percent and 7 percent in 2011, partly owing to aging populations.[16] Some major drug companies are already moving to capitalize on this increase. For example, **Novartis** acquired majority control of Alcon, an eye-care products manufacturer, at the start of 2010 and plans a full merger in a bid to gain access to the fast-growing eye-care sector driven by aging populations.[17] Likewise, GSK expects significant growth for dental-care products as the number of denture wearers increases.[18] Emerging-market fundamentals, of rising incomes and large populations, will also support significant growth in the developing world. In December 2010, **Reckitt Benckiser,** a UK household products group, acquired India's Paras Pharmaceuticals in a £454 million deal, as they seek to benefit from India's growth potential.[19]

A particular area set for growth is combinatorial chemical and pharmaceutical research, such as biotechnology and nanotechnology. **Pfizer** became the first pharmaceutical major to have a dedicated program, with a US$100 million budget, to develop stem-cell products targeted at treating age-related illness.[20] A rise in chronic diseases and increasing focus on cost cutting will support demand for preventive medicine that decreases the need for hospitalization. These factors will also drive greater demand for residential and nursing home care.

Connected health

The demand for healthcare is set to rise rapidly with population aging and longer lifespans. In an effort to control cost and improve the quality of and access to healthcare, organizations will need to reshape provision through significant investment in IT and e-health. Leading firms such as **Google, Microsoft** and **Intel** are already expanding into the connected health market.[21] A recent Accenture survey of more than 1,000 physicians in small practices across the United States found that almost 60 percent of all current non-users intend to purchase a system for electronic medical records by 2012 (see "Connected health: Technology improvements will transform health systems").[22]

Lifelong finance

Access to suitable financial services will become increasingly important as people plan for longer lives. However, existing financial products have been optimized for a world with a lower life expectancy. In some cases, there are barriers to certain financial products, such as age limits on taking out a mortgage. People also feel highly uncertain about the future of their retirement income. For example, in one global survey, 87 percent of respondents did not know what income they could expect in retirement.[23] Financial services innovation could lead to new products designed for a longer lifespan, such as equity release schemes to convert the value of a home to retirement income. For insurance companies, there is a significant opportunity to develop new retirement products, particularly as the public sector is becoming less involved in supporting income in retirement. **Aviva**, the global financial services company, is focusing on the growth of equity release products and expects its sales to increase by 38 percent within five years, from £950 million in 2009 to £1.31 billion in 2014.[24]

We may also see new financial products that address particular concerns of older age groups. For example, the "older old" are more conscious of personal data security than the average consumer, but they also find it more difficult to recall passwords. The financial services industry can tap into this segment by finding ways to design secure and flexible ways to access money. For example, the **Bank of Maharashtra**, one of the largest banks in western India, announced plans in 2009 to ramp up installations of biometric ATMs, which enable users to access their bank accounts with a thumb impression instead of a personal identification number (PIN).[25]

"The future competitiveness of our economy depends, to a great extent, on how we develop skills throughout life and retain older people in the workforce."

Fabian Wendenburg, The Linde Group

Age-inclusive consumer goods

The need to reflect the changing physiological condition of the older generation in the design of new products will be a pivotal challenge and opportunity for consumer goods industries. Carmakers already employ techniques to make driving safer and more comfortable for older people. Designers at **Nissan** and **Ford** now make regular use of "aging suits," specially developed clothing that simulates many of the effects associated with old age. For example, the Nissan suit has a waist belt that simulates "middle-age spread," while the Ford suit adds bulk in the knees, elbows, stomach and back to reduce flexibility.[26] According to Ford, its Third Age suit played a major role in the development of the Ford Focus, though the car has wide appeal and is marketed to both younger and older age groups. The success of the Focus indicates the potential of innovations that spring from age-related issues to spread into the larger, mainstream market.

Beyond the automotive industry, retailers also may adapt store formats for older shoppers. Examples include devices with large buttons and a tilting screen that can be attached to supermarket carts; the shopper uses the device to scan a product and see or hear price and other information about the product.[27] Technology products are thought to be underused by older consumers. But many older consumers are becoming more familiar with technology and are embracing it for personal use. For example, a recent study found that the fastest growth in online social networking has been among the 74+ age group, increasing for this cohort from 4 percent in 2008 to 16 percent in 2010. Forty-one percent of respondents aged 46-64 use the Internet to look up financial information, such as stock quotes and mortgage interest rates.[28] This indicates that properly designed products can have high take-up and become very successful. Consider the Raku-Raku phone series, made by Japan's **Docomo**. More than 15 million units have been sold. The product has voice-to-text conversion, clear-voice technology and a large 2.8-inch screen. The latest models also have built-in health-monitoring features, such as pedometers and a pulse rate monitor.[29]

Connected health: Technology to transform health systems

Over the next decade, health systems will need to change dramatically to address many challenges—aging populations with increasing incidences of chronic disease, steadily rising costs and people's growing expectations for care that is more accessible, affordable, of high quality and personalized. In response, healthcare providers and public health organizations, particularly in developed markets, are making unprecedented investments in e-health. The aim: to improve patient and public health outcomes by enhancing the accessibility and quality of healthcare services, while driving down costs.

Demand for e-health solutions is set to grow significantly in a number of sectors, including the following:

Healthcare management systems use reporting, analytics and process optimization solutions to improve the performance of back-office, business and clinical processes. Solutions include core administrative, enterprise resource planning, payroll, HR, finance, business intelligence, patient management and hospital information systems.

Electronic prescribing systems enable clinicians to create and transmit electronic prescriptions to dispensing organizations. Solutions include e-prescription and computerized physician order entry systems.

Health information systems store and provide clinicians with access to information related to patients' health, diagnosis and care provisions. Solutions include clinical information systems (CIS), electronic medical records (EMR), electronic health records (EHR) and health information exchange (HIE) systems.

Health analytics systems maximize the value of clinical and administrative information by turning it into actionable insight to support evidence-based decision making. Solutions include clinical decision systems that support evidence-based medicine, payer analytics, epidemiological/public-health analytics and clinical research analytics systems.

Patient-centric e-health solutions empower patients to manage their health more effectively. Solutions include health 2.0 websites, personal health records, health portals, wellness tools and patient education platforms.

Remote health systems support mobile and home-based delivery of health care services. Solutions include telecare, telemedicine, mobile health, smart homes and mobile devices. Home-based care models can significantly reduce the need for overnight stays in hospitals and demand for accident and emergency services.

These investments can enable transformation to a highly coordinated, connected health system characterized by a focus on improved quality of care, long-term wellness, prevention and chronic-care management, and informed and engaged consumers.[30]

Health Information Exchange

Building a truly connected health system requires cooperation across the spectrum of health care providers—the private, public and not-for-profit sectors—along with commissioners and policymakers. This cooperation is now happening in many countries that join efforts to build and implement national e-health strategies. In the **United States**, for example, the 2009 Health Information Technology for Economic and Clinical Health (HITECH) Act made available US$31.2 billion to build e-health infrastructure and increase EMR adoption. This investment from the federal government is likely to have a marked impact on EMR adoption.

In terms of maturity, connected health models are already in place in Scandinavia. And **Singapore** is implementing a national EHR system, which will enable care providers across the country to share key medical information such as patient demographics, allergies, clinical diagnoses, medication history, radiology reports, laboratory investigations and discharge summaries.

Creating growth through the silver economy

Current trajectory

The Oxford Economics modeling finds that aging populations hold significant growth potential over the next decade. The current trajectory incorporates a number of positive and negative effects of trends in population aging, including impacts on consumption and on labor markets, based on an expected supply-side accommodation to these trends.

Alternative trajectory

While the trend in aging will positively contribute to growth and employment in economies, additional growth can be realized through actions to raise labor-participation rates and increase productivity. The low labor-force participation rates among older age groups suggest that there is significant room for improvement. In the United Kingdom, for example, the participation rate among men over 65 is just 11 percent; for women, 13 percent. In Germany, participation rates are even lower: 6 percent for men and 3 percent for women. Research also suggests that productivity improvements are a source of long-term economic growth.[31]

Increasing the number of older people in the workforce, combined with productivity-enhancing human-capital investment, could create a virtuous cycle. These two changes would enable older people to increase their disposable income as they become more productive and stay financially independent for a longer time. Higher disposable incomes can boost consumption within the economy. At the same time, public budget balances can improve, as tax revenue rises and pension expenditures fall.

Oxford Economics analysis shows that, if these two interventions are made, economies could boost the benefits of these demographic shifts, producing the following results by 2020:

- Increase US GDP by US$442 billion, an increase of 2.2 percent above the current trajectory in 2020. This translates to lifting employment levels by 5 million by 2020 (Figure 20).
- Raise Germany's GDP by €61 billion, 2.1 percent above the current trajectory in 2020. This translates to lifting employment levels by 1.5 million by 2020 (Figure 21).
- Boost UK GDP by £46 billion, an increase of 2.5 percent above the current trajectory in 2020. This translates to lifting employment levels by 1.3 million by 2020 (Figure 22).

Figure 20: United States

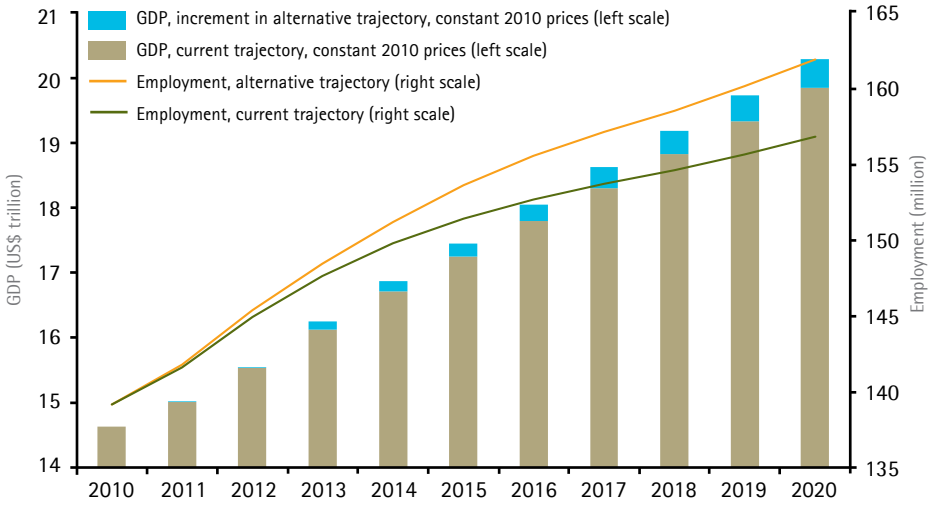


Figure 21: Germany

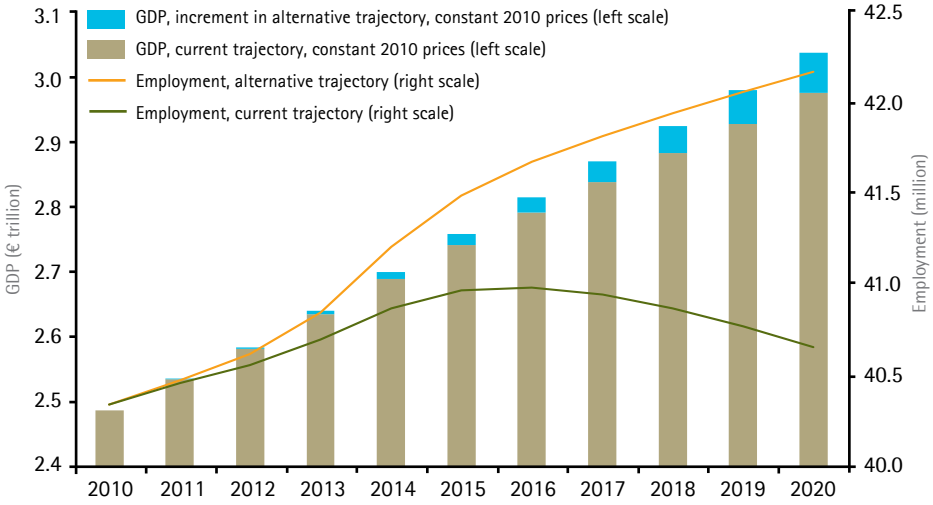


Figure 22: United Kingdom

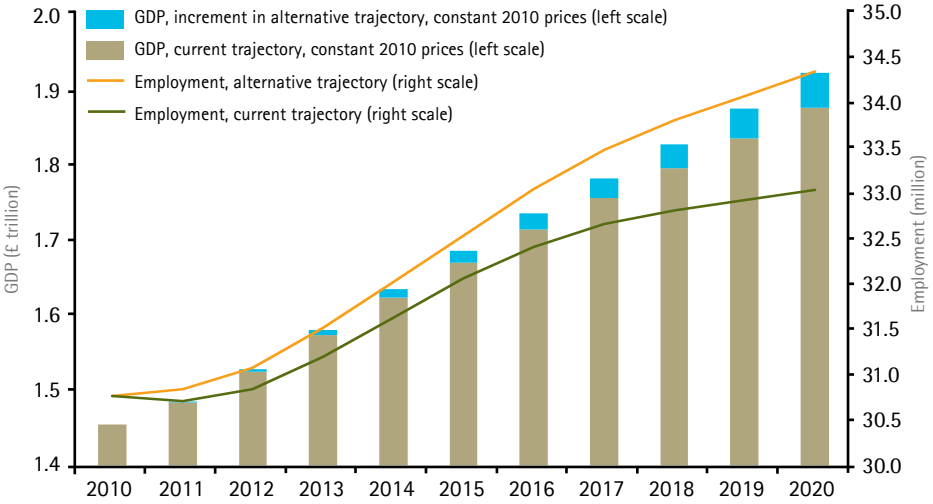


Figure 20-22 Source: Oxford Economics

Creating the conditions for success

To unlock this potential growth, labor-force participation will need to increase, and productivity will need to be raised. These conditions can be introduced through the use of technology to enable knowledge creation, incentives for people to stay employed longer and restructuring of the work environment to enhance the productivity of older workers. Growing awareness of an aging population and the consequences of aging can enable business leaders to shape their organizations' future rather than be blindsided by demographic shifts.

Widening the net

Retaining older people in the workforce will be critical for preventing a human-capital crunch. In the coming years, large portions of employees will withdraw from working life, taking with them years of expertise and accumulated knowledge. Among our case-study countries, Germany is likely to suffer most, with its working-age population expected to decline by nearly 2 million in the next 10 years.[32] But this shift is not just a function of aging populations; the current regulatory and working environment discourages workers from staying employed. Accenture research among German companies found that two-thirds of employees were not motivated by their employer to work past retirement age.[33]

Changes that could incentivize a longer working life include reform of tax and benefit systems, alignment of pension systems, and investments in learning. An extended working life would have the added benefits of sustaining older workers' consumption power and extending their financial independence.

The productive capacity of older citizens can also be harnessed through forms of co-production, a process where users and providers collaborate in the delivery of services.[34] The third sector, including not-for-profit organizations and social enterprises, can tap into the increased willingness of older people to stay active in the community. For example, over-60s in the United Kingdom contribute 18 million hours per week of voluntary work.[35] In the United States, the **Peace Corps** actively recruits older people as volunteers to work in developing countries and to help local communities meet basic food and education needs.[36]

Ensuring future supply of "hands and minds"

Identifying the skills needed for the future is the stepping-stone to developing the right workforce. Future growth sectors—such as nursing, residential care, tourism and travel—will require large numbers of people with non-routine manual skills. Such skills call for a high degree of personal interaction with service recipients.

The ways in which these different types of skills are formed, developed and deployed differ markedly. Organizations need a strategy for ensuring a sufficient supply of non-routine manual skills for the future. Business and public-service providers will need to seek closer and more effective interaction with educational bodies to produce key skills. Various tools can be deployed to achieve

> " Engaging older adults as workforce participants and as empowered consumers can spur economic growth ... but this will depend on our ability to reinvent the life-course."
>
> Alvaro Fernandez, SharpBrains
> Council for Brain Fitness Innovation

this, including the establishment of business-run schools or academies, apprenticeships and tuition-reimbursement programs.

Promoting productive aging

Older age cohorts can help increase their productivity. Education also enhances mental capacity and social networking, which have positive spillover effects on productivity. A survey by the UK Learning and Skills Council found that 51 percent of workers were retraining to improve job prospects and security, with a particular focus on communication, IT and literacy.[37]

The first step for organizations is to assess whether current learning programs focus on critical skills needed for the future and whether their training is designed to meet age-specific learning needs. Gathering input from employees, in all age groups, can help organizations collect actionable information, while at the same time demonstrate commitment to a flexible and tailored training curriculum.

A second key step is to harness the power of technology as it becomes a central element in promoting and sustaining productive aging through education. Technology can enable flexible and remote work arrangements that might be more appealing to older workers who are seeking to balance work with their personal commitments. But organizations should also seek to understand how technology in education is evolving, from a tool for capturing and imparting knowledge information to a learning medium, blurring the boundaries between formal and informal training. At the same time, increasingly sophisticated human-computer interfaces will accelerate the shift to personalization of learning.[38]

Organizational imperatives

Age-proof your human capital

Organizations can use workforce analytics to gain a better understanding of how aging will affect their employee profile and to identify potential shortages of key capabilities before they happen. **Dow Chemical** uses a custom modeling tool that mines historical data for 40,000 employees, segments the workforce into age groups and levels, and uses the insights gained to anticipate workforce needs and carry out scenario planning.[39]

Organizations can then use the results to identify the risks that an aging population poses and develop strategies for managing and mitigating those risks. Strategies could include workplace adjustments such as creative ergonomics to help older workers; company operations reform, such as altering performance assessments to reflect the differences between older and younger workers; and leadership and succession planning.

To illustrate, **BMW** implemented 70 changes to a production line staffed with a mix of employees that reflected the workforce profile that the company expected for 2017. The changes covered healthcare management, skills enhancement and workplace environment improvements such as orthopedic footwear and adjustable worktables. The production line's productivity improved 7 percent in one year, bringing it to the same level as lines staffed by younger workers.[40]

Recycle experience

Organizations have to find ways to strengthen the interactions between their different workforces and explore new methods to cascade experience throughout the organization. They should also assess how they can retain older workers' critical knowledge and experience. New approaches can include phased retirement options and flexible work arrangements, such as job sharing, remote work arrangements and "snowbird programs," whereby workers are allowed to transfer to different locations on a seasonal basis.

Informal mentoring schemes can also help recycle knowledge and expertise between older and younger workers and may even replace training to some extent. At **Linde+Wiemann Group**, an automotive supplier, mentoring teams of older and younger employees emerged step-by-step to combine the strengths of both groups. The teams combine long experience and talent for improvisation, as well as extensive knowledge about modern materials and technologies.[41]

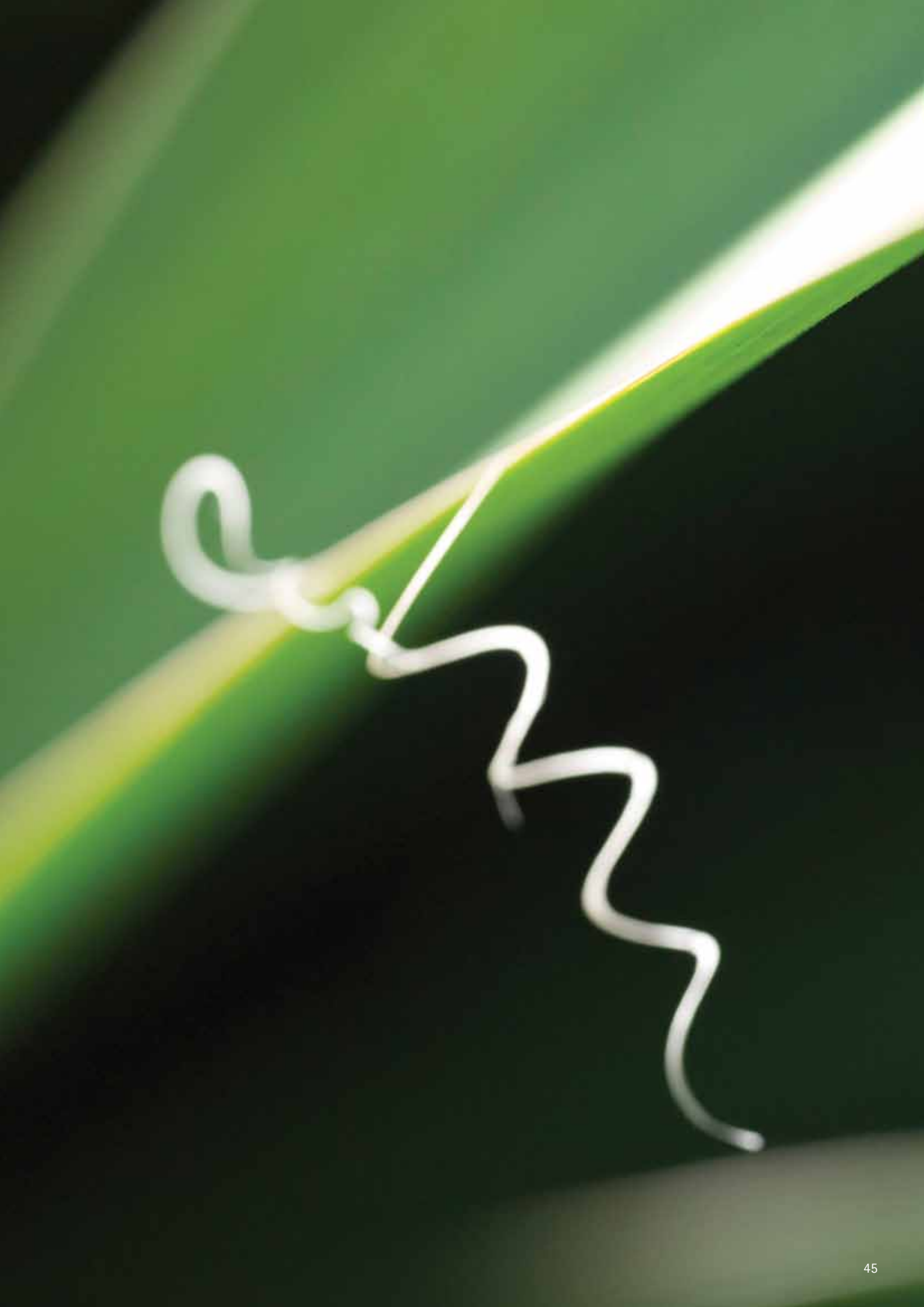
Develop your silver radar

Better analytical capabilities to segment demand, coupled with improved marketing techniques, will be critical for unleashing growth opportunities. Capturing market share among older consumers will require a better understanding of their distinct characteristics. The older age groups also need to be treated as a heterogeneous group in which each cohort has unique needs and will demand different goods and services. But analytics presents a wider opportunity for organizations to understand evolving demographics and segment their target markets more accurately. It could help them to analyze demand according to gender, ethnicity or generational characteristics.

This can help organizations to strengthen the link between their workforce and their target market. A significant step would be to appoint an older senior-level executive to coordinate and drive innovation efforts for older-consumer offerings. Accenture's Innovation Survey identified that one of the most important reasons that innovations had fallen flat was a failure to understand customer needs.[42]

Exploit cross-market transfers

Organizations should be alert to the growth opportunities presented by repositioning their brand for changing demographics. Products initially developed for younger consumers may become popular with older consumers. An example is **Nintendo's** Wii. The game console's feature of combining entertainment with exercise encouraged its spread as a social activity among older age groups. **Apple's** iPhone has also been widely adopted by older users owing to its accessible touch interface and consumers' ability to customize the phone's features using apps. These cross-market transfers, between one market segment and another, could flow both ways, just as **Ford's** Focus, originally designed with older drivers in mind, is popular with younger drivers. Organizations have to design their offerings in a way that seeks and exploits such cross-market transfers.



The resource economy

The resource economy

Chapter summary

Areas to watch

- Intelligent energy
- Green infrastructure
- Food and agribusiness
- Alternative energy sources
- Eco-ethical products
- Waste, water and land management
- Eco-consultancy
- Carbon finance and investment

Creating the conditions for success

- Building the skills needed for a green economy, such as technical, engineering and "green collar" skills
- Enabling complementary infrastructure to support new technologies and energy solutions

The resource economy

Organizational imperatives

- Develop new products and services to serve the resource economy
- Integrate a carbon price into business units to identify carbon hotspots
- Turn scarcity into abundance by transforming waste into assets

Impact on growth and jobs

- US: US$148bn added to 2020 GDP, 0.7% above current trajectory; 850,000 additional jobs
- Germany: €14bn added to 2020 GDP, 0.5% above current trajectory; 320,000 additional jobs
- UK: £6bn added to 2020 GDP, 0.3% above current trajectory; 36,000 additional jobs
- India: Rs458bn added to 2020 GDP, 0.3% above current trajectory; 821,000 additional jobs

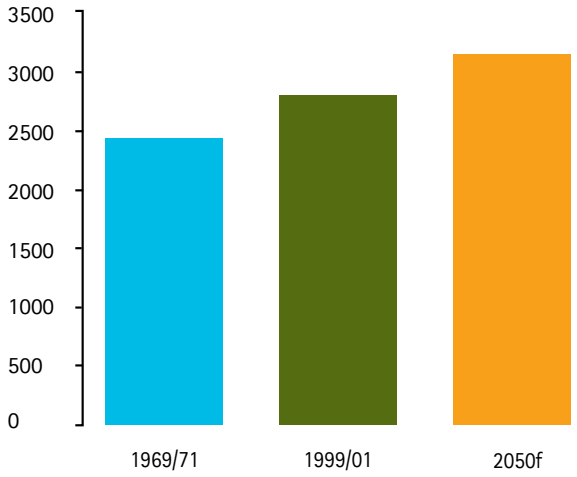
Assessing the trend: Growing scarcity of resources

The world's resources—land, water, energy, food and minerals—are growing scarcer. Meanwhile, total food consumption per capita is increasing (Figure 23), and global energy consumption is set to grow by nearly 50 percent from 2007 to 2035, driven mostly by growth in emerging markets (Figure 24). On the demand side, a growing world population, changes in demographics brought on by urbanization and a population shift to coastal cities, and fast-growing industrialized emerging markets are increasing competition for all kinds of resources. **South Korea**, for instance, is doubling its investments in overseas energy projects and acquisitions amid growing competition from China, India and Japan for natural resources.[43]

Meanwhile, resource supplies are being strained by geopolitical factors and various forms of regulation. By setting restrictions and targets on the use of resources, governments are trying to address the externalities associated with greater usage of resources, such as pollution, resource depletion and climate change (Figure 25). At the United Nations climate change conference, held at Cancún, Mexico, in December 2010, governments agreed to formalize mitigation pledges and ensure increased accountability for these targets, to provide financial assistance to developing nations to achieve their targets, and to take action to protect the world's forests.[44] As a result of this double-edged scarcity, concerns are growing over the availability and prices of resources (Figure 26). Global food prices, for instance, rose in December 2010 to their highest level on record.[45]

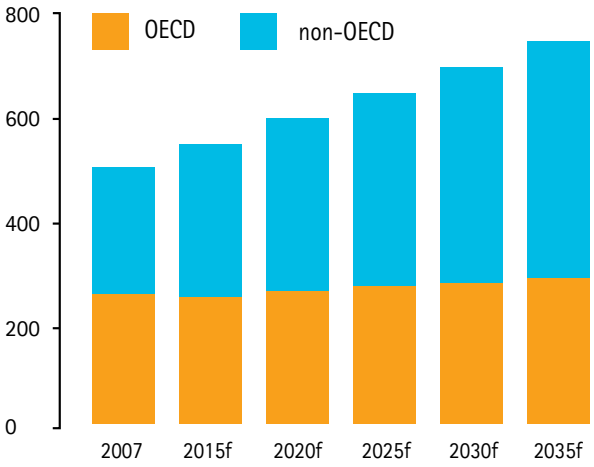
Yet, approached imaginatively, the quest for resource efficiency can become an important source of economic growth and job creation. Our research and analysis show that the green sector could generate valuable new jobs and boost the necessary structural transformation of economies. The global low-carbon sector, for instance, was worth £3.2 trillion in 2009 and employed more than 28 million people.[46] In the management of scarcity, with the help of new technologies and many new innovations, fresh sources of growth are unfolding.

Figure 23: Total human food consumption (kcal/person/day)



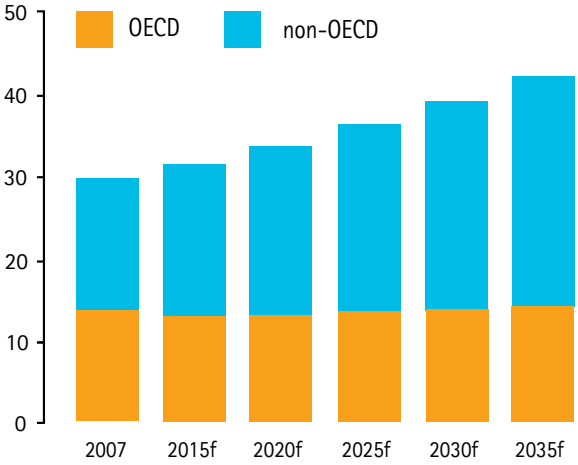
Source: Food and Agriculture Organization of the United Nations

Figure 24: World energy consumption (quadrillion Btu)



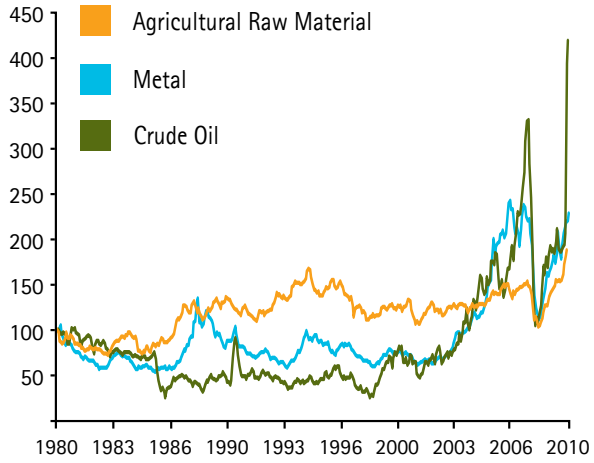
Source: U.S. Energy Information Administration

Figure 25: World energy-related carbon dioxide emissions (billion metric tons)



Source: U.S. Energy Information Administration

Figure 26: Commodity prices (Index 1980=100)



Source: International Monetary Fund

" Green technology is a promising growth area with huge potential for German technology and innovation."

Hartmut Mayer, University of Oxford

Areas to watch

Which sectors stand to benefit most from this resource-efficiency revolution? Our research shows that managing the scarcity of resources is opening up growth opportunities for a wide range of old and new industries—including agriculture, energy, consumer products, and business and financial services.

Intelligent energy

The trend toward the low-carbon economy will accelerate the growth in intelligent energy solutions: smart grids, carbon capture and storage, smart buildings, remote sensors and meters. This growth will facilitate the introduction of new forms of smaller-scale energy provision to cities. It will also increase the efficiency of energy systems, reducing consumption and cost while increasing reliability and transparency.

Smart grids, using communications and computing technology, can transmit and distribute energy more efficiently. The worldwide market volume for smart grid technologies is expected to increase from roughly US$22 billion in 2010 to US$115 billion in 2030, an average annual growth rate of 8.8 percent.[47] It is estimated that the benefits of smart grids to the US economy alone could amount to US$227 billion over the next 40 years.[48] Smart grids will also aid the emergence of other low-carbon initiatives, such as electric cars and distributed generation. Moreover, the opportunity to provide such intelligent solutions lies beyond the domestic market—there is potential for economies to export these solutions to other economies affected by climate change, particularly emerging markets (see "Intelligent energy systems: Driving resource efficiency in cities").

Green infrastructure

Green infrastructure is a major beneficiary of government fiscal stimulus (over US$430 billion allocated to climate-friendly activities worldwide)[49] and business investment. Establishing the low-carbon infrastructure of economies—buildings, transport networks, energy sources, power generation and industry—will breed demand for a host of green capital goods and construction and building materials. Policy Exchange estimates that the United Kingdom would need to spend a minimum of £434 billion on new and refurbished infrastructure by 2020 to address underinvestment and kick-start the transition to a low-carbon economy.[50]

Food and agribusiness

The global food and beverage market is set to increase at an average compound rate of 3.5 percent per year to US$7 trillion in 2014.[51] Rising wealth in emerging markets, particularly in Asia, as well as a growing appetite for meat, means that millions of people are increasing their food consumption. The United Nations has warned that as the global population grows from 7 billion today to 9 billion by 2050, the world will need to double its food production.[52]

Heightened food demands, combined with trade liberalization and technological modernization, have opened up markets for a growing global agribusiness industry. As

supermarkets replace the traditional local markets in developing countries, related activities in farming such as processing, handling, packaging, transportation, marketing and product distribution are increasingly in demand. Agribusiness has the potential for high growth, overshadowing previous boom industries. For example, Australia's AU$108 billion agribusiness sector was a key export earner during the slowdown. Growth in the agribusiness market will also complement other related sectors of the economy, such as industrial and marine biotechnology.

Alternative energy sources

Supported by rising fossil fuel prices, environmental costs of generating higher levels of power and government incentives to diversify energy sources, alternative energy sources including renewables and nuclear power offer a promising opportunity. About 200 gigawatts of nuclear power capacity is planned or being built worldwide, adding to the 372 gigawatts currently in operation. Much of this expansion is happening in Asia, with 28 reactors planned for construction in **China**.[53]

Renewable sources of energy—including wind, solar, hydropower, biomass and geothermal—are growing faster than non-renewable sources. The global renewables market is expected to reach a value of over US$500 billion by 2013.[54] With more than US$150 billion invested in new renewable energy capacity and manufacturing plants in 2009 globally,[55] renewable energy sources is likely to be a major growth engine and job generator in the coming decade. According to the Carbon Trust, the United Kingdom has the potential to create almost 250,000 jobs from offshore wind and wave power generation schemes by 2050.[56] The Global Wind Energy Outlook 2010 finds that India can grow employment in the wind sector from an estimated 21,400 jobs today to almost 150,000 by 2020.[57]

Alternative energy sources can create new industries and export opportunities, while renewing the manufacturing base. Canada, for instance, has a revealed comparative advantage in the production of certain green capital goods, such as photovoltaic system controllers, and towers and lattice masts for wind turbines. It could become a leading manufacturer and exporter of these components. Indeed, photovoltaic system controllers are Canada's second most valuable climate-friendly export, and the category is experiencing rapid global growth (10 percent compounded annually from 2002 to 2008). But Canadian exports grew by only about 3 percent over the same period, suggesting unmet export potential.[58]

Eco-ethical products

New patterns of consumer demand are unfolding. Consumers are becoming increasingly conscientious, choosing and preferring to buy goods and services that have been produced in ethically, socially and environmentally responsible ways. An Accenture survey found that 90 percent of consumers would probably (56 percent) or certainly (34 percent) switch to products manufactured or designed to reduce their environmental impact (for example, products that make better

use of recycled materials, that make greater use of renewable energy or that have a smaller carbon footprint). Consumers were in many cases prepared to back up their words with action—around a quarter had actually switched to lower-carbon products, while more than half of them were considering such a switch.[59]

Businesses, such as fair-trade organizations, that gain ethical and green credentials are poised to enjoy an advantage in the marketplace. Despite the tough economic climate, the Fairtrade Foundation noted that the UK market grew by 12 percent in 2009 from 2008, as sales reached £800 million.[60] As the demand for green goods and services increases, the price premium attached to sustainable products can be expected to fall with greater investment, spurring further growth in the market. According to the Centre for Retail Research, European sales of green products are expected to accelerate in the next five years, doubling the value of the nascent market from €56 billion in 2009 to €114 billion by 2015.[61]

Waste, water and land management

Land degradation, a changing climate and growing water scarcity will put a premium on efficient land and water use. As acknowledged by the Indian Ministry of Environment and Forests, 70 percent of India's surface water resources and a growing percentage of its groundwater reserves are already contaminated by biological, toxic, organic and inorganic pollutants.[62] Pressure on global resources has also moved the focus away from simply managing waste to preventing waste and reusing products before they enter the waste stream. Demand is therefore opening up for creative solutions for sustainable land use, waste prevention, and water and wastewater productivity. Technology will form a key part of the solution; the market for desalination technology, for instance, is expected to increase from US$3.8 billion in 2005 to approximately US$30 billion in 2015.[63] Innovative and accessible low-cost solutions will also be popular. **Kenya's Kilimo Salama scheme** uses Safaricom's mobile-money systems with a network of automated weather stations to provide crop insurance to farmers.[64]

"Desalination for water sustainability, wind farms and biogas for agribusiness, all provide growth opportunities for India."

Ruth Kattumuri, India Observatory & Asia Research Centre

Eco-consultancy

With tougher regulatory requirements, rising energy prices, and greener stakeholder demands, organizations have come under pressure to reduce their impact on the environment. Over the next few years, US businesses alone are expected to double their sustainable-business spending from US$28 billion in 2010 to US$60 billion in 2014.[65] The journey to sustainable-business models will open up a host of green business solutions including carbon advisory and management, energy mapping and carbon modeling, and environmental and behavioral research and policy analysis. Rapid growth of software companies offering enterprise carbon accounting solutions saw more than US$46 million of venture capital invested by two vendors in the industry in 2009, with **Microsoft** and **CA Technologies** joining the race to become the world leader in carbon-emissions tracking software.[66]

In particular, there is potential for business opportunities from wider sustainable business practices such as brand, reputation, ethics and integrity. The urgent need to rebuild trust from the public and key stakeholders, which was shaken during the recent financial crisis, will be a key driver for introducing sustainability strategies. For example, 72 percent of CEOs surveyed by the United Nations Global Compact cited "brand, trust and reputation" as one of the top three factors driving them to take action on sustainability issues.[67]

Organizations will also increasingly seek advice on how best to compete for low-carbon opportunities. In the United Kingdom, the **Manufacturing Advisory Service** helped BGB Innovation unlock its green capability. As the Marketing and IT Director of the company explained, "We saw the potential for our generator slip ring assemblies to supply the wind turbine industry... As a result we have become one of the leading manufacturers and exporters of these components." [68]

Carbon finance and investment

The role of capital markets in tackling climate change, still in its infancy, has the potential to drive growth. The International Energy Agency estimates that the total investment required to reduce emissions by 50 percent by 2050 is around US$750 billion per year by 2030, rising to US$1.6 trillion per year from 2030.[69] **ING Group**, a financial institution, hopes to capture some of this market. Its green finance unit provides loans for environmentally friendly projects, covering areas like renewable energy and biological agriculture. In 2008, ING Groenbank (the company's Dutch green bank) managed €925 million for ING customers for green projects.[70]

New opportunities will also arise in the field of carbon finance and derivatives, though these are still at an embryonic stage. The future global market for carbon trading includes credits for carbon dioxide (CO_2) emissions as well as other greenhouse gases such as nitrogen dioxide (NO_2) and methane (CH_4). ABI Research, an emerging technology market specialist, estimates that the global carbon-emissions trading market could reach US$395 billion in 2014, more than three times the US$118 billion value of allowances traded in 2008.[71] Trading would also spur demand for ancillary services such as lawyers, auditors and brokers specializing in the carbon field.

Intelligent energy systems: Driving resource efficiency in cities

Cities are trying to achieve ambitious environmental targets while creating an attractive and competitive urban ecosystem. With over 90 percent of the world's electricity, gas and water meters currently using antiquated 1970s-era technology, the market for intelligent energy systems is likely to be vast.[72] As illustrated by Boulder, Amsterdam and Yokohama, dispersed metropolitan centers represent ideal platforms for the development of intelligent transmission systems.

Boulder, Colorado, is the world's first fully functional intelligent energy city. The intelligent energy grid is transforming the way energy is created, supplied and stored in Boulder. Electricity will be generated when and where it is needed, saving on the need to build more power plants. Homeowners can monitor when, where and how energy is used in the home. They can also generate their own energy (for example, from micro-generation solar panels), pump power back into the grid and store energy in the home if a surplus is generated.

The City of Amsterdam embraced a vision to reduce CO_2 emissions by 40 percent by 2025. It introduced a range of methods to cut CO_2 emissions, including smart meters in homes, retrofitting of commercial buildings and deployment of intelligent power connections for cargo vessels.

Yokohama, southwest of Tokyo, has a vision to become a smart city that the rest of the world will emulate. Launched in 2010, the "Yokohama Smart City Project" is a five-year pilot program involving a consortium of seven Japanese companies.[73] The smart city could become Japan's next big export, fueling new growth at a time when the country faces economic difficulties and has been overtaken by China as the world's second-biggest economy.

Looking beyond Japan, many countries are tapping into the lucrative smart grid market. **South Korea** is pumping US$200 billion into a smart grid project on Jeju Island, which is expected to create 500,000 jobs and reduce the country's power consumption by 3 percent once it is completed in 2030. **Australia** is spending US$100 million on developing its first commercial-scale smart grid in a city in New South Wales.[74] And **Singapore** is embarking on an intelligent energy system pilot project to improve energy efficiency.[75]

Creating growth through the resource economy

How could the resource economy affect economic growth and jobs? To answer this question, we shine the spotlight on the green sector—a vital strand of the resource economy. To model the impact of the green sector on the economy, Oxford Economics used the generally accepted definition of green businesses as those that make use of low-carbon and resource-efficient practices to operate more sustainably than competitors in their industry. This definition includes "traditional" environmental businesses dealing with pollution, waste management, water treatment, environmental consultancy and recycling as well as renewable-energy companies and those involved in emerging low-carbon activities (such as alternative fuels, carbon capture and storage, carbon finance, energy management, and green building technologies).

Current trajectory

The Oxford Economics modeling shows that under the current trajectory, the green sector will be a significant contributor to growth and jobs. Take the United States as an example. Its green sector is set to grow by US$619 billion in the next decade, to US$1.9 trillion, raising employment levels by 1.4 million. The green sector is also expected to grow in our other three case-study economies; for example, in Germany it will grow by €61 billion, a 33 percent increase over the next decade, and account for additional employment of 188,000 by 2020.

Alternative trajectory

The potential of the sector could be improved, however, with pro-green regulation combined with skills development, investment incentives and measures to induce greater technology spillovers. With these enablers, the US green sector could achieve an additional US$135 billion of growth, a 7 percent increase, and account for more than half a million additional jobs by 2020.

Some trends driving the green sector, such as looming resource shortages and new environmental regulation, will undoubtedly impose a cost on our four case-study economies in the short term. But by 2020, the break-even point for these vital investments in sustainable growth would have been reached in all four countries. Thus additional growth is not limited to just the green sector. Thanks to broader positive spillover effects on other sectors—for instance, in the form of technology transfers and innovation—the sector has the potential to increase the growth of the whole economy and create a substantial number of new jobs.

The Oxford Economics modeling shows that, buttressed with an appropriate blend of regulation, skills development, investment incentives and technology spillovers, the green sector could produce the following growth by 2020:

- Boost US GDP by US$148 billion, an increase of 0.7 percent above the current trajectory by 2020. This translates to lifting employment levels by 850,000 by 2020 (Figure 27).
- Raise Germany's GDP by €14 billion, 0.5 percent above the current trajectory in 2020. This translates to lifting employment levels by 320,000 by 2020 (Figure 28).
- Increase UK GDP by £6 billion, an increase of 0.3 percent above the current trajectory in 2020. This translates to lifting employment levels by 36,000 by 2020 (Figure 29).
- Boost India's GDP by Rs458 billion, 0.3 percent above the current trajectory by 2020. This translates to lifting employment levels by 821,000 by 2020 (Figure 30).

Potential of interventions to stimulate the resource economy

Figure 27: United States

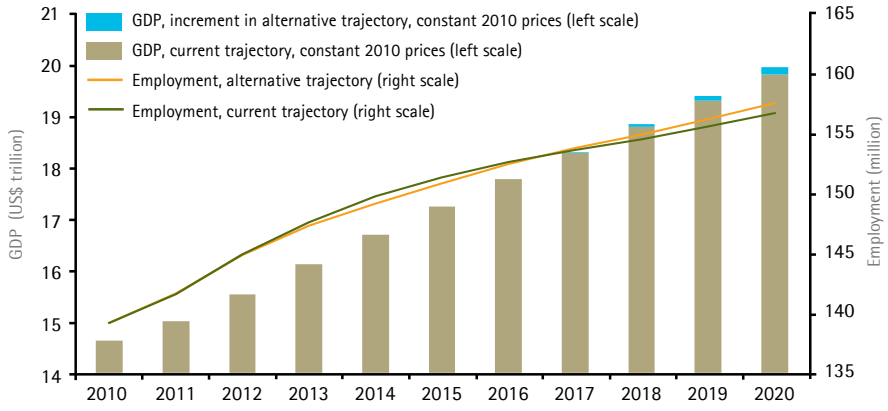


Figure 28: Germany

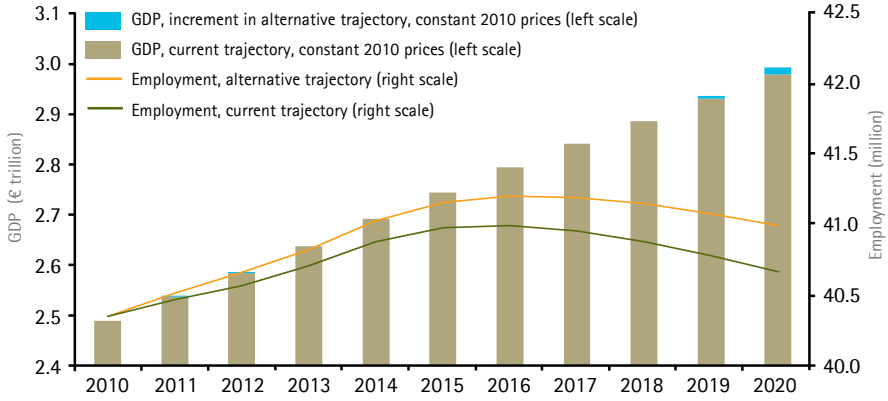


Figure 29: United Kingdom

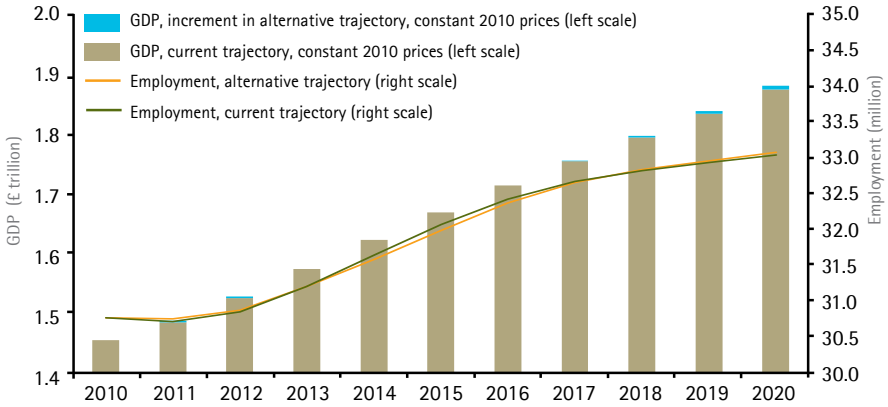


Figure 30: India

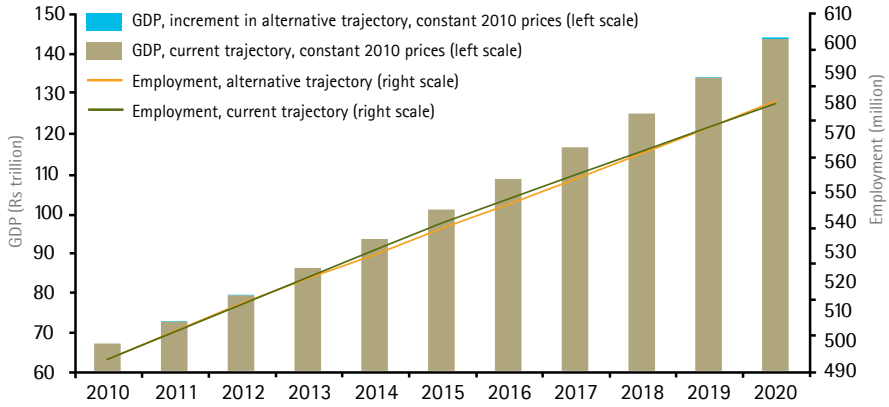


Figure 27–30 Source: Oxford Economics

Creating the conditions for success

The resource economy has the potential to create significant growth opportunities—but only if business and government take action to ensure that the right environment is created for these sectors to flourish. As suggested by our analysis of growth opportunities, there is an urgent need for skills development, investment incentives and technology spillovers to realize the growth potential. To bridge the supply-side deficit, economies need to build up the green skills of their workforce to meet the demand for skills emerging from new sectors. They should also address the infrastructure shortages currently hampering resource-related growth opportunities.

Building green skills

A resource-efficient economy will need a host of new skills such as carbon accounting and energy auditing. Organizations will require scientists, engineers and entrepreneurs with the skills to help develop innovative solutions. But deficits are emerging in technical job-specific and critical management skills—many of which are based on science, technology, engineering and mathematics (the so-called STEM skills)—as existing workers retire and university enrollments in these disciplines decline relative to other courses. Green jobs are not limited to highly qualified technicians, engineers and managers; they span a wide array of skills and educational backgrounds, from manual laborers through skilled workers. Therefore training "green-collar" workers is just as important as putting an emphasis on high-tech and high-skilled jobs.

Building green jobs will require governments and industry to create sufficient vocational training courses and certifications for emerging sectors such as bioenergy and wind technologies. **Gamesa**, a wind-turbine manufacturer headquartered in Spain, has set up a corporate university to address its specific skill-set shortages and enhance the employability of its workforce. The colleges (for technical

skills) and business schools (for management and leadership skills) are accessible by Gamesa's 6,300 global employees, both online and in person, at campuses across Europe, the United States, China and India.[76]

Enabling complementary infrastructure

Enabling conditions and complementary infrastructure are necessary to support the emergence of new technologies and energy solutions. For instance, widespread adoption of electric vehicles is difficult without a support network of charging and maintenance stations. And aging grid connections are unable to transfer energy over the long distances demanded by renewable power stations. While Germany has incentivized the micro-generation of solar power via feed-in tariffs, its aging power grid is struggling to cope with the extra capacity.

Advances such as new fuel-cell and battery technologies and cloud computing can help enhance infrastructure. The pan-European computing-grid infrastructure, for instance, uses virtualization and cloud technologies to enable scientists to share computer power, data, instruments and storage space.

To cope with the increasing capacity pressures on existing grids, economies or regions can focus on supporting large-scale interconnection of networks and grids beyond their domestic borders. Countries can then power their economy largely from renewable resources, helping to bring clean-tech energy to everyone from wherever these sources are abundant. The **United Kingdom**, for example, is planning a major grid connection with other European countries across the North Sea. This so-called supergrid would take in and join up the huge offshore wind development projects planned in many countries' waters.

Organizational imperatives

Develop new products and services to serve the resource economy

Companies have the opportunity to innovate to serve emerging needs for consumer and business-to-business products and services. Organizations will need to understand and track evolving patterns in resource scarcity, climate, regulation and consumer behavior. Upgrading analytical capabilities can provide a strong basis for reaching the required levels of insight.

Shape pro-growth approaches to resource scarcity

Organizations need to engage with each other and the scientific and academic communities, as well as work closely with policymakers and regulators, to help create a regulatory environment that is favorable to growth. They can also work with the regulators to create a joined-up approach to educate other stakeholders, including customers and investors, about the value of sustainable business models.

Given the complex and multifaceted nature of resource management, siloed thinking would result in only inappropriate policies and lost opportunities. Businesses are best placed to provide advice on how quickly they will be able to adjust to new rules and regulations, on the possibilities of new abatement technologies and on the time taken to roll out new products and services.

Integrate a carbon price

Greenhouse-gas emissions will have a price. In some parts of the world, such as the European Union, they already do. Integrating a "shadow" carbon price within business units ahead of regulation can help drive innovation in technologies and business models that promote resource efficiency.

Even if an organization does not operate in an industry where carbon emissions are directly regulated, many of the firms in its supply chain will be, indirectly affecting costs and prices. Recognizing this fact, **Walmart** is encouraging its suppliers to "go green," including promoting environmental best practices among small and medium farmers.[77]

Find new skills in traditional industries

Organizations need to "green" the skills of their workforce today to prepare for the realities of tomorrow. A host of these new skills can be found in traditional or declining industries by retraining workers or adding to their existing skills base. For example, workers in shipbuilding or the oil and gas sector can use their skills in welding, surface treatment and outfitting in the renewable energy industry. In Denmark, industrial electricians are learning to manage renewable energy. In the United Kingdom, commodity traders are retraining as carbon traders.[78]

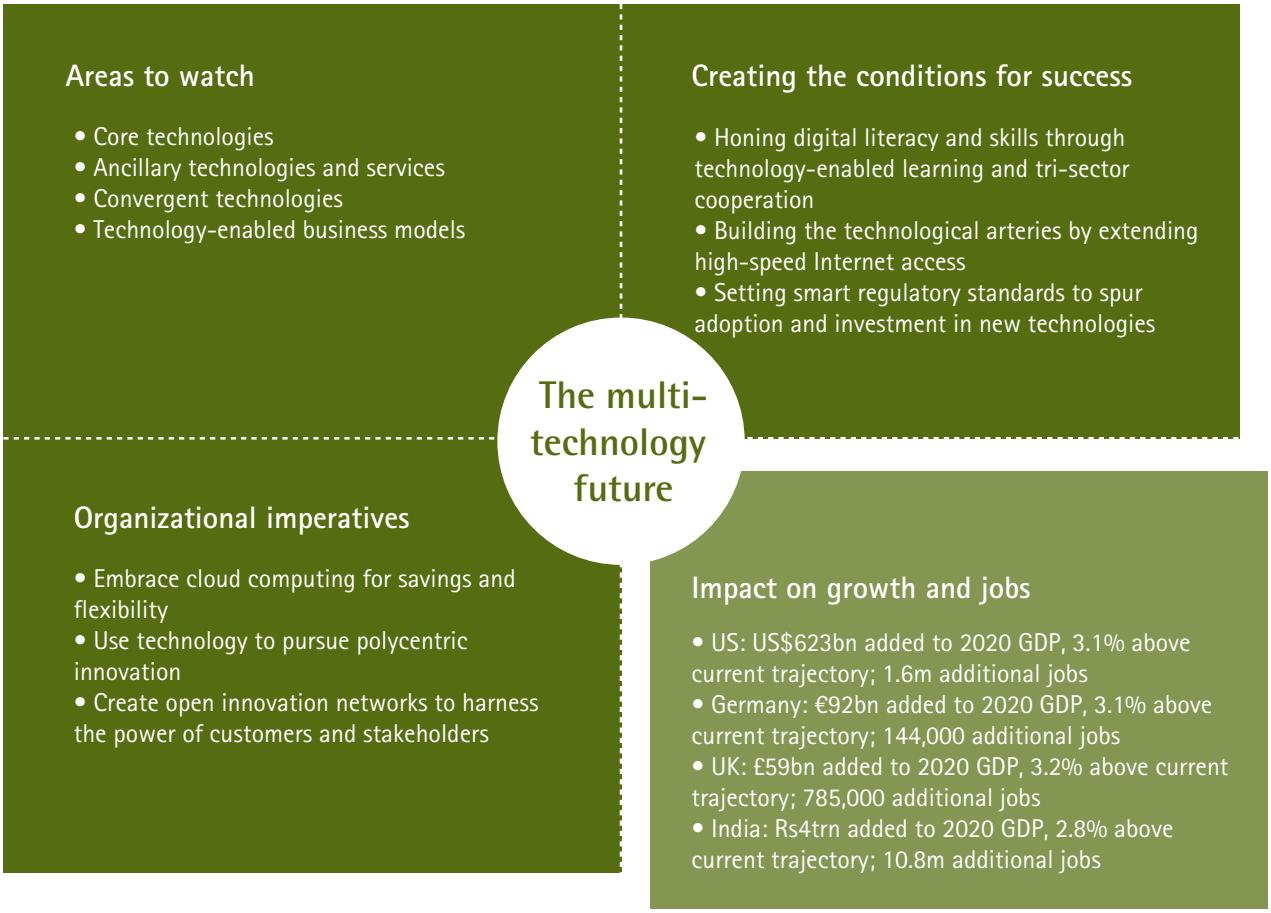
Turn scarcity into abundance

Typically, as use of resources grows, so does generation of waste. But by using resources in more creative ways, waste can be transformed into assets, helping to provide food, raw materials and energy while cutting down on water and pollution. Many organizations are turning their waste into fuel. **Novozymes**, a leader in bioinnovation, has aided this trend, launching an enzyme in 2010 that turns agricultural waste into ethanol.[79] **Adnams**, a small UK brewer, is not only "greening" its beer by using energy-efficient ingredients and equipment, and thus saving water; it is also combining local food waste to generate biogas used by the National Grid.[80]

The multi-technology future

The multi-technology future

Chapter summary



" The dramatic drop in the costs of computation and communications means that the smallest 'micro-multinationals' can afford a communications infrastructure that only the largest firms could afford 10-15 years ago. This is an ideal platform for business innovation."

Hal Varian, Google

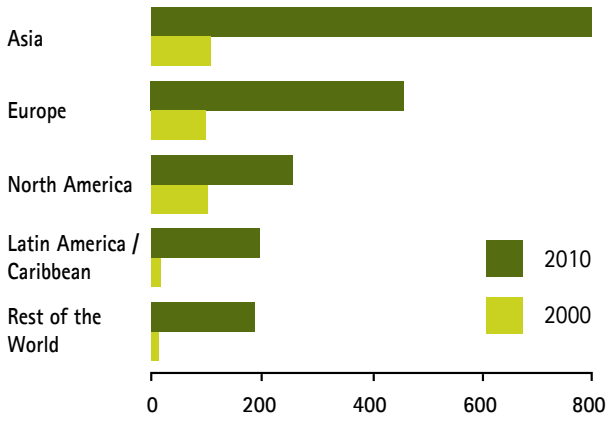
Assessing the trend: The acceleration of everyday life

Attention is beginning to refocus on a trend recently obscured by economic turmoil: the maturation of information and scientific technologies. The rise in Internet connectivity over the last decade has been colossal—particularly in Asia and Europe. Almost 2 billion people now have access to the Internet (Figure 31). Cost, reliability, standards, openness and ease of use of both hardware and communication capabilities have all improved as well, with powerful effects in business, government and social settings. Just as important are Internet usage habits, with Facebook's meteoric rise highlighting the shift toward the Web as a community and social forum (Figure 32). Scientific research has also continued to march onward, with major advances in biotechnology, nanotechnology and robotics.

These developments are creating a fast-paced and competitive business ecosystem, with reduced time-to-market and the ever-present danger that businesses will miss out on market trends. Users' adoption of new technologies and trends is faster than ever before; Twitter reached 175 million registered users in just five years.[81] The process of globalization is also reinforced by technology, with talent in Bangalore as easily accessible as that in Boston. The implication: Emerging-market firms are competing heavily with developed-world incumbents in a more interconnected landscape.

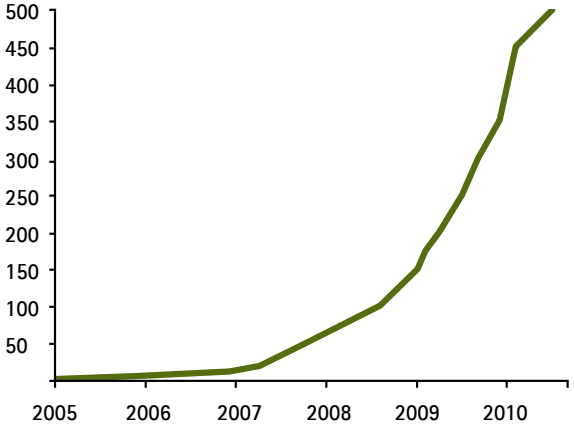
However, the brisk forward march of scientific and information technology also presents a massive growth opportunity for businesses and public-sector organizations. New technologies mean not just new sources of demand but also whole new business and service models. The rapid spread of mobile payments for everyday activities and the penetration of cloud services into the public and financial sectors are just two examples (Figure 33 and Figure 34). As communications technology continues to shrink the globe, opportunities will span economies and regions. Some existing markets will be disrupted by the advent of new technology but, overall, the promise of technology-enabled economic growth is as great as ever.

Figure 31: Internet users (million)



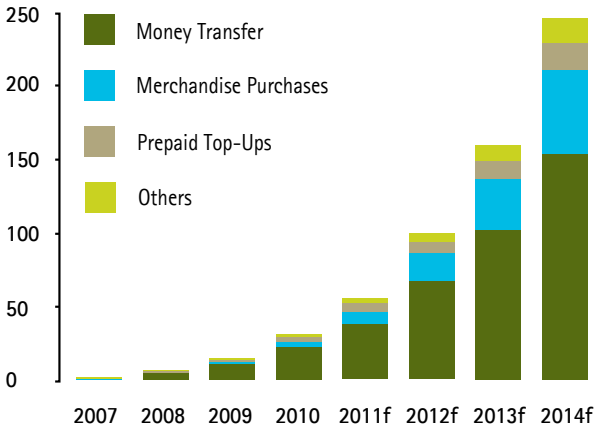
Source: Internet World Stats

Figure 32: Active Facebook users (million)



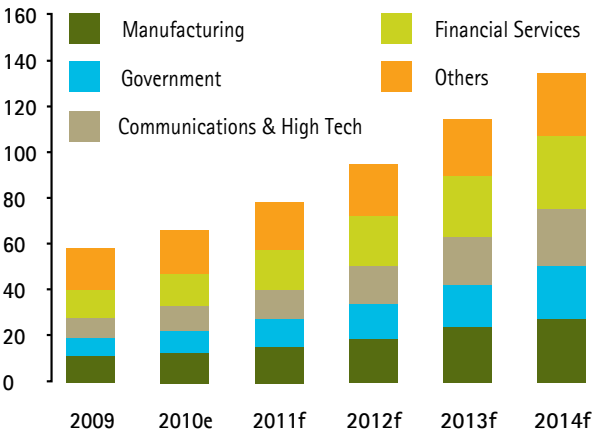
Source: Facebook

Figure 33: Mobile payment transactions (US$ billion)



Source: Gartner, 2010

Figure 34: Global cloud services (US$ billion)



Source: Gartner, 2010

Areas to watch

As technologies mature and are brought to market, they can present opportunities for business growth through a variety of means. The core technologies themselves will develop their own market as they are adopted, as well as ancillary markets for related technologies and services. Sometimes growth stems from the convergence of one technology with another. Finally, new technologies can enable new ways of doing business with existing products.

Core technologies

Breakthroughs in a number of fields promise significant growth possibilities as new technologies are brought to market. These core technologies offer opportunities in areas as diverse as information and communication (superfast broadband, cloud computing), living things (genomics and biotechnology), materials (nanotechnology) and mobility (mobile devices, robotics and remote sensors).

In particular, the long-predicted rise of cloud computing is finally upon us, with a huge range of IT functions—from software and platforms to storage and other infrastructure—available as a service. Studies show that cloud computing can make a significant economic impact. For instance, in the EU it could lead to the creation of several hundred thousand new small and medium-sized enterprises and have a positive result on growth and employment.[82]

With ever-increasing demands for efficiency savings and seamless collaboration, CIOs are choosing to reap the benefits—in scale, flexibility and cost—of an increasingly sophisticated set of rich Internet applications.[83] According to a recent Accenture survey, executives in France, Brazil and Germany are leading the way, with around two-thirds of businesses using the cloud—half of them for business-critical applications.[84] Perennial concerns about reliability and security remain, with over half of survey respondents in the United Kingdom, China and the United States "very concerned" about privacy issues in cloud services. Nonetheless, providers of cloud computing services face an immense opportunity, with the total value of cloud-based software alone reaching US$7.5 billion in 2010 and forecast to exceed US$20 billion within four years.[85]

Ancillary technologies and services

New technologies also enable the provision of new services such as enterprise analytics, the extensive use of data and statistical analysis to guide management decision making. In some cases, the adoption of innovative technologies will lead to a novel problem, such as cyber crime, and an associated service, such as cyber security to safeguard increasingly complex information flows across networks.

From logging all their internal activities and dealings with customers and suppliers, companies operate in a sea of their own data. While this mass of data can be overwhelming, improvements in computing power and analytical tools are enabling companies to harness the data to inform decision making. The insights

" Individuals demonstrate on a daily basis their willingness to trade information—as seen through the growth of Facebook and Google. The growth opportunities from organizations mobilizing their data and data analysis are substantial."

Michael Hulme, Social Futures Observatory

derived from such analytics can help with marketing new products, evaluating employee performance, predicting workforce shortages and much more. Accenture surveyed 600 blue-chip companies in the United States and the United Kingdom and found that 70 percent of management teams were committed to using analytics for data-driven decision making.[86] As these and other businesses develop their analytical capability, the industry for analytics tools will undergo rapid expansion.

As businesses and governments increase their reliance on IT-based networks, cyber attacks are a critical—and growing—threat. As much as 58 percent of executives polled by Accenture across 19 countries say that their companies have lost control of sensitive personal information, and in almost 60 percent of cases this was not an isolated event.[87] Far from being the preserve of isolated hackers, cyber crime has become a global industry; 45 percent of financial services representatives believe that fraud attacks against their institutions have made use of card data stolen in bulk over communications networks.[88] The opportunities for suppliers of improved cyber security are clear. Over the next six years, the **US federal government** alone is expected to spend US$55 billion on cyber security at an annual growth rate of over 6 percent.[89]

Convergent technologies

Clusters of high-tech businesses are particularly suitable for what Hal Varian, at Google, has termed combinatorial innovation—when a new space is created by the convergence of two different fields. For example, many of the most promising recent developments in healthcare owe a debt to the combination of nanotechnology and biotechnology, which offers a new vector for delivery of anti-cancer treatments. "Functional" foods combine biotechnology, food science and even pharmacology to deliver medicines to consumers. Bio-informatics draws on information technology to model biological systems, enabling scientists to make sense of huge datasets on the human genome or the progression of cancer.

Biometrics is leaving behind its origins in science fiction to become a pervasive part of everyday life. With increasingly mobile populations and workforces and ubiquitous Internet access, secure identification is coming to rely on biometric technology. Additionally, the continued threat of international terrorism is driving strong demand for biometrics in the public sector. Significant cost advantages and a more mature technology have fingerprint technology dominating the market in the medium term, although by 2017, one-third of revenue is expected to come from iris and facial recognition.[90] Border management agencies in the **United States** and **United Kingdom** have implemented an automated border clearance system that relies on biometric technology to improve both security and capacity. The automated system deals with border clearance more quickly and cheaply, as well as being more easily adaptable to legislative changes.[91]

The biometrics industry is set for extremely rapid growth; when buying Cogent (a biometrics specialist) in August 2010, **3M** cited a biometrics market worth over US$4 billion globally and growth rates exceeding 20 percent each year.[92]

Technology-enabled business models

Whole new business models that would not have been profitable—or even possible—before are being brought to life by the application of technology. Superior communications technology has already revolutionized the delivery of information goods, products whose value lies in the information they contain. Examples include e-books and full-length films downloaded from the Internet. The rise in e-government and e-governance has equally transformed public-service delivery, improved government accountability and transparency of public funds, and set the foundation for a strengthened relationship between governments and the people they serve (see "IT in public services: Enabling efficiency and transparency"). Peer-to-peer networks are even providing products and services outside the realm of the corporation, challenging existing business models in the music and journalism industries. The coming years are likely to see business models built around this phenomenon through micro-selling; **PayPal** has just launched a micropayments system for digital goods with a number of high-profile partners such as Facebook and FT.com.[93] Online delivery allows closer monitoring of consumption and the unbundling of traditional media. **Politico**, for instance, plans a news journal on public policy that would sell articles on a pay-per-article basis.[94] There are even examples already of journalists being paid per viewing of their work.[95]

Manufacturing: New links in the value chain

The manufacturing sector is innovative and valuable to national economies. Manufacturers maintain their technological edge by high R&D spending; manufacturing generates half of R&D spending in the United States.[96] As a result, this sector offers significant spillover effects and improves the productivity of traditional firms[97] while still supporting employment—around 18 million jobs in the United States alone.[98] However, there is uncertainty about which areas of manufacturing enable companies to add value in the long term and help them avoid a "race to the bottom" in price competitiveness. Our research has identified three promising areas of long-term value for manufacturers.

Servitization, or the blurring of the line between manufactured products and services, is one encouraging trend for manufacturers. **Rolls-Royce** now rents its engines under its TotalCare® scheme, with all support and maintenance included[99] —clients pay an agreed rate for the service of "power by the hour."[100] Firms manufacturing high-tech goods with significant embedded technology have a built-in advantage in this lucrative "manu-services" market. The reason: Manufacturing advanced products builds the technical knowledge needed to provide support for them. The European Union has 140,000 enterprises in high-tech manufacturing, but over four times as many enterprises in knowledge-intensive service activities dependent on this manufacturing base.[101]

Convergent technologies can provide an enduring competitive advantage for manufacturers, by enabling them to draw on multiple areas of expertise. Close proximity among firms provides a more fertile environment for sharing of technologies by allowing them to draw on a broader base of embedded knowledge. Studies show that such technological spillover effects lead high-tech manufacturers to form industry clusters,[102] and emerging-market governments are working hard to develop such clusters of their own. To illustrate, top medical institutions are offered subsidized rents at **South Korea's Daedeok Innopolis** and the government is spending 2.5 trillion won in the area to encourage a medical cluster.[103] **China** and **Singapore** plan to jointly develop the Singapore-Nanjing Eco High-Tech Island into a hub for sustainable research and development, including water treatment.[104]

Innovation in low-cost goods and services is also expected to be an important source of demand for the manufacturing sector. This may involve new business models targeted at base-of-the-pyramid consumers, or the redesign of existing products so that they can be sold at price levels appropriate to average incomes in these markets. **Procter & Gamble**, for instance, made an early entry into the Indian market when it developed the Gillette Guard, a safety razor that sells at just Rs15 (33 cents), by using 80 percent fewer parts than equivalent developed-world models.[105]

IT in public services: Enabling efficiency and transparency

Public services around the world are being asked to do more with less, owing to the combination of limited resources and increasingly demanding populations. Developed-world governments in particular face a combination of budget deficits, reduced tax bases as a result of fewer people in employment and ever-increasing demand for public services. In the developing world, the agenda is much the same, as governments seek to deliver services in a cost-effective manner. In emerging markets, the agenda is more urgent still as governments strive to address the pressing social problems of rapid economic development.

To meet this challenge, governments are turning to IT. Central and regional governments already constitute the second- and third-largest sectors, respectively, in enterprise IT spending. Between 2010 and 2014, total government IT spending is expected to increase by US$52 billion—reaching almost half a trillion dollars—despite a general backdrop of fiscal retrenchment.[106]

Public-sector spending on IT is shifting from operations-focused technology investments to solutions that provide information for consumers. By enabling secure information sharing and breaking down information silos, IT allows collaborative service delivery both within and outside government. E-government channels give citizens on-demand access to automated services such as online tax returns and national statistical data. E-governance tools such as online town halls and government gateways can provide easier access to information, as well as improve government accountability and transparency. And many e-governance tools use Web 2.0 technologies that empower people to connect with each other and with the government through interactive forums, blogs, wikis, e-participation tools and social networking platforms. Some use these Web 2.0 technologies to maximize the value of shared information by opening government data vaults to the public and encouraging them to create mash-ups, applications and widgets to solve real-world problems. The coming revolution in public-service delivery is championed by Vivek Kundra, appointed in 2009 as the first Chief Information Officer of the United States.[107] His initiatives so far have included the Web portals data.gov and apps.gov—providing government datasets to the public and cloud computing to federal agencies—and an IT dashboard for monitoring public spending.

Integrating technology into public services also facilitates the collection of data and metrics on client demands. **New York's** universal line, 311, makes logs of the more than 100 million complaint calls received so far to produce metrics by time and city location. To give just a couple of examples, New York officials can now pinpoint illegal social clubs by using public-drinking complaints and can anticipate the surge in the city's chlorofluorocarbon recycling programs in spring as residents upgrade their air conditioners in hotter weather.[108]

Creating growth through the multi-technology future

Econometric modeling by Oxford Economics shows that the high-tech sector—defined according to the level of technological knowledge embedded in its products and services—has the potential to be a significant growth driver throughout the coming decade, especially for developed economies. This growth would come from high-tech manufacturers (who spend a significant proportion of revenue on R&D) and service companies engaged in knowledge-intensive activities such as telecommunications, IT programming, and research and development itself.

Current trajectory

In the current trajectory, the high-tech sector will be a significant driver of economic output. For example in Germany, the high-tech sector will grow 32 percent faster than that nation's overall economy. This growth will amount to €41 billion and will stimulate further economic output through significant spillovers. High-tech sectors similarly will outperform the economy in the United States (by 18 percent) and the United Kingdom (by 29 percent), adding US$545 billion and £47 billion to their respective economies.

Alternative trajectory

Despite these impressive numbers, the technology sector's potential could be even higher if supported by improved skills and widespread technology adoption. The knowledge-intensive nature of the high-tech sector means it is highly vulnerable to shortages in skills. Even with significant slack in European and US labor markets, companies are reporting skills shortages in some high-tech sectors. Oxford Economics considered the effect of sustained, targeted improvements in education and training policies for the high-tech sector. Widespread adoption of technologies, such as Web 2.0 and ever-cheaper sensors, is also expected to drive continued strong growth in value-added in the IT and communications sector over the next decade. Cloud computing and smart systems would unleash the multi-technology future, a trend observed over the last 10 years—to varying extents—in our four case-study economies.

Oxford Economics analysis illustrates that, by investing in skills and widespread technology adoption to harness the technology trend, countries featured in this study can add the following economic value by 2020:

- Boost US GDP by US$623 billion, a 3.1 percent increase above the current trajectory by 2020. This translates to lifting employment levels by 1.6 million by 2020 (Figure 35).
- Raise Germany's GDP by €92 billion, an increase of 3.1 percent above the current trajectory by 2020. This translates to lifting employment levels by 144,000 by 2020 (Figure 36).
- Increase UK GDP by £59 billion, 3.2 percent above the current trajectory by 2020. This translates to lifting employment levels by 785,000 by 2020 (Figure 37).
- Boost India's GDP by Rs4 trillion, 2.8 percent above the current trajectory by 2020. This translates to lifting employment levels by 10.8 million by 2020 (Figure 38).

Potential of interventions to stimulate the multi-technology future

Figure 35: United States

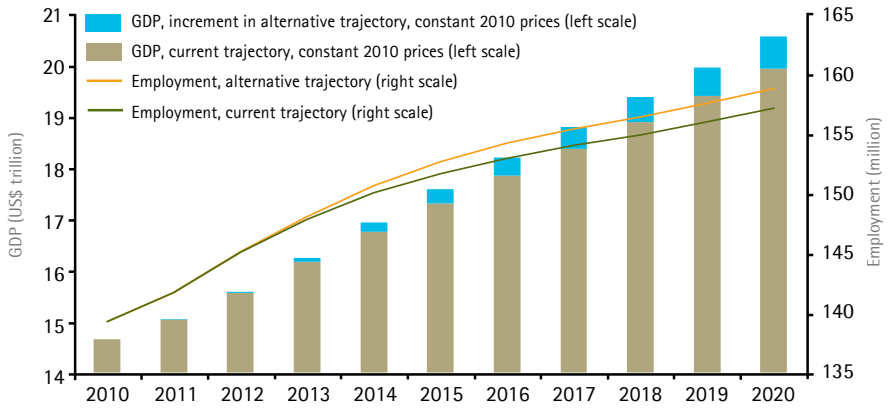


Figure 36: Germany

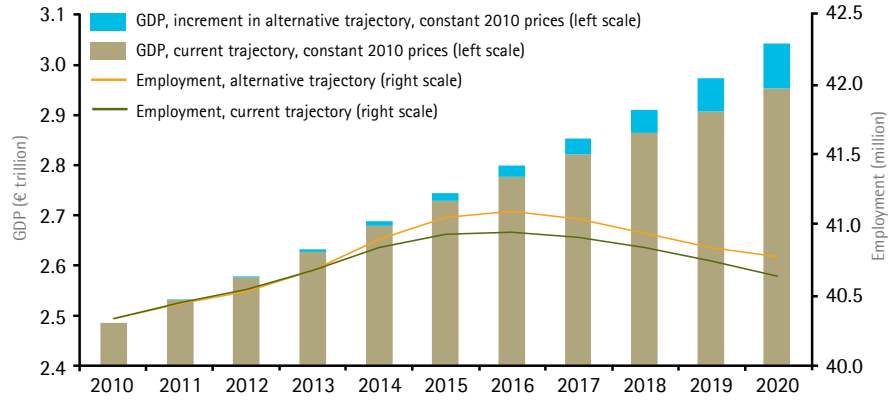


Figure 37: United Kingdom

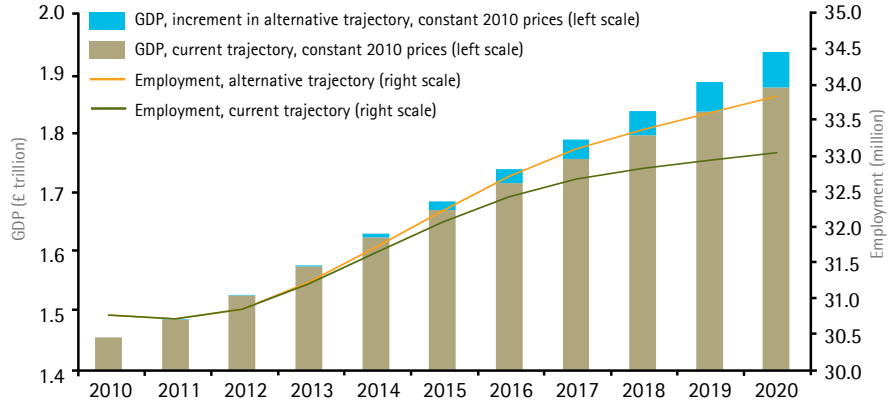


Figure 38: India

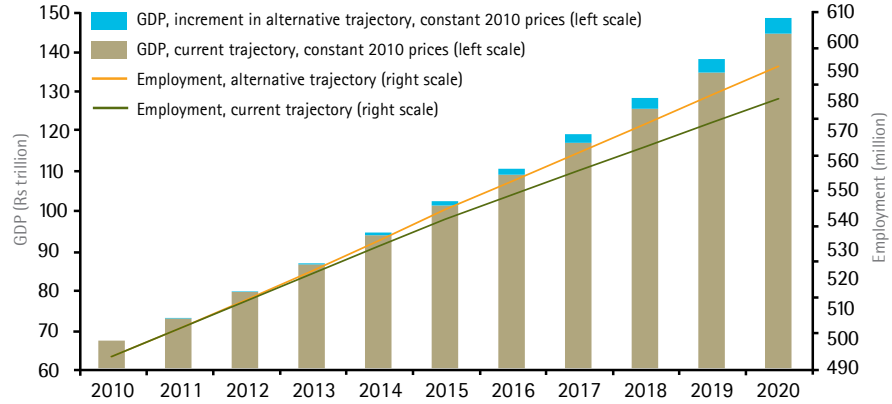


Figure 35–38 Source: Oxford Economics

Creating the conditions for success

Unleashing the full potential of these growth sectors, as well as the wider productivity gains for a country's overall economy, will require business and government to put in place the appropriate supply-side initiatives. The workforce of tomorrow needs the skills and connectivity to fully embrace the digital world. The adoption of new technologies relies on regulation to provide stability for businesses and public services along with assurances of data privacy for consumers. Continued innovation would flow from strong links between research and business, to give budding entrepreneurs the funding and other support they need to bring technologies to market.

Honing digital literacy and skills

Availability of digital skills is vital to the growth of the high-tech sector itself. But more importantly, widespread digital literacy is critical in catalyzing the impact of technology on productivity and innovation across the wider economy. This creates a virtuous cycle where higher productivity lowers production costs and prices, enhancing consumption, investment and job creation.

Organizations around the world can act together to improve digital literacy. For example, efforts to place digital technology in primary and secondary schools should be encouraged. The government of **Uruguay** has launched Plan Ceibal, one of the world's most ambitious rollouts of education technologies. The program's aim is to provide a laptop for every student and teacher in Uruguay.[109] Technology is equally important in postsecondary education. India's **Indira Gandhi National Open University**—the largest university in the world by the number of students[110]—has recently partnered with **Nokia** to deliver distance-education courses in English through SMS mobile messaging, soon to be launched on a national scale.[111] However, meeting the needs of future growth sectors may also require more advanced technological skills. Educational institutions can best provide such skills through collaborative, employer-led qualifications. **Middlesex University** in the United Kingdom, for instance, has cultivated strong links with business[112] following the recommendations of a government skills review.[113]

Building technological arteries

Internet connectivity is the lifeblood of the high-tech economy. Pushing ahead into the next phase of Web connectivity—whether fourth-generation mobile connectivity or super-fast fiber-optic connections—will therefore be a critical step for businesses and governments around the world. Three areas stand out.

The first surrounds expanding uniform access to the Web in a reliable and convenient fashion. **Australia** is taking steps to ensure e-access for all citizens with its AU$43 billion National Broadband Network initiative. Through this initiative,[114] a government-subsidized enterprise is designing and building a network that will provide download speeds of 1 gigabyte per second to 93 percent of Australian homes, schools and businesses.[115] Finland has gone so far as to enshrine in law Internet access as a basic human right.[116]

But it is not only about access. The second priority for stakeholders in the future of national economies will be improving the quality of connectivity activity, including connectivity speed in wired and wireless environments. Fiber-optic networks hold promise as they become affordable compared to copper networks and have a much higher carrying capacity than current wireless networks. South Korea and Japan have made significant progress in delivering high-speed connectivity.[117]

Finally, policymakers and business leaders will need to establish clear-cut rules on the Web's walls, and how they are governed. Network operators' offers to shape Internet traffic to the advantage of paying customers has sparked recent debate over the principles of "net neutrality."

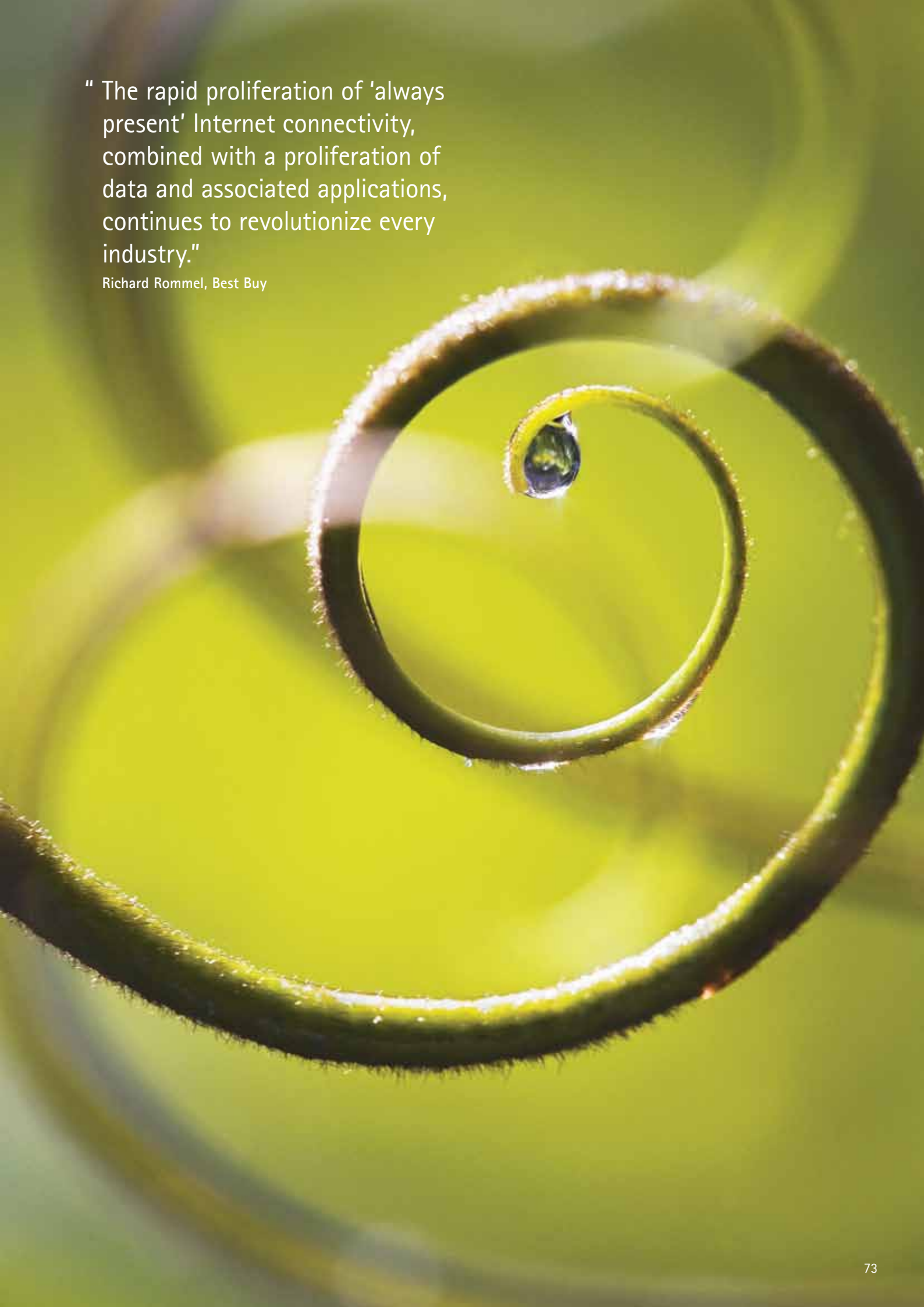
Setting smart regulatory standards

Lack of visibility about technology formats and standards increases risk for companies and discourages investment. Regulation of industry standards can help avoid such stalemates and facilitate the uptake of a new technology. For instance, early regulation of catalytic converters in Europe has granted market leadership to European firms by providing them with a stable market.[118] European standards for eco-design will similarly police the efficiency claims made by different manufacturers and stimulate green markets. Although microfinance in Asia and sub-Saharan Africa is thriving, the lack of a standard protocol for mobile-phone payments is holding back adoption in the developed world. The **UK Department for International Development's** 2009 initiative to fund an international mobile finance regulatory framework is welcome.[119] Research has revealed that support for mobile banking has been stymied by severe security concerns among UK consumers.[120]

The ease of replicating digital information has fueled concerns about the limited control of individuals and companies over their own data. Many businesses are concerned about public cloud providers' access to sensitive customer information. Moreover, much legislation on data privacy is outdated, drafted before the Web became a social phenomenon. The next round of regulation will require a collaborative, international approach that balances domestic priorities against cross-border concerns through clear guidelines on data sharing and access.

Moving from inspiration to marketable products

Moving from scientific research to a technological application with commercial potential requires attention to product development and marketing. Relationships among academia, research universities, start-up businesses and larger companies are crucial to this process, with each type of organization playing a different role in the birth of a new technology. Germany, for instance, benefits from



" The rapid proliferation of 'always present' Internet connectivity, combined with a proliferation of data and associated applications, continues to revolutionize every industry."

Richard Rommel, Best Buy

Europe's largest application-oriented research organization, Fraunhofer, with a €1.7 billion annual budget; research contracts with industry and government fund 60 Fraunhofer Institutes across the country.[121] Innovation clusters should also be supported. They are central to the innovation ecosystems, and linkages between the clusters can provide opportunities for additional scale and combinatorial innovation, by bringing together a broad and diverse mix of skills, venture capital, marketing and development expertise, universities, industry and spin-outs.

Commercialization of technology also needs a national culture of entrepreneurship. European bankruptcy laws stigmatize failure, while the United States celebrates "phoenix" entrepreneurs. In **Malaysia**, the bankruptcy code is being reformed to allow bankrupt debtors a second chance to enter the financial system.[122] Venture-capital spending plays a vital role in actively bringing together technologies from different scientific fields and financing small-company growth, especially because it stimulates patenting up to 10 times as effectively as corporate R&D.[123] Bringing innovation in-house at large companies significantly boosts resources for technical research and commercialization, but organizations that have built their success on standardization and efficiency can stifle entrepreneurs' creativity. A controlled tolerance for risk-taking, and willingness to take a longer-term view, is crucial for corporate innovation. Indeed, in a recent Accenture study, 73 percent of polled US and UK executives agreed that their companies prefer expanding existing products to bringing true innovations to market, perhaps because of a short-term focus on financial results.[124]

Organizational imperatives

Anticipate the devolution of technology

The coming crop of "millennial" workers, increasingly confident with technology, will insist on using their preferred platforms at work. The spillover of consumer computing platforms such as the iPhone into business continues apace, with tablet computing set to further the trend. The technology-enabled workforce should be happier and more innovative, but the ensuing conflicts with data security and compliance need to be carefully managed.

Embrace the cloud

With technology integrated into organizations' working practices, leaders need to focus on the possibilities of cloud computing. Purchasing IT solutions as a service enables rapid entry into new markets while minimizing sunk costs and enables all businesses to enjoy the benefits of cutting-edge software.

Use technology to pursue polycentric innovation

Telecommunications technology allows innovation to be a truly polycentric process for organizations willing to seek out new sources of ideas. For example, **Nokia's** innovation value chain stretches from nanotechnology research facilities at the University of Cambridge to an innovation center at Tsinghua University in Beijing that

" People are more productive with technology in their personal lives than their professional lives, so organizations need to provide a basic infrastructure that empowers individuals to make the most of the potential that personal computing has to offer."

David Coplin, Microsoft UK

localizes new nanotechnologies for Asian markets.[125] Over a quarter of all international patent applications in 2009 listed at least one foreign co-inventor, with 65 percent of patent applications involving Indians developed with foreign companies.[126] Many products undergo "reverse innovation" and originate entirely in emerging markets before being sold into the developed world.

Create open innovation networks

Organizations have the opportunity to take full advantage of the creativity of customers and other stakeholders through open innovation and crowd sourcing. Maturing communications technologies make it easier than ever to develop and harness the energy of digital communities from around the world; Danish toy maker **Lego's** DesignByME site allows enthusiasts to upload their designs and have them distributed by Lego.[127]

Harness technology to customer needs

Commercially useful innovations harness the power of technology to address customer needs. Successful organizations adopt a systematic and disciplined approach to anticipating these needs using consumer and marketing analytics, and developing innovations that meet them.[128] **Intel** and **HP**, for example, have set up an Industry Innovation Center in Shanghai to approach innovation systematically.[129]

Share your digital literacy

Full integration of new technology requires IT skills in the workforce at a range of levels, from basic digital literacy to more advanced technical skills. Knowledge-sharing schemes such as mentoring, social networks and enterprise wikis can spread the necessary IT expertise cheaply and effectively, and help to bridge generational gaps in working practices.

The emerging-markets surge

The emerging-markets surge

Chapter summary

Areas to watch

- Low-cost business models
- The "southern surge" in financial services
- Infrastructure
- Citizen services
- International knowledge exchange
- The global middle class

Creating the conditions for success

- Building new bridges through trade liberalization, economic diplomacy, new technologies and collaborative partners
- Uncovering and strengthening comparative advantage and unleashing domestic excellence on to world markets

The emerging-markets surge

Organizational imperatives

- Create geographic options for inputs and customer markets
- Be authentically local to tailor marketing and innovation toward emerging markets
- Design a flexible international operating model to benefit from scale and standardization

Impact on growth and jobs

- US: US$534bn added to 2020 GDP, 2.7% above current trajectory; 1.7m additional jobs
- Germany: €138bn added to 2020 GDP, 4.6% above current trajectory; 1.1m additional jobs
- UK: £40bn added to 2020 GDP, 2.1% above current trajectory; 700,000 additional jobs
- India: Rs7trn added to 2020 GDP, 4.9% above current trajectory; 28.2m additional jobs

Assessing the trend: Globalization raises emerging markets' prominence

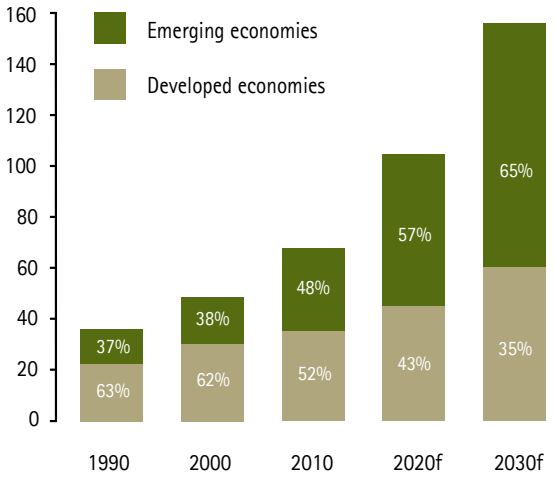
In the multi-polar world, economic activity is increasingly gravitating toward the powerhouse economies of Asia and Latin America. Emerging economies are contributing to an increasing share of the world's output, trade and investment. In 2009, they accounted for nearly half of global GDP at purchasing power parity, up from 37 percent in 1990, and their share of global output is set to rise still further to 65 percent by 2030 (Figure 39). This ascendancy of emerging-market power is mirrored in the corporate arena, with emerging-market multinationals now making up 95 of the *Fortune* Global 500, compared with just 20 in 1995.[130]

These economies are taking their place on the international stage and are increasingly driving economic growth (Figure 40). No longer viewed as merely low-cost production locations, emerging markets are becoming important sources of new consumer demand (Figure 41)—and an increasing number of business leaders are recognizing their potential. In fact, in one recent survey of business leaders, 76 percent of the respondents now perceive emerging markets as sources of new business growth, up from 67 percent in 2009.[131]

The surge in emerging-market growth is being driven by the twin dynamics of a burgeoning middle class of consumers and very rapid rates of urbanization. Estimates show that the number of households in emerging markets with annual incomes above US$5,000 is set to rise from 320 million in 2009 to 400 million by 2014.[132] The total urban population of the developing world is expected to increase from 2.6 billion in 2010 to nearly 4 billion in 2030 (Figure 42).[133]

Companies that ignore trade with emerging markets not only lose a valuable opportunity but can also harm growth in their own domestic markets. Their economies would miss out on the productivity benefits that arise from trade, as well as the potential to increase their long-term sustainable growth. Moreover, foreign competitors seeking a global presence after gaining a foothold in emerging markets could enter established players' domestic markets.

Figure 39: Share of global GDP
(US$ trillion at 2005 prices and PPP)

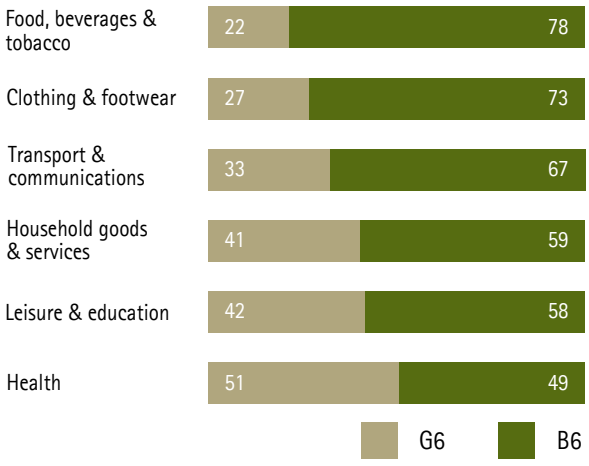


Source: Oxford Economics

Figure 40: Real GDP growth
(percent)

Source: Oxford Economics

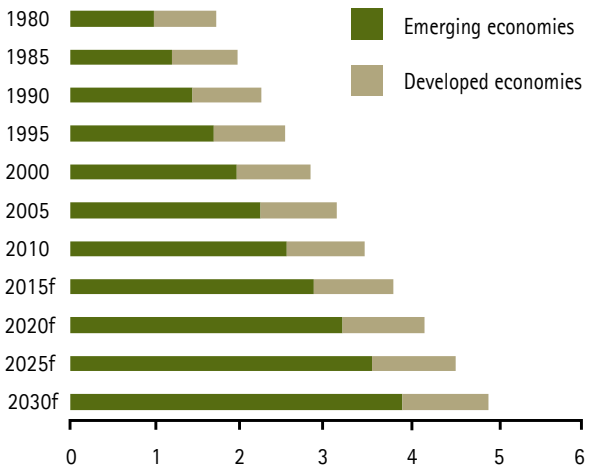
Figure 41: Source of growth of product and service categories 2010–2015 (percent)



Note: G6 comprises France, Germany, Italy, Japan, United Kingdom and United States. B6 comprises Brazil, China, India, Mexico, Russia and South Korea.

Source: Economist Intelligence Unit, Accenture analysis

Figure 42: Global urban population
(billion)



Source: United Nations

" Disintermediation of the supply chain across sectors is resulting in the creation of new market segments, new players and the emergence of innovation in business models."

Ratika Jain, White Owl Advisory

Areas to watch

Spurred on by the twin dynamics of a rising middle class and rapid urbanization, demand from emerging markets is opening up opportunities in consumer and intermediate goods, capital goods such as machinery, and exports of services.

Low-cost business models

Emerging-market consumers with limited financial means are driving demand for low-cost, mass-market solutions, creating opportunities for local and foreign companies that can provide no-frills products and services. Volume, simplicity and function, along with longevity or durability, take center stage in offering design. **Tata** has experience in this kind of "frugal innovation." For example, it has designed a low-cost portable water purifier made from rice husk ash (a waste product in abundant supply in India). The device removes harmful bacteria from water without requiring electricity or running water. Tata hopes that the purifier will bring clean drinking water to India's poor and aims to sell 3 million units in the next five years,[134] with an eventual market of 100 million units.[135]

Companies can also engage in "reverse innovation." This is more than simply a matter of stripping out costs and features from a developed-market product to sell in an emerging market and then selling a newly modified version in existing developed markets. Instead, it means starting from scratch with a fresh paradigm and building to local cost and demand conditions. In India, **Nokia's** cheapest mobile handsets feature durable rubberized key pads and multilingual menu systems, several phone books to cater to multiple users, and flashlights for the frequent power cuts in India.[136] Businesses can also benefit by supporting low-cost innovations from other countries. For example, 50 percent of the components for Tata Nano, an innovative and remarkably affordable automobile born in India to target India's lower middle classes, are manufactured by German companies.[137]

The "southern surge" in financial services

Financial services are expected to experience a surge in emerging markets, particularly in South Asia and Southeast Asia, as households become wealthier and build up assets.[138] But around 3 billion of the world's population are unbanked,[139] leaving vast potential for banks and other financial service companies; the need to pay bills, buy houses, remit earnings and save for retirement is creating demand for a host of financial institutions, intermediaries and supporting services.

Less developed economies have even more need for microfinance facilities. Consumers living on volatile subsistence-level incomes often rely on microcredit to smooth their consumption and enable investment. Though average loan sizes are small—around US$200—there are already 150 million borrowers globally, with the total industry valued at US$30 billion.[140] The recent listing of microfinance firm **SKS** on the Bombay

" The mobile revolution is credited with leapfrogging India's growth in a myriad of ways, including connecting the rural hinterland. The next revolution that can potentially supplement this is the Internet revolution, especially with the introduction of 3G."

Krishna Angara, Vodafone India

Stock Exchange raised US$358 million, with the share price jumping over 16 percent on the day.[141] A number of microfinance firms are offering savings facilities by trimming the cost of many small transactions through the use of technology; **Safaricom's** M-PESA banking system in Kenya is based on mobile phone technology.[142]

Insurance is another promising market, with emerging markets spending under 3 percent of GDP on insurance premiums in 2009, compared with 8.6 percent in advanced economies.[143] Over the coming decade, emerging-market households can be expected to start purchasing products from health and life to agricultural and property insurance, with emerging-market life insurance set to grow by 10 percent in 2011 alone.[144] India's general insurance market is estimated to grow from a value of less than US$10 billion in 2010 to US$340 billion by 2030.[145] Innovative solutions can help insurers access remote consumers. A Peruvian micro life-insurance scheme is collecting premium payments through a relationship with 112 regional water irrigation committees that have access to 1.6 million individuals across mountainous and coastal areas of the country.[146]

Infrastructure

Thanks to mass urbanization in emerging markets and the growing number and size of cities, emerging markets' physical infrastructure requirements have ballooned to unprecedented proportions. The number of cities with 1 million or more inhabitants is set to rise from 442 in 2010 to 527 in 2020, and the number of people living in such cities is expected to rise from 1.33 billion to 1.63 billion.[147] Some developing countries have experienced particularly fast urban growth. For example, the proportion of people living in urban areas in Nigeria has grown from 44 percent to 52 percent in 10 years.[148]

The rapid influx of new inhabitants into urban centers is placing a strain on basic services such as public transportation, roads, electricity and water, creating pressing demand for investment in infrastructure. Such needs are not limited to urban regions—rural communities that are often overlooked also suffer from a lack of basic infrastructure. Governments in emerging markets will need to address these challenges to continue attracting foreign investment and remain competitive.

The demand for, and growth of, infrastructure spending across the globe and particularly in emerging markets offers significant opportunities for businesses. Estimates suggest that the global economy will need US$30-40 trillion of infrastructure investment over the next 20 years, of which Asia alone will account for over US$6 trillion in the next 10 years.[149] Africa, for instance, faces great infrastructure challenges, particularly in the power and transportation sectors. Power generation capacity and household access to power are approximately half the levels observed in South Asia and about a third the levels observed in East Asia.[150] Emerging markets are using public-private partnership schemes to develop the necessary infrastructure. **Indonesia**, for instance, is offering 100 projects worth a total of US$47.3 billion between 2010 and

2014 comprising air, land, marine transportation, railways and toll roads[151] (see "Urban infrastructure: Developing cities point the way").

Citizen services

After basic necessities, the key concern for most emerging-market citizens is access to vital services: healthcare, education, public safety, housing and transport. Even individuals living on low incomes are prepared to spend their disposable income on improvements to their quality of life. These needs and wants are creating market opportunities for enhanced public services at both the local and national levels. Examples include supplying ID cards to citizens, providing e-border control, transforming policing infrastructure, designing social security systems and offering e-health services such as telemedicine, electronic medical records and healthcare information systems. Delivering these services will require extensive use of new technologies. For example, ahead of hosting the FIFA World Cup in 2010, **South Africa** set up a border management agency and system that introduced automatic data capturing and accelerated the processing of documents at border controls.[152]

International knowledge exchange

Home to predominantly young populations, emerging markets are building up their talent base, creating potential for collaborative educational initiatives between domestic and foreign universities. This presents a major opportunity for international universities to establish campuses in emerging markets, enabling students in those markets to obtain university degrees at a fraction of what it would cost to study overseas. British universities run over a dozen satellite campuses around the world—in locations like Mauritius, Dubai, Qatar, China and Malaysia—while the United States has established six times as many.[153] A growing number of Internet users and of new technologies should further boost the market for distance- and e-learning. To illustrate, **Imperial College London**, based in the United

Kingdom, is teaming up with Nanyang Technological University in Singapore to offer a joint medical degree with a number of e-learning modules.[154]

The global middle class

The global middle class is set to increase from 1.8 billion people in 2010 to 3.2 billion by 2020 and to 4.9 billion by 2030. Almost all of this growth (85 percent) is expected to be in Asia.[155] An expanding base of young, financially stable generations with a fondness for aspirational purchases is changing consumer habits and values and driving growth for fashion, home decor and automotive goods. For example, **Daimler AG** expects Mercedes-Benz's sales in India to compete with those of the United Kingdom by 2020.[156] **Philips**, a European electronics manufacturer, plans to move the headquarters of its domestic appliances division to Shanghai in 2011, as part of its strategy to derive at least 40 percent of its sales from emerging markets by 2015.[157]

The global luxury goods market is set to exceed US$307 billion by 2015, thanks to intensifying demand from emerging markets.[158] Leading luxury brands are expanding their presence beyond metropolitan cities to smaller cities for additional growth potential; Gucci, for instance, has a store in Wuhan, China, as well as in Shanghai.[159] But retail fashion should also boom as fashion expands to new mass markets. Vogue Turkey was launched in March 2010.[160] **H&M**, a Swedish clothing retailer, announced the opening of its first store in Singapore in late 2011[161] and is exploring expansion into Brazil and Argentina.[162]

Emerging-market tourism is expected to further support the demand for luxury goods. Asia is reportedly leading the global recovery in the luxury travel business.[163] European countries like **Switzerland** are particularly targeting the wealthy Asian traveler. Keen to gain an authentically European experience, these travelers consume high-value goods and services such as Swiss watches and specialized experiences.[164]

Opportunities extend beyond products for consumers, to the provision of professional services for companies that are venturing into emerging markets. **Synovate**, the market research arm of marketing group Aegis, is moving into the Russian market. It acquired a majority stake in Comcon, a Russian marketing firm, based on the expectation that Russia's growing middle class will lead to increased demand for advertising spending and marketing research.[165]

Urban infrastructure: Developing cities point the way

For the first time in history, over half of the world's population lives in urban areas.[166] Today's global urban population of 3.4 billion is expected to swell to almost 5 billion by 2030, with growth concentrated in emerging countries in Africa and Asia.[167] To accommodate this influx, the number of cities worldwide is expected to rise steeply, particularly in less developed regions.

Rapid urban growth is putting enormous pressure on existing infrastructure. For example, there are around 3 million urban citizens living in poverty who have no access to a sewage system in Dhaka, Bangladesh, where the population is set to almost double over the next decade.[168] The Accenture Global Cities Forum found that urban citizens in the developing world are increasingly expecting improvements in public services and infrastructure.[169] Cash-rich developing-world governments are expected to spend between 7 and 9 percent of emerging-market GDP, or about US$1 trillion per year, addressing these needs and expectations.[170]

The urgency of infrastructure requirements masks great diversity. Cities face a variety of challenges, from needing to invest in utilities to cope with the urbanization process to crafting strategic development initiatives to position themselves in a global marketplace. Different cities play different roles in the world, particularly in China, where a state-guided policy of harmonious urbanization specifies a variety of city tiers for development.[171] Finding the right mix of infrastructure spending depends on the role a city seeks in the global economy, and our research has identified a range of city functions with differing infrastructure needs.

Flagship cities: These cities, often capitals, market themselves as prospective financial centers and business headquarters. As companies and employees continue to become globally mobile, competition among cities for this function will intensify. Top-quality digital infrastructure and international passenger transport links are a given for flagship cities—**Shanghai**, for example, spent RMB10 billion on a high-speed maglev train linking the city to Pudong International Airport,[172] just part of a colossal RMB270 billion infrastructure package in preparation for the World Expo held in 2010.[173] However, footloose international workers will also need to be persuaded to settle and work in cities with soft infrastructure offerings. Internationally competitive schools and hospitals, and attractive well-kept civic areas, can be key powerful lures. Aware of this, Shanghai spent two years and RMB5 billion renovating the historic riverside Bund district before the Expo.[174]

Factory cities: These cities' economies are built around manufacturing—from heavy to high-tech—often for export markets. International freight transport links through rail, roads and ports are vital for factory cities, as are the utilities needed to support growing industries. **Shenzhen** spent RMB57.2 billion building a subway system, transformer substation, water supply network and other infrastructure[175] to support its industries of electronics and light manufacturing and is now concentrating on putting 35,000 electric cars onto its roads in the next three years.[176] Although large contract manufacturers in factory cities have provided residential services for workers in the past, recent concerns about living conditions will put such public services back on the government agenda.[177]

Regional-hub cities: Medium-sized cities often develop satellite towns, acting as regional hubs for business clusters and handling the higher-value activities of the local economy.[178] A number of provincial capitals in China such as Changsha and Wuhan fulfill this function, where passenger transport links by rail and road are vital for commuters.[179] Strong national transport links and the title of national innovation pilot city have stimulated local infrastructure construction in **Wuhan**. In this provincial capital, seven metro lines at a total length of 215 km are planned by 2017, and local intercity railways are under construction. In the first half of 2010 alone, Wuhan attracted RMB22 billion (US$3.3 billion) in domestic investment, a 17.3 percent increase year-on-year, and US$2 billion in foreign investment.[180]

Figure 43: Population growth in urban agglomerations, 1990–2020

Size of bubble reflects population

- 1990
- 2010 estimate
- 2020 forecast

Source: UN Department of Economic and Social Affairs, Population Division, 2009

Creating growth through the emerging-markets surge

World trade is recovering fast from the 2009 slump and will increasingly be driven by demand from emerging markets as they continue to expand at a robust pace. Emerging-market import growth is expected to be around 8 percent over the next decade, compared with 5 percent for developed economies.

As economies scout the world for growth opportunities, those that increase their trade with emerging markets should stand to benefit. This trend has the potential to power growth in developed economies. However, in a multi-polar world, there are many different centers of economic activity and trade. Emerging-market-to-emerging-market activity is also intensifying. For example, India is pursuing a "Look East" policy as a means of achieving its strategic economic goals and in October 2010 committed to increasing trade with Malaysia and Vietnam.[181] The message is clear: Fully exploiting the opportunities from emerging markets requires ever greater openness to trade.

But the contribution of trade extends beyond the direct impact on economic output. Trade stimulates higher productivity and innovation among export-competing firms. It also enhances knowledge and technology transfers across economies. Moreover, operating in larger markets allows for greater exploitation of economies of scale. These effects increase an economy's productive capacity.

To assess the impact of trade with emerging markets on economic growth, Oxford Economics modeled the four case-study countries, taking the novel approach of including the positive spillover effects of trade (such as knowledge transfers and innovation) (see "Exploring the impact of trade with emerging markets: Areas of excellence"). The econometric analysis shows that, by embracing the spillover effects, trade with emerging markets could translate into higher sustainable growth in all four economies by 2020:

- Boost US GDP by US$534 billion, an increase of 2.7 percent above the current trajectory by 2020. Although the US has a comparatively low export share in economic output, it benefits from a relatively large exposure of exports to emerging markets (Figure 44).
- Raise Germany's GDP by €138 billion, an increase of 4.6 percent above the current trajectory by 2020, as a result of the extensive openness of the German economy and the large share of exports already directed to emerging markets (Figure 45).
- Increase UK GDP by £40 billion, 2.1 percent above the current trajectory by 2020, thanks to its strength in financial services and consumer goods—sectors set to grow as emerging-market consumer incomes rise (Figure 46).
- Boost India's GDP by Rs7 trillion, an increase of 4.9 percent above the current trajectory by 2020, owing in part to its high degree of integration in emerging-market trade (Figure 47).

Concerns are often expressed that opening up trade threatens domestic jobs, but the econometric research finds that trade with emerging markets would stimulate employment as new demand is created, raising 2020 employment levels by 1.7 million in the United States, 1.1 million in Germany and 700,000 in the United Kingdom.

Potential of interventions to stimulate the emerging-markets surge

Figure 44: United States

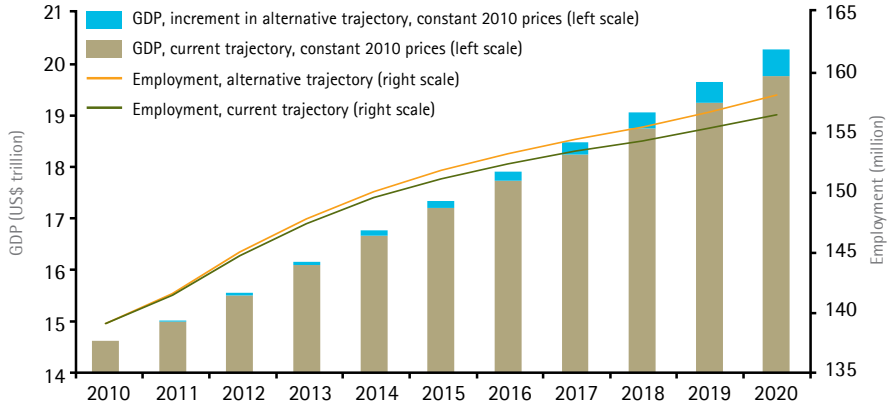


Figure 45: Germany

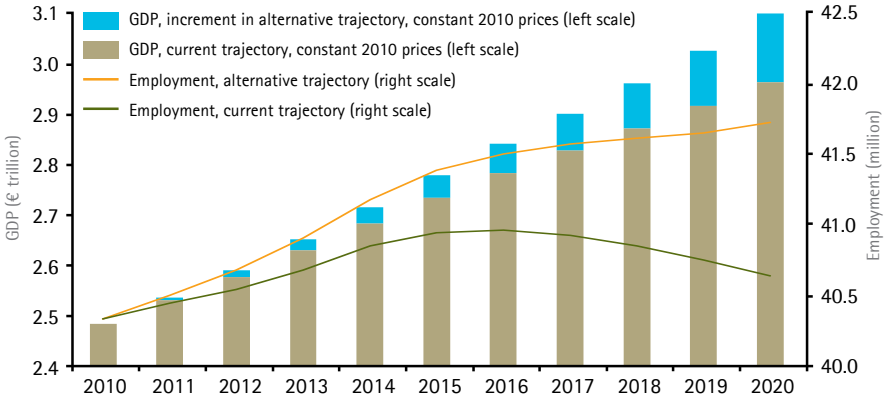


Figure 46: United Kingdom

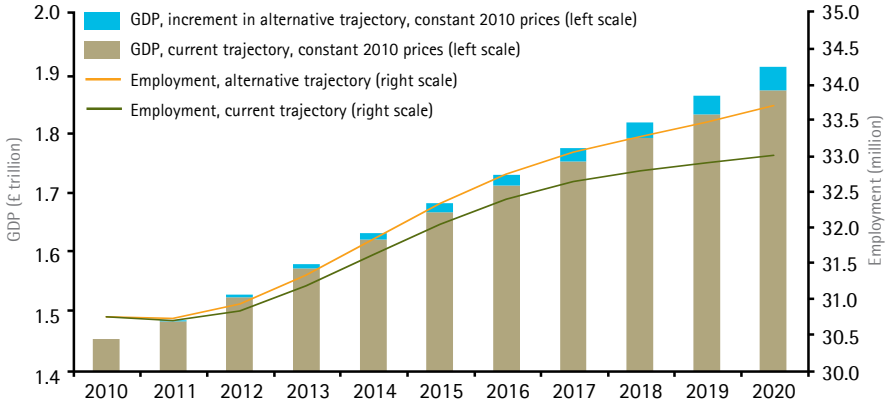


Figure 47: India

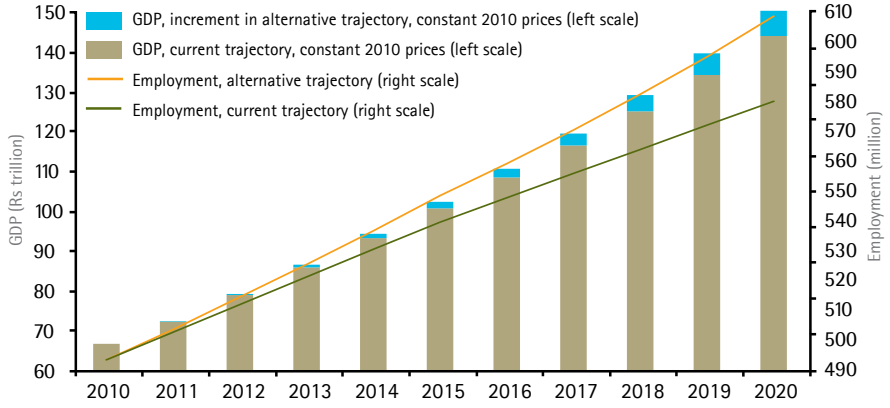


Figure 44–47 Source: Oxford Economics

Exploring the impact of trade with emerging markets: Areas of excellence

To explore the impact of trade with emerging markets, Oxford Economics looked at, among other factors, the comparative advantage of the four economies in our study. The analysis found the following:

- Germany has developed an area of excellence in investment goods (such as machinery and equipment) and thus has the opportunity to exploit the growing demand for these goods arising from the rapid economic transformation of emerging markets.

- The United States also has a comparative advantage in the investment-goods sector. In addition, it is well poised to benefit from its comparative advantage in the services sector, as technological change enables more services to be traded and as a burgeoning global middle class consumes non-essentials, such as travel and tourism.

- The United Kingdom has a comparative advantage in financial services and consumer goods, so it is well positioned to exploit the opportunities that spring from rising emerging-market household incomes and consumption.

- India has the potential to exploit its existing advantage in consumer and intermediate goods, which is driven by cost competitiveness relative to developed economies.

These results indicate that it is imperative that countries identify and exploit their areas of excellence if they are to fully capture the benefits from trade.

" With its comparative advantage in higher education and creative and cultural services, as well as a range of financial and trade-related services, the United Kingdom has the potential to develop and grow its service-sector exports to emerging markets."

Ian Brinkley, The Work Foundation

Creating the conditions for success

Emerging economies hold great promise for long-term growth for businesses operating inside and outside these markets. However, access to emerging markets is often hindered by various factors, such as restrictions on trade and investment, inadequate infrastructure or distribution systems, and cultural and social differences affecting the nature of consumer demand. To make the most of growth in emerging markets, economies need to open trade routes to emerging markets through international agreements and business relationships as well as uncover and strengthen areas of comparative advantage.

Building new bridges to the emerging world

Our analysis highlights the importance of economies' maintaining momentum toward openness in trade and investment flows. While protectionism may be a tempting expedient for policymakers seeking to support struggling industries, in the longer run it can damage economies' competitiveness and foreclose new overseas trade and investment routes. Completion of the deadlocked Doha trade round would be strongly beneficial, but economies can alternatively pursue bilateral and regional trade agreements to free up flows of trade and investment. They can also deepen their economic integration with regional trade areas. In addition, regional economic cooperation can often extend to areas such as public infrastructure investment, again offering commercial opportunities for businesses. The ASEAN-India Trade in Goods agreement, for instance, created the world's largest free trade area by population, bringing together 1.8 billion people, by liberalizing tariffs on over 90 percent of products traded between the regions.[182]

Gains from free trade can be further boosted by the adoption of innovative new technologies, which can overcome barriers such as physical distance. Business models built around social networking, for instance, can span many countries and open up new markets.

Uncovering and strengthening comparative advantage

As barriers to trade and capital erode, and technology opens up more sectors to international competition, economies need to understand and reinforce their true areas of comparative advantage. For instance, the United Kingdom has a natural linguistic advantage in India over other European countries because of India's large English-speaking workforce. This is one of the reasons that several Asian countries look to the United Kingdom as the most favored inward investment location in Europe.[183] Similarly, the size of Germany's medium-tech manufacturing sector—the Mittelstand, which accounts for over a third of European medium to high-tech manufacturing[184]—offers a solid base of skilled workers for associated knowledge-intensive services worldwide.

Approaching globalization from another angle, newly tradable sectors

provide opportunities for countries to turn domestic excellence into new areas of comparative advantage. For example, **China's** removal of barriers to entry for foreign universities is the latest opening in a huge—and growing—global market for education. English-language universities from Australia, the United Kingdom and the United States have established campuses in other countries. These universities previously limited themselves to teaching students who were willing to travel overseas to study. From 2007 to 2009, the number of satellite campuses for such universities worldwide has grown 43 percent, to 162.[185] Another tradable sector is Business Process Outsourcing (BPO). India's strong base of English-fluent graduates has propelled that vast nation into a global leadership position of US$62.6 billion in the BPO market.[186] Companies with a strong position in their domestic markets should proactively seek innovative ways to export their success overseas.

Organizational imperatives

Create geographic options

Organizations need to proactively and continually explore new geographic sources of value. No two markets are the same, and organizations may need to go to multiple markets to find what they need—be it talent, capital or raw materials. **Santander**, the Spanish banking group, was able to record strong growth in 2009 despite the troubles of its domestic market, owing to its geographic diversification.[187] A new Accenture study finds that the superior performance of the growth champions among the top 500 companies in Germany is partly due to their ability to gain a foothold in emerging markets (see Accenture's publication "Germany's Top 500—Strategies for Global High Performance"). Businesses can reach out to potential customers in overseas markets with new business models, channels and infrastructure investment that tap into otherwise latent demand.

Be authentically local

Tastes, customs, regulations and political environments differ widely and can create barriers to cross-border trade. Being authentically local can help companies access and multiply the value inherent in diverse markets by putting themselves at the center of local business ecosystems. Developing local partnerships, for instance, can unlock that vital knowledge about the region or area, and help companies adapt their strategy, operations and products to meet local conditions and tastes. Companies can also pursue "polycentric" innovation (see the chapter entitled "The multi-technology future")—integrating globally distributed R&D capabilities to serve innovation demand worldwide—much like **GE**, **Cisco** and **Nokia** are doing. Rather than simply stripping frills from their "born in the West" products, companies can engineer innovations at R&D facilities based in emerging markets. Although the primary targets of such innovations are emerging markets, suitable frugal innovations can be imported into developed markets.

" Enterprises that want to harness emerging-market growth will need to adopt and develop entirely new business models that can scale in the face of numbers not seen before."

Nick Vitalari, nGenera Insight

Network the organization

Organizations should actively find ways to scale the benefits of local success to the organization at large. They will need to move toward a model that mirrors their multi-polar business environment and enables them to reap the benefits of being both "super-global" and "super-local." Creating structured channels can allow the rapid diffusion of ideas and know-how across geographic regions. This requires investments in mobility and technology solutions that facilitate the movement of talent and ideas within the company and between value chain partners.

Foster multi-polar world leadership

A global mindset will ensure that organizations maintain the appropriate flow of ideas and know-how. But this requires leaders who understand the global environment and how to harness the new trends and dynamics. Effective geographic options are more likely to flow from a leadership team that reflects the company's current and future geographic footprint.

Apart from the composition of the leadership team, a global mindset can be inculcated in various ways, such as training programs to understand cultural differences.

Design an appropriate international operating model

Business strategies and operating models should be aligned to the realities of the external business and economic environment. As market dynamics evolve at a more rapid pace, so organizations will need to be prepared to change their operating model and align to the new opportunities and risks that are uncovered. Executives will need to ensure that the critical levers of their operating model are capable of sensing, flexing and adapting to signals for change; this is true across their management processes, their technologies, their organizational structures, and their people and culture. This flexibility across the operating model is central to continually achieving an optimal balance between global efficiency and local responsiveness.

Making it happen

In years to come, how will economic historians judge the dramatic events that marked the end of the first decade of the twenty-first century? As a precursor to a decade of continued uncertainty and economic decline? Or as an episode that sparked a different direction and a new era of economic renewal, growth and job creation?

Today, there is a chance to take a new direction. Our detailed investigation of four major economies—with very different characteristics—shows that governments and businesses together can mine rich seams of growth through imaginative responses to oft-perceived challenges around aging populations, the transition to a resource-efficient economy, the advent of new technologies, and the ascendancy of emerging markets. But such growth is not assured, and every year of delay increases the costs of inaction still further.

So how can economies plant seeds today to yield growth tomorrow?

Articulate the vision

A strong strategic direction is crucial. For an economy, this means having a clear-eyed view of comparative advantage (both existing and potential)—put simply, what do economies want to be famous for? For organizations, it means being able to anticipate trends and distinguish "big enough market insights" from mere sparks of ideas.

Breadth of vision will be critical. Greater growth momentum can be achieved when economies apply a broad lens to potential sources of growth, both sectorally and geographically. In many cases the rapid advance of a particular sector will spawn additional demand in a raft of adjacent sectors or upstream or downstream industries. Growth opportunities can also be enhanced through more strategic economic and business engagement with emerging markets, for example through trade liberalization and greater emphasis on the role of economic diplomacy.

Find the gaps

New growth sectors must be built on firm supply-side foundations: enough workers with the right skills, sufficient complementary infrastructure, smart use of technology and clear channels to new markets. Differences between current capabilities and those needed in the future will have to be understood and planned for. In this respect, timing is everything. Take the example of workforce planning. To ensure that they have the right skills for the future, organizations will increasingly need to think of talent management and development in terms of three "workforces": first, the silver workforce, ripe with experience and insight, whose skills must be retained and productivity augmented through lifelong learning strategies; second, the younger workforce (Generations Y and Z), generally technology savvy and aspirational in outlook, which requires a diversity of work experiences and continual learning opportunities; third, the new workforce that will need to be discovered and developed for the

" Forces of growth are knocking at India's doors, demanding to be let in. Reaching this potential, however, requires organized effort and adequate investment, both in the public and private sector, to improve productivity of land, labor and capital."

Aditi Phadnis, The Business Standard

industries of the future. For the last of these, businesses can work with government to identify skills gaps and initiate vocational programs targeting fast-growing industries thirsty for new talent. As well as investment in education and skills, better mechanisms to match supply and demand in labor markets will also be important, including innovative use of IT and social network platforms. For example, **Germany's** federal labor agency pioneered an online job portal that increased the efficiency of the labor market in filling job vacancies while also reducing unemployment, even in the teeth of a global recession.

Fertilize the soil

For emerging sectors to take root, a fertile growth environment needs to exist. This encompasses a host of elements, such as the cost and availability of skills, competitive access to varied sources of capital (including seed and venture funding), and the availability of key resource inputs. It also implies a business environment conducive to growth. Examples of this include smarter regulation that is in tune with the needs of fast-growing companies, or an innovation ecosystem that aids the growth of technology clusters and promotes deeper networks among business innovators, universities and governments.

Pioneer new models of cross-sector collaboration

In the more tightly knit and interdependent economy of the next decade, coordination among the three sectors—business, government and non-profit—will no longer be a bonus but a necessity. The sheer scale of the challenge and the requirement for diverse expertise make it unlikely that any one sector can harness the new waves of growth single-handed. Substantial uncertainty and capital commitment, in particular for the resource economy, suggest that coordination and collaboration among sectors can help to spread risk and smooth the flow of information and ideas.

Each sector has a part to play, individually and collectively. The corporate sector brings commercial acumen, technical know-how and entrepreneurial flair. It can take a far-sighted view, spotting "big enough market insights" that have long-term growth and investment value. Governments, for their part, can provide enabling infrastructure, a supportive policy context and the right regulatory incentives. The third or non-profit sector, long underestimated, brings important expertise as well as innovation in delivery models (such as cross-sector partnerships and social enterprises) and is also uniquely positioned to raise public awareness about the possibilities of new growth sectors. But cross-sector collaboration should not be limited to the domain of national layers. As cities become increasingly important nodes of economic activity and decision making, they will become the starting point for stakeholders that seek to execute a national strategy. IT and social network platforms provide important tools to deepen such collaboration. Via their ability to demonstrate "what works," pilot projects can provide a focus for collaborative efforts, mitigate risks, and enable policy and business model experimentation.

Appendix

New Waves of Growth Panelists

Krishna Angara, Operations Director, Vodafone India (India panel)

Jens Bastian, Alpha Bank Visiting Fellow for Southeast Europe, St Antony's College, University of Oxford (Germany panel)

Graham Baxter, Global Programmes Director, International Business Leaders Forum (United Kingdom panel)

Ian Brinkley, Director of Socio-economic programmes, The Work Foundation (United Kingdom panel)

Andreas Busch, Professor of Comparative Political Economy, University of Goettingen (Germany panel)

David Coplin, Director of Search, Microsoft UK (United Kingdom panel)

Bibek Debroy, Economist, Professor, Centre for Policy Research (India panel)

Emily Stover DeRocco, President, The Manufacturing Institute (United States panel)

Marie Diron, Head of European Macro Services, Oxford Economics (United Kingdom panel)

Simon England, Director, Health industry, Accenture UK (United Kingdom panel)

Alvaro Fernandez, CEO and Co-Founder, SharpBrains Council for Brain Fitness Innovation (United States panel)

Dr. Valpy FitzGerald, Professor of International Development Finance and Head of Department, Department of International Development, University of Oxford (United Kingdom panel)

Dr. Stephanie Hare, Senior Editor/Analyst for Western Europe, Oxford Analytica (Germany panel)

Paul Hofheinz, President and Co-Founder, The Lisbon Council (United Kingdom panel)

Professor Michael Hulme, Director, Social Futures Observatory (United Kingdom panel)

Ratika Jain, Co-Founder and Director, White Owl Advisory (India panel)

Professor Erik Jones, Johns Hopkins School of Advanced International Studies (Germany panel)

Dr. Ruth Kattumuri, Co-Director, India Observatory & Asia Research Centre, London School of Economics and Political Science (India panel)

Professor Desmond King, Andrew W. Mellon Professor of American Government, Nuffield College, University of Oxford (United States panel)

Jean-Pierre Lehmann, Professor of International Political Economy, and Founder Director of The Evian Group, IMD (India panel)

Scott Livermore, Director of International Macroeconomic Forecasting, Oxford Economics (United Kingdom panel)

Dr. Rory Macleod, Independent Financial Consultant and International Region Head, Oxford Analytica (United Kingdom panel)

Nick Manning, Advisor, Public Sector Governance, World Bank (United States panel)

Dr. Hartmut Mayer, Fellow in Politics – International Relations, St Peter's College, University of Oxford (Germany panel)

Ann Mettler, Executive Director and Co-Founder, The Lisbon Council (Germany panel)

Geoff Mulgan, Director, The Young Foundation (United Kingdom panel)

Dr. Greg Parston, Director, Accenture Institute for Health and Public Service Value (United Kingdom panel)

Aditi Phadnis, Political Editor, The Business Standard (India panel)

Michael Pitsch, Managing Director, Health and Public Service industry, Accenture (Germany panel)

Mark Purdy, Chief Economist, Accenture Institute for High Performance (United Kingdom panel)

Matthew Robinson, Global Trends Director, Accenture Institute for High Performance (United Kingdom panel)

Richard Rommel, Senior Vice President & General Manager of New Business Solutions Group, Best Buy (United States panel)

Stephan Scholtissek, Global Managing Director of Resources, Growth & Strategy, Accenture (Germany panel)

Debasis Sengupta, Managing Director, ICICI Winfra Limited (India panel)

Mark Spelman, Global Head of Strategy, Accenture (United Kingdom panel)

Dr. Paola Subacchi, Research Director, International Economics, Chatham House (United Kingdom panel)

Girish Tutakne, Senior Executive, Accenture (India panel)

Hal Varian, Chief Economist, Google (United States panel)

Nick Vitalari, Senior Vice President, nGenera Insight (United States panel)

Tom Wales, Deputy Editorial Director, Oxford Analytica (United States panel)

Dr. David Washbrook, Historian of Modern South Asia, Oxford Analytica (India panel)

Fabian Wendenburg, Manager Public Affairs, The Linde Group (Germany panel)

Dr. Angela Wilkinson, Director, Futures Programme, Smith School of Enterprise and the Environment, University of Oxford (United Kingdom panel)

Professor Rob Wilson, Professorial Fellow and Deputy Director, Institute for Employment Research, University of Warwick (United Kingdom panel)

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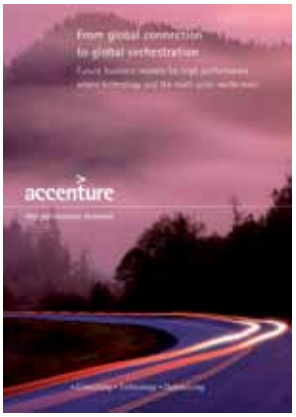

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