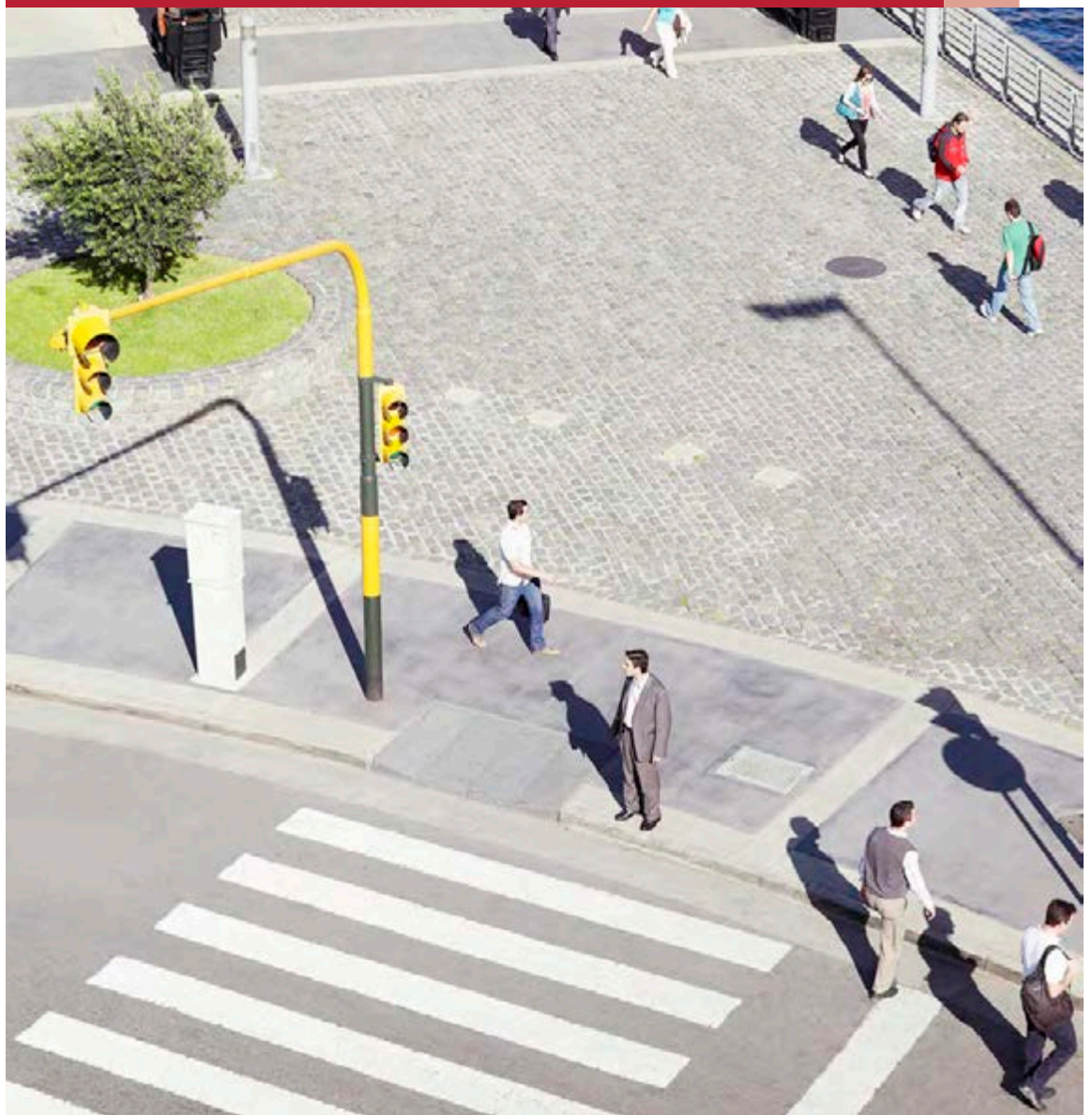


Five megatrends and possible implications

April 2014

Directors edition



What is a megatrend?

Megatrends are macroeconomic forces that are shaping the world. They are factual and often backed by verifiable data. By definition, they are big and include some of society's biggest challenges—and opportunities.

The concept of megatrends is not new. Companies may call megatrends by different names, but most companies have organized their strategy in some way, shape, or form around them.

Our process

Over the last few years, we have observed that many of our clients have been studying global megatrends, and they've been adjusting and refining their strategies in light of them. Those clients are driven not only by short-term bottom line performance but also a desire to ensure their company remains relevant for the long term. Said differently, if you're not taking advantage of opportunities provided by the megatrends, you run the risk of becoming irrelevant to a large part of society.

In the pages that follow we provide:

- A summary of the five megatrends as we have described them
- Potential implications to management teams, directors, and other stakeholders

At PwC, we see many of our clients already adapting to the megatrends. We are optimistic about the future of business, and we believe there can be more examples of success than failure.



Megatrend *One*

Accelerating urbanization

In the 1950s, less than 30% of the world's population lived in cities. Currently, that proportion has risen to 50% and, by 2030, the UN projects that some 4.9 billion people will be urban dwellers. By 2015, the UN estimates that there will be 22 mega-cities—those with populations of 10 million or more—with 17 located in developing economies. By 2050, the world's urban population will have increased by some 72%.¹

Much of the growth in urban population will likely take place in Asia and Africa. Large scale migrations from rural areas will power much of this growth.

In developed economies and older cities in the developing world, infrastructure will be strained to the utmost—and beyond—as populations expand. Meanwhile, in emerging economies, new cities will rise rapidly and require massive investments in smart infrastructure to accommodate explosive growth.

Industry examples

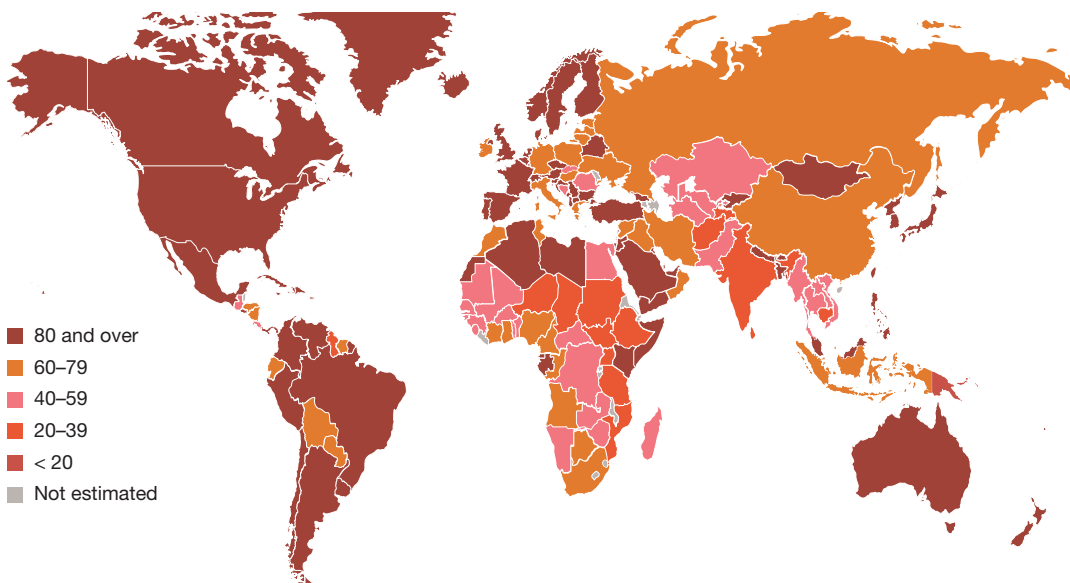
1. Citi's 150 cities strategy

As part of Citi's strategy, the company has identified 150 cities it believes will shape the world in coming years.² It is active in 80% of them and plans to enter the rest. The company has often talked about its presence in more than 100 countries, but CEO Michael Corbat predicts more talk about cities in the future.³

2. "Smart Cities"

Cisco is one of several large IT and telecommunications companies that have developed new solutions and initiatives for developing smart cities around the world.⁴ These "smart cities" will use cloud technology, mobile devices, data analytics, and social networks to automate and connect city departments and promote eco-friendly practices.

Percentage of population in urban areas, 2030



Source: UN Department of Economic and Social Affairs.

- ¹ The United Nations Department of Economic and Social Affairs, Population Division.
- ² "New Citi-Commissioned EIU Report Projects Competitiveness of 120 of the World's Major Cities in 2025," Citigroup, June 4, 2013, retrieved February 19, 2014, http://www.citigroup.com/citi/citiforcities/home_articles/n_eiu_2013.htm.
- ³ "Remarks by CEO Michael Corbat at Citi's 2013 Annual Meeting," Citigroup, April 24, 2013, retrieved on February 21, 2014, <http://www.citigroup.com/citi/news/executive/130424Ea.htm>.
- ⁴ Used with the permission of <http://thenetwork.cisco.com/>, retrieved February 18, 2014.

Megacities require small, fuel-efficient, and environmentally clean light vehicles, which provides an opportunity across our businesses.

Roger Wood

President and Chief Executive Officer, Dana Holding Corporation

World urban population



The world urban population is expected to increase by 72% by 2050

Source: World Urbanization Prospects: 2011 Revision, Produced by the UN Department of Economic and Social Affairs.

Possible implications

- As megacities grow in breadth and number, many analysts believe that their power will rival that of national governments due to the sheer size of their constituencies.
- Megaprojects will be required to build city infrastructure, support new trade flows (airports, sea ports), address education, health, security, employment demands, etc.

Megatrend *two*

Climate
change &
resource
scarcity

Climate change and resource scarcity

Scarcity of resources and the impact of climate change are of growing economic concern. Demand for energy is forecast to increase by as much as 50% by 2030, and water withdrawals by 40%.⁵

Impacts may include increases in extreme weather and rising sea levels, which could make traditional methods of farming, hunting, and fishing difficult or impossible in some places.

The need for sustainable solutions may well be at odds with the need for resources to fuel growth and feed populations. Time-honored traditions will be challenged by changes to the physical environment.

Industry examples

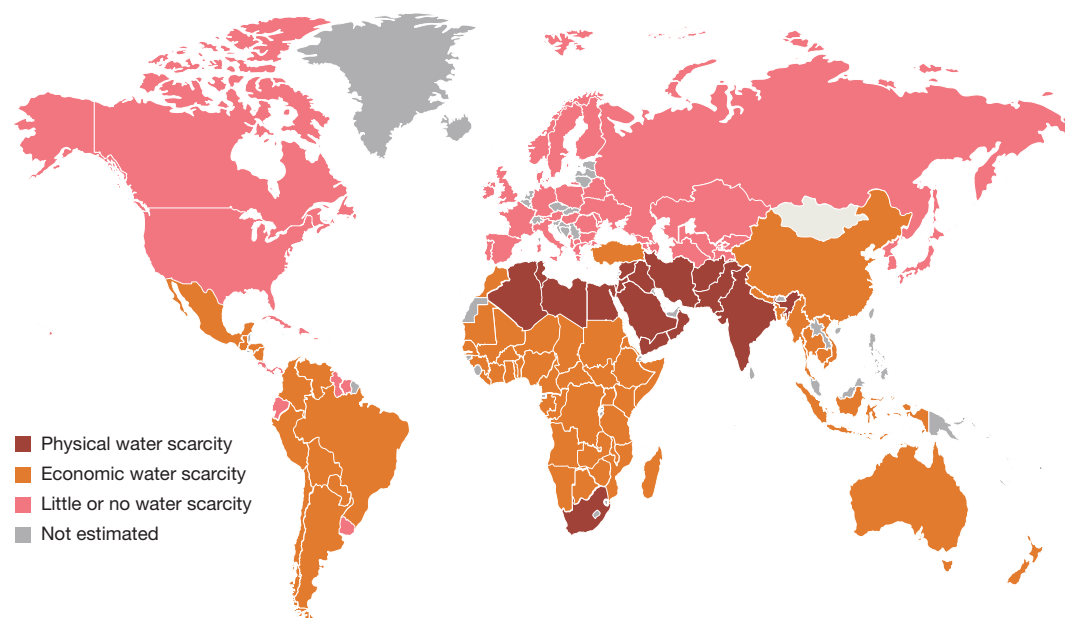
1. Plugging in on the road: an issue for **electric vehicle** owners

More than 96,000 plug-in hybrid and electric cars were sold in the US in 2013,⁶ but only about 22,000 public charging stations exist.⁷ Companies such as electric vehicle charging service and network provider **CarCharging Group** and electric vehicle services provider **Recargo**, whose PlugShare app shows charging spots, see opportunities for innovation.⁸

2. **Coca-Cola** and the USDA team up to improve **water resources**

In 2013, the two announced a five-year public-private partnership to restore and protect US watersheds. The goal: to return more than a billion liters of water to the National Forest System, which provides more than 60 million Americans with drinking water.⁹

Projected water scarcity in 2025



Source: International Water Management Institute.

⁵ National Intelligence Council: Global Trends 2030: Alternative Worlds.

⁶ WardsAuto.com, January 3, 2014.

⁷ US Department of Energy, "Alternative Fueling Station Counts by State," www.afdc.energy.gov, as of April 3, 2014.

⁸ "Car Charging About Us," retrieved February 19, 2014, www.carcharging.com; "Recargo PlugShare Overview," retrieved February 19, 2014, www.recargo.com.

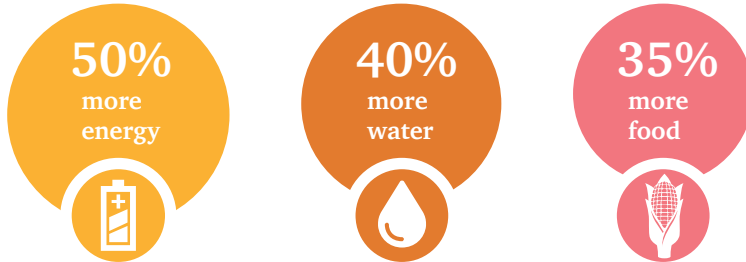
⁹ "USDA and Coca-Cola Partner to Replenish One Billion Liters of Water to Nature," United States Department of Agriculture, September 13, 2013, retrieved February 18, 2014, <http://www.usda.gov/wps/portal/usda/usdahome?contentid=2013/09/0180.xml&contentidonly=true>.

Access to resources, especially water, is going to be an increasingly important issue affecting the mining industry in general and the gold mining industry in particular.

Gary J. Goldberg

President and Chief Executive Officer, Newmont Mining Corporation

With a population of 8.3 billion people by 2030, we'll need...



Source: National Intelligence Council: Global Trends 2030: Alternative Worlds.

One of Towers Watson's lines of business is our investment consulting group. . . We've identified 30 risks. Food, water, and energy shortages would probably be the major impacts that we would be most concerned about.

John Haley

President and Chief Executive Officer, Towers Watson

Possible implications

- Securing resources domestically and internationally via strategic relationships becomes even more critical for governments and businesses.
- Increased conflict and political tension, especially over resources, may occur as food, energy, and water patterns change.
- Increased level of regulation, both directly relating to environmental changes and indirectly through taxation and similar types of incentives/disincentives.
- New industries created, or existing ones revolutionized, in response to energy scarcity, climate change and lack of resources; the pace of these changes will be accelerated by new technologies.



Megatrend *three*

Demographic shifts

Explosive population growth in some areas against declines in others contributes to everything from shifts in economic power to resource scarcity to the changes in societal norms.

Countries have very different demographic trajectories. Some societies are aging rapidly and their workforces will be constrained as a share of the total population.

Other societies are young and growing, which will create ever larger labor forces and consumer markets.

Youthful, growing populations must be fed, housed, educated, and employed for productive potential to be realized.

Industry examples

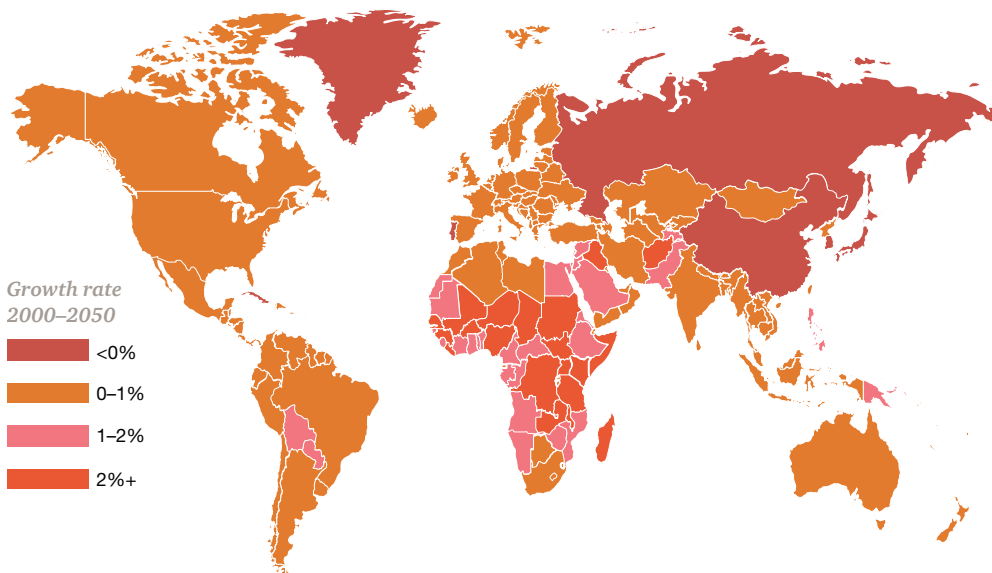
1. Turning to **robots** to help growing **elderly populations**

With the number of Americans over the age of 65 expected to nearly double to 72.1 million by 2030,¹⁰ many companies, universities, and research facilities are looking to robots to help with their care. Georgia Institute of Technology researchers developed **Cody**, a robotic nurse that can help with bathing,¹¹ and **GeckoSystems' SafePath™** robotically assisted wheelchair uses navigation technology for situationally-aware, real-time obstacle avoidance.¹² Companies in Japan, France, and other countries are also developing caretaker robots.

2. **CEOs** are concerned about **talent**

Half of CEOs are planning to increase headcount in the coming year, according to PwC's *17th Annual Global CEO Survey*, and 93% recognize the need to change or are changing their strategies for attracting and retaining talent. Sixty-three percent are concerned that the lack of key skills could threaten growth prospects.

Annual population growth rate, 2010–2050 (medium variant)



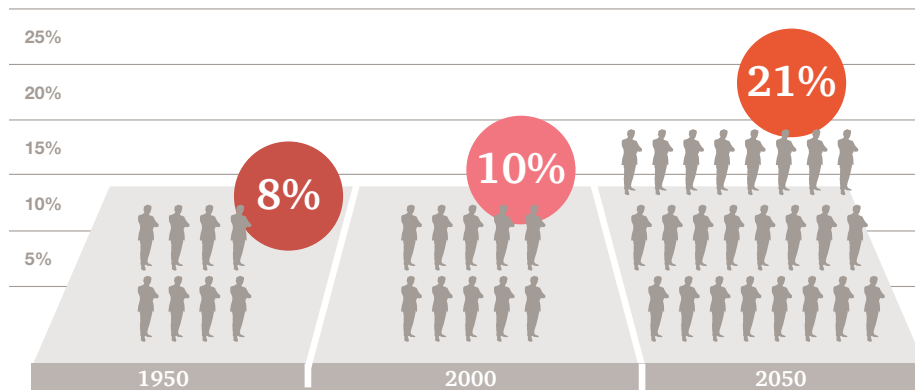
Source: UN Department of Economic and Social Affairs.

¹⁰ "Aging Statistics," Department of Health and Human Services Administration on Aging, retrieved April 16, 2014.

¹¹ "Robotic Cody Learns to Bathe," Georgia Tech College of Engineering, retrieved April 16, 2014, <http://www.coe.gatech.edu/content/robotic-cody-learns-bathe>.

¹² "Personal Assistance Robots: Not Just Science Fiction," GeckoSystems, retrieved April 17, 2014, http://www.geckosystems.com/markets/personal_assistance.php.

Proportion of the world population aged 60 years or more



Source: UN report World Population Ageing 1950–2050.

The megatrend that really affects us is the aging of the populations in most developed countries. The implication of that onto healthcare costs and the ability to deliver healthcare is quite profound. We believe strongly in the merging of wireless into the healthcare industry to provide continuous feedback, to monitor patients who might have chronic conditions.

Dr. Paul E. Jacobs
Executive Chairman,
Qualcomm Incorporated

Possible implications

- As the population ages in mature economies and the ability to use debt is limited, governments may come under pressure to raise taxes to maintain social programs.
- Shifts in longevity may affect business models, pension costs, and talent goals/ambitions.
- Societal and political pressure to create jobs may increase, especially for older workers and the “have nots.”
- Health systems may need to be re-engineered (and paid for) to handle many more participants in economies which will often see declining GDP.
- The workforce may need to be retooled in all parts of the world: in the aging economies, older workers will need to learn new skills and work longer, and their work may have to be supplemented by migrant populations. In emerging growth markets, the gaps between supply and demand for those with university-level education will have to be filled.



Megatrend *four*

Shift in global economic power

The focus of global growth has shifted. Western economic dominance is a relatively recent phenomenon, and the developments we see are essentially a rebalancing of the global economies.

A realignment of global economic and business activity is transitioning BRIC and other growth countries from centers of labor and production to consumption-oriented economies. As they become exporters of capital, talent, and innovation, the direction of capital flows is being adjusted.

Along with the growth and size of the emerging markets, it's important to appreciate the interconnectivity of the trade and investment flows between them, which are growing much faster than the traditional routes from developed-to-emerging and developed-to-developed countries.

Industry examples

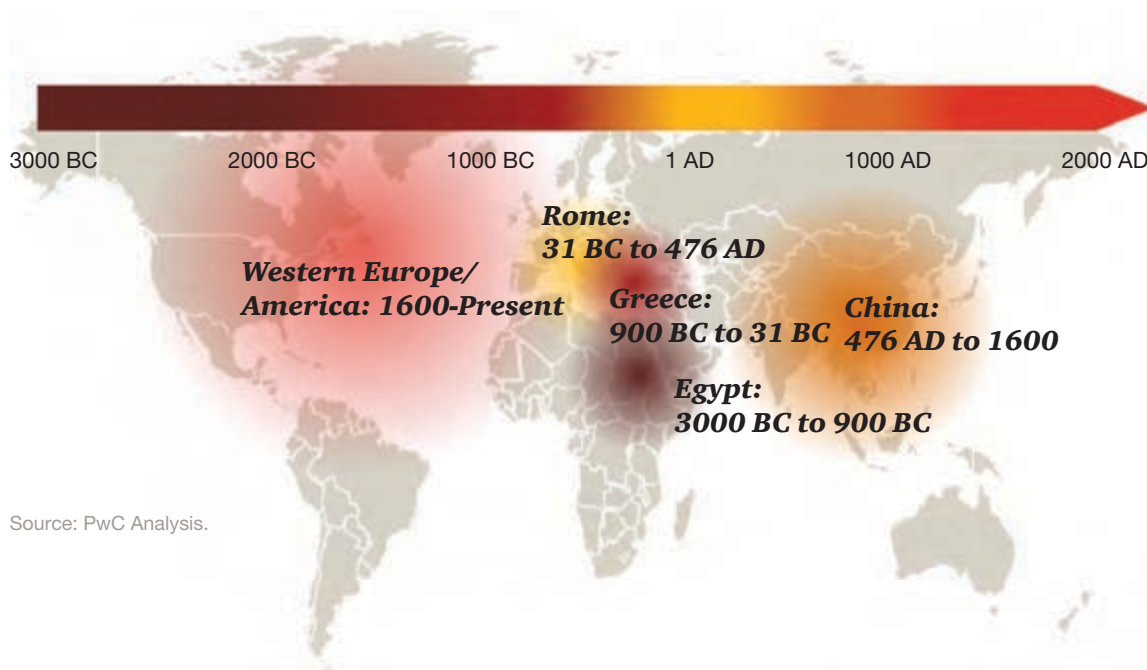
1. Decoupling from **export-led growth** in Asia-Pacific

The economies of China, Malaysia, the Philippines, Peru, and Chile grew more than 5% in 2012, while also experiencing steep declines in exports relative to their GDPs, according to PwC's *2013 APEC CEO Survey*. Growth in the Asia-Pacific Economic Cooperation (APEC) region had largely been defined by exports.

2. Steering to **emerging markets**

Asia will represent 66% of the global middle-class population and 59% of middle-class consumption by 2030, up from 28% and 23%, respectively, in 2009.¹³ This could be a boon for automakers: In India, there are about 18 cars per 1,000 people, and in China, there are about 60 cars per 1,000 people.¹⁴ That compares to 765 in the US.¹⁵

Western economic dominance is a recent development



Source: PwC Analysis.

¹³ Mario Pezzini, "An emerging middle class," OECD Observer, 2012.

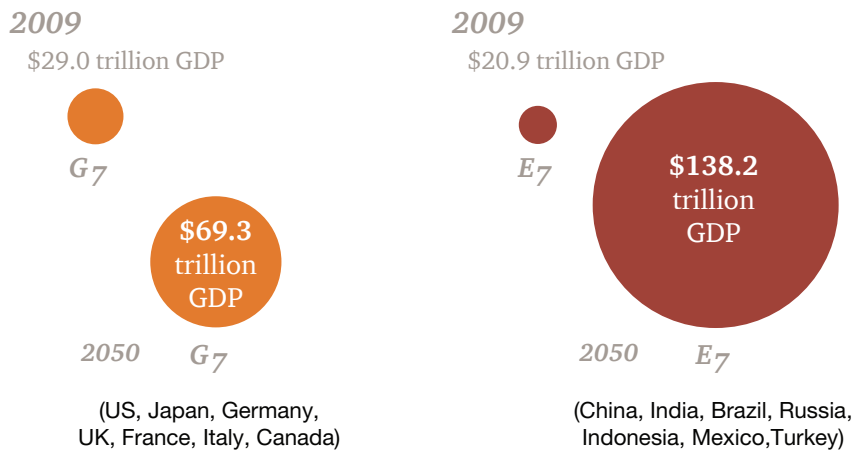
¹⁴ The World Bank, World Development Indicators, 2010.

¹⁵ Ibid.

There's a major shift in India in the rise of the middle class and geographic dispersion, and we have to meet the needs of our clients there. That's a global trend, and our clients, particularly in the consumer goods sector, have to focus on where the consumers are and how do you reach them.

Michael I. Roth
Chairman and Chief Executive Officer, Interpublic Group

GDP of G7 and E7 countries at US\$ PPP



Source: PwC Analysis.

Possible implications

- The increasingly multi-polar world created by the shift from largely Western-led global organizations to regional players may reshape the competitive environment for companies.
- Competing versions of capitalism could arise as well as an array of planned economies. Planned economies could create/support new global champions in strategically important business sectors.
- Mature markets may lose influence and capital and become less attractive for talent and business. Governments increasingly may compete using tax and regulation as well as investment support.
- Competition generated from new geographies and sources may create different competitor profiles than those historically faced.



Megatrend *five*

Technological breakthroughs

Breakthroughs in nanotechnology and other frontiers of research and development are increasing productive potential and opening up new investment opportunities.

Entire new industries are being created, which could have a significant impact on the size and shape of the world's manufacturing and high-tech sectors and the companies that operate within them.

The combination of the internet, mobile devices, data analytics, and cloud computing will continue to transform our world. Many companies across all sectors are grappling with how these developments will affect consumer expectations, the way they interact with their customers, and the underlying business models that support this.

Industry examples

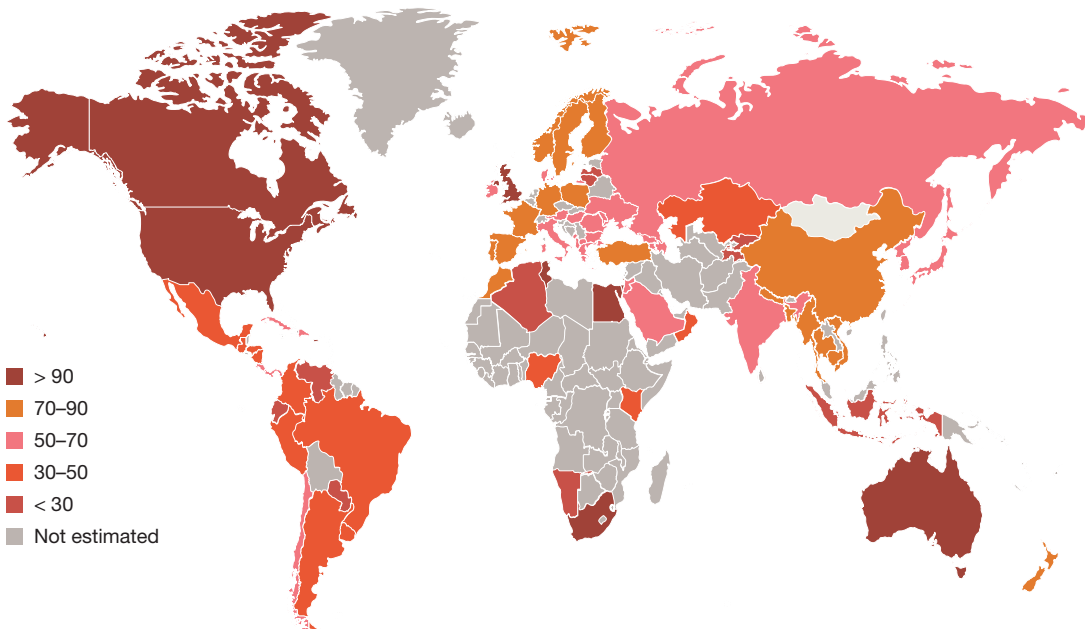
1. Plans for **drone delivery**

In Australia, where commercial drone activity is legal, textbook rental startup **Zookal** will start using drones for deliveries this year. In December 2013, **Amazon** CEO Jeff Bezos unveiled its "Prime Air" delivery plan via drone-like aerial vehicles.¹⁶ The FAA has yet to approve commercial drone delivery in the US.

2. A **3D liver** is coming

San Diego-based bioprinting company **Organovo** delivered its first 3D printed human liver tissue to an outside lab in January 2014.¹⁷ The company plans a commercial launch of the product before December. The liver model will only be used for research and drug testing, which could help drug companies combat the average \$1.2 billion, 10- to 15-year process to develop new drugs.¹⁸

Venture capital and private equity country attractiveness index



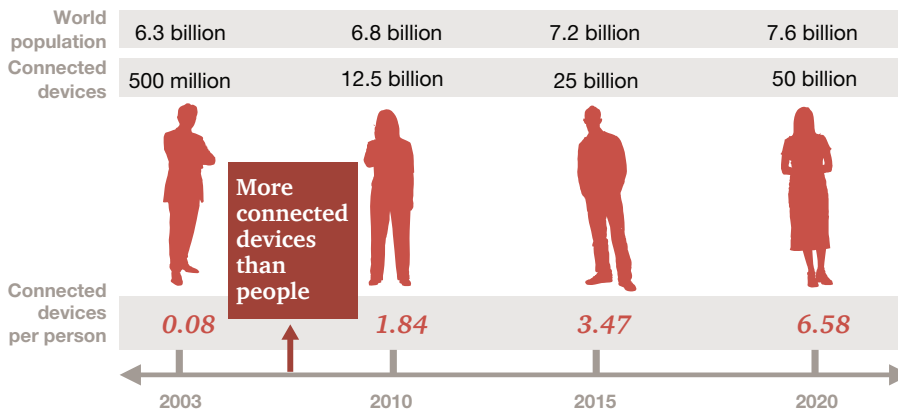
Source: The Global Venture Capital and Private Equity Country Attractiveness Index, IESE Business School, 2013.

¹⁶ "Amazon Prime Air," retrieved February 19, 2014, <http://www.amazon.com/b?node=8037720011>.

¹⁷ "Organovo Announces First Delivery of 3D Liver Tissue to Key Opinion Leader," Organovo, January 29, 2014, retrieved February 19, 2014, <http://ir.organovo.com/news/press-releases/press-releases-details/2014/Organovo-Announces-First-Delivery-of-3D-Liver-Tissue-to-Key-Opinion-Leader/default.aspx>.

¹⁸ Pharmaceutical Research and Manufacturers of America, 2013 Profile: Biopharmaceutical Research Industry, 2013.

The rise of the “Internet of Things”



Source: Cisco Internet Business Solutions Group, April 2011.

The “next big thing” in IT never ends, but there are a few fundamentals. One, it will be mobile. Technology will be wherever you are in the world of the Internet, everything connected together. . . Second will be the data that’s analyzed in a free-form format to find business and market opportunities. . . The next one is . . . what I would call ease of use. . . Every vendor is going to make tremendous investments in the future to make everything that they create simple to use.

Robert M. Dutkowsky
Chief Executive Officer,
Tech Data Corporation

Possible implications

- Technology will enable virtual versus physical business and operating models.
- Assets (and liabilities) will be increasingly accessed on flexible terms: where previously assets were primarily available to own, adaptable businesses now provide them for rent in innovative ways.
- Access to systems and information should enable management models to flatten organizational structures.
- New competitors will emerge as technology and innovation create new competitive advantages and increase productivity across sectors and geographies.
- The ability to gather and analyze data in real time may become a requirement for doing business, rather than a competitive advantage.

What do these mean to you as directors?

Boards have responsibility for strategy oversight. Here are five things for directors to consider relative to the megatrends:

- (1) What is your company's purpose? Stakeholders are increasingly becoming more than just clients and shareholders—social media allows accessibility to brand, and society as a whole often forms judgments that impact us. A well-defined purpose not only helps build trust with your stakeholders but also helps assure your relevance to society.
- (2) How is your business considering the megatrends in the development of company strategy, and how do management teams get ready for these changes? The “day-to-day” pressures are significant, and management may need help balancing short- and long-term expectations and demands as they take on the megatrends. Is your board able to provide support and guidance?
- (3) Are you engaging with outside parties to help shape your point of view on where the world is going relative to your business—for example, futurists, Silicon Valley or other innovators, or different groups within your stakeholder chain? Has your board challenged itself and the company's management team to consider the threats posed by nontraditional competitors?
- (4) What is your acquisition and retention strategy as it relates to talent? Does it consider the expectations of the millennial generation and/or the emerging markets? Technology is advancing rapidly: have you planned for science, technology, engineering, and math (STEM) skill sets or others to help you keep up? If you have an aging C-suite, how is your succession planning, and does it detail competencies needed in order to be successful?
- (5) We see companies spending more time thinking about different ways of doing business or going to market, including looking at how to work effectively with all levels of governments. Given the societal nature of some of these challenges, such as caring for the elderly and developing infrastructure, are you or should you be thinking about public/private partnerships?

Contact us

To have a deeper discussion about how these topics might impact your business, please contact Tim Ryan or a member of PwC's Governance Insights Center.

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