

INVESTMENT PERSPECTIVES

APRIL 1, 2014

“Abundance” Through Technology

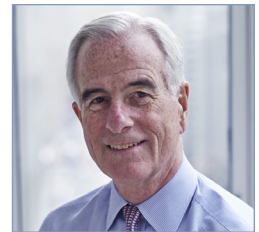
After an unusually harsh winter in most parts of the U.S., spring is finally set to arrive—and with it a certain sense of renewal and optimism. As investors, of course, we can't let ourselves be swayed by such emotions, much less the weather. Instead, we must maintain an attitude of complete objectivity when analyzing the prospects for a specific stock, or any investable asset for that matter.

It was thus with considerable skepticism that I recently opened a copy of *Abundance: The Future Is Better Than You Think*, by Peter Diamondis and Steven Kotler. The very title suggests that most people are inclined to doubt the book's contrarian thesis. As I read through it, however, I couldn't help but feel a bit more positive about the world, our society and the long-term investment outlook. It also frames some of the key themes of our upcoming client conference, *Navigating Our World 2014*, in late April.

In contrast to the conventional view that we live in a world of shortage and increasing inequality between the privileged few and the rest of society, *Abundance* takes the view that several key forces are combining to create an environment in which the supply of food, water, energy, health care and education will accelerate, lifting the underprivileged out of poverty and into the mainstream. The authors focus on four factors they believe are helping to solve shortages:

- **“Exponential” technologies:** In the developed world, we tend to take for granted the advancements in technology that occur every day. Just 30 years ago, for example, the most portable computer was the Osborne Executive Portable, weighing 28 pounds and costing about \$2,500. In 2007, the first iPhone weighed 1/100th as much, sold

for about 1/10th the price, and had 150 times the processing speed and 100,000 times the memory. Moore's Law (the tendency for integrated circuits to double their speed for the same price every 18 months to two years) suggests that continued progress will be made, bringing much greater computing power to the masses at increasingly affordable prices.



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- **The “DIY innovator”:** The advent of the personal computer, combined with Internet access, has given rise to a whole new generation of entrepreneurs who have the ability to communicate instantly and to tap into resources that can help build a business and attract potential customers, often with little capital investment. Making the “tools” (such as PCs) available to people with an entrepreneurial instinct means that small groups of like-minded people are able to collaborate on solving problems that were once exclusively the province of big companies and governments.
- **“Technophilanthropists”:** Think Bill Gates, but there are many others. Successful businessmen and women of today are making enormous commitments to solving some of the world's most vexing problems, like the Gates Foundation's attack on malaria and other health issues. In the “Giving Pledge” initiated by Gates and

Warren Buffett, so far over 120 of the world's wealthiest people have pledged a majority of their assets to charity, unleashing huge resources to address all kinds of important problems. Moreover, a new approach to giving is "impact investing" in which investors back businesses that both earn a profit and help meet key social or environmental objectives—potentially a far more effective approach than government, which has historically been the only resource large enough to meet these challenges.

- *The "Rising Billion":* The advent of inexpensive smartphones is a great example of how technology is opening the way for economically and socially isolated people to become more mainstream. Cell towers have been built where no land lines ever existed, and phones provide far more than the ability to talk with others. Mobile banking, for example, is allowing millions of people who formerly lacked any practical access to financial services to accept or make payments instantly, thereby boosting commerce in poor countries. Health care is another example, as smartphones allow sick or injured people to locate doctors easily, and applications such as one that turns a smartphone into a stethoscope are being developed to spread health services to remote areas.

Clearly, the common element among these four factors is *technology*.

WHAT FACEBOOK LIKED

Let's look at a recent example. In one of the largest technology mergers ever, on February 19 **Facebook** acquired **WhatsApp**, a pioneer and the largest operator in cross-platform mobile instant messaging for smartphones. WhatsApp provides these

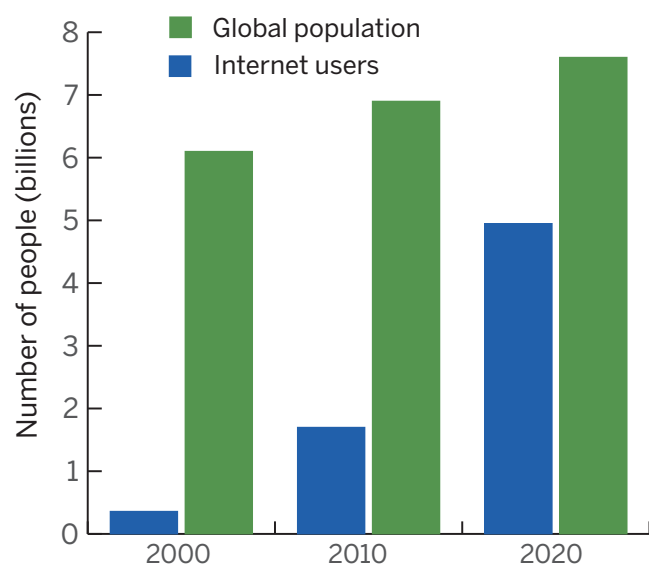
services essentially for free (actually \$0.99 per year for a subscription after one free year), while conventional "SMS" (Short Message Service) providers like Verizon or AT&T charge by the message or the month, which is normally much more expensive. WhatsApp's technology is not particularly complicated, as it uses a custom version of an "open standard" messaging protocol combined with proprietary software. It functions on most Android, BlackBerry, iPhone, Nokia and Windows devices, so it can be used by the vast majority of smartphone users.

WhatsApp was founded by Jan Koum and Brian Acton, who are good examples of "DIY innovators." Koum, interestingly, is Ukrainian by birth and immigrated to the U.S. at the age of 16 in 1992 with nothing. He swept floors and was kicked out of high school but taught himself networking with used manuals. He got the idea for the messaging application shortly after Apple launched its App Store in 2008, realizing that the Store would usher in a new era in which thousands of independent operators would develop applications of every conceivable description. One of the many interesting aspects of Koum and Acton's story is the light-speed at which events have taken place. By the time you read this, WhatsApp will probably have over 500 million monthly users, up from 190 million last November and zero five years ago. Daily volume has reached as high as 27 *billion* messages. Once Facebook's Mark Zuckerberg began negotiations with Koum and Acton, it took just two weeks to close the deal despite its being the largest-ever purchase of a venture-backed company.

Which brings us to the possibility of the founders being potential technophilanthropists. The \$19 billion in stock and cash that Facebook paid for WhatsApp certainly raises the prospect of Koum and Acton following Zuckerberg's lead in becoming major charitable donors (he has signed the Giving Pledge and gave away nearly \$1 billion last year alone), or at least proactively directing some of their new-found resources toward solving major problems.

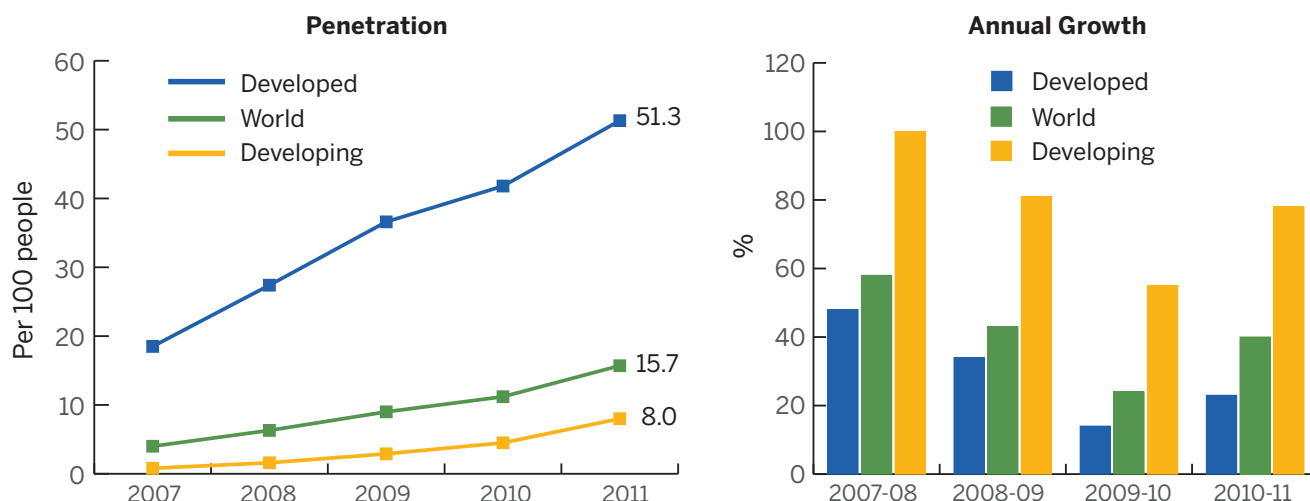
Finally, WhatsApp is typical of technological developments that can help bring the "rising billion" into the mainstream. Shortly after the merger was consummated, Facebook let it be known that it would soon offer voice calls over the WhatsApp network. Users still need a data connection (i.e., to the Internet) for which they pay something, but wider usage of the Internet continues to drive down the cost of access. *Forbes* reports that wireless carriers have lost \$33 billion in SMS "per text" revenue to date because of WhatsApp. Importantly, the availability of text, video and voice communications across the globe for essentially no additional cost should be a boon to the developing world. WhatsApp already has a reported 40 million users in India and 38 million in Brazil, with the potential for spreading to many other emerging markets. In just five years, then, the company has emerged from complete obscurity to become another major tool bringing the world closer together, promoting commerce and reducing inequality.

FIGURE 1: Global population and Internet users, 2000-2020



Source: www.FutureTimeline.net

FIGURE 2: Active mobile-broadband subscriptions, worldwide and by level of development



Source: ITU World Telecommunication/ICT Indicators database.
Charts reflect calendar years.

TECHNOLOGY IN ENERGY

A very different example of technology’s ability to address major challenges and thereby contribute to abundance is the energy sector. As has been well publicized, the U.S. has become less and less reliant on imported oil largely because of the implementation of technology in extracting oil and natural gas. The U.S. Energy Information Administration (EIA) projected earlier this year that the import of liquid fuels into the U.S., as a share of consumption, will decline from its high of 60% in 2005 to about 25% in 2016, a tremendous shift in just over 10 years. The EIA further projects that the U.S. will become a net exporter of natural gas by 2018. This shift has lowered the cost of energy for consumers and reduced manufacturing input costs, thereby improving U.S. competitiveness in global markets. And importantly, energy independence has favorable implications for national security. Hydraulic fracturing is the primary driver of the rapid increase in oil and gas production, as is well known, but “fracking” poses certain environmental risks and is opposed in many communities, so it’s not without controversy.

So while one type of technology has successfully addressed the nation’s energy shortage in the short to intermediate term, it may not be the best long-term answer. In addition to environmental concerns, we could eventually run out of accessible hydrocarbons. Moreover, if living standards around the world are to rise substantially, energy—along with food and water—must be made far more abundant. The ultimate answers are likely to lie in biofuels (using algae in synthetic photosynthesis on a massive scale), nuclear (next-generation “passive fast breeder” reactors) and renewables (predominantly solar). In all cases, technology breakthroughs are key to the solutions.

To take one example, nuclear energy holds huge potential if it can be made completely safe and deployed more readily in smaller plants. So-called Generation IV reactors are being designed to burn fuel at higher temperatures using nuclear

waste and surplus weapons-grade uranium and plutonium. If it overheats for any reason, the fuel expands and the reactor slows down automatically. It may be possible to manufacture smaller units and seal them completely for further safety, simplified operation and ultimate “burial.” Bill Gates and venture capitalist Vinod Khosla have invested in a start-up named TerraPower to develop these simple reactors. Khosla is a veteran of **Sun Microsystems** and Kleiner Perkins, and now has his own venture firm focused on environmental and social investing. He’s another successful entrepreneur looking for “impact investments” that combine social benefits with the profit motive.

Thomas Friedman, the noted author (*The World Is Flat*, etc.) and *New York Times* columnist, recently published an article titled “Start-Up America: Our Best Hope,” in which he contrasted the innovation and vitality of Silicon Valley with the paralysis in Washington politics. He noted that today’s technology entrepreneurs are “fixated on creating abundance, not re-dividing scarcity, and they respect no limits on imagination.” Among the many examples he cited are **LinkedIn**’s plan to build a “graph” to link the entire global workforce with every job posting in the world, the skills required for each job—and a way to access every educational institution that offers a means to acquire the necessary skills. Such a development could help close the skills gap that keeps unemployment elevated in so much of the world. In terms of its scale, we’re reminded of Google Earth’s project to map the entire planet with interactive, photographic images. Both projects are ambitious and have the potential to make an enormous difference in connecting people and contributing to abundance.

HOW CLIENTS PARTICIPATE

Even if technology isn’t able to create a path to abundance for all, it impacts an increasing proportion of the global population and represents a tremendous driver of economic growth. As a result, we think it’s important that clients have meaningful

exposure to it in their portfolios. Yet it's not a simple matter. Depending on one's specific risk tolerance, need for liquidity and return objectives, there are lots of options.

- For those with the need for liquidity coupled with moderate risk tolerance, our large-cap growth portfolio provides the greatest amount of exposure. **Google**, **Apple** and **Qualcomm** are among the largest holdings, and technology comprises over a third of the weighting of the portfolio.
- Next in order of risk is our small-cap growth portfolio, which also holds more than a third of its positions in technology. Technology dominates its top-10 holdings, but these are smaller, inherently more volatile stocks, thus adding to portfolio risk. Liquidity is essentially the same as the large-cap portfolio since all the holdings are publicly traded.
- Hedge funds and other partnership vehicles available to qualified investors concentrate in technology in certain cases. Long/short hedge funds are typically designed to lower volatility while participating in the sector, while certain long-only funds include both public and private companies. Liquidity is limited although available as often as quarterly, depending on the particular vehicle's redemption privileges.*
- Buyout funds occasionally offer concentrated exposure to technology. Perhaps the purest example is Silver Lake Partners, which focuses exclusively on large-scale tech transactions—most recently having led the buy-out of **Dell Inc.** Returns may run well in excess of publicly traded securities, depending on the fund, but liquidity is severely limited by the timing of exits.*
- Early-stage venture capital funds such as NEA, JMI Equity, Lux Capital and others probably have the highest risk/return profile of any technology investment vehicle, and they are the most illiquid in the sense that most of their investments take years to reach the point where they can achieve liquidity by going public or selling to another company. The backers of companies like Google, Facebook and WhatsApp made enormous profits on those investments and, of course, have lost money on others, but returns over the years have, on average, been quite good relative to the public markets.*

Investing in technology is complicated. As we've just seen, it's important to identify the most appropriate vehicles and combine them in proportions designed to achieve the risk/return/liquidity mix that matches each investor's particular circumstances. From a fundamental perspective, the task is even more complex. Separating the potential winners from the also-rans and losers requires knowledge of the underlying technology itself as well as an ability to analyze each company's fundamentals, including growth prospects, competitive position, financial strength, etc.

Earlier this year, Erik Brynjolfsson and Andrew McAfee published *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, echoing some of the same themes as *Abundance* but with an added twist, examining the impact on how we live today and how we can adjust to the changes they see coming. They envision a world in which human ingenuity coupled with vast processing power will transform the way we live. We're also reminded that technology is not a cure-all. In fact, there will be numerous pitfalls and challenges along the path to abundance, including cyber threats as the world moves online, labor-force upheaval as workers adjust to change, and environmental risks as resource use accelerates among the rising middle class.

One of the positive examples that *The Second Machine Age* cites is new communications and software technology that will allow machines to diagnose—and possibly treat—disease with greater accuracy than doctors can. In such a world, how will doctors then behave in the future, and how will health care be structured? Our challenge as investors in the sector is to understand the technology (and the disease state as well) and to assess the competitive advantages and other fundamental qualities of each of the major factors in the market. In addition, of course, we need to make judgments about what price to pay for those fundamentals.

So, while it's uplifting to consider how technology may lead the world to a new era of abundance, translating that big-picture theme into investable ideas requires specific industry knowledge, judgment, discipline—and objectivity. But it can also be rewarding, especially for those with a long-term perspective. [B](#)

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