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Institutional investors and the technological tidal wave

With the rise of artificial intelligence, nanotechnologies and genomics, we are at the dawn of a period of intense technological progress in life sciences. The financial community needs to acknowledge that breakthrough technologies are on the verge of disrupting the global economy.

Key takeaways:

- The technological revolution currently underway, which is primarily impacting life sciences, could lead to a sharp increase in life expectancy.
- Faster technical progress could disrupt the savings cycle, force company closures and replace workers with artificial intelligence.
- Competition from fintechs and the increase in life expectancy is likely to cause changes in the banking and insurance sectors.
- The financial community must diversify risks in preparation for a volatile and uncertain future.

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The NBIC[1] revolution is underway

An unprecedented technological revolution is dawning. Moore's Law, named after Intel co-founder Gordon Moore, states that computer power doubles every 18 months; although the rate has slowed slightly to closer to every two and a half years, the price of IT technologies is certainly decreasing. Meanwhile, there is an ongoing wave of coordinated innovation in biotechnologies, nanotechnologies and cognitive sciences, hence the notion of NBIC (nano, bio, IT, cognitive).

Our civilisation has already weathered technological upheaval, with the period between 1870 and 1910 marked by the invention of aviation and electricity, while the 1970s saw the inception of the fine chemicals industry. However, this has never occurred in the field of life sciences. Over the past three years, the democratisation of human genome editing, i.e. the capacity to modify DNA via different types of enzymes called nucleases, has seen huge advancements, and formed the topic of a recent summit in Washington. Like the IT sector, the cost of these technologies is declining rapidly. Over the past ten years, the cost of DNA sequencing has been cut by a factor of three million. New life science technologies which are expected to be made available for human use by 2030 include nano-motors, nano-captors and nano-implants which will be able to detect, prevent or treat illnesses.

From this moment onwards, life expectancy is forecast to rise steeply, at a rate of around three months per year in OECD countries, which implies that each year, we are only nine months closer to our death. This leads me to conclude that the first immortal human has already been born. Let us not forget that a child born last year will not reach the age of 85 until 2100. That person's life expectancy will then depend on the technology available in 2100, not today.

Multiple social and economic consequences

Such a drastic increase in the ageing of the world population could result in several consequences. It will probably initially lead to a continued decrease in the birth rate, as is generally observed in countries where longevity is increasing sharply, such as Germany or Japan, although this phenomenon is eclipsed by immigration in France. Once life-expectancy exceeds 80 years, the population begins to decrease. **In economic terms, this factor will lead to turmoil in the savings cycle**. Above all, we should not lose sight of the fact that greater life expectancy is not the only major change to be expected over the next few decades. Artificial intelligence and robotics will also lead to increasingly rapid technological turnover. We can also anticipate the appearance of the extreme "creative destruction" phenomena as defined by Schumpeter. We are on the brink of a technological and industrial revolution which is expected to last for 20 to 30 years and cause **widespread company closures across all sectors impacted by the changes underway: education, healthcare, the automotive sector, manufacturing and most services**. Furthermore, although life expectancy will increase, the employability of individuals will diminish. Sebastian Thrun, the inventor of the Google Car, summarises this future reality by saying, "it will be increasingly difficult for a human with a biological brain to compete with artificial intelligence". Since the first academic discussion of artificial intelligence at a Dartmouth College conference in 1956, specialists have been disagreement over its future. We can imagine, however, that by 2030, automated surgery machines will be capable of operating autonomously on patients. It is therefore not just lowly qualified jobs which are potentially under threat.

What will be the impact for the financial sector?

All of these changes will impact the financial industry, which should follow closely developments in technology, as illustrated by the arrival of fintechs, companies using new technologies to provide innovative financial and/or banking services. During the 2000s, traditional banks proved relatively resilient with the emergence of online banking services, but they are now starting to lose ground. The increasing use of mobile phones as payment terminals, even between individuals, could accelerate this trend. If banks fail to modernise their IT systems, they run the risk of progressive decline, with the GAFA[2] group of companies becoming bankers via mobile phones. Disruption by fintech companies using bitcoin-related technologies is another possibility. It seems likely that banks will ultimately wake up to the threat they are facing and begin recruiting technophiles to their boards of directors. Insurance companies are facing technical challenges and actuarial issues. **Beyond 2030, major incertitude will reign regarding life expectancy, which will destabilise insurance companies, along with mortgage lenders and retirement savings schemes**. For example, in the case of life insurance, once clients have access to their own genome, they will benefit from information unavailable to the insurer. This informational imbalance raises a number of questions.

The financial community will have to adjust to the uncertainty

It will become vital for institutional investors and financial analysts to account for these increased technological risks. For example, financial analysts have only very recently become concerned about how the self-driving car will impact traditional vehicle manufacturers, as valuations fail to reflect the risks of potential upheaval in the sector triggered by Google, Apple or Tesla. Just a few years ago, vehicle manufacturing company management simply considered self-driving cars without ground-based guidance systems to be impossible. **Artificial intelligence, which already exists in a reliable form in high-frequency trading, will accentuate market volatility and may be banned or at least strictly controlled**. Furthermore, will potential alpha generation through the use of artificial intelligence within investment management processes be sustainable, given that—let us repeat—the use of this technology will soon be commonplace?

Economic and financial forecasting has always been a difficult art to master, but the **technological revolution now underway is exacerbating the unpredictability issue**. A decade ago, few predicted that the smartphone would become commonplace or that YouTube and Facebook via mobile would expand to the point of challenging Google's internet search monopoly, which was previously assumed to be indomitable. The question of how this rapid progress will impact society and vice versa remains unanswered. **With such major uncertainty in the face of these upcoming changes, predicting tomorrow's winners is a real challenge**. Let us not forget that in the 1950s, there were over 100 motorcycle manufacturers in Japan. Who would have predicted then that Yamaha, Honda and Suzuki would triumph over all the others which ended up in Schumpeter's dustbin of history? **There now appears to be an even greater need than ever before to diversify financial risks between sectors and asset classes.**

[1] Nanotechnologies, biotechnologies, artificial intelligence and cognitive sciences
[2] GAFA : acronym designating the digital giants Google, Apple, Facebook and Amazon

Written February 3rd 2016

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