



# Sustainable Investment Spotlight

Sustainable Investment Research, Bank J. Safra Sarasin

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## Disruptive Technologies pave the way to the Fourth Industrial Revolution

- A series of technological breakthroughs, ranging from Big Data processing to Robotics and Automation, are changing current business models and entire industries.
- The application of technological innovations in many sectors is reaching a tipping point. It offers very high economic rewards but also poses substantial risks.
- A cross-sector research approach enables a deep understanding of emerging risks and opportunities. Not only technology innovators, but early adopters outside of the IT sector will benefit.
- The sustainable investment research lens identifies overlooked investment risks like societal acceptance of new technologies and data privacy issues.

### Disruptive Business Models

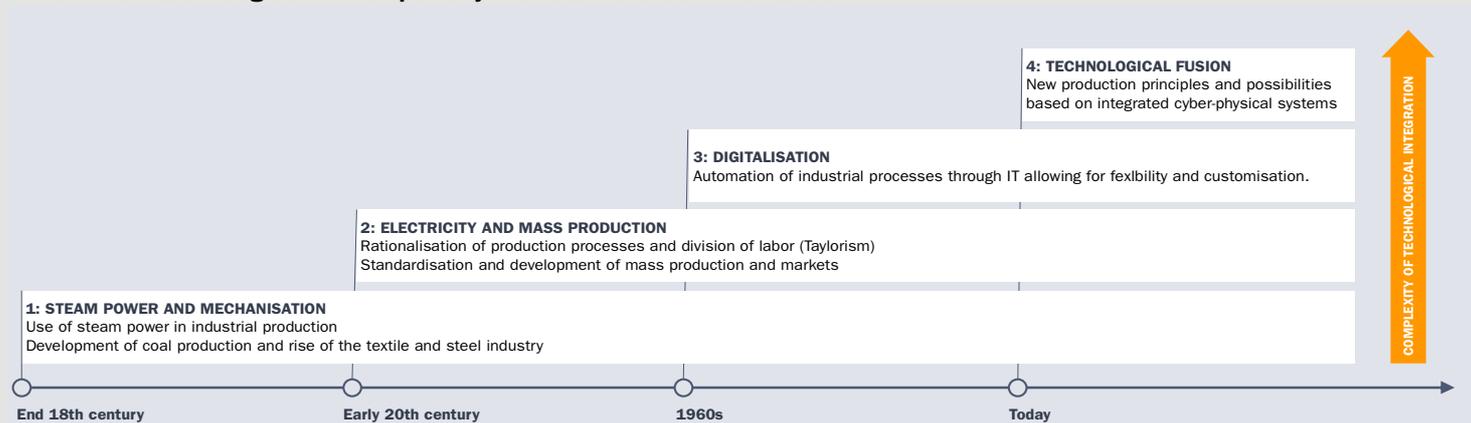
A **disruptive innovation** is an innovation that creates a new market, business model or value chain and displaces established market-leading firms or products. Generally, disruptive innovations are designed and implemented by outsiders and entrepreneurs, rather than existing market leaders. In most cases, **disruptive companies** do not create new categories per se, but radically redesign or reinvent key elements of existing products and services.

### On the way to the 4<sup>th</sup> Industrial Revolution

Today we are at the transition from the Third to the Fourth Industrial Revolution. A number of disruptive technologies, such as Artificial Intelligence, the Internet of Things, Robotics and Autonomous Vehicles, will reshape our world. These trends will have wide-reaching economic, societal and political

implications. Similar to revolutions that preceded it, the Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life. At the same time, this shift also carries the risk of disrupting labour markets and replacing workers with machines, thereby increasing inequality.

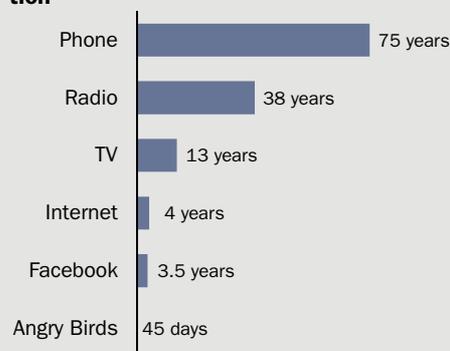
Chart 1: New technologies will disrupt many business models and industries



Source: Bank J. Safra Sarasin, Bitkom, 2017

The speed, effects and complexity of the current technological revolution have no historical precedent. Chart 2 illustrates the pace of change. When the telephone was introduced, it took 75 years to accumulate 50 million subscribers, while Facebook has attracted the same number of users in just 3.5 years.

**Chart 2: Increasingly rapid pace of adoption**

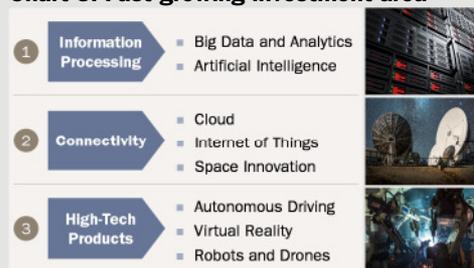


Source: City Digital Strategy Team, Safra Sarasin, 2016

### Thematic research identifies opportunities along the technology value chain

In order to benefit from the fast adoption of new technology opportunities, we have developed a thematic investment approach. Several in-house sector specialists in cooperation with external research partners, academia and industry experts have collected data on private equity capital flows and analysed recent acquisitions done by large-cap technology firms. Our sector analysts have also discussed the mid- and long-term impact of emerging technological trends with industry experts. On that basis, three high-level themes (Information Processing, Connectivity and High-Tech Products) and eight promising and fast-growing investment areas have been defined (Chart 3). 'Big Data and Analytics' is one exemplary investment area of our thematic cross-sector approach. The technology companies provide innovative solutions, while early adopters in several sectors benefit from their first-mover advantage.

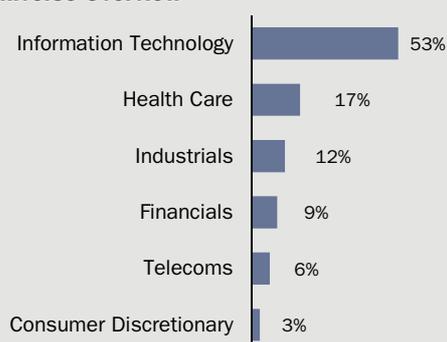
**Chart 3: Fast growing investment area**



Source: Bank J. Safra Sarasin, 2017

In fact, out of the 110 shortlisted firms in our sustainable technology disruptor investment universe (chart 4), 47% come from the Healthcare, Industrials, Financials, Telecom and Consumer Discretionary (e.g. Automobiles) sectors and the remaining 53% from the Information Technology (IT) sector. We believe that there are many investment opportunities outside the IT sector benefiting from their technology-centric business model. Thus, we introduce a more balanced approach than a pure IT-focused sector approach, spanning the entire economy.

**Chart 4: Sustainable Technology Disruptors Universe Overview**



Source: Bank J. Safra Sarasin, 2017

### Technological disruption is not only about technology firms

As discussed previously (chart 1), our society is at the cross-roads between the Third (Digitalisation) and Fourth Industrial Revolution (Technological Fusion). On the one hand, there is still a big group of industries characterised by a very low level of digitalisation. According to Morgan Stanley, only 27% of the US economy is fully digitalised. On the other hand, massive technological innovation creates new product categories and changes our lives. Our thematic approach responds to these trends. We divide the universe into 'Enablers' and 'Early Adopters'. We believe that technological innovation is not only about high-growth technology firms, but equally about investing in technology beneficiaries that adapt to technological advances faster than their peers. As a result, these early adopters will benefit from a first-mover advantage and gain market share from their competitors.

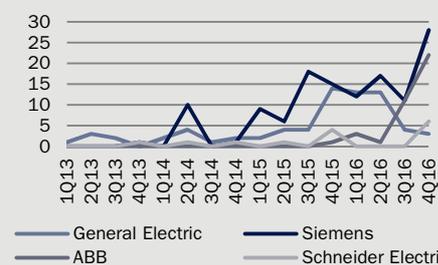
As confirmation of this development, we have observed that many industries have begun to collide with the world of technology. Incumbents are increasingly aware of the importance of technology in their respective sectors and are aggressively acquiring innovative players or are building these capabilities in-house.

### Industrials, Automotive and Healthcare sectors benefit most from the technology revolution

A good illustration of innovative technology adoption is the **Industrials sector**, where companies like Siemens, General Electric, ABB or Schneider Electric are developing digital platforms and automating the production process. The need for a fully integrated business model has resulted in multiple acquisitions of technology companies by the incumbents in the Industrial sector. Some software companies have been successfully developing a strong footprint in the industrial production process and analytics design. The most notable transactions include the acquisition of Mentor Graphics by Siemens for USD 4.2bn in November 2016 and Honeywell acquiring Intelligrated for USD 1.5bn in January 2016.

A case in point for the fusion of the Technology and Industrials sectors is also the rhetoric of corporate top managements in recent investor conference calls (chart 5). The management focus is shifting from manufacturing and processing towards digitalisation and technology disruption.

**Chart 5: Use of the word "digital" by industrial companies during quarterly conference calls**



Source: Thomson Reuters, Morgan Stanley Research,

Bank J. Safra Sarasin, 2017

Another example of technology disruption relates to the **Automotive sector**. The car maker Toyota used to crash on average 68 physical prototypes in security tests before putting a single model on the road. Thanks to the implementation of advanced simulation software from the US-based company ANSYS, the car manufacturer was able to reduce this number to 20. It aims to cut the number to six prototypes within the next few years. This represents a significant cost saving for Toyota.

The **satellite industry** is also experiencing disruption. The traditional players are being challenged by so called High-Throughput Satellite (HTS) operators. The newcomers are placing satellites closer to Planet Earth.

These narrow-beam satellites are able to take much more precise pictures and transfer data in a quicker and more efficient way. Investment managers benefit from this trend, and for instance use satellite pictures of parking spots in front of the shops to verify whether an activity at a store matches the company's guidance.

**Advances in Artificial Intelligence (AI) are crucial to the acceleration of innovation**

The area where technological progress has been the most noticeable is Artificial Intelligence. The 4:1 victory of Alphabet's super computer 'AlphaGo' over the best Go player Lee Sedol in March 2016 has marked a new era in the field of AI. Go is a complex Chinese board game, which for more than two decades represented an insuperable challenge for computers. The important difference between 1997, when Garry Kasparov lost a chess series against IBM's super computer 'Deep Blue', and 2016 is that Deep Blue has been trained primarily by playing with human beings, while Alpha Go learned mainly by competing with other supercomputers.

What has enabled this massive progress? At first analysis, it seems that algorithms are becoming more intelligent. However, this is only partially correct. In fact, our research shows that the current AI applications often utilise models introduced 30+ years ago, like neural networks, decision trees or clustering algorithms. What has changed is the massive increase in the computer's processing power, driven by Moore's Law (doubling the number of transistors per square inch every 18 months), and more importantly by a shift away from von Neumann computing architecture (sequential processing) towards parallel processing.

As a result, for the first time computers can cope with overwhelming data volumes. It is estimated that in the past two years more data has been produced than in the entire history of humanity. At the same time, only 5% of this data volume is systematically analysed. This opens a plethora of opportunities for the economy and spurs innovations.

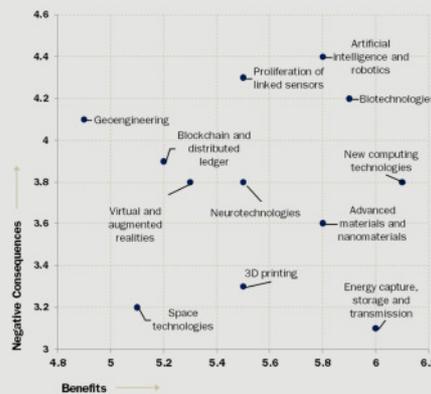
**High benefits and risks of emerging technologies**

The rapid pace of technological innovation and interconnectivity present many new emerging risks. The Global Risk Report 2017 published by the World Economic Forum (WEF) explored the topic of emerging technologies and the related benefits and risks in a detailed chapter. The report is based on a survey of 745 global respondents from business, academia, government and NGOs.

The related benefits and negative consequences of emerging technologies are assessed and displayed on a scale from 1 (minimal) to 7 (very high). Chart 6 provides an overview of how different types of emerging risks are perceived by the survey respondents. 'Artificial Intelligence' and 'Robotics' rank highest on both axes.

The globally recognised report speaks about a 'governance dilemma' on how to govern emerging technologies. Too much regulation might prevent and delay potential benefits, while no regulation might create regulatory uncertainty and societal backlashes. In order to avoid anticipated negative consequences, a multi-year stakeholder dialogue between governments and regulators, corporate technology leaders, NGOs and consumer protection organisations, and labour unions needs to happen. Sensible regulatory frameworks on emerging technology risks across sectors and industries should provide guidance to all involved parties.

**Chart 6: Emerging Technology Risk Radar**

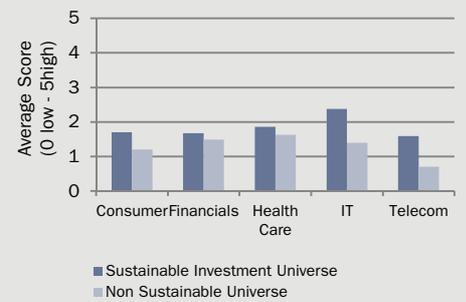


Source: WEF Global Risk Report, Safra Sarasin, 2017

**Sustainable Investment Research lens provides additional insights**

Sustainably minded investors should be conscious of the aforementioned emerging technology risks and related regulatory uncertainty. For this reason, Bank J. Safra Sarasin's sustainable investment research also analyses relevant emerging technology risks in the field of cyber security, i.e. data security and protection of personal privacy. There are two striking observations. Firstly, the overall performance scores across sectors in the field of cyber security prevention are low. The strategic relevance and management performance are still very underdeveloped, and there is significant room for improvement. Secondly, the companies within our sustainable investment universe score higher than those outside it, which confirms the quality of the overall sustainability analysis methodology (see chart 7).

**Chart 7: Low strategic relevance of data security and protection of personal privacy**



Source: Bank J. Safra Sarasin, 2017

**New investment opportunities for tech-savvy investors**

We have developed a cross-sector thematic research approach to cater for the high level of investor interest in technology disruption. We identify technology innovators and leading technology adopters from the Technology, Industrials, Healthcare, Financials and Automotive sectors, among others. We focus on three thematic areas: 1) Information Processing and Artificial Intelligence; 2) Connectivity and the Internet of Things and 3) Robotics and Virtual Reality. At the same time, we consider relevant sustainability risks that might increase over the coming years.

Investors should keep in mind a quotation of Bill Gates: "We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten".

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## Sustainability Rating Methodology

The environmental, social and governance (ESG) analysis of companies is based on a proprietary assessment methodology developed by the Sustainable Investment Research Department of BJSS. All ratings are conducted by in-house sustainability analysts. The sustainability rating incorporates two dimensions which are combined in the Sarasin Sustainability-Matrix® :

- Sector Rating: Comparative assessment of industries based upon their impacts on environment and society.
- Company Rating: Comparative assessment of companies within their industry based upon their performance to manage their environmental, social and governance risks and opportunities.

Investment Universe: Only companies with a sufficiently high Company Rating (shaded area) qualify for Bank J. Safra Sarasin sustainability funds.

## Key issues

When doing a sustainability rating, the analysts in the Sustainable Investment Research Department assess how well companies manage their main stakeholders’ expectations (e.g. employees, suppliers, customers) and how well they manage related general and industry-specific environmental, social and governance risks and opportunities. The company’s management quality with respect to ESG risks and opportunities is compared with its industry peers.

## Controversial activities (exclusions)

Certain business activities which are not deemed to be compatible with sustainable development (e.g. armaments, nuclear power, tobacco, pornography) can lead to the exclusion of companies from the Bank J. Safra Sarasin sustainable investment universe.

## Data sources

The Sustainable Investment Research Department uses a variety of data sources which are publicly available (e.g. company reports, press, internet search) and data/information provided by service providers which are collecting financial, environmental, social, governance and reputational risk data on behalf of the Sustainable Investment Research Department.

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