FINANCIAL INNOVATIONS FOR GLOBAL CHALLENGES

Sustainable Finance Geneva

Contents

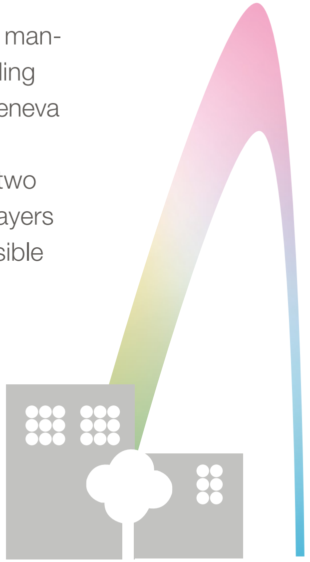
A word from
the Geneva Financial Center

Yves Mirabaud, Chairman

Geneva's competitiveness as a financial center depends greatly on our spirit of innovation and our openness to new fields of activity. Sustainable finance, in particular, is an important growth driver and a factor of differentiation that's strengthens Geneva's appeal compared to other global financial centers.

Almost CHF 266 billion are managed in Switzerland according to sustainable principles. Geneva plays a leading role in this momentum: over the past two decades, many financial players here have adopted responsible investment strategies.

Training also plays a vital role in this trend. Thanks to the University of Geneva and the Geneva Finance Research Institute, the ongoing professional development of client advisors is making good progress.



Sustainable finance is not a fringe phenomenon. Quite the contrary: it contributes to the diversity of financial services provided in the Geneva region, alongside personal and institutional wealth management, commercial and retail banking, and commodity trading. Social and governance criteria are included in investment strategies, for the benefit of customers and of society as a whole.

The Geneva Financial Center is proud to support Sustainable Finance Geneva, a partnership that dates back to 2008. This book explores the territories of sustainable innovation and shows that, thanks to its assets, Geneva has a bright, sustainable future in finance.

A word from
the City of Geneva

Sandrine Salerno, Vice-Mayor

The City of Geneva embarked years ago on a path of development that focuses on environmental issues and social wellbeing. In Geneva, we are convinced that the time has come for more sustainability in finance. Indeed, some of the innovations described here make it possible to reconcile legitimate financial objectives with fundamental concerns for social performance and environmental protection.

Public authorities can lead the way in promoting ethical finance, by acting as role models in the management of their portfolios. The City of Geneva made this choice in 2010, soon imitated by its pension fund, by adopting principles for socially responsible investment. The City wished to be consistent with its commitment to sustainable development and to demonstrate to institutional investors that the integration of environmental, social and governance criteria is a viable alternative investment policy.

In addition, the City of Geneva wishes to raise the population's awareness of both the potential and the limits of sustainable finance, to foster the debate on criteria for public investment and to call into question the operation of the financial services industry. This is why we decided to support the publication of this book, which gives a broad overview of financial innovation and provides a better understanding of the role Geneva can play in the future in the field of sustainable finance.

Purpose of this book

The Sustainable Finance Geneva team

The Geneva financial center didn't wait for the emergence of sustainable finance to build a solid reputation in this field, back in the early 1990s. Leveraging an unparalleled ecosystem that combines a leading global financial center, a unique network of international organizations, large foundations and a highly active academic sector, Geneva strengthens its global appeal by preparing today the financial industry of tomorrow.

And, today, the entire financial services industry is changing. Society faces major global transformations, many of them disruptive and impacting the whole planet. Each of these trends creates opportunities for financial innovation – whether it is climate change, digitalization or the rapid pace of social change.

Meanwhile, the profile of investors is changing with the arrival of the "millennials", also known as "digital natives". From the business, financial and even cultural perspective, this generation is very different from the previous ones. In Europe, 30% of them have never been inside a bank. Through their digitalized practices and their expectations, the millennials are reshaping the financial services industry.

SFG is keenly aware of these developments –and of Geneva's role as a laboratory for financial innovation. After presenting ten initiatives in a first book, we now wish to share some insight on financial innovations from here and around the world that provide a response to the global challenges ahead.

This book aims to be open and inclusive. Indeed, finance and sustainability need to meet –and cross-fertilize– as much as possible. The ramifications of sustainable finance reach further and further, to include business models that don't necessarily make claims to this sector.

To give a broad audience food for thought and real-life examples of solutions, SFG brought together some 40 experts based in French-speaking Switzerland, many of them leaders in their lines of work, to identify and discuss inspiring financial innovations that are representative of the market's rapid evolution.

Many of the roughly 60 innovations mentioned here are direct or indirect investment opportunities. They enable people and organizations to invest capital in actual projects that aim to have a positive impact on society or the environment. Other innovations transform the financial sector to make it more accessible and inclusive. Some are open to everyone –from private investors to pension funds– while others address a specialized audience.

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SFG offers insight on local and international financial innovations that respond to global challenges

The question today is not whether one should invest in this sector but how. And Geneva has the expertise required to guide investors in their choices.

GLOBAL CHALLENGES

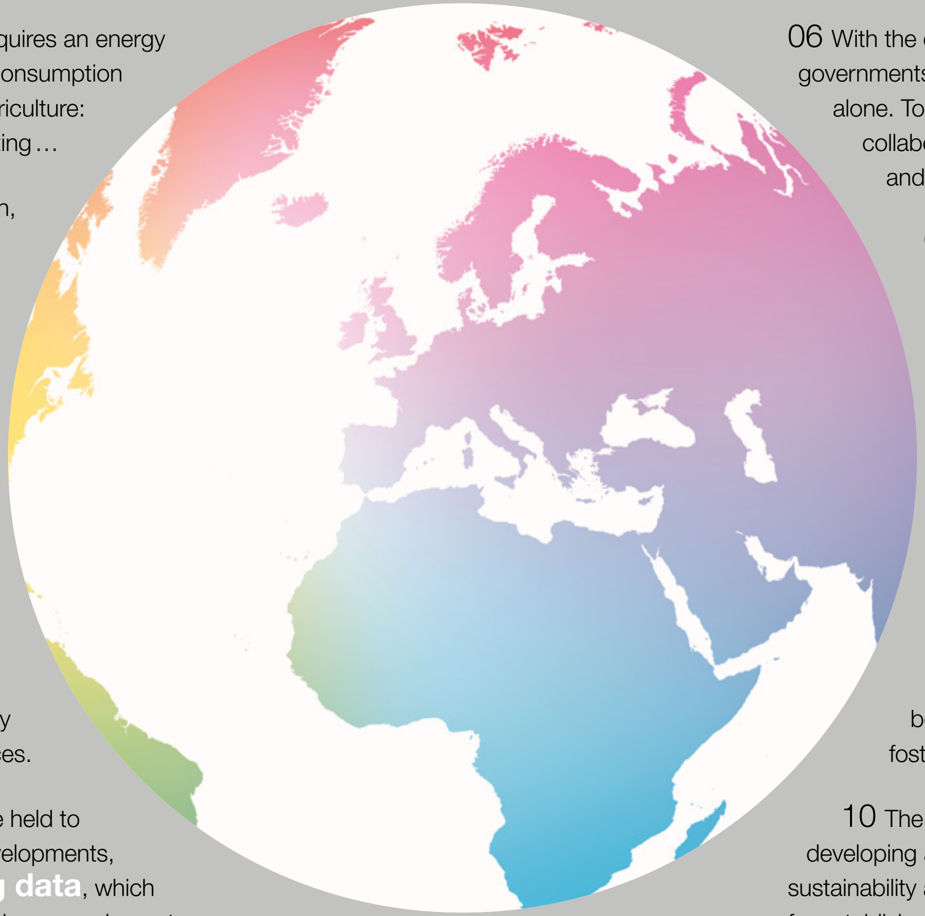
01 Mitigating **climate change** requires an energy transition and innovations in both the production and consumption of goods and services. Transport, housing, agriculture: everything needs reinventing …

02 **Agriculture** faces many challenges. Nutrition, delivery, waste… Innovative stakeholders seek alternatives to industrial and chemical-heavy production methods. They are revisiting agricultural infrastructures and practices.

03 Eroding trust in political institutions and suspicion of globalization are fostering relations within **networks**, both local and of interest, thanks in particular to the power of the internet.

04 **Digitalization** is shaking up the world as we know it, challenging established industries and enabling the development of technologies that offer new ways of traveling, communicating and investing … It simplifies the **inclusion** of people who did not previously enjoy access to these services.

05 All public authorities, industries and individuals are held to high standards of **transparency**. Technological developments, the internet and social networks provide access to **big data**, which opens the way to new solutions, improves traceability and increases impact.



06 With the continuous increase in the world's population, governments cannot respond to pressing **social needs** alone. To face these challenges, multiple forms of collaboration are developing between public and private sector players.

07 **Blockchain** could prove to be as revolutionary and innovative as the internet. This technology's long-term impact is almost impossible to predict; it's disrupting established practices and creating opportunities.

08 Unprecedented levels of **migration**, caused by political unrest and climate change, affect all continents and create colossal challenges. They also offer an opportunity for demographic renewal.

09 The **aging of the population** in some parts of the world affects many aspects of the economy and society. The amounts invested by pension funds have become very influential, which enables them to foster more sustainable practices.

10 The new generation, called **millennials**, is developing and using new technologies with concern for sustainability always in mind. This creates a challenge for established players and drives positive change.

FINANCIAL INNOVATIONS

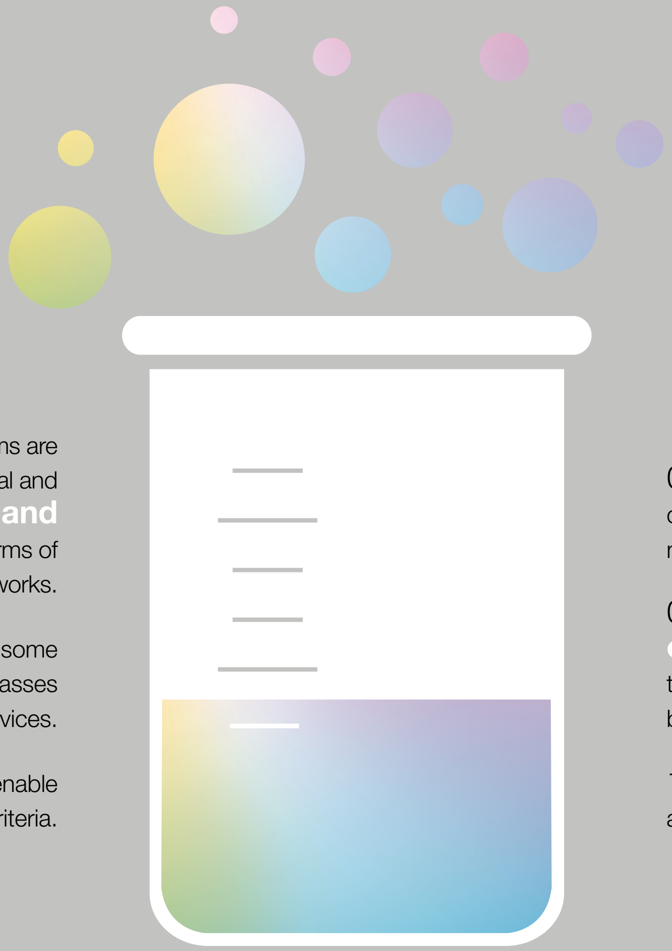
01 **Green bonds** provide targeted and transparent financing for environmental projects, while **2°C portfolios** limit the carbon footprint of investments in line with international climate goals.

02 Innovative financing mechanisms improve **access to land**. The capital raised serves to buy farms and tracts of land to rent them to farmers who are committed to sustainable agriculture.

03 **Crowdfunding** broadens access to investment. Its platforms are becoming increasingly specialized, some of them focusing on the social and solidarity economy, renewable energy or microcredit. Meanwhile, **local and virtual currencies** are fostering new forms of economic interaction within their networks.

04 The rapid development of **mobile banking** in some African countries is giving the unbanked masses access to financial services.

05 **Sustainable thematic funds**, increasingly specialized, enable investors to target companies according to very specific criteria.



06 **Mission-Related Investment**, a practice that aims to align investment against a foundation's mission, is gaining ground, seeking to maximize impact. Alongside donations, new financial mechanisms –such as **Social Impact Bonds**– are emerging to increase the long-term feasibility of social actions.

07 **Blockchain** enables everyone to transfer liquidity to other individuals, without relying on a centralized intermediary. The technology makes financial services more accessible and affordable. It improves transparency and cuts transaction costs.

08 The development of a **digital identity** based on unconventional data simplifies access to financial services for migrants who do not possess a passport.

09 Pension funds play a major, pioneering role in **shareholder engagement**. They leverage their influence to lead listed companies towards more sustainable practices. Through them, ordinary people's savings bring change in the corporate world.

10 Super-connected and concerned about sustainability, the **millennials** are natural customers of the innovations offered by sustainable finance.

01 CLIMATE CHANGE

Mitigating climate change requires an energy transition and innovations in both the production and consumption of goods and services. Transport, housing, agriculture: everything needs reinventing…

Climate change is no longer a question. It's a fact. The need for a proactive approach to mitigate global warming is almost consensual. The question is no longer whether financial players and the economy in general can contribute to this effort, but how they should do it.

The economy is increasingly committed to sustainable development and to managing environmental risks. Though production costs do not factor in some negative externalities, such as carbon emissions or the excessive use of natural resources, companies and banks are aware that the financial and reputation risks can threaten the very survival of their business model. Taking climate change and the energy transition into account is becoming a financial necessity for both companies and investors.

This trend translates into a rapidly expanding offering of financial products and services, such as green bonds, investment funds focused on sustainable development, investment products in companies that drive the energy transition, cheaper mortgages for energy-efficient houses, as well as the possibility to measure the carbon footprint of investment portfolios.

Focus
Green bonds, out to win in the market

Sustainable finance seeks to address investors' growing appetite for transparency and traceability. However, conventional bonds and shares have traditionally been unable to finance specific projects.

That was before green bonds. Their purpose is to raise funds for projects that support energy transition or environmental protection. This is a genuine innovation in what is termed "use of proceeds", defining contractually the use of the funds for a specific project or product. Investors know exactly and in advance what purpose their money will serve.

First issued in 2007 by the European Investment Bank, green bonds got off to a running start. Companies in various industries – including energy (GDF SUEZ), food (Unilever) and technology (Apple) – rely on these financing solutions. Meanwhile, Poland and France became the first States to issue green bonds, while many local governments issue their own Green City Bonds to finance urban infrastructures. In 2016, Chinese issuers were the most active. Many funds enable investors to invest in this sector, including Geneva-based Lombard Odier, the responsible investment arm of France's Natixis, Mirova, as well as Swedish bank SEB. After green bonds, we're now seeing the emergence of water-related "blue bonds" and "social bonds" focused on social issues.

This innovation could even impact the conventional bond market. In the future, customers might want to know exactly how their money is used. And alongside the ordinary bonds of a pharmaceutical company, for instance, we might see bonds issued for the sole purposes of research on cancer or rare diseases, or for the development of telemedicine.

Focus
A 2°C portfolio to minimize one's carbon footprint

The notion of "carbon footprint" has become mainstream in recent years. Companies have started paying attention to their own footprint: they are rolling out tools to measure and reduce their CO_2 emissions, whether related to the manufacturing, use or transportation of their products. Investors are also increasingly aware of the issue and many aim to "decarbonize" their portfolios by focusing on companies and investments that limit their CO_2 emissions.

In this spirit, new assessment methodologies provide practical ways of measuring carbon footprints, thanks to pioneering British and Swiss companies such as Trucost, Inrate or South Pole Group (ISS now owns the methodology). Many market players –such as Vontobel, Unigestion and J. Safra Sarasin– use these methodologies to measure the share of greenhouse gas emissions related to their investment portfolios. A next step is to build "2°C portfolios" that limit these emissions and align investment with international climate goals. To make these strategies more accessible, several "low carbon" indexes were created in recent years, such as those of Corporate Knights Capital and of leaders MSCI and Standard & Poor's. An international think tank was even established in 2012 (2° Investing Initiative) to bridge the gap between climate targets and investment processes.

This trend is spreading even to the largest investors. In France, for instance, institutional investors have to inform on their contribution to the fight against climate change

And also

RENOVATING A BUILDING WITHOUT CAPITAL

Besides developing new sources of renewable energy, there's plenty to be done to increase energy efficiency –for instance by improving buildings' insulation. Zurich-based fund SUSI Energy Efficiency facilitates investment in this type of project, by bringing together three types of players:

- investors, who finance the works and receive a yield based on the energy savings achieved;
- technical partners, who carry out the work and guarantee the energy savings;
- the owners of the renovated buildings, who benefit from the renovation without investing themselves, foregoing the savings for a given period for the benefit of the investors.

A PUBLIC-PRIVATE PARTNERSHIP FOR THE CLIMATE

The objective of the Global Climate Partnership Fund is to speed up the energy transition, especially in developing countries. To this end, the fund co-finances innovative small and medium enterprises that have insufficient access to appropriate financing. The fund's structure, designed as a public-private partnership, simplifies the participation of private investors thanks to the risk's partial coverage by the public authorities. Initiated by the German government and managed by Zurich-based responsAbility, the fund raised hundreds of millions of dollars of capital and has extended more than 45'000 loans via its partner institutions.

BUILD SUSTAINABLY TO BORROW AT LOWER RATES

In Switzerland, buildings account for about a third of CO_2 emissions. Several Swiss banks offer attractive mortgage rates for environmentally friendly buildings – such as Alternative Bank Switzerland. ABS developed sustainability criteria related to energy consumption during the construction and use of the building, the management of rainwater or the proximity of public transport. The higher a building scores according to these criteria, the lower the interest rates for the entire duration of the mortgage.

ONE BILLION FOR GREEN ENERGY

The Breakthrough Energy Ventures fund has a capital of $1 billion to invest in green energies. Bill Gates announced it at the COP21 summit in Paris and the fund launched in late 2016. Other top business leaders joined the Microsoft founder, including the bosses of Alibaba, Amazon and Virgin. They plan to support innovative companies in the fields of electricity production and storage, agriculture and transport.

02 AGRICULTURE

Agriculture faces many challenges. Nutrition, delivery, waste… Innovative stakeholders seek alternatives to industrial and chemical-heavy production methods. They are revisiting agricultural infrastructures and practices.

Many current trends reflect the will to make people and the environment the starting point of farming practices. Demand for local, organic produce keeps growing at a rapid rate and minimizing food waste has become a priority. Agriculture is also a major source of employment: 1.3 billion people worldwide depend on farming for their livelihoods.

The sector, however, faces many challenges. Resources are unequally distributed, biodiversity is under threat, soil is contaminated and many still suffer from hunger and malnutrition. These challenges will only increase with the growth of the world population, which will reach 10 billion in 2050. Meanwhile, the issue of natural capital is a major challenge: agriculture consumes 70% of freshwater resources, for instance.

It is therefore necessary to transition to more sustainable forms of agriculture. Though finance cannot resolve these issues on its own, it can help accelerate the implementation of new models by favoring inclusive systems, organic and integrated farming, and short distribution channels, as well as by financing farmers directly and over the long run.

These evolutions are made possible by new business models and investment tools, such as group purchasing of farmland, creating digital marketplaces, using indexed debt to finance food companies, or reducing the vulnerability of smallholders in developing countries by offering index micro-insurance policies.

GROWTH IN AGRICULTURE IS AT LEAST TWICE AS EFFECTIVE IN REDUCING POVERTY AS GROWTH FROM OTHER SECTORS.

FAO

Focus
Farmland for all

The increasing price of land and the mechanization of agriculture have concentrated profit in large, often industrialized farms. To broaden access to land and support sustainable models, new mechanisms are emerging.

One pioneer in this field is Terre de Liens in France, an organization open to everyone. The capital accumulated serves to purchase land and farms that are rented out to farmers who practice local, organic agriculture on a human scale.

Similar organizations operate in the USA, such as Iroquois Valley Farms, which smooths the transition to organic farming by offering cut-rate loans during the years of conversion. In Belgium, Terre-en-vue created a cooperative as a tool of citizen investment. In Germany, RWAG, a company of citizen shareholders, invites people to invest in small and medium enterprises in the entire value chain, from farm to shop. Similar investment vehicles have also appeared in the UK in the form of land trusts.

And also

REDUCING VULNERABILITY TO CLIMATE SHOCKS

Index micro-insurance opens new perspectives to help farmers in developing countries face meteorological disasters. Supported by the largest reinsurance companies, the InsuResilience Investment Fund makes it possible to finance climate insurance products for farmers in emerging countries. Using satellite imagery, Switzerland's CelsiusPro detects –for instance– that it has not rained in a particular area and automatically triggers the compensation of the afflicted farmer by the reinsurance company.

ALIGNING INVESTORS & ENTREPRENEURS' INTERESTS

Geneva-based Quadia reinvented indexed debt to provide financing for food companies that innovate in the sector and help meet the growing demand for organic and local produce. Investors' potential yields increase with the speed of the financed model's commercial success. Meanwhile, entrepreneurs pay back amounts in proportion to their revenues, unlike with the fixed reimbursement schedule of conventional loans. In addition, they raise funds without diluting their capital.

TECHNOLOGY CONNECTS FARMERS TO THE MARKETS

Surfing on the success of mobile payment in East Africa, Mastercard –through its Labs for Financial Inclusion– created 2KUZE, a digital marketplace to connect small farmers, middlemen, customers and banks. The platform enables farmers to buy, sell and receive payments for their produce, all on their mobile phones. It improves farmers' knowledge of market prices and provides a more direct route to customers. It also keeps a log of financial transactions, which opens the way to credit and other financial services.

03 NETWORKS & CLOSENESS

Eroding trust in political institutions and suspicion of globalization are fostering relations within networks, both local and of interest, thanks in particular to the power of the internet.

What do the Eiffel tower, the Oculus augmented reality headsets and Swiss crypto-currency startup Ethereum have in common? All three projects directly appealed to various networks to see the light of day and finance their development.

This phenomenon has gained momentum in recent years, with the erosion of trust in banks, the shortage of credit, as well as the wish to focus on one's communities – whether local or of interest. Not to forget the will to make the exchange of money meaningful – as well as a good dose of optimism and entrepreneurial spirit.

So while globalization enabled trade across the planet, it also inspired people to take back ownership of their networks and foster the development of local communities. Why go through several middlemen when you can gain direct access?

These major trends in our societies take on various forms, including local (often digital) currencies and online crowdfunding platforms.

Focus
Local and virtual currencies to stimulate exchanges

Alongside national currencies (like the Swiss franc) and regional ones such as the euro, thousands of complementary currencies have appeared around the world. Their numbers have increased constantly since the financial crisis of 2008. Their development is essentially based on citizens' will to take back control over the currency they use in their day-to-day lives and to stimulate trade within their communities, whether regional or of interest.

One of the oldest complementary currencies is Swiss. Introduced in 1934, the WIR has the particularity of being designed for the sole use of companies. The "Palmas", created in the late 1990s in Brazil, are a complementary currency intended to foster trade in poor neighborhoods (favelas). Since then, more than a hundred "banco palmas" have developed. In France, there are now some forty local currencies, like in Germany.

On top of these complementary currencies, systems have emerged for trading goods and services. These Local Exchange Trading Systems (LETS) first appeared in the 1980s in North America and Europe.

Complementary currencies are not necessarily limited to a single region. Some, such as the bitcoin, are becoming international thanks to the internet and new technologies. Digital technology also simplifies management, by removing the need for bills and coins, and reaches a larger audience. Consumers can shop, for instance, using a digital card, by text message or over the internet. Many recent currencies, such as SoNantes (France) and TicinoCoin (Switzerland) have in fact chosen to go all digital.

Focus
Communities 2.0, vibrant and activist thanks to crowdfunding

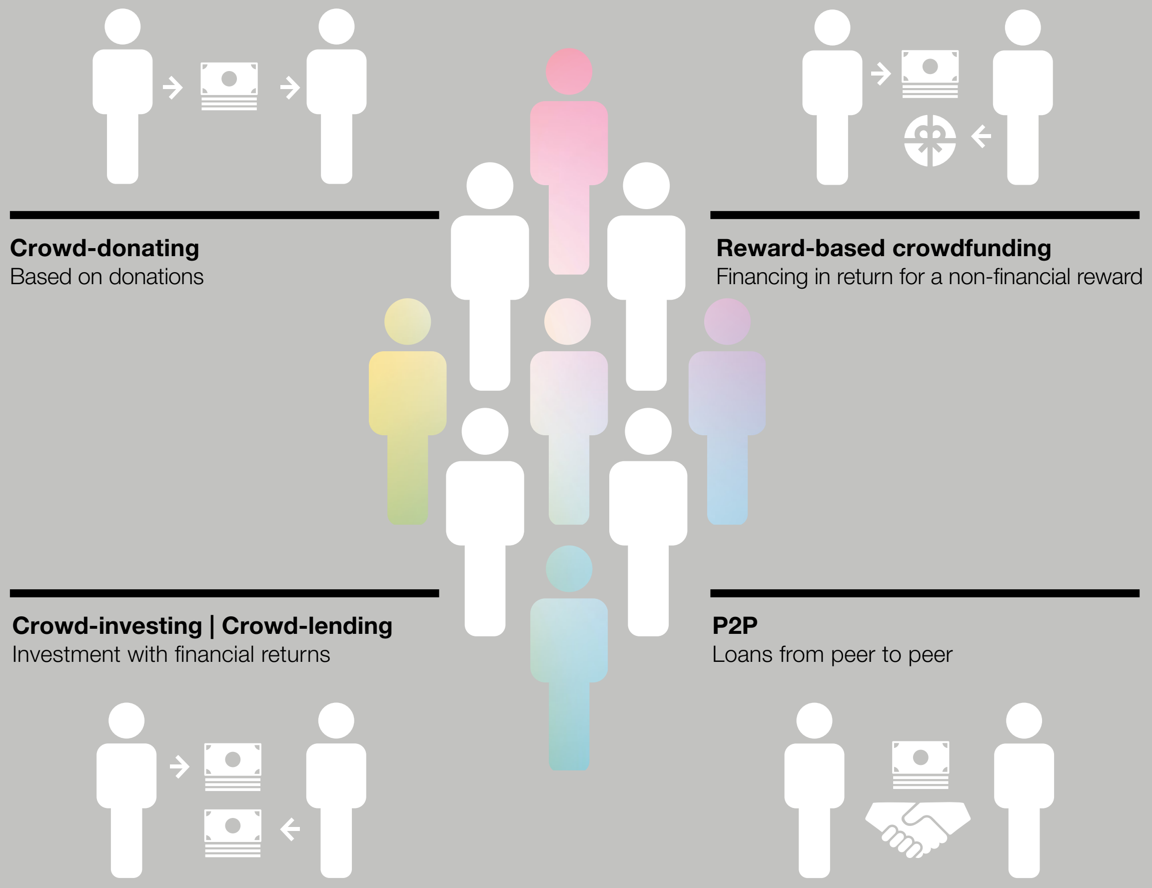
Investing in a company or project was never so simple and accessible. Crowdfunding, or participative financing, is growing rapidly in all parts of the world, democratizing investment. It is gaining a more established structure, diversifying and giving rise to projects that probably wouldn't exist without this direct source of financing. Internet's disruptive impact, combined with media and social networks, enabled the sector to take off.

In less than ten years, leading platform Kickstarter financed more than 130,000 projects, thanks to several million individuals. NGOs, startups, small & medium enterprises and even large companies are turning to these new models of financing. Many platforms were also created with sustainability in mind, for instance to fund renewable energy projects through Windcentrale and Lendosphere, as well as financing of the social and solidarity economy, such as 1001pact and We Do Good. Microcredit platforms –such as Babyloan or Kiva– have also appeared, with Kiva facilitating more than a billion dollars of loans over a decade. Now a new generation of these platforms, including Kubo financiero and Zidisha, enables peer-to-peer (P2P) loans, without any intermediary.

The popularity of crowdfunding shows no sign of abating, especially since the direct relations they enable between project owners and investors are themselves powerful instruments of marketing.

The trend is towards specialization, with increasingly targeted offerings. Crowdfunding is also attracting the interest of pension funds and banks, especially local, mutual banks and savings banks, which are more involved in their communities.

Forms of crowdfunding



04 DIGITALIZATION & INCLUSION

Digitalization is shaking up the world as we know it, challenging established industries and enabling the development of technologies that offer new ways of traveling, communicating and investing… It simplifies the inclusion of people who did not previously enjoy access to these services.

The lack of infrastructures in developing countries stimulates innovation and spurs the adoption of new technologies. This "leapfrogging" of technologies has reached unprecedented levels thanks to the internet and new mobile techs, which enable the decentralization of many services.

There are more and more examples. There's no electricity in a remote area, or it suffers regular outages? Decentralized renewable energy units pick up the slack. The roads are awful and postal deliveries are unreliable? Early tests show that drones can deliver documents and medication. The closest bank branch is miles away? Telecom operators transfer money anywhere in the country and even abroad.

These innovations make life easier for the underprivileged. Undreamed-of just a few years ago, they improve people's safety, wellbeing, health, as well as their inclusion in economic life and their access to financial services. In Africa, the success of fintechs and the banking services delivered by telecom operators have opened the way to numerous innovations in many fields of the economy and society.

Mobile payments, microcredit, micro-insurance, savings accounts or real-time information on the prices of commodities are increasingly available to the world's 2 billion people who don't have access to conventional banking services.

Focus
Mobile banking… without the banks

Mobile payments and m-banking have become a fact of life in some African countries in the past decade. More than 80% of the continent is now covered by these services, thanks to the boom of mobile telephony. Africa even has the world's second largest customer base, with more than 560 million unique users. The rapid growth of the mobile industry is solving in part one of the continent's major problems: the very low penetration of conventional banking services, due to the lack of local branches and price of these service.

Kenya is undoubtedly the emblematic success story of m-banking in Africa. Vodafone's SMS-based payment system M-Pesa took the country by storm –before spreading to new markets. Other solutions have taken off in Africa with operators such as Orange (Orange Money). In late 2016, Mastercard also signed a partnership with Ecobank to develop a pan-African m-payment solution, with an ambitious target to reach 100 million customers by 2020.

Mobile payment is user friendly, safe (less cash carried around in handbags), and cheaper than the services offered by banks and international transfer operators. Other systems have since appeared for companies and vendors, enabling them to better manage their shops, cash flow and stocks, directly on their mobile phones.

8 IN 10 INDIVIDUALS IN THE DEVELOPING WORLD OWN A MOBILE PHONE.

World Bank

And also

MANAGE YOUR COMPANY ON YOUR MOBILE

The purpose of Lausanne-based KiWi is to foster the financial inclusion of budding entrepreneurs. Created in 2013, the company offers micro-merchants a way to manage their business on their smartphones, which the solution turns into cash registers and payment terminals both for cards and mobile payments. Very active in Central America, KiWi-Bop also generates additional revenues: the micro-entrepreneurs can sell new products and services, such as prepaid mobile credit, which are in high demand in many emerging countries.

PAY WITH YOUR FINGERPRINT

Identifying people can be a real challenge in emerging countries, where many people simply do not own any ID. The government of India, for instance, has started a large campaign to enable people to be identified by their finger-prints. With Aadhaar, every resident of India is given a 12-digit number that is linked to three biometrical recognition techniques: fingerprint, iris and facial. This virtual ID card enables people to access services such as social and banking services, by using digital ID readers.

SOLAR ENERGY BOOSTED BY MOBILE BANKING

The boom of micro-payments on mobile phones has opened the way to other innovations. M-Kopa Solar in Kenya and Off Grid Electric in Tanzania offer solar energy to low-income households thanks to a kit installed at their homes. The families pay by mobile transfer. In regions with poor conventional electricity supplies, the benefits are tremendous, as the solution reduces reliance on unhealthy and destructive energy sources such as kerosene. Following a small initial payment, customers pay a few cents per day, depending on their consumption. When they reach a given threshold, they become the owners of the solar kit.

05 BIG DATA & TRANSPARENCY

All public authorities, industries and individuals are held to high standards of transparency. Technological developments, the internet and social networks provide access to big data, which opens the way to new solutions, improves traceability and increases impact.

Big data and transparency are closely related. When data is available, it can be extracted, analyzed and compared. And this is the challenge offered by big data: to collect and mine the huge quantities of data with smart systems that can make predictions, extrapolate trends or optimize processes.

This evolution is also an opportunity and a catalyst for the adoption of sustainable solutions, enabling –for instance– the deployment of smarter production chains, the lowering of CO_2 emissions or the more efficient management of energy consumption by a company or a whole city. All stakeholders are also expected to become more and more transparent. Never had companies published so much data on their production methods or their non-financial impacts. Politicians are more accountable for their actions. Even ordinary citizens have become more transparent. Whether one approves of this trend or not, it's a far-reaching trend that is only gaining momentum.

Transparency and access to information are probably one of the most significant steps forward for sustainable management. The world of investment is much larger and more mature than 15 years ago, with investment funds and sustainability indexes for almost all categories of assets.

"Granular" funds make it possible to target one's investments at a very specific theme. Simple, online tools enable investors to analyze portfolios and assess a company's impact. And technology also facilitates access to credit.

Focus
Next-generation thematic funds

A new generation of sustainable investment funds has emerged thanks to the improved access to new types of data. The first generation, created in the 1990s, focused on companies chosen according to Environmental, Social and Governance (ESG) criteria. Meanwhile, thematic funds developed, selecting companies active in specific sectors, such as renewable energy, water management or healthcare.

With the growing availability and quality of data on companies, a third trend is complementing the previous two. Mining detailed data on a given topic, it invites investors to seek out companies that champion –for instance– gender equality (e.g. the Pax Ellevate Global Women's Index Fund or the Amazone Euro Fund) or children's rights (e.g. the RobecoSAM Global Child Impact Equities Fund). In addition, the Corporate Human Rights Benchmark compares companies active in the textile, mining and farming industries in terms of human rights.

Alongside these developments, impact investing specialists now enable investors to focus on very specific areas that generate positive environmental or social impacts. Credit Suisse manages a financial product that offers students with meager resources to finance their Masters degree at prestigious universities. The Ginkgo fund is active in soil decontamination. The funds operated by INOKS Capital and Impact Finance Management facilitate investment in specific activities of sustainable agriculture.

And also

HOW DOES YOUR PORTFOLIO RATE FOR SUSTAINABILITY?

More and more consumer goods –such as household appliances and cars– display sustainability ratings, which make it easy for consumers to make informed, responsible choices. Why couldn't investment portfolios do the same? Thanks to technology, this is now possible. Geneva-based Conser offers online "portfolio checks" for simple, fast assessments of a portfolio's average sustainability performance. The company developed a screening and analysis tool that covers some twenty rating approaches. This methodology provides objective points of comparison to establish an average rating for each portfolio, called "ESG Consensus".

BIG DATA AT THE SERVICE OF FINANCIAL INCLUSION

Lacking sufficient banking data, financial institutions in emerging countries also make increasing use of alternative data –from social networks, browsing histories, mobile payments– to carry out credit scoring and decide whether to grant a loan. The companies specializing in this area, such as EFL, First Access or Lenddo, provide their technology to banks and telecom operators, enabling them to offer their services to a broader segment of the population –and to cut down on defaults. In developed countries, financial institutions are also taking an interest in big data's ability to refine and speed up their credit scorings. Many players have adopted such solutions, including Kreditech in Germany, Aire in the UK and TrustingSocial in the USA.

MULTIPLE SOURCES TO FIND OUT EVERYTHING ABOUT A COMPANY

In recent years, the data used to assess companies' sustainability was essentially collected by analysts. This process required considerable resources and limited the scope of research. Today, artificial intelligence makes it possible to "scan" big data automatically: companies' sustainability reports, press clippings from around the world, as well as the opinions of NGOs. In the footsteps of Geneva-based Covalence, new players such as TruValue Labs and eRevalue, in the USA, are innovating in this field. The evaluation of a company's social impact by the many members of an online community is another new approach offered by Geneva-based project Impaakt.

SUSTAINABLE DEVELOPMENT GOALS ADOPTED BY THE FINANCE INDUSTRY

The UN's Sustainable Development Goals (SDGs), unveiled in 2015, created a particularly strong momentum in the financial industry. Banks are increasingly using the SDGs as a framework for action and reporting. Some financial institutions are also developing related financial tools, such as the Solactive Sustainable Development Goals World Index, which consists of companies that contributes to the SDGs –and based on which BNP Paribas arranged bond emissions.

06 SOCIAL NEEDS

With the continuous increase in the world's population, governments cannot respond to pressing social needs alone. To face these challenges, multiple forms of collaboration are developing between public and private sector players.

Social issues are extremely challenging in the developing world as well as in wealthier countries. Though considerable progress was made in the past twenty years, particularly in healthcare, the needs remain considerable. Poverty, disease, illiteracy and unemployment take a huge toll on society and produce negative externalities.

How can we make society more inclusive and address these issues, considering that neither government programs nor charities can solve everything? How can we make social mechanisms more efficient and increase their impact? Part of the solution lies with the private sector, where new types of companies are emerging, including "benefit corporations" and social enterprises that aim to have a positive impact on society while remaining profitable, so as not to depend on donations.

On the financial level, new solutions are emerging to address social issues. These include public-private partnerships to help finance positive projects through Social Impact Bonds, foundations' efforts to align their actions with their purposes (Mission-Related Investment), as well as impact investing, which focuses especially on social entrepreneurs.

Focus
Increasing foundations' impact through MRI

A foundation's purpose is to allocate its capital to achieve its goals, whether in education, renewable energy, medical research or other fields of activity. To date, attention focused primarily on a foundation's donations and the projects it supports, rather than on the management of its capital. In recent years, however, the practice of Mission-Related Investment (MRI) has taken hold. It seeks to invest the foundation's capital in accordance with its mission, to avoid contradictory situations and to increase its positive impact.

How? By actively addressing the consistency of the foundation's investments, in line with its mission. For instance, when a foundation has holdings in fossil fuels when aiming to develop renewable energy, it's being contradictory. On the contrary, when a foundation that supports medical research invests in healthcare, it's being consistent. Pioneers, including FB Heron in New York, dedicated more than half of their fortune to impact investments that are in line with their mission –and even 90% in the case of the KL Felicitas Foundation created by Silicon Valley entrepreneurs. In Switzerland, the sector's umbrella organization included MRI as a good practice in its Swiss Foundation Code. Some of its members, including the Robert Hahnloser Foundation, adopted integrated approaches that include MRI by encouraging their portfolio managers to develop skills in this area.

Other foundations go a step further. As they don't always find financial tools that fit their missions, they create bespoke products. The PeaceNexus foundation, for instance, created an investment fund that selects companies that help stabilize regions plagued by unrest or war.

Focus
Social Impact Bonds finance social action

Social Impact Bonds (SIB) offer a promising alternative for the financing of social needs. What makes them innovative? They offer a financial solution to ensure the long-term viability of social action and to improve its results.

SIBs' are based on a "pay for success" principle, where investors finance programs carried out by social organizations. If – and only if – they achieve their targets, government authorities pay the investors back their initial capital as well as interests based on the project's rate of success. SIBs serve the government's interests: if the results are good, it will save money it can reinvest in social development.

The first SIB was issued in 2010 in the UK, aiming to reduce the rate of repeat offense by inmates of the Peterborough prison. In Switzerland, the canton of Bern, backed by a committee of business people, pioneered the practice in 2015 by issuing an SIB to help refugees find jobs, in partnership with Caritas.

SIBs are increasingly popular and are expanding into new fields, for instance with the International Committee of the Red Cross' Humanitarian Impact Bond and the Development Impact Bond from the Educate Girls NGO.

And also

4 FOUNDATIONS TO SUPPORT THE NEW ECONOMY

Partners for a New Economy (P4NE), an affiliate of the Swiss Philanthropy Foundation, is a novel philanthropic fund where foundations Oak, Mava, Marisla and KR joined forces to finance the transition towards more sustainable and inclusive business and financial models. This collaborative operating model creates a "lever effect" on impact, pooling resources and expertise.

A MIX OF PARTNERS TO FINANCE ENTREPRENEURSHIP

"Blended finance" is a partnership that attracts private capital to social projects, thanks to the backing of a public partner. Applying this logic, assets manager Symbiotics launched a fund to finance small and medium enterprises in emerging countries, with investors-cum-partners UBS and the Swiss State Secretariat for Economic Affairs, which are also covering part of the risk.

170 PLEDGERS FOR PHILANTHROPY

Officially unveiled in 2010 by Warren Buffett and Bill & Melinda Gates, the Giving Pledge requires its signatories to donate at least 50% of their fortunes to charity. The group of donors now includes 170 of the world's wealthiest individuals and families from 21 countries –and counting. This initiative will make considerable funds available for philanthropic programs in the years to come.

SHAREHOLDERS' INFLUENCE TO FOSTER COOPERATION

Some fund managers use their influence on companies to produce positive social impacts. Through its Cadmos Engagement Funds, de Pury Pictet Turrettini encourages cooperation between innovative social stakeholders and the major companies in which the fund invests. For instance, the fund intends to act as a facilitator in the sharing of expertise between a pharmaceutical company and hospitals in emerging countries, to improve care for breast cancer patients.

07 BLOCKCHAIN

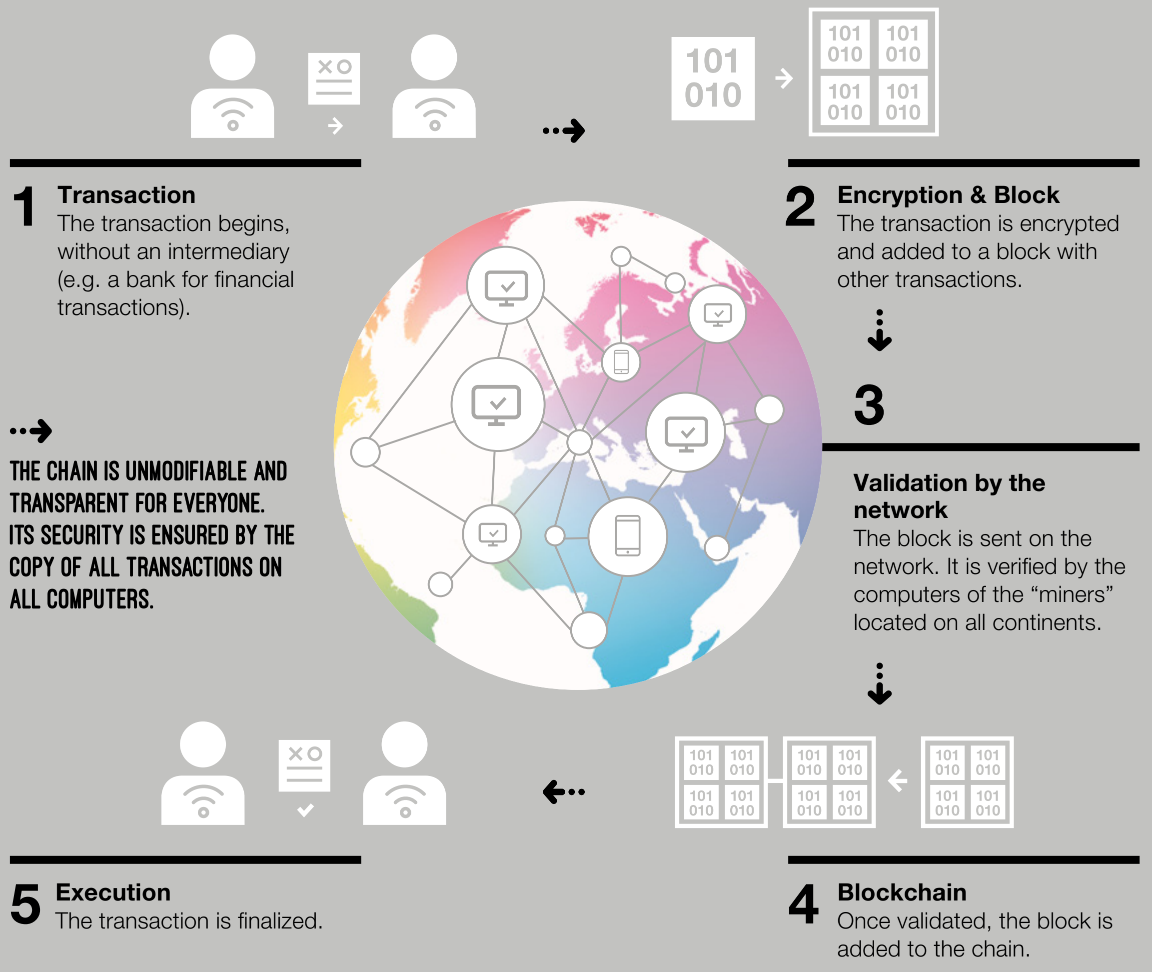
Blockchain could prove to be as revolutionary and innovative as the internet. This technology's long-term impact is almost impossible to predict; it's already disrupting established practices and creating opportunities.

Blockchain is part of the broader trend of digitalization of the economy. Until recently, digitalization mostly affected the broader fields of communication and information, through internet-based innovations. Now a new phase is underway, with the gradual digitalization of commerce –including goods, services and currencies. This trend has found a concrete expression in crypto-currencies, the most famous of which –the bitcoin– is precisely based on this technology. By enabling the creation of decentralized and transparent information systems, the blockchain also furthers the de-intermediation of our economies and societies.

Blockchain's impact is felt in many sectors: industry, agriculture, real estate, energy… It is often used to address business matters such as the transfer of money and/or property. But there isn't just one blockchain; there are many different blockchains. Some systems were designed to be very open, with clear forms of governance, while others are more closed, even private. This offers many possibilities of applications.

The blockchain can enable the development of more sustainable and inclusive economic systems. It can, for instance, simplify voting by shareholders, decrease transaction costs or fight corruption through the improved traceability of property rights. It is also used to encourage green energy and controlled consumption.

Blockchain



And also

MODERNIZING VOTING RIGHTS

Shareholders face many administrative barriers when they seek to exercise their voting rights. The blockchain could help shareholders by making the system more agile, fast and transparent, which would definitely increase participation rates. In the USA, Broadridge recently tested –successfully– an online shareholder voting scheme based on the blockchain.

REDUCE FINANCIAL TRANSACTION COSTS

Several blockchain-based initiatives arose to fluidify systems and reduce costs. Stellar, for example, offers an instant and affordable money transfer solution that will enable 300,000 Nigerians to transfer money between the circa 200 banks of the Oradian network. This solution fosters the financial inclusion of rural communities which did not previously have access to this kind of services.

GREEN ENERGY & COLLABORATIVE ECONOMY WITH THE BLOCKCHAIN

A project initiated in 2016 by TransActive Grid, in New York, received a lot of press: using a blockchain-based technology, the residents of a Brooklyn neighborhood can sell electricity produced by solar panels on their roofs to their neighbors. The purpose is to encourage the local production and consumption of renewable energies. Other projects were introduced since. In France, in late 2016, a consortium involving Bouygues Immobilier, Microsoft and two startups developed a system enabling the exchange of electricity between flats, also based on the blockchain.

REGISTERING YOUR PROPERTY WITHOUT A NOTARY

When the ownership of goods or land is not efficient and guaranteed, the risk of fraud or extortion arises. Customary systems are sometimes inadequate and costly, or even inexistent. In these conditions, several countries decided to establish a land registry based on the blockchain. In Ghana, at the instigation of NGO Bitland, land ownership titles are registered on a blockchain system. In Georgia, a government project carried out in partnership with Bitfury Group enables citizens to register their property with their smartphones, with no need for a lawyer. Even in developed countries, many start-ups are addressing these issues.

08 MIGRATION

Unprecedented levels of migration, caused by political unrest and climate change, affect all continents and create colossal challenges. They also offer an opportunity for demographic renewal.

Migration and international mobility are major challenges of the 21st century. According to the UN, the total number of migrants increased twice as fast between 2000 and 2010 as in the previous decade. And the trend is likely to continue. Whether they are economic migrants seeking a better life or refugees fleeing political unrest, all continents are affected. In addition, climate change will push more and more people to move.

For both migrants and the host countries, in addition to inflow capacities and political considerations, the essential challenge is rapid economic and financial integration. Even the International Monetary Fund calls for the speedy inclusion of migrants, which is a source of opportunities as well as challenges. Indeed, migrants make a positive contribution to the job market, increase the working population and have a positive long-term impact on growth and public finances, while mitigating the aging of the population in developed countries.

Financial innovations focused on migrants have already appeared in recent years, including digital ID systems, international money transfer comparison tools and micro-loans to help them to a good start in their new place of residence.

Focus
Your network, Facebook or your iris instead of a passport

Hundreds of millions of people in the world don't possess valid personal identification. UNICEF revealed that more than 200 million children are stateless, as their parents didn't register them upon birth. Migrants can also end up being "undocumented" if they've had to leave their countries without their ID –or lost it or had it confiscated on the way.

In these circumstances, how can one provide access to the most essential financial services, when the identification of people is often a precondition? Several initiatives have begun to solve this challenge by providing digital identities to migrants, so they may have their rights recognized. The Bitnation Refugee Emergency Response (BRER) made the headlines by offering to provide an identity to undocumented migrants thanks to the blockchain, in the form of a QR code. Refugees can also receive a debit card that does not require a bank account.

We should also mention fintech startups such as BanQu and Taqanu, which help migrants access banking services by providing them with a digital identity. Though many migrants do not possess the documents required to open an account, they usually have cellphones, on which an app can be installed to trace their data, create a reputation network with their families and friends, as well as upload documents, for instance from a refugee camp. This identity is gradually enriched.

Digital identities are not only for migrants. As our societies digitalize, many States are introducing projects to offer their inhabitants a digital identity. Switzerland is one of them.

And also

AN INTERNATIONAL MONEY TRANSFER COMPARISON WEBSITE

Monito was created following a disappointing transfer experience: its Swiss founders, having made a donation to an NGO in Africa, realized that the transfer operation cost more than 10% of the amount donated. They decided to create an online comparison service for international money transfers. Monito improves transparency, promotes the cheapest platforms and decreases the cost of transfers. At first intended for migrants, the website is gaining a broad audience.

A DIGITAL MARKET PLACE FOR MIGRANTS

Available in several countries of Asia, MyCash Online enables people without local bank accounts or credit cards to create an online account. The company targets migrant workers, who can make some types of purchases directly on the platform, such as plane tickets, cellphone credit, international money transfers or bill payments. The Swiss app Pintail is developing the same type of offering.

A LOAN TO GET BACK ON THEIR FEET

One of migrants' major challenges is to find a job in their host country, where their degrees and work experience is not always recognized. The purpose of the Immigrant Access Fund (IAF), created in Canada in 2005, is to offer credit to finance the period during which immigrants have their diplomas recognized or complete their training. To date, the fund granted some 17 million dollars in loans to more than 2,700 immigrants. A survey of beneficiaries showed that almost 90% of them were able to have their education recognized and to work in the same field and at the same level as in their country of origin.

09 POPULATION AGING

The aging of the population in some parts of the world affects many aspects of the economy and society. The amounts invested by pension funds have become very influential, which enables them to foster more sustainable practices.

For the first time in history, most people on Earth have a life expectancy exceeding 60 years. The share of the population older than that will double by 2050, reaching 21%. This aging of the population will affect many aspects of the economy and society: pensions and health insurance, the labor market, transport, housing, etc. The management of this population's retirement assets is another vital matter, as the need for capital will increase continuously.

Indeed, throughout our professional lives, we all invest through our pension funds. How do we want these assets to be managed? The volumes invested by pension funds acquired a considerable weight that makes them levers of sustainable change. In recent years, the appetite for transparent management of these funds has increased, the members wishing to know exactly how their savings are managed and which sustainable good practices are implemented.

Today, these same institutional investors are no longer content to exclude or select securities for their portfolios based on environmental, social and governance (ESG) criteria. They vote in shareholders' meetings and discuss issues with companies. Many are also divesting from fossil fuels or joining forces to increase their sway as shareholders.

IN 2000, 10% OF THE GLOBAL POPULATION WAS 60 OR OLDER. BY 2050, THIS PROPORTION SHOULD INCREASE TO 21%.

UN DESA

Focus
Institutional investors, pioneers of shareholder engagement

Institutional investors play a leading role in asset management. In Switzerland, the total assets of pension funds exceed 800 billion Swiss francs. These retirement planning funds belong to ordinary people. In recent years, institutional investors often set the tone in matters of sustainability, sending clear signals to their asset managers. Thanks to their considerable financial weight, they act as catalysts for some strategies, such as socially responsible investment (SRI), micro-finance, and now shareholder activism. Not only do pension funds vote at shareholders' meetings, they also dialogue with company management to make them adopt sustainable practices.

Major public pension funds abroad are playing a key role thanks to their activism, such as CalPERS (California Public Employees' Retirement System), the largest American public pension fund, and its French equivalent ERAFP (manager of the civil servants' complementary pension scheme). In Switzerland, after Ethos, it's the Swiss Association for Responsible Investments (SVVK - ASIR) –an alliance of some of the largest public pension and insurance funds– that is using its influence to conduct a dialogue with companies.

And also

PUSHING YOUR PENSION FUND TO SUSTAINABLE APPROACHES

British NGO ShareAction and Switzerland's Actares aim to bring together as many stakeholders as possible to promote sustainability, particularly in the management of pension funds. They facilitate the dialogue between policy holders and their pension fund by informing them and developing practical tools to put pressure on it. The adoption of a sustainable investment policy by the UK's largest pension fund led to the creation of ShareAction.

DIVESTING FROM FOSSIL FUELS

By the end of the noughties, some investors began to divest from fossil fuels. In late 2016, some 700 institutions –universities, municipalities, charities, pension funds, banks and insurance companies– along with 60,000 individuals, had pledged not to invest in this sector. Norway's sovereign fund, the world's largest and already very active in sustainable finance, announced in 2015 that it would divest from companies active in the coal industry.

SUSTAINABILITY AND PERFORMANCE GO HAND IN HAND

Contrary to popular belief, consideration for sustainability does not imply a poorer financial performance. On the other hand, it does translate into lower risks in the medium and long run. 80% of studies conducted to date show a positive correlation between sustainability and the stock performance of companies. The Zurich-based collective foundation Nest, for instance, always ranks among the best both in terms of sustainability and performance. This Swiss pension fund is one of a kind: it was created in 1983 with the guiding principle of investing pension savings according to strict environmental and ethical guidelines.

10 MILLENNIALS

The new generation, called millennials, is developing and using new technologies with concern for sustainability always in mind. This creates a challenge for established players and drives positive change.

They have been dubbed "millennials", "Generation Y" and "digital natives". Born before the turn of the millennium, the members of this generation are powerful drivers of change, seeking innovative solutions that combine financial performance with sustainability.

They cannot be ignored: they will account for more than 50% of the world's population in 2020. In the US, like in most European countries, there are already more millennials than baby-boomers.

This generation's expectations, coupled with digitalization, have already transformed the retail sector, the travel industry and the media, in particular. Financial services are the next step.

Surveys show that millennials are aware of the global challenges ahead and that they seek innovative solutions to harness private capital for the public good. They don't see a contradiction between financial performance and sustainable development.

Millennials are therefore the natural customers of the innovations we explored in these pages. They stimulate financial institutions; they challenge fund managers and established processes. They are an opportunity for the development of sustainable finance.

And also

DISRUPTIVE

All surveys say so: millennials don't expect the same financial services as their parents. In a world of transparency, connectivity and mobility, they want to interact through the channel of their choice, 24-by-7, and receive a personalized service. These trends are similar in all countries. Banks will also need to convince them of their value added: in Europe, more than a third of millennials simply never entered a bank. And another third believes it will no longer need a bank by 2020. New digital banks such as N26, Atom Bank and bunq are developing in this niche.

AFFLUENT

Millennials are the future customers of wealth managers. Some of them already are, thanks to the acceleration of value production in the field of technology, for instance, which has produced a rapid increase in the number of millionaires under the age of 30. The generational transition underway will also lead to an unprecedented transfer of wealth: in the USA, baby-boomers should transfer some $41 trillion to the next generation in the coming years.

SUSTAINABLE

This generation cares about its investments' impact and seeks solutions that perform socially and environmentally, as well as financially. 84% of millennials say they are interested in sustainable finance. Two thirds of the younger ones consider that their financial investments should reflect their social, political and environmental values. This involves the creation of new, innovative, sometimes hybrid financial instruments that deliver –on top of financial performance– a positive impact on society.

@SFG

@ sfg we:

CONNECT PEOPLE

Since its creation in 2008 by professionals who firmly believe in the opportunities offered by sustainable finance for Geneva and the world, Sustainable Finance Geneva relies on the commitment of individuals and the power of collective intelligence. Agility, freedom of expression and action are in our DNA.

SFG doesn't work in silos. Bringing together professionals of the financial services industry in French-speaking Switzerland, we help break down the barriers between the various stakeholders and types of players operating in the region and interested in sustainable finance. SFG builds bridges between banking and impact investing, between foundations and socially responsible investment (SRI), as well as between fintech players and sustainable portfolio assessment.

SFG thereby raises awareness and trains individuals regarding the opportunities of sustainable finance, to meet the growing expectations of customers and society in general.

SHARE INNOVATIONS

Conventional business models have proven their worth, but they've also shown their limits. In a world of accelerating change, we need to keep abreast of the far-reaching developments underway, so we can identify and stimulate financial innovation.

SFG considers it a strategic priority to monitor innovations that make the connection between finance and sustainable development, both in Switzerland and abroad.

In a collaborative perspective, where innovation feeds innovation, SFG shares all its expertise in a variety of ways. We regularly inform our members and the public through publications such as this book, as well as in our newsletters, conferences, social networks and training programs.

PROMOTE GENEVA

From the very beginning, SFG has positioned Geneva as a laboratory for ideas and a center of innovation in sustainable finance.

Geneva enjoys a unique ecosystem that fosters development and innovation: financial expertise in many areas, high-level international organizations, recognized universities, major foundations, connections and a culture of openness onto the world.

SFG is now an essential platform for sustainable finance in French-speaking Switzerland. It also ensures the promotion of "Swiss-made" sustainable finance, in cooperation with Swiss Sustainable Finance.

MERCI

The experts

Many thanks to the approximately 40 experts who shared their knowledge. Many of them are global leaders in their lines of work, and they helped us identify the trends and innovations presented in this book.

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There's the matter of confidentiality. Many ideas emerged during workshops involving experts from the region. They contributed considerably to this book, both in terms of content and regarding the organization of ideas.

You will find the websites of the organizations and innovations presented, as well as the list of the main reports and studies that provided material for this book on our website at:

www.sfgeneva.org

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Global capital markets are powerful forces. Directed properly, they can alleviate the burden on governments and unlock a sustainable economic future.

Henry M. Paulson, Jr.