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Megatrends and disruptions:

Consequences for Asset Management

RESEARCH STRATEGY & ANALYSIS

Megatrends and disruptions

Consequences for Asset Management[1]

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Summary[1,2]

The asset management industry has to face three different types of challenges.

1. **First, a new environment,** with the rather new fierce competition between bigger and bigger players, with the emergence of new players (SWF, pension funds ...), the low rate environment, the changes in regulatory constraints. ***One of the ambitions of this paper is to present how to cope with the current environment.***
2. **Second, the emergence of megatrends:** how to play demographic challenges, climate change, technological revolution, innovations, how to play social, ethical, and behavioural values... ***The second ambition is to answer this question: how to invest and make money in investing in megatrends and disruptions?***
3. **Third, to cope with a real disruption:** how will what we can call Watsonisation (the development of cognitive computing), Googlisation (the availability of a greater

[1] *A version of this paper has been presented at the 2017 FLAR conference, held in Cartagena, Colombia, on November 9-10. The author would like to thank all participants and especially M. Iker Zubizarreta, Chief Financial Officer of FLAR (Fondo Latino Americano de Reservas). He also wants to thank M. Xavier Musca (deputy-CEO of Crédit Agricole) for insightful discussions and M. Bernard Agulhon for his contribution on MiFid.*

[2] *This article discusses the impact of megatrends and disruptions on the asset management business model. It complements the Discussion Paper published in May 2016, which analysed the impact of the low / negative interest rate environment on the asset management business model (Ithurbide Ph (2016). «Low/negative interest rate environment, secular stagnation... Implications for asset management»; Amundi Discussion Papers DP-15-May, 48 pages).*

volume of data), Amazonisation (the power of platforms), Uberisation (hatching new business models) and Twitterisation (doing business in an increasingly connected and collaborative world) ... reshape – or not – the asset management industry? ***Last question to address: how to adapt business models, survive, be efficient and profitable in such a changing environment?*** Tech remains one of the largest sectors in the world economy, but in today's new economy, practically all corporations – small and large – are in technology, directly or indirectly.

Some of these questions can be addressed to any company that manages assets and risks: insurance company, pension funds, central bank, endowment, mutual funds...

Investing in megatrends has several advantages: it is a good way to invest in future "winners", to go away from secular stagnation themes (weak growth, low rate environment) and to gain greater exposure to secular growth, by reducing exposure to purely cyclical factors and profiting from thematic approaches. It is also a good way to find a more favourable risk/return ratio, to invest where risk is rewarded.

The asset management is in the business of disruption, which explains why 73% of American CEOs and 61% of CEOs worldwide think that new competition is going to disrupt their industries in the next five years; according to those surveyed, newcomers will disrupt their activities or preserve their business models but apply new technology to them. Portfolio management will be extensively redefined as cognitive computing and the resulting analyses more extensively use the resulting data and methods. Artificial intelligence, big data and platforms will impact the business models. The product distribution process will also be extensively impacted by strategies focused on data and online platforms. Big data give asset management companies new opportunities to improve investors' knowledge (risk culture, shared knowledge, better understanding of the business lines), engage more deeply with investors, and understand their ever-evolving preferences. Companies having the capacity to develop infrastructures and invest in innovation will also have competitive advantages that will be hard to counter. As investment activity becomes more data-driven, because of regulatory and investor requirements, the quality of transactions and trading platforms will be an increasingly important competitive factor. Blockchain in particular will make it possible to automatically enter any online trade and provide full transparency on all transactions: By eliminating intermediaries and providing a reliable, transparent tool, blockchain can cut costs (fewer error reconciliations, greater simplicity), accelerate settlement (quicker validation), increase solidity (little risk of failure or error), and increase transparency (with rapid, simple, efficient, low-cost oversight). Last but not least, the

asset management companies will need people who have the right skills for this new business environment, in particular top-flight data specialists and developers of algorithms adapted to trends in the business lines.

All in all, **to remain competitive and profit from new opportunities, management companies must think more about their business models and look beyond simple improvements. Asset management is now in the business of disruption.** This requires new thinking, a conscious shift in mentality and effective leadership on the company and industry levels. These are undoubtedly the keys to future success**.**

Keywords

megatrends, disruption, innovation, digitalisation, asset management

Table of contents

Introduction

This article deals with a current hot topic: "*The impact of megatrends and disruptions on asset management, business models, and management activities*". It's a hot topic for several reasons:

- First, because asset management activity has grown considerably since the 1950s, of course, but also since the financial crisis. In the United States alone, asset management was valued at 50% of GDP in 1946, compared to more than 250% today.
- Next, because the changes to come are just as extensive as they are uncertain, indeed not even clearly identified. In any case, they are likely to change a good many business models, including asset management.
- Lastly because they will inevitably decide who the big winners and losers of these structural transformations will be. How will we face this overwhelming trend? What can we do to stay alive and stay successful?

This article presents three different types of challenges / disruptions.

- **1st challenge: the new environment that asset managers face,** with the rather new fierce competition between players being bigger and bigger, with the emergence of new players (SWF, pension funds...), the low rate environment, the changes in regulatory constraints. The ambition is to present how to cope with the current environment.
- **2nd challenge: the megatrends: how to play demographic challenges, climate change, technological revolution, innovations, how to play social, ethical, and behavioural values ...** the goal is to answer this question: How to invest and make money in investing in megatrends and disruptions?
- **3rd challenge, which is the real disruption: how what we can call watsonisation, uberisation, googlisation, amazonisation, twitterisation ...will reshape – or not – the asset management industry.** Last question to address: How to adapt, survive, be efficient and profitable in such a changing environment?

I. Asset management, a key role in today's financial landscape

How do we define the scope and the role of asset managers in today's financial landscape? Probably nothing is more telling than the US banking crisis in 2008, and the close relations between Tim Geithner (chairman of the New York Fed (2003-2009) and secretary of the Treasury (2009-2013)) and Larry Fink of Blackrock.

In the 2008 financial crisis, the person most often called on by Tim Geithner (if we look at the investigations that were part of a Senate inquiry) was not the chairman of Goldman Sachs, JP Morgan, or Citibank. Nor was it the chairman of Lehman Brothers. It was the CEO of Blackrock, the largest asset manager in America - and in the world. The fear was that investors would pull out of financing the banks, equity, and debt. The Federal Reserve and the Treasury even ordered Blackrock to assess (it wasn't a bank in charge of that) and sell the 130 billion in toxic assets from AIG and Bear Stearns. Directly after that, he was called to the rescue of Citigroup, Fannie Mae, and Freddie Mac, the two mortgage lending giants, and, in sum, became a sort of surrogate Treasury secretary. So, during the financial crisis, Larry Fink was in constant communication with the Fed, the Treasury... helping to set up - to influence - the largest financial bailout plan in history. Less than 20 years ago, or even 10 years, this was all unimaginable... And just a little over a decade ago, Larry Fink was telling his employees, "*With a little luck, one day our families will know what BlackRock is*"! A few years later, due to various acquisitions and the exceptional circumstances of the financial crisis, they did.

The same trend occurred in Europe, where, since the debt crisis, the ECB intensified relations with the major asset management entities: their role in recycling the liquidity generated by unconventional monetary policies, or in the bank bailout plans, all this has made consulting with the central banks and issuing agencies unavoidable, as well as triggered regular meetings with central, national, and European bank governors.

Asset management is an activity that has gradually become indispensable because it has grown so much, all over the world.

It's also become an essential activity for a good many banking groups because it rounds out and diversifies the offering and ensures more comprehensive global growth that in some regards has more limited risks. It gives the groups in question greater visibility and brand awareness.

To oversimplify this: a bank makes commitments to clients (such as loans) and therefore takes on financial risks (foreign exchange risks, borrower default risks, client bankruptcy risks), while a management company "simply" (so to

speak) manages its clients' money (it manages third-party accounts not on its balance sheet). There is a reputational risk, for instance, in both cases, but there's no comparison of the risk of loss between these two types of commitments.

Since this is a highly profitable activity, asset management has also witnessed the creation of large – sometimes very large – independent actors, in other words, not backed by banking groups.

II. Asset management: a huge expansion since the Great Financial Crisis

The management industry has seen exceptionally high expansion over the past few years, nearly everywhere in the world, for several reasons:

Reason # 1: The excess of savings in certain parts of the world, specifically Asia and Europe. China, for one, has become the biggest saving country in the world over the years. In the emerging countries as a whole, the development of a larger and larger, richer and richer middle class has also promoted savings and, as a result, the management industry:

Reason # 2: Abundant liquidity. Obviously, this has been helped by the low interest rates (which have been in steady decline since the mid-80s), but it has also been "exaggerated" because of exceptionally accommodating monetary policies, via the quantitative easing programmes in Japan, the US, and the Eurozone;

Reason # 3: The significant expansion of pension funds is another reason behind the expansion of asset management. The world's two biggest public funds are also national pension funds. Social Security Trust Funds in the United States manage a little less than 3 trillion dollars, while the GPIF - Government Pension Investment Fund in Japan manages more than 1.3 trillion dollars. Anything to do with retirements and pensions is becoming crucial in the world of today, with the ageing population, the emergence of middle classes in the emerging countries, and pension fund reforms.

Reason # 4: The appearance of new market participants such as sovereign funds, which are completely different from historical market participants. These are public investment funds that essentially meet three criteria:

1. They are owned or controlled by a national government;
2. They manage the financial assets in a long-term strategy;
3. The aim of their investment policy is to achieve macroeconomic objectives like managing intergenerational savings, diversifying GDP, and smoothing economic activity.

Their resources come from the accumulation of current account surpluses often tied to exporting commodities (such as Norway, the Arab Emirates, and Russia), or structural surplus savings (like Singapore). They can also come from the transfer of a portion of the central bank's currency reserves (like China).

To simplify, then, creating a sovereign fund can satisfy four different objectives:

- Combating the "Dutch disease ": this "disease" has caused certain commodity-producing countries to favour commodity production to the

detriment of everything else. This leads to major de-industrialisation (disengagement from the production of entire sectors and appreciation of the currency which penalises exports);
- Combating volatility in commodity prices;
- Better managing surplus currency reserves;
- Putting savings toward long-term goals.

The Norwegian sovereign fund manages a little less than 1 trillion dollars; the ADIA manages more than 800 billion, as does the Chinese CIC, while the Kuwait Investment Authority and the Saudi Arabian SAMA manage more than 500 billion dollars. Sovereign funds have become so big that their actions draw a lot of commentary (when we find out about them!) and sometimes dread. Some sovereign wealth funds are not regulated at all or very little and the opacity of their actions and their governance is often blamed on them. It should also be noted that not all sovereign wealth funds have only financial objectives, and they are sometimes the armed arm of the states that created them, some of which being also considered to be not very democratic.

Reason # 5: Another factor in the development of asset management is banking regulation, which has pushed the market towards disintermediation. The European credit market is less and less "in-bank" (system in which credit insured primarily by the banks) and more and more "non-bank": to put it plainly, businesses are increasingly raising money on the capital market, driven by low rates and investors' search for yield. In France alone, virtually half of all new corporate financing now comes from bank loans and half from the financial markets (80%/20% 20 years ago, and 75%/25% just a half dozen years ago). In the United States, 75% of financing occurs through the financial markets (typical non-bank system, which has been the case for a long time). In other words, especially in Europe where disintermediation was low, the relationship between banks and clients has been turned upside down by banking regulation: **liquidity, which was previously offered by the banks, is now in the markets, and insurers and asset managers have become the intermediaries. This "new role" for asset managers is sometimes played in partnership with the banks**, because they (alone) are intimately familiar with the businesses... whom they've been lending to for years.

The state of disintermediation in Europe

Contrary to large corporations, listed companies having a rating by the rating agencies, SMEs continue to count on the banks for their financing (96% of them in France today, for example). ISEs are already using (specifically in France) a combination of financing sources (banks at 74%, markets at 26%, with market financing growing rapidly).

Let us remember a few overwhelming trends:

- Disintermediation has gained ground in France (60% banks, 40% markets … in a country that nonetheless has the most solid banking system in Europe), and in Belgium specifically, but not in the other peripheral countries (Spain or Greece… where the banks' share is even higher at 90%). The analysis of new financing flows (not existing inventory) is very conclusive on this subject: the portion of new loans coming from the markets is now similar in France and the United Kingdom, for example.
- In Italy and Germany, the majority of loans to businesses (84% and 79%, respectively) is still coming from the banks. Businesses of all sizes depend on the banks; there are still strong disparities among the countries, but in terms of financing flows, Europe is gradually becoming a "non-banking" system as opposed to a banked system.

This trend toward disintermediation will continue, because banks, investors, and businesses all have a common interest:

- The businesses, because they still have financing requirements (e.g. upcoming refinancing, financing for mergers and acquisitions, etc.)
- The banks, because they are increasingly limited by local and international regulations (Basel 3) (increase in cost of capital/resources).
- The investors, (1) because they need diversification and (2) because they're looking for yield (through risk premia and liquidity).

Overall, excess of saving, abundant liquidity, the emergence of new actors, banking regulations and disintermediation, all of it paved the way for **the proliferation of new asset management companies** (more than 600 have received AMF approval and are operating in France), but at the same time **the proliferation of new giants** in this industry, such as PIMCO (a major American debt management specialist) and Blackrock in the US: virtually unknown a little over 10 years ago, Blackrock was managing 200 million dollars in 2000. It now manages more than 5 trillion dollars! In Europe, Amundi, manages more than 1.5 trillion euro… compared to around 300 billion in 2004.

According to the BCG's website, the volume of assets under management managed by professionals (in exchange for management fees), including the captive funds of pension funds and insurance companies entrusted to asset managers, was approximately 70 trillion dollars at the end of 2016, compared to 27 trillion in 2002 and just 38 trillion in 2008. Of the current 70 trillion,

about 50% are domiciled in the US (about 1 trillion was domiciled in the US in 1990, when European asset management was just at the beginning). It's easy to see the explosion in assets under management, specifically since the financial crisis. Three years ago, the Bank of England ventured to say, "*We may be about to enter the Age of Asset Management*".

All in all, the asset-management landscape looks nothing like it did just 10 or 15 years ago.

Note, too, that there are two types of management company coexisting: those that are the spearhead of banks (like Amundi or JP Morgan Asset Management), and those that are totally "independent" of banking groups (such as PIMCO and Blackrock in the US, and Carmignac in France).

III. A huge expansion, and a fierce competition

This concentration and this explosion in activity obviously go hand-in-hand with fierce competition to, one, capture savings in one's own country or area of location, the savings concentrated in sovereign funds and pension funds that are in the asset accumulating phase, and also, two, to go hunting in the competition's territories. But this is not without consequences.

Consequence # 1: reduced margins and management fees

Though it's true that the large management companies' profits often stay high, the context is becoming difficult for a good many of them. Not only has competition pushed management companies to do more to control costs, revise their business models, and reduce the number of funds carried... it has also pushed prices, and therefore margins, very far down. So much so that concentration is itself pushing toward concentration... Given this competition, the reduction in margins has, first of all, hit asset management for institutional investors much harder: for a single product, the margins on institutional investors are now about two to three times lower than those delivered by management for retail/distribution clients. The decline in rates is responsible for a portion of the decline in margins, and the international competition between the major players is a big reason for the profitability gap between institutional and retail investors, and the increasing uniformity of margins. This trend is far from over, and it is pushing toward the continued streamlining / reduction in the number of funds.

Consequence # 2: a stricter regulation

Everyone has banking regulation on their mind; it's been dissected in the financial press in recent years. It has become increasingly strict since the 2008 financial crisis, due to the systemic role of banks in certain countries. A number of banks have been qualified as systemic and are subjected to specific and regular reviews by the ECB, for the purpose of correcting any drift, and reassuring investors, the financial markets, and preventing financial and economic shocks. In terms of asset management companies, regulation has essentially been aimed at **protecting consumers and investors.** This is the traditional angle of asset managers' regulation. The MiFID now tightens this regulation. Five main targets:

- Refocus the trading of equities stocks and derivatives in regulated and organized markets;
- Extend the rules of pre-trade and post-trade transparency (especially in the bond markets);
- Promote a fair competition between execution venues orders by aligning organisations;

- Supervise algorithmic trading activities to guarantee market stability;
- Strengthen the protection of investors: monitoring commissions, information on the commissions and management fees and guaranteeing a better control of the "best execution" principle.

With regard to client protection, there are three major subjects that have an uneven impact on management:

- *The mode of compensation for fund distribution (inducements)*: two models facing off with, on one side (in the UK), distribution dominated by independent financial advisors who were personally taking chargebacks of management fees and whose advice could therefore be biased; and, on the other side, an integrated model (bank - management company) with branch advisors unaware of the compensation agreements negotiated by management. This is the model that was adopted, and chargebacks remain authorised for "non-independent" advisory.
- *Suitability constraints*: this means ensuring the recommended product is entirely suited to the client's need. General branch advisors are already uneasy with management products, and even more so now that there is this new requirement. Life insurance products, on which regulations are less strict in this regard - at least so far - are easier to sell.
- *Cost transparency*: this transparency will be increased by MiFID provisions entering into force in early 2018, and it will inevitably have an impact on management costs. The greatest nuisance is that it threatens to further heighten the shift toward ETFs to the detriment of higher-added-value active management.

More generally, the development of the MiFID has shown how much the European Commission was now influenced by the omnipresent concept of conflict of interest that underpins every legal argument in Brussels, and the consequences are sometimes damaging (see the summary table below).

Summary of Mifid2 issues for financial institutions: significant issues, moderate issues and non-significant issues

	Investment banks	Asset management industry	Retail banks / Private banks	Brokers / Dealers / Market players	Central Counter parties
Market infrastructures					
Creation of OTF (Organised Trading Facilities)					
Framework of OTC trading					
Regulatory framework of Algorithmic trading					
Access to clearing					
SMEs market					
Market transparency					
Pre-trade transparency					
Post-trade transparency					
Reporting of trades to the regulator					
Protection of investors					
Clients typology / suitability and appropriateness test					
Information on costs and fees					
Advisory on investment					
Inducement					
Product governance					
Best execution					

Source: Marcerou et alii (2015)

This is the case when it comes to funding research on securities used by managers.

Very strict rules have been introduced to prevent managers from having an interest in favouring brokers who provide them with more research.

Even though balanced provisions had been in place since MiFID1 in the context of best execution of orders, with commission sharing agreements, new and extremely burdensome analytical accounting requirements are being introduced with MiFID2, which will cause many players to take over this research (or not) and probably internalise a portion of it (or not).

This trend will be to the detriment of the diversity of solutions, with potentially very damaging consequences for research on mid-caps and for mid-sized management companies, which frequently offer the best active management.

Consequence # 3: the search for innovation and differentiation.

The great difficulty, and the major issue, is to quickly identify what is "disruptive" and/or what is durable, and what is the most appropriate technological solution. For example, is the electric car the proper solution? Probably not, according to some CEOs in autos, such as M. Tavarez, PSA's CEO, who considers that hydrogen might be the good technology for the future... but public subsidies go to electric cars at present).

Mr Jean-Marie Dru (non-executive chairman of the American communications group TBWA) is recognised for inventing the word 'disruption'. He has just published a book, "The Ways to New: 15 Paths to Disruptive Innovation". Mr Clay Christensen, a Harvard professor, is a respected author on disruption.

The different forms of innovation are:

- *Process innovation*: these are technologically new production methods;
- *Radical innovation*: the arrival of a new technology that upends the old ways, and often renders them obsolete;
- *Incremental innovation*: a product's function does not change radically, but it is improved (example: the move from wired to wireless telephones);
- *Disruptive innovation*: innovation that underperforms at first, but ends up becoming the default (example: moving from paid software to free software);
- *Cluster innovation* (term by J. Schumpeter (1883-1950)): around an initial innovation, other innovations grow and form interdependent sets. Each cluster upends the old economy and can ultimately be destructive

When we speak of technological revolution, we are referring to several things: big data, the pace of technological change, genetic research, new innovations, nanotechnology, robotics, the knowledge economy, microsurgery, automation, networks, and so on.

Like any business, asset management is clearly impacted by these megatrends and disruptive innovations.

Note that robots are replacing low-skilled workers, due to the gain in efficiency, coming from lower costs, better quality, accuracy and risk mitigation, uninterrupted production (24/7), more flexibility/multi-tasking and more reliability than humans (Deloitte).

Never has asset management been so innovative, so creative. Let's mention a few recent innovations:

- "**ETFs**", which make it easier and less costly to take a position on a market or to hedge portfolios; is this a process innovation?
- "**SMART Beta**", which pushes toward the search for better-performing or less-risky indices; is this an incremental innovation?
- "**Factor investing**", which invites investment not by contrasting asset classes but risk factors. Is this a disruptive innovation?
- "**Alternative risk premia**", which cross all asset classes. Is this a disruptive innovation?

IV. Lots of challenges ahead

Never has asset management been so innovative, so creative, but beyond these major disruptions, asset management must contend with four types of challenges.

4.1. Challenge # 1. The capacity to preserve its profitability/ competitiveness in the low-interest-rate environment

An iconic example to illustrate this challenge: the money-market fund situation. With rates close to zero or even negative, how do you bill a client for more than the fund's total return? And how do you increase return without taking risks that are incompatible with the nature of these funds? This is why money-market funds have disappeared in Japan after two decades of zero-rate policies, where scarcely 20 years ago, Japan held the world record for money-market assets under management. Fixed-income funds are having the same problems in Japan, as well as in Europe, where rates are very low and staying there…

Key question: Is the low-rate environment a real megatrend, in other words a durable situation? When we talk about interest rates, we can distinguish between different types: market rates, administered rates, theoretical rates…

- **The Equilibrium rate**: the interest in line with fundamentals,
- **The Market rate** at which transactions take place,
- **Short term rates**,
- **Long term bond yields**,
- **Key rate**: the central banks' rates,
- **The Natural rate**: the interest rates that balance savings and investment when growth is at its potential,
- **The Neutral rate**: at the potential growth rate, the neutral nominal natural rate is equal to the neutral real rate, plus the central bank's inflation target,
- **The Nominal rate**: the rate at which a contract is set,
- **The real rate**: the nominal rate minus inflation,
- **The discount rate**: the interest used, to name a few, to value assets.

What is remarkable in the current situation is that all of these rates have declined sharply, for cyclical reasons, but also for structural reasons, and for reasons associated with central banks' strategies…

The "major" structural factors behind this include:

- **The shrinking working-age population and/or the decline in activity rates**. This is a reality in most advanced countries and in China as well, an old before being rich country,

- **The slowdown in the increase in technical progress, which is reducing productivity gains**. This is, with demography, a topic usually mentioned by the supporters of the secular stagnation thematic,
- **A massive increase in inequality which represent a burden on potential growth**, a theme developed in particular by Robert Gordon,
- **The decline or the stagnation of real disposable income** (then comes the role of wage policies and taxation),
- **The impact of the debt burden**. The excess of credit had boosted growth artificially in lots of countries (United States, Spain amongst others...) until the 2008 financial crisis. Widespread deleveraging that followed has dragged down growth, while economic policies hampered by debts, must still support indebted entities, especially governments, and can no longer counter the economic cycles. But the deleveraging is still to come, should we refer to debt indicators, private, public or total debt depending on countries. In other words, debt is keeping the natural interest rate very low.

The macroeconomic stability of such a regime requires low interest rates, and this should last for a while, because these changes are more structural than cyclical. Debt accumulation is another factor keeping rates at low levels and pleading against any massive interest rate and bond yields increases.

But we also have to admit that the bond market has reached excessive levels, driven by four factors:

1. Rationality: low growth and low inflation are two unquestionable and rational elements that justify the low level of interest rates.

2. Confidence: This is provided by central banks, including asset purchase programs that push and keep rates lower than "normal" levels.

3. Complacency: globalization (capital flows), regulation (which pushed some types of investors towards bonds) and the search for safe assets (US Treasury bonds or German bonds) have fostered complacency. These drivers seem to be irreversible.

4. Difference or perception of difference: Many people think that this time is different.

- Interest rates are low for a long time, and the impression that market conditions (rates) will never change
- The ultra - accommodative monetary policies did not have an impact on inflation and growth expectations, reinforcing the thesis of "secular stagnation".
- Central bankers see a complete cycle pass without ever being able to significantly increase rates

- Policy makers have no choice but to keep the cost of debt servicing as affordable as possible
- Finally, with regard to households, the decline in real disposable income in many countries is pushing for savings, not consumption.

These four prerequisites remain topical, but we must not underestimate the changes taking place at present:

1. Monetary policies have come to an end … and **"the era of low rates forever is over"**
2. **The big disinflation period is over**
3. **QE brought interest rates into unfamiliar and uncharted territories** … and it's hard to imagine that these programs will endure indefinitely
4. **The debate on productivity gains**, which determines the potential growth and therefore the equilibrium and natural levels of interest rates, **is unclear**.

Where do we stand? There are four positive camps, and three negative camps (M. Friedman said once that if you have a problem and ask the solution to 10 economists, you will have 11 answers …)

- **Positive # 1: Some studies reject the inevitability of secular stagnation and show that even in Europe technological progress (total-factor productivity) is not faring as poorly as generally claimed**, even if there are significant differences between countries; the duality of some economies and gaps between regions/areas/countries hide a reality that is actually more positive than one might think;
- **Positive # 2: Others believe that we are not yet able to correctly measure the effects of the Industrial Revolution on productivity, as such effects may only appear in the future**. It should be reiterated that over the course of history, it has taken decades before new techniques/technologies began spreading to the rest of the economy. However, it should be also noted that the spread of tools / technologies / inventions / innovations is now faster than ever before and that it is constantly accelerating: the telephone required 75 years after its invention to reach 50 million users and that to reach the same milestone, it took radio 38 years, TV 13 years, the Internet four years, the iPod three years, Facebook two years, the smartphone one year and the Angry Birds app 35 days! It also took more than 180 years before 90% of the countries adopted steam- and motor-ships, 120 years for the railways, more than 100 years for the telegraph and for the telephone, more than 70 years for electricity, more than 60 years for the automobile, more than 50 years for the plane, 20 years for the PC laptop, less than 20 years for the cellphone, and less than 10 years for the internet and the MRI (Magnetic Resonance Imaging). It also took 64 years for the plane to be

used by 25% of the American population, 55 years for the automobile, 46 years for electricity, 35 years for the telephone, 34 years for the VCR, 26 years for the television, 22 years for the radio, 16 for the PC, 13 years for the cell phone, 10 years for the tablet PC, 7 years for the internet, 3 years for the smartphone. For the artificial intelligence, it will probably be faster still. Everything is accelerating.

- **Positive # 3: According to some authors, today's problem is not that the pace of technical progress is slowing** (the aggregate productivity of the most innovative and productive companies is not falling). Instead, **the issue is the current difficulty in integrating new forms of productivity into economies and businesses**. It is a question of time.
- **Positive # 4: Others rightly advance that we cannot measure productivity gains because the phases that follow a recession always lead to a phase of "creative destruction**", to borrow the expression coined by Joseph Schumpeter. The positive effects would therefore be partially "obscured" by the inevitable damage. Once completed, the positive effects will be revealed.
- **Negative # 1:** Robert Gordon, for example, does not expect total-factor productivity to fall but rather to remain at a **low level as inequality and access to education** are two significant negative factors.
- **Negative # 2:** What further worries R. Gordon is that the effects of the Third Revolution and the related developments in information and communications technology began around 1960 and have already reached their peak: according to Gordon, **the benefits of the Digital Age were concentrated in the decade 1994-2004.**
- **Negative # 3: some tend to consider that the technological revolution will lead to destructive creation, and not to creative destruction...** here lies the debate on the percentage of jobs to be destroyed vs. the number of jobs to be created, the debate on the universal income... even Mark Zuckenberg supports this idea, as many others considering that only 20% of people might be employed in the future. It is not a question of potential growth, but a question of labour market structure, sustainability of the economic, social and political systems...

What should we make of all this? There is some truth in what is stated above, which makes our task all the more difficult. Play the bet that productivity gains will finally come thanks to the technological revolution.

In total, economies boost their productivity in two ways—micro and macro.

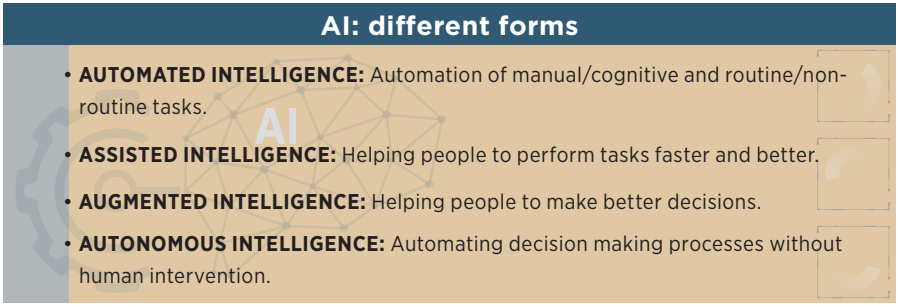
- **Microeconomic gains** take place within an enterprise as it invests, trains workers, innovates and competes.

- Macroeconomic gains occur when the overall economy reorganizes, shifting resources so they produce more than before.

Both types of productivity make us better off. Statistics capture productivity's capacity to increase consumption and leisure, but they ignore other gains, such as better working conditions, new and better products, and greater variety, grater safety and security, an eventually the (positive) impact on the environment (nothing new; see FRB Dallas (2003)).

Labour productivity improvements are expected to account for over 55% of all GDP gains from AI over the period 2017 – 2030. And 58% of all GDP gains in 2030 will come from consumption side impacts.

Forms of AI in use today include digital assistants, chatbots and machine learning amongst others.



As humans and machines collaborate more closely, and AI innovations come out of the research lab and into the mainstream, the transformational possibilities are staggering.

AI is undoubtedly a game changer, and according to PwC, what comes through from all the PwC analysis is just how big a game changer. "*AI could contribute up to $15.7 trillion to the global economy in 2030, more than the current output of China and India combined. Of this, $6.6 trillion is likely to come from increased productivity and $9.1 trillion is likely to come from consumption- side effects*".

According to PwC, global GDP will be up to around 15% higher in 2030 as a result of the accelerating development and take-up of AI. The economic impact of AI will be driven by:

- Productivity gains from businesses automating processes (including use of robots).
- Productivity gains from businesses augmenting their existing labour force with AI technologies (assisted and augmented intelligence).
- Increased consumer demand resulting from the availability of personalised and/or higher-quality AI-enhanced products and services.

There is a lot of questions remaining at this stage:

- When will central banks reverse seriously their monetary policy?
- Is secular stagnation a fatality?
- Is inflation a real threat?
- Is the relative weakness of "productivity" a mystery? If not, will potential growth come back to old standards ... or event higher thanks to the "technological revolution?
- In other words, are interest rates still stuck at such low levels?

Whatever the final outcome on productivity and the answers to all these question, the implications of the low interest rate environment for the asset management business model are many and asset managers already had to adapt processes and strategies:

- With negative short rates eliminating returns and advantages in terms of macro-hedging, the concept of "risk-free asset" needed to be revisited;
- Portfolio construction had to be re-examined, especially in terms of the role and share of government bonds;
- Portfolio diversification had to be redefined, as some correlation corrections (already unstable) have been structurally modified;
- The number of funds it is feasible and beneficial to hold had to be re-evaluated;
- The management fee structure had to be revised—downward;
- Transaction execution quality should be improved;
- Focus had to be placed on advisory services, which are a differentiating factor.

There are also various solutions aimed at improving portfolio returns:

- We must accept longer portfolio durations to go and look for higher, more promising returns;
- We must accept more credit risk (more bonds with spreads, lower average ratings… or both);
- We must add leverage into portfolios, but do so in moderation (in other words not replicate the situation of 2007-2008),
- We must use the distortion in yield curves or spreads;
- We must look for undervalued assets, because they've been largely abandoned by investors: sooner or later, these under-valuations will be corrected;
- We must find assets with higher yields and lower volatility, or higher collection rates (this is very often the case with ABS, infrastructures, and private debt in general);
- We must agree to add a "currency" component to the portfolios, because the foreign-exchange markets quite often provide the easiest and most liquid way to play off of major events (see Brexit, EMG markets, monetary policy reversals, and so on);
- We must capture liquidity premia (but provide liquidity mechanisms in the funds);
- We must revise portfolio building with respect to the usual non-optimal, underperforming benchmarks (these are the Smart Beta approaches);
- We must use the new Big Data / Smart Data environment to better understand information and trends;
- We must do a better job of evaluating investment factors, those that, beyond correlations and asset classes, determine performance (these are the so-called "factor investing" strategies);
- We must invest in Alternative Risk Premia or ARP, an appropriate method for avoiding a weak correlation or decorrelation among the different asset classes;
- We must allocate more risk to absolute return strategies, and procure the resources (appropriate risk budgets) to seize investment opportunities.
- Finally, we must focus more on real assets (real estate, private debt, infrastructure debt, investment capital, private equity), which, by their positioning in the cycle (inflation or growth), their correlations, their diversity, their liquidity premium… have a special appeal for asset allocation, especially in times of crises (Ph. Ithurbide (2017)). So, we get a better understanding of investors' temptation to move toward less-liquid assets, precisely to seize illiquidity premia and improve return on the portfolios. This is precisely what we're offering our clients, with the emphasis on business lines like private debt, private equity, real estate, and loans. But to do this, we must have a critical

size and a local presence: that's the only way we can access deals and form partnerships, potentially with expert contacts. Concentration, tighter margins, and competition among asset managers all come from this drive to be more competitive / profitable

4.2.Challenge # 2. The capacity to adapt to long-term structural trends

Another important issue is to adapt the product line to the major long-term structural trends that are emerging, like the technological revolution, climate change, the growing popularity of investment products that stress social, ethical, and behavioural values, demographic issues (ageing populations; understanding of Generations X, then Y, and soon Z, generations that are very different from the previous ones and very different from each other as well...). The search for yield is not the only thing driving investors. Structural changes in the global economy (which are called megatrends) provide indisputable opportunities, which management companies can seize. Megatrends are disruptions, and therefore investment opportunities. They have far-reaching, lasting, global impacts. Investing in megatrends amounts to investing in "winning" futures with methods that are different from the usual methods; it also means being more exposed to secular growth, reducing exposure to purely cyclical factors, and moving away from traditional investing, which occur in a weak-growth environment. It's also a good way to get some distance from themes of secular stagnation, find a better risk/return ratio, and move away from the low-rate environment. Finally, it means having the option to profit from thematic approaches and investing where risk is still being rewarded. In sum, **megatrends represent game changers, and / or disruptive events ... but in any case, they also represent investment opportunities.**

Megatrends and disruptions: challenges and opportunities	
Key trends	**Some themes**
Demographic trends	Ageing population Rising middle class Urbanisation and migration Infrastructure needs Increasing role of women New generations (X, Y, Z)
Macroeconomic trends	« Secular stagnation » EMG markets and capital flows (inflows and outflows) Gaps on wealth between countries (the « global divide ») Economic and social inequality as regard the access to, the use of, or the impact of information and communication technologies (the "digital divide")
Technology and trends	Watsonisation (taking advantage of cognitive computing, Artificial Intelligence) Googlisation (take advantage of the availability of a greater volume of data) Amazonisation (exploiting the power of platforms) Uberisation (hatching new business models) Twitterisation (doing business in an increasingly connected and collaborative world)
AM industry trends	Regulatory changes (AM as systemic risk?) E-trade The expansion of passively managed portfolios The expansion of real assets and alternative investments Concentration of the AM industry SRI SMART Beta Factor investing Alternative Risk Premia

What's Amundi doing? Two specific experiences, among others, deserve to be pointed out:

- Among the megatrends, the climate theme is very dominant, and there's a lot of talk about the **energy transition**. However, it is not easy to get into this highly technical theme and attract capital. Based on this finding, Amundi and EDF have signed a partnership that can be summed up like this: EDF selects promising energy projects on a technical basis (originality, feasibility, sustainability, advisability), and Amundi provides funding through its network of large international institutional investors that want to diversify their portfolios better and get in on this "megatrend" theme.
- **Socially-Responsible Investing (SRI)** is another of the major areas of expertise that is a response to a megatrend (the climate, ethical

and social values, and other themes). Amundi offers one of the most complete ranges of solutions on the market. This is why we are number one in Europe in this area, with respect to assets under management and surveys that rank management companies according to the quality of their research. We help our clients in defining their SRI policy, in setting their frame of reference (their investment universe), in calibrating and monitoring their risk, in building their portfolio (specifically, the average rating in terms of environmental, social, and governance criteria), their reporting, their policy of excluding the most controversial stocks, and their Best-in-Class policy (selection of the best issuers or companies according to precise criteria). Amundi also helps them in their engagement policy, their controversy management, and their communication on impact investing. In short, it's a multi-faceted, complete range of solutions, adapted to each client. This is necessary, because they are increasingly blending the Best-in-Class, exclusion, and thematic approaches with or without limit. We have developed the methods for supporting them down to the finest level of detail.

1. Investing in long-term themes does not fit in with a traditional investment approach.

In "traditional" investment, benchmarks are given top billing, and investing is fairly easy: liquidity, regions, and sectors are well defined. Admittedly, the benchmarks are less than optimal, because they give past winners a leading role.

Thematic investing is quite different:

- It does not involve any ex ante view in terms of benchmarks;
- The idea is to focus on future winners: no more benchmark constraint (specifically in terms of market cap), no more predefined regional or sectoral constraint. Note, however, that sectoral and regional diversification is still possible;
- Thematic investing offers a certain decorrelation with traditional betas, and with investment factors, which is an important asset;
- These are real long-term investments, in a world dominated by the short term (the average holding period for a stock has gone from 48 months in the 1950s, to eight months in 2000, and... 22 seconds in the early 2010s);

When we speak of future themes, we think of innovative processes, which we'll find in the large companies but also in small businesses. There comes the trade-off between Large caps vs SMID caps

An innovative process in biomedical, for example, will most likely be present in large pharma companies (but amid other, less innovative, less

promising (or unpromising) processes), whereas it will probably be the sole activity of an SME: no dilution in the investment. An example: skin graft. When one cannot use the skin of the person, we normally use the skin of pork ... or more recently the skin of fish... a promising approach, cheaper and with a lower rejection rate. Then one can find a company in Brazil (using the skin of tilapia fishes) and a company in Iceland 100% dedicated to this technology...

2. How to "play" the megatrends? There are so many investment themes. A few examples (M. O'Sullivan (2013):

Theme 1: When we talk about **urbanisation**, we think:

- About building (choosing businesses that are exposed to infrastructure, home and office construction, and urban mobility, in the emerging countries as well as the developed countries);
- Smart cities (carefully choosing the leading or promising businesses in the development and management of smart networks, traffic management, escalators, air conditioning, all sectors that should benefit from the emergence of smart and sustainable cities).

Theme 2: Overpopulation is bringing about major changes in:

- Energy management (selecting businesses that are exposed to new trends in global energy consumption, including the increased demand for energy in the emerging markets and the new energy sources);
- Food management: investment will be needed in technologies that provide effective solutions for increasing agricultural productivity, including farm machinery, precision farming, crops, and fertilizer;
- Water management (investing in the leading water treatment, filtration, supply, and distribution companies, and in companies that are innovating in seawater desalination).

Theme 3: In terms of the **health** and **ageing** of the population, we naturally think:

- About health care (selecting companies exposed to the new trends in diagnosing and treating illness, particularly age-related illness, as well as companies that provide access to care in the emerging countries, personalised medicine, and cyber-healthcare;
- About lifestyles (selecting companies that do business in senior activities, healthy eating, and dedicated cosmetics).

Theme 4: In the area of **networks** and **automation**, we think:

- First, about companies exposed to hyper-connectivity, including data storage, person-to-person and person-to-machine communication, or wireless modules and devices;
- Second, control machines and systems for increasing the accuracy and

efficacy of manufacturing processes, including man-machine interface, industrial robots, and self-driving cars.

Theme 5: The growth of the **emerging world** has a major impact on:

- Consumption (favouring local and multinational companies, with solid industrial positioning, that should benefit from the steady increase in consumption in the emerging markets);
- Production (favouring industries in the emerging countries that penetrate the global goods and services markets by means of unique business models, brand value, or competitive advantage);
- Some developing markets, such as Africa and South Asia, should also be prioritised (choose companies exposed to the next wave of growth markets).

Theme 6: Globalisation affects several areas:

- Transport (choose companies that operate between emerging economies, a high-potential area, whether in sea shipping, air freight, or more generally transport infrastructure);
- Tourism (industries exposed to the global travel industries, including reservation services, hotels, and resorts, and passenger airlines).

Theme 7: The **management of natural resources** is an especially important issue.

- The search for renewable resources becomes essential (choose producers of alternative energy sources, including wind, solar, hydroelectricity, and biomass);
- Same for waste management and recycling (collecting, transporting, transforming and recycling waste);
- Same for the search for new materials (producers of advanced composites, nanotechnology, and organic or biodegradable material).

Theme 8: Climate change will increasingly push us toward the search for solutions for dealing with its harmful effects, including weather insurance, resilient infrastructure, and early warning systems.

In sum, investing in megatrends is:

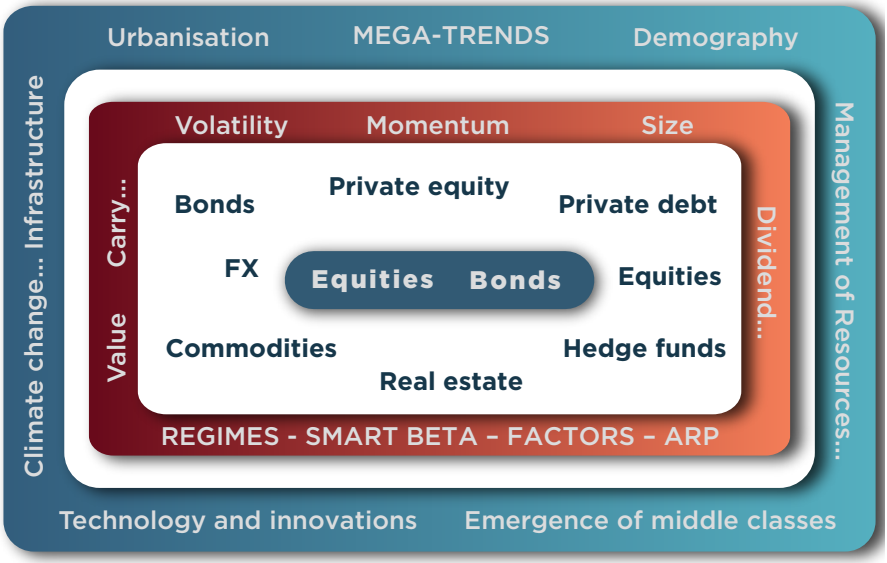
- Investing in future "winners" with methods that are different from the usual methods,
- A good way to distance yourself from secular stagnation themes,
- Gaining greater exposure to secular growth,
- Reducing your exposure to purely cyclical factors,
- Moving away from traditional investing, which is done in a weak-growth environment,
- A good way to find a more favourable risk/return ratio,
- A good way to distance yourself from the low-rate environment,

- Profiting from thematic approaches (a supplement to factor investing approaches), and
- A good way to invest where risk is rewarded.
- A good way to add value to asset allocation combining traditional asset classes (cash + bonds + equities) and all asset classes (cash + bonds + equities + real assets (real estate, private equity, private debt...), and even for those having decided to complement their approach with SMART Betas (to optimise benchmarks), Factor investing (to play factors instead of asset classes) and Alternative Risk Premia (to capture risk premia and to play transverse characteristics).

3. Megatrends, SMART beta, factor investing, real assets, equities, bonds, etc. are complementary approaches

The graph below presents the different way to allocate asset and risk

- In the very traditional - and very old-fashionable – view, investors tended to allocate assets and risk between equities and bonds (50/50, 60/40...), with cash being considered as a way to park cash and to reduce global risk;
- A more modern view dealt with the inclusion of additional asset classes, such as commodities, FX, real assets, hedge funds ... in order to benefit from additional opportunities, different correlations, different timeframe ...;
- For investors wanting to take distance from traditional benchmarks or play assets classes differently, detecting regimes (volatility, trends),



using SMART betas approaches (to optimise benchmarks), factor investing (size, momentum, dividends, value ...) and playing Alternative Risk Premia (ARP) make sense;

- Last but not least, get away from "secular stagnation themes" and play "secular growth themes" lead to megatrends stories such as demography, urbanisation, infrastructure needs, emergence of new generations, technology, innovations, climate change, SRI...

These different approaches are competitive in some way, but they are also complementary, giving the possibility to combine assets, risks, correlation, benchmarks optimisation, different time horizons, thematic...

4. Infrastructure, a megatrend combining megatrends: real assets, emerging markets, demography...

When we refer to megatrends in relation with development / urbanisation / emerging countries / ... etc ... we immediately refer to infrastructure needs. According to the Global Infrastructure Outlook report of the independent firm Oxford Economics (2017), the cost of providing infrastructure to support global economic growth and begin to narrow the infrastructure gap between countries amount to $ 94 trillion by 2040, or about 40 times the French GDP. Add the Sustainable Development Goals (SDGs) of universal provision of clean water, sanitation, and electricity, and the total cost rises to $ 97 trillion.

To determine investment needs, the authors usually rely in particular on the UN population projections: 9.2 billion inhabitants in 2040, which is about 2 billion more than today... a population increase of almost 25% that will not be equitably shared between countries, between continents, and between cities and rural areas: if the rural population is expected to be stable over the next 20 years, one can bet on an increase in the population of cities of almost 50%. Such population growth in urban areas should lead to massive investments in infrastructure, in particular to reduce the congestion phenomenon already present in some countries.

This is a real challenge for emerging countries in general, but it should be noted that investment needs vary considerably from one continent to another. Asia should be the region that needs the most investment by 2040, followed by America.

According to the Oxford Economics report, three of the five countries most in need of infrastructure investment are in Asia. These are China, India and Japan (these countries represent 39% of global infrastructure investment needs). For China alone, the necessary investments are estimated at 28,000 billion dollars, more than half of the needs in Asia and almost one third of the total: for the period 2016-2040, the infrastructure investment needs amount more than USD 50 000 billion in Asia, over USD 20 000 billion in America (of

which EUR 12 000 billion in the United States), close to EUR 15 000 billion in Europe, EUR 6 000 billion in Africa and EUR 2 000 billion in Oceania. It seems that European countries meet standards in terms of infrastructure needs, but Russia is nevertheless the fourth country in the world among those studied that has the biggest needs.

The Oxford Economics report is very crucial, because it is the very first time we have data about what each country needs to spend in each sector, and importantly – the gap between what needs to be spent and current spending trends.

The United States is forecast to have the largest infrastructure investment gap – the difference between investment needs and current trends in investment – of $3.8 trillion, double the next largest of China at $1.9 trillion, followed by Brazil at $1.1 trillion and Russia at $0.7 trillion.

Closing the gap and meeting the Sustainable Development Goals will require spending as a proportion of global GDP to grow from the current level of 3% to 3.7%.

The majority of global infrastructure investment gap is in the road and electricity sectors.

- There is an $8 trillion infrastructure investment gap in roads, which represents more than half of the total global infrastructure investment gap.
- The electricity sector represents the second largest infrastructure investment gap at $2.9 trillion, and the majority of that gap is in developing and emerging countries.

In fact, services in basic infrastructure such as roads, water and sanitation systems, or electricity networks are lacking in many developing countries. Some 60% of the world's population do not have access to the Internet, 1.2 billion people live without electricity, more than 660 million people do not have access to safe drinking water (by 2025, 1.8 billion people will live in areas with absolute water shortages), and one person in three has no toilets or sewage disposal facilities. In addition, countries are faced with the urgent need to invest in infrastructure resilient to climate change, as well as in renewable and efficient energy. At least one-third of the rural population in the world is not served by all-weather roads

All in all, the search for jobs, the huge housing needs, the rapid growth of the world's population and overcrowding, the growing share of the urban population, the growth of the middle classes, the continuous rural exodus, immigration, the increasing number of refugees, water management, energy needs ... all these factors highlight the problems of adequacy between supply and demand for infrastructure. Beyond these global figures are the country and sector specific stories that represent the real challenge of finding and funding infrastructure projects that enhance people's lives.

Due to excess savings, very low interest rates and insufficient return on financial assets in advanced countries, one would expect more substantial capital flows from advanced to emerging markets, particularly on infrastructure projects. It is not really the case, for at least reasons:

First, programs to meet the infrastructure needs of emerging countries compete (and will also compete in the future) with those in developed countries.

Second, the nature of the risks of the projects in question. Projects in advanced countries are considered less risky. Infrastructure investors face a wide range of risks in any country, but mostly in emerging countries, where the huge gaps exist, especially given long construction and payback timeframes: construction risks, completion risks, operational risks, transfer risks, macroeconomic risks, exchange rate risk, tax policy risk, legal risks, political risk, regulatory risks, ... In developing countries – and in some emerging countries to a lesser extent, though – where governance and market institutions are may be weak or dysfunctional, individual project sponsors or investors cannot manage or hedge part of these risks ... and cannot take a risk of failure. For example, the various legal risks such as the instability of laws, the instability of contracts, corruption, the loss of income that we no longer receive or that we can no longer repatriate cannot be hedged.

Third, the lack of capacity of banks to finance these projects. The Great Financial Crisis has reinforced the need to solidify the capital structure and to reduce risks in the portfolios, while the regulation continued to be more and more restrictive.

Fourth, the constraints investors face. SWFS, insurers, big investors in general have more and more capacity, *in theory*, to finance these deals, especially as regard the necessity to chase returns and spreads to overcome the low rates / low yields environment. But it is different *in practice*, due to constraints on duration, ratings, risk...,

- Investors tend to select projects with duration below 7/8 years and are reluctant to invest in infrastructure deals over 20-year duration:
- They tend to select first OECD projects vs. non-OECD projects:
- They prefer safe *brownfield* infrastructure projects (projects that are already built and operating) vs. *greenfield* infrastructure projects (projects that are under development);
- And when they accept to invest in greenfield infrastructure projects, the large majority accept to invest in senior, secured and if possible guaranteed debt. The riskiest tranches are often neglected.

As a consequence, infrastructure deal in advanced countries are better received by advanced countries' investors and flows from advanced to emerging and developing countries do not cover the needs, it is the least we

can say ... Developing products / structures / vehicles giving the possibility to alleviate or skirt the constraints (duration, rating, guarantees, risk...) developing standardisation, reducing specific risks which are not easy to hedge (legal risk, contracts risks, repatriation risk, payment risk, corruption ...) and linking better and more the public (e.g. the MDBs - Multilateral Development Banks) and private sectors is therefore inevitable.

In total, megatrends represent major issues for the coming decades, but also big opportunities for the asset management activities, as the table below points out.

Megatrends:
Issues and Opportunities for asset management

Issues	Opportunities for asset management
DEMOGRAPHY	
– Food issues, – Issues related to aging – An impact on the growth of the population – An impact on health – The role of women – Globalization – The growth of the middle class – The role of emerging markets – Time spent at work – Urbanisation – The energy – Life expectancy – Transportation.....	– Retirement products – Infrastructures – Real estate – Investing in thematic...
ENVIRONMENT	
– The search for new materials – The rise of environmental risks – Waste Management – The change of behaviours – Impacts in the field of construction – Alternative energies – Security issues for resources – Energy storage – Resource management – Urban pollution – The development of «smart cities» – The recycling...	– Rising adoption of ESG criteria – The decarbonisation of portfolios – Water, probably the next «factor» built into the portfolios – Adapted tailor-made referential to clients – The management of controversies – Voting policies – The best-in-class management – Exclusion management – Energy transition – Investing in thematic...

Megatrends: Issues and Opportunities for asset management	
Issues	**Opportunities for asset management**
TECHNOLOGY	
– Big data – The speed of technological change – Genetic research – New innovations – Nanotechnologies – The robotics – The knowledge economy – The micro-surgery – Automation – The networks...	– Robotic Process Automation (RPA) – Becoming data experts – Gain in efficiency of business models – New set of expertise – Investing in thematic...
SOCIAL, BEHAVIOURAL AND ETHICAL VALUES	
– A stronger demand for immediacy and the development of different connection and communication tools – A desire for simplicity – A desire - and the need - to better manage cultural differences – Better management of social differences – The strong growth of media and social networks – A greater desire for transparency – A request for customization – Managing political differences – Strong ethical values, such as respect, integrity – A greater desire for equality – A greater desire for social justice...	– Platforms – Robo-advisors – KYC approaches – Diversified approach to the different generations – Social networks / marketing – Investing in thematic...

4.3. Challenge # 3. The capacity to adapt the business model to the technological upheavals of the current industrial revolution

Tech remains one of the largest sectors in the world economy, but actually, in today's new economy, practically all corporations – small and large – are in technology, directly or indirectly.

What does this mean for asset management? In the past few years, management companies have developed the application of information technology to promote portfolio management, achieve economies of scale, and make their complex transactions more efficient. But they should not (they

cannot) stop there, because technology also has vast potential for enriching client relations, developing new innovative products, and reinventing business models, and it is precisely those opportunities that many investment companies have begun to exploit.

Over the past 50 years, many innovations have been scalable rather than revolutionary, based on reconditioning products or improving certain processes. In rare cases, investment companies have applied technology to reinvent business models or value chains. However, they cannot ignore today's major trends and they must procure the means of remaining competitive in the coming years, rather than staying inert.

Ross Ellis and Jim Warren (2017), of SEI Investment Management Services, consider that there are five radical trends that asset managers will be facing (they already are, actually), trends they must grab onto if they want to stay competitive in the years to come: Watsonisation, Googlisation, Amazonisation, Uberisation and Twitterisation.

Trend # 1: The development of cognitive computing (WATSONISATION):

Artificial intelligence has advanced; cognitive information systems can learn to analyse and interpret massive quantities of data. To give some examples, Google already wrote poems and novels (bad ones ... so far). Language modelling is making quick progress at present. Note that a machine is also able to reproduce any master's painting. Next step will the certainly the capacity of a machine to do a new painting with a master's technique (i.e. a new Picasso, for example) and good poems and novels. Will the machine be able to detect its own errors and to correct it? If so, machine would have human intelligence... some data scientists consider that Artificial intelligence could be considered as the "end of thought", no more no less...

Artificial Intelligence (AI) is a disruptive technology with an unquestionable long-term trend, and massive potential. PwC predicts that AI will add USD 16 trln to the global economy by 2030.

Artificial intelligence covers four different areas

1. **AUTOMATION AND ROBOTS** Field of research that creates programs able to complete tasks automatically. It reduces or eliminates the intervention of humans
2. **IMAGE RECOGNITION** Field of research that gives a machine the ability to process, understand, and recognize what it is seeing
3. **MACHINE LEARNING** Field of research that gives computers the ability to learn without being explicitly programmed
4. **SPEECH RECOGNITION** Field of research that teaches to machines how to communicate with humans

According to McKinsey, there are five factors affecting pace and extent of adoption of automation:

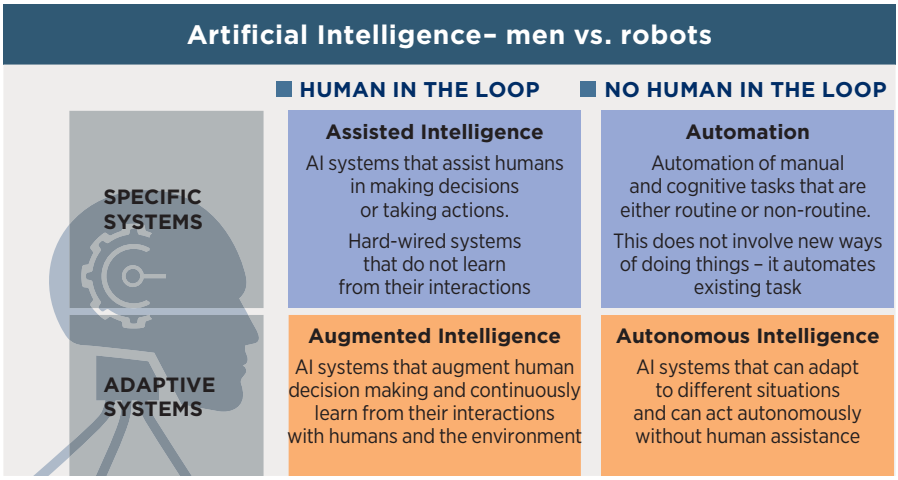
The technical feasibility: technology has to be invented, integrated, and adapted into solutions for specific case use;

The cost of developing and deploying solutions: hardware and software costs;

The labor market dynamics: the supply, demand, and costs of human labor affect which activities will be automated;

The economic benefits: include higher throughput and increased quality, alongside labor cost savings;

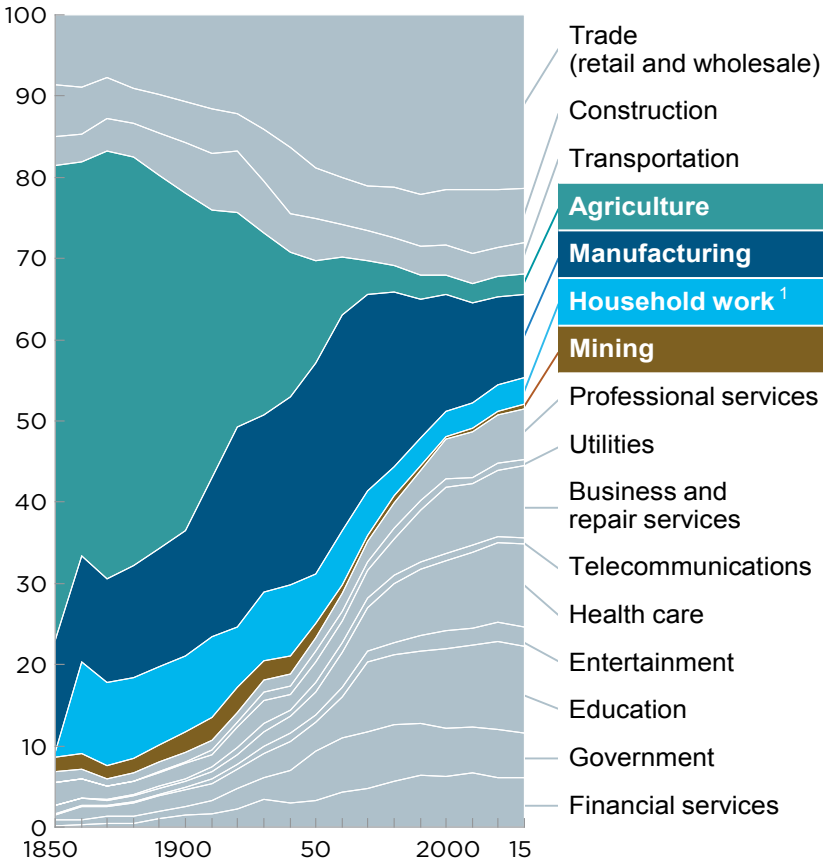
The regulatory and social acceptance: even when automation makes business sense, adoption can take time.



Source : PwC (2017)

The impact of automation varies by a country's income level, demographics, and industry structure, it is a fact. But history recalls that technology has created large employment and sector shifts, but it also creates new jobs (see graph below). In total, large-scale sector employment declines have been countered by growth of other sectors that have absorbed workers (McKinsey, Dec. 2017).

Share of total employment by sector in the United States, 1850–2015



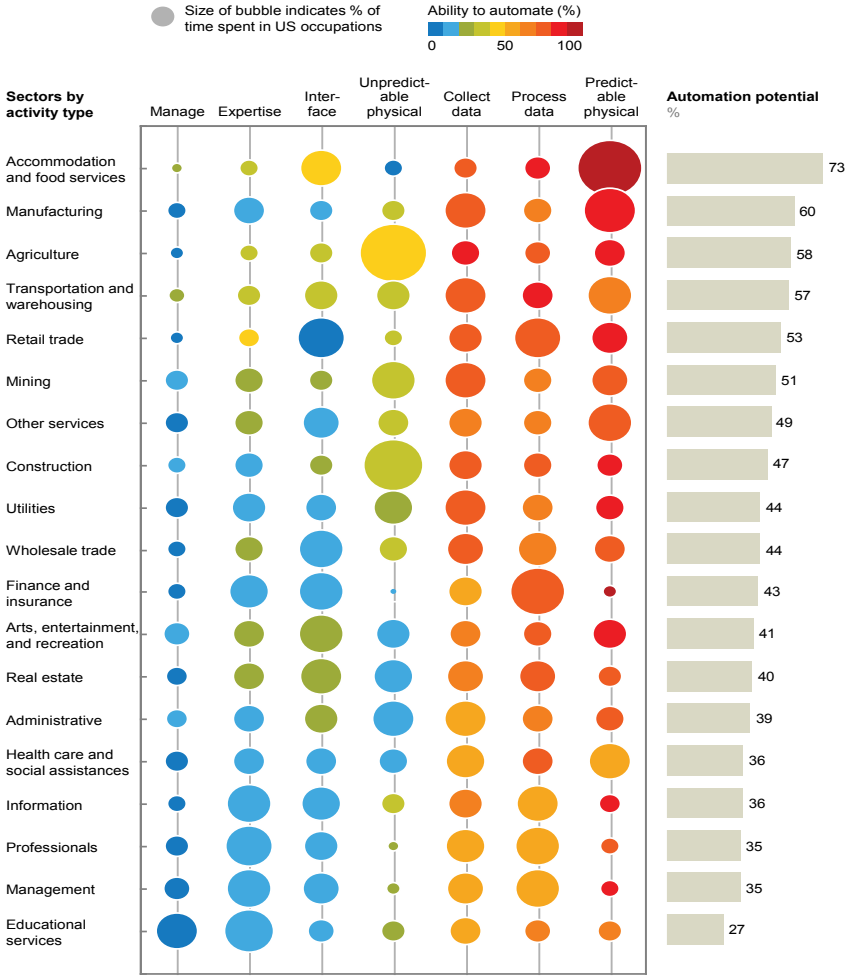
1. Increase from 1850 to 1860 in employment share of household work primarily due to changes in how unpaid labor (slavery) was tracked.
NOTE: Numbers may not sum due to rounding.

Source: IPUMSUSA 2017; US Bureau of Labor Statistics; Groningen Growth and Development Centre 10 -Sector Database; Moody's; IMPLAN; US Bureau of Labor Statistics; FRED; McKinsey Global Institute analysis

As regard asset management, the systems will (and some already do) automate interactions with clients, conduct all types of research, detect security risks, and solve complex problems. Robo-advisors, which we're developing at Amundi, may be the vanguard of a broader trend toward automated advising. According to Deloitte, there should be 7 trillion US dollars in assets under management by robo-advisors in 2025.

Will passive management need portfolio managers in the future? Will artificial intelligence "clever" enough to replace active Portfolio managers?

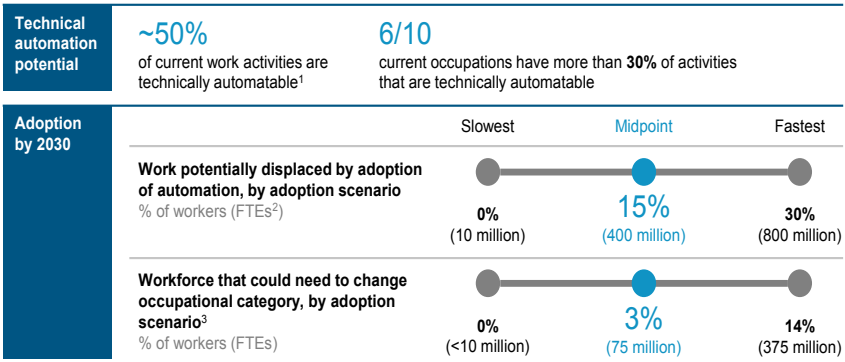
Technical potential for automation across sectors varies depending on mix of activity types



Source: US Bureau of Labor Statistics; McKinsey Global Institute analysis

McKinsey (2017) estimates that in the United States, 5% of jobs are fully automatable while 60% of all occupations have at least 30% of technically automatable activities. All countries are concerned, but to varying degrees (see appendix). Automation will therefore change many professions - partially automating them, for example - rather than replacing them. But in total, 800 million jobs could disappear in the world (see table below and appendix). In asset management, 40 to 50% of jobs would be totally or partially (at least 30%) automated.

Global workforce numbers at a glance



1 By adapting currently demonstrated technologies.
2 Full-time equivalents.
3 In trendline labor-demand scenario.

Source: McKinsey Global Institute analysis

Trend # 2: The availability of a greater volume of data (GOOGLISATION):

"We live in an age of data abundance". And the power of search algorithms coupled with the collapse of data storage costs and cloud computing, has given each of us "unlimited" access to the world. Yet this abundance of information is also an incredible challenge: extracting value from all those data. The most successful managers are those who bring data sophistication to multiple aspects of competitiveness, not just portfolio management. To give you an idea of the stakes, here are a few figures:

- In 2011, Google was already processing 24 petabytes of data, four times the total content of the US Library of Congress.
- According to data from 2014 (which is without a doubt far below today's reality), every minute, users share 2.4 million pieces of content on Facebook, send nearly 300,000 tweets, upload nearly 75 hours of new video on YouTube, complete 85,000 online sales on Amazon, exchange 350,000 photos on WhatsApp, send more than 200 million messages, spend nearly 25,000 hours on Skype connections, and post 220,000 images on Instagram...
- Today, there are more than 40,000 Google searches every second - that's 3.5 billion per day, and 1.2 trillion per year!
- Since 2010, the world produces in 48 hours more information than the one produced since the humanity started to write (around 5000 years ago). 98% of this information is digitalised, and 70% of it comes from

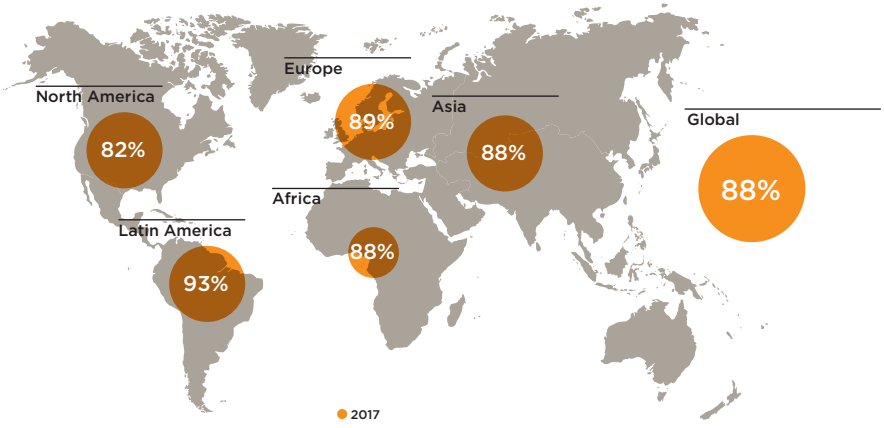
individuals and is compiled and analysed by private companies. An expert from IBM recently mentioned that more than 80% of available data were still unstructured.

- According to Betts – Savi - Shen (2015), the 4000 daily broker reports would mean close to 40,000 pages per day, which requires powerful analytical tools.
- Now we're seeing companies that translate legal text that can process thousands of pages in a few hours, companies that extract data from 500-page documents in less than a second, others that process stacks of fund documentation in less than 30 seconds (compared to 30 hours in the past).

The world of FinTechs, RegTechs, and other InsurTechs is well on its way. Two examples:

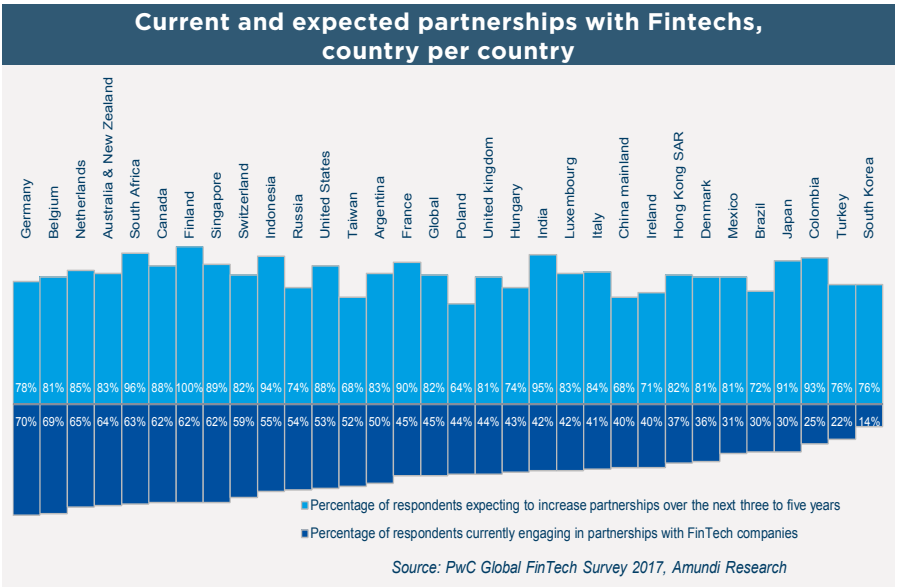
- According to the 2017 PwC global FinTech survey, the vast majority (88%) of participants admit they are worried that part of their business is at risk to standalone FinTech companies. Note that this survey covers a variety of areas of the Financial Services industry, including banking, asset management, fund payments and institutions, insurance/ reinsurance... i.e. more than 1300 participants from 71 countries and across six regions.

Percentage of incumbents who believe that part of their business is at risk of being lost to standalone FinTech companies within the next five years



Source: PwC Global FinTech Survey 2017, Amundi Research

- As a consequence, a large majority of participants, with 82% on average, expect to increase partnerships with FinTech companies over the next three to five years. This is true in all countries should we refer to the 2017 PwC survey. In some countries though, current partnerships tend to be an exception.



Trend # 3: The power of platforms (AMAZONISATION):

Amazon, Netflix, and other e-commerce companies have clearly demonstrated the inherent advantage of online markets: the more people use them, the more useful they become. Web-based platforms make it easier for consumers to search for products, compare and learn from other customers and other suppliers. Now, online platforms are rapidly developing around finance-related activities, and the e-commerce giants are also moving toward lending and management. In just 10 months, at its launch, Alibaba collected 90 billion USD in assets, deposited by 81 million investors. It looks as though this upheaval in the AM industry is a combination of threats and opportunities that they cannot afford to ignore. By way of comparison, about a decade ago, it took Vanguard about 10 years to arrive at the same result. Williams (2017) recently reiterated that platforms must have several essential features:

- They must be sophisticated, i.e. capable of processing all types of data and delivering them clean, reliable, and easy to use;
- They must be developed in the interest of supporting key functions: in the case of asset management, they must be useful to management, research, compliance, and marketing functions;
- They must be flexible, adaptable to different needs according to activity (management is not compliance, for example), and endlessly changing;
- They must have a high level of expertise, with analytical and calculating power in line with the richness of the data. It is probably in this sense that asset management is behind.

Trend # 4: Hatching new business models (UBERISATION):

It's estimated that just a few years from now, 40% to 50% of people will work for themselves, in the service sector, as consultants, in connection with platforms. In the United States, nearly 55 million workers are already in this situation - that's one-third of the labour force.

The traditional organisation model of AM is being remodelled with open architecture, specialisation, and outsourcing. Accelerating competition, rising costs, pressure on tariffs, margins, commissions, and the regulatory burden are now pushing asset managers to rethink their value chains. Companies like Uber (and China's Didi) in taxis, Airbnb in lodging, Spotify in music (streaming), to name just a few of these examples, suggest a new type of model - one where the driving force has the technology. Such companies create a network of participants who interact and participate in creating value. Not only does this model allow companies to achieve economies of scale with low marginal costs, but it also lets them improve the product, speed up the service, and even personalise it. But how? It's not necessarily easy to agree to outsource activities that were seen, not long ago, as being part of the core business: pharmaceutical companies are outsourcing some of their research (which is critical to their activity), Uber is the world's largest taxi service without owning a single car, and Airbnb "supplies" 1.5 million lodgings in 190 countries without owning a single hotel. **Can we imagine that the largest asset management service providers of tomorrow will not manage assets in the strictest sense, but will act as a driving force, simply recruiting asset managers?** We don't expect the asset management business line to disappear, but we do expect a radical change in job descriptions, with the arrival of platforms, big data, roboadvisors, and passive management robots (easy to replicate benchmark ... and easy soon to anticipate precisely changes in benchmarks also). What about active management? Does Artificial intelligence have limitation?

Will the current set-up Portfolio management – trading - research – risk – compliance – middle office – back office – reporting ... survive as such? Certainly not. Platforms, blockchain... etc... will force the business model to be in depth revisited.

Trend # 5: Doing business in an increasingly connected and collaborative world (TWITTERISATION)

The world of social digital platforms and interactive digital media has exploded, transforming the way businesses communicate with their clients and also learn from their clients. Management companies have been late to move into this new activities, but the industry is starting to catch up. Before the rise of these platforms, corporate communication was generally a one-way street. Now, any company, whether it be large, small,

local, and so on, can enter into a dialogue with its clients, its employees, its peers, and the whole world. New media is used to create the brand, increase penetration, reduce distances, improve client experience, get to know market trends better, test new products, and accelerate employee collaboration and innovation. The new media are giving the tools to make sure that investor client "training" programmes, content marketing, and advertising are possible and effective. Twitter and other social media allow to gather knowledge on the market. This goes well beyond the traditional information channels still used a few years ago.

How far can it go? This seems - at first glance - to be limitless (Google has already announced that it will eventually fight the "universal scourge" ... i.e. death) and, in some regards, frightening (everyone will have their own idea):

- "*Privacy is something which has emerged out of the urban boom coming from the industrial revolution*". As a result, "privacy may actually be an anomaly" (Vincent Cerf, chief internet evangelist – Google – 2013).
- "*I actually think most people don't want Google to answer their questions. They want Google to tell them what they should be doing next*" (Eric Schmidt, Chairman of the Board of Directors of Google – 2007)
- "*Only when we have their attention can we hope to win their hearts and minds*" (Eric Schmidt, Chairman of the Board of Directors of Google – 2011)
- "*Everything that is technically feasible must be achieved, whether that achievement is judged morally good or condemnable*" (Dennis Gabor – Nobel Prize in Physics, 1971)
- "*Science is on the brink of causing a catastrophe, the creation of two humanities evolving differently for the first time in the history of the species* " (Israël Nisand – professor of medicine, initiator of the European bioethics forum, 2013)
- "*I'm increasingly inclined to think that there should be some regulatory oversight, maybe at the national and international level, just to make sure that we don't do something very foolish*" (Elon Musk, 2014).

Part of asset management activities are based on figures: computing, accounting, risk control... being very precise and very accurate is absolutely crucial. Part of asset management activities are on the other hand based on concepts: brand, marketing, proximity of clients... As a rule of thumb, one can say that **everything that is repetitive might be mechanised. Everything that produces value (**portfolio management, research, risk management ...) **will continue to exist as such... this is true for any sort of business**.

As regard asset management, the Robotic Process Automation will be used for different functions, such as, for example (Buisson (2017):

- Trade processing (email writing and sending based on exception criteria, difference in price between investment manager and broker)
- Trade support (streamline of derivatives processing, trade validation)
- Reconciliations (comparison of data sets, launching of research queries)
- Information delivery (generating standard report, performing data quality checks)
- Financial reporting
- Transactions (KYC – Know Your Client)...

All in all, technology's repercussions on asset management activities are very significant and omnipresent:

- **Portfolio management could be extensively redefined** as cognitive computing and the resulting analyses more extensively use the resulting data and methods. Artificial intelligence, big data and platforms will impact the business models.
- **The product distribution process will also be extensively impacted** by strategies focused on data and online platforms.
- **Asset management companies have new opportunities to improve investors' knowledge** (risk culture, shared knowledge, better understanding of the business lines), engage more deeply with investors, and understand their ever-evolving preferences.
- **Companies having the capacity to develop such infrastructures and invest in innovation will undoubtedly have competitive advantages** that will be hard to counter.
- As investment activity becomes more data-driven, because of regulatory and investor requirements, **the quality of transactions and trading platforms** will be an increasingly important competitive factor.
- **Blockchain** in particular will make it possible to automatically enter any online trade and provide full transparency on all transactions: The Economist calls it "*a machine for creating trust, ... a shared, trusted, public ledger that everyone can inspect, but which no single user controls*"). By eliminating intermediaries and providing a reliable, transparent tool, blockchain (PwC 2016) can cut costs (fewer error reconciliations, greater simplicity), accelerate settlement (quicker validation), increase solidity (little risk of failure or error), and increase transparency (with rapid, simple, efficient, low-cost oversight).

Blockchain and cryptocurrencies : a common destiny? The future official position of central banks with be crucial...

Digitalisation is everywhere, including on cryptocurrencies. A cryptocurrency is a digital asset designed to work as a medium of exchange using cryptography to secure the transactions, to control the creation of additional units, and to verify the transfer of assets. The emergence of such currencies is directly linked to the blockchain technology. The bitcoin was the first one to be created, in 2009, and since then, lots of cryptocurrencies have emerged. As of November 2017, there were around 1300 cryptocurrencies. And with more than USD 130 bln market capitalisation, the Bitcoin was - by far – the most frequently used, followed by the Ethereum (USD 32 bln), the Bitcoin cash (USD 18 bln), the Ripple (around USD 9 bln), the Litecoin (around USD 3.6 bln), the Dash (around USD 3.2 bln), and the IOTA (around USD 2.2 bln).

These currencies are quoted every day, and some observers already consider they represent attractive investment opportunities:

- It is a way to diversify further the portfolios due to the weak correlation with equities: less than 5% correlation between S&P 500 and the DLT10 index (a cryptocurrency index with the top 10);
- Cryptocurrencies are fully independent of central banks, which might give a specific attractiveness in specific periods;
- Last but not least, they might be considered as an anti-inflation store of value, due to the limited volume issued..

Caution is required, however:

- **The cyber-attacks and the very high price volatility remain major drawbacks at the moment:** the price of Bitcoin has benne multiplied by 20 in one year, and it went from $ 10,000 on November 29th to 20,000 dollars on December 17th. A situation that strongly looks like a bubble...
- On the other hand, **these currencies are beginning to be decried, as they are energy-intensive.** According to some estimates, the bitcoin industry would use the equivalent of Ireland's electricity consumption. For others, this would represent 8 times the electricity consumption of France, or twice that of the United States (a single bitcoin transaction would consume the energy equivalent of 8 American homes per day). Bitcoin has significant electricity needs and generates greenhouse gas emissions. Recall that cryptocurrency works on the basis of a blockchain validation mechanism: to be authenticated, the currency is legitimized by a decentralized verification chain. They are "mining farms" that provide this service (these are places dedicated to bitcoin where hundreds of

machines run, especially in China, where more than 50% of the global "mining pools" are located).

- **Central banks are becoming interested in cryptocurrencies, and their views are not always favourable** (E. Lam (2017)). Randal Quarles, vice (chairman of the **Fed**'s supervisory committee, considers that cryptocurrency is likely to become an issue for monetary policy. **ECB** Vice-President Vitor Constancio is referring to a "tulipmania" (a bubble), Benoît Coeuré warns about the instability of the price and the links with tax evasion and organized crime. Mr Draghi for his part considers that the impact of cryptocurrencies remains limited and safe ... so far. The **Reserve Bank of India** and the **Bank of Korea** are hostile to Bitcoin, because they fear that cryptocurrency will be used for money laundering and terrorism financing. Elvira Nabiullina , governor of **Russia's central bank**, is fiercely opposed to any private currency, whether physical or virtual: according to Sergey Shvetsov, a deputy governor, the central bank even planned to block Web sites that provide access to bitcoin exchanges. The **People's Bank of China** has taken control of cryptocurrencies and banned trading. The **Bank of Japan** is still in the study phase. Mark Carney, governor of the **Bank of England**, speaks of a real revolution but does not think that the BoE will issue a digital version of the sterling anytime soon. The **Central Bank of New Zealand** believes in cryptocurrency, but not in the form taken by Bitcoin: more speculative than payment tool, it considers the current situation as a dangerous bubble. Same view in **Germany** and **Australia**, where the central bank governors are talking about speculation and not about payment. Same restriction also from the **Bank of France**: Governor F. Villeroy de Galhau recommends caution towards bitcoin because of the lack of public institutions in its governance, and he recalls that the examples of private currencies have always been badly finished in history. The attitude of **Morocco** is even more extreme: according to a recent statement by the governor of the central bank (last November), crypto-currencies violate the rules of exchange regulation, and any transaction is against the law and subject to sanction. As for the **Bank of Canada**, it considers cryptocurrencies as financial assets and not as real currencies. The Netherlands and the Scandinavian countries went a little further, experimenting with cryptocurrencies. The **Dutch central bank** has created its own cryptocurrency (the DNBcoin) to better understand how it works and recognizes the blockchain's interest in the settlement of financial transactions, including complex transactions. The **Central Bank of Sweden** and the **Central Bank of Norway** do not seem hostile to the introduction of digital currencies (e-krona). The **Central Bank of Denmark** has a different opinion, and fears of seeing the digital currencies facilitate

bank runs **were** mentioned. The **Bank of International Settlements (BIS)**, the central bank of central banks, recognizes the success of crypto-currencies, but also raised the risk of bank runs, which always goes hand in hand with a sharp contraction of bank deposits in particular. In other words, Bitcoin deserves a thorough analysis of the assets and especially the risks associated with it. All in all, **if the blockchain technology appears useful - and irreversible - to all central banks, it is not the same for cryptocurrencies**. Topics to be monitored closely...

- **The asset management companies will need people who have the right skills** for this new business environment.
- **They also need top-flight data specialists and developers of algorithms** adapted to trends in the business lines.
- **Every asset management company should do an audit on the impact of this new environment**, its capacity to integrate into this environment, and its internal capacity to make the necessary changes to adapt.

We are in the business of disruption. But as of now, there is no asset management company (nor any bank for that matter) anywhere in Forbes' annual ranking of the world's 100 most innovative companies.

4.4.Challenge # 4: The inevitable tighter regulatory environment

Regulation is tightening step by step, and it probably won't stop. These regulations involve just about every activity: funds, savings, ETFs, documentation, research, governance, insurance, securities sales, pension funds, disclosure, tax on trades, invoicing... their purpose is to protect investors and soon they will probably encompass systemic risk. Our complex world is driving us toward hyper-efficient data management... Meeting regulatory constraints is a must, and that requires money, skills, and an ever-growing workforce, in other words, investments. Not all asset management companies can secure these investments without difficulty, which is why they baulk at these tightening regulations.

Yet after focusing their work on the banks, regulators are now looking at other sectors, which are referred to in bulk as 'shadow banking' and suspected of carrying within them the seeds of the next crisis. In their sights: asset management. Are asset management companies and/or their funds systemic? **The next wave will depend crucially on the answer to this question.**

In this sense, the question is the same as for the banks: the weight of certain players on public debt, or on the equity market, or even on bank debt, makes them potentially systemic institutions. The sector inevitably attracts attention, for several reasons:

- Reason 1: *The size of the assets at stake*. In all, assets under management make up about 80 trillion, or one year of global GDP or three-quarters of banking assets, and they could stand at 400 trillion by 2050 according to the Bank of England (2014).
- Reason 2: in addition to the amounts at stake, *the asset management market is increasingly concentrated* (see Amundi – Pioneer, Henderson – Janus, Aberdeen – Standard Life, not to mention recent deals). The share of the world's top 10 asset management companies now exceeds one-quarter of the total assets under management (20% of assets for the top 10 banks). The biggest asset manager on the planet (Blackrock) is about 30% bigger than the biggest of the banks in the sector (ICBC). However, this is an isolated case, because as for the nine other institutions in the top 10, the banks are the biggest.
- Reason 3: *funds have less and less liquid assets* (emerging markets, high yield bonds, real assets (real estate, private debt, private equity) and increasingly liquid liabilities: final investors, who are more volatile, and carry more risk, in place of intermediaries). In other words, like the banks, funds are transforming liquidity.
- Reason 4: *the pro-cyclical nature of the activity*: since the different players have similar risk and stress constraints, there is a strong tendency to accompany the cycle. Big drops in the market inevitably result in sales, and vice versa. This is true for insurers and pension funds, although they are considered long-term investors. More and more studies have looked into this.

All in all, it is not very surprising that the regulators are increasingly concerned by the irresistible rise of shadow banking. Against this backdrop, the Financial Stability Board's (FSB) consultation on the methods for identifying NBNI G-SIFIs (read: "Non-Banking, Non-Insurers, Global Systemically Important Financial Institutions") is giving way to a battle between the supporters of regulations and (some) professionals in the sector. Regulators want to respect a principle of precaution, but certain asset managers explain that to date, no failure has had systemic repercussions on the markets. For the reasons we mention above, regulations must be tightened. This seems desirable and inevitable. It is an underlying trend.

Conclusion

"This time is different"... can we find another phrase as overused in the portfolio management business? However, as you've seen, the asset management world is growing fast, but at the same time it is turning upside down with the structural changes that are going on. The demographic, technological, and environmental challenges are in the process of redrawing the financial landscape and redefining business models. According to a recent PwC survey, 73% of American CEOs and 61% of CEOs worldwide think that new competition is going to disrupt their industries in the next five years: according to those surveyed, newcomers will disrupt their activities or preserve their business models but apply new technology to them.

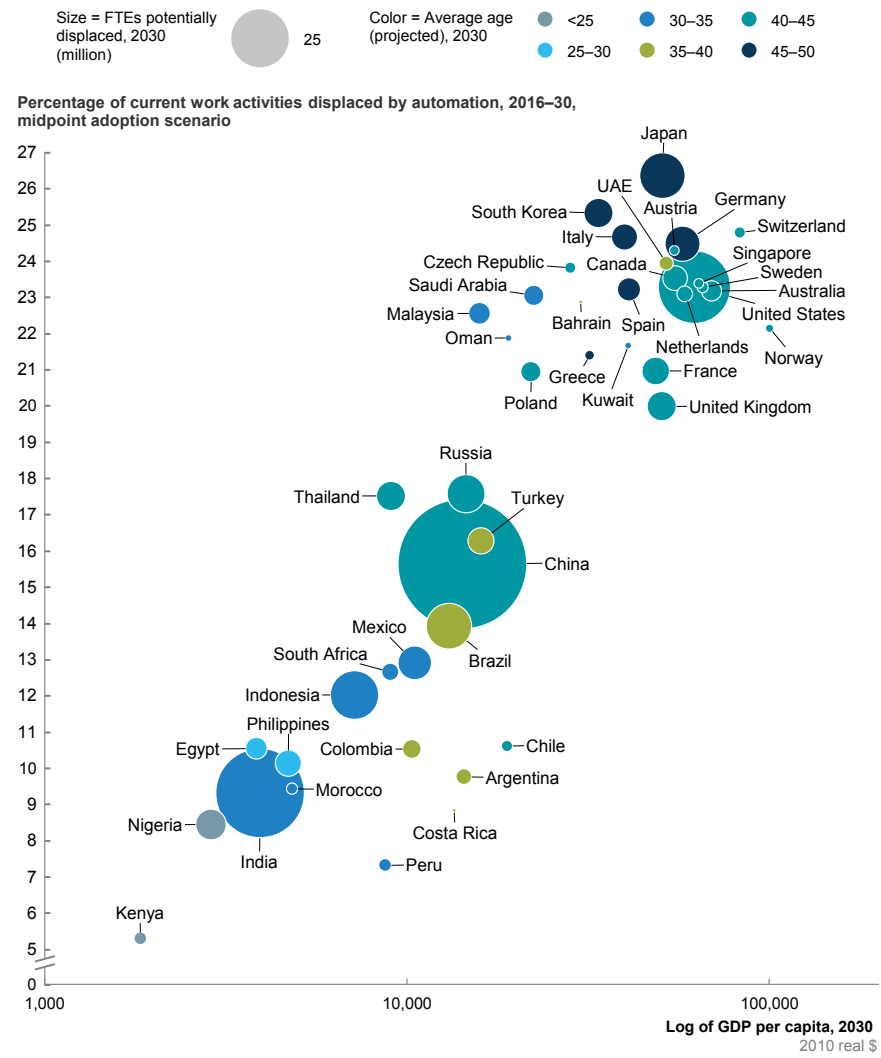
Against this backdrop, what should asset managers do to be / stay successful? They should take action in several areas:

- **Develop strongly customer-centred business models** (diversity, aspirations, flexibility, transparency, platforms, etc.);
- **Be both global and local** (knowledge of the global markets, proximity to local customers);
- **Attain critical size** in order to maintain independence and resiliency;
- **Attain critical size in order to be able to adapt and enter markets quickly and effectively** (entry costs are often very high);
- **Develop partnerships with key clients.** Amundi does this with sovereign funds and other large institutional investors on particular themes like SMART Beta, strategic asset allocation, and risk management.
- **Optimise distribution networks**; forging partnerships with local entities becomes indispensable to really penetrate the local markets: faster saturation of the culture, activation of long-standing networking, an immense reduction in the entry ticket, an immediate strike force that's stronger than the competition who do not have this type of network. Amundi has some twenty partners in different countries, like Korea (NH), China (ABC), Japan (Resona), Germany, the Netherlands, Belgium, Italy, the Czech Republic... solid local partners with, quite often, capitalistic ties, sometimes crossed.
- **Seek out distribution agreements with banking networks.** For example, with every acquisition of an asset management company that is a bank subsidiary, Amundi has negotiated distribution agreements for products and funds (generally for a 10-year term) with the banks that made the sale: this was the case with Société Générale in France, with Bawag in Austria, and more recently with UniCredit in Italy.
- **Have the capability to sell services** that go beyond savings and cash flow management, such as regulatory reporting, risk management, etc.

- **Develop advisory activities covering any and all areas of potential relevance to the asset management business.** These services are also chargeable.
- **Have the capability to develop simplified operating methods**: enabling lower costs, greater agility and flexibility, etc.
- **Be capable of evaluating the impact of changes in the economic environment at all times**. Today's battle is less about the big and powerful against the small and weak and more about competition between those that are agile and those that aren't. The world is moving very fast, and we must move with it (ahead of it?), and have mastery over its structures and its business model.
- **Be capable of using available data advantageously**: networking, big data, "robo-advisors", etc. for example. Robo-advisors are developed rapidly, including on active management, SMART betas, fund selection (Arnaud (2017)
- **Be quick and innovative, and thus capable of investing**; the network of start-ups (including a number of Fin-techs, Reg-techs and other Insur-techs) that make up, for example, the "Crédit Agricole villages" (in different cities in France and with strong partnership in many countries) is making it possible, in partnership with industrial groups, to select projects, support them, grow them, monitor the existing major trends, detect/participate in innovations... and potentially invest in innovative companies in disruptive themes.
- **Effectively manage risks, regulatory constraints** (which are increasingly numerous, complex and difficult to satisfy without critical size) **and capital**
- **Becoming an expert in data management is becoming more and more essential. In 2016, SEI experts were reiterating the prerequisites for success:**
  - *Ensure better - and different - decision-making*. Adopt an approach based on listening to the experts (on data) rather than following the traditional hierarchical or financial model (the opinion of the highest-paid person).
  - *Promote Portfolio Management*. Equip portfolio management teams with tools they can use to analyse the data better and seize on trends and relationships between asset classes and assets.
  - *Develop smarter distribution networks*. Use CRM system type tools to track and better understand distributors and advisors.
  - *Effect targeted sales and marketing*. Develop initiatives and messages based on the record of trades and interactions; use analysis to generate digital campaigns and prioritise prospects.

Appendix

impact of automation on jobs, country per country
(McKinsey, December 2017)



Source: World Bank; Oxford Economics; McKinsey Global Institute analysis

- **Becoming an expert on Robotic Process Automation (RPA**). Lots of companies recruit actively RPA experts, considering RPA as "an unmissable opportunity to improve back office processes, retrench work previously outsourced, leverage data analytics, and eliminate mundane work" (Prudential Financial). easy to implement, with a rapid return on investment, favouring an increase in productivity, increasing the quality of the service to clients, improving the process control, facilitating the compliance monitoring, RPA is largely considered as a cost-cutter and a quality accelerator.
- **Document the product's design better**. Analyse mutual funds and institutional mandates to identify key characteristics.
- **Analyse investors' needs and desires better**. Discover and spotlight hidden factors, which you'll be able to isolate using big data, and which affect behaviours (for example, the influence of others in an investor's social circle); understand the coming needs and preferences.
- **Figure out how to have happier and more productive employees**. Develop "personalised data analyses" that reveal motivation and performance factors. Manage the next generations better; they are more complex in some regards, with different motives and aspirations. It's long been shown that performance and motivation depend on happiness at work. Note that a mass transition to a new generation of asset managers will happen without disruption to the system. The asset manager is disproportionately - compared to other businesses -near retirement age.

All in all, to remain competitive and profit from new opportunities, management companies must think more about their business models and look beyond simple improvements. We are in the business of disruption. This requires new thinking, a conscious shift in mentality and effective leadership on the company and industry levels. These are undoubtedly the keys to future success.

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