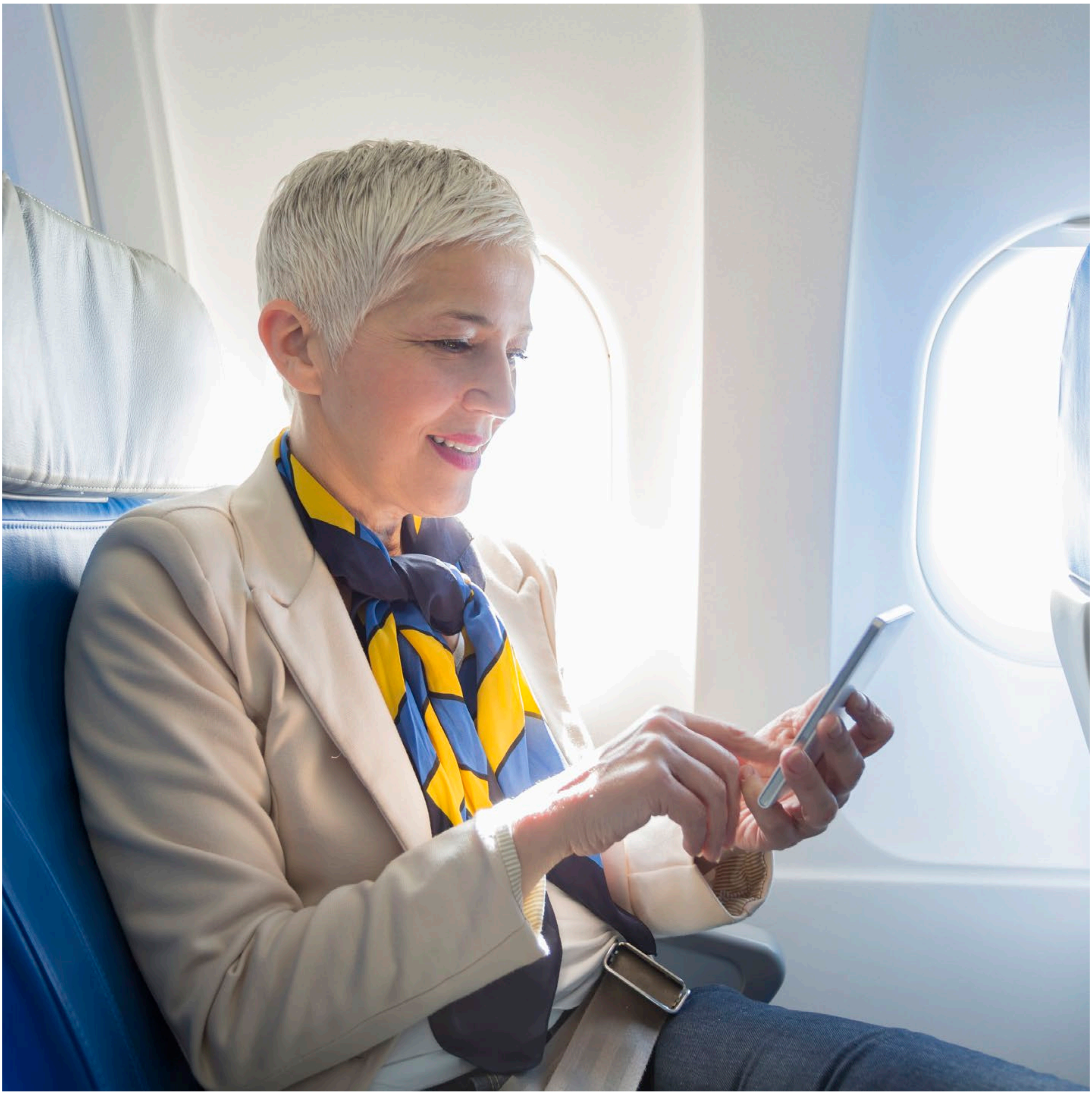
Silver Economy
Research paper

January 2021



Rothschild & Co
Asset Management

Summary

Introduction

Since the 1960s, portfolio management has almost exclusively developed around the notion of market indices. Whatever the benchmark chosen, be it a general, geographic, sector or style index, the portfolio manager's mission is to beat the benchmark. These indices have taken such a prominent place in the industry that for many investors the index is the market, and yet it is only a structurally biased and partial representation of it.

At the same time, a different approach to portfolio management has developed in recent years: thematic investment. Leaving these benchmarks to one side, it aims to identify and encompass themes that will significantly influence the valuation of assets over the long term that will create winners and losers. The beauty of this approach is that it is relatively intuitive, even for non-market specialists. For example, the impact of the ageing world population, which we are going to talk about today, but also that of climate change, the business digitalisation or the scarcity of resources, are all themes that everyone can appreciate will have a decisive impact on the tectonics of financial markets.

The first step in thematic investment is therefore to identify these structural trends and determine their scale, their future impact on the valuation of stocks and their sustainability, in order to avoid simple fads. It will also be about getting the timing right. Some themes can take decades to generate an effect and the key is not being right too soon... or too late. We remember Bill Gates's enthusiasm for home automation in the late 1980s. It is clear that 30 years later we still open our refrigerator by hand and put the key in the front door lock. This obviously does not mean that these changes will not take place but that their adoption takes longer than expected by their promoters.

In addition, a theme is a living concept and is not set in stone. In particular, it will be necessary to re-evaluate its validity over time and the way in which it may be implemented, in particular with regard to sub-themes which could become obsolete or, on the contrary, come to the fore.

The second step is stock picking. At this stage, it will be a question of identifying the companies which, in addition to their intrinsic value, will be most responsive to changes in the chosen theme. It is probably at this stage that a thematic manager reveals his true talent; the factors influencing the evolution of a stock are multiple by nature (valuation, quality of the management, level of competition, etc.) and should also be taken into account.

Next, the portfolio manager needs to work on the construction of his portfolio and ensure it does sufficiently balance its diversification (at the level of the sub-themes and the single stocks), in order to offer a robust profile without "diluting" the capacity of the stocks from capturing the dynamics of the theme.

Thematic investment therefore seems to be a useful tool in an investor's global portfolio, to be used alongside benchmarked strategies. Rothschild & Co Asset Management Europe saw this way forward, launching its first thematic fund in 2010 and dedicating a specialised team to it.

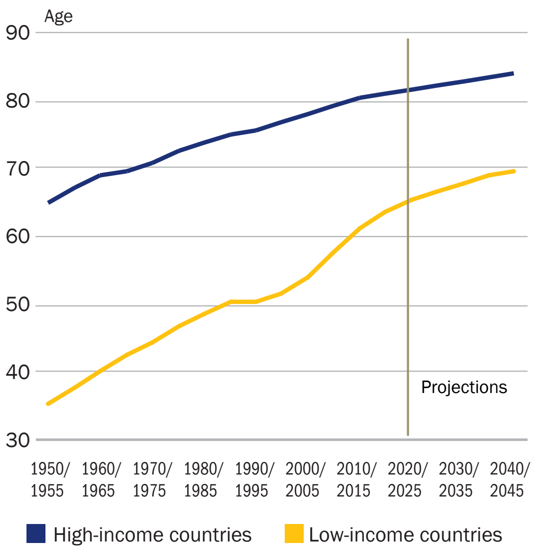
In this letter, we go into more detail on our approach to the Silver Economy, which is based on a major and lasting trend, namely that of the ageing global population. We will illustrate the way in which we try to cover this theme, by describing the different sectors that we believe are best able to benefit from it. Finally, we will focus on in vitro diagnostic, which we believe to be one of the most promising innovative industries in this context.

1 Silver Economy - Overview

Ageing world – The global demographic transition

Population ageing is a global phenomenon. This megatrend observed almost everywhere is linked to a drop in the birth rate, although the timing and scale differs across countries. It can also be explained by the increase in life expectancy, made possible by the prevention of infectious diseases, the improvement of eating habits and, more recently, the treatment of chronic and degenerative diseases. (Fig. 1)

Fig. 1 - World - Life expectancy per income group

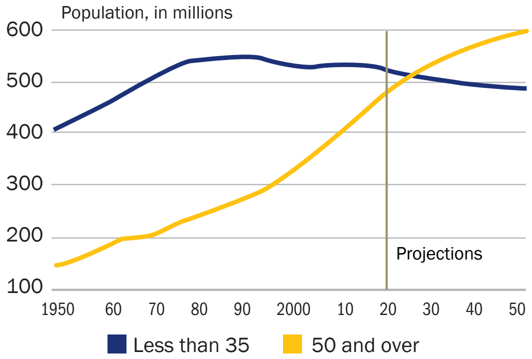


Sources: United Nations, Rothschild & Co Asset Management Europe, 2020.

According to the United Nations, a person aged 65 years in 2015-2020 could expect to live, an additional 17 years on average and that figure increasing to 19 years by 2045-2050. Women currently outlive men by almost 5 years, but this global gender gap is expected to narrow over the next three decades. In that respect, rapid population ageing is transforming societies and will thus create an unprecedented demographic shift.

In 2018, for the first time in history, people aged 65 years or over worldwide outnumbered children under age 5. In high-income countries, projections indicate that there will be more people over 50 than under 35 by 2025. (Fig. 2)

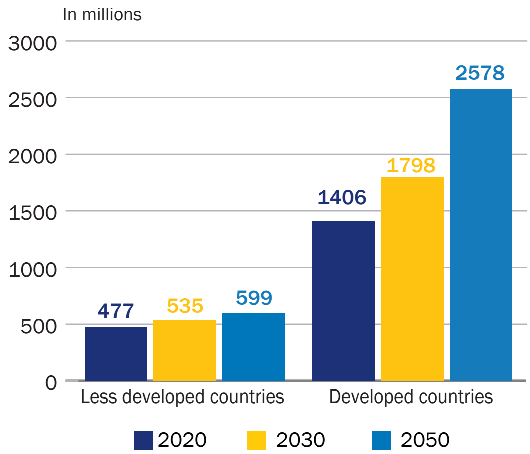
Fig. 2 - High-income countries - Population



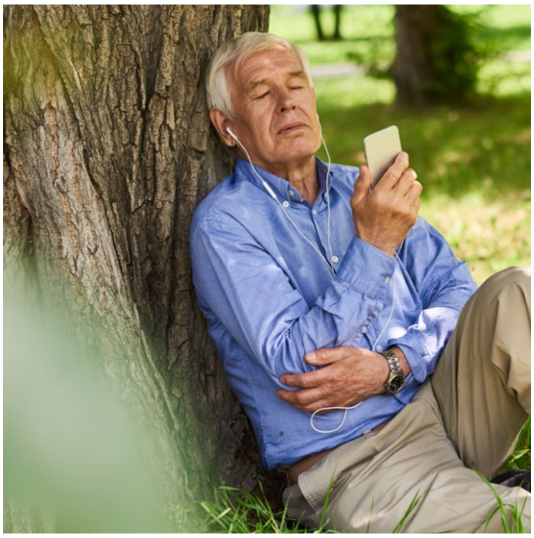
Sources: United Nations, Rothschild & Co Asset Management Europe, 2020.

Globally, there are 1.9 billion people aged 50 years or over in the world and that number is projected to each 3.2 billion in 2050, with the proportion rising globally to 33% by 2050 from 24% today. The fastest increase is projected to happen in the less developed countries (Fig. 3). By regions, Asia will account for more than half of the increase.

Fig. 3 - World - Population aged 50 and over



Sources: United Nations, Rothschild & Co Asset Management Europe, 2020.



In contrast, the expected rise of older people is relatively small in Europe and Northern America, regions where the population is already significantly older than in other parts of the world. (Fig. 4)

Fig. 4 - Numbers of persons aged 50 and over by regions

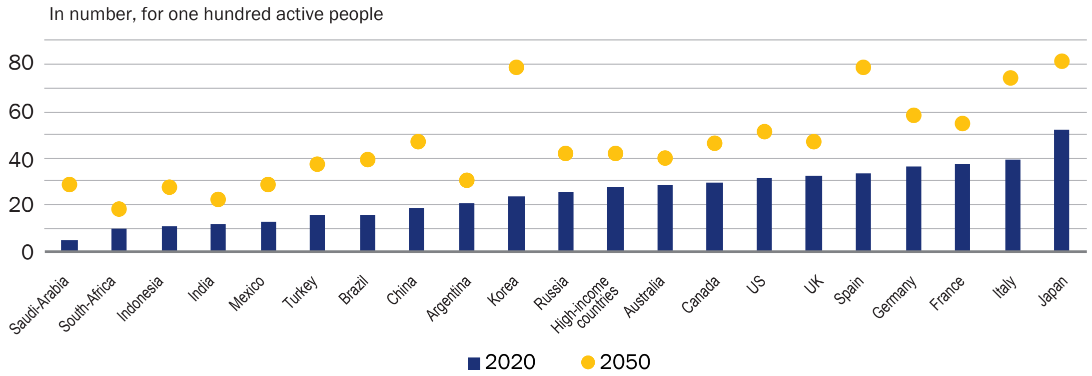
Region	Number of persons aged 50 and over in 2020 (mn)	Number of persons aged 50 and over in 2050 (mn)	Population change (mn)	Population change (%)
World	1883.4	3178.7	1295.4	69%
North America	132.5	175.0	42.5	32%
Latin America & Caribbean	153.2	289.3	136.0	89%
Europe	296.1	332.0	35.9	12%
Central and Southern Asia	370.9	783.8	412.9	111%
Eastern and South Eastern Asia	719.3	1053.1	333.8	46%
Oceania	12.2	19.6	7.4	61%
Sub-Saharan Africa	108.6	314.0	205.3	189%
North Africa and Western Asia	90.5	212.0	121.4	134%

Sources: United Nations, Rothschild & Co Asset Management Europe, 2020.

To describe changes in the population age structure, demographers apply measures that compare the relative sizes of different age groups, the most common measure being the old-age dependency ratio which equals the number of persons aged 65 years or over divided by the number of persons aged 20-64 years. (Fig. 5) Unsurprisingly, Japan is experiencing the fastest ageing of its population, with 47 people older than 65 per 100 working-age adults, and rising to 80 by 2050. Among advanced G20 countries, Italy, Spain, Germany and South Korea will also face some of the most significant challenges from ageing, while the US is expected to improve its favorable relative position.

Among emerging countries (EM), the picture is mixed. Their populations are currently much younger than in most advanced economies and in countries like India, South Africa and Indonesia, populations will age only slowly. However, some emerging countries are facing rapid demographic change. For instance, while ratios in Brazil and China are hovering around 15%, half of the high-income countries level, both will swiftly convergence towards it.

Fig. 5 - World - Old-age dependency ratio



Sources: United Nations, Rothschild & Co Asset Management Europe, 2020.

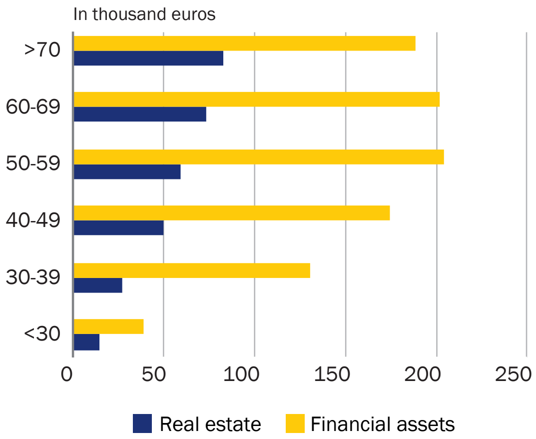
Ageing world -
The longevity economy

The Silver Economy is considered part of the general economy that are relevant to the needs and demands of older adults, i.e. all those that are aged 50 years and over. The global demographic transition thus represents a powerful structural trend in favour of this segment. This is a large cohort that comprises a heterogeneous mix of people. Older people fund their consumption from four different sources:

- Public programmes such as pensions, health care and other social welfare programmes
- Transfers from family members or other private sources
- Own assets and wealth (Fig. 6)
- Their own labour income

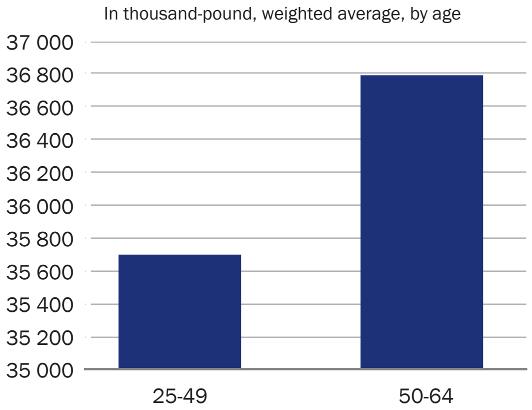
Although hardship of poverty amongst the older population should not be underestimated, their poverty level is lower than that of the general population in 20 of the 35 OECD countries. The 50-64-year-old population have substantial disposable income in most advanced economies that is above average. (Fig. 7) After 65 years old (the old-age population), the average disposable income is usually lower than the average disposable income of all age groups, yet many older people have lower or no mortgages. In addition, the average wealth of households over the age of 50 is much higher, almost three times higher than that of households aged 25-50 in the case of the United States, for example. (Fig. 8)

Fig. 6 - France - Average net worth by age group



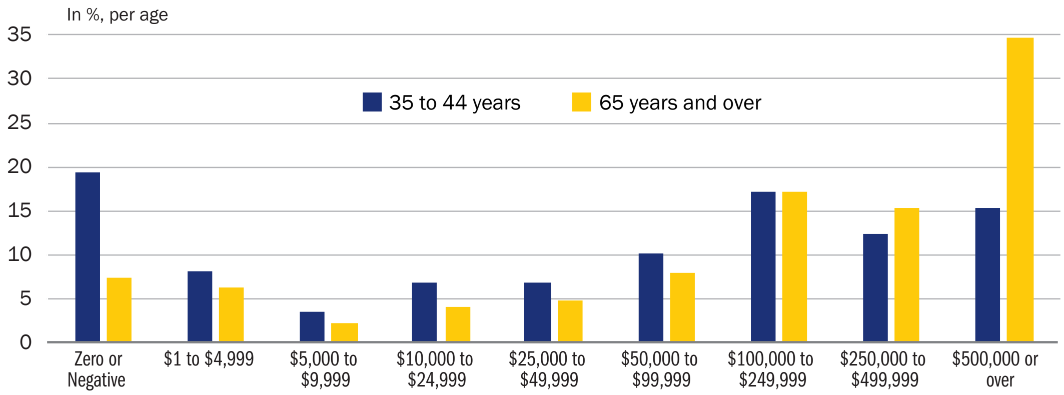
Sources: INSEE, Rothschild & Co Asset Management Europe, 2020.

Fig. 7 - United Kingdom - Household disposable income



Sources: ONS, Rothschild & Co Asset Management Europe, 2020.

Fig. 8 - United States - Distribution of household net worth



Sources: US Census Bureau, Rothschild & Co Asset Management Europe, 2020.

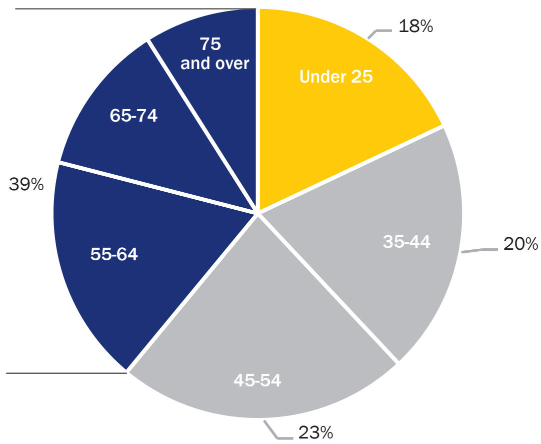
What's more, in many European countries, net public transfers, that is, the net of transfer inflows and outflows, support about 70% or more of old-age consumption. Overall, in 20 out of 35 OECD countries, old-age income poverty is lower than for the population as a whole. Incidentally, the Silver Economy consumes a disproportionate share of goods and services. In the United States, consumers above the age of 55 spend twice as much as "Millennials". (Fig. 9)

In the European Union, around 39% of the population are 50 years or over and they (privately) contributed almost 41% of private consumption expenditure. Unsurprisingly, by sector, healthcare is the sector in which senior citizens spend the most, accounting for more than 50% of total expenditure.

They also spend more, in relative terms, on recreation and culture (perhaps reflecting greater available leisure time) and furnishings and household items (perhaps reflecting higher rates of home ownership). In contrast, the demand for education is lower compared to that of younger populations, as seniors account for less than 30% of total expenditure in this sector. (Fig. 10)

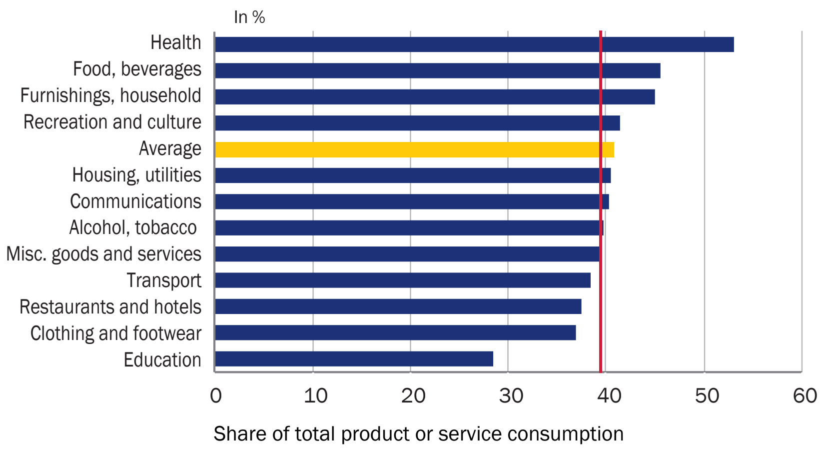
Fig. 9 - United States - Total consumption by age group

Percentage of total spending by age cohort



Sources: US Bureau of Labor Statist, Rothschild & Co Asset Management Europe, 2020.

Fig. 10 - Europe - Senior consumption by segment



Sources: European Commission, Rothschild & Co Asset Management Europe, 2020.

39%

of the European Union's population is over 50 years

Ageing world – Challenges for economic growth

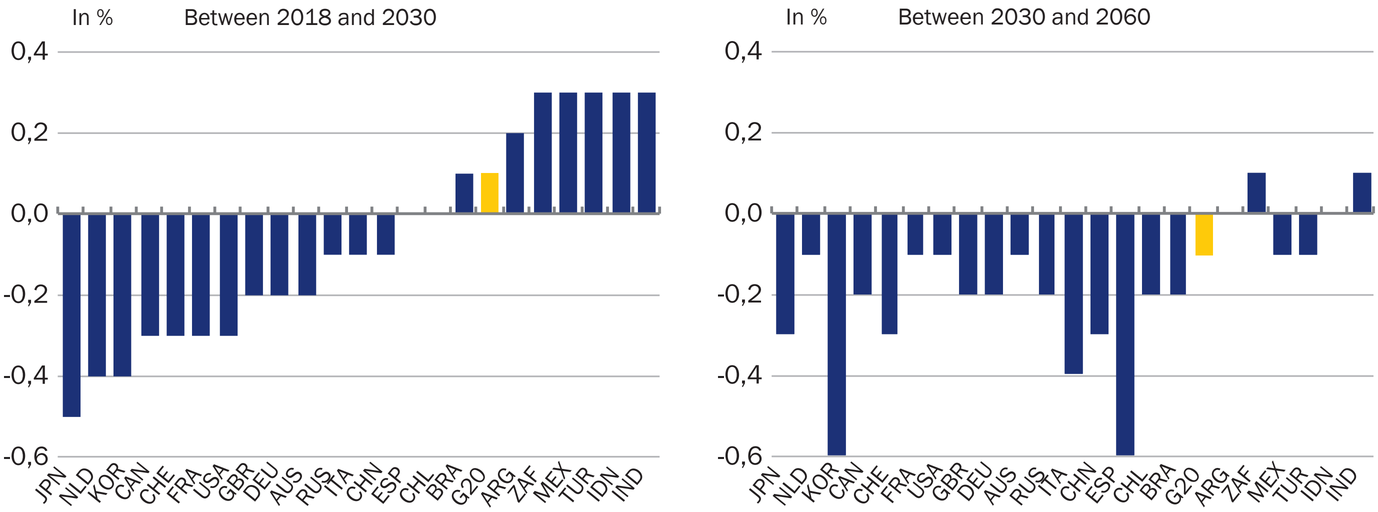
Demographic change is already affecting macroeconomic outcomes in several economies. However, the effects on growth in the coming decades remains uncertain and will be influenced by the depth and speed of ageing in each country. Ultimately, the impact will depend of three main factors:

- Declining employment to population ratios
- Rising capital per worker
- Productivity growth

The slowing growth of working-age populations will exert pressure on potential growth of GDP per capita. Over the period 2018-30, declining working-age populations will drag down GDP per capita growth in 11, mostly advanced, G20 countries according to OECD estimates. What's more, over the period 2030-60, only India and South Africa will still enjoy a demographic dividend. (Fig. 11)

Demographic change is already affecting macroeconomic outcomes in several economies...

Fig. 11 - World - Contribution of working age population to GDP per capita growth



Sources: Guillemette and Turner, Rothschild & Co Asset Management Europe, 2018.

Ageing of the world's population is expected to result overall in higher capital per worker...

Ageing of the world's population is expected to result overall in higher capital per worker. Indeed, as demographic change reduces the ratio of working-age to total population, the price of labour relative to physical capital is expected to rise, leading firms to increase capital per worker, especially considering talent shortages should incentivise firms to invest in labour-saving technologies such as robotics and artificial intelligence.

Regarding productivity, there are concerns that population ageing has been one of the forces behind the recent slowdown and may continue in decades to come through several channels. For instance, the age profile of employment will continue shifting towards older workers whose skills are more at risk of becoming obsolete as digitalisation transforms labour market needs. On the other hand, ageing holds potential to spur increased R&D to find technology solutions to labour shortages, as well as to respond to the needs of older individuals, including in health-related technology and robotics.

2 Silver Economy: how to play it?

Silver Economy as an investment theme

The Silver Economy is very well represented in European equity markets where it constitutes a deep and well diversified universe of companies that, no matter where their headquarters are located, are today globally active for most of them.

Therefore, investors wishing to benefit from its long-term potential of profitable growth can do it quite easily: either directly or *via* thematic funds such as R-co Thematic Silver Plus.

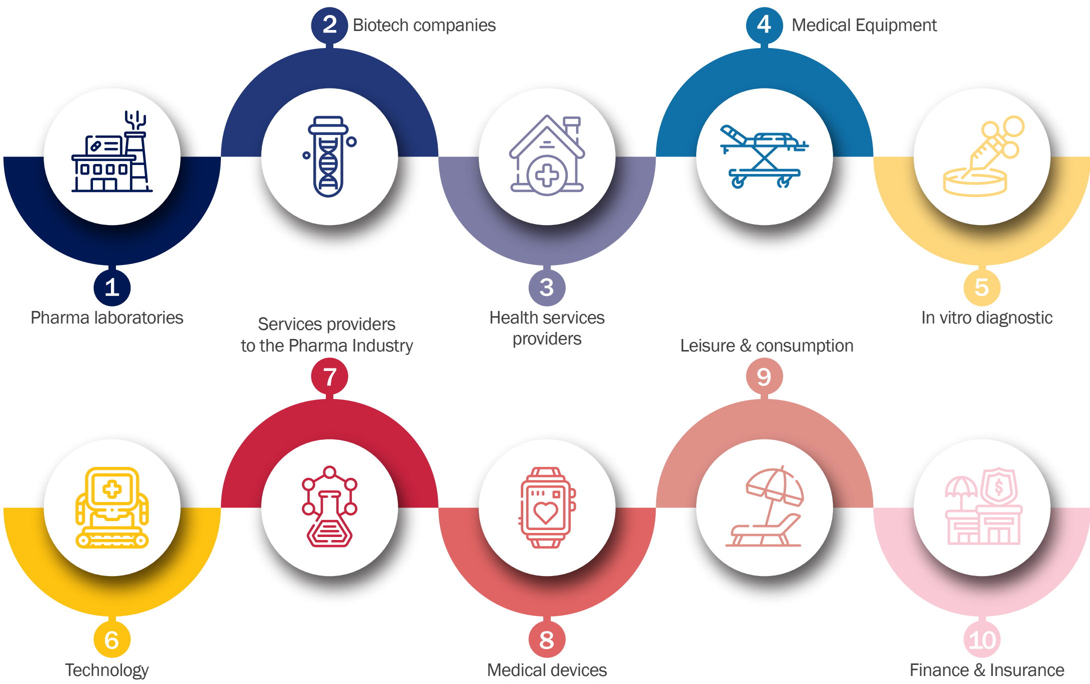
We have identified 10 segments whose growth is directly linked to ageing population and whose products & services offers fulfill the specific needs of senior people

- **Pharma laboratories.** This segment is growing on a regular and much faster pace than GDP with +6.4% expected per annum by 2024. Growth drivers are innovation notably to improve existing treatments or to find new ones and China opening to European innovations and now representing a very significant market for the industry. Pharma laboratories include General laboratories with, for example, Sanofi and specialty laboratories addressing niche markets (e.g.: diabetes with Novo Nordisk which estimated that type 2 diabetes is estimated to grow at around 3% per annum by 2025).

Blood by-products market (plasma) is also a good example. It is estimated at 24 bn$ and has grown by more than 7% over last years. This market is 70% controlled by 4 actors, of which Spanish Grifols (18% market share according to analysts).
It is characterized by high technological barriers (complexity of fractioning and manufacturing process) and by insufficient offer as demands is very strong for this type of products e.g. to treat hemophilia.

- **Biotech companies.** Those groups collaborate very closely with large pharma laboratories in the race for innovation. Dutch Galapagos is a very good example.
- **Health services providers.** This segment notably includes nursing homes operators. Their business is fueled by the lack of supply vs growing demand and also by the fact that private operators seem more and more to be the best positioned to consolidate the market, renovate the offer of services to make it compliant with regulation. French Orpea is among the best-in class players. This segment also includes home services such as home dialysis in the United States, with Fresenius Medical Care as a reference actor, and sleeping apnea monitoring and care with Bastide Le Confort Medical as an example of active company in this kind field.

Fig. 12 - 10 segments of the Silver Economy



Source: Rothschild & Co Asset Management Europe, 2020.

- **Medical Equipment.** A good example of what this segment represents is medical imaging which is an oligopolistic market with very high entry barriers. Emerging countries investing to equip their hospitals is a very strong growth driver (apart, of course, from innovation). Philips, General Electric and Siemens Healthineers share a 35 bn$ market according to analysts. In that segment, equipment for ophtalmologists (like microscopes for ophthalmic surgery), equipment for in vitro diagnostic i.e. analyzers can also be included. Here Tecan and Stratec are very strong market players.
- **In vitro diagnostic.** This segment refers to all the tests designed to detect diseases and pathologies and determine the best treatment. Biomérieux, Diasorin, Qiagen (for companion test) are very good examples. (Cf. Focus on the in vitro diagnostic, p.16)

The Silver Economy is well represented in European equity markets...

- **Technology.** Here we refer to technology helping to improve any kind of processes within the healthcare world (e.g. groups like CompuGroup Medical or Pharmagest) and helping to improve the lives of patients especially at home. Here we find connected devices and Internet of things, online (drug sales, telemedicine, remote monitoring of patients) and of course home automation (with Somfy as world player).
- **Services providers to the Pharma Industry.** Many companies position their business to help pharma laboratories to find new molecules and to improve their productivity. Lonza, Sartorius Stedim are positioning themselves on that specific business model.
- **Medical devices.** That segment includes hearing aid devices, optical devices, prothesis, etc. Hearing aid devices is an attractive market, very fragmented, and today fueled by China. Italian Amplifon is today expanding worldwide to benefit from that growth potential. Optical market is estimated at around 110 bn$ and growth averages between 4% and 5% per annum also thanks to emerging countries which are lagging mature countries. EssilorLuxottica is a very well-known name positioned on this activity.
- **Leisure & consumption.** Hotels, Cruises, Leisure vehicles, Sports clubs, cosmetics, DIY, Cinema, ... All those sub-segments illustrate the great diversity of Leisure & Consumption and share the fact that they contribute to keep senior people in good health and socially active. Beneteau, Trigano, Accor, Kinepolis are active on those sub-segments. In consumption goods, active cosmetics (anti-ageing products) market is growing at 5% per annum (as senior people want to look young as long as possible and to feel well). L'Oréal is for sure one of the world leaders having identified the senior people as a very attractive market. Luxury sector is, according to us, not very relevant for the investment theme as "Millennials" account for most of the growth. In food, one can of course think about vitamins or functional food with for example Nestlé or Danone expanding on those markets.
- **Finance & Insurance.** This segment includes asset managers helping senior people to optimize the management and transmission of their assets with DWS and Banca Generali as good examples while Health Insurers offer specific products to this part of the population. One can think about Allianz.

3 Focus on the in vitro diagnostic

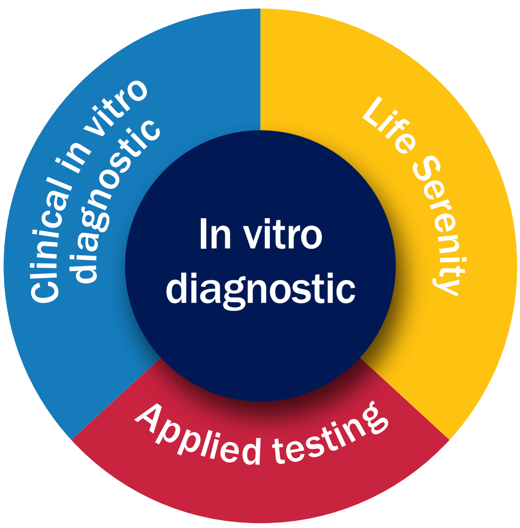
In vitro diagnostic, what are we talking about?

That the future of health systems heavily relies on in vitro diagnostic from a medical and financial perspective...

The global in vitro diagnostic (IVD) business which represents around 110 Bn$ of sales, can be split in three main markets, all of them growing at annual rates equal to or above 5%:

- **Clinical in vitro diagnostic** (nearly 50 Bn$), growing at 5% per annum, consists in tests achieved in Hospitals & Laboratories or even at home to detect diseases, infections, etc. A sample is extracted from a living body and is subsequently analyzed in vitro. This market also includes the Molecular Diagnostics ("MDx") which, in itself, represents 5 Bn$ of annual sales but is growing at a pace of around two times the global clinical in vitro diagnostic market with annual progressions nearing 9%-10%. In the latter, the goal is to detect diseases or risks of developing diseases by analyzing biomarkers (such as DNA, RNA...) that characterize virus, protein, cell and to determine whether or not the target is there. Reasons why it develops so quickly lay in the fact that it is more accurate and can also help to implement the best possible treatment for a patient.
- **Life Sciences** (nearly 40 Bn$), growing at 4%-5% per annum, correspond to tests achieved in pharma groups laboratories and Research institutes and universities laboratories with the specific aim to contribute to drug discovery and to assess the different clinical trials phases results.

Fig. 13 - In vitro diagnostic: three main markets



Source: Rothschild & Co Asset Management Europe, 2020.

- **Applied testing** (nearly 12 Bn$) is the smallest market, growing at more than 5% per annum and corresponds to tests in various organizations such as industrial groups (e.g. in the food business), administrations and governments. Here the target is not the human body but targets from various origins (veterinary, forensics, ...).

The virtue of the business model is that it works like the famous razor & blades model as diagnostic players usually place their instruments at hospitals, laboratories venues and then sell their customers reagents (to test or search for a disease, a specific target, etc.). It is estimated that between 60% and 80% of sales of in vitro diagnostic players are recurring with the highest proportion in clinical in vitro diagnostic. In some case, this works as a"closed" system (i.e. the analyzer can only use the reagents from the in vitro diagnostic player that placed the machine). As in the razor and blades model where blades have high profitability, it is the same for reagents.

In vitro diagnostic, what are the growth drivers?

Nowadays, the challenge for doctors, patients, administration and health systems is to test better, more accurately and faster to identify as soon as possible the cause of a disease so as to implement the right medical treatments at an advanced stage, and, as a consequence, to save money. Today, inadequate testing leads to patients being not properly treated (sometimes even with highly expensive drugs that are not active against the diseases) or being treated too late. One can easily understand that the future of health systems heavily relies on in vitro diagnostic from a medical and financial perspective especially as ageing population is spreading globally. To put figures, in vitro diagnostic is said to account for only 2-% of healthcare spending but it contributes to 70% of medical decisions[1].

(1) Source: Investir, 6 May 2020.

9-10%

Clinical in vitro diagnostic market annual progressions

As a matter of fact, due to ageing population, the prevalence of cancers, or of other diseases among the most vulnerable part of the population dramatically increases and is, as a consequence, sadly, a very powerful growth engine for the in vitro diagnostic business as the cost is increasing sharply and as it becomes necessary to take care of those people in the best and most efficient manner.

Current COVID-19 crisis has also proved to be a powerful boost to the entire industry with many players in the race for finding the quickest, most accurate tests using different technologies (PCR, antibodies...). This was a boost not only on the business of those players but also on their share price evolution on equity markets.

Technology is also a very powerful growth trends in the in vitro diagnostic business (addressing the need to be faster, more accurate, to offer wide test menu able to detect as many targets as possible at the same time). From that perspective, molecular diagnostic and multiplexing offer self-explanatory illustrations.

Molecular diagnostic is the fastest growing segment in the in vitro diagnostic world as here...

Molecular diagnostic is the fastest growing segment in the in vitro diagnostic world as here, the process is to determine from the analysis of DNA, RNA... if a bacteria, a protein, a virus is present or not, especially in the fields of infection, heredity, oncology and personalized treatments.

Molecular diagnostic has the main advantages of being faster and much more accurate than other technologies. The most recent trend is the emergence, within molecular diagnostic, of multiplexing which allows to achieve not just one, but a panel of tests on the very same sample. The next step is to have one test for all the targets that are suspected. In this area, bioMérieux is so far an undisputed player with around 80% market share[(2)] while Qiagen also recently entered this fast-growing niche (in 2019 mutliplexing market was estimated by analysts at 800 M€[(3)]) which address infectious diseases. In the past, the testing process for a patient with symptoms was to test for a possible cause and if the result was negative, to try to test another cause. This was a lengthy and costly process. With multiplexing, the chances of identifying precisely the relevant pathogen agent and potential co-infections increase dramatically in a much shorter timeframe. Patients can start treatments earlier, stay less at hospitals and increase their chances to recover when confronted with respiratory, gastrointestinal diseases, or meningitis to give a few examples. The selling proposition is, therefore, unique for all parties.

Finally, regulation also plays a key role in some specific areas like in the food industry but also in the pharma industry (to adequately validate efficacy and safety profiles of drug candidates) and is a significant boost to applied testing.

Research & Development in pharma grows at around

5%

per annum

After years of M&A, the global in vitro diagnostic market is well consolidated...

In applied testing, the outlook is, consequently, also promising. For the food or the agro-chemical industries, for example, testing is a good way to avoid contamination (bacteria, carcinogenic component…), outbreak of health crisis and therefore products recall, reputation issues, trials and so on. Public opinion – especially among the most vulnerable people (i.e. the senior) – is asking for more safety and public authorities are responding to this by implementing stricter regulation. Therefore the number of tests to ensure food quality, absence of toxic ingredient in any consumer product, absence of pollution in the environment… is set to increase. The REACH adoption in Europe in 2006 in the chemical sector is a good illustration, as is the 2015 Chinese law to reinforce food safety.

Lastly, in life science, the structural increase of Research & Development (R&D) budgets at pharma and biotech companies' level is very supportive for the in vitro diagnostic business. Pharma and biotech companies must react to generic threat and to off-patent issues as they also have to offer more efficient treatments that will be more profitable for them. Using tests allow them to better understand the virus, bacteria, diseases they are trying to address and human complexity as it allows them to monitor the efficacy and safety profile of their drug candidates throughout the different clinical phases from the research phase to the commercialisation. Historical analysis shows that on average R&D in pharma grows at around 5% per annum. In the future, the goal for pharma companies is to move towards more personalized therapies, meaning more complexity, this leading to more tests being necessary.

In vitro diagnostic, who are the main players?

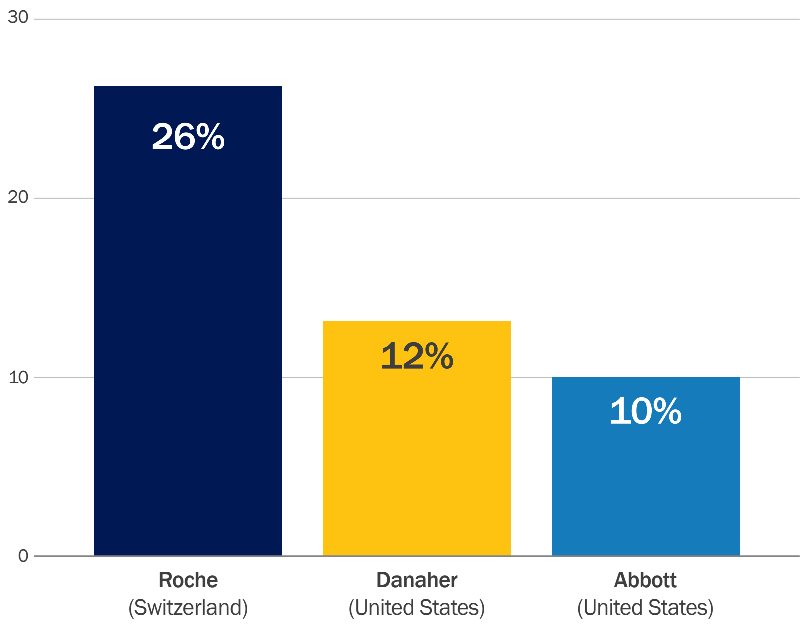
After years of M&A, the global in vitro diagnostic market is well consolidated as market analysts assume that around 10-12 companies command 85% market share. Roche (Switzerland), Danaher (United States) and Abbott (United States) are the top 3 leaders with respectively around 26%; 12% and 10% market share. (Fig. 14)

As in vitro diagnostic players usually have rock-solid balance sheets, the trend towards consolidation is set to continue as players want to enrich their portfolios of technologies even if the Covid-19 crisis put a halt on this process. Market analysts estimate the acquisition firepower of established players at more than 200 Bn$ given very limited leverage of slightly more than 1x ND/EBITDA for the large groups.

This broad picture masks actually the fact that European players such as bioMérieux (France), Qiagen (Germany), DiaSorin (Italy), commanding respectively 7%, 1%, 1% market shares on the global in vitro diagnostic business, are more exposed to the clinical in vitro diagnostic, position themselves as niche-players and focus on specific technologies. As an illustration bioMérieux and Qiagen are very active on MDx with market share of around 10% each, but on multiplexing bioMérieux is clearly number one with more than 80% market share.

Competition between big players exists, while newcomers appear on specific niches. Nevertheless, the key success factors lie in innovation (broader menu, faster and more accurate tests) and installed base which acts as a strong entry-barrier.

Fig. 14 - Market share of the three main players in global in vitro market



Source: Rothschild & Co Asset Management Europe, October 2020.

(1) Sources: Companies, Bloomberg, Rothschild & Co Asset Management Europe, October 2020.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Contacts

France - United Kingdom

Paris
29, Avenue de Messine
75008 Paris
+33 1 40 74 40 74

Switzerland

Geneva
Equitas SA
Rue de la Corraterie 6
1204 Geneva
+41 22 818 59 00

Germany - Austria

Frankfurt
Börsenstraße 2 - 4
Frankfurt am Main 60313
+49 69 299 8840

Belgium - Netherlands - Luxembourg

Brussels
Avenue Louise 166
1050 Bruxelles
+32 2 627 77 30

Italy - Spain

Milan
Passaggio Centrale 3
20121 Milano
+39 02 7244 31

Rothschild & Co
Asset Management