UBS

Retirement Homes

Retirement care

CIO WM Research | **10 February 2017**
Matthias Holzhey, economist

- Because societies are aging fast, demand for retirement care is expected to grow at a robust pace in the coming decades. Aging healthily does not offset the increased need of care triggered by higher life expectancy.
- In many developed countries, the "baby boom" generation is reaching retirement age, and the average life expectancy is now above 75. In 2040, it is expected to reach 85.
- The most attractive markets for investments in retirement homes, in our view, are Japan, Canada, France, Singapore, Germany, Qatar, and the US. Some markets are difficult to access due to the lack of investable instruments, but private markets offer access to differentiated investment strategies (equity and real estate) supporting the different stages of asset development.

Our view

Demand for retirement care, including housing, is expected to grow at a fast pace in the coming decades. The probability of needing to rely on living assistance or even long-term full care rises sharply as people age. As a consequence, ever-increasing life expectancy will fuel the need for long-term care facilities and services. For purposes of this publication, the term "retirement homes" comprises all types of housing for seniors, from independent living apartments to nursing homes, home healthcare and other age-related services.

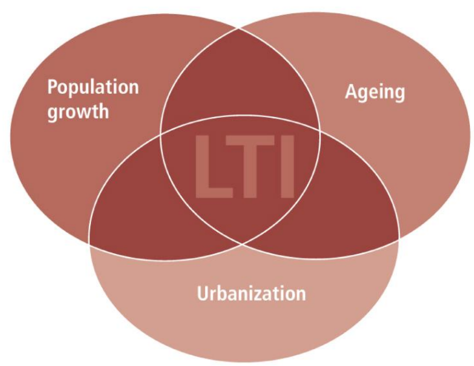
The larger population of seniors results directly from the combination of historic birth patterns and increased longevity. The "baby boom" generation (born between 1945 and 1965) is progressively reaching retirement age. In addition, average life expectancy is expected reach 85 in 2040 (from 75 to 80 currently), thus substantially increasing the number of people aged 80 or above in absolute and relative terms.

Demand for retirement homes is also supported by social trends. The rise of nuclear families (each household hosting 1–2 generations) and the reduced number of children taking care of their elders add up to the need of external care. This has prompted a paradigm shift in senior housing, from curing illness to fostering quality of life.

We expect the opportunity to generate stable cash flows and significant risk-adjusted returns to materialize in different geographic markets and to be captured either through listed instruments (such as equities or real estate investment trusts) and/or private markets (private equity and private real estate).

Introduction to the Longer Term Investments (LTI) series

- **The Longer Term Investments (LTI)** series contains thematic investment ideas based on long term structural developments.
- Secular trends such as population growth, ageing, and increased urbanization create a variety of longer term investment opportunities.
- Investors willing to invest over multiple business cycles can benefit from potential mispricings created by the typically shorter term focus of stock markets.



"In the long run, we are all dead."* Meanwhile, we prefer to get older.

** John Maynard Keynes*

Aging is a global phenomenon, though it affects countries in varying pace and proportion. The absolute and relative increase in the population of seniors is the combined result of historic birth patterns and increasing longevity.

From "baby boom" to senior boom

In many developed countries, the "baby boom" generation is progressively reaching retirement age (see Fig. 1). In the US, we expect a 30-year period of strong increase in the number of people aged 80 or older. In Japan, we will see peak demand in absolute numbers in 2035, and demand growth will already start slowing down after 2025. In Europe, demand growth will be relatively constant over the next 30 years. In fact, aging is already more advanced in Europe and Japan than in the US.

As we age, we need care

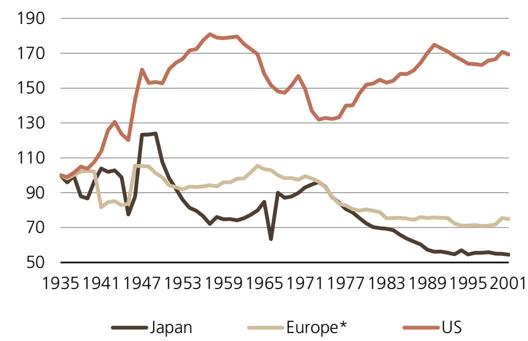
The average life expectancy in developed markets is now between 75 and 80 years. In 2040, it is expected to reach 85 (see Fig. 2). The absolute number of seniors over 80 globally is therefore expected to increase 56% to 192 million in 2030 from 124 million in 2015, while their proportion of the world population is expected to rise to 2.3% from 1.7%. This evolution is most striking in Japan, where more than 10% of the population will be above 80 as early as 2020. In the US, seniors over 80 will represent 5.3% of the population in 2030 (versus 3.7% in 2015).

Longevity leads to care. The number of seniors who depend on care services increases significantly after age 75. At 75, roughly 25% of people need long-term care. At 80, 35–40% require extensive care. At 85 and beyond, the percentage increases swiftly toward 50% and above.

Notable facts

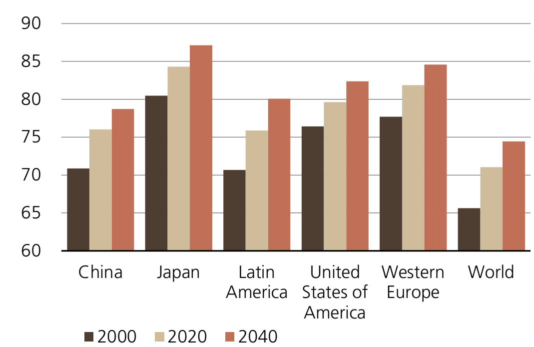
- In the short run, demand for retirement homes offering housing services for cohorts between 70 and 80 will grow the strongest.
- Demand for nursing care (age cohort 80+) will grow rapidly from now on over the next 30 years.
- Based on demographics, the US (next to China) seems to have the most favorable growth outlook for retirement services/care (see Fig. 3).
- Japan will reach peak demand within the next 15 years. A declining population could imperil the affordability of housing for seniors as this might be difficult to finance.
- In Latin America, even though life expectancy is expected to improve strongly, the relatively low number of seniors above 80 suggests that the market will remain nascent.

Fig. 1: Births lead the way
Evolution of the number of births (index 1935 = 100)



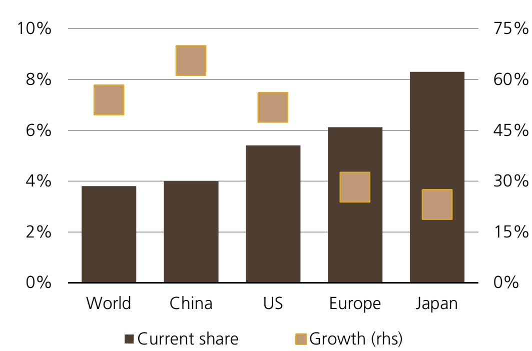
*European data are estimated based on France, Italy and Sweden. Source: UNstats, US census, INSEE, ISTAT, statistics Sweden, UBS, as of 26 January 2017

Fig. 2: Living longer worldwide
Evolution of life expectancy in select regions



Source: UN, UBS, as of 26 January 2017

Fig. 3: More and more people need services/care
Current share and expected growth rate of population needing long term care services 2015-2035.



Source: Estimates based on UN population projections and OECD care probabilities by age group, as of 26 January 2017

Retirement homes are no longer synonymous with hospice

Retirement homes were historically centered on curing illness and thus optimized for standardized delivery of specific services. The aim was either to bring a person back to health and full independence, or to support an end-of-life scenario. Housing for seniors is now centered on quality of life in old age and focused on providing a wide range of services, from hospitality to medical care. During the 1990s, a first wave of investments tried to address the long-term trend of aging without acknowledging this paradigm shift. Ill-aimed offerings led fewer people than expected to join old-fashioned nursing homes. As a result, some leading American providers went bankrupt. The current generation of providers offers care tailored to the actual needs of seniors, flexible enough to evolve with them.

The gradation of services determines categories of retirement care

The retirement care industry provides both housing and care services to seniors (usually defined as individuals aged 75 or above). Depending on the level of care provided in conjunction with the living arrangement, the sector is divided into three main categories: independent living facilities (ILF), assisted living facilities (ALF), home health, and skilled nursing facilities (SNF) (see Fig. 4).

Independent living facilities (ILF)

Independent living facilities offer a lifestyle choice of age-appropriate living in combination with reduced routine housework. The typical resident is over the age of 75, but relatively healthy and covers the costs privately. Barriers to market entry are low, as ILF face regulations similar to multi-family apartments.

Assisted living facilities (ALF)

The decision to live in an ALF is mostly need-driven (and thus the demand is less elastic than for ILF). Residents do not require full-time supervision, but cannot live independently at home anymore. The typical resident is over the age of 80. Overall funding is a mix of private and public sources, and depends on the social security systems of the different countries considered. However, there is also a private-pay, high-quality market segment in most countries. The required management skills represent a substantial barrier to entry in the assisted living market.

Skilled nursing facilities (SNF)

Nursing care facilities are a special case of the retirement homes industry, as demand is need-driven and providers receive a majority of revenues from public sources. Most clients are long-stay residents and are typically 85 and older, while a smaller share of clients may also be short-stay residents coming for rehabilitation after a hospital stay. For that reason, it is the segment showing the lowest elasticity. Nursing care has the highest barriers to market entry as it is typically the most strongly regulated segment.

Fig. 4: Real estate and service components

	Real Estate	Hospitality	Services	ADL-Care	Nursing-Care
Multi-family	✓				
Seniors-apartment	✓	✓			
Independent living	✓	✓	✓		
Assisted living	✓	✓	✓	✓	
Nursing homes	✓	✓	✓	✓	✓

In practice, the distinctions drawn are not always clear cut. ALFs also increasingly serve residents with high acuity illnesses, who would traditionally have been sent to an SNF. Specialized memory care facilities and continuing care retirement communities (offering all care services) are also part of the senior housing industry. ILFs and ALFs provide, at various degrees, a sense of independence and dignity to seniors. More and more facilities provide a choice of care through a "hub" setting: transportation, housekeeping, meals, personal care, and often other services such as adult day care, vision clinics, rehabilitation programs, and health promotion centers are provided. This enables residents to move through levels of care as needed.

Source: UBS, as of 26 January 2017. ADL stands for Activities of Daily Living.

À la carte senior housing – and risk-return profiles

The type of facility and the level of care determine whether retirement homes constitute more of a real estate investment or a service industry investment (see Fig. 4). Clearly, apartments for seniors and ILF represent real estate investments. Conversely, skilled nursing facilities provide support services, and logically should be considered primarily a service business investment. We differentiate in the following between real estate owners and facility operators, since the risks and returns involved differ significantly. But note that in the retirement homes industry, owners and operators are often but not always distinct companies.

The proportion of real estate income determines strongly the risk-return profile of the investment (see Fig. 5). Pure operators, especially of assisted living facilities, are likely to profit faster and more directly from the secular growth story in the next decade as higher occupancy rates and rising asking rents will affect profitability directly. Furthermore, demand for ILF and ALF are expected to grow especially fast in the next couple of years given their focus on the relatively younger age cohorts (aged 70 to 80). As a downside, revenues will be at risk during an economic downturn. On the contrary, demand for SNF is need-driven and expenses are often covered by public sources. Hence, skilled nursing care operators have lower exposure to the business cycle. However, public financing constrains the pricing and the income of SNF. Pure real estate investments in nursing facilities exhibit the lowest risk, but also the lowest exposure to the theme.

Since ALFs operate at lower cost than nursing homes, and require less capital, they are cheaper than nursing operators. They are easier for seniors to access privately (that is, on their own budget). It is estimated that 25–50% of nursing home residents could move to assisted living facilities at substantially lower costs. ALF could thus unlock its own demand by providing an affordable and more enjoyable living space for seniors.

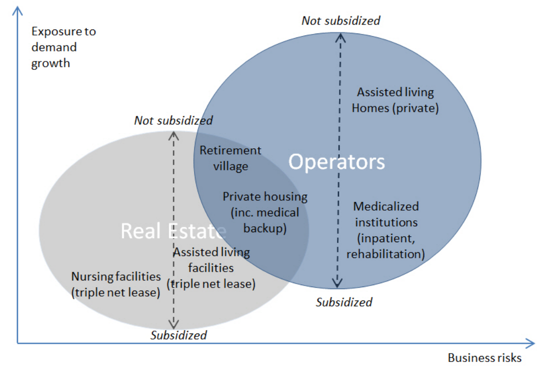
Where to invest?

To identify the most attractive markets, we look at a combined measure of expected demand growth and the sustainability of payments. The model identifies seven key markets and 19 level 2 markets (see Table 1 and Fig. 6).

Level 1 countries exhibit a market sufficiently large to provide recurring and significant investment opportunities, and a solid and solvent demand. These seven markets will require a significant senior housing and other retirement care offering during a prolonged period of time to absorb the demand. Nevertheless, each has its own pension system and social drivers, as well as specific demand drivers. These have to be carefully assessed and understood when selecting markets and assessing investment risks.

Level 2 markets should also be assessed for their intrinsic qualities as well as attractiveness for foreign seniors willing to benefit from better living conditions (favorable climate, available cultural and recre-

Fig. 5: Risk and returns of the different segments of the retirement homes markets



Source: UBS, as of 26 January 2017. This figure is provided for illustration purposes only. Definition of triple net lease: the tenant is responsible for paying all property related expenses (taxes, insurance, and maintenance).

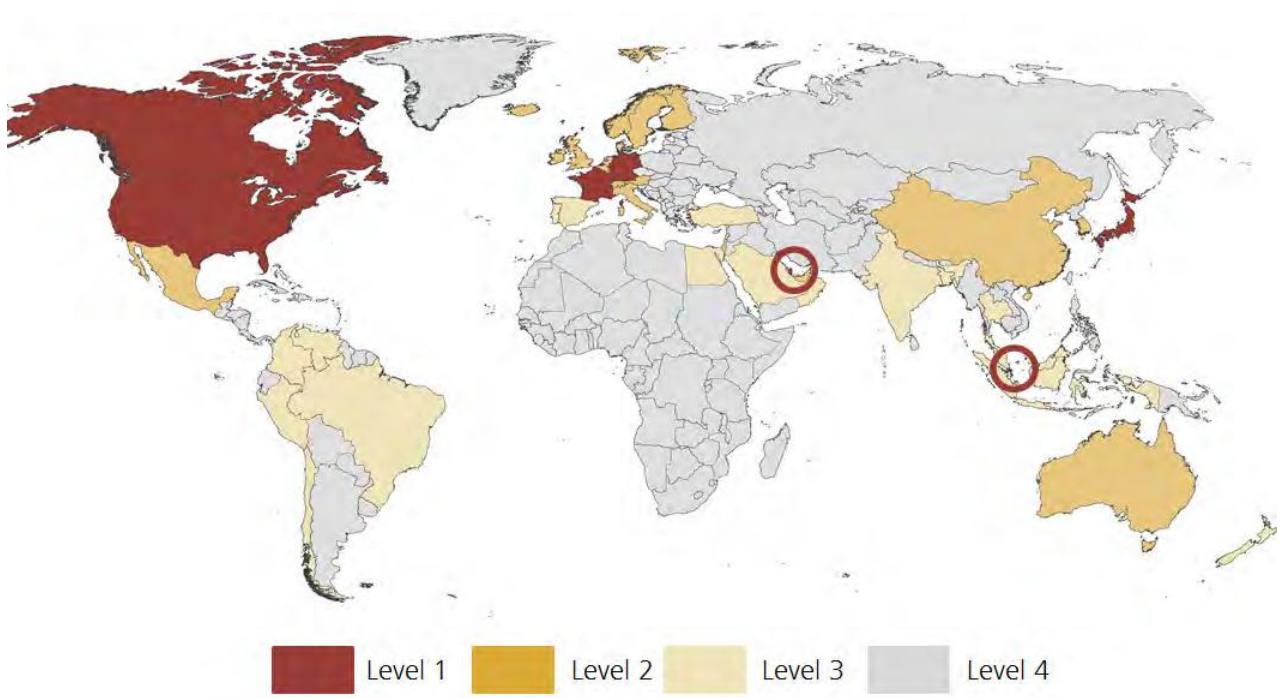
Table 1: The most attractive markets for investments in retirement homes

Level 1	Level 2
Japan	Australia
Canada	Switzerland
France	Netherlands
Singapore	Sweden
Germany	Korea, Rep.
Qatar	Austria
United States	Belgium
	Denmark
	Finland
	Israel
	Norway
	United Arab Emirates
	Italy
	United Kingdom
	Ireland
	Iceland
	China
	Luxembourg
	Mexico

Source: UBS. The ranking is based on two series of indicators. The first reflects on needs and aggregates life expectancy at birth (as of 2012), the number of individuals at or above 80 (as of 2030), and the growth rate of this cohort (2015–2030). The second reflects on affordability and purchasing power. It aggregates the health expenditure as regards to adjusted net national income, the age dependency ratio, and the overall adjusted net national income. The combination of these two indicators is converted to a score, which helps to identify key markets with a score of 20 or above, and second rank markets.

ational activities, higher purchasing power). For example, Australia, Austria, Italy, Israel, and the UAE may be attractive destinations for regional retirees. For that reason, Spain (ranked 30th), Malta (35th), Thailand (37th), Colombia (39th), Cyprus (40th), and Tunisia (60th) may appear more attractive than their initial ranking suggests. (For the full ranking, refer to Table 3 in the appendix.) However, some of these markets may be difficult to access due to a lack of investable instruments.

Fig. 6: The most attractive markets for investments in retirement homes



Source: UBS, as of 26 January 2017

Focus: Fundamentals of the US market

In the US, there are approximately 23,000 investment grade retirement home properties containing roughly three million units. Some 21.9% of senior households (aged 75+) were living in retirement care facilities, including skilled nursing, assisted living and independent living facilities in 2015. More than 50% of these seniors, or 11.2% of the senior population, were living in nursing care facilities.

Promising demographic outlook…

As mentioned above, the demographic outlook is very promising for retirement homes in the US. From 2016–2020, average annual growth in the 75–80 age cohort is expected to reach 4.1%, while growth in the 80+ age cohort is projected to reach 1.7%. Hence, the senior population will already have been growing significantly faster than the total population (annual growth of around 1%) up to 2020. From 2020–2025, the growth rate of the senior population will accelerate further as baby boomers enter the 75+ population. The 75–80 age cohort will grow at 5.3% annually or close to 30% cumulatively during these five years.

...but challenging affordability

Demand is constrained by affordability, whether the residents pay privately or get compensation from public sources for the respective services. For nursing care, 67% of revenues come from public sources in the US. Given monthly asking rents of about USD 5,000–10,000, potential residents need relatively high levels of wealth. But concerns about the financial feasibility seem to be overdone. The increasing wealth of the elderly should support demand for seniors housing at least up to 2025. The current age cohort of 65- to 75-year-olds has higher wealth than current seniors aged 75+ or the average household below 65.

…and intense competition

The increase in construction of senior housing facilities in recent years has started to put some pressure on occupancy rates. However, accelerating demand growth for retirement homes should improve fundamentals in the medium term, even if supply continues to expand at the current pace. And in the short run, demand and supply are expected to match. That said, nursing care facilities are struggling the most in keeping their beds filled. Cost pressure has led to a shift among seniors into cheaper, community-based nursing services.

In most states, building ALF and SNF is strongly regulated. For a developer to receive a building or acquisition permit for an assisted living facility, unmet assisted living demand in the area must be demonstrated (through a certificate of need). Barriers to entry for nursing care home builders vary strongly across states, depending on the respective legislation. As a general rule, facilities receiving Medicare and Medicaid funding must adhere to very tight standards. In many states, moratoriums on the construction of new nursing homes exist.

How to invest?

Private markets: equity instruments

Private markets offer a broad investment universe, with assets of different sizes, but also a tailored exposure to geographies that are often not covered or inaccessible through listed instruments (such as REITs). Private markets offer investors à la carte access to operators and real assets through different level of risks (and expected returns), such as:

- Venture capital (equity), financing new types of facilities or innovative operators;
- Growth capital (equity), financing the development of facilities or the growth of operators;
- LBO (equity), financing M&A, restructuring, and operational improvements of assets and operators;
- Private real estate (equity), financing the construction, extension, or renovation of assets, as well as their acquisition.

Attractive niches

In the case of nursing care facilities, the most recent or innovative assets are often still in development and not listed. Private markets are also suited for capitalizing on the emergence (or the conversion) of nursing homes dedicated to apartment-like facilities providing assisted living facilities. The most attractive niche is low-intensity medical services housing, and assisted living units built in conjunction with single-family homes and condominiums in a planned unit development or adjacent to a health center. The latter allows seniors to mingle with their children, relatives, or other young people in a neighborhood. Community-based satellite healthcare facilities serve the needs of non-resident seniors in their communities as well as residents.

Listed equity markets
The retirement care equity universe is strongly US-centric. In the US, the market is split between owners (typically real estate investment trusts, or REITs) and operators (skilled nursing, assisted living, independent living facilities). Healthcare REITs are a significant source of financing for the retirement homes industry. Traditionally, healthcare REITs lease their retirement home operations through a 10- to 15-year triple net lease, in which the operators are responsible for paying property expenses such as taxes, insurance, and facility maintenance, with an initial cash yield in the 6–9% range. We estimate the dividend yield of those REITs in our base case to be particularly sustainable due to long and very stable lease contracts and the relative very low vacancy risks. Furthermore, the demographic trends in the US will likely create substantial long-term development potential for the healthcare REIT subsector and lead to growing capital needs in the retirement home industry.

Importantly, since 2009, the REIT Investment Diversification and Empowerment Act (RIDEA) allows REITs to share in the property's profits from operations, as opposed to the traditional triple net lease structure, where operators provide fixed payments regardless of how the property performs. Under this structure, they can generate higher profits in a booming market than they could through triple net leases, but with the trade-off that they are taking a greater risk. Lower occupancy rates of a building or higher operating costs would have an immediate impact on profitability. On the other hand, operators have also recently shown an increased preference for owning the whole value chain through outright ownership of the real estate in use.

Sustainable investing in retirement care

Demand for assisted living and care facilities is expected to grow fast in the coming years. The baby-boom generation is progressively reaching retirement age, and increasing life expectancy will fuel the need for long-term care facilities and services. With nuclear families on the rise and fewer children taking care of their elders, assisted living services provide seniors with a higher quality of life. Retirement home operators and specialized real estate companies should profit from this predictable, strong demand growth and the resulting capital needs.

Providing housing solutions tailored to seniors' personal needs supports their well-being. Personalized daily life support, as well as à la carte socialization thanks to optional health and leisure services, is increasingly being offered by operators. These services provide seniors with a higher quality of life, and fulfill one of the goals of sustainable investing – investing with values – by supporting and improving the lives of elders. However, in many countries, the provision of retirement homes is not underpinned by sustainable long-term financing. Widening financing gaps limit accessibility for the broader public.

Risks

In the long run, the main source of risk is the lack of sustainability of public sector spending on long-term care that could affect rental income growth. It seems clear to us that in the very long run the dramatic projected increase in the need for long-term care will confront significant constraints in the resources available. Hence, the establishment of a more comprehensive social insurance program or increased support (subsidies) for private market solutions will be inevitable as currently only about 10% of the population has private long-term care insurance. Furthermore, real estate valuations are tied to the relative yields of debt. In case of a strong increase in interest rates, long-duration assets such as healthcare REITs typically underperform the broader market. Hence, the prospect of higher interest rates in the US may harm the short-term performance of the sector. Note that for a long-term investor those risks are mitigated as household wealth (and ability to pay for senior housing services) grows as the economy improves. In addition, interest rate exposure will be smoothed out over the business cycle.

Other risks that can influence the value of investments in this space include:

- government reimbursement rates
- labor expenses
- new construction rates
- occupancy rates
- pricing power
- regulatory changes

Table 3: Most attractive markets for investments in retirement homes – full list
A model-based selection

Level 1	Score	Level 2	Score	Level 3	Score	Level 4	Score	Level 4	Score
Japan	21.0	Australia	19.8	China	17.8	Albania	14.8	Slovak Republic	13.0
Canada	20.8	Switzerland	19.8	Luxembourg	17.8	Costa Rica	14.8	Guinea	12.8
France	20.8	Netherlands	19.8	Mexico	17.5	Ecuador	14.8	St. Lucia	12.8
Singapore	20.3	Sweden	19.8	New Zealand	17.3	Greece	14.8	Malawi	12.8
Germany	20.0	Korea, Rep.	19.3	Bahrain	17.0	Iran, Islamic Rep.	14.8	Russian Federation	12.8
Qatar	20.0	Austria	18.8	Oman	17.0	Lebanon	14.8	Rwanda	12.8
United States	20.0	Belgium	18.8	Spain	16.8	Sri Lanka	14.8	El Salvador	12.8
		Denmark	18.8	Bangladesh	16.5	Maldives	14.8	Suriname	12.8
		Finland	18.8	Indonesia	16.5	Panama	14.8	Togo	12.8
		Israel	18.8	India	16.5	Poland	14.8	Uganda	12.8
		Norway	18.8	Brazil	16.0	Slovenia	14.8	St. Vincent and the Grenadines	12.8
		United Arab Emirates	18.5	Malta	15.8	Tunisia	14.8	Central African Republic	12.5
		Italy	18.5	Portugal	15.8	Belize	14.5	Comoros	12.5
		United Kingdom	18.3	Thailand	15.8	Dominican Republic	14.5	Gambia, The	12.5
		Ireland	18.0	Turkey	15.8	Ethiopia	14.5	Haiti	12.5
		Iceland	18.0	Colombia	15.5	Guatemala	14.5	Iraq	12.5
				Cyprus	15.5	Honduras	14.5	Mali	12.5
				Egypt, Arab Rep.	15.5	Jordan	14.5	Mongolia	12.5
				Malaysia	15.5	Cambodia	14.5	Senegal	12.5
				Peru	15.5	Nigeria	14.5	Hungary	12.3
				Venezuela, RB	15.5	Nicaragua	14.5	Estonia	12.0
				Vietnam	15.5	Philippines	14.5	Croatia	12.0
				Bahamas, The	15.3	Vanuatu	14.5	Romania	12.0
				Chile	15.0	Czech Republic	14.3	Solomon Islands	12.0
				Saudi Arabia	15.0	Argentina	14.0	Sierra Leone	12.0
						Barbados	13.8	Trinidad and Tobago	12.0
						Macedonia, FYR	13.8	Burundi	11.8
						Mauritius	13.8	Micronesia, Fed. Sts.	11.8
						Paraguay	13.8	Jamaica	11.8
						Afghanistan	13.5	Seychelles	11.8
						Angola	13.5	Tonga	11.8
						Benin	13.5	Azerbaijan	11.5
						Burkina Faso	13.5	Cabo Verde	11.5
						Bolivia	13.5	Gabon	11.5
						Bhutan	13.5	Ghana	11.5
						Botswana	13.5	Kazakhstan	11.5
						Cameroon	13.5	Kyrgyz Republic	11.5
						Algeria	13.5	Sao Tome and Principe	11.5
						Eritrea	13.5	Tajikistan	11.5
						Fiji	13.5	Turkmenistan	11.5
						Guinea-Bissau	13.5	Uzbekistan	11.5
						Guyana	13.5	Samoa	11.5
						Kenya	13.5	Congo, Rep.	11.3
						Kiribati	13.5	Liberia	11.3
						Lao PDR	13.5	Uruguay	11.3
						Morocco	13.5	Bulgaria	11.0
						Madagascar	13.5	Ukraine	11.0
						Mozambique	13.5	Armenia	10.8
						Mauritania	13.5	Belarus	10.8
						Namibia	13.5	South Africa	10.8
						Niger	13.5	Yemen, Rep.	10.5
						Nepal	13.5	Congo, Dem. Rep.	10.5
						Pakistan	13.5	Zambia	10.5
						Papua New Guinea	13.5	Zimbabwe	10.5
						Sudan	13.5	Equatorial Guinea	10.3
						Swaziland	13.5	Lithuania	10.0
						Chad	13.5	Latvia	10.0
						Tanzania	13.5	Lesotho	9.8
								Georgia	9.3

Source: UBS, as of 4 January 2017

Non-Traditional Assets

Non-traditional asset classes are alternative investments that include hedge funds, private equity, real estate, and managed futures (collectively, alternative investments). Interests of alternative investment funds are sold only to qualified investors, and only by means of offering documents that include information about the risks, performance and expenses of alternative investment funds, and which clients are urged to read carefully before subscribing and retain. An investment in an alternative investment fund is speculative and involves significant risks. Specifically, these investments (1) are not mutual funds and are not subject to the same regulatory requirements as mutual funds; (2) may have performance that is volatile, and investors may lose all or a substantial amount of their investment; (3) may engage in leverage and other speculative investment practices that may increase the risk of investment loss; (4) are long-term, illiquid investments, there is generally no secondary market for the interests of a fund, and none is expected to develop; (5) interests of alternative investment funds typically will be illiquid and subject to restrictions on transfer; (6) may not be required to provide periodic pricing or valuation information to investors; (7) generally involve complex tax strategies and there may be delays in distributing tax information to investors; (8) are subject to high fees, including management fees and other fees and expenses, all of which will reduce profits.

Interests in alternative investment funds are not deposits or obligations of, or guaranteed or endorsed by, any bank or other insured depository institution, and are not federally insured by the Federal Deposit Insurance Corporation, the Federal Reserve Board, or any other governmental agency. Prospective investors should understand these risks and have the financial ability and willingness to accept them for an extended period of time before making an investment in an alternative investment fund and should consider an alternative investment fund as a supplement to an overall investment program.

In addition to the risks that apply to alternative investments generally, the following are additional risks related to an investment in these strategies:

- Hedge Fund Risk: There are risks specifically associated with investing in hedge funds, which may include risks associated with investing in short sales, options, small-cap stocks, "junk bonds," derivatives, distressed securities, non-U.S. securities and illiquid investments.
- Managed Futures: There are risks specifically associated with investing in managed futures programs. For example, not all managers focus on all strategies at all times, and managed futures strategies may have material directional elements.
- Real Estate: There are risks specifically associated with investing in real estate products and real estate investment trusts. They involve risks associated with debt, adverse changes in general economic or local market conditions, changes in governmental, tax, real estate and zoning laws or regulations, risks associated with capital calls and, for some real estate products, the risks associated with the ability to qualify for favorable treatment under the federal tax laws.
- Private Equity: There are risks specifically associated with investing in private equity. Capital calls can be made on short notice, and the failure to meet capital calls can result in significant adverse consequences including, but not limited to, a total loss of investment.
- Foreign Exchange/Currency Risk: Investors in securities of issuers located outside of the United States should be aware that even for securities denominated in U.S. dollars, changes in the exchange rate between the U.S. dollar and the issuer's "home" currency can have unexpected effects on the market value and liquidity of those securities. Those securities may also be affected by other risks (such as political, economic or regulatory changes) that may not be readily known to a U.S. investor.

Appendix

Chief Investment Office (CIO) Wealth Management (WM) Research is published by UBS Wealth Management and UBS Wealth Management Americas, Business Divisions of UBS AG (UBS) or an affiliate thereof. CIO WM Research reports published outside the US are branded as Chief Investment Office WM. In certain countries UBS AG is referred to as UBS SA. This publication is for your information only and is not intended as an offer, or a solicitation of an offer, to buy or sell any investment or other specific product. The analysis contained herein does not constitute a personal recommendation or take into account the particular investment objectives, investment strategies, financial situation and needs of any specific recipient. It is based on numerous assumptions. Different assumptions could result in materially different results. We recommend that you obtain financial and/or tax advice as to the implications (including tax) of investing in the manner described or in any of the products mentioned herein. Certain services and products are subject to legal restrictions and cannot be offered worldwide on an unrestricted basis and/or may not be eligible for sale to all investors. All information and opinions expressed in this document were obtained from sources believed to be reliable and in good faith, but no representation or warranty, express or implied, is made as to its accuracy or completeness (other than disclosures relating to UBS and its affiliates). All information and opinions as well as any prices indicated are current only as of the date of this report, and are subject to change without notice. Opinions expressed herein may differ or be contrary to those expressed by other business areas or divisions of UBS as a result of using different assumptions and/or criteria. At any time, investment decisions (including whether to buy, sell or hold securities) made by UBS AG, its affiliates, subsidiaries and employees may differ from or be contrary to the opinions expressed in UBS research publications. Some investments may not be readily realizable since the market in the securities is illiquid and therefore valuing the investment and identifying the risk to which you are exposed may be difficult to quantify. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS, into other areas, units, divisions or affiliates of UBS. Futures and options trading is considered risky. Past performance of an investment is no guarantee for its future performance. Some investments may be subject to sudden and large falls in value and on realization you may receive back less than you invested or may be required to pay more. Changes in FX rates may have an adverse effect on the price, value or income of an investment. This report is for distribution only under such circumstances as may be permitted by applicable law.
Distributed to US persons by UBS Financial Services Inc. or UBS Securities LLC, subsidiaries of UBS AG. UBS Switzerland AG, UBS Deutschland AG, UBS Bank, S.A., UBS Brasil Administradora de Valores Mobiliarios Ltda, UBS Asesores Mexico, S.A. de C.V., UBS Securities Japan Co., Ltd, UBS Wealth Management Israel Ltd and UBS Menkul Degerler AS are affiliates of UBS AG. UBS Financial Services Incorporated of PuertoRico is a subsidiary of UBS Financial Services Inc. UBS Financial Services Inc. accepts responsibility for the content of a report prepared by a non-US affiliate when it distributes reports to US persons. All transactions by a US person in the securities mentioned in this report should be effected through a US-registered broker dealer affiliated with UBS, and not through a non-US affiliate. The contents of this report have not been and will not be approved by any securities or investment authority in the United States or elsewhere. UBS Financial Services Inc. is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule") and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule.
UBS specifically prohibits the redistribution or reproduction of this material in whole or in part without the prior written permission of UBS and UBS accepts no liability whatsoever for the actions of third parties in this respect.
Version as per September 2015.