

Q-Series®

How will demographics shape investing for the next ten years?

Equities

Global
Quantitative

The Demographic Shockwave has entered its final stage

What will outperform over the next ten years? The answer lies in the demographic DNA. Across the developed world populations are ageing, fertility rates are declining, longevity is increasing, and most importantly the 'Baby Boomers' are retiring. In this environment our models suggest that demographic shifts are likely to provide a headwind to growth for years to come. We do not believe that this is fully priced into the market.

Growth and bond yields likely to remain low, equity risk premia trade higher

Demographics drive growth, yields, and the equity risk premium. Growth is likely to remain structurally lower until 2025 as the effect of the Baby Boomers exiting the workforce continues to weigh upon labour, capital and productivity. At the same time, the increase in demand for low risk, income producing assets is likely to keep yields across asset classes suppressed. The equity risk premium is likely to increase as the ageing population sells down risky assets in order to finance retirement. The demographic effect suggests lower growth and inflation, which lowers investment, which in turn lowers the neutral cash rate. Lower interest rates are still stimulatory, but with a smaller effect. Central Banks are thus more likely to hit the zero lower bound, extending the period of lower rates.

Equities: High Quality Growth and High Quality Income are the winners

From a style perspective: High Quality Growth and High Quality Income equities are likely to outperform. The likely outperforming sectors are those that cater for an ageing population such as Entertainment and Healthcare, defensive sectors that are likely to perform well in a low growth environment such as Utilities and Consumer Staples, and those that drive productivity enhancements such as Information Technology, or are able to capitalise on emerging market opportunities, such as Consumer Goods.

Stocks that we believe are likely to outperform:

High Quality Growth: Universal Health Services, Mondi, Alps Electric, Catcher Technology, Sirtex. **High Quality Income:** McDonald's Corp, Marks & Spencer, Daiwa House Industry, Siam Cement, Harvey Norman. Please see pages 28 to 31 for our full stock screen lists.

We have created a number of interactive models to assist investors with their own analysis. Click on the below links to access:

1. [Demographic Model suggested growth rates by country](#)
2. [Suggested sector tilts based on demographic shifts](#)
3. [Evaluate your own Macro scenario with our Macrosense model](#)

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Executive summary

What will outperform over the next ten years? The answer lies in the DNA of the economy, the demographics. Ultimately, asset class, equity style and sector returns are a function of demography, as it is the demographic structure and change in demography that drives both the overall growth of the economy as well as demand across and within asset classes.

How does this work? The Production Function holds that growth is a function of labour, capital and productivity. In practice these variables are interdependent, as increases in the size and age of the labour force are likely to lead to increases in capital and improvements in productivity. As a consequence, understanding the demography of an economy, its trading partners and potential investors allows us to assess both the likely growth of the economy as well as the demand across asset classes.

Across most of the developed markets the labour force has been increasing in both size and age since the early eighties. As a consequence, we have enjoyed the benefits of above trend growth for an extended period. In a high growth environment, risky asset classes such as equities are likely to outperform as earnings growth rates are pushed higher and risk premia fall. The demographic tailwind has subsequently ended, and we have entered into a period of structurally lower growth as 'Baby Boomers' retire. In a low growth environment such as this, defensive income producing assets are likely to outperform as growth rates remain low and risk premia rise.

However, the second driver of returns is demand. Specifically, each demographic cohort has a different demand profile across asset classes. As a consequence, the relative size and change in size of each cohort affects demand across and within asset classes. This is further complicated through international investment, as a small open economy such as Australia, with a relatively high dividend yield, becomes an attractive proposition for international investors seeking income.

Where to from here? Developed world populations are ageing, fertility rates are declining, longevity is increasing, and most importantly the 'Baby Boomers' are retiring. In this environment our models suggest that demographic shifts are likely to provide a headwind to economic growth and inflation for years to come.

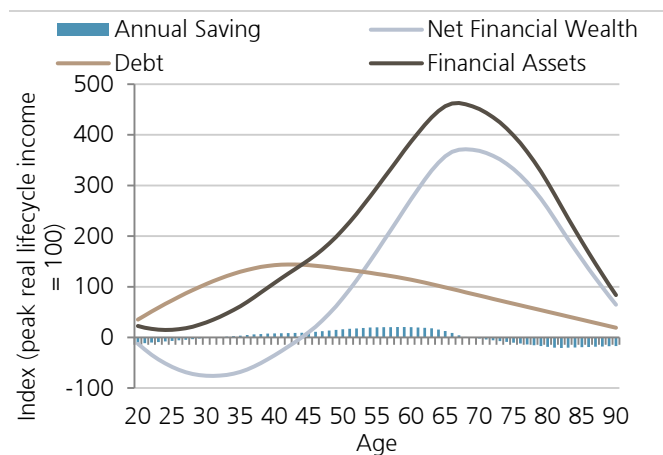
What does this mean for asset classes? In a slow growth environment low growth is normally offset by higher yields. However, with policy makers likely to hold cash rates lower in an effort to stimulate growth, the yield differential across asset classes is likely to prevent an 'asset meltdown'. We do, however, expect equity risk premia to rise.

It is the demographic structure that drives both the overall growth of the economy as well as demand across and within asset classes

The demographic tailwind has ended, and we have entered into a period of structurally lower growth and bond yields

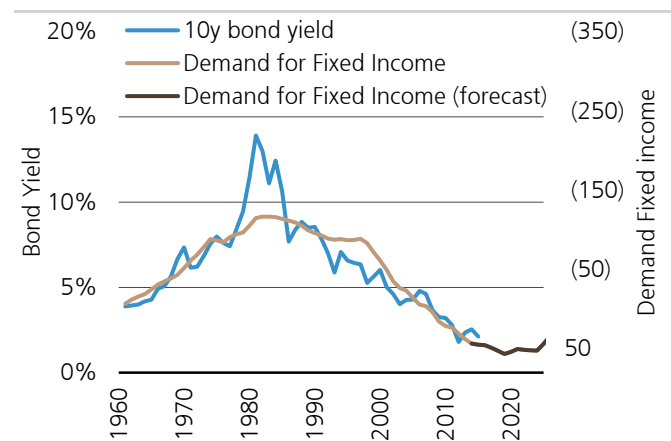
We expect equity risk premia to rise, and expect high quality growth, and high quality dividend yielding companies to outperform

Figure 1: Financial Assets, debt and savings life cycle



Source: UBS, Gourinchas and Parker (2002), US Census (2013), Federal Reserve Bank of New York: Center for Microeconomic Data

Figure 2: United States: Demographics and bond yields



Source: Factset, Haver, Survey of Consumer Finances, UBS

From a style perspective, traditional risk factors such as value and small caps tend to outperform in a high growth environment where investors' risk appetite is increasing. However, in a low growth environment, where risk premia are rising and investors require income, high quality growth, and high quality dividend yielding companies are likely to outperform.

From a sector perspective, outperformance is likely to come from: defensive sectors such as Utilities and Consumer Staples, sectors that cater directly to an ageing demographic such as Entertainment and Healthcare; and finally, sectors that drive productivity enhancements such as Information Technology, or are able to capitalise on emerging market opportunities, such as Consumer Goods.

Sectors that are likely to outperform are: Utilities, Consumer Staples, Entertainment, Healthcare, Information Technology, and Consumer Goods

Figure 3: Stocks that are likely to outperform based on Demographics and our Quantitative analysis

Sedol	Bloomberg	Company	Sector	Country	PE	PB	DY	Last Closing Price	Price Target	Currency	UBS Rec.
High Quality Growth											
2923785	UHS.UN	Universal Health Services	Health Care	US	16.86	3.17	0.32%	120.68	145.00	USD	Buy
B1CRLC4	MNDI.LN	Mondi	Materials	UK	13.34	3.33	3.86%	1490.00	1750.00	GBP	Buy
6021500	6770.JT	Alps Electric	IT	Japan	12.26	3.14	0.79%	3575.00	5300.00	JPY	Buy
6186669	2474.TT	Catcher Technology	IT	Taiwan	10.37	2.73	2.90%	321.50	460.00	TWD	Buy
6286008	SRX.AT	Sirtex Medical	Health Care	Australia	31.41	12.80	0.85%	37.50	43.00	AUD	Buy
High Quality Income											
2550707	MCD.UN	McDonalds	Consumer Disc	US	19.61	8.28	3.67%	112.94	122.00	USD	Buy
3127489	MKS.LN	Marks & Spencer	Consumer Disc	UK	13.72	2.58	3.93%	511.00	640.00	GBP	Buy
6251363	1925.JT	Daiwa House Industry Co	Financials	Japan	14.12	1.72	2.34%	3141.00	3400.00	JPY	Buy
6609917	SCC.TB	Siam Cement	Materials	Thailand	12.31	3.12	3.66%	456.00	570.00	THB	Buy
6173508	HVN.AT	Harvey Norman	Consumer Disc	Australia	14.19	1.70	5.36%	4.01	4.80	AUD	Buy

Source: Factset, UBS

Please see pages 28 to 31 for our full stock screen lists.

Introduction

Aim of the paper

The objective of this paper is to explore the demographics of the developed world and the effect of demographic shifts on asset class returns as well as future sector and style performance.

How do we measure growth?

Economic growth can be thought of as the change in the sum of the population weighted by either the income or expenditure distribution.

How do we model asset class yields?

Asset class yields are modelled based on the underlying supply and demand for each asset class. Ultimately asset class preferences shift with age. Consequently, the size of each age cohort weighted by asset class preference should provide a proxy for demand. The change in demand should theoretically drive a change in yield.

Please see the Appendix for more detail on the models.

Demographic data

We have used demographic data provided by the United Nations. The future estimate data includes estimates of fertility, mortality and international migration.

Theory behind demographics

The Production Function (and hence growth) is a function of labour, capital and productivity. In this note we focus on demographics and highlight that ultimately the demographic structure of a nation is a core driver of growth and hence returns across asset classes.

$$Y = A f(K, L)$$

Y: is output (real GDP)

K: is the stock of capital

L: labour

A: measure of productivity

In practice these variables are interdependent. Increases in the size and age of the labour force are likely to lead to increases in capital and improvements in productivity. An increasing and ageing labour force (L) is likely to drive up demand for capital (K) which will in turn drive up the price assuming supply remains constant. However, as the population ages and the workforce shrinks (relative to the total population), the demand for capital is likely to fall causing the price to fall. Correspondingly, changes in the aggregate age of the workforce are significantly correlated with changes in aggregate productivity (A) (Freyer, 2005).

As a consequence, understanding the demography of an economy, its trading partners and potential investors allows us to assess both the likely growth of the economy as well as the demand across asset classes.

Which demographic trends matter?

There are three key demographic trends that are impacting growth, yields and returns which we discuss in this paper.

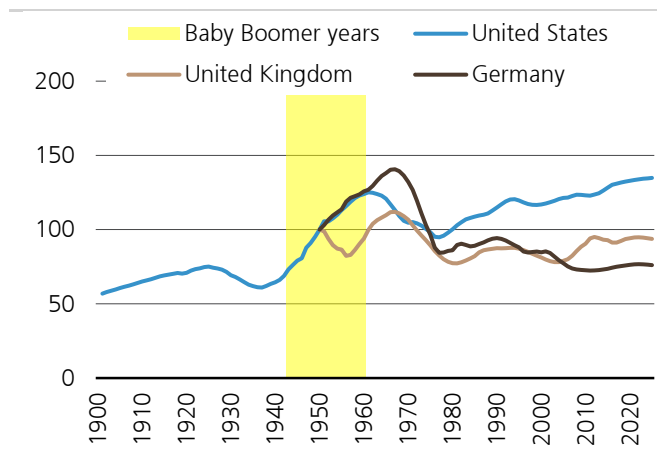
- (1) The size of the working population
- (2) The average age of the working population
- (3) The increase in the percentage of the retiree population

The size and age of the population

The birth rate through time creates the demographic profile of a nation. Across the developed world there have been two events that have had a significant impact on demography. Firstly, the Great Depression which began in 1929 and lasted until 1939 saw birth rates fall significantly. Secondly, this was followed by World War Two which triggered a pickup in economic growth which was accompanied by an increase in the birth rate. Post WW2 veterans returned home, consumption picked up and this was accompanied by a housing and baby boom.

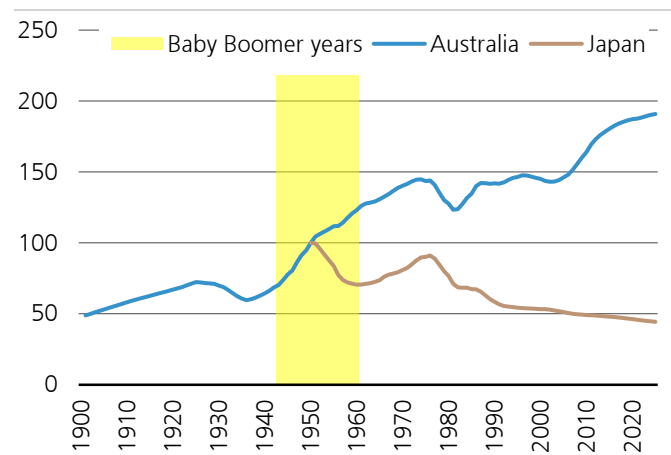
In the charts below we use the size of the 0 to 4 cohort as a proxy for birth rates.

Figure 4: Size of the 0-4 cohort: US, UK and Germany (rebased to 100 in 1950)



Source: Haver, UBS

Figure 5: Size of the 0-4 cohort: Japan and Australia (rebased to 100 in 1950)



Source: Haver, UBS

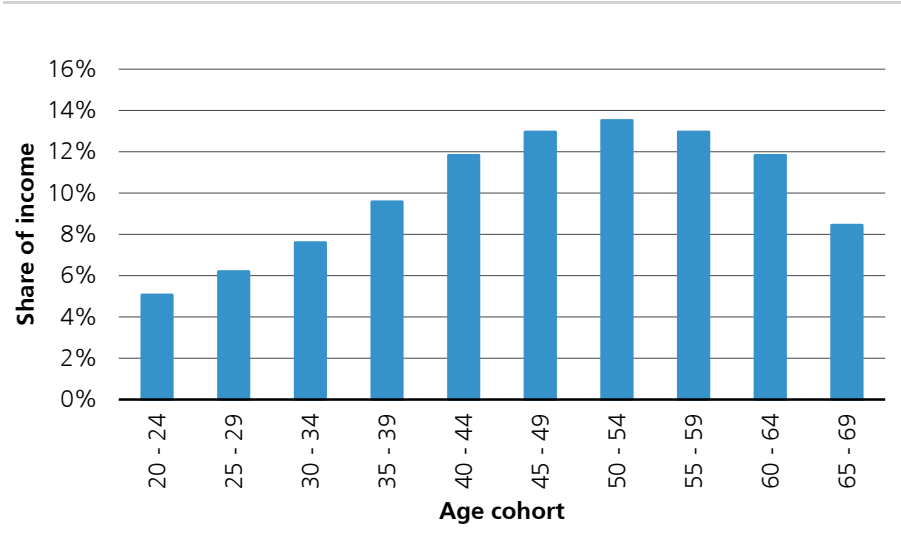
The net effect of the Great Depression followed by the Baby Boom, has resulted in a 'Shockwave' through time as Baby Boomers have driven economic growth – the so-called 'demographic dividend'. Furthermore, they have invested in housing initially, followed by equities, then bonds, and finally rotating into higher yielding, income producing assets as they retire.

This exacerbates the 'Shockwave' effect of the Baby Boomers ageing. If we make the assumption that income is a reflection of productivity, as Baby Boomers hit their peak earning potential (ages 40 to 60) this will mean that not only is there a large contribution to the supply of labour, but there is also an increase in

The net effect of the Great Depression followed by the Baby Boom, has resulted in a 'Shockwave' through time as Baby Boomers have driven economic growth

productivity. This falls in line with the research conducted by Freyrer (2005). Furthermore, as they retire, we are likely to witness both slower growth rates in the labour force as well as slower rates of productivity improvements as the average age of the workforce increases at a slower rate.

Figure 6: Income distribution (United States data)



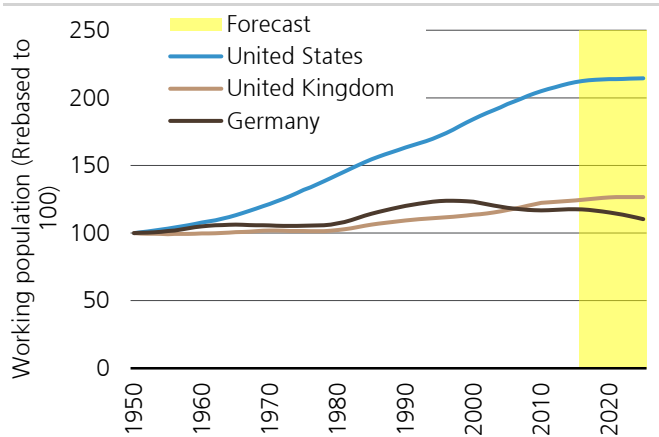
Source: US Survey of Consumer Finances

Birth rates began increasing in 1943, as a result, those that retired at age 65 did so in 2008. This demographic shift of Baby Boomers moving into retirement is likely to slow in 2025 when the last of the Baby Boomers retire, assuming they retire at age 65.

The increase in size and age of the workforce has been a tailwind for most of the past thirty years

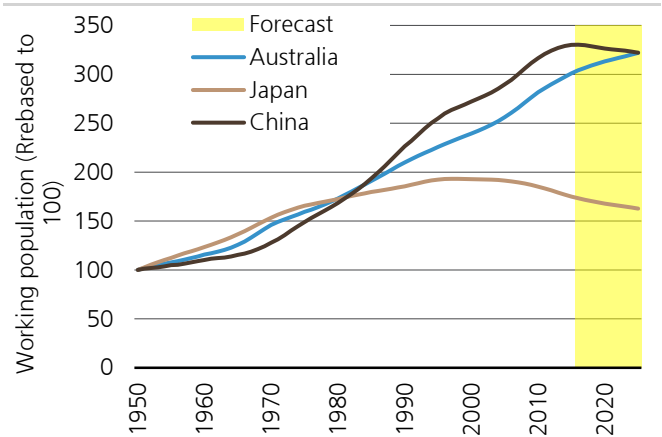
The workforce continues to grow in the US, UK and Australia, albeit at a significantly lower rate. However, Germany, Japan and China are likely to experience shrinking workforces over the next ten years.

Figure 7: Size of the working population



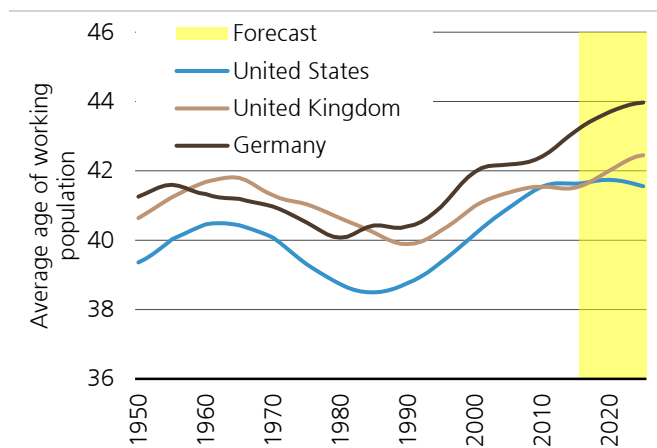
Source: Haver, UBS

Figure 8: Size of the working population



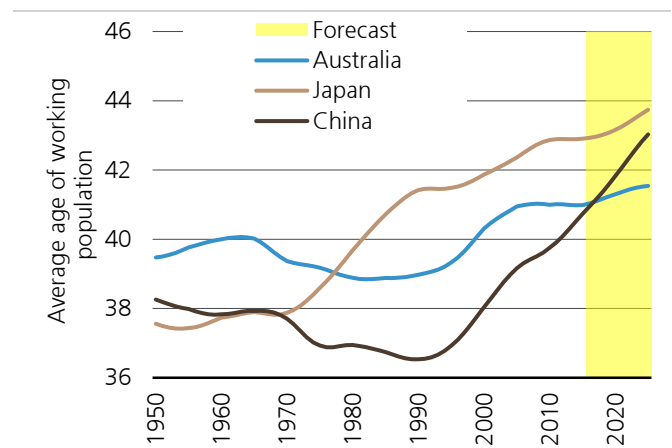
Source: Haver, UBS

Figure 9: Average age of the working population



Source: Haver, UBS

Figure 10: Average age of the working population



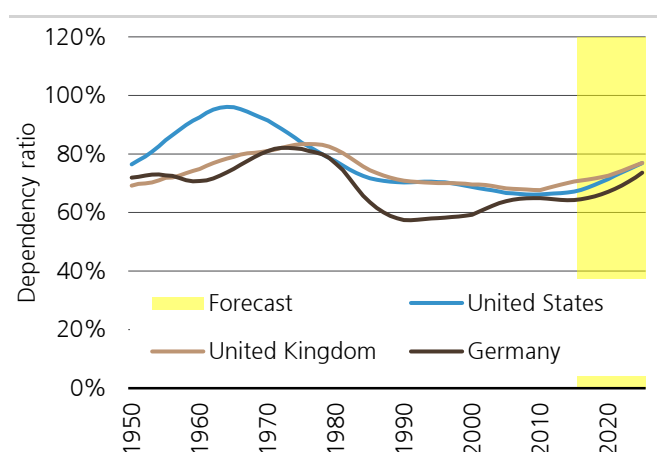
Source: Haver, UBS

The average age of the workforce has been increasing across most of the developed world since the 1980's. However, this tailwind has likely ended for the United States. In the UK, Germany, Japan, China and Australia, the average age of the working population continues to increase.

Increasing proportion of retirees

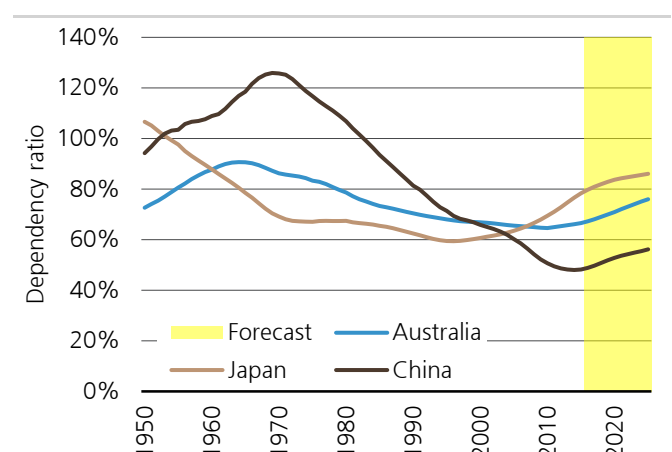
Whilst Baby Boomers have contributed significantly to growth historically, as they retire this is likely to become a drag on both the supply of labour as well as productivity, and hence growth. Across the developed world we are witnessing an increasing dependency ratio. We assess the Dependency Ratio and find that it has begun to increase across the US, UK, Germany, Japan, China and Australia. The increase will be most noticeable over the next ten years as Baby Boomers retire.

Figure 11: Dependency ratios



Source: Haver, UBS

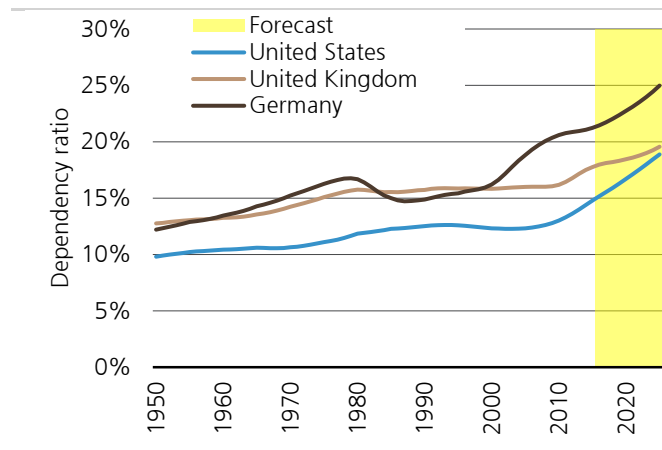
Figure 12: Dependency ratios



Source: Haver, UBS

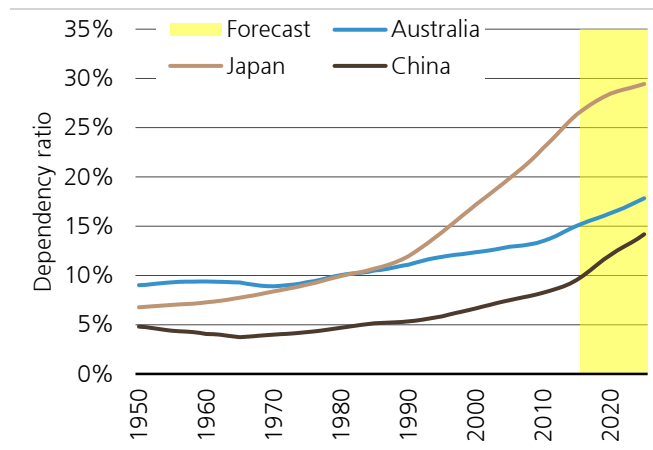
At the same time, the increase in the retiree population is also likely to lead to a shift in demand across asset classes and risk preferences. Specifically, retirees are likely to favour fixed income over equities and within the equities space are likely to prefer high quality income producing equities over riskier investments.

Figure 13: Percentage of the population over 65 years



Source: Haver, UBS

Figure 14: Percentage of the population over 65 years

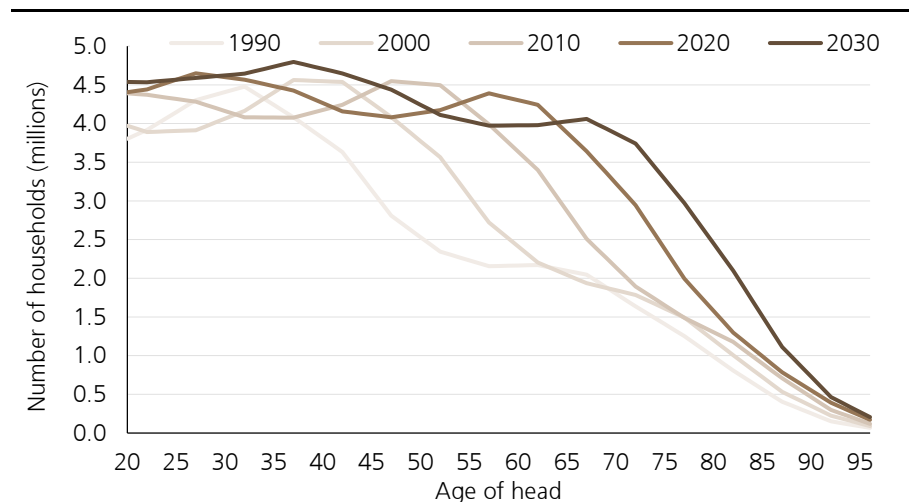


Source: Haver, UBS

Where are we in the demographic cycle?

In order to understand where we are in the demographic cycle we have taken historical and projected population data for different age cohorts with 5-year intervals and used linear interpolation to narrow the age cohorts to 1 year intervals. We have then multiplied the population statistics by household per capita statistics to estimate the number of households at different points in time and presented the results in Figure 15 below.

Figure 15: The demographic shockwave¹



Source: UBS Estimates, Survey of Consumer Finances, Gourinchas and Parker (2002), US Census (2013), Federal Reserve Bank of New York: Center for Microeconomic Data

¹ Refer to Appendix for a technical explanation of how we produced the data presented in Figure 15.

To reiterate, Figure 15 shows the number of households at different points in their lifecycle based on historical or forecast data for a given year. We can see that, based on data available in 2010, the head of most households (about 4.5 million) were around age 50. This observation is broadly consistent with the timing of the Baby Boomer cohort mentioned earlier. In fact we can track the Baby Boomers by observing the pronounced peak in the number of households, for each year's data, moving gradually from younger age cohorts to older age cohorts. We can also observe a demographic "echo" in the form of subsequent generations supporting the middle age cohorts based on the forecast data.

The extent to which new savings offset savings that are being drawn down will determine the demand for equities and fixed income. Therefore, we are very interested in how the age cohorts move through their consumption life cycles and at what point in the larger demographic cycle we are in right now. While we have seen increasing levels of saving and a rising demand for equities since the baby boomers began forming households, forecast data suggests that this trend will not continue. The question is: at what stage does the demographic cycle "turn" back to a reduced stock of savings?

The extent to which new savings offset savings that are being drawn down will determine the demand for equities and fixed income

Demographics drive growth and yields

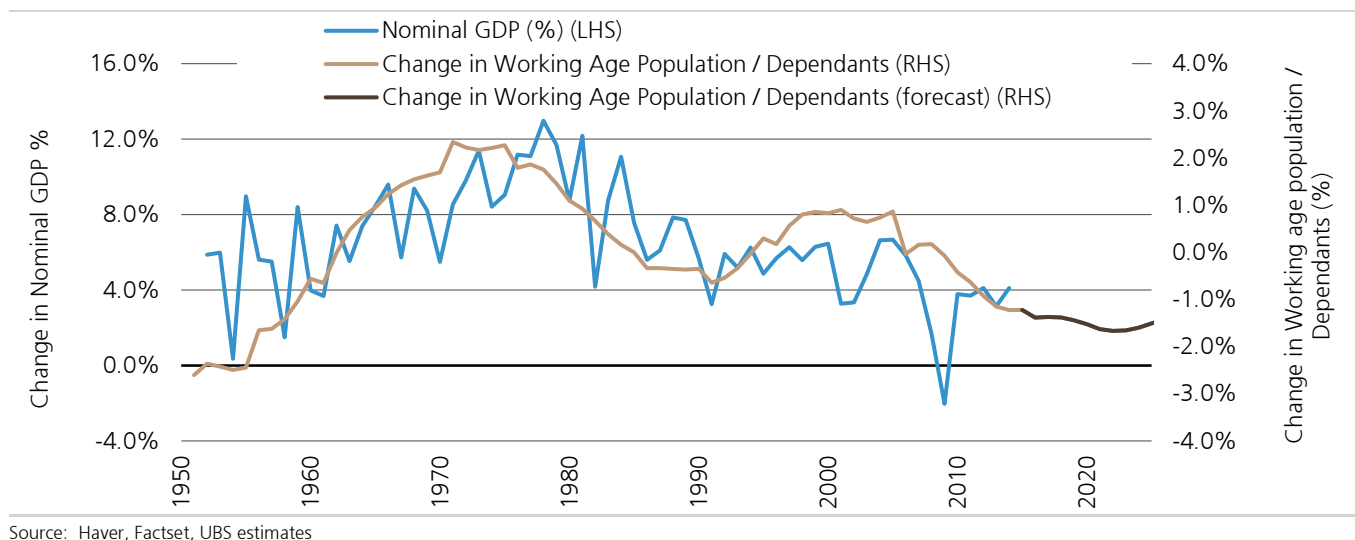
In the remainder of this paper we assess the outcome for the United States. We use the US as it is the source of the highest quality long term data. However, as we have noted above, the demographic headwinds that face the US are likely to impact the remainder of the developed world in a similar fashion.

Understanding Growth

The dependency ratio is often used as a guide to future economic growth. It is argued that increases in the number of workers will increase labour, capital and productivity, and hence place upward pressure on GDP, whilst increases in the number of dependents leads to higher social and healthcare costs, which in turn leads to increases in tax rates and downward pressure on GDP. Consequently, increases in the dependency ratio are likely to reduce the long run trend rate of economic growth. This falls in line with the research conducted by Freyrer (2005).

The dependency ratio is often used as a guide to future economic growth

Figure 16: United States: GDP and the inverse Dependency Ratio



We extend this concept, however, we recognise that not all workers are equal in either their incomes or their expenditures. As a consequence, in order to model growth we create an overlapping generational model weighted by the expenditure distribution. The theory being that expenditure is a reasonable proxy for demand. As a consequence the model should generate a more intuitive output of suggested growth.

We extend this concept by weighting demographic cohorts by their level of expenditure

Demographic model: Expenditure Weighted (DMEW)

The model is the weighted average of the number of people across age cohorts, with the weights being the proportion of the expenditure of each cohort

$$DMEW = \sum_{c=1}^N w_c D_c$$

Where:

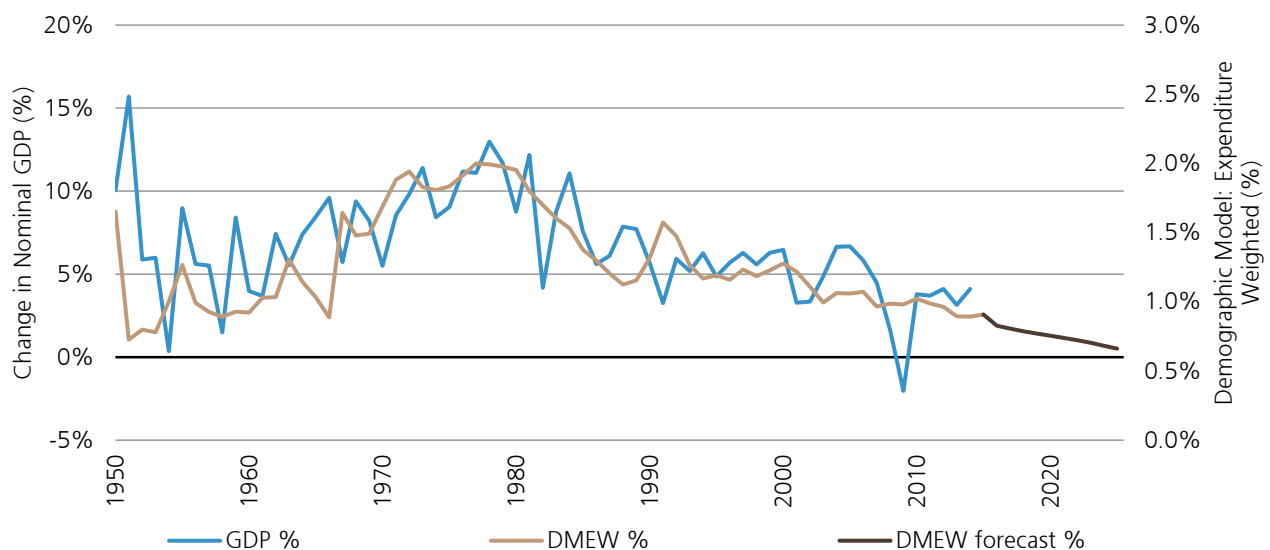
DMEW is the Demographic Model Expenditure Weighted

c is the cohort (20-24, 25-29 65+)

w is the proportion of expenditure of the cohort relative to total expenditure

D is the number of people in the cohort

Figure 17: Demographic Model: Expenditure Weighted



Source: Haver, Factset, UBS estimates

Using our model we can generate a long-term demographic implied growth rate for the market.

Click here for [Demographic Model suggested growth rates by country](#)

Overall, the Demographic Model does a good job of describing the longer term aggregate growth rate. However, it does not take into account shorter term market cyclicality. Currently, due to the retiring Baby Boomers, the Model is suggesting that we have entered into a period of structurally lower growth that is likely to last until 2025 as the Baby Boomers retire and exert downward pressure on growth.

The Demographic Model does a good job of describing the longer term aggregate growth rate. However, it does not take into account shorter term market cyclicality

Understanding Yields

Now that we understand the current demographic headwinds and the role they play in the great stagnation of economic growth, we can turn our attention to the less studied impact of these same demographic headwinds on the prices and future returns of financial assets and the implications for portfolio strategy.

At every stage of a population's ageing, the increased demand for safe, yielding assets will promote the performance of fixed income assets versus equities. The effect of ageing on the price of other financial assets is more complex.

In the early stages of a population's ageing (i.e. when the largest cohort of citizens are aged 40-60), the increased demand for financial assets will decrease the yields on both fixed income and equities as workers accumulate assets for retirement. Concurrently, the decline in household borrowing will exert further downward pressure on interest rates.

After this point (i.e. when the largest cohort of citizens are aged 60 and over), individuals begin to sell their financial assets as they finance consumption in retirement. In addition, they should reallocate their savings away from equities and toward fixed income.

At present, the age cohort who hold the most interest for us are those individuals born during the peak of the baby boomer era, since they are the largest cohort of a relevant age for markets. (Technically the 20-29 year old cohort is larger, but their net saving is small and, if anything, slightly negative). As the later baby boomers age over the next decade, they should accumulate financial assets at the most rapid rate of their lifetime, increasing the prices of financial assets, but particularly defensive financial assets.

Not all asset classes will be impacted equally. Each demographic cohort has its own suite of preferred asset classes. Both of these factors mentioned in the preceding paragraph lower the neutral discount and/or cash rate, and the term premia embedded in long term bond yields. Ageing households should shy away from riskier assets, and so the equity risk premium is likely to increase.

As a result, assets with stable income producing factors are likely to benefit from these demand trends. Fixed income will benefit as both long and short term bond yields fall. The effect on equities is mixed. The appreciative effects of a lower discount rate is counterbalanced by an investor base which is increasingly averse to volatility, as a consequence, low volatility income producing equities are likely to outperform higher beta stocks.

Demographic cohorts exhibit different asset class and risk preferences. This shift in preferences drives asset class yields over time.

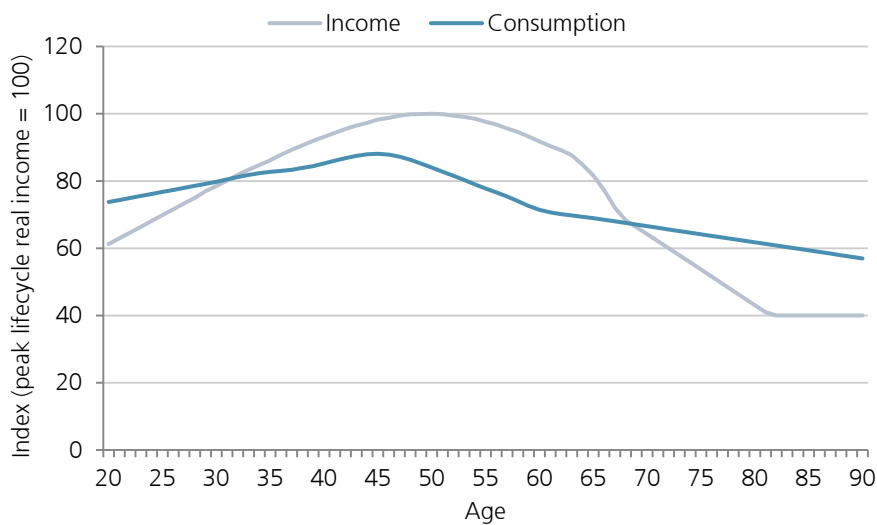
Baby Boomers are accumulating assets at the most rapid rate of their lifetime, increasing the price of financial assets, but particularly defensive financial assets

The demographic cycle of a household

To forecast the asset price cycle, we must first understand life-cycle consumption behaviours. Workers tend to be borrowers in the early stages of their lives, to acquire human capital (via student loans), or to purchase housing (via mortgages). From the point after they take on a mortgage, they revert to being net savers each year until the date of their retirement, and draw down on their net wealth to smooth their consumption as labour income falls.

To forecast the asset price cycle, we must first understand life-cycle consumption behaviours

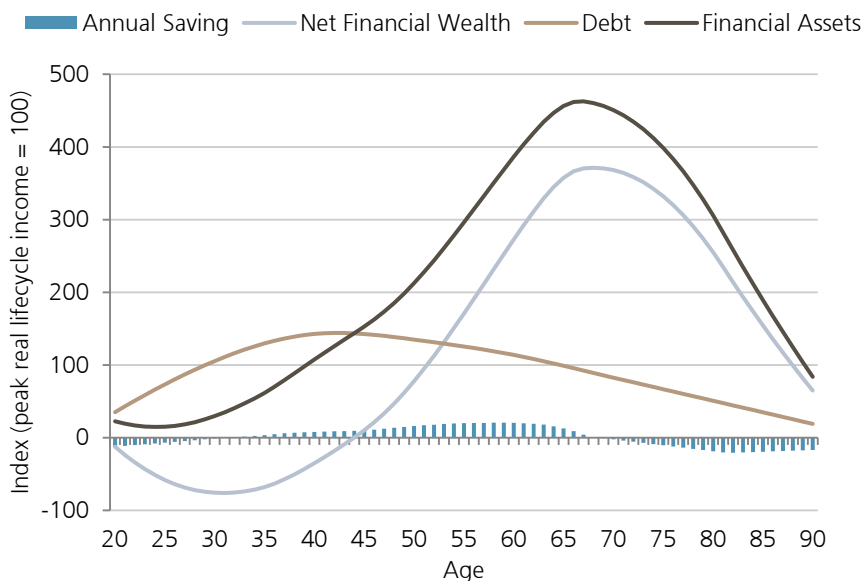
Figure 18: The Income and Consumption life cycle



Source: UBS, Gourinchas and Parker, US Census 2013, Federal Reserve Bank of New York: Center for Microeconomic Data

While the life cycle stages of borrowing and saving will happen at starkly different ages for any individual consumer, averaging across the population, a smooth pattern tends to emerge.

Figure 19: The financial assets, debt, and savings life cycle



Source: UBS, Gourinchas and Parker (2002), US Census (2013), Federal Reserve Bank of New York: Center for Microeconomic Data

Note: debt data includes: mortgage accounts, home equity revolving accounts, auto loans, bank card accounts, student loans, consumer finance and retail loan accounts

Income, consumption and debt data are used to calculate the indices in Figure 19². We find that the average consumer tends to accumulate debts until their early thirties, at which point average incomes exceed average consumption, and they turn to being net savers. Their net financial wealth returns to zero in their mid-

The average consumer tends to accumulate debts until their early thirties, at which point average incomes exceed average consumption, and they turn to being net savers

² Refer to the Appendix for a technical explanation as to how the data in Figure 19 was derived.

forties, and they begin to accumulate financial assets for retirement in their mid-sixties.³

We create a model with one representative household. To calibrate our model, we begin with an accepted model from academic literature - Gourinchas and Parker (2002). The model uses income and consumption data from the Survey of Consumer Expenditures for households with heads aged 25 to 65 years. We then project incomes and consumption outside of these labour years using a combination of US Census data, the Center for Microeconomic Data from the Federal Reserve Bank of New York, and modelling from Villaverde and Krueger (2005).

The lifecycle pattern of borrowing and investment tells us about the coming pool of demand and supply of financial assets from the household sector. Our representative household is a net *supplier* of financial assets (since their debt outweighs their financial assets) until age 44, and then a net *demand*er of financial assets for the remainder of their life. As the population ages, the relative scarcity of financial assets will increase the price of financial assets, and thereby lower its returns.

The lifecycle pattern of borrowing and investment tells us about the coming pool of demand and supply of financial assets from the household sector

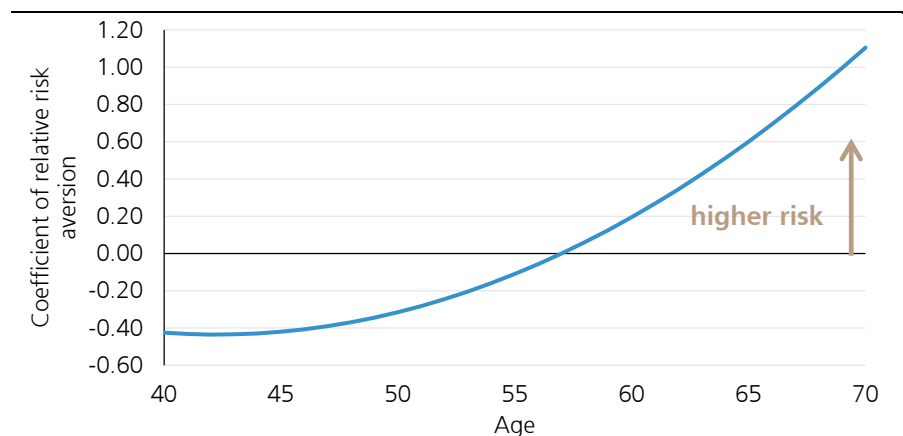
Older households seek out safer returns

Aggregate borrowing and saving behaviour only tells half the story, as each demographic cohort has its own suite of preferred asset classes.

As households age, their propensity for taking risk tends to decrease. The ageing population will not only lower future returns, but also promote the outperformance of income producing assets (such as bonds and dividend yielding stocks) versus riskier growth assets (other equities).

As households age, their propensity for taking risk tends to decrease

Figure 20: Coefficient of relative risk aversion rises with age



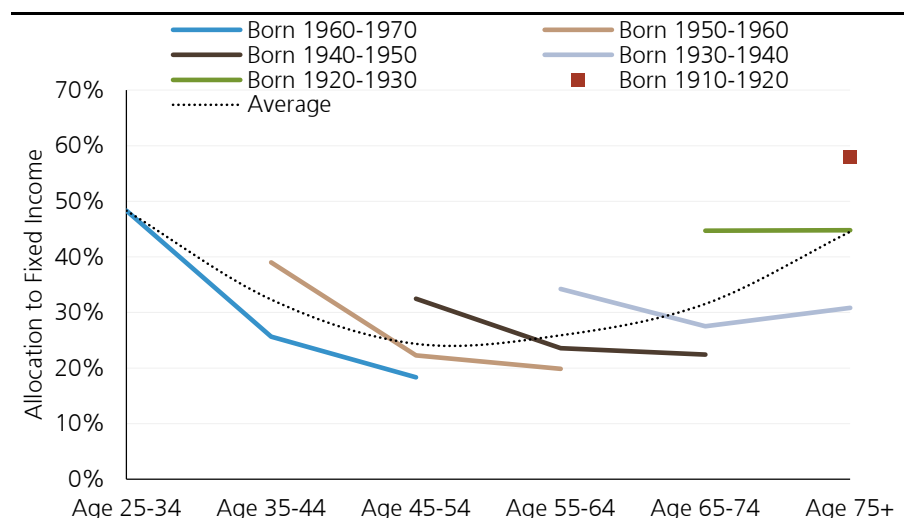
Source: UBS, Lin (2009)

We augment our model of household demand for financial assets with the composition of assets held using data from the Federal Reserve's Triennial Surveys of Consumer Finances. We create a panel of data across three decades to track how households adjust their asset allocation through their life cycle, adjusting for

³ For our purposes, we treat the purchase of a house as a consumption good, rather than a financial asset. As such, houses are excluded from "net financial wealth", which, in our model, results in the average household remaining in negative net financial wealth until their mid-40s.

fixed effects across generations and time⁴. Each line represents the allocation to fixed income versus equities, given a particular decade, of an average household as the head of that household ages over time. The average across age cohorts allows us to imply the desired proportion of fixed income versus equities at each point in the investment life cycle.

Figure 21: Desired holdings – fixed income (and other cash like investments) versus equities



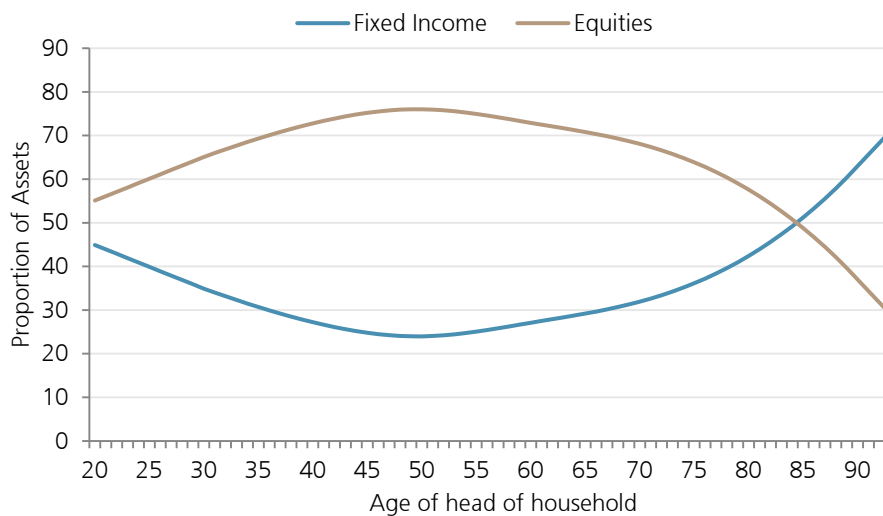
Source: UBS Estimates, Survey of Consumer Finances

The data shows a trend reduction in household holdings of fixed income assets over the last two decades. (This is demonstrated through the downward slope of the lines representing individuals born in the 1940's, '50's, and '60's). We can identify some of the causes - between the 1990's and the 2000's, stock ownership by households increased due to the increased take-up of retirement accounts through the employed population (Poterba & Samwick, 1995). Household allocations to fixed income continued to decline through 2013, partly in response to central bank purchases of bonds to lower their yield and shift investors into equities.

In total, households reduced their allocations to fixed income by ~1.75% per year over our period of analysis. Since we are interested in the change in households' asset allocations to fixed income due to ageing alone, we remove the impact of the trend reduction in fixed income across all ages.

⁴ We need to adjust for these effects as much of the differences in asset allocation are due to differences in risk tolerances between generations – for example, those who lived through the 1987 stock market crash are less likely to allocate to equities late in their lives. In addition, the supply of available fixed income versus equities securities leads to varying fixed effects over time.

Figure 22: Desired holdings – fixed income versus equities



Source: UBS Estimates, Survey of Consumer Finances

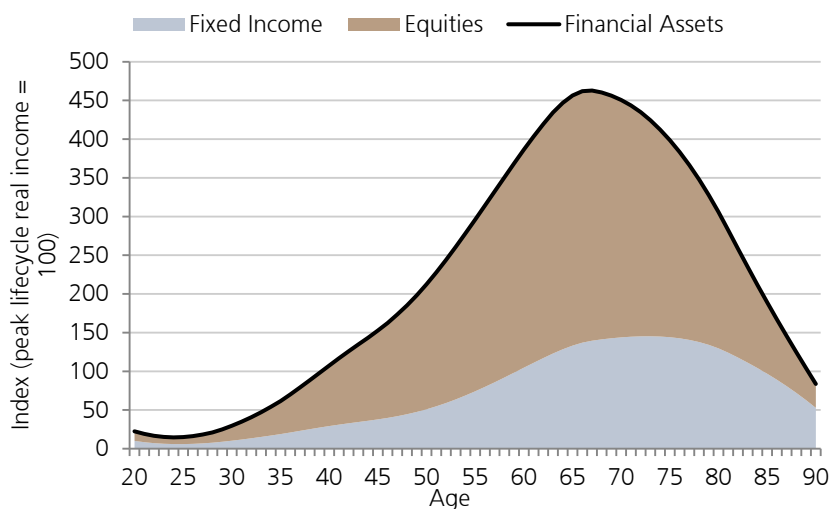
We find that, once we remove the trend reduction in fixed income assets over time, allocations to equities and fixed income follow a convex and concave-shaped cycles, turning at age 50⁵.

At first this seems counterintuitive, since the theory would predict that the share of assets held in fixed income would start low and increase monotonically over one's life. However, the median young worker tends to have little financial wealth, and deposits it in transaction and term deposit accounts, which leads to this result.

We then estimate the desired asset allocation of a representative average household at different ages by multiplying the fixed income and equity proportions shown in Figure 22 by the financial assets index shown in Figure 19.

We estimate the desired asset allocation of a representative average household at different ages by multiplying the fixed income and equity proportions by the level of financial assets

Figure 23: Representative average household, desired asset allocation

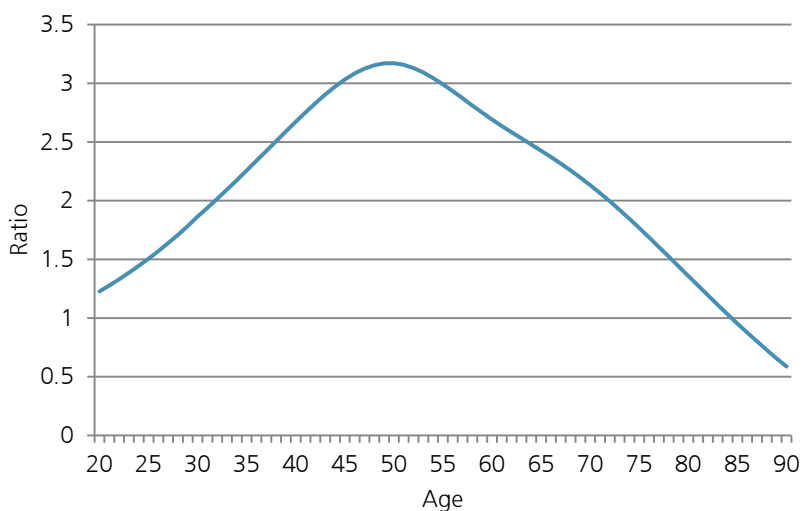


Source: UBS Estimates, Survey of Consumer Finances, Gourinchas and Parker (2002), US Census (2013), Federal Reserve Bank of New York: Center for Microeconomic Data

⁵ We use a cubic spline to extend the dataset beyond the categories defined in the survey – i.e. under 25 and over 75 years. Please see the Appendix for a technical explanation of the approach taken here.

Figure 23 shows how the desired asset allocation of a representative household changes over time. Three key observations stand out. Firstly, during the accumulation phase or working life of the head of the household there is a rapid increase in the desired proportion of equities while the increase in the desired proportion of fixed income is much more gradual. Secondly, the desired proportion of equities peaks several years before the desired proportion of fixed income. Thirdly, the desired proportion of equities decreases very rapidly in the decumulation phase when retirees are drawing down on their portfolio. To understand the historical asset allocation behaviour better we plot the ratio of equities to fixed income as the representative household ages.

Figure 24: Ratio of Equities to Fixed Income



Source: UBS Estimates, Survey of Consumer Finances, Gourinchas and Parker (2002), US Census (2013), Federal Reserve Bank of New York: Center for Microeconomic Data

Figure 24 shows that in the formative years households hold \$1.22 of equities for every \$1 of fixed income. This ratio increases steadily to a maximum of \$3.17 at age 50 and declines to a minimum of \$0.59 at age 90. The age at which fixed income begins to represent a greater proportion of household financial assets than equity is 85.

It should be evident that the demand and subsequent return of the equity and fixed income asset categories will follow the desired asset allocation of representative households through time. Given that the typical baby boomer born between 1943 and 1960 is between 55 and 72 years of age today, Figures 23 and 24 would suggest an inevitable decline in the demand for financial assets, especially equities, over the next ten years.

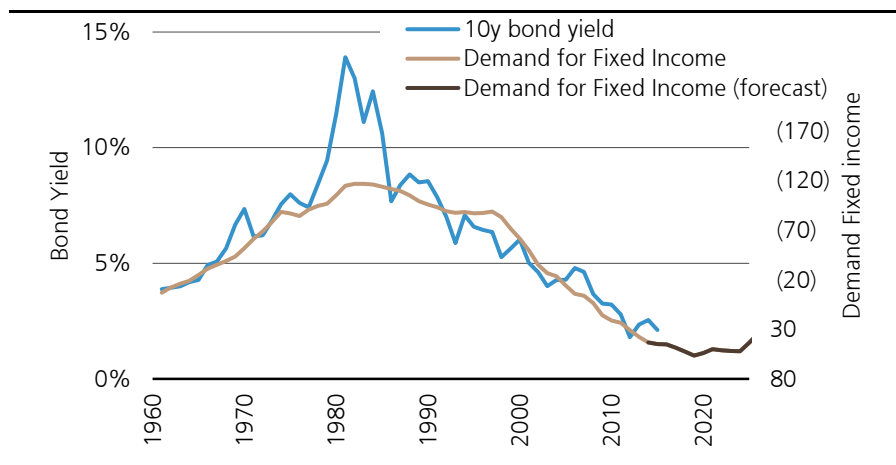
The demand and subsequent return of the equity and fixed income asset categories will follow the desired asset allocation of representative households through time

Understanding Bond Yields

The desired asset allocation data combined with population statistics can also allow us to estimate the net new demand for fixed income and equities over time. We consider the change in the demand for each asset class and present net new demand as a flow of demand for debt versus fixed income in figure 25 below, and as a percentage of the total fixed income and equities demand in Figure 26 below.

The model has provided a reasonably accurate estimate of the suggested level of bond yields through time with one exception, the period during the 1970's oil price shock which drove supply side inflation significantly. We regard this as an exogenous shock that was unrelated to demographic variables. Overall, supply and demand factors would suggest that 10 year bond yields are likely to remain at these levels until 2025 when demand preferences shift.

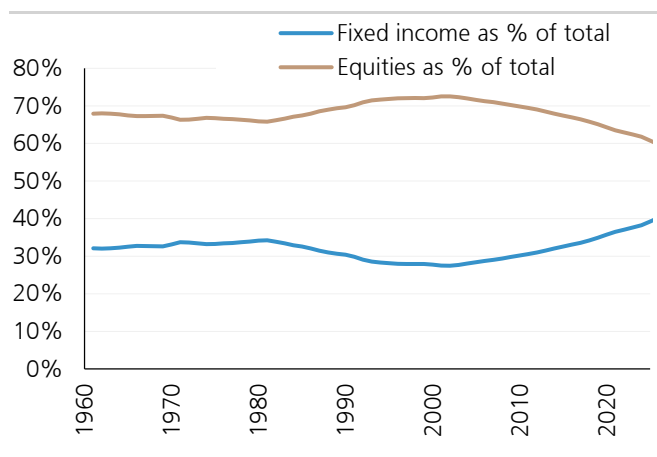
Figure 25: Fixed income flow and long term rates



Source: UBS Estimates, Factset, Haver

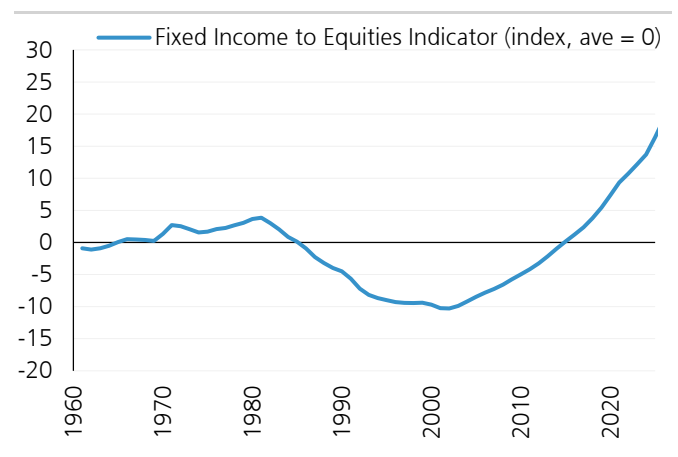
The ageing population has resulted in an increasing demand for fixed income assets up until now. In order to obtain insights regarding how long this trade will last, we would like to determine the point in the future (if it exists) where the demand for fixed income relative to equities begins to decline based on the projected demographic data (Figure 26 and 27).

Figure 26: Net new demand per asset class



Source: Haver, UBS estimates

Figure 27: Relative Demand for Fixed income



Source: Haver, UBS estimates

It would appear that we have entered into a period of secular increase in demand for fixed income assets which is likely to continue for the foreseeable future. This is likely to reverse in the future when the 'echo boomers' hit their peak earning potential and start to save for retirement.

The Equity Risk Premium

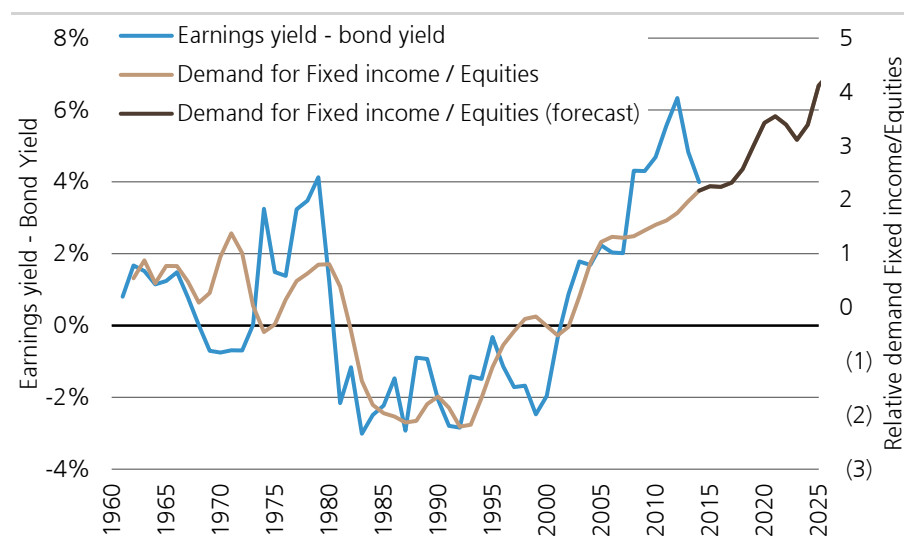
Understanding the relative demand for fixed income assets relative to equities allows us to better understand the risk premium. (We define the equity risk premium as simply the yield differential between equities and fixed income). We represent the equity risk premium as a flow of demand for fixed income versus equities.

We represent the equity risk premium as a flow of demand for fixed income versus equities

There are a number of obvious departures from the model, including the 1973 oil price spike which drove risk premia higher between 1973 and 1980; the Tech bubble of the late '90's which drove risk premia lower, and the Global Financial Crisis which drove risk premia higher. At the time of writing, it would seem that risk premia are exactly where the model suggests they should be. However, the model is also suggesting that risk premia should trade higher over the next five years as baby-boomers sell down risk assets in retirement.

A key point here is that whilst demographics seem to be the primary driver of risk premia, there can be significant departures from the demographic suggested risk premium through exogenous factors.

Figure 28: Demographic Model implied Equity Risk Premium



Source: Haver, Shiller, UBS

What about volatility?

We know that earnings growth rates are correlated with earnings certainty. Similarly, we know that earnings certainty is inversely correlated with volatility. As a consequence, periods of higher earnings growth rates in the market are generally commensurate with periods of low volatility. Conversely, periods of low (or negative) earnings growth rates are commensurate with higher levels of volatility.

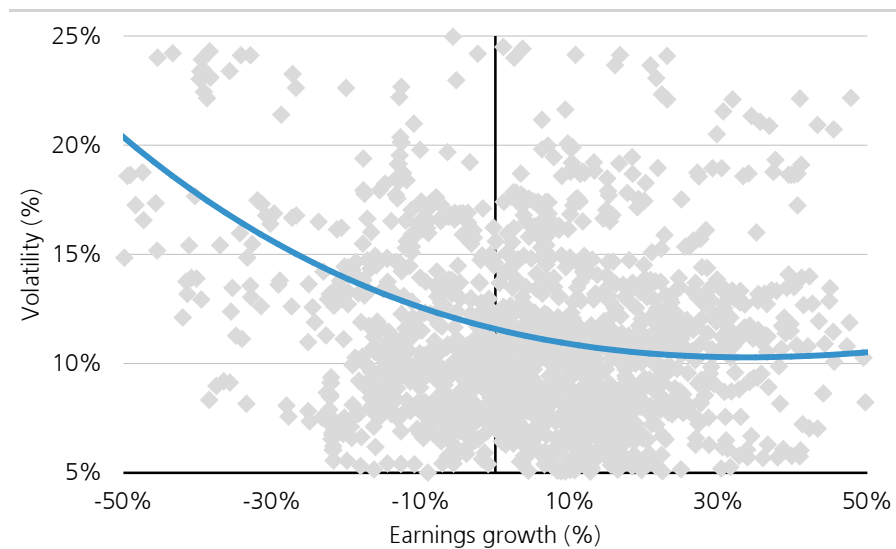
Below we demonstrate the relationship between S&P500 earnings growth and volatility from 1874 to 2015. Overall, we find an inverse relationship between earnings growth and volatility. As a consequence, in a world of lower growth and increasing risk premia, we are also likely to witness higher levels of equity market volatility.

This is likely to have a significant impact on asset allocation as investors targeting risk adjusted returns are more likely to favour low risk assets and investment strategies.

For a more detailed discussion on equity market volatility, please see [‘Surfing the Macro Wave’, Wu et al.](#)

In a world of lower growth and increasing risk premia, we are also likely to witness higher levels of equity market volatility

Figure 29: Relationship between earnings growth and volatility



Source: Factset, Shiller, UBS

Note, earnings growth rates and investor confidence are not the only drivers of volatility, market structure and liquidity play an important role as well.

Central Bank Policy

The interrelation of central bank policies and demography

Central bank policy is the other key driver of present and future returns. Unfortunately, the feedback loop is likely to compound the demographic effect on lower future returns.

Overall, demographics suggest a lower growth rate. This in turn lowers investment and the demand for capital and hence the neutral cash rate.

If we consider a simple model of the effect of interest rates on consumption, interest rate cuts are most effective on those in the "borrowing" stage of their life, who are optimising inter-temporally. Their higher levels of consumption mean that interest rate policy is most effective for this group.

Those in the "middle" stages of their life are impacted by two competing effects – lower expected returns mean as they purchase fixed income assets, they are forced to accept lower returns, and experience a negative income effect. Still, lower interest rates shift the balance to more consumption now and less savings. On net, decreasing interest rates increase their consumption modestly.

Those who are in the "drawdown" stage of their life, holding fixed income assets, have a reduced lifetime income as they anticipate lower returns. As a consequence wealth effects dominate and consumption is lowered.

From the above, the ageing demographic means quantitative easing can have a perversely contractionary effect on consumption for some groups. Lower interest rates are still likely to stimulate on net, but with a smaller effect. Central Banks are thus more likely to hit the zero lower bound, extending the period of lower rates.

An exception to this outcome would be if Central Banks mandates were altered to include targeting asset price inflation.

Overall, demographics suggest a lower growth rate. This in turn lowers investment and the demand for capital and hence the neutral cash rate

How does this play out?

From a growth perspective, nominal GDP is likely to remain structurally low until such time as the Baby Boomers have exited the workforce. The majority of the downward pressure on growth should dissipate by 2025. This is reflected not only in income growth resuming, but also in the relative demand for fixed income slowing causing long bond yields to rise at that time.

Equity risk premia are likely to increase over the next ten years as the aggregate demand for fixed income relative to equities continues to increase.

In line with the slower growth rate, volatility is likely to be structurally higher than it has been in the past.

Downward pressure on growth should dissipate by 2025

Bond yields are likely to remain low

Equity risk premia are likely to increase

Volatility is likely to increase

What could change the outcome?

What could change the outlook for growth?

Altering the factors of production could in theory change the outcome.

- (1) Policy makers could extend retirement ages,
- (2) Increasing migration rates (although from a global perspective this is a zero sum game),
- (3) Increasing participation rates,
- (4) Investment in human capital: both improving the skillset of new workers, but also the reskilling of the workforce in an increasingly automated world,
- (5) Improvements in productivity: through significant investment in technology, and incentives to develop industries that drive productivity enhancements,
- (6) Industries of the future: investing in industries that cater to globally ageing populations such as healthcare and entertainment; and industries that cater to the emerging markets such as consumer goods.

What could change the outlook for bond yields and equity risk premia?

Ultimately, very little can change the outlook for bond yields and risk premia. What we are dealing with is a very large cohort whose appetite for risk assets has been increasing since the early 80's and is now declining.

Having said that, if the trend of investors to switch to risk parity strategies continues, then it is likely that relative asset class demand becomes less relevant as investor asset class preferences remain constant and only their appetite for leverage changes throughout their lifecycle. This would likely offset the increase in risk premia somewhat.

Can demand from an Emerging Market middle class offset the relative asset class preferences?

We don't believe so. The emerging markets comprise a mere 14% of global financial assets (of which China makes up 9%). As a consequence, the rise of the emerging market middle class is unlikely to be of sufficient magnitude to offset the relative shift within the developed markets over the next ten years.

What about intergenerational wealth effects? When do assets pass from an older cohort to a younger cohort?

Mortality rates are too broadly distributed to have a meaningful impact to the modelling of asset class demand. Mortality rates are broadly distributed between ages 50 and 100. As a consequence, assets are redistributed over a long period of time and the transition is unlikely to have a meaningful impact on asset class demand at any point in time.

So is this going to be like Japan in the 1990s?

This is unlikely to be similar to the Japanese experience. Japan has experienced an internal demand shock based on a shrinking workforce. The developed world is unlikely to face this as working age populations are still growing; they are simply growing at a slower pace than they have in the past.

What to invest in?

We believe the key drivers of investment over the next ten years are likely to be:

- (1) Low nominal growth rates
- (2) Low bond yields
- (3) Higher risk premia
- (4) Structurally higher volatility

In this environment, high quality income producing equities and high quality growth equities are likely to do well, cyclical, high beta companies are likely to underperform.

Sectors

There are two approaches here: the first is to assess sectors that are likely to benefit from an ageing demographic (increasing retirees %), and the second is to investigate sectors that are likely to perform well in a low growth environment.

Sectors that are likely to perform well with an ageing demographic are those that either cater directly to the demographic, such as entertainment and healthcare, or those that are likely to outperform in a world of falling demand such as utilities and consumer staples.

Sectors that are likely to perform well in a low growth environment are those that are able to exploit growth opportunities offshore such as consumer goods, and those that are able to improve productivity domestically, such as information technology.

Our results are in line with DellaVigna (2007) who used consumption and demographic data to forecast future consumption demand and found that demand forecasts can predict profitability by sector.

Styles

For the purposes of this study we rely on the Kenneth French data going back to 1927⁶. The reason being is that demographic data are slow moving and in order to estimate relationships we need to assess them over a long period. We make the assumption that if the relationship is logical and significant it will hold for other markets. This is particularly true for listed assets with heterogeneous demand profiles.

Value – defensive value likely to outperform cyclical value

We define value as either: the risky end of value, typically stocks with high earnings yields, or the defensive end, stocks with a low price-to-book or high dividend yield.

In a world of slower growth and an increasing proportion of the population retiring, we find that defensive value strategies such as high dividend yield and low price-to-book strategies outperform.

⁶ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

However, on the other end of the spectrum, we find that stocks with high earnings yields are more highly correlated with the business cycle. As a result, we conclude that the risky end of value is unlikely to offer the same 'value premium' that it has in the past. We would advocate remaining defensive and instead hold positions in high dividend yielding and low price-to-book stocks.

For a discussion on the value premium, please see ['Investing in Value'](#) Winter et al.

Importantly, in a world of low growth, good quality companies with a policy of paying out profits to shareholders are likely to outperform. In particular, we prefer companies that are able to grow their dividends or at the very least increase their payout ratios (sustainably).

Size - Large caps are likely to perform well

Small caps have outperformed large caps over the past 85 years with few exceptions. However, we know that small caps are more sensitive to the economic cycle than large caps. As a consequence it stands to reason that in a world of structurally low growth and high risk premia, large caps are likely to perform better and small caps carry a smaller premium than they have historically.

For a full discussion of the small cap premium, please see ['Understanding Size Investing'](#) Winter et al.

UBS Recommendations

From a style perspective, in a low growth environment where growth rates are low, risk premia are rising and investors require income, high quality, large cap, dividend yielding companies are likely to outperform. High quality growth companies are also likely to perform well as companies that can grow or drive productivity enhancements are likely to be rewarded. We highlight some of these names in our stock screens on the following pages.

For a full discussion of Quality, please see ['Investing in Quality'](#) Winter et al.

For a full discussion of Growth, please see ['Investing in Growth'](#) Winter et al.

From a sector perspective, outperformance is likely to come from: defensive sectors such as utilities and consumer staples, sectors that cater directly to an ageing demographic such as entertainment and healthcare; and finally, sectors that drive productivity enhancements such as information technology, or are able to capitalise on emerging market opportunities, such as consumer goods.

Click here to access [suggested sector tilts based on demographic shifts](#)

Given that every portfolio manager has their own view on how the macro-economic environment is likely to unfold, we have created a model that will allow you to insert your own inputs and will calculate the recommended sector exposures.

[Please click here to access Macrosense](#)

Screening for High Quality Income and High Quality Growth

The Quality Income screen comprises our Financial Statement Quality model overlaid with dividend yield. Stocks with a UBS Sell rating are removed, as are stocks identified by the "Bear Ideas" screen.

The Fundamental Growth screen comprises our Financial Statement Growth model combined with a Momentum (Price and Earnings) composite. Stocks with a UBS Sell rating are removed, as are stocks identified by the "Bear Ideas" screen.

High Quality Growth

					Fundamental	Growth:	Composite								
					Fundamental	Score	Momentum	Composite	Last Closing						
Sedol	Bloomberg	Company	Sector	Country	Growth: Group		Decile	Growth Score	PE	PB	DY	Price	Price Target	Currency	UBS Rec.
United States															
2923785	UHS.UN	Universal Health Services	Health Care	United States	High Quality	17	10	2.21	16.9	3.2	0.3%	120.68	145.00	USD	Buy
2980906	FL.UN	Foot Locker Inc	Consumer Disc	United States	High Growth	17	10	1.92	15.9	3.9	1.5%	68.02	78.00	USD	Buy
2842255	SBUX.UW	Starbucks Corp	Consumer Disc	United States	High Growth	16	10	1.86	30.3	14.5	1.4%	63.51	63.00	USD	Buy
2917766	UNH.UN	Unitedhealth Group Inc	Health Care	United States	High Growth	15	10	1.82	16.3	3.3	1.3%	119.78	152.00	USD	Buy
2640147	NKE.UN	Nike Inc	Consumer Disc	United States	High Growth	17	10	1.78	27.4	8.3	1.0%	131.29	140.00	USD	Buy
2284084	DRE.UN	Duke Realty Corp	Financials	United States	High Growth	14	10	1.66	32.1	2.0	3.4%	21.06	23.00	USD	Buy
2434209	HD.UN	Home Depot Inc	Consumer Disc	United States	High Growth	16	10	1.62	19.7	16.3	2.1%	123.82	138.00	USD	Buy
2310194	EA.UW	Electronic Arts Inc	IT	United States	High Growth	14	10	1.56	21.5	6.9	0.0%	76.77	83.00	USD	Buy
2365161	GD.UN	General Dynamics Corp	Industrials	United States	High Growth	15	9	1.31	14.8	3.9	2.0%	150.78	161.00	USD	Buy
2767381	STJ.UN	St Jude Medical Inc	Health Care	United States	High Growth	16	8	1.28	14.9	4.6	1.9%	62.90	80.00	USD	Buy
Europe															
5980613	GIVN.VX	Givaudan	Materials	Switzerland	High Growth	18	8	1.58	21.4	4.8	3.2%	1776.00	1700.00	CHF	Neutral
682538	PSN.LN	Persimmon Plc	Consumer Disc	UK	High Growth	14	10	1.54	12.0	2.8		19.84		GBP	Not Rated
B1CRLC4	MNDI.LN	Mondi Plc	Materials	UK	High Growth	15	10	1.43	13.3	3.3	3.9%	1490.00	1750.00	GBP	Buy
B119QG0	PGHN.SE	Partners Group Holding Ag	Financials	Switzerland	High Growth	14	10	1.34	22.0	8.0	2.9%	359.25	371.00	CHF	Buy
B1YD5Q2	ATLN.VX	Actelion Ltd-Reg	Health Care	Switzerland	High Growth	16	8	1.30	21.6	9.9	1.1%	135.80	143.00	CHF	Neutral
B1KJJ40	WTB.LN	Whitbread Plc	Consumer Disc	UK	High Growth	16	8	1.26	18.0	4.3	2.0%	4901.00	5000.00	GBP	Neutral
3121522	CCL.LN	Carnival Plc	Consumer Disc	UK	High Growth	14	10	1.21	16.4	1.7	3.4%	3600.00	3850.00	GBP	Buy
4354350	FPE3.GY	Fuchs Petrolub Se -Pref	Materials	Germany	High Growth	14	10	1.18	21.6	5.7	2.2%	38.03		EUR	Not Rated
3091357	BT/A.LN	BT Group Plc	Telcos	UK	High Growth	15	8	1.11	13.2	40.8	3.3%	468.65	430.00	GBP	Neutral
B23K0M2	CPI.LN	Capita Plc	Industrials	UK	High Growth	15	7	1.02	16.0	9.3	2.7%	1272.00	1200.00	GBP	Neutral
Japan															
6021500	6770.JT	Alps Electric Co Ltd	IT	Japan	High Growth	15	10	2.13	12.3	3.1	0.8%	3575.00	5300.00	JPY	Buy
6610403	6981.JT	Murata Manufacturing Co Ltd	IT	Japan	High Growth	17	10	1.89	15.3	2.9	1.4%	16820.00	23000.00	JPY	Buy
6251363	1925.JT	Daiwa House Industry Co Ltd	Financials	Japan	High Growth	14	10	1.55	14.1	1.7	2.2%	3141.00	3400.00	JPY	Buy
6474535	2914.JT	Japan Tobacco Inc	Consumer Staples	Japan	High Growth	17	8	1.43	14.3	2.6	3.1%	4151.00	5150.00	JPY	Buy
6010906	2802.JT	Ajinomoto Co Inc	Consumer Staples	Japan	High Growth	14	10	1.26	23.3	2.1	1.1%	2690.00	3100.00	JPY	Buy
6642406	6479.JT	Minebea Co Ltd	Industrials	Japan	High Growth	16	8	1.23	8.9	2.0	1.8%	1344.00	2000.00	JPY	Buy
6640682	6594.JT	Nidec Corp	Industrials	Japan	High Growth	14	10	1.18	20.3	3.1	1.1%	9072.00	11000.00	JPY	Buy
6054409	2502.JT	Asahi Group Holdings Ltd	Consumer Staples	Japan	High Growth	15	8	1.13	20.2	2.0	1.5%	3764.00	4700.00	JPY	Buy
6490995	6861.JT	Keyence Corp	IT	Japan	High Growth	15	8	1.07	21.8	3.4	0.4%	62200.00	68000.00	JPY	Buy
6497662	3405.JT	Kuraray Co Ltd	Materials	Japan	High Growth	15	8	1.04	12.4	1.1	2.8%	1496.00	1750.00	JPY	Buy

Source: Factset, UBS

					Fundamental	Composite									
Sedol	Bloomberg	Company	Sector	Country	Fundamental	Growth:	Composite					Last Closing		Currency	UBS Rec.
					Growth: Group	Score	Momentum Decile	Composite Growth Score	PE	PB	DY	Price	Price Target		
Asia															
6186669	2474.TT	Catcher Technology Co Ltd	IT	Taiwan	High Growth	18	10	1.72	10.4	2.7	2.9%	321.50	460.00	TWD	Buy
6408374	11.HK	Hang Seng Bank Ltd	Financials	Hong Kong	High Growth	16	10	1.52	13.1	1.9	4.4%	143.30	137.50	HKD	Neutral
6609917	SCC.TB	Siam Cement	Materials	Thailand	High Growth	16	10	1.37	12.3	3.1	3.6%	456.00	570.00	THB	Buy
6344456	051900.KP	LG Household & Health Care	Consumer Staples	South Korea	High Growth	16	9	1.26	26.7	8.0	0.5%	934000.00	1050000.00	KRW	Buy
6495730	015760.KP	Korea Electric Power Corp	Utilities	South Korea	High Growth	15	10	1.21	4.9	0.6	2.7%	51600.00	60000.00	KRW	Buy
6449629	14.HK	Hysan Development Co	Financials	Hong Kong	High Growth	16	7	1.14	14.4	0.5	3.8%	34.15	34.34	HKD	Neutral
6191997	1093.HK	CSPC Pharmaceutical Group Lt	Health Care	Hong Kong	High Growth	16	8	1.07	20.2	4.8	1.7%	7.20	8.24	HKD	Buy
6433912	2884.TT	E.Sun Financial Holding Co	Financials	Taiwan	High Growth	14	10	1.06	11.0	1.4	2.2%	19.65	22.20	TWD	Buy
6030506	101.HK	Hang Lung Properties Ltd	Financials	Hong Kong	High Growth	17	6	1.05	12.5	0.6	3.9%	19.34	24.07	HKD	Buy
6495428	010130.KP	Korea Zinc Co Ltd	Materials	South Korea	High Growth	15	9	1.03	12.0	1.7	1.5%	481500.00	600000.00	KRW	Buy
Australia															
6102267	BKL.AT	Blackmores Ltd	Consumer Staples	Australia	High Growth	17	10	2.19	37.5	18.9	2.0%	175.51		AUD	Not Rated
6702623	JBH.AT	JB Hi-Fi Ltd	Consumer Disc	Australia	High Growth	17	10	1.83	13.0	5.5	5.2%	18.50	21.50	AUD	Neutral
6006886	ABC.AT	Adelaide Brighton Ltd	Materials	Australia	High Growth	16	10	1.42	14.6	2.4	5.1%	4.14	4.67	AUD	Neutral
6397825	OZL.AT	Oz Minerals Ltd	Materials	Australia	High Growth	18	7	1.24	13.2	0.4	3.1%	4.51	4.56	AUD	Buy
6286008	SRX.AT	Sirtex Medical Ltd	Health Care	Australia	High Growth	15	10	1.21	31.4	12.8	0.8%	37.50	43.00	AUD	Buy
6238645	CSR.AT	CSR Ltd	Materials	Australia	High Growth	18	6	1.16	9.5	1.3	7.5%	2.77	4.15	AUD	Buy
6151311	SKC.AT	Skycity Entertainment Group	Consumer Disc	Australia	High Growth	16	9	1.10	14.5	2.8	5.7%	4.03	4.45	NZD	Neutral
B3X0F91	EVN.AT	Evolution Mining Ltd	Materials	Australia	High Growth	15	9	0.91	7.2	1.1	1.1%	1.46	1.70	AUD	Buy
6161503	CTX.AT	Caltex Australia Ltd	Energy	Australia	High Growth	15	8	0.89	14.5	3.1	3.7%	31.36	31.80	AUD	Neutral
6673042	IPL.AT	Incitec Pivot Ltd	Materials	Australia	High Growth	14	9	0.81	14.2	1.5	3.6%	3.92	5.00	AUD	Buy

Source: Factset, UBS

High Quality Income

Sedol	Bloomberg	Company	Sector	Country	Absolute Quality: Group	Delta Quality: Group	Risk Alert: Group	PE	DY	PB	Last Closing Price	Price Target	Currency	UBS Rec.
United States														
2550707	MCD.UN	Mcdonalds Corp	Consumer Discretionary	United States	High Quality	Improving Quality	3:Safe	19.6	3.7%	8.28	112.94	122.00	USD	Buy
2684703	PFE.UN	Pfizer Inc	Health Care	United States	High Quality	Improving Quality	3:Safe	13.7	3.6%	2.87	35.45	39.00	USD	Buy
2198163	CSCO.UW	Cisco Systems Inc	Information Technology	United States	High Quality	Improving Quality	3:Safe	11.3	3.2%	2.27	29.36	33.00	USD	Buy
2475833	JNJ.UN	Johnson & Johnson	Health Care	United States	High Quality	Improving Quality	3:Safe	14.7	3.2%	3.82	100.48	119.00	USD	Buy
2595708	MMM.UN	3M Co	Industrials	United States	High Quality	Improving Quality	3:Safe	16.8	3.1%	6.75	158.08	185.00	USD	Buy
2206657	KO.UN	Coca-Cola Co	Consumer Staples	United States	High Quality	Stable Quality	3:Safe	19.2	3.5%	6.14	42.73	49.00	USD	Buy
2812452	SPG.UN	Simon Property Group Inc	Financials	United States	Neutral Quality	Improving Quality	3:Safe	32.6	3.5%	12.92	205.71	215.00	USD	Buy
2278719	DOW.UN	Dow Chemical Co	Materials	United States	Neutral Quality	Improving Quality	2:Neutral	12.2	4.1%	2.50	51.37	53.00	USD	Buy
2831811	T.UN	AT&T Inc	Telecommunication Services	United States	Neutral Quality	Stable Quality	3:Safe	11.9	5.9%	1.95	33.42	42.00	USD	Buy
2778844	MRK.UN	Merck & Co. Inc.	Health Care	United States	Neutral Quality	Stable Quality	2:Neutral	13.3	3.7%	2.92	55.10	68.00	USD	Buy
Europe														
3127489	MKS.LN	Marks & Spencer Group Plc	Consumer Discretionary	UK	High Quality	Improving Quality	3:Safe	13.7	3.9%	2.58	511.00	640.00	GBP	Buy
4732495	TEL.NO	Telenor Asa	Telecommunication Services	Norway	High Quality	Improving Quality	2:Neutral	14.3	5.2%	3.51	166.70	195.00	NOK	Buy
5671735	SAN.FP	Sanofi	Health Care	France	High Quality	Improving Quality	2:Neutral	14.5	3.7%	1.98	93.30	111.00	EUR	Buy
4808084	SIK.VX	Sika Ag	Materials	Switzerland	High Quality	Improving Quality	2:Neutral	14.9	2.8%	3.47	3202.00	3500.00	CHF	Buy
7103065	NOVN.VX	Novartis Ag-Reg	Health Care	Switzerland	High Quality	Stable Quality	3:Safe	16.7	3.2%	2.93	89.65	115.00	CHF	Buy
989529	AZN.LN	Astrazeneca Plc	Health Care	UK	High Quality	Stable Quality	2:Neutral	15.3	4.4%	4.55	41.97		GBP	
4588364	MLFP	Michelin	Consumer Discretionary	France	High Quality	Stable Quality	2:Neutral	9.6	3.7%	1.55	90.08	105.00	EUR	Buy
5048566	SWMA.SS	Swedish Match	Consumer Staples	Sweden	High Quality	Stable Quality	2:Neutral	15.9	3.4%	415.00	267.00	295.00	SEK	Buy
3319521	KGF.LN	Kingfisher Plc	Consumer Discretionary	UK	High Quality	Stable Quality	2:Neutral	15.5	2.9%	1.35	351.90	400.00	GBP	Buy
5271782	ELE.SQ	Endesa	Utilities	Spain	Neutral Quality	Stable Quality	2:Neutral	17.1	5.9%	2.21	20.11	20.00	EUR	Buy
Japan														
6251363	1925.JT	Daiwa House Industry Co Ltd	Financials	Japan	High Quality	Improving Quality	3:Safe	14.1	2.3%	1.72	3141.00	3400.00	JPY	Buy
6474535	2914.JT	Japan Tobacco Inc	Consumer Staples	Japan	High Quality	Improving Quality	3:Safe	14.3	3.6%	2.65	4151.00	5150.00	JPY	Buy
6429126	4217.JT	Hitachi Chemical Co Ltd	Materials	Japan	High Quality	Improving Quality	2:Neutral	9.0	3.0%	0.96	1928.00	2600.00	JPY	Buy
6597045	6503.JT	Mitsubishi Electric Corp	Industrials	Japan	High Quality	Improving Quality	2:Neutral	10.0	2.8%	1.25	1265.50	1600.00	JPY	Buy

Source: Factset, UBS

											Last			
					Absolute Quality:		Risk Alert:				Closing	Price		
Sedol	Bloomberg	Company	Sector	Country	Group	Delta Quality: Group	Group	PE	DY	PB	Price	Target	Currency	UBS Rec.
Asia														
6609917	SCC.TB	Siam Cement	Materials	Thailand	High Quality	Improving Quality	3:Safe	12.3	3.7%	3.12	456.00	570.00	THB	Buy
6752349	ROTH.MK	British American Tobacco Bhd	Consumer Staples	Malaysia	High Quality	Improving Quality	3:Safe	18.4	5.3%	31.90	62.24	67.50	MYR	Buy
6202673	2395.TT	Advantech Co Ltd	Information Technology	Taiwan	High Quality	Improving Quality	2:Neutral	23.7	3.0%	6.84	236.50	270.00	TWD	Buy
6603737	CD.SP	Comfortdelgro Corp Ltd	Industrials	Singapore	High Quality	Stable Quality	3:Safe	18.3	3.5%	2.71	3.03	3.54	SGD	Buy
6073556	941.HK	China Mobile Ltd	Telecommunication Services	Hong Kong	High Quality	Stable Quality	3:Safe	13.1	3.3%	1.68	93.55	108.00	HKD	Buy
6005504	177.HK	Jiangsu Express Co Ltd-H	Industrials	Hong Kong	High Quality	Stable Quality	3:Safe	13.9	5.4%	2.01	10.16	11.20	HKD	Buy
6685661	TEL.PM	Philippine Long Distance Tel	Telecommunication Services	Philippines	High Quality	Stable Quality	3:Safe	13.7	6.5%	3.82	2250.00	2650.00	PHP	Buy
6030506	101.HK	Hang Lung Properties Ltd	Financials	Hong Kong	Neutral Quality	Improving Quality	2:Neutral	12.5	4.4%	0.59	19.34	24.07	HKD	Buy
6435327	6.HK	Power Assets Holdings Ltd	Utilities	Hong Kong	Neutral Quality	Stable Quality	3:Safe	19.5	3.7%	1.28	77.60	80.00	HKD	Buy
6425663	2882.TT	Cathay Financial Holding Co	Financials	Taiwan	Neutral Quality	Stable Quality	2:Neutral	10.6	4.2%	1.33	46.10	57.00	TWD	Buy
Australia														
6173508	HVN.AT	Harvey Norman Holdings Ltd	Consumer Discretionary	Australia	High Quality	Improving Quality	3:Safe	14.2	5.4%	1.70	4.01	4.80	AUD	Buy
6123451	CCL.AT	Coca-Cola Amatil Ltd	Consumer Staples	Australia	High Quality	Stable Quality	3:Safe	17.4	5.0%	3.46	9.11	9.35	AUD	Neutral
6006886	ABC.AT	Adelaide Brighton Ltd	Materials	Australia	Neutral Quality	Improving Quality	3:Safe	14.6	5.0%	2.43	4.14	4.67	AUD	Neutral
6948836	WES.AT	Wesfarmers Ltd	Consumer Staples	Australia	Neutral Quality	Improving Quality	3:Safe	16.8	5.5%	1.78	40.18	43.10	AUD	Neutral
6714394	IFL.AT	IOOF Holdings Ltd	Financials	Australia	Neutral Quality	Improving Quality	2:Neutral	13.5	6.7%	1.88	9.18	8.70	AUD	Neutral
6129222	ASX.AT	ASX	Financials	Australia	Neutral Quality	Stable Quality	3:Safe	17.4	5.2%	1.95	41.00	40.80	AUD	Neutral
6358004	GUD.AT	G.U.D. Holdings Ltd	Consumer Discretionary	Australia	Neutral Quality	Stable Quality	2:Neutral	12.9	6.2%	2.26	7.85	9.65	AUD	Buy
6076243	BOQ.AT	Bank Of Queensland Ltd	Financials	Australia	Neutral Quality	Stable Quality	2:Neutral	11.3	6.8%	1.25	12.98	13.00	AUD	Neutral
6709958	AMP.AT	AMP Ltd	Financials	Australia	Neutral Quality	Stable Quality	2:Neutral	14.0	5.4%	1.94	5.80	6.70	AUD	Buy
6205694	IOF.AT	Investa Office Fund	Financials	Australia	Neutral Quality	Stable Quality	2:Neutral	15.0	5.0%	1.09	4.06	4.01	AUD	Neutral

Source: Factset, UBS

Conclusion

What will outperform over the next ten years?

The answer lies in the demographic DNA. Across the developed world populations are ageing, fertility rates are declining, longevity is increasing, and most importantly the 'Baby Boomers' are retiring. In this environment our models suggest that demographic shifts are likely to provide a headwind to economic growth for years to come.

What does this mean for asset classes? In a slow growth environment low growth is normally offset by higher yields. However, with policy makers likely to hold cash rates down in an effort to stimulate growth, the yield differential across asset classes is likely to prevent an 'asset meltdown'. We do, however, expect risk premia to rise.

From a style perspective, in a low growth environment where growth rates are low, risk premia are rising and investors require income, high quality, large cap, dividend yielding companies are likely to outperform. High Quality Growth companies are also likely to perform well as companies that can grow or drive productivity enhancements are likely to be rewarded.

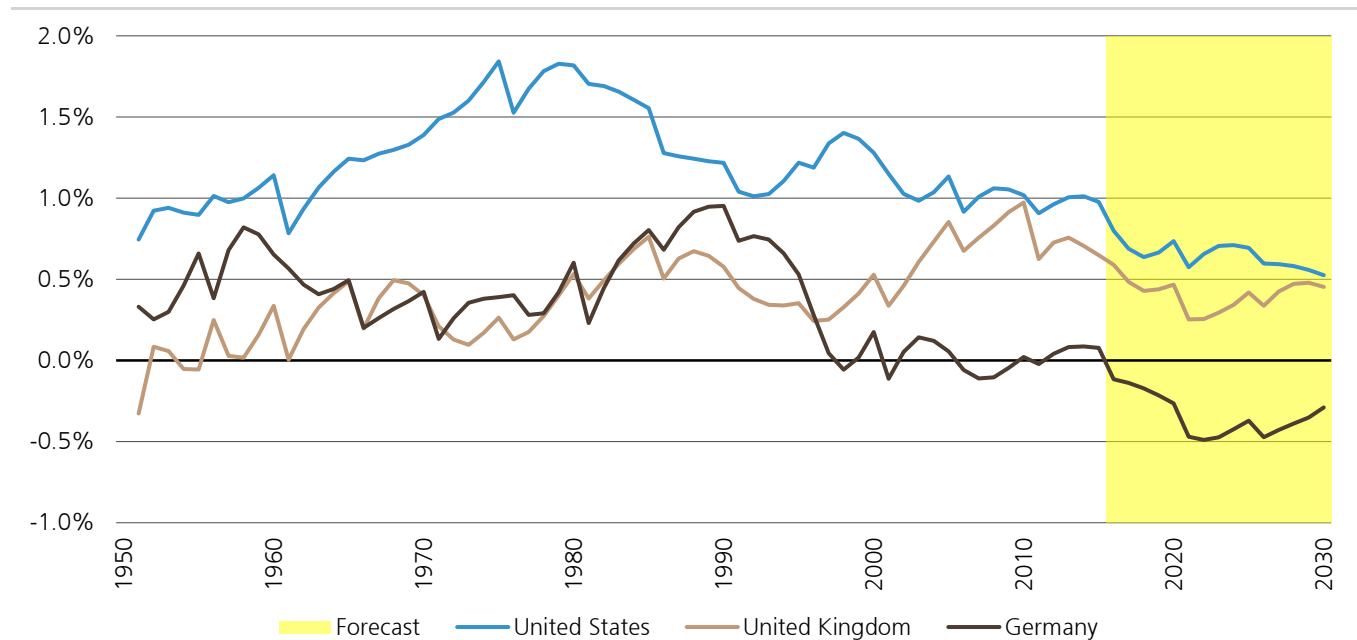
From a sector perspective, outperformance is likely to come from: defensive sectors such as utilities and consumer staples, sectors that cater directly to an ageing demographic such as entertainment and healthcare; and finally, sectors that drive productivity enhancements such as information technology, or are able to capitalise on emerging market opportunities, such as consumer goods.

Note, whilst we believe that demographics are a key driver of returns through time, there is much that can be done by policy makers to change the course of history. As a result we suggest using them as a guide only.

Appendix

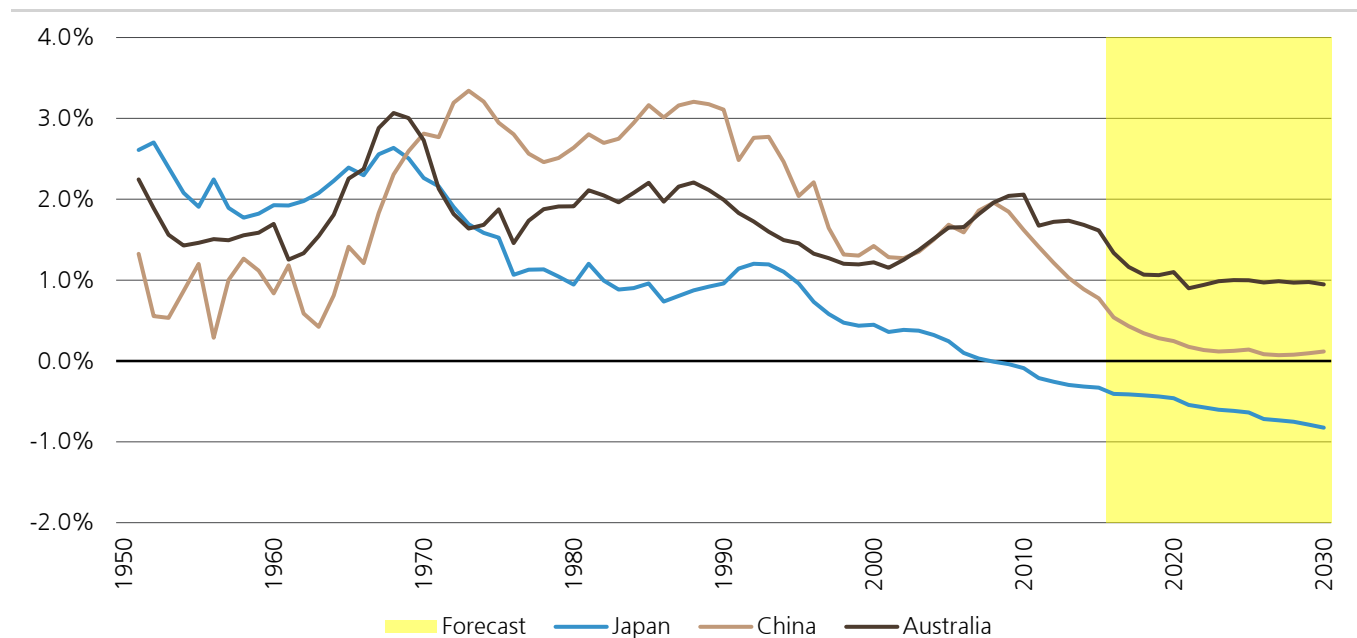
Demographic Models for other nations

Figure 30: Demographic Model (Expenditure Weighted) for the United States, Europe and Australia



Source: Haver, Survey of Consumer Finances, UBS

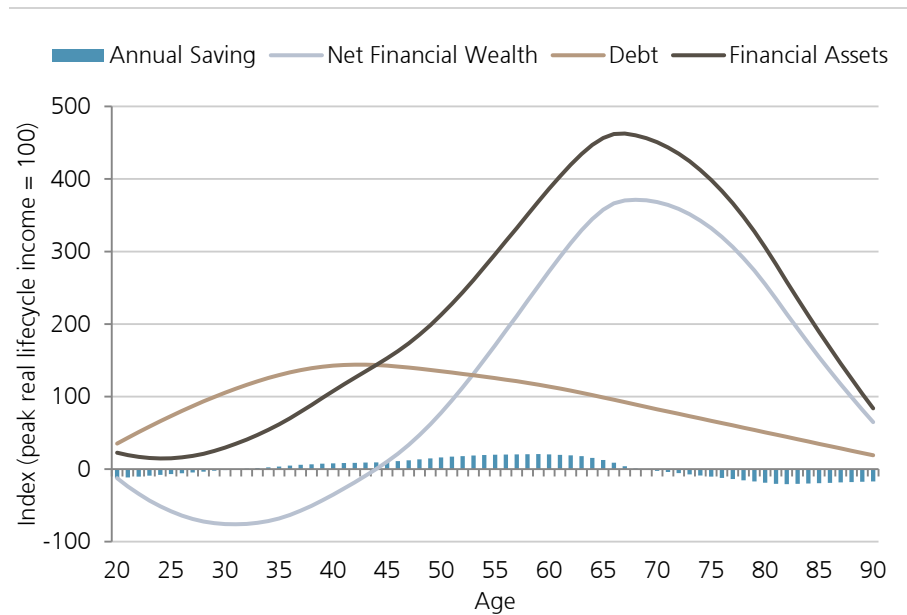
Figure 31: Demographic Model (Expenditure Weighted) for the Japan, China and the Emerging Markets



Source: Haver, Survey of Consumer Finances, UBS

The consumption life cycle

Figure 32: The financial assets, debt, and savings life cycle



Source: UBS, Gourinchas and Parker (2002), US Census (2013), Federal Reserve Bank of New York: Center for Microeconomic Data

$$\text{Annual saving}_i = I_i - C_i$$

where

I_i = annual income at age i and C_i = annual consumption at age i

and

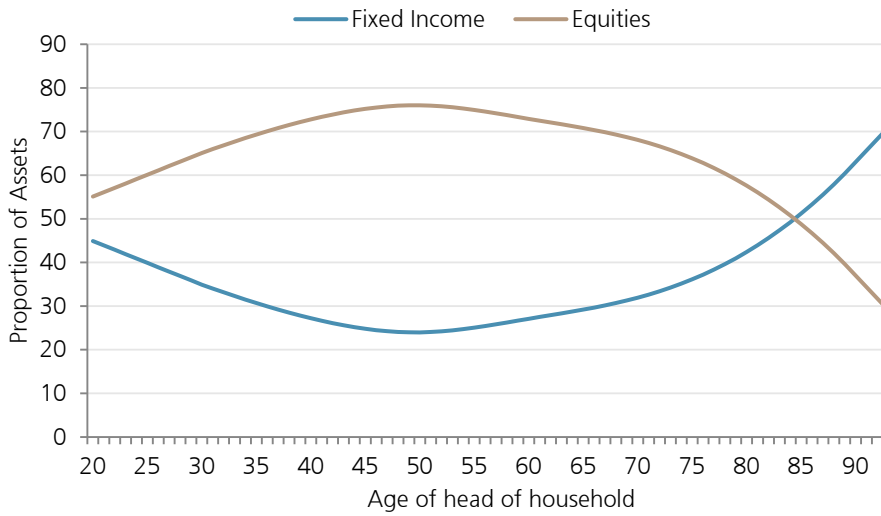
$$\text{Net financial wealth} = \sum_{i=1}^n (\text{Annual saving}_i)$$

and

$$\text{Financial assets} = \text{Net financial wealth} + \text{Debt}$$

Proportion of fixed income holdings

Figure 33: Desired holdings – fixed income versus equities



Source: UBS Estimates, Survey of Consumer Finances

Denote f_i to be the proportion of assets held in fixed income at age t . Formally, our panel data analysis allows us to estimate desired fixed income asset holdings for four midpoints of each SCF category (i.e. $f_{i_{30}}, f_{i_{40}}, f_{i_{50}}, f_{i_{60}}$). We estimate the desired proportion of fixed income holdings for all ages interior to these data points by estimating a cubic polynomial function $g(t)$ which satisfies the following:

$$g(t_1) = f_{i_1}$$

$$g(t_2) = f_{i_2}$$

$$g'(t_1) = m_1$$

$$g'(t_2) = m_2$$

$$g(t) = (1 - \theta)f_{i_1} + \theta f_{i_2} + \theta(1 - \theta)(a(1 - \theta) + b\theta)$$

$$\text{where } \theta = \frac{t - t_1}{t_2 - t_1}$$

$$a = m_1(t_2 - t_1) - (f_{i_2} - f_{i_1})$$

$$b = -m_2(t_2 - t_1) - (f_{i_2} - f_{i_1})$$

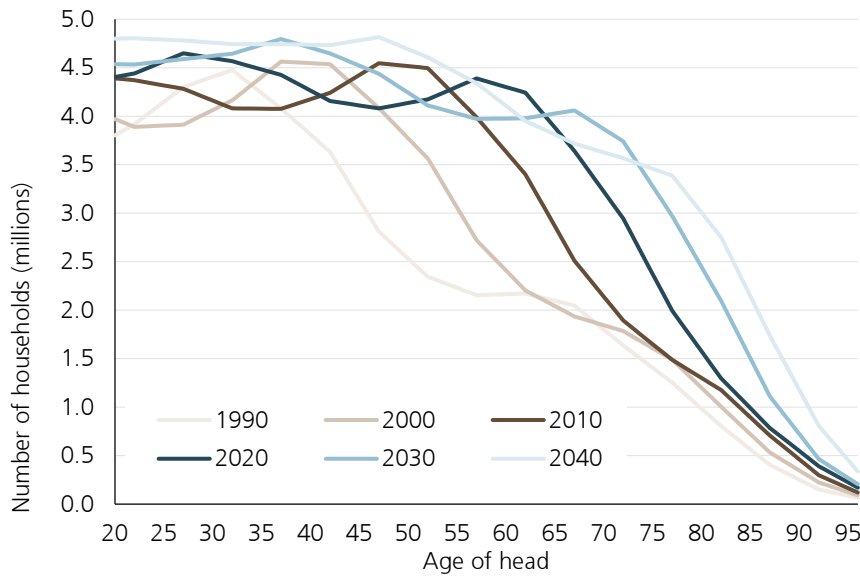
for all known fixed points f_{i_i}

We estimate the desired proportion of fixed income holdings for all ages exterior to these data points by extending the above cubic polynomial for all exterior t using f_{i_n} and $f_{i_{n-1}}$ as fixed inputs. (And the reverse for all $t < f_{i_1}$).

Since $g''(t_1) = g''(t_n) = 0$ for all natural splines, this result is the same as setting $g(t) = f_{i_n} + m(t - t_n)$ for all $t > t_n$ and $g(t) = f_{i_1} + m(t - t_1)$ for all $t < t_1$.

Estimated number of households

Figure 34: The demographic shockwave



Source: UBS Estimates, Survey of Consumer Finances, Gourinchas and Parker (2002), US Census (2013), Federal Reserve Bank of New York: Center for Microeconomic Data

Denote the likelihood of an individual being married at age t as $P(M|t)$, and the number of individuals of age t as λ_t . We take $P(M|t)$ from Wolfers and Stevenson (citation) and the population estimates of λ_t for each year in the future from the United States <bureau name>.

We assume people only marry partners of their own age. Therefore, the expected number of households in each year with age is given by $0.5\lambda_t \times P(M|t) + \lambda_t \times (1 - P(M|t))$.

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Buy	FSR is > 6% above the MRA.	49%	33%
Neutral	FSR is between -6% and 6% of the MRA.	40%	26%
Sell	FSR is > 6% below the MRA.	12%	18%
Short-Term Rating	Definition	Coverage ³	IB Services ⁴
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	less than 1%	less than 1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	less than 1%	less than 1%

Source: UBS. Rating allocations are as of 30 September 2015.

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3:Percentage of companies under coverage globally within the Short-Term rating category. 4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

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Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
Alps Electric Co.	6770.T	Buy	N/A	¥3,575	29 Oct 2015
Catcher Technology	2474.TW	Buy	N/A	NT\$321.50	29 Oct 2015
Daiwa House Industry^{2, 5}	1925.T	Buy	N/A	¥3,141	29 Oct 2015
Harvey Norman Holdings Limited	HVN.AX	Buy	N/A	A\$4.01	29 Oct 2015
Marks & Spencer	MKS.L	Buy	N/A	512p	29 Oct 2015
McDonald's¹⁶	MCD.N	Buy	N/A	US\$112.62	29 Oct 2015
Mondi^{14, 18}	MNDI.L	Buy	N/A	1,513p	29 Oct 2015
Siam Cement	SCC.BK	Buy	N/A	Bt456.00	29 Oct 2015
Sirtex Medical Limited	SRX.AX	Buy	N/A	A\$37.50	29 Oct 2015
Universal Health Services¹⁶	UHS.N	Buy	N/A	US\$122.17	29 Oct 2015

Source: UBS. All prices as of local market close.

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