The influence of demography on inflation and nominal rates

Global financial markets

Vincent Heaney, Strategist, UBS AG
Veronica Weisser, Analyst, UBS Switzerland AG
Linda Mazziotta, CFA, Strategist, UBS Switzerland AG

• Alongside population growth and increased urbanization, aging is a secular trend that underpins our longer-term thematic investment ideas.

• Demographic trends are also an important input into the likely level of inflation and interest rates.

• In this paper we look through a demographic lens at the development of inflation and interest rates in a number of key countries/regions, to highlight trends and point to possible future scenarios for real rates.

• If current macroeconomic policy trends persist in the longer run, their interaction with demographic changes could potentially lead to a more structurally inflationary environment in the US and a less disinflationary one in China.

Executive summary table: Impact of demographic and other selected trends on inflation and nominal rates

<table>
<thead>
<tr>
<th></th>
<th>From 2020</th>
<th>Towards 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Pressure on inflation and rates is balanced</td>
<td>At the margin the trend is for upward pressure on inflation and rates</td>
</tr>
<tr>
<td>Eurozone</td>
<td>Downward pressure on inflation and rates</td>
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<tr>
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<td>China</td>
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<td>Less disinflationary backdrop and less downward pressure on rates</td>
</tr>
<tr>
<td>Japan</td>
<td>Downward pressure on inflation and rates</td>
<td>Downward pressure on rates and inflation maintained until debt seen as unsustainable</td>
</tr>
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Introduction

Aging is leading to a dramatic shift in the population structure; it is now taking center stage as the economic, social, and political impact of more people living longer starts to emerge.

Alongside population growth and increased urbanization, aging is a secular trend that underpins our longer-term thematic investment ideas. But we also need to consider how demography will influence investment portfolios from a broader perspective. Demographic change, through its impact on the demand for goods and services, helps shape a country’s longer-term inflation outlook. By influencing the supply and demand for capital, demography is also an input into the level of nominal interest rates. This has implications for the future path of monetary policy and also, by impacting real interest rates, the portfolio choices investors will face.

These questions are particularly important at a time when the fiscal policy debate is changing. Global debt (government, household and non-financial corporate debt) has increased substantially since the global financial crisis, fuelled by a decade of ultra-low interest rates. Relative to global GDP, it has risen from 208% in June 2008 to 234% in June 2018, according to data from the Bank for International Settlements. The cost of providing pensions and healthcare for an aging population is an important element in how this trend will evolve.

"Demographic change, through its impact on the demand for goods and services, helps shape a country’s longer-term inflation outlook. By influencing the supply and demand for capital, demography is also an input into the level of nominal interest rates."

There are signs of a greater willingness to use expansionary fiscal policy to meet the macroeconomic objective of full employment against this backdrop of increasing fiscal demands from an aging population. At the far end of the potential policy spectrum is Modern Monetary Theory (MMT), which holds that budget deficits aren’t a sign of excessive spending, but rather inflation is. Thus running a bigger budget deficit doesn’t matter until the economy’s available resources are used up and inflation increases. Japan is often used as an example to support this unorthodox approach. The nation’s debt is equivalent to 240% of its GDP. That ratio has been at more than 200% for a decade and the Bank of Japan’s balance sheet is larger than the nation’s GDP. Yet annualized inflation is well below 1%. Japan is also a clear example of a nation at a late stage of the demographic transition.

Clearly, this is a complex area. Demographic trends evolve slowly and are by no means the sole input into the likely level of inflation and interest rates. In this paper we look through a demographic lens at the development of inflation and interest rates in a number of key countries/regions, to highlight trends and point to possible future scenarios. Against a backdrop of rising longevity, the likely trend in real rates is an important consideration for people planning how to save for a potentially longer retirement.
In the following analysis, we indicate the direction of the expected impact of various factors on inflation and interest rates over a time horizon of the next 10-15 years with the following symbols:

+ Factors putting upward pressure on inflation/nominal interest rates.
- Factors putting downward pressure on inflation/nominal interest rates.
~ Neutral.

The old age dependency ratio is the ratio of older dependents (people 65 and older) to the working-age population (aged 15-64). The replacement rate shows the level of pensions in retirement relative to earnings when working.

Data has been sourced primarily from the United Nations Population Division, with additional data from the Statistical Handbook of Japan and the US Office of Immigration.
US

Current population structure and demographic characteristics: late candle/early diamond:

- The US has a surprisingly benign demographic profile relative to a lot of industrialized nations due to significant immigration. According to UN population forecasts it will still be in the candle profile through the 2020s on current trends and expected to remain in the diamond demographic profile through the end of the century.
- The US exhibits some of the characteristics of the candle profile, although the domestically born population shows characteristics of the diamond phase.
- The US has a consumption culture, rather than a high savings culture. Hence it has persistent trade deficits. This characteristic of the US is important for deciphering how aging will impact the economy.

"The US has a surprisingly benign demographic profile relative to a lot of industrialized nations due to significant immigration."

Inflation

++ The Trump administration has pushed the budget deficit to historically high levels for a peacetime economy outside the years following the global financial crisis. Trump and the Democrats have agreed that USD 2 trillion is needed for infrastructure investment. Debt-financed increases in government expenditure produce upward pressure on inflation. While these are currently politically motivated, in future debt-financed spending will also be needed to fund the aging society’s social security promises.

~ Productivity has been rising from below-average levels in recent years, but over the longer term there is no discernible upward trend in productivity growth.

~ The overall population continues to grow slowly. The old age dependency ratio is rising with baby boomers retiring. It is expected to increase from 26% currently to 33% by 2030. The proportion of pensioners with lower purchasing power is growing (the US replacement rate is 49% of pre-retirement earnings).

- - The US has a large working age population, which is still growing. The UN projects the working age population of the US (15-64) will grow by 1.5% by 2030, with migration continuing to provide a significant proportion of the growth. The US census bureau estimates that 42% of the growth
in population in 2019 will be from migration, rising to 51% in 2030. The working age population is expected to decline from 65% of the total to 61% by 2030. However, more people over the age of 65 have been staying in the workforce, lifting the employment rate for the group by around 7 percentage points over the past three decades. Medical care breakthroughs should allow people to work longer, and more jobs require little physical labor. Defined-benefit pensions are disappearing too, so the era of longer retirements might not last.

*The US has a large working age population, which is still growing.*

**Nominal interest rates**

+ Substantial fiscal spending is required as an aging population puts pressure on healthcare/pension systems. Persistent current account deficits need to be financed through the capital account.

+ Gross government debt is more than 100% of GDP, higher than in most developed countries, and even under vibrant economic conditions the budget deficit will exceed 5% of GDP in 2019, by our projections.

~/-/ The savings of the working age population are currently balanced relative to the dis-saving of pensioners. But the trend is towards more dis-saving than in the recent past, where greater savings by baby boomers significantly exceeded pensioners’ dis-saving. But in the household sector, it is younger workers (and students in the US) who borrow, and there will be fewer of them in the future. Retirees might dis-save, but they won’t borrow, and they will still have a stock of savings that they want to lend to earn interest on. In addition, older people can dis-save by shifting their portfolios from equities into fixed income. Within the household sector population aging should put downward pressure on interest rates.

- The US dollar is the world’s reserve currency, holdings of which are recycled into demand for Treasuries by overseas holders. At present there is no practical viable alternative to the dollar, but over time its dominant position may be eroded.

Overall, the impact of demographic trends on inflation and interest rates is currently balanced. The trend at the margin and further into the future is towards a more inflationary environment with upward pressure on interest rates. The US has an inflation-targeting central bank, so the Fed’s target of low and stable inflation would suggest on average higher real rates.

*The trend at the margin and further into the future is towards a more inflationary environment with upward pressure on interest rates.*

Proponents of MMT do not agree that this upward pressure on inflation and rates will materialize. If they are correct, the US could run large deficits funded by printing money to resolve the demands on the social security system without inflation. If MMT is wrong, then the result would be inflation and higher rates.
Europe is a heterogeneous region, so generalizations are more difficult, but we identify the following trends.

**Inflation**

- The Eurozone’s population is relatively stagnant – it is projected to grow only slightly from 339m in 2020 to 340m in 2030, and the old-age dependency ratio is expected to increase from an already high 34% today to 43%, according to the UN. Average life expectancy in the Eurozone is 82 years at present and will likely increase another five years by 2050. Growth in demand for goods and services will be lower. Absent countermeasures, demographic developments imply slower demand growth, which will drag on the currency bloc’s prosperity and could reduce economic trend growth below today’s 1% in the coming decades. Even though the replacement rate (the percentage of a worker’s pre-retirement income paid out by a pension program) for the Eurozone is relatively high at 72%, the increasing proportion of pensioners with lower spending power will weigh on demand for goods and services.

+ The Eurozone’s working age population is shrinking as a proportion of the total and from current levels of 64% it is estimated to reach 60% by 2030. An overall stagnant population in Europe and a declining working age population, would, all else equal, weigh on growth in the supply of goods and services, reducing disinflationary pressures.

Allowing migration on the scale required to offset the shrinking working age population in the Eurozone would present challenges. Population projections for the Eurozone already assume 5.4m net inward migrants from 2020 to 2030. Greater migration would likely face stiff political resistance. Populist movements have gained ground in a number of EU states, partly in response to the refugee crisis. Even if the public views highly qualified immigrants differently than refugees, the current crisis has illustrated the EU’s limited political capacity to absorb further significant immigration flows.

“Allowing migration on the scale required to offset the shrinking working age population in the Eurozone would likely face stiff political resistance.”

On balance migration is unlikely to offset completely the reduction in the working age population in the Eurozone, so at the margin, growth in the supply of goods and services will be lower, hence there will likely be less deflationary pressure compared with today.
- Automation helps to offset a declining working age population by increasing productivity, but may not be sufficient to offset fully the demographic change in the Eurozone.

**Nominal interest rates**

- Lower trend growth and limited fiscal expansion will likely weigh on the demand for capital. Demographic change will also affect government debt sustainability. Eurozone government debt averaged 87% of GDP in 2017, with some countries significantly exceeding this figure. Europe, in particular Germany, is the region most likely to resist moves towards increased debt-funded spending on pensions/social security.

- Pension savings still outweigh dis-saving by pensioners, but by less than in the past. The logical response to greater life expectancy is to save more to finance a longer retirement. Within the Eurozone it is the wealthier northern countries, like Germany, that are the main suppliers of savings; countries such as Italy supply less. Over a 10-year time horizon this supply of savings will still be present but diminish as the old-age dependency ratio rises.

  “Growth in the supply of capital will likely still be greater than growth in demand for capital, but by less than in the past, so the trend is likely to be towards continued but less severe downward pressure on nominal rates.”

The net result for inflation is to maintain the status quo, as demographic change reduces both the growth in demand for and supply of goods and services. Given the current status quo is characterized by low inflation, there is little from a demographic perspective to suggest this will change over the next decade.

Growth in the supply of capital will likely still be greater than growth in demand for capital, but by less than in the past, so the trend is likely to be towards continued but less severe downward pressure on nominal interest rates. In these circumstances the level of real rates will remain under pressure, but on average is likely to be less negative.

**Switzerland**

<table>
<thead>
<tr>
<th>Supply of goods and services</th>
<th>Demand for goods and services</th>
<th>Supply of capital</th>
<th>Demand for capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable working age population</td>
<td>Overall population continues to grow</td>
<td>Pension savings still outweigh dis-saving from pensioners</td>
<td>Limited credit demand as economic growth moderates</td>
</tr>
<tr>
<td>Extensive automation and stable productivity growth</td>
<td>Deflationary pressure and trade surpluses</td>
<td>Supply growth &gt; demand growth</td>
<td>Downward pressure on nominal interest rates</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switzerland</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (million)</td>
<td>8.7</td>
<td>9.2</td>
</tr>
<tr>
<td>Working population (%)</td>
<td>66</td>
<td>62</td>
</tr>
<tr>
<td>Old age dependency rate (%)</td>
<td>29</td>
<td>38</td>
</tr>
<tr>
<td>Replacement rate (%)</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

**Inflation**

- In Switzerland the working age population is estimated to rise slightly from 5.7m to 6m, but will decline from 66% of the total population to 62% by 2030. Net immigration is expected to be significant from 2020 to 2030 at
50k per year. In contrast to the Eurozone, immigration is expected to offset the decline in the local working age population, mitigating additional wage pressure.

- The overall population will continue to rise, although the old age dependency ratio is estimated to increase from 29% to 38%. A rising share of pensioners limits the growth in demand for goods and services, given in Switzerland the replacement rate is just 45% of pre-retirement income. While more elderly people mean less marginal consumption, steady immigration leads to additional consumer demand. The overall impact on inflation is difficult to determine and instead may be reflected in changes in price dynamics in different sectors of the economy.

- Switzerland is likely to continue to run a current account surplus, putting upward pressure on its currency, which will eventually filter through to lower inflation.

- Relatively cheap capital and expensive labor favor rapid automation, which should substantially support output growth.

- High savings rate and an efficient capital allocation process could lead to high investment rates, which could lead to higher productivity and deflationary pressure. However, large parts of Swiss manufacturing are exported.

- In services, more limited competition and labor shortages in specific sectors like healthcare mean the trend is towards upward pressure on inflation. But this trend is offset by structurally lower wages in services compared with manufacturing.

- Swiss inflation is already close to the zero bound. For inflation to go lower on a sustainable basis nominal wages would have to decrease, which is likely to be unacceptable to Swiss employees on a regular basis.

**Nominal interest rates**

- Switzerland’s fast-aging population implies slower trend growth and lower demand for capital.

- Pension savings still outweigh dissaving by pensioners, but by less than in the past. Switzerland has one of the longest life expectancies in the world. The logical response to greater life expectancy is to save more to finance a longer retirement.

"Downward pressure on inflation and interest rates in Switzerland is likely to persist."

- Expansionary fiscal policy abroad could put pressure on credit ratings and lead to downgrades, which could lead to even lower Swiss long-term rates because of demand for the dwindling supply of AAA bonds.

Downward pressure on inflation and interest rates is likely to persist. Overall, in a low inflation environment with downward pressure on nominal rates, we would expect real rates to be negative as the central bank endeavors to mitigate deflationary tendencies with accommodative policy (although in the longer term, expansionary SNB policy could lead to higher long-term nominal rates.)
China

The table above describes the situation China in the early 2000’s. Looking at
the situation today and towards 2030, we see the following changes.

Inflation

- China’s working age population has peaked in both absolute terms and as a proportion of total population, even though the latter is still growing. China’s working population is currently still large at 70% of total population, but this proportion will fall to 68% by 2030. Downward pressure on inflation from growth in the supply of goods and services is likely to be less pronounced than in the past.

"China’s working age population has peaked in both absolute terms and as a proportion of total population, even though the latter is still growing."

+ The conflict over trade with the US could also have implications for China’s productive capacity if companies choose to locate factories outside China because of potential sanctions or tariffs, further reducing growth in productive capacity.

+ The population is still growing, underpinning growth in demand for goods and services. But the population is also aging, with the old having lower per capita income. The old age dependency ratio is now rising, and is projected to increase from 17% currently to 25% by 2030.

~ Government policy is aimed at shifting towards consumption, while expenditure on social policy can also create demand for goods and services. However, this is a rebalancing, so less spending on investment goods can be expected.

Nominal interest rates

~ China has a strong savings culture, although this is likely to shift as the government rebalances the economy towards consumption and away from investment. The implications of the one child policy are also a slower pace of savings growth over time and slower growth in, or even a stagnant supply of capital.

+ Demand for capital. Looking over a 10-year horizon a large negative economic shock that reduces demand is a possibility, although historically the government has managed economic slowdowns successfully. If the government manages to extend the economic expansion, growth in demand

<table>
<thead>
<tr>
<th>China</th>
<th>2020</th>
<th>2030</th>
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</thead>
<tbody>
<tr>
<td>Population (million)</td>
<td>1424.5</td>
<td>1441.2</td>
</tr>
<tr>
<td>Working population (%)</td>
<td>70</td>
<td>68</td>
</tr>
<tr>
<td>Old age dependency rate (%)</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Replacement rate (%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Global financial markets
for capital may continue to put some upward pressure on nominal interest rates.

“Inflation and rates in China will likely be pushed higher in the future by demographic change if current trends/policies continue.”

Overall, supply and demand growth for goods and services are likely to be more balanced, which points towards less disinflationary pressure and a lower (or no) trade surplus in the future. The supply/demand for capital will also shift towards less excess supply, so there is likely to be less downward pressure on nominal interest rates than in the past.

Inflation and rates in China will thus likely be pushed higher in the future by demographic change if current trends/policies continue. Overall, real rates are likely to remain mostly positive, given the less structurally disinflationary backdrop and a government/central bank with tight control of the economy and financial system, which should prevent inflation running away. But it is unclear whether real rates will rise or fall from current levels.

**Japan**

<table>
<thead>
<tr>
<th>Diamond</th>
<th>Urn</th>
<th>Supply of goods and services</th>
<th>Demand for goods and services</th>
<th>Supply of capital</th>
<th>Demand for capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising pension age</td>
<td>Strong productivity growth</td>
<td>Working age population stagnates or declines</td>
<td>Overall population declines</td>
<td>Limited downsizing by pensioners offset by savings of working-age population</td>
<td>Slowdown economic growth</td>
</tr>
<tr>
<td>Example Japan</td>
<td>Example Japan</td>
<td>Productivity growth</td>
<td>Deflationary pressure and trade surplus</td>
<td>Labor shortage and slowing credit demand</td>
<td>Falling real rates</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Japan</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (million)</td>
<td>126.2</td>
<td>119.1</td>
</tr>
<tr>
<td>Working population (%)</td>
<td>59.1</td>
<td>57.7</td>
</tr>
<tr>
<td>Old age dependency rate (%)</td>
<td>48.9</td>
<td>54.4</td>
</tr>
<tr>
<td>Replacement rate (%)</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

**Inflation**

- Japan is already at an advanced stage in the demographic cycle. The total population is shrinking and the old-age dependency ratio is already 48% (15-64) and is forecast to rise to 53% by 2030. With a rising number of pensioners and a replacement rate of only 40%, purchasing power will be increasingly under pressure.

- The working age population, currently 59% of the total population, is expected to shrink further in absolute and relative terms. By 2030 the working age population is expected to be 57.5% of the total. Productivity growth, helped by automation, can help maintain productive capacity as the labor force shrinks. But a shrinking and sharply aging labor force will likely result in slower growth in the supply of goods and services, thereby increasing disinflationary or deflationary pressure.

“Productivity growth, helped by automation, can help maintain productive capacity as the labor force shrinks.”

- Demographic factors are unlikely to create upward pressure on inflation over the next 10 years. However, all else equal, we estimate that raising the
retirement age by five years to 70 could reduce the growth slowdown over the next quarter-century by 0.25 to 0.40 of a percentage point annually.

**Nominal interest rates**

- As the population ages, dis-saving by pensioners becomes more significant relative to savings by the working age population.
- Slowing trend economic growth weighs on growth in demand for capital.
- Later in the demographic transition, higher government spending on the state pension system and medical expenses, combined with lower tax revenues, could have an upward effect on rates. On the one hand, the government will issue relatively more bonds (higher capital demand) to fund its deficits, and on the other its credit risk will rise as the health of its finances deteriorates. Finally, dis-saving by large numbers of retirees who sell assets to finance consumption will put upward pressure on rates as the supply of capital falls (although on current trends this latter point is in part offset by a rising corporate savings rate.)

"The scenario in which government commitments start to put upward pressure on rates is partly dependent on market perceptions. While Japan’s debts are seen as manageable, rates are likely to remain very low."

Overall, on current trends and policies, the balance remains tilted towards disinflationary or deflationary pressure persisting and downward pressure to continue on nominal interest rates. The scenario in which government commitments start to put upward pressure on rates is partly dependent on market perceptions. While Japan’s debts are seen as manageable, rates are likely to remain very low. Japan’s debt-to-GDP ratio has been over 200% for a decade, without any upward pressure on rates. Overall, in a low inflation environment with downward pressure on nominal rates, we would expect real rates to be negative as the central bank endeavours to mitigate deflationary tendencies through accommodative policy. If the environment turns deflationary, then real rates would potentially turn positive again.

The authors would like to thank Brian Rose, Ricardo Garcia, Alessandro Bee, Daiju Aoki, Yifan Hu and Philip Wyatt for their contributions to this report.
Appendix

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