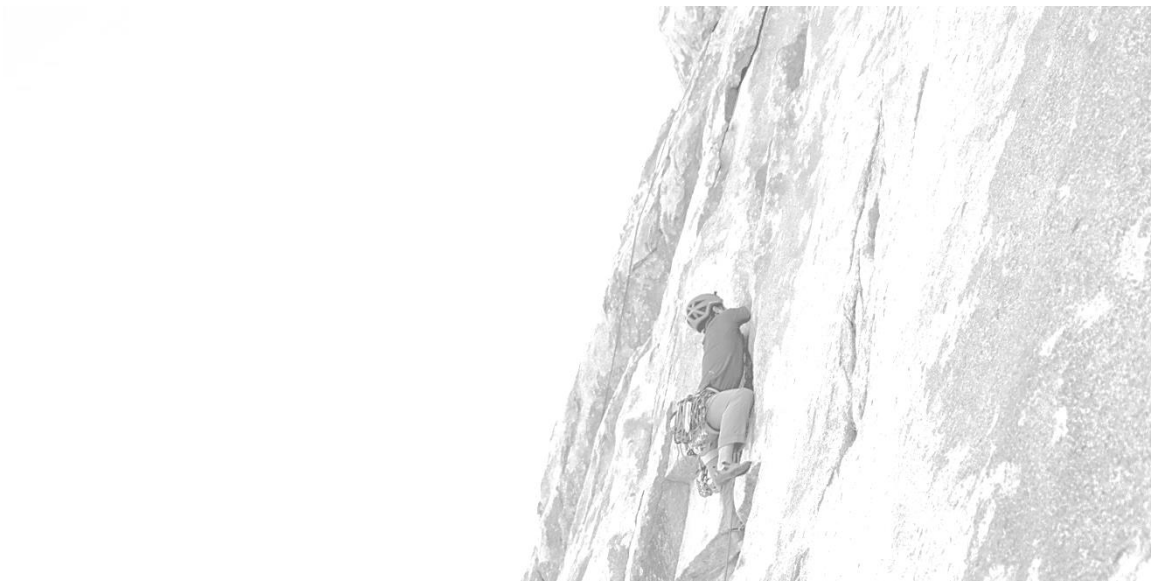
What Will It Take For Rates to Climb?

Institutional investors often assume a degree of "return-to-normality" for long-term rates in their investment plans. But what are, if any, the preconditions for return to higher interest rates? And if those preconditions are not met, what could be the expectation range that takes into account the structural drivers of interest rates?



The fortunes of pension funds at least on paper depend on the level of long-term (real) interest rates. Despite new all-time highs in equity prices, pension funds are not keen to celebrate so long as the rates remain subdued and the net present value of liabilities remains high.

Our conventional "classical" understanding of business cycles suggests that there should be a positive correlation between long-term interest rates (bond yields) and equity markets: as the aggregate demand picks up, so does the long-term GDP growth rate and finally - interest rates. This understanding however falls short of explaining the secular decline in long-term interest rates observed in most of the developed markets (Figures 1, 2).

Figure 1: Real Interest Rates in the Eurozone (10-year-CPI)

Figure 2: Real Interest Rate in the US (10-year yield - CPI)

This conundrum of interest rates raises a number of questions:

i. If there are structural reasons for lower interest rates, what are they?

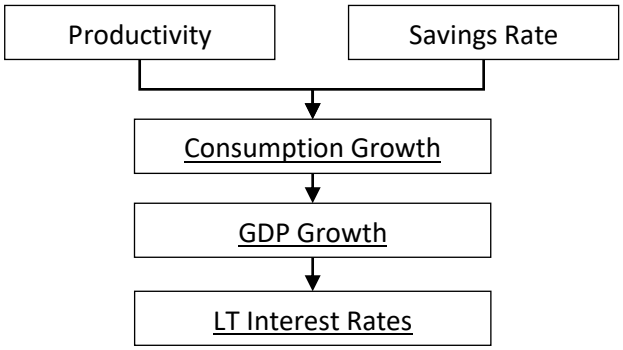
ii. Is it reasonable to expect that interest rates would bounce back to historical average?

iii. If return to historical average is not feasible, what is the level of expectation that takes all available information into account?

Productivity and Savings Drive Rates

It is customary to assume that in the long-term real interest rates tend to be aligned with long-term real economic growth rate. The primary driver of GDP growth rate is household consumption growth, which in turn depends on how much is saved vs. spent currently and the productivity of labor (individuals can save and spend more if they are more productive). The interest rate driver diagram helps explain the key drivers (Figure 3).

Figure 3: Interest Rate Drivers



In this context, the activity of Central Banks in terms of managing the supply side of capital within the economy has a transitory nature: in the absence of real improvement in aggregate demand driven by productivity gains, any additional growth derived from Central Bank stimulus is bound to be at the expense of leverage.

The familiar government spending and business investment components of GDP are missing in the diagram because household consumption is the biggest contributor to the GDP in the US and Europe, and we focus on the most relevant factors driving the rates. Intuitively then productivity and savings should have a significant impact on interest rates (Figures 4-7).

Figure 4: Productivity growth and AAA 10-year real rates, source: ECB, Eurostat

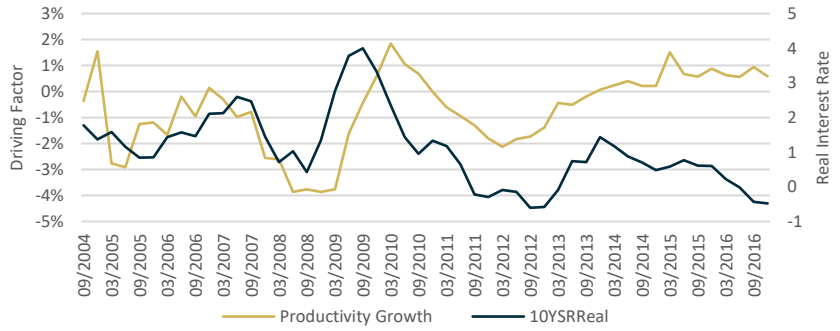


Figure 5: Household savings rate and Eurozone triple-A 10-year government bond yields, source: ECB, Eurostat

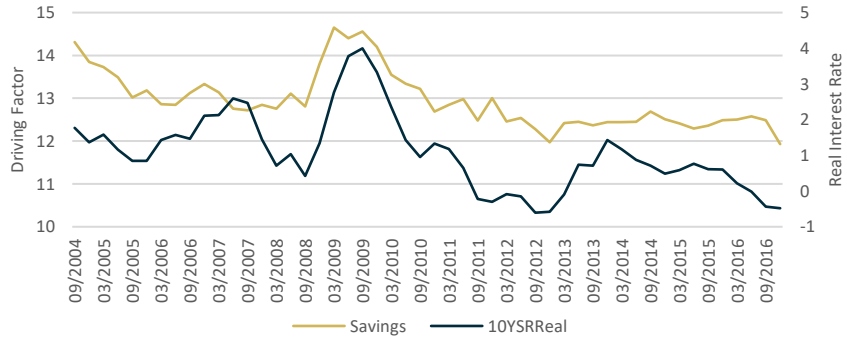


Figure 6: US Savings rate and 10-year yield less inflation rate, source: Bloomberg, US BEA

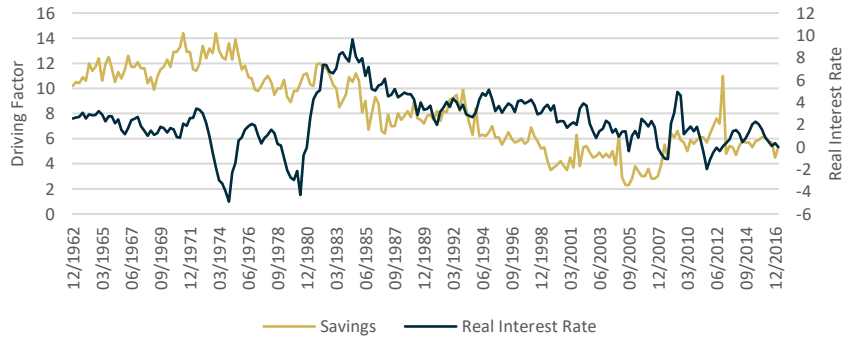
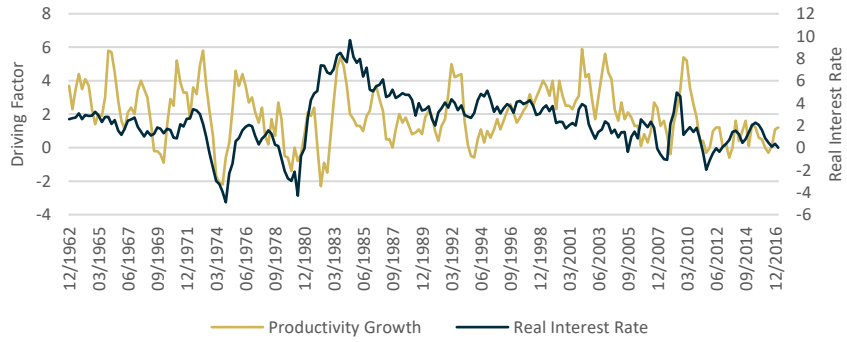


Figure 7: US productivity growth and 10-year yield less inflation rate, source: Bloomberg, US BEA



The relationship is clearly strong and may actually go a long way in explaining why interest rates are in structural decline: productivity growth and household savings rates have been declining continuously over the past few decades in the US and in Europe. But this leaves an open question: why are the productivity growth and savings rates stagnant?

The Extreme Productivity Trap

Improving technology has traditionally been associated with higher labour productivity. The introduction of mechanization in agriculture and automation in manufacturing have boosted output per hour worked in the last century and created huge improvements in the standards of living.

The gains have not been uniform though: episodes of extreme poverty, migration and crises such as farmers in 1920-30s in the US and 1980s mine workers in the UK have experienced, left lasting impact on certain regions in those countries. As we witness another seismic shift in technology in terms of automation and data revolution, the pressing question is whether what was limited to certain geographic regions in the last century could spread to the whole population in 2020s?

This question is related to the puzzle of sluggish improvement in productivity in the past decade despite the arguably unparalleled pace of technological progress in agriculture, industry and services. One often quoted explanation is the problem of measurement: with technological change people gain greater improvement in quality and benefits of products and services than what is expressed in monetary terms. Adjusted for these gains, labour productivity improvements could still be high.

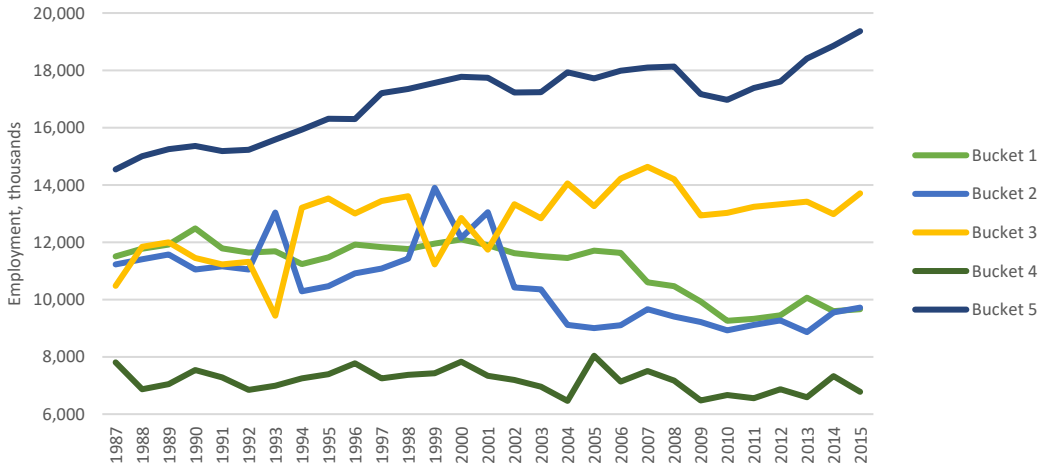
Although the “measurement” argument may have a merit, the issue is that the same argument could be applied any time in the past thousand years: there have been many transformational shifts rendering everyday products qualitatively different.

The second thesis explaining slow productivity growth is less sanguine: in the extreme, technological improvements crowd out labour and push people into sectors with lower productivity growth. Sectors with greater productivity improvements see continuously improving returns on capital due to lower labour costs, but as labour is pushed to lower productivity areas, overall productivity of the economy remains weak.

In order to test this counterintuitive hypothesis, we divided all the economic activities in the US into five buckets based on the labour productivity and calculated the number of people employed in each bucket from 1987 to 2015. To be clear, from one year to another each bucket may contain different industries; the only thing that matters is how many people are employed in the most productive vs. least productive industries.

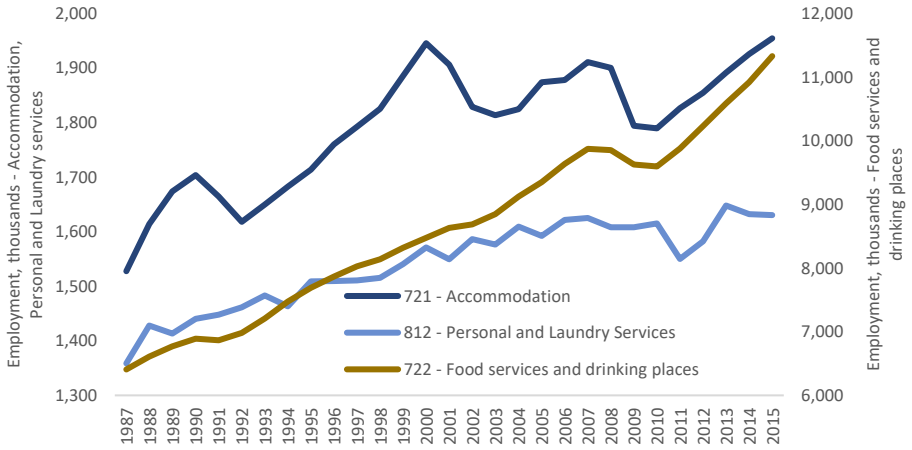
The results appear to support the “crowding out” argument (Figure 8). The least productive industries in the US (bucket 5) employed about 15 million people in 1987 vs. 19.3 million now. The top two productivity buckets both saw falling employment numbers from 23.1 million to 19.5 million.

Figure 8: Number of people employed in groups of industries based on productivity ranking, Bucket 1 represents the group of industries with highest productivity, Bucket 5 – lowest, Source: US BLS, BEA, LINKS calculations



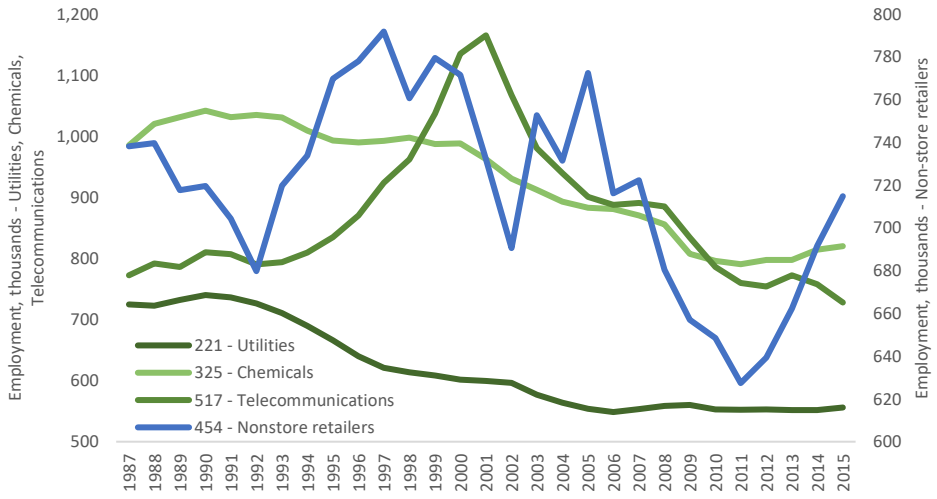
Although the industry constituents of the least productive bucket can change over time, the most stable members of this bucket are accommodation, personal and laundry services and food service industries. These industries saw continuous increase in the number of people employed (Figure 9). Note that Food services is by far the largest employment provider in the least productive industry list.

Figure 9: People employed in the industries with consistently lowest labour productivity, Source: US BLS, BEA, LINKS calculations



Industries with highest productivity such as telecommunications, chemicals, utilities, non-store retailers (internet retail) saw a steady decline in the number of people employed.

Figure 10: People employed in the industries with consistently highest labour productivity, Source: US BLS, BEA, LINKS calculations



To put it simply, there has been a strong crowding out of people by technology, with the food industry absorbing the bulk of new employment. It should be noted that there are many low-productivity industries that due to lack of data are not included in this analysis: chiefly health care services and education. These industries have experienced a notable increase in employment and productivity gains there have a natural limit.

The "crowding out" process results in changing proportion of people employed by industry (Figure 11). As employment is more and more concentrated in the low-productivity industries, the value added by labour and the corresponding compensation growth is sluggish, which results in falling proportion of labour in total income (Figure 12). This has a major dampening effect on consumption.

Figure 11: Estimated Trends in Labour Shares by Sector, Source : IMF World Economic Outlook, April 2017

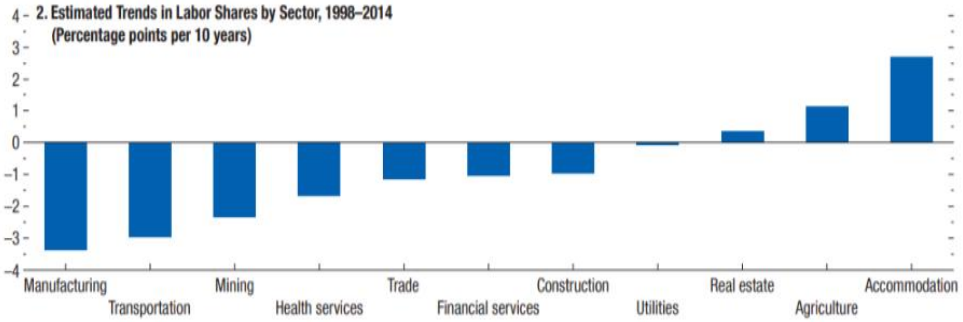
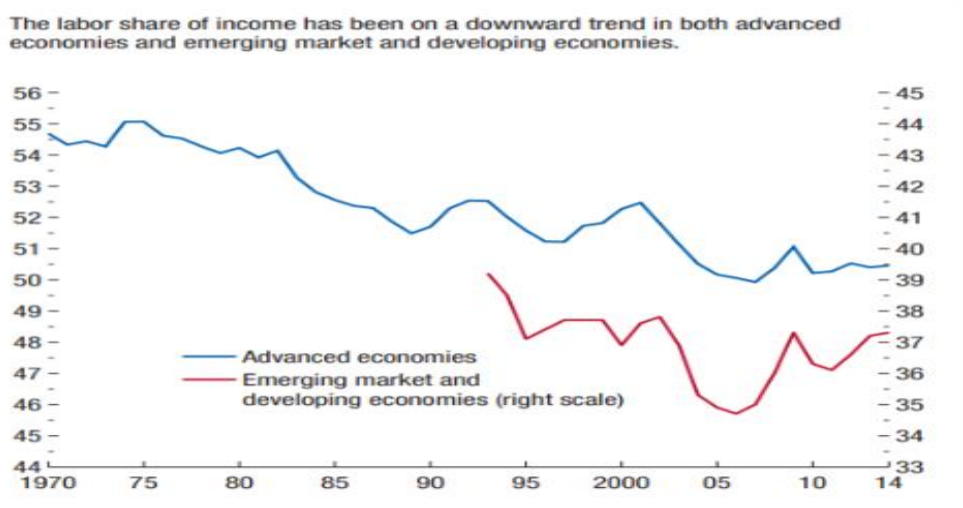


Figure 12: The labour share of income in total, Source : IMF World Economic Outlook, April 2017



The Role of Savings

The explanation for falling savings until now is a puzzle in itself. Last three decades were the period when the baby boomer generation in the US entered the 45 to 65 year-old cohort, which happens to be the highest saving population group. The population group with the highest dollar amount of savings in the US is 55 to 64 year-olds, with average $7201 savings (Table 1). The group over 65 years-old experiences drastic cuts in savings (to $1679) and income levels.

Table 1: Income and expenditure in the US by age group, Source: US BLS

Per capita spending by age group (USA)

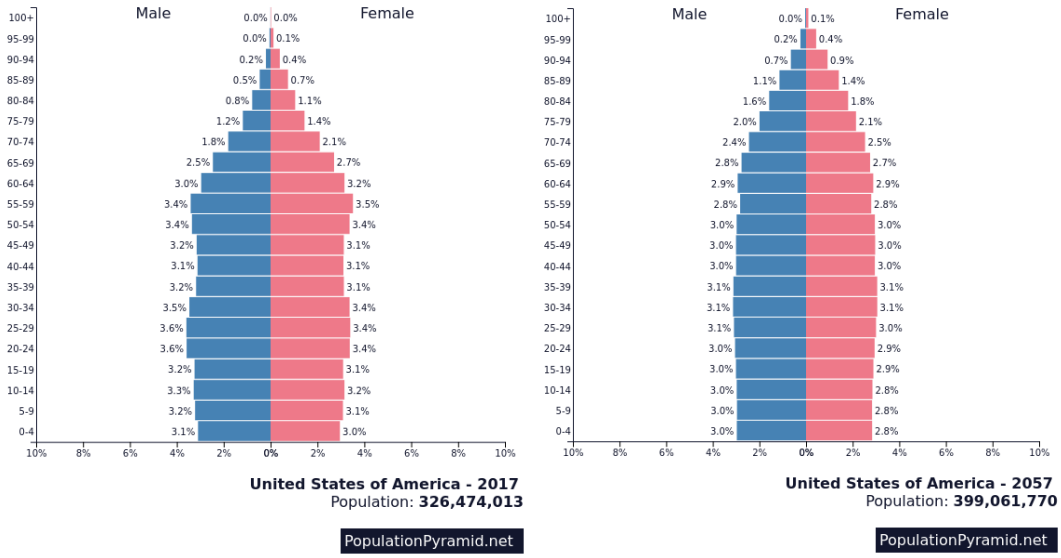
	Age of householder						
	Under 25 years	25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65 to 74 years	75 years and over
Income after taxes	12761	20443	22697	27664	32184	24288	19545
Difference income and expenditures	-1299	3838	5333	6697	7201	1679	-253
Average annual expenditures (dollars)	14060	16605	17364	20967	24982	22609	19798
Food	2090	2203	2352	2659	3001	2927	2618
Food away from home	866	961	1004	1108	1250	1049	836
Housing	4868	6164	6274	6787	8091	7612	7382
Apparel and services	698	668	711	673	758	696	496
Transportation	2667	2740	2535	3360	3963	3702	2269
Health care	338	645	764	1133	1855	2582	2987
Entertainment	617	894	1005	1134	1384	1315	992
Personal care products and services	180	198	208	238	294	316	285
Reading	21	25	26	43	70	81	84
Education	955	289	283	734	478	95	88

Note: the data lists household income and expenditures by age of householder. Per capita spending is derived by dividing household expenditure by the number of persons in households. Source: U.S. Bureau of Labor Statistics (Consumer Expenditures in 2009)

Despite this strong tailwind of larger proportion of the saving cohort, the savings rate declined. We have found references to two plausible drivers here: the wealth effect and the increase in federal health insurance programs (Medicare and Medicaid). The former argument suggests that higher asset prices create stronger household balance sheets and dis-incentivize savings. The latter reason is more technical: federal health insurance spending is accounted for as income for households, but spending of this income is by default 100%, which cuts the average savings rate.

Unfortunately, the tailwind that savings had from age cohorts is about to reverse: the proportion of high-saving age cohort in the total population is expected to fall from 19.4% to 17.8% in the next 40 years, while the proportion of population older than 65 that actually do not save will increase from 6% to 8.5% for men and from 10.8% to 11.9% for women.

Figure 13: US population pyramid, 2017 and 2057, Source: PopulationPyramid.net



As population ages, therefore, it is reasonable to assume that the savings rate will continue to remain low or will fall further. It is important to note that this fall in the savings rate would be independent of the interest rate: disincentives to save due to wealth or age do not depend on the interest rates offered on those savings. Lower savings rate now means lower potential consumption in the future and correspondingly lower consumption growth rate.

Return to Historical Rates Unlikely

At this stage, instead of forecasting the long-term rates, it would be more interesting to examine the preconditions for interest rates to go back to their historical averages. This would require commensurate shifts in the savings rate and productivity growth rates.

As we mentioned earlier, savings rates are kept low due to the household wealth effect and potentially – the effect of aging population. Although there are sometimes demographic surprises, the reversal of the aging trend at this point is not plausible. A reversal in the wealth effect may actually happen if there is a sustained bear property and equity markets. This means that a future scenario of strong equity markets and higher interest rates is unlikely – an important conclusion for pension funds in itself.

The reversal of productivity gains would require either people moving out of low productive industries or an increase in the value of output of those industries. Both options are problematic: since there are no industries to move “into”, people moving out of low productive industries are likely to enter the structural unemployment pool, and this development would require policy change in wealth redistribution. Higher corporate tax rate paying for free college tuition would be an example of such a policy.

In summary, return to higher real interest rate environment would require one or more of the following:

i. reversal of the aging population trend,
ii. protracted bear market for equities and property,
iii. major and long-term tax and welfare policies.

The three preconditions are listed in the order of increasing likelihood of happening. A reversal of the aging population trend in the US and Europe can happen only due to a significantly lighter immigration regime – a nearly impossible political outcome at present. A bear market in equities can be a likely outcome of plateauing returns on capital as further increases in ROC would require greater scale brought about by greater aggregate demand. Finally, as long as the present trend of higher structural unemployment and falling incomes continues, it is very likely (more so in Europe) that major long-term tax and welfare policies will have to be put in place to reestablish the balance in income distribution.

Infobox 1: Graham Risk Asset Pricing

The Graham Risk framework is a cross-asset class pricing framework based on Internal Rate of Returns.

Graham risk for sovereign bonds is given by: $GR_{Sovereign} = Yield_{Fair} - Yield$, fair yield is driven by the following empirical model:

$Yield_{Fair} = \beta_0 + \beta_1 P + \beta_2 s + \beta_3 g_{GDP} + \beta_4 I + \varepsilon$, where *p* is the productivity growth, s is the net savings, g_{GDP} is trend growth of GDP, *I* is the rate of inflation.

The actual model estimation in LINKS Mira is carried out based on ARIMA approach with additional regressors.

Likely range of rates

If the return to historical averages is unlikely, what are the ranges of likely interest rates in the US and Europe in the next decade? The most plausible course of development in the absence of reversing trends described in the previous section is that there will be a continued decline in average cross-cycle savings rates and flat labor force productivity. Combining this with falling labor participation rates we get a range of "drivers" going forward (Table 2).

Table 2: Values for drivers – assumptions are based on the average pace of historical development

Driver	Current	Intermediate	Final
EU Labour force productivity per hour worked (seasonally adjusted)	0.59%	0.59%	0.59%
EU Gross household savings rate, seasonally and calendar day adjusted	11.9	12.0	10.0
EU Employment (working persons as % of total population)	43.8%	42.0%	39.0%
US Gross Household Savings Rate, seasonally and calendar day adjusted	5.3	5.05	3.7
US Labour force productivity per hour worked (seasonally adjusted)	1.2%	1.2%	1.2%
US Employment (working persons as % of total population)	38.0%	36.0%	35.0%

Table 2 describes the intermediate and ultimate states of interest rate drivers in ca. 2030 and 2050 respectively. In both cases there is a conservative assumption of flat productivity rate (null

gains in productivity, but no declines) and aging population is taken into account by shrinking the working population as percentage of total population. Finally, steady savings rate declines are factored in.

We use LINSK Graham Risk framework to estimate fair levels of interest rate under these conditions. For more detail on the methodology used to derive the fair yields please consult the Information Box 1.

Table 3: Interest rate expectations based on the Graham Risk methodology

Nominal rate forecast			Long-Term Fair Yield	
Asset	**Recent**	**Current (Fair)**	**Intermediate**	**Final**
EU Rates, 10-year	0.45	0.92	0.33	-3.16
US Rates, 10-year	2.23	3.81	2.55	1.20

Infobox 2: LINKS Mira

We arrived at these estimates using LINKS Mira - a value-based asset pricing framework combined with an Agent Based Model, which enables scenario analysis and stress testing:

- ✓ Monitor daily events and their impact on the portfolio
- ✓ Check the valuation of the portfolio and individual asset classes
- ✓ Short- and long-term nominal and risk-adjusted returns
- ✓ Over 60 asset classes, equity sectors, 44 countries

Download LINKS Mira directly from our site.

While much has been said about the Central Banks holding the rates unnaturally low, Table 3 suggests that given the current macroeconomic environment of low savings and productivity, the 10-year rate in Europe should not be higher than 0.9%. In the intermediate term (until 2030), the normal rate should fall to 0.33 and if there are no reversals in major trends, it will continue to fall into the negative territory thereafter. Rates in the US should be closer to historical averages, but in the longer term they too will spiral downwards.

Conclusion

There are structural reasons for falling interest rates over the last two decades independent of business cycles and central bank policies. Falling household savings rate and flat labor productivity are the likely main culprits, since strong savings and productivity gains are preconditions for higher interest rates.

Unfortunately, these long-term trends are unlikely to stop any time soon. The wealth effect is the main driver of lower savings rate, and in the next two decades aging population will produce an added impact. Lack of progress in productivity improvements is explained by the "crowding out" effect of labor by capital. Higher interest rate environment is only plausible if one or more of the following changes occur:

i. reversal of the aging population trend
ii. protracted bear market for equities and property
iii. major increases in long-term tax and welfare policy size

In the absence of these shifts, it is likely that the current value of 10-year yields are close to long-term sustainable average levels. Over time, however, productivity, savings and other critical variables change can and will change, which then has an impact on the "fair" levels of expected

rates. LINKS Mira is a system well suited to monitor these developments over time, price assets and run scenarios (see Information Box 2 for details).

About LINKS:

LINKS Analytics B.V. has a focused offering of industry leading systemic risk management solutions for institutional investors. Our unique and proven methodology of estimating the degree of systemic risk is based on the assessment of asset valuation dislocations globally (Graham Risk) and the degree of interconnectedness and concentration (Network Risk).

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