Asset Owner Market Report

Rising Interest Rates and Pension Plans

Recent Effects on Assets, Liabilities and Funding Ratios

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Introduction

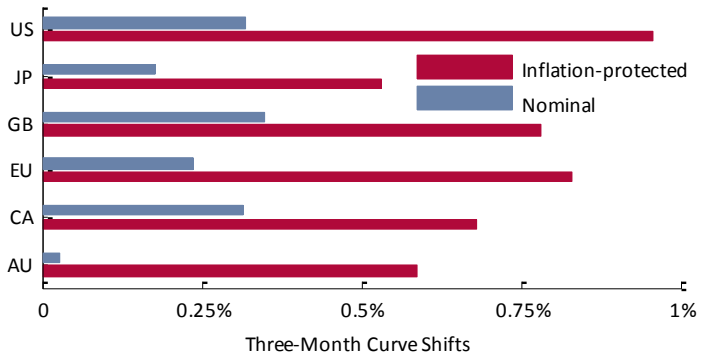
From the start of May 2013, statements from the Federal Reserve have raised questions about the longevity of its quantitative easing program, with interest rates on the rise during the same period. Defined-benefit (DB) pension plans have been battered by low interest rates since the financial crisis; market observers reviewing 2013 Q2 pension performance might expect to see substantial improvement in plan funding ratios. In this Market Report, we use data from our quarterly *MSCI Risk Monitor: Asset Owners* to look at how markets have behaved during the past quarter, and how this has affected model plans in the US, UK and the Netherlands. We find that the model plans in these markets fared differently, depending on how they had been positioned in the low-interest environment, in particular their allocation to fixed income.

How Rates Have Changed During the Past Quarter

In Figure 1, we see that sovereign curves across markets (as measured by their parallel moves) have risen markedly. Inflation-protected sovereign curves have moved considerably more, indicating a fall in break-even inflation and a rise in real yields.[1]

Figure 1: Q2 Changes in Sovereign Rates.

Date Range: April 1, 2013 - June 30, 2013.

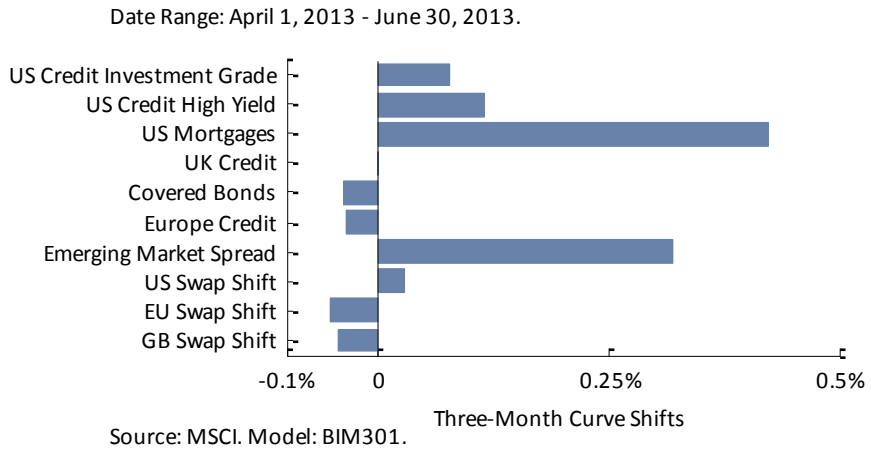


Source: MSCI. Model: BIM301.

[1] For simplicity, we show the parallel movements in the sovereign yield curves calculated as the monthly returns of the shift factors in the Barra Integrated Model. Additional factors in the model capture other changes in the yield curve, such as steepening.

In Figure 2, we see the spreads over Treasuries. Credit-sensitive bonds were exposed to risk from the swap-spread curve and, in some cases, sector and rating factors. The movements in these rates were mixed.

Figure 2: Q2 Changes in Credit Spreads.



Source: MSCI. Model: BIM301.

The Impact of Rising Rates on Pension Plans

To analyze the effect of market risk factors on pension plans and plan sponsors, we look at the surplus of the plans, constructed as a long-asset, short-liability portfolio. The performance and risk characteristics of the surplus provide information on the average level of contributions to the plan and on the volatility of these contributions.

Rising interest rates may affect a plan's surplus in three ways:

(i) When a plan's liabilities are discounted using a market curve, rising rates reduce the present value (PV) of the liabilities and thereby improve the plan's funding status.

(ii) Rising rates directly affect bonds held in a plan's asset portfolio; the price of these bonds will fall, worsening the funding status.

(iii) Other asset classes may be affected indirectly by the rise in rates; in two recent MSCI Market Reports, we looked at the impact of rate increases on equity markets in the US[2] and China.[3]

Plans differ in their susceptibility to interest-changes depending on their asset allocations, funding status, and the relative durations of their liabilities and their fixed-income assets.

To assess the impact, we constructed model portfolios of assets and liabilities for four types of pensions: US public, US corporate, UK, and Dutch. We examine how their assets, liabilities, and funding status were affected during the last quarter. The model portfolios reflect the average holdings of assets for each region, without any hedging overlays.

[2] J-H Lee, J Menchero, F Vallario: *The Impact of Recent Fed Announcements. MSCI US Market Report, July 2013*.

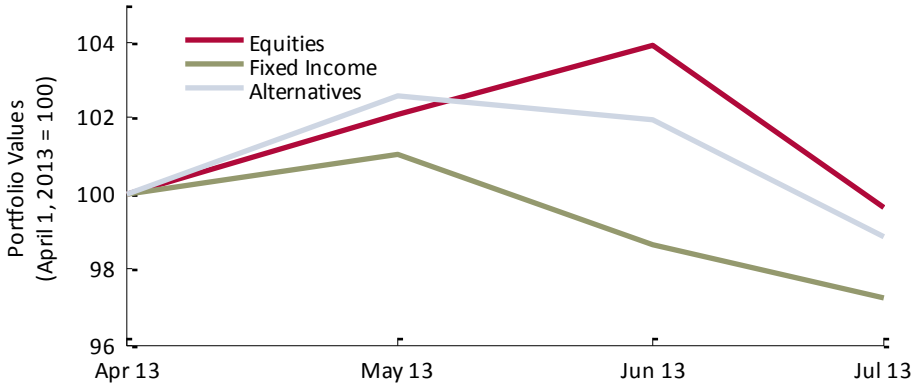
[3] O Ruban, K Zhang: *Analyzing the June Liquidity Squeeze. MSCI China Market Report, July 2013*.

Q2 Asset Class Returns

Figure 3 plots asset class returns during the quarter.[4] Since May, bonds have been hurt by interest rate increases. Other asset classes have also seen declines — in fact, they have not served as a hedge for bonds, a change from recent historical behavior. Equities saw reversals of recent strong performance in June. Alternatives also performed poorly during the second half of the last quarter.[5]

Figure 3: Q2 Changes in Asset Class Levels.

Date Range: April 1, 2013 - June 30, 2013. Currency: USD.



Source: MSCI, Bank of America Merrill Lynch, Hedge Fund Research.

The charts in Figure 4 show the asset allocations[6] of model plans.[7]

[4] The quarterly *MSCI Risk Monitor: Asset Owners* contains more detailed information: figures showing forecast volatilities and correlation, performance by region, or the returns of relevant market factors in the context of the Barra Integrated Model BIM301. It also gives the compositions of the portfolios with which we represent the asset classes.

[5] Our alternatives portfolio is 40 percent private equity, 40 percent real estate and 20 percent hedge funds. For more details, see the *MSCI Risk Monitor: Asset Owners, 2013 Q2*.

[6] The holdings within the asset classes vary by plan type for the model portfolios. For more details on intra-asset class allocations, see the *MSCI Risk Monitor: Asset Owners, 2013 Q2*.

[7] The model portfolios were constructed based on (1) the annual report of 57 US public plans (for US Public Plans), (2) data on the top 100 US corporate plans provided by Pensions & Investments (for US Corporate Plans), (3) statistics provided by the Pensions Regulator (for UK Schemes), and (4) statistics published by the Dutch Central Bank. For more details on the model portfolios, see Appendix B of the *MSCI Risk Monitor: Asset Owners, 2013 Q2*.

Figure 4: Asset Allocations of Model Plans.

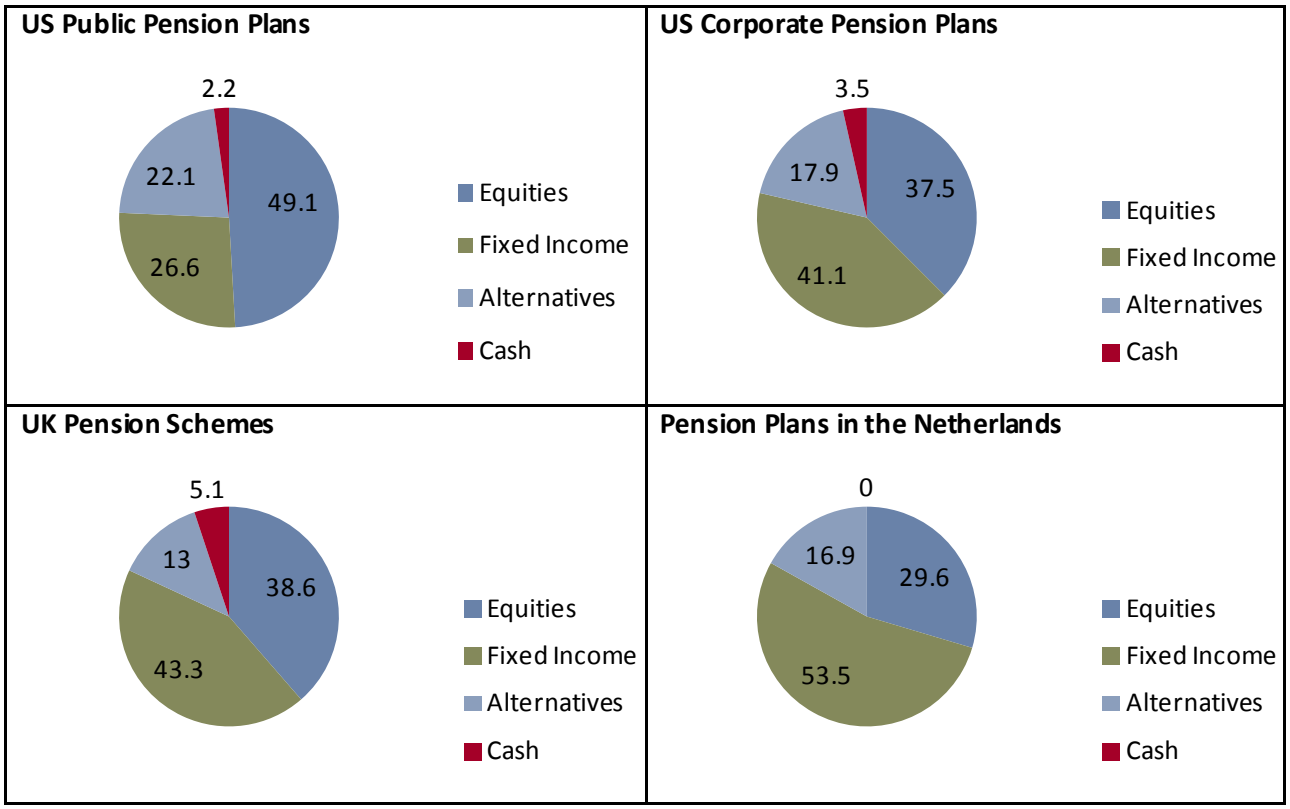
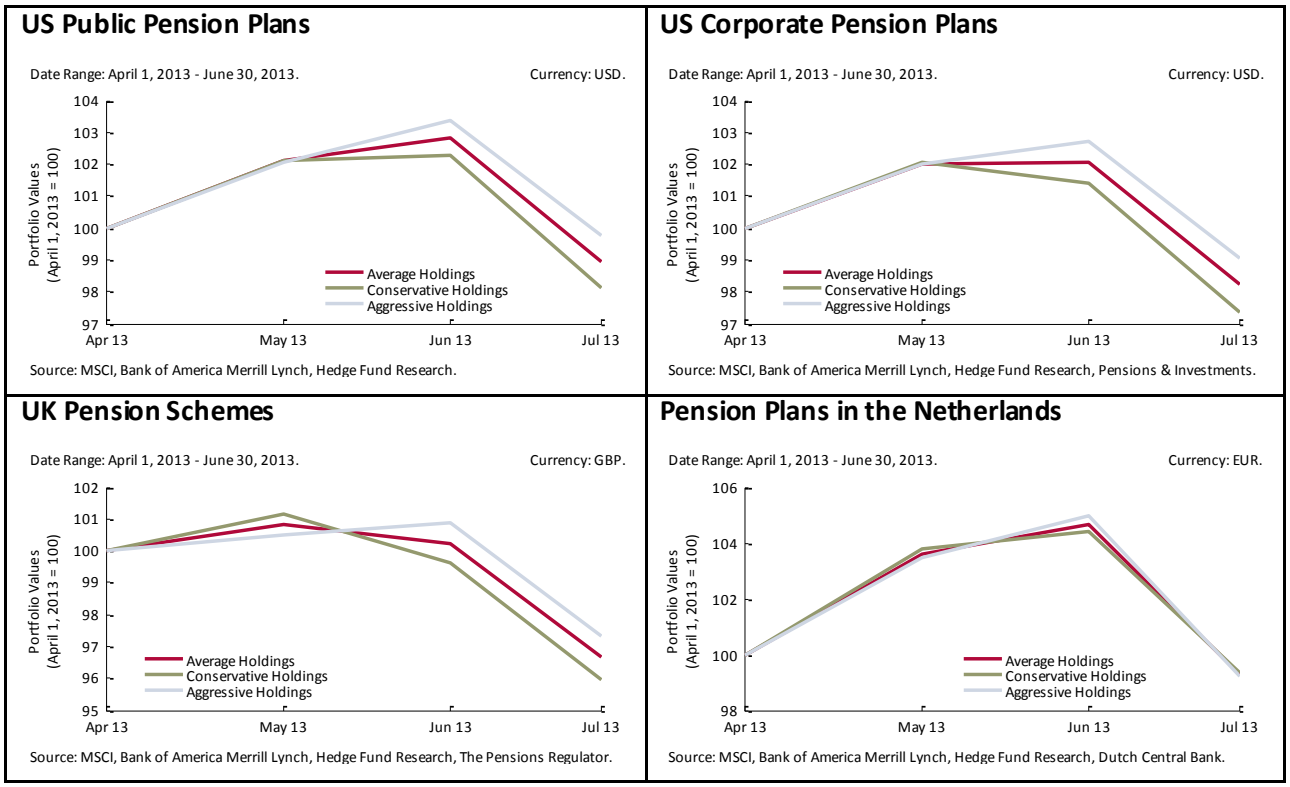


Figure 5 combines asset class returns with the asset allocations, demonstrating the resulting estimated asset performance, including more and less aggressive allocations.[8]

[8] Conservative holdings overweight fixed income by 20 percent; aggressive holdings underweight fixed income by 20 percent; holdings in other asset classes are modified proportionally, keeping the cash position unchanged.

Figure 5: Estimated Q2 Changes in Asset Levels of Model Plans.



We note first that the model Dutch plans fared the best, with only slightly negative returns, despite the highest allocation to fixed income. This is because their bond holdings were largely euro-denominated bonds, whose rates were less affected over the quarter than those of US and UK bonds (see Figures 1 and 2). The difference in returns between aggressive and conservative holding was more muted, reflecting the similar performance of their fixed income portfolio and that of the other asset classes. Second, among the model UK and US plans, those with higher fixed income allocations (UK, then US corporate, then US public; and conservative plans within plan types) fared worse, as other asset classes outperformed US and UK bonds.

Changes in Liabilities

Table 1 provides details on the liabilities of the model plans in our analysis. Our estimates indicate that the PV of liabilities decreased last quarter as discount rates increased.

Because of the longer duration of their liabilities and the significant change in US interest rates, US public plans saw the largest decrease in the PV of their liabilities. Our analysis focuses on the changes in liability PVs in response to changes in the market interest rates. US public plans in practice discount liabilities using a fixed discount rate, and so would see no reduction in the PV of their liabilities as rates rose. However, in order to make comparisons among plan types for the purpose of our analysis, we used a US AA corporate curve to discount their liabilities, the same curve that we use for US corporate plans. We also observe that the smallest fall in the PV of liabilities was for Dutch plans, owing to the relatively minor rise in Euro swap rates.

Table 1: Present Value Liabilities of Model Plans.

System	Liabilities	Rate	Change in Rate* (Basis Points)	Assumptions on Duration	Estimated Q2 Change in Value** (Percent)
US Public Pension Plans	Nominal	US AA Corporate	47	15.1	-10.3
US Corporate Pension Plans	Nominal	US AA Corporate	47	10.4	-7.7
UK Pension Schemes	Nominal and Real	UK Government***	35 (Nominal) and 78 (Real)	17.4 (Macaulay); 7.4 (Inflation)	-6.2
Pension Plans in the Netherlands	Nominal	Euro Swap	18	15.5	-2.9

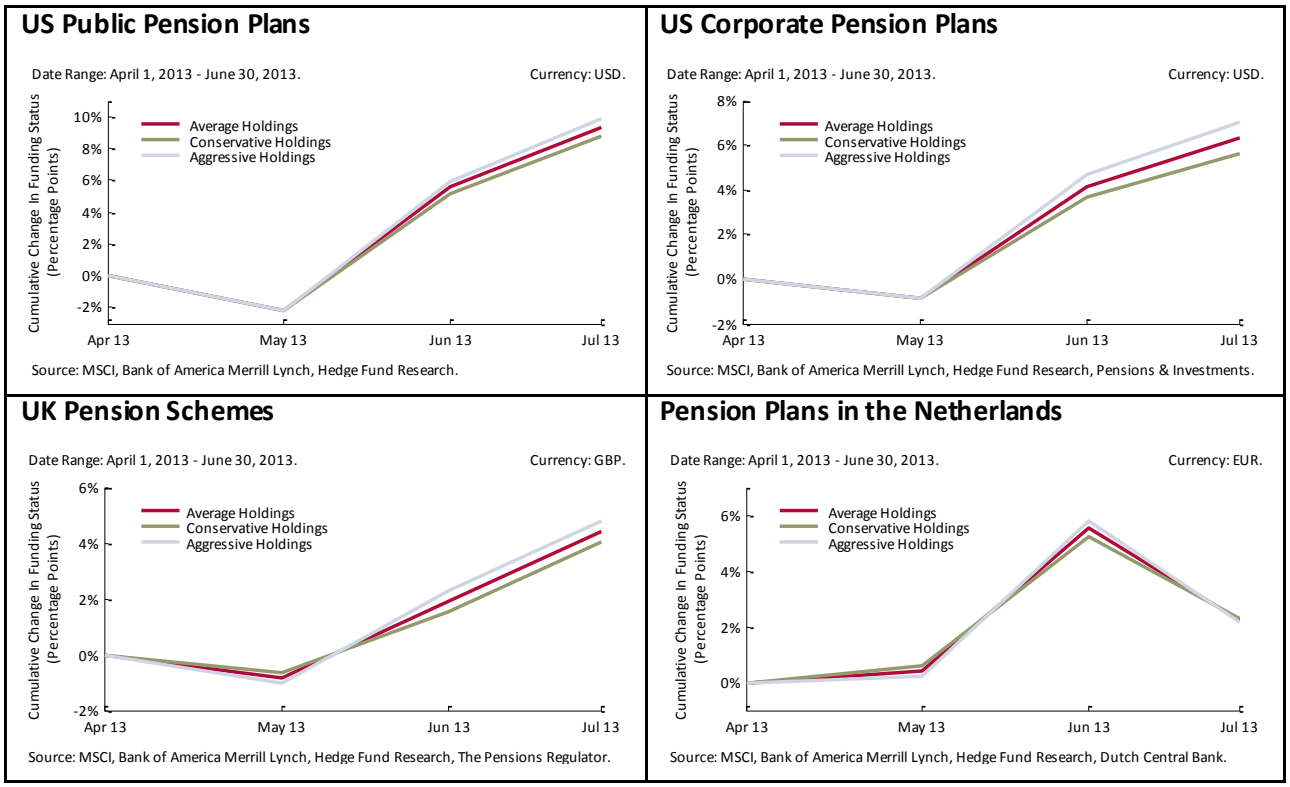
*Calculated based on government shift, swap shift and spread factor returns of the Barra Integrated Model (BIM301).
**Calculated based on full revaluation with discount curves at the beginning and end of the quarter. Besides changes due to t he parallel shift of the curve and the level of the duration, the displayed values incorporate other effects on liability present values, for example the change due to convexity and aging.
***For nominal cash flows, the nominal gilt yield curve is used for discounting. Inflation-indexed cash flows were discounted by the real gilt yield curve.

Impact on Funding Ratios

We combine the changes in assets and liabilities to look at the estimated change in the surplus by plan type, shown in Figure 6.[9]

[9] As we mentioned above, we do not include any hedge overlays, and therefore do not include their hedging effects and costs.

Figure 6: Changes to Funding Ratios during Q2.



We note several things from our study. First, the magnitude of moves in US public plans exceeded that in US corporate plans. This reflects the positive effects of both the longer duration of liabilities and the higher allocation to non-fixed income assets. Note that, for US public plans, the funding status improved under our assumption of market discount rates. Under a fixed discount rate, their funding status would have declined, driven by losses in the asset portfolio. Second, all plan types had positive moves in their funding ratios in May, during which interest rates dropped and return-seeking assets saw largely positive returns. Third, June was positive for all types, except for the Dutch plans. Although the Dutch plans benefited modestly from the effect of rising rates on their liabilities, their asset values decreased significantly and the latter dominated. For the other three model types, the effect of the decreasing rates was stronger.

Conclusion

Pension plans have been considering what would happen when interest rates started to rise, and in the past quarter we saw a noticeable increase in rates across developed economies. While it is unclear if, when, and by how much rates will rise in the future, this recent quarter has shown the impact of this particular increase in rates, and the different ways in which plans were affected. In this Market Report, we reviewed how asset allocation, the relative duration of liabilities and fixed-income assets, and the co-movement of asset classes influenced the funding ratios of model pension plans. Understanding a plan's exposures to interest-rate movements, in the context of managing its surplus, will allow asset owners to make informed trade-offs between hedging risks to their liabilities and seeking opportunities for return.

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[1] *As of September 30, 2012, as published by eVestment, Lipper and Bloomberg on January 31, 2013*

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