

Since the 2nd pillar came into force in 1985, **the Ordinance on Occupational Retirement, Survivors' and Disability Benefit Plans (OOB2/BVV2)** has defined the legal framework within which a Swiss pension fund may invest the assets of its insured persons. It specifies the permissible investments and the limits within which pension fund managers must make them.

This restrictive framework is, nonetheless, broad enough to permit a wide range of allocations that are compatible with the investment regulations of OOB2. The choice of a particular strategy will contribute significantly to the outcome of asset management. However, most pension funds regularly adjust their investment guidelines and allow themselves considerable deviations from the reference weightings of their allocation within the framework of the definition of fluctuation bands.

Notwithstanding this last comment, however, it is possible to retrospectively examine the performance potential associated with this legal framework by simulating a large number of possible allocations that all meet the legal requirements. Since the weights of the permissible asset classes vary in accordance with market developments, the adopted assumption is that the allocations are readjusted to their reference values on a monthly basis. These operations require purchases and sales, the costs of which are considered when calculating the performance of the allocations.

For the sake of simplicity, we assume that once a pension fund has determined the choice of a reference allocation at the beginning of the period, it will not deviate from it again until the end of the period under consideration, i.e., in the last 21 years (2001–2022). We limit the eligible asset classes included in our allocations to the most liquid and homogeneous among them. Finally, we use a benchmark index for each of these classes widely accepted by the Swiss financial community as most representative of the performance of the underlying asset class. As it is impossible to invest directly in an index, we will charge the calculated performances with an annual management fee of 40 basis points, **corresponding to the average management costs of Swiss pension funds in 2014**.

Based on the above, we have simulated the performance of 750 portfolios from January 2001 to December 2022 and annualized their performances. The lowest-performing allocation has an annualized performance of 2.9%, while the highest-performing allocation has an annualized performance of 5.1%. The difference is very significant with a spread of 2.2% per year between both. The median, which separates the 50% of allocations with the highest return from the 50% of allocations with the lowest return, is 4.1%. All this information is presented in **a boxplot** that graphically illustrates the statistical distribution of the annual performance of the 750 allocations.

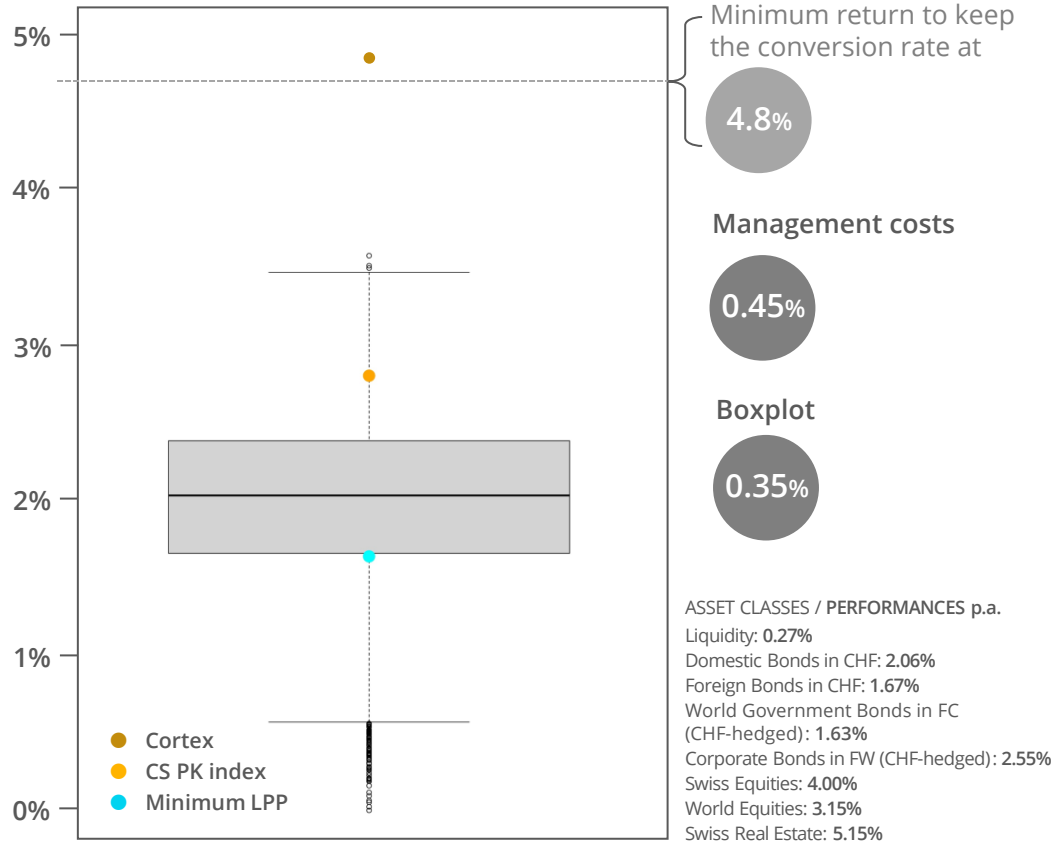
Over the same period, **a representative index of the performance of Swiss pension funds** whose assets are held in custody at Credit Suisse achieved an annualized performance of 3.5%. This is well below the median of 750 allocations, but well above **the average minimum return** for 2nd pillar assets set by the Federal Council each year. In contrast to our simulations, the index calculated and published by Credit Suisse is a composite of the real performances achieved by the pension funds under consideration.

Since a pension fund is not obliged to set its investment guidelines once and for all and then not deviate from them thereafter, we have added an orange dot to the graph to illustrate the performance that could have been achieved by an algorithm whose allocation would have evolved dynamically over the financial history of the last 21 years. This comparison quantifies the improvement potential of such an artificial intelligence that would have learned the lessons of a varied financial history on the fly. This improvement potential is in the order of 2% per year compared to the average performance of 750 static, mechanically rebalanced allocations.

It should be noted that the necessary computing power for these algorithms was not yet available in 2001 and that this study is retrospective, i.e., it is historically dated. The results can therefore not be used to make predictions for the near or distant future.

Distribution of the Performances of OOB2/BVV2-Compatible Static Portfolios (Boxplot)

Annualized performances (748 combinations) Period: 2001-12-29 to 2022-12-31



2001-2022

Nominal Assets
 Average decline in federal bond yields of 0.12% p.a. (from 4.25% to 1.56%).

Real Assets
 Performances p.a.:
 SPI = 4% (+128%)
 MSCI World = 3.15% (+92%)
 SXI RE = 5.15% (+187%)

ASSET CLASSES	INDICES
Liquidity	FTSE Swiss Franc 3-Month Euro Deposit
Domestic Bonds in CHF	Swiss Bond Index Domestic AAA-BBB
Foreign Bonds in CHF	Swiss Bond Index Foreign AAA-BBB
World Government Bonds in FC (CHF-hedged)	FTSE World Government Bond Index (WGBI) [TR] (CHF-hedged)
Corporate Bonds in FW (CHF-hedged)	Bloomberg Barclays Global Aggregate Corporate Index [TR] (CHF-hedged)
Swiss Equities	Swiss Performance Index [TR]
World Equities	MSCI World All Country Index (ACWI) [TR]
Swiss Real Estate	SXI Real Estate Funds Index [TR]

- The rules for calculating the LOB minimum rate of return were set in a world of **nominal assets**, but we live in a **world of real assets**, which means that this rate is systematically underestimated.
- When the **OOB2 standards** were established, nominal assets had a positive expected return. If they continue to be applied today, assets must be held that do not contribute anymore to the performance of the portfolio.