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Overview of KOF AHV Expenditures Model

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September 2024

Approach and Assumptions

This report briefly explains our simple model of AHV expenditures. The framework is based on publicly available and easily accessible data. We model old-age pensions and the remaining payments (such as widow and orphan pensions) separately. The old-age pensions are further divided by place of residence and gender: men in Switzerland, women in Switzerland, and people abroad. We estimate the number of pensions and the average pension separately for these three groups.

For old-age pensions paid in Switzerland, we distinguish between gender and assume that the percentage of pensioners in the total male (female) population of Switzerland over 65 (64) years of age remains constant. The future population of Switzerland is taken from the population scenarios of the BFS.

The number of pensions paid abroad is the cumulation of people who worked in Switzerland at some point in the past and later claimed a Swiss pension while living outside of Switzerland after retirement age. To approximate the number of people abroad we use a combination of the net emigration rate 29 years ago, the growth in foreign workers 30 years ago, and the growth of the number of men aged 65 and more in Switzerland.[1] The motivation is that, according to historical data, changes in net migration from Switzerland are driven by the population centered around age 35, and people aged around 35 retire roughly 30 years later. Using regressions, we find in-sample that growth in the number of pensions abroad is explained by growth in foreign workers many years ago, their subsequent rate of emigration, and general Swiss demographics.

The average pension payment to men in Switzerland is modeled only as a function of the mixed index (the weighted average of consumer price and wage inflation). The average pension payment to women in Switzerland grows mostly with the mixed index, but we also include a correction for the average age difference between retired men and women. The average pension paid abroad is explained in-sample using the mixed index, the share of foreign workers aged 40–54, and the share of foreign workers in Switzerland that are cross-border commuters. Figure 1 illustrates the close in-sample fit of our model. Knowing only the Swiss population distribution, the mixed index, and lagged migration and foreign worker variables, total payments by group are closely matched.

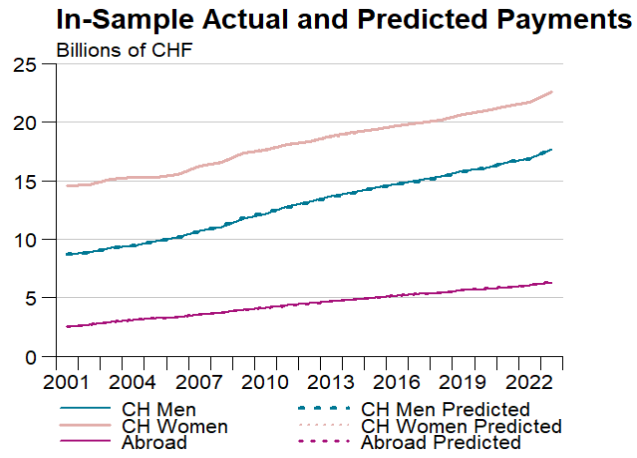

Figure 1: In-Sample Fit (from 2007) for Old-Age Pension Expenditures

[1] Specifically, we use 5-year moving averages of the net emigration and foreign worker series.

The remaining AHV benefit payments are modeled as a fraction of old-age pension payments. Finally, we scale-up our measure of total expenditures by approximately 2% to match the official accounting measure of AHV expenditure, which includes costs aside from social benefits.[2]

Forecasting with our model is then straightforward, requiring only population scenarios and mixed index forecasts. The other variables used for explaining pensions abroad through 2040 are sufficiently lagged to remain in-sample. We account for the 13th AHV payment after 2025, but in this overview we exclude AHV 21.[3] Using the BFS reference population scenario (Referenzszenario A-00-2020) and baseline BSV assumptions for the mixed index, our forecast shows total expenditure rising from roughly 50 billion CHF in 2023 to just over 90 billion CHF by 2040 (growth of around 80%). In 2040, around 11 billion CHF is paid to old-age pensions abroad. 35 and 40 billion CHF are paid to men and women in Switzerland, respectively.

Sensitivity Analysis

We now briefly illustrate the sensitivity and precision of our forecast. Plotted in deviations from our baseline, Figure 2 shows how the forecast changes over 2023–2040 under different assumptions regarding the Swiss population and mixed index. AHV expenditure is quite sensitive to assumptions about the mixed index. Our own mixed index forecast ("Alt. Mixed Index," which assumes lower long-term wage growth than in the baseline) cuts almost 2 billion CHF from 2040 expenditure. The "Low Mixed Index" scenario, which assumes the long-term price inflation rate stays at the post-1999 historical average, decreases expenditure by around 5.5 billion CHF in 2040. The alternate BFS population scenarios "High" (hohes Szenario B-00-2020) and "Low" (tiefes Szenario C-00-2020) yield a symmetric band of roughly +2.5/-2.5 billion CHF by 2040, around the baseline.

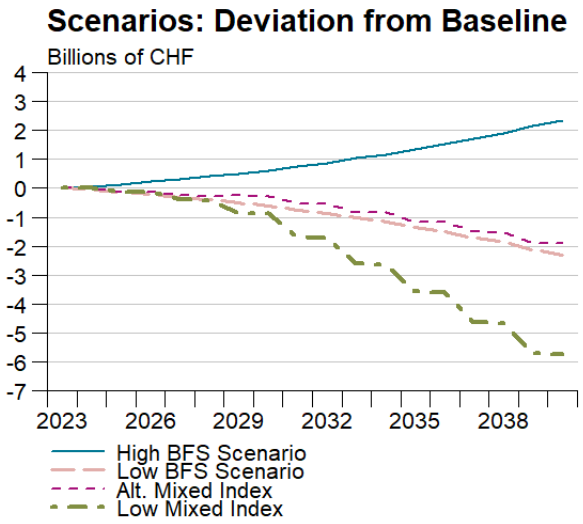

Figure 2: AHV Expenditure under Alternate Population and Mixed Index Assumptions

[2] The percent difference between official total AHV expenditure and the benefits we model appears to be stable in recent years.

[3] For example, we do not account for the increased female retirement age. BSV provides a separate version of our forecast that accounts for AHV 21.

Finally, Figure 3 illustrates uncertainty stemming from features of our model. The line "CPI/Wage Only" replaces our model of average old-age pension payments with the assumption that average payments for all groups evolve only according to the mixed index. The effect on expenditure is relatively small by 2030 and leads to an increase of less than 1 billion CHF in 2040.[4] The exact emigration/foreign worker lag structure we use to model growth in the number of pensions abroad is motivated by quality of in-sample fit (vs. a precise theory of the appropriate lags), so it is important to perform sensitivity analysis regarding this point. Specifically, we shift the original lags (29 and 30) either backwards (up to 4 years)[5] or forwards (up to 5 years), reperform the in-sample regression analysis, and update the forecast. Figure 3 shows that our forecast is relatively robust to shifts of +1 or -1 years. After this point, the in-sample fit becomes worse. While the empirical motivation for using the most extreme lags ("Abroad Lags Back -4" and "Abroad Lags Forward +5") is questionable, we nevertheless show their implications in Figure 3. While they provide a relatively similar forecast through much of the forecast period, they imply increased spending of 2 billion CHF in 2040.

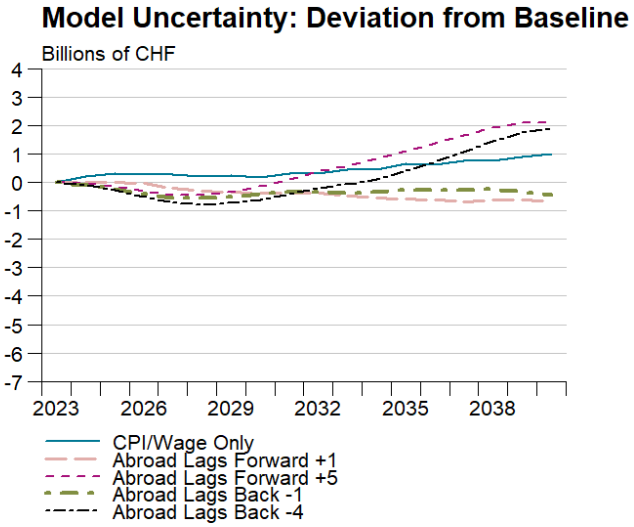

Figure 3: AHV Expenditure under Alternate Model Assumptions

While the numbers stemming from our model uncertainty analysis are clearly not small in an absolute sense, comparing with Figure 2 one could argue that our forecasts are much more sensitive to assumptions about the mixed index and the evolution of the Swiss age distribution than to model uncertainty.

[4] So while our model of average payments abroad and to women in Switzerland helps the in-sample fit, it is not a key driver of our forecast.

[5] Lags further in the past are limited by data availability.

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