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SFI Public Discussion Note

Pension at Risk: Is Our Pension System Under Threat? Future Scenarios for the Swiss 2nd Pillar

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1 Introduction

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How can we strengthen the financial stability of the 2nd pillar?

By ensuring there is structurally adequate financing of benefits.

By limiting dilution of the coverage ratio when new affiliates join a fund.

By standardizing investment control processes.

With its *Public Discussion Note* series the Swiss Finance Institute (SFI) is actively promoting a well-founded discussion of topics relevant to the financial industry, politics, and academia. Furthermore, SFI disseminates its findings through research, publications, Master Classes, and conferences.

The environment for pension funds has undergone considerable change since the Swiss Federal Law on Mandatory Occupational Old-Age, Survivors', and Disability Pension Plans (known as the Occupational Pensions Act, or OPA) was introduced in 1985. The OPA governs the 2nd pillar of the Swiss pension system (the 1st being the state-level insurance and the 3rd being voluntary private pension plans), making it mandatory for most employees to contribute a certain amount to their own pension funds. The continuing increase in life expectancy and in the level of retirement benefits are often seen as the main challenges facing a fully-funded 2nd pillar system. For many years, however, interest rates changes have also represented a considerable challenge for pension and insurance plans in Switzerland.

In this *Public Discussion Note* (PDN), we analyze the effects of interest rates in the current context and then test the robustness of the Swiss 2nd pillar's financial capacity in light of several different economic scenarios. We build on our 2022 study for the Federal Social Insurance Office (FSIO), in which we analyzed pension fund data gathered through 2020. Since then, some major economic changes have occurred: inflation has made a strong comeback, even in Switzerland, and negative or even zero interest rates are now clearly a thing of the past. Extending our study for the FSIO, we here present updated calculations and results as of the end of 2022, both for the current economic context, as well as for possible future scenarios.

The level of detail in the data we use in our study for the FSIO has made it possible, for the first time in Switzerland, to study the stability of the 2nd pillar system in a granular way, using complete and individual data for all of the country's pension funds. Taking an academic approach, we develop economic scenarios based on robust models that can easily adapt to changes in economic and financial fundamentals, as demonstrated by the possible future scenarios we discuss in this *Public Discussion Note*.

The granularity of the data allows us to develop a precise model of the future evolution of each pension fund and to map out the risk borne by each institution. Our approach also allows us to synthesize robust results by type of pension fund, in order to better identify groups of institutions that are at risk and to formulate recommendations aimed at improving and reinforcing the overall stability of the Swiss 2nd pillar.

For clarity, the terms followed by an asterisk are defined in the technical glossary, on page 14.

2 Data and Sample

In this *Public Discussion Note*, we present the results of both an overall analysis of the Swiss 2nd pillar and of a more specific analysis by type of pension fund, including public pension funds without a state guarantee, company pension funds, collective foundations, joint foundations, and so-called funds for pensioners.[1)]

The data we use were collected by the Occupational Pension Supervisory Commission (OPSC) as part of its annual survey. The distinction by type of institution allows us not only to map the distribution of risk between the different types of pension funds, but also to analyze whether certain types of institutions are more exposed to risk than others.

For various reasons, some pension funds could not be included in our analyses.[2)] After removing these funds, our sample represents 1'179 pension funds, i.e., 81% of the total number of active pension funds in Switzerland. Their balance sheet liabilities* total CHF 758 billion, the equivalent of 75% of the entire Swiss 2nd pillar.

Table 1—Segmentation of the Pension Funds Selected for the Analysis

	Number (%)	Liabilities (%)
Company pension funds	77%	44%
Joint foundations	8%	14%
Collective foundations	7%	24%
Public pension funds without a state guarantee	4%	17%
Funds for pensioners	4%	1%

Source: OPSC

As Table 1 suggests, we should pay particular attention to the size effect within the various groups of pension funds. Public pension funds without a state guarantee are, in general, larger than the average institution in our sample: they represent only 4% of the total number of institutions, but account for 17% of the total liabilities. The same is true of collective and joint foundations: they respectively account for 7% and 8% of the total number of institutions, but 24% and 14% of the total liabilities. In contrast, company pension funds and funds for pensioners are comparatively small institutions: they respectively make up 77% and 4% of the total number of institutions, but account for only 44% and 1% of the liabilities.

We should also note that, unlike other foundations, collective foundations, due to their commercial nature, have no choice but to grow. They are, therefore, more likely to offer attractive benefits, particularly in regard to the interest rates paid out. Compared to other types of foundations, collective foundations are characterized by less solidarity among their affiliates, who keep separate accounting systems.

1) For definitions of the different types of pension funds, please refer to the box on page 15
2) The excluded funds are: defined benefit funds; public funds with a partially capitalized financial system in accordance with Article 72a of the OPA; pension funds defined in Article 1e of the Ordinance on Occupational Retirement, Survivors', and Disability Pension Plans 2; savings institutions; and institutions with full insurance.

3 Macroeconomic Context

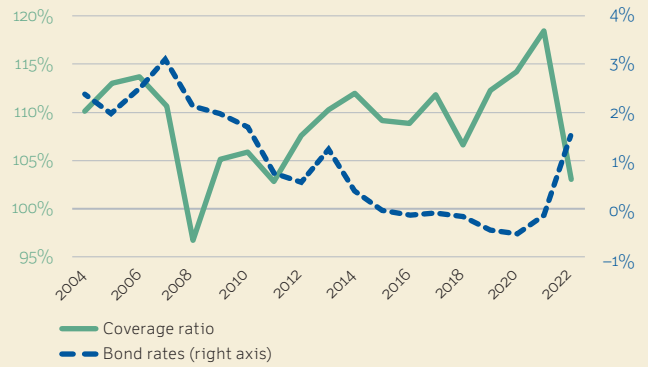
The decline in interest rates between 2008 and 2021 strengthened the financial performance of the 2nd pillar

As shown in Figure 1, pension funds' strong financial performance allowed them to improve their coverage ratio* between 2008 and 2021. A significant part of this strong performance was thanks to the exceptional revaluation of financial assets caused by falling interest rates, themselves due to the ultra-accommodative monetary policies of the central banks.

Our study for the FSIO showed that a rise in interest rates would mechanically pull down valuations and significantly limit future investment performance, compared to that achieved between 2008 and 2021, thus limiting the future contributions of the pension funds' third contributor* (in addition to the employer and the insured). In 2022, this scenario quickly and painfully became reality. The sharp rise in interest rates resulting from the fight against inflation, as well as from the faster than expected abandonment of those ultra-accommodative monetary policies, put intense pressure on pension funds. They saw their assets fall by 10% on average, according to various reports—see Credit Suisse (2023) and UBS (2023).

These losses resulted in a significant deterioration of the coverage ratio: between December 31, 2020 and December 31, 2022, the average coverage ratio fell from 113% to 103%. Since a pension fund's coverage ratio must top 100% for it to be fully capitalized, by the end of 2022 approximately 25% of pension funds were under-covered.

Figure 1—Coverage Ratio and Bond Rates

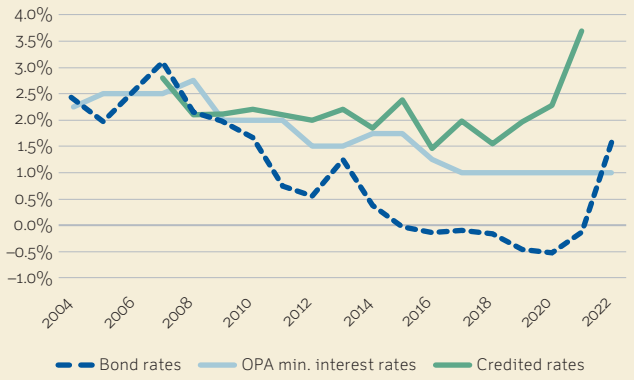


Sources: OPSC and Pittet Associés
Note: 2022 coverage ratio estimated by the authors

The third contributor fully played its role in the low interest rate environment

Pension benefits have generally decreased since their creation in 1985, particularly in terms of the conversion rate* (i.e., converting retirement assets to an annual pension). However, from 2004 to 2021, despite low bond interest rates, pension funds were able to offer insured persons, on average, est rates higher than the mandatory minimum rate* set by the legislature, as shown in Figure 2.

Figure 2—Bond Rates, OPA Minimum Interest Rates, and Credited Rates



Sources: OPSC and Pittet Associés
Note: 2022 credited rate isn't known yet

From 1985 to 2020, credited interest rates were also higher than the nominal increase in salaries, by an average of 1.5 percentage points. Thanks to the third contributor, since 1985 the capitalized 2nd pillar system has made it possible to pay out benefits that go beyond the OPA's initial goal of strictly maintaining the purchasing power of the insured.

The level of value fluctuation reserves* differs from one type of institution to another

The various types of pension funds have generally evolved in a similar fashion, in terms of asset allocation, technical parameters, and credited interest rates.

In our study for the FSIO study, however, we noted a significant difference in the creation of value fluctuation reserves, which compensate for losses in the financial markets, for collective foundations and for public pension funds without a state guarantee. At the end of 2020, these two types of funds had reached only 60% of their reserve targets, vs. about 80% for the other categories of pension funds.

The level of value fluctuation reserves remains comparatively lower for collective foundations. In fact, the liabilities of these pension funds have increased rapidly, at a rate approximately 5% higher than for other types of institutions, due to a large number of new affiliations.

The increase in the popularity of collective foundations can be explained primarily by two factors:

1. Structural elements, which lead to a liquidation of small foundations in favor of collective foundations. Among the elements that make managing small foundations difficult are a more complex legislative environment and low efficiency in both administration and fund asset management.

2. Competitive elements, which push collective foundations to be very active in their search for new affiliates.

The strong growth of collective foundations has resulted in a dilution of their reserves and therefore of their coverage ratio. If new adverse economic scenarios were to occur, this dilution could weigh heavily on the financial health of these institutions in the years to come.

As the data on value fluctuation reserve ratios for 2022 are not yet available, we can draw no definite conclusions. Nevertheless, in light of the current economic context, marked by a clear reversal of monetary policy and a sharp rise in interest rates, we underline the importance of these analyses for a fully capitalized pension system and recommend that the data be regularly updated by type of pension fund.

4 Economic Scenarios

The global economic and financial context in which Swiss pension funds operate has changed dramatically in recent years: inflation has risen sharply in the U.S. and Europe, with the price surge fueled by the war in Ukraine.

Despite these unpredictable developments, the economic scenarios we present in this *Public Discussion Note* show that the projections we made in our study for the FSIO remain relevant.

Note that our economic scenarios are not intended to be used to make probability-based forecasts. We are simply highlighting the consequences that certain potential changes in economic activity and interest rates could have on the financial health of the Swiss 2nd pillar. The horizon we chose for our projections is ten years, a time frame that smooths out unavoidable cyclical fluctuations and takes into account the full evolution of an economic cycle, in line with pension funds' long-term perspective.

Construction of economic scenarios

In our study for the FSIO, we imagined seven scenarios: four baseline and three stress scenarios. In constructing these seven scenarios, our challenge was to accurately reflect the universe of possibilities, while determining how to identify the most likely or most relevant ones based on the current economic context.

For this *Public Discussion Note*, we developed two new stress scenarios to take into account the changes in the economy over the last two years.

Scenarios for the FSIO study (based on 2020 data)	Scenarios for the PDN (based on 2022 data)
Basic scenarios: • **Normalization scenario:** a gradual increase in interest rates and a reduction in extreme valuation levels of asset classes. • **Status quo scenario:** the current situation, with stable and negative interest rates. • **Continuation scenario:** the observed trend, with a further decline in interest rates. • **Breakout scenario, then normalization:** a sharp rise in interest rates, followed by moderate rate cuts. **Stress scenarios:** • **Scenario of continuation and then explosion**: the observed trend, with a further decline in interest rates, followed by a strong rise in interest rates. • **Rate shock scenario:** a sharp rise in interest rates, then interest rates remain high. • **Recession scenario:** the observed trend, with a further decline in interest rates, combined with an economic recession.	**Stress scenarios:** • **Stagflation scenario:** accelerating inflation, as a result of successive shocks (ecological transition, protectionism, relocations), with economic growth broken but not collapsing and monetary tightening still sustained and vigorous; followed by a normalization phase. • **Recession scenario:** an economic recession followed by a period without economic recovery (an L-shaped scenario), with strong disinflation due to a severe economic downturn and monetary policy easing. This scenario replicates the *stress test* scenario used by the Fed to assess bank resilience.

Modeling returns on financial assets using the "building blocks" method

For each scenario, we estimated the expected returns within the investment universe of the Swiss pension funds. To develop these calculations, we used a financial performance generation model, built according to a "building blocks" approach. This methodology, based on academic research, is commonly used in the financial industry by practitioners in banking, economics, and consulting (see, for example, Nelson & Siegel, 1987; Fung & Hsieh, 2004; Shiller, 2005; and FSIO, 2022).

In Table 2, we present the results for the normalization scenario and the two new stress scenarios, stagflation and recession. The estimates shown are annualized over ten years and represent the average annual expected performance. We also show inflation projections—with price increases estimated on an annualized basis, over five and ten years—and their initial values. The worst-case scenario, that of a recession, shows an annualized portfolio performance of -1.4% over ten years. Specifically, bonds gain 1.3%, stocks lose 6.5%, and real estate gains 1.2%. The other two scenarios show very similar expected returns, a situation attributable to the normalization phenomenon being chosen in both cases.

Table 2— Annualized Performance of Major Asset Classes and of a Typical Portfolio

Annualized performance by economic scenario

	Bonds	Stocks	Real estate	Portfolio
Normalization (N)	2.4%	4.2%	3.7%	3.3%
Stagflation (S)	2.1%	3.4%	1.8%	3.0%
Recession (R)	1.3%	-6.5%	1.2%	-1.4%

Annualized inflation by economic scenario (initial, five-year and ten-year)

	Switzerland			US			Europe		
	Initial	5 years	10 years	Initial	5 years	10 years	Initial	5 years	10 years
(N)	2.8%	1.9%	1.0%	8.1%	5.0%	2.0%	8.0%	4.8%	1.5%
(S)	2.8%	3.5%	2.3%	8.1%	5.5%	3.8%	8.0%	5.5%	3.5%
(R)	2.8%	0.0%	0.0%	8.1%	1.3%	1.3%	8.0%	1.0%	1.0%

Source: Pittet Associés

Note: Standard portfolio is made up of 37% bonds, 30% stocks, 21% real estate, and 12% other (alternative investments, infrastructure, cash)

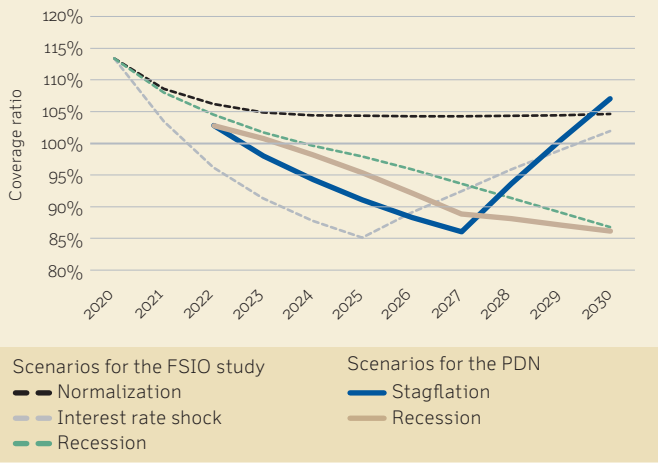
Modeling pension fund assets and liabilities

Our methodology here is identical to that used in our study for the FSIO study. It is based on modeling each pension fund individually, over a ten-year horizon, given a set of assumptions regarding key economic and market parameters. This balance sheet projection, both in terms of assets and liabilities, uses data provided by the Occupational Pension Supervisory Commission at the end of 2020. The projection is based on an extrapolation of the financial situation of each institution at the end of 2022 (liabilities and coverage ratio), as well as on the characteristics of each fund (insured salaries, contributions, conversion rate, technical bases, strategic asset allocation, etc.).

5 Projection Results: No Failure of the Swiss 2nd Pillar

Our projections allow us to conclude that the self-funding system of the Swiss 2nd pillar should not be called into question, no matter which of the basic scenarios is examined. Even when we consider the stress scenarios, as in Figure 3, the coverage ratio remains close to, or even above, 105% over the long term, except in the event of a recession, when levels drop to around 85%, corresponding to a financing gap of around CHF 150 billion. The two new stress scenarios (stagflation and recession) introduced here paint a similar picture to that presented by the stress scenarios in our study for the FSIO (interest rate shock and recession). Note that for readability reasons, not all scenarios are shown in Figure 3. This update allows us to assess the robustness of the model we established in 2020, as well as the conclusions of our study for the FSIO.

Figure 3—Evolution of Weighted Average Coverage Ratio



Source: Pittet Associés

Note: Valuation method for liabilities according to risk capacity and weighting in relation to liabilities

In a normalization or stagflation scenario, as shown in Table 3, the risk of the 2nd pillar defaulting can be ruled out in view of the close to zero proportion of pension liabilities with a coverage ratio of less than 90% after ten years. This proportion is comparable to, or even lower than, the proportion of institutions that were actually underfunded at the end of 2020. Over the long term, the vast majority of pension funds would be able to withstand the financial shocks inherent in these two scenarios.

In addition, despite the fact that stagflation is economically less favorable than normalization, it should be noted that the stagflation scenario leads to a less marked deterioration of the 2nd pillar. This result, which may not seem intuitive at first, can be explained by the fact that remedial measures are introduced more rapidly in the context of stagflation than normalization.

Table 3—Proportion of Institutions by Final Coverage Level (ten-year horizon), in % of Liabilities

	Normalization 2020 data		Stagflation 2020 data		Recession 2020 data	
Final coverage ratio	**[90%; 100%]**	**Below 90%**	**[90%; 100%]**	**Below 90%**	**[90%; 100%]**	**Below 90%**
Complete universe	**35%**	**1%**	**16%**	**0%**	**27%**	**68%**
Company pension funds	13%	1%	7%	1%	52%	38%
Collective foundations	69%	0%	18%	0%	6%	93%
Joint foundations	22%	0%	5%	0%	10%	90%
Public pension funds without a state guarantee	51%	2%	49%	0%	13%	87%

Source: Pittet Associés

In the most pessimistic of the scenarios examined, that of a recession, company pension funds display the most reassuring figures, with 52% of their pension liabilities having a coverage ratio between 90% and 100%. The other types of pension funds, however, are hard hit by the prolonged recession envisioned in this scenario: around 90% of pension fund assets have a coverage ratio of less than 90%.

Notably, the size of certain collective foundations has a significant impact on the consolidated financial situation of the 2nd pillar. At the end of the period under consideration, in the normalization scenario, 36% of collective foundations would be under-covered (this value is not shown in the table). The liabilities of these under-covered institutions represent 69% of the total liabilities of this type of pension fund, revealing a high concentration of risk.

Over the long term, the 2nd pillar can withstand the stress scenarios examined

In a scenario of significant and lasting stress, such as a ten-year recession, the results of the projections are obviously unfavorable to the 2nd pillar, pointing toward a worse situation than that seen after the 2008 financial crisis. In the recession scenario described here, 68% of total pension liabilities would have a coverage ratio of less than 90% after ten years.

If this ten-year recession were followed by a five-year period of normalization, however, the sustainability of the pension system would be ensured, provided that remedial measures were taken in advance. A long recession would exert strong financial pressure on pension funds, forcing them to adjust their level of benefits by lowering conversion rates and reducing credited rates, for example. But even in a long-term economic downturn, the financial security of the 2nd pillar could be guaranteed by reducing certain benefits.

The financial health of a pension fund is dependent on its initial coverage and its performance needs

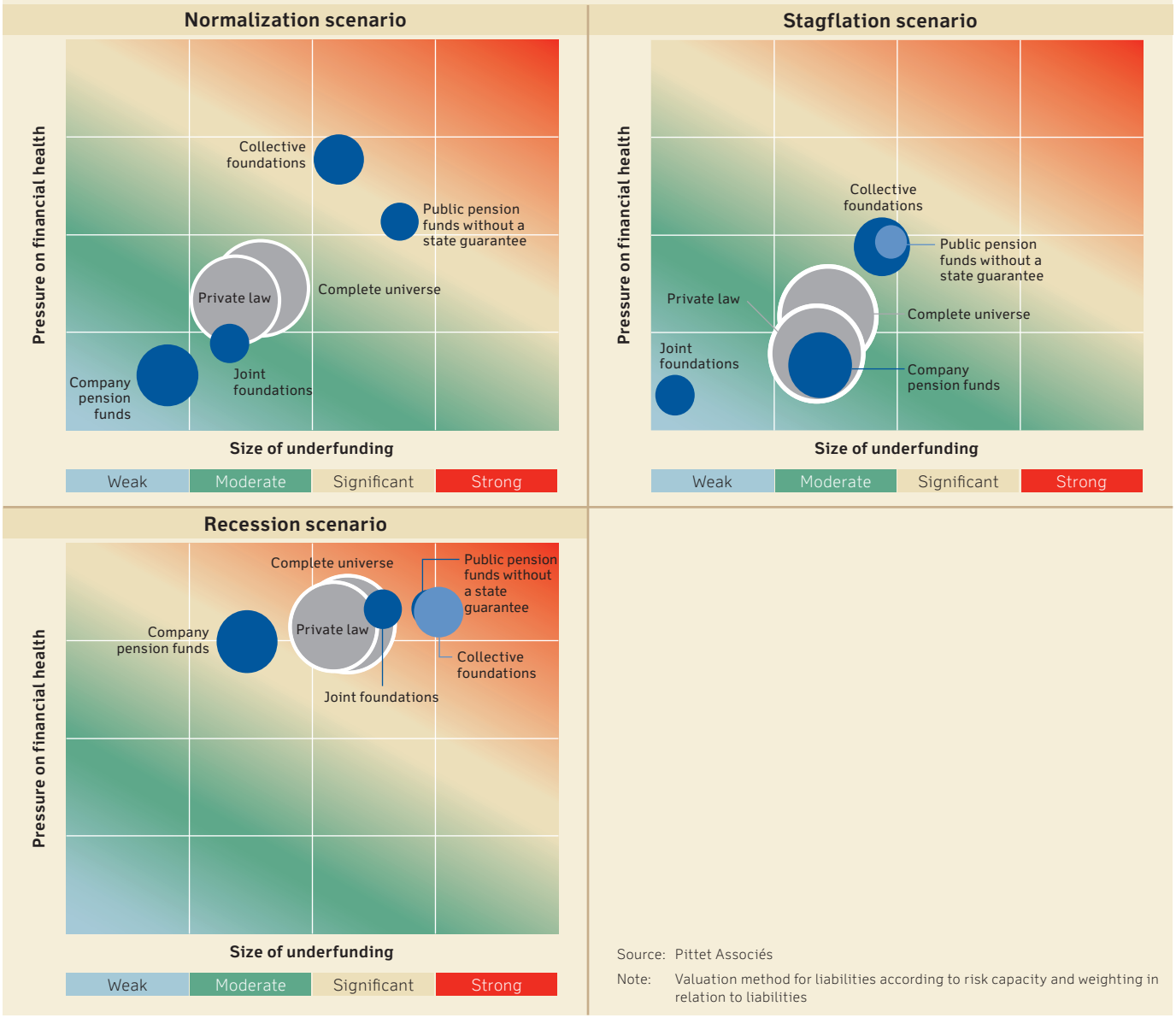
In the economic scenarios examined, the differences in asset allocation observed between pension funds do not seem to have a decisive influence on their overall financial health. Instead, the financial health of a pension fund is a function of its initial coverage level and of its return requirements; these, in turn, depend on the dynamics of technical rates, balance sheet valuation, and the costs of maintaining conversion rates. This observation is confirmed by sensitivity analyses carried out in the context of our study for FSIO study, in which we simulated the effects of additional risk-taking in asset allocation.

6 Risk Mapping by Type of Pension Fund

When we further analyze the results of the normalization scenario and the two new stress scenarios (stagflation and recession), we can identify the types of pension funds that appear to be the most vulnerable over the next ten years.

Figure 4 maps the risks for these three scenarios: normalization, stagflation, and recession. The vertical axis of each map measures the pressure on institutions' financial health, i.e., the proportion of pension funds that are underfunded after ten years, weighted by pension liabilities. The horizontal axis measures the extent of the underfunding, i.e., the ratio between the aggregate underfunding of the pension funds and the expected liabilities at the end of the ten-year period. The higher these values are, the riskier the situation. Finally, the size of the circles represents assets under management for each type of pension fund.

Figure 4—Risk Mapping by Scenario



Source: Pittet Associés

Note: Valuation method for liabilities according to risk capacity and weighting in relation to liabilities

Based on the chosen risk criteria (pressure on financial health and size of shortfall), collective foundations and public pension funds without a state guarantee are the two riskiest types of pension funds overall, regardless of the scenario analyzed.

Note that in the recession scenario, all foundations find themselves in the riskiest zone of the dial – the one that puts the entire pension system at risk. A stagflation scenario, by contrast, would greatly reduce the financial risk of all pension institutions, regardless of their type.

The stagflation scenario is also more beneficial than the normalization scenario. The reason for this is that a stress phase of moderate duration, i.e., five years, as predicted in the stagflation scenario, would force pension funds to take rapid remedial action in order to regain financial health. The normalization scenario, by contrast, would not result in any of these remedial measures, given its business-as-usual environment.

These risk maps, and their underlying analyses, highlight the following points:

- The main factor influencing the projected financial health of a pension fund is its initial coverage level. This ratio is generally lower for collective foundations and for public pension funds without a state guarantee than it is for other pension funds. The second determining factor is the level of conversion rates applied, especially when these rates exceed 6%.

- In a normalization scenario, the financial situation of collective foundations and of public pension funds without a state guarantee deteriorates more significantly than that of company pension funds and joint foundations.

- All pension funds are at risk in a recession scenario. Even joint foundations, which in a normalization scenario show better results than collective foundations, are under considerable financial pressure during a recession.

- Size has an important influence on the financial situation of pension funds. As mentioned earlier, the risk borne by large pension funds represents a major economic issue. Particular attention must therefore be paid to the ever-increasing concentration of the 2nd pillar and, in particular, to the greater risk borne by large collective foundations.

7 Ways to Strengthen the Financial Stability of the 2nd Pillar

Despite the proven strength of the 2nd pillar, in light of our analyses we recommend that the following avenues be explored to improve the financial stability of this system:

- Ensure structurally adequate financing of benefits. The results of our sensitivity analyses clearly show that performance requirements are the cornerstone of the 2nd pillar's long-term stability. These performance requirements depend on the regulatory conversion rates. The constraint of an OPA conversion rate of 6.8% or even 6.0% puts financial pressure on the Swiss occupational pension system as a whole, and should be alleviated by additional funding. Actuarially, this financing should be covered by contributions, rather than by performance, so that, on the one hand, it is structurally secure, and, on the other, performance requirements are reduced.

- Investigate solutions to limit the dilution of the coverage ratio when new affiliates join a fund. Our analyses show that the concentration of pension funds, and the resulting dilution of coverage ratios, affects the stability of the 2nd pillar. When new employers join collective or joint foundations, the technical provisions and value fluctuation reserves are generally not financed, partly because of a lack of funds and partly because of the rules governing liquidation and partial liquidation. Introducing measures to limit the dilution of the coverage ratio, however, would probably reduce the possibilities for companies that wish to change their pension funds.

- Strengthen the supervisory framework by standardizing investment control processes. While the actuarial parameters and accounting values, such as the financial situation and annual statements, of a pension fund are periodically controlled by an independent body (i.e., by certified occupational pension experts and by auditing firms, respectively), investment of the fund's assets is the sole responsibility of the Foundation Board (see OPA art. 51a para. 2 let. m and n), without any defined body tasked with exercising independent control and assuming civil and criminal liability. A uniform framework for the investment control process, both in actuarial and accounting terms, would strengthen the monitoring of risk management at the asset allocation level. In this regard, we also recommend studying various ways to improve control of the investment process, such as:
  - Appointing an independent body responsible for ensuring the adequacy of asset allocation.
  - Establishing standard economic scenarios for pension funds and regularly monitoring those scenarios (for example, on an annual basis, as we do in this *Public Discussion Note*).
  - Developing key indicators for the investment process and regularly monitoring those indicators for each pension fund.

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Technical glossary

Coverage ratio: the ratio between the net pension assets (total assets minus liabilities) of a pension fund and its actuarial liabilities (pension capital of active insureds, pensioners, and technical provisions). A coverage ratio of over 100% indicates that the pension fund is **fully capitalized.** Conversely, a coverage ratio of less than 100% indicates that the pension fund is **partially capitalized.**

Liabilities: the future benefits promised by pension funds to their insured persons, the value of which is shown as a liability on the institution's balance sheet.

Value fluctuation reserves: the reserves set aside by pension funds to compensate for losses in the value of financial assets recorded on the capital markets. These reserves are shown as liabilities on the institution's balance sheet. Each pension fund must define a target reserve level, which depends on the risk level of the chosen investment strategy, the risk capacity of the pension fund, and the risk aversion of the Foundation Board.

Conversion rate: the rate used to determine the amount of an annual pension, based on the accumulated retirement capital at retirement age.

Mandatory minimum rate: the interest rate on retirement assets corresponding to the OPA or legal minimum. This rate is set annually by the Federal Council.

Third contributor: the investment returns on assets. Pension funds are financed by the employer (1st contributor), the insured (2nd contributor), and by financial results (3rd contributor).

Definitions of the different types of pension funds:

Public pension fund without a state guarantee: a pension fund organized under federal, cantonal, or municipal public law, with which at least one public law employer (municipality, canton, etc.) is affiliated and which is fully capitalized, as indicated by its coverage ratio* (since the public law corporation does not guarantee the benefits of the pension fund, as would be required to manage a partially capitalized institution).

Company pension fund: a pension fund with which only the founder (whether a single employer, a group, a holding company, or a parent company) is affiliated.

Collective foundation:** a pension fund with which several employers are affiliated, who, as a rule, have no economic or financial ties among them. Separate accounting units are formed by one or more affiliated employers. The main characteristic of a collective foundation is this plurality of accounting units, which as a rule have individual coverage rates and do not create solidarity among themselves. Invested assets can be managed jointly or separately for each accounting unit.

Joint foundation:** a pension fund with which several employers are affiliated, who, as a rule, have no economic or financial ties among them. The characteristics of a joint foundation are joint management of the investment of assets and a joint accounting unit, which makes it possible to present a joint coverage ratio.

Fund for pensioners: a pension fund with only pensioners, or with an extremely low proportion of pension capital for active insureds.

*: terms defined in the technical glossary on page 14

**: definitions used by the Occupational Pension System Commission in its annual census

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