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What is it That Makes the Swiss Annuitize? A Description of the Swiss Retirement System

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Abstract

The Swiss model of retirement savings and benefits distinguishes itself by several aspects. The system is successful in encouraging substantial savings, that are exonerated from tax and guaranteed. The market risk is not transferred to the individuals. It is extraordinary that more than half of the Swiss who retire *choose* to annuitize their capital at retirement. In addition, not only does the retirement scheme offers annuity benefits in case of retirement, but it also offers annuity benefits in case of disability and death, and this in a coherent, coordinated way. It is the main area of practice of actuaries in Switzerland.

In this paper, we describe the Swiss social security system with an emphasis on retirement benefits, and give some insights about what in the Swiss model could explain why the so-called "annuity puzzle" is not observed. We also discuss some of the main issues the Swiss pensions system is currently facing.

Key words: annuitization, pensions, Switzerland, mandated retirement savings, regulation

JEL codes: J26, H55, D91, E21

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1 Introduction

The Swiss old age security system is based on three pillars. Although the main focus of this paper is on retirement, there is a strong nexus between retirement savings and disability and death benefits. These benefits are usually paid in the form of an annuity. These three eventualities are always considered together and the associated system of policies is referred to as "forethought"² (if translated literally). This word reflects well the properties of anticipation, planning, prudence and vision, and we will keep it in this paper.

In a nutshell, the first pillar represents the universal benefits that any resident is entitled to, and is run by the government. Whereas the second pillar is highly regulated and controlled by the government, it is run independently and is entirely self financed. Its goal is to complement the first pillar for the active population (with an income) and is thus usually referred to as "professional foresight". The third pillar essentially refers to individual initiative and can be regulated or not.

The Swiss system of professional foresight is a highly developed, complex system. But it is successful. Switzerland is one of the few countries with global private pension savings exceeding the gross domestic product (Gerber and Weber, 2007), which aggregated to an amount of CHF 604.4 bio in 2007 (OFAS, 2009). On the top of that, most of the Swiss decide to annuitize their savings at retirement. Almost two thirds of the Swiss convert the total amount of their retirement capital into an annuity, whereas about one fourth of them want the totality of their capital to be paid as a lump sum (Bütler, 2003). In 2003, 78% of the income of the retirees was received in the form of an annuity, whereas investment income generated from wealth accounted for only 14.9% (OFS, 2007). Almost 900,000 persons were receiving an annuity from the professional foresight in 2007 (OFAS, 2009). The fact that the so-called "annuity puzzle" is not observed in Switzerland is...puzzling! In this paper, we aim at giving some explanations on this situation. This cannot be done without describing the system at a certain level of detail, that is itself of some interest for pensions actuaries.

This description gives some insight on an area of actuarial practice (the main one in Switzerland) that is probably not as developed in other countries. The actuaries' technical, juridical and communication skills are useful in many areas of the professional foresight. They play an active role in legislation, litigation, regulation, pricing, reserving, as well as in designing the pensions plans. Their technical role is acknowledged in the law and Swiss pensions actuaries must obtain a special qualification³ in order to become fully qualified in this field.

² "Prévoyance" in French, "Vorsorge" in German.

³ Professional exams are run by the Swiss Association of Actuaries and by the govern-

In the next section, we give a brief overview of the three pillars. In Section 3, we give more details about the benefits and the organization of the professional forethought. In Section 4 we highlight the special features that encourage a high level of annuitization, before concluding in the last section by discussing some issues the system is currently facing.

2 Overview of the Swiss old age security system

2.1 Preliminaries

In this section, we give an overview of the three pillars of the Swiss old age security system. Their main characteristics are summarized in Table 1, whose components are developed in the following subsections. Note that although the contents of this paper outline the main features of the Swiss system, many exceptions apply. Not only is the set of laws around social security usually complex, but also does the situation of Switzerland (an "independent" island) in the middle of the European Union imply even more complexity, as many legal agreements between both parties have a direct impact on how the Swiss system is run.

Before going into further details, we would like to present some demographic and economic indicators on Switzerland in order to help the reader put the following in perspective. In 2007, 7.6 mio people were residing in this country, of which 16.4% was 64 years old or more and 4.7% was more than 80 (OFS, 2009). This last percentage increased dramatically in the previous years. According to Eurostat (2009), Switzerland had in 2006 one of the highest life expectancy of the EU and AELE combined. Men had a life expectancy at birth of 79.2 years (second rank after Iceland—79.5 years) and women 84.2 years (second rank after France and Spain—84.4 years). At the age of 65, men could expect to live another 18.5 years (second rank after Iceland—18.52 years) and women another 22.08 years (second rank after France—22.62 years). The ratio between retired and active population is expected to increase from 25% in 2000 to more than 50% in 2050 (OFAS, 2009). The Gross Domestic Product (GDP) per capita was CHF 67,223⁴ in 2007 (OFS, 2009).

It is remarkable that the whole system is articulated and coordinated in terms of (multiples of) a reference variable, denoted here by M , that is adapted to the level of prices and wages every two years by the government⁵.

ment.

⁴ This is equivalent to approximately USD 60,000.

⁵ In 2009, the reference variable M is worth CHF 1,140, approximately USD 1,000.

Pillar	Social Security	Professional forethought		Savings	
	1	2a	2b	3a	3b
Who?	All Swiss residents	Swiss workforce		n/a	
Mandatory?	yes	yes	no	no	
Insured salary	(0M – 72M)	18M – 72M	0M – 720M	n/a	
Tax incentives	n/a	yes		yes	no
Funding	pay-as-you-go	funded with some exceptions		funded	

Table 1

The three pillars of the Swiss social security system

2.2 Personal coverage

All residents of Switzerland (Swiss or foreigners) are covered by the social security system (the first pillar), even if they do not have any income⁶. Cover under the minimum occupational plan (pillar 2a) defined in the law is mandatory for employees (as opposed to self-employed) that have a minimum level of salary from the same employer (18M on an annual basis) for more than 3 months. Often, second pillar plans offer better benefits than the minimum plan. In that case, what exceed the minimum benefits is considered as pillar 2b. The second pillar (2a and 2b) is referred to as "professional forethought". Self-employed may enter such a plan (often set up by a professional association) on a voluntary basis, and some of them do. Even though the government has the option (since the introduction of the law in 1985) to make it mandatory for certain categories of self-employed, it has never exercised it. Finally, if individual voluntary investments, whose form can range from a simple savings bank account to investments in mutual funds with death and disability riders, meet some legal criteria, they are classified as pillar 3a. These qualified investments attract some advantages (the main being tax exoneration), and of course some constraints, and are regulated. Any other unregulated type of investment linked to "forethought" is classified in the pillar 3b.

⁶ Because of its agreements with the EU, Swiss residents who work preeminently in a country of the EU and EU residents who work preeminently in Switzerland are insured under the system of the country where they work. If they work in several countries and if no preeminent country can be determined, they are insured in their country of residence.

2.3 Benefits

Benefits offered by the social security are not means-tested but earnings-related. Declared incomes during contribution years are averaged and indexed to form a base salary. Extras are added in certain circumstances, such as if the insured took care of children, or if he⁷ is young (in case of death or disability). This adjusted base salary is translated into a base annuity, which ranges from a minimum of $12M$ per year (for very small salaries) to a maximum of $24M$ ⁸ (for base salaries over $72M$), which corresponds to approximately 20% and 40% of the GDP per capita, respectively. In order to have full benefits, insureds need in addition to have paid a minimal contribution every year of their life since they turned 20 and until the benefit is calculated (retirement age, death or disability). If they don't, their annuity corresponds to the proportion of contributed years, times the base annuity. Married couples get a maximum of $36M$ per year when they both retire (instead of $48M$). Survivors partner⁹ and children annuities are of 80% and 40% each of the insured annuity, respectively. A global maximum applies in case of many eligible children.

Switzerland was the first OECD country to mandate a second pillar cover to complement the social security benefits. The goal was to provide a retirement benefit (pillars 1 and 2a combined) of at least 60% of the last salary for incomes of $72M$ or less. In 2003, newly retired households achieved a replacement rate of 61.2% (OFS, 2007), of which 44.7% were first pillar benefits and 32.3% were second pillar benefits.

The main reference text of a second pillar cover is always the pension *plan*, where insured salary, contributions and benefits are precisely defined. There are as many plans as pension funds. The golden rule is that these plans should give *at least* as much as what the minimum legal plan would have given. It is a legal requirement to compare both values each time a benefit is calculated. In the minimum plan, the salary in excess of $18M$ is insured, with a minimum of $3M$ and a maximum of $51M$. The absolute maximum insured salary under the second pillar (2a and 2b) is restricted to $720M$. More details are given in Section 3.

⁷ Unless otherwise specified, use of "he" is due to language conventions, and does not exclude women, who in principle have exactly the same conditions and benefits as men.

⁸ Unless otherwise specified, the amounts in function of M are given on an annual basis.

⁹ We will denote by "partner" benefits the ones that are offered to the surviving spouse (in case of heterosexual married couples) or partner (in case of homosexual couples who are "married" under the new partnership law that is available only to homosexual couples in Switzerland). Restrictions may apply according to the age of the survivor, the length of the union, and the existence of children.

2.4 Contributions, tax and funding

Contributions to the social security are due on *all* (work related) incomes¹⁰. In case of employees, half of the contributions are paid by the employer. Insureds without income have to pay a minimum contribution. Contributions to professional forethought are defined in the plan and depend essentially on the range of benefits; however, at least half of the contributions must be paid by the employer¹¹. In 2003, Swiss households contributed for 4.4% of their income to the first pillar, 4.1% to the second pillar, and 2.8% to the third pillar (OFS, 2007).

Of course, the dynamics of the system are strongly influenced by tax incentives. None of the contributions to the pillars 1 to 3a are taxed (i.e. they are deducted from income before calculating taxes), within the limits defined in the law. The limits applied in the second pillar depend on the level of income and also on how the pension plan is designed. Limits for the pillar 3a are of 5.76M if the person is insured by a pension fund. If not, the limit is the minimum between 28.8M and 20% of the income. As usual, taxes are payable on the benefits.

The social security is a pure pay-as-you-go system. The government holds a reserve corresponding to approximately one year of benefits. On the other hand, pension funds are fully funded. Some public pension funds may have a mixed funding, but they are the only exception. They usually aim at a certain percentage of the liabilities to be funded, the rest being financed on a pay-as-you-go basis. The third pillar is always funded.

3 The Swiss "professional forethought" system

The Swiss "federal law about professional forethought for aging, survivors and disability"¹² (if translated literally) aims at setting general rules and a minimal level of benefits. It was first discussed in 1963 and came into force in 1985; for more details on the first steps of the law, see Hepp (1998). If a pension fund complies with the rules defined in the law, it can ask to be registered accordingly and then

¹⁰ In 2009, the contribution rate is of 9.8% for employees and ranges from 5.116% to 9.5% for the self-employed.

¹¹ According to OFAS (2009), employers' contributions in the second pillar were in average 71% higher than the employees' in 1990, 51% higher in 2000 and 60% higher in 2007 (last value in the statistic).

¹² In French, "Loi fédérale sur la prévoyance professionnelle vieillesse, survivants et invalidité" (LPP); in German "Bundesgesetz über die berufliche Alters-, Hinterlassenen- und Invalidenvorsorge" (BVG).

enjoy some advantages (such as tax exemption). If it does not comply, it falls under the pillar 3b. The minimal level of benefits is defined through a detailed, exhaustive plan in the law itself. We will begin by outlining the main aspects of this minimal plan, and will then discuss what the Swiss pension funds usually offer before discussing the regulation and the organization of the pension funds.

3.1 The minimum legal plan

The minimum legal plan has a mixed funding principle. The savings (retirement) component is a funded defined contribution account. Contribution rates $\rho(x)$ increase from 0% (for insureds under 25, who are only covered for death and disability benefits) to 18% (for insureds 55 or more) of the insured salary ω . On the other hand, the present value of all death and disability benefits (including for all the future years) are financed in a pay-as-you-go fashion during the same year. In other words, if there is a permanent disability case in 2008 that leads to an annuity, then the present value of this annuity has to be wholly financed by the risk premiums of 2008¹³. These risk premiums are calculated individually, given the age, sex and accumulated capital of the insureds. Whether they are married or have children is not taken into account; the benefits that depend on these figures are calculated using a collective method. The sector of activity is not taken into account either.

Let $x^{(12)}$ and x be the age of an insured in years, rounded up to the lowest month and year, respectively. Thus x is an integer and $x^{(12)} \geq x$ is a multiple of $1/12$. Let $w(x, t)$ be the gross salary received from a single employer by an insured during a proportion t of the year during which he had his x -th birthday. His *coordinated salary* under the minimal plan for that year¹⁴ is then

$$\omega(x) = \begin{cases} \min \{ \max[3Mt, w(x, t) - 21Mt], 51Mt \}, & t \geq 0.25 \text{ and } w(x, t) \geq 18Mt, \\ 0 & \text{otherwise.} \end{cases} \quad (3.1)$$

To understand the conditions, recall that insurance is mandatory only if the contract with a single employer has a minimum length of three months and corresponds at least to an annual salary of $18M$. If $t < 1$, the insured is covered only

¹³ Note that this system leads to considerable IBNR and RBNS reserves, whose amount due to the disability risk is very difficult to estimate because of the gap between the disabling event and the official decision of disability. Disability (and also death cases incurred around the end of the year) may not even be known by the pension fund when it finalizes its annual financial statements.

¹⁴ For sake of simplicity, we make here the assumption that our insured worked for only one employer during the year n . If not, the following formulas can easily be extended.

during that proportion of the year when he was employed, and (possible) death or disability benefits would be calculated on an annualized insured income of $\omega(x)/t$.

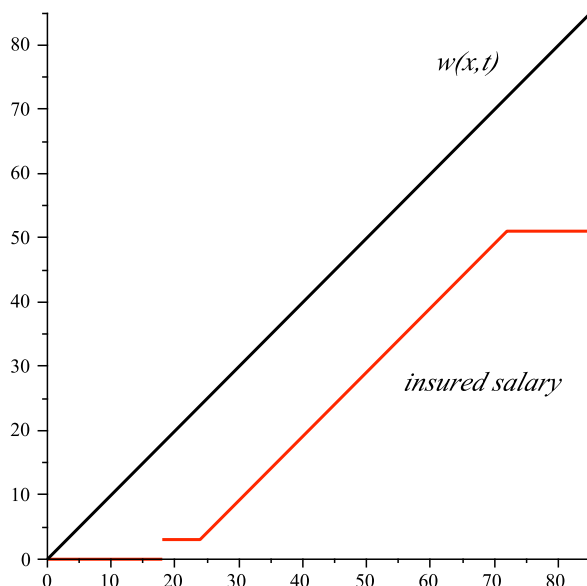


Figure 1. Insured salary in the minimum legal plan, as a function of the gross salary $w(x, 1)$

Based on (3.1), the capital κ accumulated at the age of retirement R is

$$\kappa(R) = \sum_{k=25}^{R-1} \omega(k) \rho(k) (1 + i_k)^{R+x^{(12)}-x-k-1} + \omega(R) \rho(R), \quad (3.2)$$

where i_k is the rate of interest defined by the government for the year when the insured had his k -th birthday¹⁵.

When an insured retires¹⁶ the accumulated capital is converted into a lifetime annuity with riders. The conversion rate, denoted by ξ_m and ξ_f for males and females, respectively, is defined by the government. It represents a package of a

¹⁵ This rate of interest was of 4% from 1985 to 2002, 3.25% in 2003, 2.25% in 2004, 2.5% from 2005 to 2007, 2.75% in 2008 and 2% in 2009. This can be compared with an average rate in 2007 of 3.11% for 10 year Swiss treasury bills, 1.06% on standard savings accounts, and 3.32% on mortgages (OFS, 2009, National Bank of Switzerland). Note also that since the law came into force only in 1985, insureds that retire now do not have a complete career insured under the minimum plan yet.

¹⁶ In 2009 the ordinary age of retirement is 65 for men and 64 for women (month following their birthday). When the law was introduced, the age of retirement for women was of 62.

lifetime annuity of $\kappa(R)\xi$. for the insured, a (survivor) partner lifetime annuity of $\kappa(R)\xi \cdot 60\%$, as well as immediate children annuities of $\kappa(R)\xi \cdot 20\%$ each, paid until they are 18 (or 25 if they are studying), whether the insured is still alive or not¹⁷. The pension funds are supposed to adapt these benefits to prices if they have the financial capacity to do so, but it is not mandatory. Since 2005, the insureds may ask to get 25% of $\kappa(R)$ as a lump sum, but in doing so they lose all the potential additional benefits (partner and children annuities, possible indexation) proportionally to that amount.

Let $\kappa(x, R)$ be the reference capital used to calculate the insured benefits in case of disability or death of an insured of age $x < R$. This corresponds to the actual capital accumulated until age x , *plus* the sum, without interest, of all future (savings) contributions that would have accrued the insured's capital, would he have remained active until his retirement age with the same insured salary (projection without interest). Thus, at the end of the year¹⁸

$$\begin{aligned} \kappa(x, R) = & \sum_{k=25}^x \omega(k)\rho(k)(1+i_k)^{x-k} \\ & + \frac{\omega(x)}{t} \left(\sum_{l=x+1}^{R-1} \rho(l) + (x^{(12)} - x)\rho(R) \right), \quad 18 \leq x < R. \end{aligned} \quad (3.3)$$

The first line on the right hand side of the equality sign is the accumulated capital to date, whereas the second line is the projection without interest. Exclusion of interest for the projection is justified by the (mandatory) indexation of all "risk" annuities until the age of retirement.

In case of death or disability, similar benefits to the ones during retirement are provided, although lump sums are only allowed for annuities whose potential amount is too small¹⁹. It is also important to note that these benefits are provided in case of illness, but not in case of accident or professional illness²⁰.

¹⁷ The fair actuarial value for ξ . is thus the inverse of the sum of the present values of the retirement, partner and child annuities (the two last ones being calculated using a collective method).

¹⁸ Here again, for sake of simplicity, we do not treat the case of death and disability cases occurring during the year.

¹⁹ Mensual limits are of 10%, 6% and 2% of M in case of retirement or disability annuity, partner annuity and child annuity, respectively.

²⁰ The (mandatory) accident insurance in Switzerland provides benefits that are very generous, often more than the ones of the second pillar. It is also covering *professional illnesses*, that can be attributed to the professional activity but are not the result of an accident.

The disability annuity is equal to $\kappa(x, R)\xi$, times the annuity rate corresponding to the disability rate, and is due only 24 months after the insured stopped working (other insurances take care of what happens in the meantime). The disability rate correspond to the ratio of the (permanent) loss of salary due to the disability to the salary before the disabling event²¹. Annuity rates range from 0% to 100% for disability rates of less than 40% to more than 70%, respectively. Disabled insureds also receive a complementary annuity of 20% of their disability annuity for each child (with the same conditions as above). The decision on disability and its rate is made by the social security²².

In case of death of a retired or disabled annuitant, partners receive a lifetime annuity of 60% of the insured's current annuity, and children continue to receive their annuity irrespective of the death of the insured.

3.2 Flexibility in designing the plan

As long as they observe the (very) general rules defined in the law, as well as the related fiscal rules, the pension funds have a great freedom in defining their insured salary, contributions and benefits. As a consequence, there are many variations. To illustrate this, here is a (non exhaustive) list of popular additional benefits:

- a constant rate of savings contributions $\rho(x) \equiv \rho$;
- an insured salary equal to the gross income of the employee;
- a starting age for the savings contributions of 18 instead of 25;
- additional lump sum benefits in case of death or disability expressed in percentage of the insured income;
- partner benefits also for non-married partners under certain conditions;
- earlier ordinary retirement ages with or without a complementary annuity until the beginning of the social security benefits;
- possibility to choose a lump sum benefit instead of an annuity at retirement;
- possibility to make additional, voluntary contributions to the savings component.

The two last points are developed in the next section.

²¹ For instance, a university professor who loses both his legs is thus likely to have a disability rate of 0%, as it does not prevent him to continue his activity.

²² Such a decision takes typically several years to be taken, but benefits are paid retroactively.

3.3 Additional rules for the savings component

As explained above, the Swiss system is a set of standards, a lot of which pension funds can alter in their plan. At retirement, the standard is to annuitize all of the retirement capital, although it is always possible to take 25% of the mandatory capital as a lump sum. However, the pension funds can (and usually do) allow a choice (for the payment of the capital) between an annuity, a lump sum, or a combination of both. Note that annuitization is always the default choice. In order to avoid antiselection, pension funds will usually require the insured to make his decision well before retirement. The minimum period of notice has to be set in the pensions fund's plan, and is usually 1 year. Some pension funds have a decreasing proportion of the capital that can be taken as a lump sum as the insured's choice is close to retirement. Note also that if the insured chooses the annuity, the inclusion of the survivors annuities (partner and children) and immediate annuity for children is not an option.

Usually, pension funds allow for additional voluntary (lump sum) contributions from insureds. These contributions are tax deductible (up to certain limits). Moreover, such additions have the advantage of increasing immediately the level of death and disability cover, along with increasing future retirement benefits. These funds are in principle blocked until the age of retirement²³. This problem is often seen as a substantial barrier to making such contributions (except for the rich), but a set of rules in Switzerland strongly alleviates this problem.

Buying (or renovating²⁴) one's home is a recognized way of "forethought". Insureds can ask for the payment of part of their capital to that end before they retire²⁵. If the insured is more than 50 years old, this payment is limited to the maximum between the capital he had when he was 50, and half of his current capital. The idea is to restrict capital decumulation to half of its supposed level at retirement, as it is assumed that a typical insured with constant real salary has accumulated half of his capital at 50.

Also, insureds that want to create their own business and become self-employed can ask for the totality of their capital within a year of their establishment, as long as they are officially declared as self-employed.

Finally, insureds who leave Switzerland may also ask for the payment of the totality

²³ Note that this age may vary between pension funds, but the absolute minimum age of retirement set by the law is 58, except for very special cases.

²⁴ Any investment is accepted, as long as it adds a similar value to your primary site of residence.

²⁵ Once they are disabled, this is no more possible.

of their capital. Restrictions apply if the insureds move to countries who signed agreements with Switzerland (such as the European Union), especially for the mandatory part of their capital.

Savings are guaranteed irrespective of the performance of the financial markets. The market risk is not transferred to the individuals, but borne by the pension funds. The risk of a pension fund becoming insolvent is addressed by the law. This risk is actually pooled amongst all pension funds by an institution called the "Security Fund", that guarantees all benefits corresponding to a maximum insured salary of 108M. Annual premiums are paid to the security fund and are calculated as a function of aggregate savings and current annuity reserves. The premium rates are the same for all the pension funds.

3.4 Regulation

Funding and benefits principles are all summarized in the fund's *plan*, and pension funds enjoy a great freedom in defining it. Of course, this calls for a substantial level of regulation. All plans (and their modifications) have to be submitted to the regulation authority with an actuarial report. An (independent) actuary is responsible for determining if the plan comprises at least the benefits defined in the minimum plan, if it meets the legal requirements, and if the plan is financially sound. In other words, the actuary assesses the ability of the pension fund to honor its future liabilities under this new plan. The regulation authority (who usually have more legal than actuarial competences) decides if the new plan is accepted or not. Note that the regulation authority's role is also to verify each year if the pension fund has a healthy financial situation, based on its balance sheet and an actuarial appraisal.

The minimal plan of the second pillar is mandatory. This means that the state has to guarantee the existence of at least one fund that any employer could join. Such an institution, offering the minimum plan, is explicitly required by the law. It is called the "Suppletory Institution", and it is run by the government.

3.5 Organization of the pension funds

Pension funds are organized in an employer-based system, which means that employees do not have the choice of their pension fund. They are automatically insured by their employer's pension fund. The employer can choose different plans

for different groups of employees²⁶, and can offer a choice of up to three different plans to each group. This flexibility is relatively new and the great majority of the employers still have a unique plan for all employees.

Pension funds are in principle separate legal entities that are independent from their affiliated employer(s). This means that bankruptcy of the employer should not affect the financial health of the pension fund, which is solely responsible to have at any time sufficient funds to assume all of its liabilities. The only exception is the one of the public funds, whose liabilities are guaranteed by the employer (the state).

A pension fund is thus a moral person, and it can take only a restricted number of forms²⁷. We distinguish two main categories. The first category is the one of "autonomous" pension funds. They are qualified as autonomous because their size allows them to manage their funds themselves and to have no (or very little) reinsurance (such as a stop-loss reinsurance treaty with a high deductible). These funds are usually quite big, offer benefits that are much more generous than the minimal plan, and are related to a major employer or profession²⁸. The second category comprises (small and medium) pension funds that outsource their administrative and financial management, and that reinsure most (usually all) of their risks with private insurers. The collective pensions funds (with a standard plan) created directly by private insurers to pool all of their clients (usually small and medium employers) fall also under that category²⁹. In a practical sense, all of the forethought cover of small and medium employers is assumed by private insurers under that category, except if they belong to a profession that created a pension fund that is big enough to be autonomous.

In terms of funding, the pension funds usually keep the same structure as in the minimal plan: defined contribution for the savings component, and immediate reserving of the expected value of all future benefits related to each insured death or disability event. However, public pension funds are usually defined benefit, as

²⁶ Groups must be defined by objective criteria, that should potentially allow for at least several members. A "group" for the CEO exclusively would thus be forbidden. This possibility appeared explicitly in the law in 2005, but was already allowed before.

²⁷ The allowed forms are a special form of foundation, called "forethought foundation" (by far the most frequent form), cooperatives, as well as a public entity, when appropriate.

²⁸ A pension fund can restrict its access to a certain (number of) profession(s) and in this way design a plan that addresses the specific needs of that sector of activity. Such a fund will typically be created by professional corporation(s), who will need to provide the initial capital for the creation of the entity (without being able to get reimbursed in any way).

²⁹ According to Gerber and Weber (2007), 20% of all aggregate savings are managed by such funds (in 2004).

well as some autonomous funds related to big private companies. Because they enjoy a state guarantee, the public pension funds are the only ones that are allowed to have part of their liabilities funded in a pay-as-you-go fashion, although this possibility was seriously questioned in many political debates during the financial crisis of the early 2000's. This issue is still being discussed in the political arena.

4 Some insights about why the Swiss do annuitize

According to economic theory, the choice of annuitization is the one that maximizes one's utility (Yaari, 1965; Davidoff et al., 2005). However, this behavior is very scarcely observed in reality³⁰. This contradiction was called the "annuity puzzle". For that matter, the Swiss market is an exception. Our aim here is not to explain why the annuity puzzle is not observed in Switzerland, but rather to analyse what are the specialties of the Swiss model that make it possible.

Bütler and Teppa (2007) tried to understand what could explain the choice of the Swiss between the annuity or the lump sum. Of course, the personal situation of the insured has a strong influence. Because survivor and children benefits are mandated, but charged at the same rate to everybody (irrespective of their personal situation), a married insured with several young children is more likely to annuitize than a single insured without children. Small retirement capitals are more likely to be taken as a lump sum than annuitized (Bütler and Teppa, 2005).

Annuities are taxed as normal income, whereas lump sum benefits are taxed at a reduced rate. For the rich, this represents a strong incentive to choose a lump sum benefit when possible, as they end up paying much less taxes if they do. This explains (at least partially) why some of the Swiss choose a lump sum benefit. If the assumption that these insureds are rich is true, then it also means that they don't really need the security associated with an annuity.

We will now review reasons that could explain the Swiss high level of annuitization.

4.1 *Trust and simplicity*

People are usually on their guard against insurers. "Why should I give all my money to an insurer that could get bankrupt in a couple of years?" They need to trust the annuity provider and to be confident about their income security.

When the Swiss choose to annuitize, they don't give their money to a new person,

³⁰ For instance, 61 lifetime annuities (for a total amount of AUD 560,000 per annum) were sold on the whole Australian market in 2008! (Plan for Life Research, 2008).

they only leave it where it is, and where it was (presumably) for many years, sometimes even decades. The pension fund has had all the time to create and foster trust with their future pensioners. Furthermore, the pensions market is highly regulated, and the Swiss are usually very confident in this regulation process. And even if it fails, there still is the Security Fund, which guarantees a considerable part of the annuity (usually all of it, except for high incomes).

In addition, annuitize one's capital is as easy as pie. All you have to do is *nothing*. There is no underwriting process and no medical tests. Insured feel safe there as well, because the conversion rates are the same for everyone in the same plan, and these rates have to be approved by the regulator.

4.2 Size of the capital

What is likely to be the main reason for ordinary people to save a big amount of money? Probably their house or apartment. Or their business. Because of the rules described in Section 3.3, insureds can add voluntary contributions to their capital and know that they will eventually be able to get their money back before retirement if they need it for their home and/or business creation, or if they leave the country. And meanwhile, they invest it in a tax-free and guaranteed environment, together with improving their death and disability benefits. This makes voluntary contributions to their retirement capital a rational choice for many.

Insureds end up with a big capital at the moment of retirement. Why not annuitize at least some of this big sum? People usually would not know what to do of so much money, and the Swiss are not used to get advice from financial planners³¹. Even though they could get private banking services if they have more than half a million to manage, this is clearly not an ordinary behavior and there is a high probability that their capital will eventually decrease below that limit.

4.3 Housing

A minority of Swiss owns their home. If they do, the tax system is designed such that it is not optimal to own it completely. People will typically hold a mortgage for life, if they want to minimize their taxes. This means that whether they own their home or not, there *will* be a series of negative cash flows to match during their retirement time (either the rent or the interest on the mortgage). The option of annuitization may thus represent a sensible strategy to match these cash flows.

³¹ Such a profession is not very developed in Switzerland.

4.4 *Good value for money*

Annuitants get good value for money, especially if their personal situation is favorable (married and/or with children); see Bütler and Teppa (2007). This has a significant impact on the decision between an annuity and a lump sum (Bütler et al., 2008). And this is without taking into account uncertain, but probable, future adaptations of the annuity to the prices³².

The interest of annuitizing through the forethought system is also evidenced by the thinness of the private annuity market³³. Private insurers are simply not able to match the level of benefits offered by the second pillar. If people want to annuitize, they will do it through their second pillar, except if they don't have any³⁴.

4.5 *Other elements*

One of the main explications given to the annuity puzzle is the presence of bequest motive. The fact that the law mandates survivor and children benefits partially fulfills that motive.

Brown (2007) and Agnew et al. (2008) suggested that some insight on the annuitization choice could be found through the analysis of the psychological biases of the decision makers, as well as the presence of default and framing to decision making. Bütler and Teppa (2005) found that a majority of retirees chooses the default option offered by their pension fund, i.e., the annuity. Bütler et al. (2008) suggested that the statement that all insureds receive each year adds to the bias to annuitization, since more space in this document is typically dedicated to projections of the future retirement annuity rather than to lump sum benefits. The disability and death benefits mentioned in this annual statement are also expressed in the form of annuities. In addition, Brown et al. (2008) showed that agents are more likely to annuitize when the decision is exposed in terms of consumption, whereas a lump sum is preferred when the investment opportunities are emphasized. This

³² Note that these are usually *partial* adaptations, but that they are granted on a life-time basis. In other words, once the annuity is increased by, say, 0.5%, the pension fund has to pay this increase until the annuitant dies, and must therefore increase the annuitant's reserve by the same rate.

³³ The issue of security alone cannot explain that fact, since there are private insurers whose annuities are guaranteed by the cantons (the Swiss states).

³⁴ As explained before, self-employed don't necessarily have a second pillar. In addition, some professions suffer from the constraints on the minimum length of the contract (3 months) *and* the minimum salary paid (18M on an annual basis), such as plastic and visual artists, actors or musicians.

is supported by the fact that the Swiss seem to choose the annuity in times of global financial distress, whereas the lump sum is chosen when the economy is performing well.

Finally, there are explanations that can't really be classified as rational. Sometimes (often), it is simply too late to choose a lump sum. Also, the panic incurred by having such an amount of money to manage may delay or even prevent the choice of a lump sum benefit.

5 Current issues

In a context of increased longevity and financial instability, current issues are found in the main values that are mandated by the law. Bütler (2003), right in the middle of the financial turmoil of the beginning of the century, argued that the "crisis [of the pensions system] is also a consequence of an inflexible regulation that is neither indexed to economic conditions nor to demographic changes." Indeed, the minimum rate of interest i_k , the conversion rate ξ , and the ordinary age of retirement are decided through a democratic process, which means that adaptations are slow to be decided, if they are at all politically feasible.

The main topics that are currently discussed in the political arena are about the funding of public pension funds, the level of the minimum rate of interest, as well as the level of the conversion rate applicable to the mandated benefits. After many years of stability the two financial crises of the past decade force the policy makers to find rational ways of setting up the mandatory plan, whereas little thought had been given to these issues when the system was introduced (Hepp, 1998).

In 2009, the conversion rate defined in the law is much higher than its actuarial fair value. As a consequence to the recent crisis of the system, it is currently being decreased gradually from its initial value of 1985, but the final targeted value is still high, and this is without taking into account biases in the decision between a lump sum and an annuity (due to the personal situation of the insured—with or without a partner and/or children). In order to keep the target of income replacement, this decrease was compensated by an extension of the insured salary.

The level of mandated benefits is usually only a small part of the benefits defined in the plan of autonomous funds. This category of funds is not really affected by these issues, because they are so much above the minimum that they can still offer their benefits in a healthy actuarial environment. It is another story for the second category of funds (strongly related with private insurers), where most of the small and medium employers are found. Offered plans in this category are often close to the minimum plan. Schematically, pension funds pay what the minimum plan

mandates on the pillar 2a (they don't have the choice), and usually compensate the incurred losses with the return on investment of the pillar 2b, where the minimum rate of interest i_k does not apply. It should be noted though that private insurers usually guarantee a certain rate of interest (lower than i_k) also on pillar 2b funds.

Overall, the system works as long as there is enough pillar 2b to fund the mandated generosity on the pillar 2a. If all pension funds were to offer only pillar 2a with the current mandated benefits, we do not see what the system could do but collapse... On the other hand, all these issues suggest internal transfers that might also be decisive factors explaining the success of the Swiss model in terms of both annuitization rate and retirement savings.

Although its future is uncertain, one has to recognize the merits of the Swiss model and its current ability to make people save for retirement and make rational choices with their capital.

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