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Ageing and the Pay-as-you-go (PAYG) Pension System's Asset-liability (Mis)Matching

Abstract: The study present how in the late 1930s-1940s a new, modern pension system was introduced in America without any theoretical basis, as a kind of arbitrary mix of existing pension systems, to replace the by then non-functioning "traditional pension system" in which working children maintained their ageing parents in exchange for having been raised. Later, in 1958, they found an ideology for the system, "solidarity between generations," but this didn't fit in with the system's economic foundations, with the fact that the modern, pay-as-you-go pension system distributes the profits of raising children amongst the older generation regardless of how much people have contributed to it. This made raising children unprofitable, which provided a strong incentive to avoid it, thus launching the ageing process. Moreover, the modern pension system, also as a result of ageing, is making increasingly large and uncovered promises to the retired generation. The system may be repaired by matching the asset (raising children) side to the liabilities

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(pension promise) side, for example, by only promising a pension to those who have contributed to the system (through raising children or accumulating savings), and only to the extent of that contribution. Contribution payments are an obligation, the repayment of the cost of people's upbringing, with relation to which no pension is automatically due. By doing so, the 3rd pillar of the modern pension system will also have been capitalized using a special kind of capital: human capital.

Key words: Modern Pension Systems, Pay-as-you-go, Pension Reform, the Human Capital-based Pension System

Introduction

Eighty-something years ago in the mid-1930s, the developed industrial world (the United States, Western Europe, and Central Europe) looked a lot different than it does now in many respects, with different capacities and problems. Just to name a few:

- In contrast to today (and the situation a few generations prior to that), the financial basis for people's old-age livelihood was uncertain. This, coupled with the protracted global economic crisis (with low demand and high unemployment), caused significant political tensions.
- The population was mainly made up of young people and was continuously growing, since:
    - Marriage was to all intents and purposes the only legitimate form of relationship.
    - It was partly an expectation for there to be several children within a family, and in part, it was challenging to avoid there being children.
    - For most social classes, raising children was not (yet) particularly expensive, and in fact (although much fewer than previously) there

were still classes for whom having children from the child's relatively young age was regarded as a financially favorable undertaking.

- It was discovered—first in practice, followed by a kind of theoretical stamp of approval from the pen of Keynes (1936/1965)—that the transfer of income from classes that are generally more inclined to accumulate savings to those who immediately spend them is a solution to low demand, for example, stimulates the economy.

It was under such conditions that a significant social innovation was introduced in the United States, the pay-as-you-go (PAYG) pension system. Certain elements of this may have been similar to the existing systems, but it was radically different, overall. Its main and extremely novel characteristic was that no mathematical reserve was accumulated in relation to future expected benefits (only a liquidity reserve that was several orders of magnitude less), and the contributions paid into the system were to all intents and purposes immediately distributed as benefits (as indicated, in theory, by the expression PAYG). This enabled the immediate handling of two pressing problems:

1. They were immediately able to pay a pension to people who retired not long after the system was introduced, following only a short period of contribution payment, thus mitigating the above-mentioned social tensions.
2. A significant and continuously increasing income was transferred to a stratum of society (older people) who were almost guaranteed to spend most of it on consumption, meaning the new pension system was itself a great Keynesian stimulus.

The flaw in the idea was that the solution lacked theoretical foundations, and as a result, the operators of the system were concerned about possibly having established a Ponzi scheme (Blackburn, 2003). Two decades later, Samuelson wrote a paper (Samuelson, 1958) that was regarded at the time and is still regarded as the until then missing theoretical foundation of the PAYG system. The operators of the system were relieved (Blackburn, 2003), and now rejected the regular accusations of the opposers of the system (usually supporters of capitalised pension systems) with relation to the Ponzi scheme (although in 2017 the Economist already praised Samuelson (The Economist, 2017), as someone who proved that good Ponzi schemes are also possible). Much has changed since then. However:

- In the developed world, most older people in most countries primarily maintain themselves from PAYG pension systems.
- The financial foundations of these are increasingly uncertain, however, given the fact that society is increasingly made up of older people, since.
  - The ratio of marriages is continuously falling; many types of legitimate relationship exist.
  - Having children is no longer an expectation even in marriage, and contraception is easily accessible.
  - Raising children takes a long time and is becoming increasingly expensive and is no longer a financially rewarding undertaking for practically any class.
- The Keynesian stimulus has since become a slightly “overused” element of economic policy; large, and continuously increasing government debt has become the norm, which to a certain extent itself also shows the characteristics of a Ponzi scheme.

Overall, what was a great social innovation 80 years ago is now finding itself increasingly obviously in trouble in an ageing world, to the coming about of which it has probably itself contributed, ending up as its own foundation. We, therefore, need a new social innovation.

This chapter attempts to prove the following statements:

1. Samuelson did not, in fact, provide the philosophy for a good Ponzi scheme or the existing PAYG systems (but something completely different, fundamentally a solution to an imagined situation), because…
2. …existing PAYG systems are the unprincipled combination of other (logically pure) systems.
3. However, it would have been possible (and it still is possible) to bring about a good PAYG system that at the time would have handled the same problems that this bad PAYG system handled.
4. However, this is funded just like all the other logically pure systems, precisely because it is not a Ponzi scheme, although the capital is entirely different of what the supporters of the usually funded system regard as capital. The recognition and realization of this could be a true social innovation.

The structure of this chapter is as follows: it first presents the characteristics and main problems associated with logically pure pension systems, then compares these to the characteristics of the PAYG system, determining that it is a kind of unprincipled combination of the former. It then examines Samuelson's solution and determines that it, in fact, concerns a special case that does not exist in reality, and which cannot really be applied in general form to reality (since it disregarded essential things), and also that it does not in fact concern existing PAYG systems. The chapter then examines how a logically pure PAYG system could have been established and could still be established today. Finally, the chapter reviews today's main ideas for pension reform and shows that these do not lead to a long-term solution.

The Characteristics of Logically Pure Pension Systems and Their Main Problems

Looking back at history, roughly three forms of economically sound and sustainable old-age subsistence are distinguishable.

"Pension Insurance"

The first is living from previously acquired or inherited assets (primarily from its regular dividends, and perhaps from the partial or full depletion of the "capital"), also in old age. This was always the prerogative of a relatively small group and of course "still has not gone out of fashion" today. During the course of time, more and more people accumulated enough (but not necessarily more) capital during the course of their active years from which they could survive during their old age. The modern business form of this solution is life annuity insurance, or in general, the pension insurance provided by insurance companies. Its economic essence is the accumulation of a reserve, or (in the case of annuity insurance) the sharing of risk.

The solution may be called pension "insurance," but there is not necessarily a need for an insurer in every phase (insurers naturally attempt to make themselves indispensable in every phase). Accordingly, pension insurance is not necessarily a single insurance "product," or not every part of the solution is definitely linked to insurance, as expressed by the word "plan" that is usually applied to such situations in English. As a "pension plan," pension insurance can be split into two temporally separate phases, the accumulation and decumulation phase. Accumulation, meaning the accruement of the capital required to provide a living in old age, can occur in practically any form (e.g., in government bonds, investment funds, shares, property, a combination of these), and liquidity is not a particular issue; capital can be invested for a long term. Insurance companies (and depending on the regulations of the given country, other financial institutions) naturally attempt to assure that this accumulation occurs with them.

Decumulation is the (partial) depletion of this capital, and/or its previous and continuous dividends, which may occur in many forms and using several solutions. Its most obvious form is the purchasing of a life annuity using the accumulated capital. Those who choose this have maximized the (monthly) pension derived from their accumulated capital, while to all intents and purposes deciding that they themselves will be spending the full capital and its dividends (while perhaps giving smaller amounts to their relatives out of the annuity received).

The opposite of a life annuity is perpetuity, which merely means that the owner of the capital will always only be spending the (real) yield of the capital while the (real) value of the capital remains permanent and can be inherited in full following their death. This apparently only allows for a much lower standard of living during retirement compared to a normal life annuity, and therefore is only practical given a large amount of accumulated capital.

People often find compromises that lie somewhere between the two, such as a guaranteed life annuity, joint annuity, or simple capital depletion coupled with a life annuity that has a long deferral time.

The "funded" (capitalized) and "defined contribution" (DC) general professional attributes may be linked to pension insurance or a pension insurance plan. In contrast to PAYG pension systems with no capital or (often only partially capitalized) "defined benefit" (DB) pension funds, the funded, or sometimes fully funded attribute indicates a stressed characteristic that is otherwise self-evident, it could hardly be anything else. The "defined contribution" is also a self-evident characteristic, at least in the accumulation phase. This is why it is possible to state at all that in the beginning pension funds were practically exclusively of a DB character, meaning that the employer promised a concrete pension or determined a "pension formula" with which the concrete pension to be received could be calculated. The PAYG system also took the DB attribute from the pension funds.

If the pension insurance operates as a normal or deferred life annuity during the decumulation phase, it also includes a risk distribution element. The risk is the expected remaining lifespan, which is uncertain for everybody.

The economic essence of pension insurance is the voluntary balancing of income and consumption during one's adult lifetime (only taking into account the active and old age inactive periods), with the accumulation of reserves and its scheduled spending (or that of its yield), possibly with the support of risk-sharing (decumulation)—and with the possible inheritance of part of the accumulated capital as an important subsidiary motive or incentive.

The "Pension Fund"

The second solution was for the former employer to continue to care for its previous, retired employees in their old age, and to continue to pay them their salaries. This initially included only the personal servants of the very rich but was gradually extended. The basic logic is that in exchange for a certain period of service, if an employee achieved this, meaning they proved to be consistently loyal, the former employer kept the individual on the payroll until his/her death. Later, as it became more popular, they attempted to make it increasingly professional and assure the living of retired staff in their old age by setting aside the capital that would probably be required to enable payment of their pensions; they capitalized the annuity reserve, so to speak. The modern form of this solution is the pension fund, and originally the defined benefit

(DB) pension fund.

However, what has simply been given the name “pension fund” is, in fact, a cumulative term for several solutions that, however, form a kind of evolutionary chain. A kind of logical reconstruction of this evolutionary chain may help to explain the justified or unjustified nature of certain solutions.

The whole thing began with the remuneration of loyal servants (to lords, kings, and state officials), whom it was expedient to retire from service above a certain age, but who during their period of service had not accumulated enough assets to be able to live comfortably in their old age. The reward for their previously demanded a significant loyalty could not be that they should be destitute in their old age, and so their income continued to be provided to them, often in a similar manner as when they were in active service: in kind. The period spent in service was a kind of measure of loyalty, to which this benefit could be linked with a (high) minimum requirement. This is how the idea of “period of service,” which still exists there today, found its way into the pension system. In view of the fact that initially this kind of service was only available to the very few, which was further reduced by the fact that it required an extremely high period of service, and so few people survived to that age, and those who succeeded did not have many years left, initially the system did not cost too much for those who provided the service, and therefore there was no particular need to set aside a reserve for this purpose.

However, the method began gaining increasing popularity, meaning more people were included in this kind of service; private companies began to copy the practice, and the state itself also began employing increasing numbers of people, and accordingly keeping people who left active service on the simple payroll became an increasing burden. In addition, private companies were not necessarily very stable or long-term institutions such as the state, and accordingly, the beneficiaries of the service also wanted some kind of guarantee that they will still receive it if the company happens to go bankrupt. The solution to this was the actuarial assessment and planning of the undertaken services, and the establishment of relative independence for the service within the company itself. This, in turn, led to efforts to temporally balance the burdens of the company, or rather the guarantor of the services, which meant the introduction of reserving. Once reserving was introduced, the question was often raised whether this should be organized independently, giving rise to the appearance of pension funds linked to companies, which were generally not fully capitalized, meaning the account did not contain the total capital required for the full provision of services, discounted by its expected yields. Accordingly, the bankruptcy of the guarantor could lead to a significant reduction of the services undertaken, which they attempted to prevent or avoid using several methods. Firstly, the expected level of funding of the pension fund, meaning the ratio of accumulated capital to the value of the undertaken services that had to be reached, was set increasingly higher. Secondly, the independence of the pension fund from the guarantor company was also gradually increased, and particularly the fact that the company could not use the fund's capital to handle its financial difficulties. Thirdly: a kind of inter-fund risk distribution was established in case of bankruptcy, meaning the introduction of mandatory guarantee funds and solutions.

Meanwhile, the economic rationale behind the system remained unchanged: during the employee's active age the employer did not pay out the full salary, but this was instead balanced throughout their entire remaining lifespan, in addition to applying risk distribution with relation to employees who attained differing lifespans, and by doing so the employee was also remunerated for their loyalty to the company. So, in the beginning, pension funds, which are often also referred to as occupational pension systems, only paid out pensions at all concerning relatively high periods of service.

The fact that employer pensions were tied to achieved long periods of service caused increasing tension after the method became popular, in view of the fact that this represented the main source of pension for more and more people, among whom an increasing number regularly changed workplaces. In addition, the economy also transformed, with many years spent at one workplace and loyalty becoming an increasingly unimportant value. Accordingly, employees increasingly began demanding that the pension entitlements they had already acquired should not be lost when they change workplaces, while employers were increasingly less inclined to use this method to also chain their employees to them. The portability of acquired pension rights was born, the simplest form of which is the transfer of capital between pension funds. However, this applied pressure to pension funds from two directions: (1) their level of capitalisation must be close to 100%, because leaving employees will definitely be taking away 100% of the capital value of their previous entitlements, meaning that in the case of low-level capitalization those that remain (the "loyal" employees for whom the system was introduced in the first place) could find themselves in an extremely bad position, and (2) the capital value of the transferred entitlements must be easily calculable.

These tensions all pointed in the direction that pension funds, and the occupational pension system in general, should become as similar as possible to pension insurance. In its fully developed form, a pension fund can be regarded as a partially capitalized DB system, given the fact that it made a predetermined promise of a pension using a pension formula to employees who achieve a predetermined service period. The DB system itself assumed the long-term stability of both the employer, the company, and the employment of the employee.

Both have since changed; the lifecycle of companies is becoming increasingly shorter, and their size and number of employees also fluctuate strongly over a longer period. As a result, companies can best fulfill their pension promises if they correspond to their performance capabilities to the maximal extent. Moreover, this means that they should not promises a level of pension that is realized in the distant future, but a pre-set current contribution for employees that happen to be working there at the time, which means that pension funds have taken on an increasingly DC character.

Today, a general tendency with relation to employer pension systems it that old-school DB funds are closed to new employees, and only DC funds are launched for new ones. This means that pension funds are increasingly converging towards insurance pension solutions. From among the previous solutions and key concepts of the occupational pension system, the service period has become outdated and uninterpretable. To an increasing extent, the only formal difference between pension insurance and pension funds is that employers pay contributions in one and employees pay into the other, but even this difference is beginning to disappear these days.

It would seem that after their rapid proliferation and "heyday," DB pension funds are beginning to be phased out, but they will probably never disappear completely. Their application may be reduced to that exclusive group, high-ranked employees, for whom their predecessors were initially devised, and from where their expansion began. Occupational pension and pension insurance solutions are increasingly being combined into a fully capitalized DC system in which either employer or employee can be contributor in some, perhaps even changing form, but which is clearly owned by the employee, meaning it can naturally be transferred between pension funds and insurers, and entitlement is only dependent on reaching a certain age, with no role played by the employee’s period of service.

The Traditional Pension System

The two solutions described above used to only provide old-age security to a small, privileged group. For the “people,” who made up the vast majority, the solution was transferred within the family, which remained possible while the family model was several generations living together. Moreover, this was the norm right up until the industrial revolution (which occurred during a different period in Europe and the world’s countries—in some, it still has not occurred today), which was closely associated with the character of the economy and the distribution of labor. On the one hand, the economy was dominated by agriculture and family farms as the dominant “form of business,” in which practically every generation from the youngest to the oldest had their tasks in accordance with their age. The family living together was to all intents and purposes simply the logical result of this kind of distribution of labor, and of the fact that the “business” was passed down from father to son. Industry, which at the time formed a much smaller proportion of the economy, also meant artisan families, where the trade and its tools were passed down from father to son, and accordingly, multi-generational households were also the norm.

However, the industrial revolution changed all this, predominantly by splitting multigenerational families through forcing young people to leave their families and move to industrial centers to work, because, in contrast to earlier industry and agriculture, modern industry required a concentration of population. This meant that young people who found themselves far from their parents could no longer support them directly, and of course, no longer possessed the consumer goods that they previously had as active agricultural producers. This meant they could only have supported their old parents with money, since they too no longer produced consumer goods, but instead purchased them. Moreover, they were probably unable to do so initially because this element was not part of their wages (profit was realized instead, and accordingly the previous consumption of the older generation who was left to fend for themselves now facilitated the accumulation of capital). This put an end the previous state of affairs that is often referred to as the “natural” or “traditional” pension system.

Considering the economic essence of the traditional pension system, which collapsed as a result of the industrial revolution, it can be stated that in many respects it corresponds to the pension insurance detailed above (towards which pension funds are also converging). This means: saving (the employer or employee saving part of the current income, meaning removing it from current consumption) in the active life stage, the investment of the saved monies, and the gradual spending of the investment and its returns in old age.

The logic of the traditional pension system, on the other hand, is: raising children during one’s active career, who then maintain their parents when they are inactive. Economically, this can also be described by stating that partly resources are drawn away from current consumption by raising children (which is spend on children out of income), and partly an additional effort must be made in the interest of raising children (time that would otherwise be used for leisure or earning further income is invested in children). By doing so, value is being created from an economic perspective: the human capital that is embodied in children’s capabilities. When children maintain their parents in their old age (during their active career), they are able to do so by putting into operation their capabilities, meaning the human capital they have acquired with the help of their parents, which at this time they are partly spending on repaying the costs of this, and the interest on those costs, to those who at the time invested in advance in their human capital. So, the logic is the same as in the case of pension insurance: restricting current consumption—saving/investment—spending the investment and its return. The difference is that in this case, the investment occurred in a special way (raising children) and in a special kind of capital (human capital), and until now this only happened in a particular (traditional) case of the division of labor, when different generations lived together and worked together in the family business.

However, it is also different from pension insurance in that it includes no risk-sharing. The reason it exists in pension insurance is that the insurer handles the lifetime risk of many people in a single pool. From this perspective, the traditional pension system is as if there were lots of small insurers (the parents) with a few "clients" in a pool, meaning their children. For this reason, fluctuations in risk ("deviation" or "variance") may be extremely high for those involved, especially if it is taken into consideration that at one time (during the era of the traditional pension system), mortality was different than it is today. It sometimes occurred that all of someone's children died before they reached old age, and so they had no pension despite their investment. People also often died while still of active age, and so their children were exempt from having to repay the costs of their rearing. It did not occur often, but sometimes a late child did not enter active age by the time their parents had (would have) already become inactive. Moreover, finally: many people did not succeed in having children, despite wanting them. True, according to the logic of the traditional pension system the latter was easy to handle: one had to adopt one (or more) orphans, or one of many children from a poor family, or perhaps (according to the logic of pension insurance) the money saved by not raising children, or which was earned during the extra working time not spent on raising children, could be put aside.

Despite all these limitations, the traditional pension system was a logically and economically well-built construction—in contrast to the modern pension system that replaced it.

The Muddled Development of the Modern Pension System

Many trace the modern pension system back to Bismarck, although it was only born some 80 years ago via Roosevelt's New Deal. Bismarck established a state system based on the logic of pension insurance (moreover, this is why it was named "insurance," although with the "social" prefix), meaning it followed the pattern of saving—reserve accumulation—reserve spending with risk balancing, while all this was organized and made mandatory by the state. True, this system later received two major "shocks": the First and the Second World War, in which Germany's reserves lost all their value, but attempts at their re-capitalization were only abandoned in the 1950s (Németh, 2009; Werding, 2014), probably as a result of the American system, which had been developed by then.

The American system was admittedly an improvisation, without any kind of fundamental principle. The goal was for a relatively large number of people to receive a pension relatively soon after the system was launched, which also meant that pensioners did not have enough time to accumulate enough capital from their savings to receive a suitably-sized pension, meaning the logically and economically pure Bismarckian solution could not be applied. For this reason, the system did not even aim to have suitable reserves with which to cover the services it undertook to provide to new entrants, and as such also if new payments cease, as is self-evident in the case of pension insurances and the original Bismarckian system that follows the same logic. Instead, only a kind of liquidity reserve was established, and instead of accumulating and investing contributions, they were immediately put towards current payments. For this reason, opposers of the system immediately branded it as a Ponzi scheme and, although somewhat reluctantly, the operators of the system were also inclined to regard it as such. This state of affairs continued for around 20 years until the appearance of Samuelson.

The elements of the American system (or rather the system that later became popular in the modern world as the modern, PAYG-type pension system) were patched together from otherwise logically ill-fitting elements of pension insurance schemes and pension funds (occupational pensions). The element according to which the basis and source of following services is the payment of regular, individual contributions (as opposed to the ad hoc payments made by the employer in the case of employer pension system), was adopted from pension insurance schemes, to which logically, a DC system belongs. The fact that the system is DB-based, was adopted from employer pension systems, in which the level of pensions was determined according to a pension formula that was constructed based on the service period, which indicated loyalty (this was a forced element due to the fact that they wanted to provide pensions quickly, before the payments of older members provided the required collateral to cover this). Moreover, finally, the practice according to which the pension fund must not always be filled up to 100% was also taken from here, where the employer guaranteed payment as a "sponsor." This "motive" was later "overstrained" to the extreme, meaning that to all intents and purposes they totally gave up on filling up the system—despite the fact that employers did not uphold the system as guarantors. This role of sponsor/guarantor was taken over from them by the state.

The various elements of the system were apparently not in harmony with each other, because they pieced together the incompatible elements of logically pure pension systems. If individual payments are the basis for the pension, then the pension must fundamentally use a DC system, in which the period of service has absolutely no place. If the period of service is essential, then it rewards loyalty to the employer, in which case the employer should have been forced to establish a DB system for everyone, for example, an occupational pension system, or to act as guarantor for a system of this kind operated by the state. However, contributions were made individually or at least were regarded as such, even if they were based on a kind of tax on income paid into the system by employers. The state should not have disregarded the need to capitalize on the system, even if initial pensioners received larger payments that could be financed by their contributions. This should have been covered by other revenues. True, in this case, the state would have accumulated a huge reserve than needed investment, which would have been unfavorable from several perspectives. On the one hand, state officials are not particularly capable of making good investment decisions (nobody trained them to do so, in addition to which they must conform to totally different expectations than their colleagues in the private sector), and in addition the danger of corruption would have increased to a great extent, and finally the state would easily have regarded this reserve as (easily borrowable) money that can be spent on its own goals, meaning it would have converted it into sovereign debt. The operators of the system "saved on" these important problems by intrinsically not accumulating reserves (except a kind of liquidity reserve).

It is interesting, however, and is indicative of a kind of tunnel vision, that when the elements of the new pension system were patched together from the elements of two logically pure pension systems, they totally disregarded the third, the traditional pension system. They did not even attempt to take elements from that, although the modern pension system fundamentally wanted to give pensions to people who once relied on the traditional pension system, meaning that to all intents and purposes one replaced the other. This, however, was probably intrinsically prevented by the fact that the science of economics was at the time still unable to establish these principles at all. This would have required the—at the time non-existent—idea of human capital, and also that the traditional pension system is regarded as a proper construction, and not as nothing more than a kind of (humorous) economic anecdote.

Samuelson's Solution—and Its Problems

So, in the late 30s and early 40s in America, the elements of two consistent pension systems were patched together into an inconsistent one, with relation to which its supporters to all intents and purposes agreed with its opposers, that it was a Ponzi scheme. This state of affairs changed radically in 1958 when Samuelson published an article (Samuelson, 1958), the extremely complicated title of which made absolutely no reference to pensions. The theoretical goal of the study was to find an example of the fact that the free market mechanism does not always assure a socially optimal solution in a particular situation. And for Samuelson this example was pensions in an abstract economy with no money in which an excess number of children are readily available without any particular effort (or as the author of an article published 50 years later in celebration of the original paper stated, in jest, but without any malicious intent: as if they were aliens from space, or who had been laid there by the stork at the age of 20; Weil, 2008). According to Samuelson, in this abstract economy savings, and accordingly pension insurance and a pension fund, is not possible, because there is no money, and because the produced consumer goods are perishable. "Providently," but without any particular theoretical justification and very briefly ("it went out of fashion"), he excludes the obvious solution to the pension problem, that children should maintain their parents, although he mentions that such a thing did exist at one time, but without justifying why it no longer exists today. Furthermore, later he assumes that this "at one time" was so long ago that the new solution he describes has been in use for generations (it is worth noting that Samuelson's simple assumption that raising children costs nothing is consistent with the assumption that children do not give back the costs of their rearing to their parents, because there were no such costs, there is nothing for them to give back, they owe them nothing. In other words, one theoretical error provides an excellent foundation for another—although until recently, most readers only regarded this as a method of simplification).

According to such conditions—on a market basis—there remained just one alternative for Samuelson to provide for old age consumption: if older active workers "blackmail" younger active workers, meaning older active workers forego part of their consumption in favor of younger active workers in exchange for younger active workers, when they become older active workers, foregoing some of their assets and consumption in favor of people who have in the meantime become inactive older people. The result is far from optimal because, in such a scenario, young active workers will consume their full production, plus part of the production of older active workers, meaning they will be practically drowning in "chocolate" (the only consumer item available in Samuelson's abstract economy). Meanwhile, older active workers must in part give some of their chocolate to younger active workers, while also paying back the chocolate they received from older inactive workers when they were of active young age, meaning their consumption will fall radically, while they will also receive hardly anything during old age. The conclusion is that the free market mechanism does not create a social optimum in this situation, and it would be expedient for the state to interfere. Moreover, the state should interfere by taking away part of everyone's production and giving it to the older, inactive generation by, in Samuelson's example, assuring that everyone, both active and inactive alike, consumes the same quantity in the case of a stationary population. In addition, he calculates that if the state applies this same ratio of deductions in the case of an increasing population, then the consumption of the older generation will be much higher than that of active workers, because they will receive the "chocolate" that was deducted from them when they were of active age plus interest—this is what he calls "biological" interest.[2]

He calls the whole system a kind of new Hobbesian-Rousseauian social contract that links generations to each other, including generations that have not yet been born.

The paper was a huge success, the representatives of the American, non-capitalized pension system "recognized" their own system in the description, and were relieved that they were not operating a Ponzi scheme, but that behind their action, which was seemingly spontaneous and lacked any theory, lay a serious and radically new "philosophy": solidarity between generations. Samuelson's solution became the official philosophy of the PAYG pension systems, even though it is somewhat surprising why in fact the representatives of the modern American pension system "recognized themselves" in the description. Because the differences between the situation described by Samuelson and the American pension system in operation were vast, and to all intents and purposes evident to the reader:

- America was far from being an economy with no money. However, in his article, Samuelson explained the impossibility of accumulating savings and with it the need for state intervention, precisely with the lack of money. This was so true

[2] Aaron later "corrected" Samuelson on this point, drawing attention to the fact that economic growth also contributes to this (Aaron, 1966), and this is why the whole theory is often referred to as the Aaron-Samuelson theory, but this strand is of no interest to this study.

that at the end of his paper, he, in fact, notes that in the presence of money, other pension solutions are of course, possible. So, if money exists, why then should we have to resort to the instrument of the state establishing a new social contract?

- In practice, biological interest, which was cited very often, and which was rapidly officially accepted within the PAYG system, did not really work in the way described by Samuelson. According to Samuelson, the "pension contribution" is a ratio of income that is permanently fixed in the long term, and this is why the consumption of pensioners increases hugely compared to consumption during active age in the case of a growing population. In other words, the logical order here is: pension contribution → pension. In practice, however, the equation was just the reverse (and remains so—this was only changed by the NDC system, see Palmer, 2006): the operators of the pension system had an idea with relation to a "fair" level of pensions, which they determined with the help of a pension formula, and it was based on this that they determined the pension contribution that was required to enable them to provide this level of pension. Therefore, the actual logical order was: pension → contribution. As a result, biological interest was not just, or not necessarily, realized by pensioners, but they shared that with active workers such that, in the case of a growing population, pension contributions were relatively low.
- The fact that the biological interest is not only realized by pensioners only truly becomes essential when the population begins to decline.

Samuelson may have mentioned this possibility (he even put forward examples: Ireland and Sweden), but he didn't really examine the issue; in essence he suggested that the biological interest rate is positive, meaning that population is increasing, as was certainly the case during the baby boom that was in full swing when the article was written. Since according to Samuelson, the biological interest belongs to the pensioners, whether positive or negative, in the case of a declining population it means a falling pension because according to his paper pension contributions are fixed, and if those are only enough to provide a lower pension, that is what will be paid. In practice, however, this practically never happened this way. The most striking example of this is the fact that to all intents and purposes every PAYG system admits that behind it lies a vast sovereign debt that represents many times the annual GDP of the given country (and in fact, since 2017 in the European Union (EU) it has been compulsory for every member state to calculate and publish this). Samuelson did not use this idea yet (it was only "discovered" in 1974 by Martin Feldstein; Feldstein, 1974), but he did not have to use it because in the system he devised the implicit sovereign debt it 0. Moreover, this represents a vast difference compared to actual PAYG systems.

Overall, it may be stated that Samuelson did not establish the general philosophy of the PAYG pension system, but only a concrete example of it that only began being "discovered" and introduced after the end of the millennium. This is the total contribution indexed Notional Defined Contributions (NDC) pension system, which has been introduced in Italy and Poland[3] (in which the long-outdated service period was finally "forgotten"). Taking a look at the system, Samuelson's description fits perfectly, since:

- Samuelson to all intents and purposes described a DC pension system with a fixed contribution rate…
- …from which as high a pension as possible is paid out (as assured by total contributions indexing) …
- … and in which the biological interest rate can also be negative (in the case of a decreasing population, the total contributions index can easily become negative) …
- … and in which the implicit sovereign debt is zero.

It is characteristic, however, that this relationship has still not been "officially" discovered today in pension system economics, and in fact, for a long time, the NDC system was regarded as a kind of "aberration" compared to the "naturally" DB-type PAYG system.[4] Although reading Samuelsson in retrospect, he, in fact, described a DC system (true, at the high level of abstraction in which his article existed, the DB and DC systems were, in essence, the same). In comparison, James Buchanan's 1968 article (Buchanan, 1968) acted as a new revelation in pension economics, when he first proposed the NDC system. It was also left unnoticed for a long time that in contrast to Samuelson's foundations, PAYG systems

[3] The Notional Defined Contributions (NDC) system is often referred to as the "Swedish system," because the first NDC system was introduced there. However, their indexing is not based on a total contribution index but is much more complicated in view of the system's significant capital.

[4] As admitted by Robert Holzmann—at least with relation to the World Bank—at the Budapest launch of the Holzmann, Palmer, and Robalino (2013) publication.

accumulate a huge implicit sovereign debt, and this was only examined and calculated following Feldstein's article in 1974. This may be interpreted by stating that it was then that it was discovered that the operation of a PAYG system constructed in this manner requires the state to take on a vast, undetected loan, which may also be regarded as a continuous and substantial Keynesian stimulus. The methodology of generational accounting was created to detect this loan taken on for pension purposes, and since it had been established all other loans, and to calculate its distribution between generations (Auerbach et al., 1994; Kotlikoff, 1993).

If, according to the above, the Samuelsson-based pension system is reduced to a total contributions-indexed NDC pension system with no implicit sovereign debt, it may be stated that this is not a Ponzi scheme, because the assets and liabilities of the system's balance sheet move parallel to one another. It is, of course, another matter that in the case of a continuously decreasing population the pension paid out by the system will either be continuously lower, or the age of retirement will have to be regularly increased, meaning the pensioner-protection function of pensions will be strongly eroded. However, upon examination of the usual PAYG systems with high implicit sovereign debt, it becomes clear that the very existence of this implicit sovereign debt points to what extent it is based on the logic of a Ponzi scheme in which revenues are immediately recategorized as dividends with the omission of the investment period, while those liabilities are also kept on the books (as if these revenues had been invested), meaning that in essence the liabilities side of the balance sheet "snowballs" independently from the assets side.

So, in summary, what may be stated about Samuelson's article is that is provided with an elegant solution to an imagined situation and provided an ideology to a pension system that did not yet exist at the time, and which had little to do with actual PAYG pensions systems. However, everyone wanted to believe in it, and this "inclination" still exists today. For instance, this is probably why the Germans gave up on their previous plan to recapitalize their Bismarckian system and decided instead to transform it into a "modern" PAYG system—clearly based on the American model, although the citing of Samuelsson never really gained popularity in Germany.

In his article, Samuelson himself, on the one hand, avoided referring directly to the existing modern American pension system, since he stressed that the accumulating of reserves is possible in the presence of money, and it is as if he himself also believed that logically, only capitalized pension systems should be allowed in modern times. However, he was clearly "winking" at the existing pension system because, from among the possible alternatives that deserve further examination, he was quick to dismiss (and without any particular justification) the logical solution to the modern pension system, namely that it should be a modern version of the traditional pension system that it replaced. Although it would have been possible to choose a different solution, and it is still possible today, as will be described below.

Overall, Samuelson only seemingly put the modern system that until then lacked any theory in order theoretically, and in fact only increased the confusion with relation to it, which still exists today. True, according to the principles of economics that existed at the time, it would have been difficult to determine; it is, however, possible to determine it today. Accordingly, the theoretical possibility now exists to provide a philosophy for modern pension systems that better describes its essence and based on which several essential changes will, of course, have to be made to its design.

The Chance for a Logically Pure PAYG

What They Did Not Do at the Time

It is interesting that despite the fact that they were clearly aware of the fact that most people used to receive old-age care (to all intents and purposes: a pension) from their children, and the economic foundations for this were also evident ("in exchange for being raised"), it wasn't even considered that this same principle should also be applied to the modern pension system. Meaning that someone receives a pension because they raised contribution-paying children, and the payment of a contribution is itself a method of repaying the costs of being raised, which everyone owes—primarily to those who raised them (who are usually, but not always the parents), and secondly to taxpayers, thanks to whose contributions they had access to certain services in childhood (primarily towards their education). Meaning that the mandatory contribution payment of active workers could have been introduced as a matter of course without having to promise anything in return to contributors. Because everyone owed (and still owes) a contribution (or at least a contribution with an economically well-founded, carefully calculated level and period) to their parents, and to taxpayers. Instead, this debt was simply waived, without having truly noticed this fact. Moreover, they did so just as the cost of raising children began getting increasingly high (meaning the debt owed by children became increasingly large, and interestingly, the period spent in retirement, and which therefore needed to be financed, also began increasing almost parallel to this), and the costs are continuing to increase today (as has the number of years spent in retirement), meaning this gesture didn't really have any financial basis. Because by doing so, they declared and assumed that:

1. No financial compensation is due for the increasingly expensive act of raising a child; it is something everyone does "of their own accord,"

meaning the income earned during their active career must also cover those costs.

2. People must also extract their pension from their income during active age.
3. Even under such conditions, they will undertake to have and raise a suitable number of children.

Of course, if a society has been doing this for generations, then the waiving of the costs of raising children only causes additional burdens for the generation that does not receive a return on this investment for the first time, after which a new balance can develop—provided that (in contrast to the era preceding the modern pension system) enough children are born without any kind of financial incentive. However, this latter assumption has no true foundation, and it has since been proven that this is not the case, and in fact people react to the increasing cost of raising children in the same way they do if the price of any other "goods" increases: they reduce consumption (this has been specifically documented by pension researchers, e.g., see Gál 2003). This effect is compounded by the fact that thanks to birth control becoming simpler, the realization of this rational individual strategy has become much easier and (in stark contrast to earlier opportunities) requires practically no sacrifice.

Looking back, as has already been noted, when Roosevelt introduced the modern pension system, experience with relation to the traditional pension system was not quite what Samuelson described ("it went out of fashion"). In fact, it was the traditional family farm/business and the traditional division of labor that had broken down; children moved out from their parents, and it was easy for them to refuse to pay them back the cost of their being raised in the form of old-age care. While generations lived together, there were of course also children who would have been glad to save on these expenses, but at the time the public opinion of their place of residence (generally small settlements where people knew each other well) required the enforcement of this old social contract. When young people moved into big cities, this coercive force was eliminated. It was, therefore, an absolutely logical demand that the state should step in as coercer. This did not require a new social contract; however; it would have been enough to force the operation of the old social contract under these new conditions.

The Rooseveltian modern pension system is traditionally described such that its greatest winners were those who retired immediately after it was introduced, following only a short period of contribution payments, because they received an extremely high pension compared to their paid contributions. If the above logic is accepted, however, a totally different picture is arrived at: the majority of needy older people at the time were those whose children had refused to maintain them, meaning to pay back the costs of their rearing (and possibly the interest on that) in old age in accordance with the old social contract. Accordingly, it would have been entirely justified to tax active workers and distribute the tax among their ageing parents without those parents having to pay any kind of contribution. Moreover, to naturally promise the same to active workers: their children will also be taxed, and that will be distributed between them, depending on their efforts in relation to raising those children. From many perspectives, this system would have been very similar to the one that was realized, but without the element according to which a pension is due concerning the payment of contributions. A pension would have been due in exchange for raising a child, meaning for the creation of the human capital that is embodied in active workers. Moreover, the tax/contribution would have been the repayment of this.

From this perspective, the winners are not really those who first received a pension, but earlier people, who neither cared for their parents nor paid contributions. This, however, is only the first approach to the problem. It is, for instance, possible—and this would require a deeper analysis of economic history, and for this reason, is only being raised as a hypothesis—that not even they were the true winners. It is possible that the employers of the first young peasants to flow into industry did not pay, as part of their wages, the element that would have made them capable of repaying the costs of their childhood. This element simply became profit, meaning that as a result, the missing consumption of older people who received no care also contributed to the accumulation of capital. In this interpretation, the introduction of contribution payments necessarily led to an increase in wages, and reduced profits, and as a result the maintaining of old parents was finally incorporated into wages, and the accumulation of capital to the detriment of the consumption of older people was eliminated (meaning that even in this manner, a kind of Keynesian stimulus would have been realised without any kind of implicit sovereign debt, because the part of the profits that was ready to "settle" as savings would have been delivered to people who generally would have used it for immediate consumption—to increase their income—to all intents and purposes in the same manner as was actually realized).

However, it is also evident that when the modern pension system was improvised, it, in general, lacked principles, and when principles were eventually found, they were the principles of something else, and therefore proved unfit to suitably handle the problem. However, this only became obvious after a very long time (and is still only visible to few people today), when it transpired that more and more people are deciding not to set their minds on raising children, which in the meantime had become extremely expensive and a bad deal, or similar to other highly desired luxury items such as sports cars and yachts to delay what has ultimately been reclassified as a luxury until they eventually run out of time, and the whole previous construction falls into crisis, and as a result the Ponzi scheme nature of the system becomes increasingly apparent.

It may also be stated that when society "wrote off" and "threw away" the traditional pension system and waived the requirement for children to pay back the cost of having been raised, they did so by simply transferring these costs onto their parents. They did so at a time when, thanks to the otherwise justified elimination of child labor, they stripped childbearing of its last individual economic advantage. In other words, from this point on a kind of "losers" competition began at a social level to see who is prepared to have children even under such conditions. It may be stated that society's most crucial long-term undertaking—its own regeneration—was turned into a bad deal and was fully transformed into the result of a solely subjective insight. Moreover, they were unaware of all this, and in general, this realization has still not been widely recognized even today.

What They Should Have Done

Based on the above, it is, however, clear what should have been done at the time instead of creating the patchwork modern pension system, and what should be done now instead of trying to keep it alive:

1. It should have been made clear that under the new conditions the modern pension system is replacing its predecessor, the traditional pension system, meaning that it is based on the repayment of the costs of raising a child for those who have undertaken to pay them. This is in the most part, the merit of parents (or foster parents) and to a lesser degree of general taxpayers. Meaning that the modern pension system is the restoration of the no-longer-operating traditional pension system, with state assistance.
2. Accordingly, it is mandatory to pay a pension

contribution based on a well-calculated contribution rate, but that in itself does not generate a pension entitlement. Only the raising of a contribution-payer will provide entitlement to a pension (at least from this system).

3. Of course the state could have simply declared that it is the obligation of children to maintain their parents (as China recently did[5]), but it was partly too late to do so (because presumably this part of wages had already been "swallowed" by employers, meaning they would have had to be forced to incorporate this into wages in some way, e.g., through taxes), and in part it was capable of offering a better construction than the traditional pension system. The essence of this is that it widely realized the risk-sharing that was missing from the traditional pension system, meaning it applied modern insurance techniques in the interests of making the burden on children (e.g., the payment of contributions) independent from the actual age of their parents (meaning it is made calculable for them), in addition to making the parents' pension relatively independent of at what stage their children's career, income generation, and contribution payment capabilities happen to be.

They are meaning that the fund accumulated from

[5] See: Constitution (2004): "Article 49—Marriage, the family and mother and child are protected by the State. Both husband and wife have the duty to practice family planning. Parents have the duty to rear and educate their children who are minors, and children who have come of age have the duty to support and assist their parents. Violation of the freedom of marriage is prohibited. Maltreatment of old people, women and children is prohibited."

contributions should have been distributed based on people's contribution to creating contribution-payers. Raising more, or more successful (with higher incomes, e.g., generally more highly trained) contribution-payers equates to a higher pension than raising fewer or no contribution-payers. People are also eligible for something if they raise no children since they have also contributed to the education of the new generation through paying taxes, as the cost of their education was in the most part covered by contributions on the part of taxpayers.

Such a system, of course, does not provide a suitable pension to people who do not raise children, or only from an extremely high age. However, they have saved the costs of raising children (regardless of whether the lack of children was the result of a conscious calculation on their part or a deeply traumatic tragedy), so it would not have caused difficulties for them to put the saved money aside in a pension insurance scheme and have that as the primary source of their pension. When this system was introduced some 80 years ago, there was, of course, no time to devise a separate system for older people with no children, the construction of which requires a few decades. However, it would also not have caused a problem if, following the declaration of the repayment of the costs of child-raising as the underlying principle behind pensions, people without children would also have temporarily not been excluded from the system, but instead the risk of having no children would have also been handled as a distributable risk until the elapsing of a certain period of preparation, which at the time roughly corresponded to reality.

It is, of course somewhat more complicated to operate such a system than the realized PAYG system because more data needs to be kept on file, not just the contribution payments and service period. Questions are also raised in relation to the fair level of contributions, the extent of the contribution payment period, and based on what principled should the paid contributions be distributed between old parents/guardians. These are problems that can be solved, however, and it is still possible to determine general principles today that grasp the essence of the system and do not consider less important individual details. Furthermore, such a system is capable of operating for a long time such that it begins with generous estimates, and the details are continuously refined, parallel to the collection and processing of the required data.

What Can Be Done Today?

Today, the situation is much better in all respects compared to Roosevelt's era. Sufficient data is available, and it can no longer be claimed that the pension system must be necessarily highly simplified because of the need to keep records manually since a cheap and infinite computer capacity is available. Accordingly, the reform of the existing PAYG system can be realized as a matter, of course. One possible schedule: it is declared that the basis of the pension is an individual investment, of which there may be two types: child-raising efforts or individual savings—or possibly a combination of the two. The payment of contributions is mandatory (because this is the repayment of the costs of raising children—it is expedient to place this period nearer to the second half of the active career, so the family budget isn't burdened simultaneously by contribution payments and the cost of raising children) for a determined period (e.g., 30 years), but no pension is due in return (although failure to pay will result in a reduced pension). However, this principle would only apply to those who are suitably young: for instance, to those who are at least 25 years from achieving the age of retirement, and not at all to those who are only 5 years from retirement. A pro-rata combination of the old and new system would apply to those in between, meaning it would be realized gradually, while leaving everyone enough time to adapt to it with their individual life strategies. Usually, it would be assumed that everyone chooses exclusive savings instead of raising children, so new employees would begin paying contributions into a mandatory pension insurance scheme. This contribution is reduced if they begin raising a child and is eliminated altogether if they begin raising another. Meaning they would not need to simultaneously pay in two directions; raising a child will not represent an additional burden, but not having children will also not be an economically favorable choice in the short term.

The annually accumulated contributions could be distributed among older people according to a kind of points system. Points would fundamentally be distributed based on the period of child-raising (considering that the person of the child-raiser may change over time), the number of children, and their expected contribution payment capacity. The latter can be estimated in advance based on the level of education, for instance, but the method may be refined later based on experience. Some points are also given for general taxpaying, in view of the fact that children’s education was in the most part financed from that. It is expedient to apply some kind of proxy to estimate the level of individual tax payment. This could even be the contribution payment itself since this is probably in good correlation with it (although against it stands the fact that in this way it would seem as if contribution payments result in pensions, just like before).

These are the most general principles of the system, although many further details could be described, of course, but that would exceed the capacity of this chapter. Overall, such a solution would eliminate the implicit sovereign debt that lies behind the modern pension system, as well as all of the demographics-related sustainability problems (e.g., the destructive effect of ageing on the current PAYG system), since as a result all pension systems would become capitalized, in addition to which it would become clear that the realized PAYG system was merely a short, historical and theoretical oversight. Ageing could even be eliminated as a result of this change, since raising children will once again be economically rational, and will definitely become neutral from the perspective of the pension system, because its Ponzi scheme character will be eliminated.

Existing Reform Ideas—and Their Problems

The above ideas are currently not part of mainstream pension theory and practice, and in fact, few people are aware of them. Thinking with relation to the future of the pension system is dominated by the fact that the realized PAYG system is taken as read, and the ideology it was given by Samuelson is accepted—without realizing the contradiction between the two. They are currently attempting to solve the pension problem caused by ageing in three other ways, but the success of all three solutions is doubtful. These are:

1. Solutions within the pension system:
    a. The rationalization of the existing PAYG system.
    b. The rejection of the current system through its Chilean-style full capitalization.
2. As an external solution: through immigration.

These days, the demand for the introduction of NDC-type pension systems is becoming increasingly strong (although the process has come to a halt somewhat these days, as analyzed by Guardiancich et al. (2019)). This may be interpreted as meaning that the Samuelsonian logic is being taken increasingly at face value, and pensions are increasingly being tied to actual contribution payments, and the various generous allowances that various strata of society have gained for themselves are being withdrawn, for example, it may also be defined as a kind of "back to basics" movement (although it's supporters have not really noticed this).[6] Overall, this

[6] The supporters of the NDC system regard it as a novelty (see

means the rationalization of existing PAYG pension systems, with the help of which their lifespan can be extended. However, this does not solve the fundamental problem, meaning that if ageing continues, then further restrictions will have to be introduced. The most logical of these is the radical and continuous increase of the age of retirement, through which the increasingly high implicit sovereign debt can be reduced. This can also be categorized as the usual reduction mechanism of high sovereign debt, its disinflation. This solution considers ageing caused by a lack of children and reduces pension promises through the continuous and robust reduction of pensions themselves, or their period. It does nothing to handle the basis of the problem, the fact that it was the modern pension system itself that turned to raise children into a bad deal, and in fact it increases unfairness towards people who have children, because it distributes the negative effect caused by the general lack of children evenly among those who are responsible for it and those who do have children.

The Chilean solution is extremely popular among its original planners, neoclassical economists, and of course, this is also the most popular solution among life insurers because it would potentially allow their business to grow to huge proportions. However, two objections can be raised to the system, both of which are practical rather than theoretical:

1. The initial step in funding must assumable be the one-time acknowledgement or “printing” of the implicit sovereign debt, because long-term, slow capitalization solutions such as the 1998 Hungarian pension reform managed by the World Bank (for its theoretical foundations, see World

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Holzmann and Palmer, 2006; Holzmann, Palmer, and Robalino, 2013).

Bank, 1994), according to experience, can easily be reversed politically. This means, however, that sovereign debt will increase to immense proportions. In addition to practical problems, this also raises the question of whether it is realistic that this debt can be worked off at all within a reasonable time (Banyár, 2017b).

2. If the capitalization is realized such that in the long term the—now explicit—sovereign debt remains the primary capital behind the pension system, then to all intents and purposes nothing has changed. This points to the fact that such a "capitalized" pension system is practically the same as the realized PAYG system, and to the fact that not only is the pension system a Ponzi scheme, but so too is the practice of hugely increasing the sovereign debt, and thereby the burdens of future generations. Who must either undertake those, or escape from them somehow, and will most probably choose the latter, which raises grim prospects for the pension system, and for future pensioners (Banyár, 2017a).

Immigration seems to be a logical and cheap solution. Moreover, indeed: why spend huge amounts of money on raising children if others are prepared to do so instead of us, and make the result available to us free of charge? It is more logical for people to spend this money on their own consumption, as has otherwise been the practice in developed countries in recent decades, thus leading to ageing as a financial problem.

However, upon taking a closer look, it is evident that immigration is a deeply problematic solution, because, in developed Western economies in which the pension system has fallen into crisis because of ageing, not all kinds of immigrants can be suitably employed. There are many poorly educated immigrants, mainly from Africa and the Middle East. It would definitely seem, however, that these will not be the saviors of the welfare systems of developed countries, but their further beneficiaries. The reason is simple: during the critical period of their raising, for example, in childhood, there was no concentrated, high-level investment in their human capital (in their training), which would make them suitable to stand their ground in the workplaces of developed countries. By the time they arrive as migrants, they are past the age when this could be done. The only remaining solution is to invite migrants from countries in which this early investment in human capital was realized.

Moreover, this indeed works in the case of the EU: the rich EU member states attract the highly-trained workforces of less affluent member states. This also assists the further existence of their pension systems, meaning it handles the problem well for a time but at the price of exacerbating the problem in poorer member states (Banyár, 2014a). Meaning poorer member states do not enjoy the profits of the significant human capital investments they have realized, which will eventually lead to tensions in relations between affluent and less affluent member states. It would seem, therefore, that in developed countries the ageing problem cannot be solved without a human capital investment that is greater than the current one, one of the most obvious solutions to which, although undoubtedly not the only possible solution, would be the reorganization of the modern pension system as described above.

The Logically Pure State Pension System in Literature

In retrospect, it is interesting that despite the many inconsistencies described above, the majority of experts still believe that existing PAYG systems still have a coherent basic philosophy, the principle of solidarity between generations. It would seem that existing practices have "gouged" troughs in the "neural pathways" of those dealing with the topic, into which thinking with relation to the subject slips back repeatedly, and which are difficult to leave. We do not have to go far for example: in 2003, the author of this chapter published a book in collaboration with József Mészáros (Banyár and Mészáros, 2003/2009), in which he cited this approach to existing PAYG pension systems as being self-explanatory. He continued to do so—right up until 2014—despite the fact that in 2005 he read a thought-provoking study on the subject by four Czech life insurance experts (Hyzl, Rusnok, Kulhavý and Řezníček, 2005), who in a logically totally coherent manner described the possibility of a new kind of PAYG system, which is to all intents and purposes the same as has also been suggested in this chaoter, above.

It is also interesting that the supporters of pension systems based on raising children, who are thankfully increasing in number (Demény, 1987; Werding, 2014; Botos and Botos, 2011; Banyár, Gál and Mészáros, 2016; Giday and Szegő, 2018; Regős, 2015; Kovács, 2012), while pointing out the importance of raising children, want to recognize it as a contribution payment.[7] They do not realize that contribution payments are not a legitimate claim for receiving a pension, but that they are the repayment of a previous debt, which may be mandatory, but this is where the comparison ends; it does not give rise to entitlements but closes an obligation that came about previously. This also indicates the extent to which the ad hoc, theoretically unfounded solutions of the modern pension system, which according to the standards of world history were only created "yesterday," have "eaten their way" into people's way of thinking, and that it is challenging to free ourselves from this burdensome inheritance. However, let us

[7] As indicated by Banyár, Gál, and Mészáros (2016), which was written in 2012-2013, this opinion was also shared by the author of this paper, but he changed his opinion (Banyár 2014b, 2016, 2017a).

trust that it is not impossible. A great deal depends on whether we do so or not.

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