MAGYAR TUDOMÁNYOS AKADÉMIA
Közgazdaság- és Regionális Tudományi Kutatóközpont

MTA KRTK KTI

Centre for Economic and Regional Studies
HUNGARIAN ACADEMY OF SCIENCES

MŰHELYTANULMÁNYOK DISCUSSION PAPERS

MT-DP – 2014/14

Design Errors in Public Pension Systems: The Case of Hungary

ANDRÁS SIMONOVITS

INSTITUTE OF ECONOMICS, CENTRE FOR ECONOMIC AND REGIONAL STUDIES,
HUNGARIAN ACADEMY OF SCIENCES BUDAPEST, 2014

Discussion papers
MT-DP – 2014/14

Institute of Economics, Centre for Economic and Regional Studies,
Hungarian Academy of Sciences

Design Errors in Public Pension Systems: The Case of Hungary

Author:

András Simonovits
research advisor
Institute of Economics
Centre for Economic and Regional Studies
Hungarian Academy of Sciences
also Department of Economics, Central European University
and Mathematical Institute, Budapest University of Technology
e-mail: simonovits.andras@krtk.mta.hu

June 2014

ISBN 978-615-5447-28-0
ISSN 1785 377X

Design Errors in Public Pension Systems: The Case of Hungary

András Simonovits

Abstract

This paper discusses design errors in public pension systems, using Hungary as an illustration. When the communist political and economic system was replaced by democracy and market economy, the subsequent governments had even greater difficulties in designing consistent pension reforms than before. Double-digit inflation and deep decline in real wages called for indexation and valorisation of pensions. In addition to arbitrary public policy, poorly designed rules even amplified the errors of the public pension system, creating notch cohorts and disadvantaged strata.

Keywords: public pension system, social security, Hungary, design errors

JEL classification: H1, H8

Acknowledgement

I express my gratitude to Mária Augusztinovics, Zsombor Cseres-Gergely, Róbert I. Gál, and János Réti, who guided me in my research at various times and to Nicholas Barr, Elaine Fultz and Michael Lovell for a careful reading of an earlier version. They are not responsible for the content of the paper.

Tervezési hibák a társadalombiztosítási nyugdíjrendszerekben: Magyarország esete

Simonovits András

Összefoglaló

A dolgozat a társadalombiztosítási nyugdíjrendszerek tervezési hibáit taglalja Magyarországot használva szemléltetésként. Amikor a kommunista politikai és gazdasági rendszert felváltotta a demokrácia és a piacgazdaság, a konzisztens nyugdíjreformok tervezésében az egymást követő kormányoknak még a korábbiaknál is nagyobb nehézségekkel kellett szembenézniük. Többszámjegyű infláció és a reálbérek zuhanása megkövetelte a nyugdíjak indexálását és valorizálását. Az önkényes költségvetési politika mellett a rosszul tervezett szabályok még felerősítették a nyugdíjrendszer hibáit, kivételezett évjáratokat és hátrányosan érintett rétegeket teremtve.

Tárgyszavak: társadalombiztosítási nyugdíjrendszerek, társadalombiztosítás, Magyarország, tervezési hibák

JEL kód: H1, H8

1. INTRODUCTION

Since the publication of the provocative World Bank (1994) book, a lot of papers have studied the *big* problems of various pension systems: (i) Should the system be public or private? (ii) Should the public benefits be proportional to earnings or flat or between? (Private benefits should be proportional but strangely enough, there were defined benefit, namely final pay private systems, too.) Relatively few studies have analyzed smaller, though still relevant problems of private and public systems which we call *design errors*. As a careful reader warned me, what is an error to one observer may be an achievement for another. To avoid this trap I mostly pay attention to those measures which are quite generally considered as errors.

The present paper tries to contribute to this relatively neglected field, confining attention to public systems, and especially to the Hungarian public system (for a precedent, see Augusztinovics and Martos (1997)). Following the continental custom, we shall distinguish the indexation of pensions *in payment* and of *initial* pensions, and refer to the latter as *valorisation*.

As a warm up, we list some of the most important design issues. Recall that in an inflationary world, unindexed pensions quickly lose their purchasing power, therefore most modern public systems are *indexed* according to wages or prices or their averages. The *contribution rate* should be high enough to ensure consumption smoothing and low enough to preserve sustainability. Its break up into the employee and the employer parts on the on hand and between public and private pillars on the other hand also require care. The *cap* on the contribution base should be high enough to replace the lost income of the lower paid workers and low enough to constrain higher pensions (cf. Valdés-Prieto and Schwarzhupt, 2011 and Simonovits, 2013). Further problems arise with the taxation of pensions: how should pension contributions and pensions be taxed?

To be more concrete, we mention several serious design errors occurring in various countries. (i) Already Barr (1981) remarked that in the UK, for many year, pensions were increased on an *ad hoc* basis: (a) the unpublished rule was to index pensions in payment to the pre-tax average wage, (b) pensions were increased by more than that in the run up to an election, but then under-indexed after the election to preserve the long-run relation to average wages. Since the early 1970s, inflation started to rise and the governments preferred to create an automatic link between price levels and benefit levels. (ii) The initial US public pensions were not only valorised but also indexed since 1973. This elementary error was

eliminated in 1977 but the four-year anomaly created the so-called "notch cohorts", whose benefits were higher than that of earlier and later cohorts (Barr and Diamond, 2008, pp. 73–74). (iii) The British pension index was equal to the maximum of the annual wage and price inflation between 1975 and 1980. Obviously, in case of lagged wage-price spiral, such a design may significantly overindex pensions. Luckily, it was changed into a consistent method, namely price indexation since 1981, though this method significantly reduced the relative value of pensions to wages in the long run (Barr and Diamond, 2008, p. 77).

We add a fifth design error to the list: The cap on the base of the contribution was minimal, i.e. equal to the minimum wage in the UK in the 1950–1960s, equalizing all the contributions and holding down the flat benefit until the cap was increased significantly. Even in the relatively well-designed US Social Security System, the cap-average growth wage ratio wildly oscillated and in the mid-1960s, even dropped to 1! Barr (2013) also criticized the Finnish system for not having a cap.

Discussing the literature, we also refer to Lovell (2009), which is a masterpiece of analysis of such design errors. It discusses five errors in the indexation occurring in the US Social Security system in detail. Considering different career paths (ranging from minimal wage earners to maximum wage earners) Lovell shows their impacts and proposes remedies.

The partial privatization of the public systems in the East-Central European region has received a special emphasis (from Müller, 1999 through Schmähl and Horstmann, 2002 to Casey, 2014) and diverted attention from other, equally important issues. A lot of studies have been published on the big problems of the *Hungarian* pension system (e.g. Augusztinovics et al., 2002; Czúcz and Pintér, 2002; Gál et al., 2008). Orbán and Palotai (2005) warned on the problems of sustainability of the Hungarian system. Simonovits (2011) wrote an obituary for the nationalized private pillar.

Building on Simonovits (2003), in the present paper, we shall analyze a number of similar and other errors in design and reform, using the example of the Hungarian system. Section 2 presents the following errors in *indexing pensions in payment*: (i) between 1968 and 1991, the annual rises consisted of a flat and a proportional part, leading to the unwanted convergence of low and high pensions; (ii) changing the technique of indexation in 1996 and 1999 back-and-forth (see Lovell's one-year lag), the pensioners lost to the workers; (iii) by overestimating the consumer price index (inflation rate), the government raised pensions in payment by 5% above the intended level just in two years, 2013 and 2014.

Section 3 deals with the design problems of *initial pensions* in Hungary. It has many dimensions: (i) due to the originally short *reference period*, only the few latest earnings were taken into account when calculating the initial benefits, which favoured those with steep rise in their wage curve; (ii) the relatively high cap on contribution base (or its lack) causes

superfluous tensions; (iii) *improper valorisation;* calculating the average lifetime earnings, the wage increases of the latest years were neglected; (iv) *clumsy progressivity* when the reference wage is obtained from the average lifetime earnings in an awkward way, (v) *zigzags in the accrual rates*, which haphazardly transforms the reference wage (AIME) into the primary insurance amount (PIA) obtained by withdrawing (vi) at normal retirement age which was too low all over the world and (vii) the *erroneous actuarial adjustment:* the initial pension-PIA-ratio is either too low or too high with respect to the difference between the actual and the normal retirement age.

Section 4 discusses a few simultaneous occurrences of these errors in Hungary. Table 2 demonstrates the unwanted sensitivity of pensions in 1996 on the date of retirement: those who retired in 1990, received benefits 13% higher than average, while those who retired in 1994, received almost 10% less than average. Figure 2 depicts the runaway of the real values of initial pensions between 2000 and 2006: on average, they grew by 60%, while the real value of average pensions "only" grew by 40%. A third example explains the interference of personal income tax reforms with the pension formula. The paper is completed by Conclusions.

2. POOR INDEXATION

It is noteworthy that at the beginning of the spread of public pension systems, there was no regular and automatic connection between the inflation and the current value of pension. Note that this era (1950–1970) was characterized by low inflation in most of the developed world and of the communist countries.

FLAT + PROPORTIONAL INDEXATION

Between 1947 and 1990, Hungary was a communist country, where most prices were set by the central government and fixed for a long period of 1951 and 1967. When a more flexible 'new economic mechanism' was introduced in 1968, there was an optimistic forecast of 2% annual inflation and consequently, benefits were also automatically raised by 2% every year. When prices rose by more than 2%, and they did most of the times, the government additionally increased every pension by the same absolute amount, to relieve the 'small pensioners' from destitution. It is not difficult to grasp that such a system (similar to the *scala mobile* used in Italy for wage indexation around 1970) led to a convergence of low and high pensions. Since this diminishes the weight of consumption smoothing, it was a bad policy and if the government had wanted to diminish the variance of pensions with respect to

that of wages, then it should have set the initial pensions to the desired proportions; and by proper indexation, these proportions should have been preserved.

BACKWARD LOOKING AND FORWARD LOOKING INDEXATION

Every year every pension in payment is related to its previous value through indexation. The index is generally equal to the price (inflation) or wage or mixed price–wage index (= 1 + rate), whatever applies. But at the end of the year, when the government sets the new benefits for the next year, the value of the next price or wage index is not yet known. There are two solutions. Using *backward-looking* indexation, the government applies the index of the previous year. Using *forward-looking* indexation, the government applies the *expected* index of the current year. It is clear that backward-looking indexation is simple but may be costly at fast disinflation. Forward-looking indexation is less costly but needs careful forecast. (Lovell (2009) works out a sophisticated system but it may not apply to the chaotic dynamics of the inflation process occurring in fiscally undisciplined countries like Hungary. Backward indexation on a quarterly basis might be a simple solution.) Revision is easy if the government underestimated the actual index but is impossible otherwise.

To give concrete examples for erroneous indexation, consider the following events occurring in Hungary. Between 1992 and 1995, pensions were raised by forward-looking indexation. In 1996, the government introduced backward-looking indexation, reducing the nominal increase in benefits from 18.4 to 12.4% (the inflation rate in that year was 23.6%). In 1999, the next government returned to the earlier rule, reducing the nominal increase in benefits from 18.3 to 12.7% (the inflation rate in that year was 10.0%), altogether reducing the average replacement ratio. Subsequent opposition parties have successfully blamed the governments for the same tricks which they also used before or after.

UNDERESTIMATING INFLATION

A third type of design error in indexation occurred in Hungary in 2013–2014. Recall that in the Hungarian pension system, wage-price indexation replaced wage indexation in 2000 and price indexation replaced wage-price indexation in 2010. For whatever reason, in 2013 as well as in 2014, the government grossly overestimated the inflation rate: the cumulated effect was about 5% for the two years taken together. As a result of this error, in 2014 the current pensions are higher by 5% than they should be and there is no simple tool to correct the mistake in the foreseeable future. (Should the government introduce a 5% pension tax or a 5% health contribution for pensioners?) Until the last cohort of the present pensioners dies

out, the pension level remains higher than planned for a long period before it returns to its normal value.

3. ERRORS IN CALCULATING INITIAL PENSIONS

The initial pension is generally a sophisticated function of past wages (in the US context, see Lovell (2009, Section 2)) except for a truly flat benefit, where everybody receives the same amount every month. The German and the Swedish DC systems are *relatively* simple, and even the US system is simple in comparison to the Hungarian one, though it is also progressive. The Hungarian initial pension formula is especially complicated and this makes it worse not better than a simpler version. We shall discuss the following dimensions of design error: too short reference period, improper cap on the contribution base, insufficient valorisation, clumsy progressivity, haphazard accrual rates, too low normal retirement age especially for females and wrong actuarial adjustment.

SHORT REFERENCE PERIOD

Calculating the initial public pension, earnings of certain contribution years are taken into account: we shall call this period *reference period*. In a well-designed public pension system, the reference period contains all or most of the contribution years. If only the latest years are taken into account, then this reduces the initial benefits of the blue-collar workers, whose wages hardy rose with age, and increases the initial benefits of the white-collar workers, whose wages steeply rose with age. It also opens the way to manipulation of the reference wage by the collusion of the employee and the employer. In the well-designed German system, every year counts, while in the similarly well-designed US, the 35 best years. (The latter favours females raising children at home and highly educated persons with respect to workers with long careers.) In contrast, Hungary (as well as many other countries) had a poorly designed system; namely the reference period was quite short. Until 1992, only the best three years of the last five years counted.

Since 1992, every year of employment (since 1988) belongs to the reference period. By now, its length has grown to 27 years, quite long. It is noteworthy that the years spent on maternity leave are credited and years spent at higher education before 1990 are also counted but those after 1990, not. In the communist era, when the wage differences between blue and white collar workers were quite modest, the accreditation of university years was logical. But with the emergence of significant skill premium (Kertesi and Köllő, 2002) it has become unjustified by now.

EMPLOYEE'S VS. EMPLOYER'S CONTRIBUTIONS

Somewhat illogically, in most countries, the contribution is broken up into an employee contribution and an employer contribution. The former is deducted from the gross wage, while the latter is added to the gross wage, leading to the *wage cost*. Obviously, the structure of this partition is quite arbitrary and in economic terms neutral but it varies from country to country and from period to period. This custom makes the international comparison quite cumbersome and hides the employer's contribution from the participant's sights. It is small wonder that in the communist countries, the employee's contribution was much smaller than the employer's and this bad custom survived until now. For example, in Hungary, the former is 10% and the latter is 24%, adding up to 34%. Equalizing them as 17+17, the standardized gross wage rises from 100 to 107, and the normalized total contribution rate becomes 31.8%. Taking into account the much lower but still significant health care contributions, 7 + 3 = 10% = 5 + 5, would not much change the picture, the gross wage would drop to 105 and the normalized total pension contribution rate rise to 32.4%.

IMPROPER CAP ON CONTRIBUTION BASE

For various reasons (see Barr and Diamond, 2008), most of the countries most of the times put a cap on the contribution base. In terms of the gross wage, this may be as low as 1.3 in Sweden, higher in Germany: cc. 2 and in the US: cc 2.5 or rather high: in Hungary above 3 (in 1993 and between 2005 and 2012), in the Czech Republic 4. As an outlier, there was simply no cap in Hungary before 1993 and there is no cap since 2013. Typically, the valorisation applies to the capped wages.

Note that in Hungary (but probably in some other countries as well), during its existence, the cap only applied to the employee's contribution and to the benefit but the employer had to pay its full (i.e. uncapped) contribution. In economic sense, therefore the employer's contribution above the cap is a pure personal income tax. This was quite important money: in 2009, in Hungary it provided 6% of the total pension contributions and formed 10% of the de facto personal income tax. The elimination of the cap in 2013 raised the revenues on the short run but will increase the expenditures even more and also create tensions. (Contrary to oral objections to my criticque, the surviving progressivity is not strong enough to weaken this effect.)

POOR VALORISATION

Ordinary people may realize that in computing the average wage of a worker for a long period, inflation must be taken into account. But even most economists may not know that forming the average wage of various years (AIME), it is the nation-wide average wage rather than the consumer price index which is used. To avoid mathematical equations, it is worth recalling the German point system: each year, the individual earning is divided by the nation-wide average earning and the resulting points are summed up for the whole career. Every year, a new value is determined for the pension point. Turning to Hungary, between 1992 and 2007, the last two years' wage rises were neglected, making the real value of benefits highly sensitive to the inflation rates around retirement.

CLUMSY PROGRESSIVITY

Unlike Germany and somehow copying the US practice, Hungary has been characterized by a rather complex progressive formula for the initial pension. For a long time, there were 10 earning classes, starting with 100% and ending with 10%. The values of the bending points have not followed either the price level or nominal wages. Its complexity presumably contributed to its unpopularity. When the three-pillar pension system was introduced in 1998 and the entry to the mandatory private funded pillar was made voluntary for those already working. Therefore it was natural to plan to eliminate the progressivity of the public pillar for the start of the pay-out period, namely 2013. (If the remaining public pillar had remained strongly progressive, then the higher paid would have entered the mixed system, while the lower paid would have stayed in the pure public system.) It is another question that the second pillar was closed down much earlier, at the end of 2010 (cf. Simonovits, 2011).

To underline the unnecessary complexity of the Hungarian pension formula, note that until 2008, the reference wage illogically contained not only the net wage but also the employer's contribution. Since the latter was proportional to the gross rather than the net wage, this not only raised the initial benefits but counteracted the intended progressivity.

There have been vague plans to set up a flat pension in Hungary but its introduction can only be achieved by a corresponding reduction of the current, quasi proportional system, a non-starter.

HAPHAZARD ACCRUAL RATES

Recall that originally only the last few years of employment belonged to the reference period in Hungary. Therefore, in addition to the reference wage, the length of the employment

inevitably also had to be taken into account in the determination of the initial pension. (Note that calculating the AIME in the US, there are zeros for those years where the worker did not work during his 35 best years.) The simplest method would have been to make the initial benefit proportional to the product of the average reference wage and the length of the employment. By historical reasons, a much more complicated method was chosen in 1975 and retained until now. The average reference wage is multiplied by the *total* accrual rate, which is the sum of the *differential* accrual rates. Originally the government wanted to favour those who had only short careers (e.g. farmers whose farms were collectivized around 1961), therefore the latter started from a rather high 3.3% just to drop through 2 to … 0.5% but since 1996, their curve is U-shaped: 3.3% between 1 and 10 years, 2% between 11 and 25 years, 1% between 26 and 36; 1.5% between 37 and 40, and 2% again. There is a maximum, however: those, who retire at the normal retirement age, cannot receive more than 100%. This is not a real restriction (nobody starts to work at age 12 to accumulate 50 years of service until retirement), but is has some impact on the benefits at late retirement.

At the beginning, the transition to longer reference period played havoc. For example, those, who retired between 1992 and 1996 and their valorised final pays were much lower than previously, obtained much lower pensions than would be normal with a full reference period and valorisation (Table 2 below).

TOO LOW NORMAL RETIREMENT AGE

The normal retirement age is one of the most important parameter of the pension system. It allows workers to stay until reaching this age and it allows employers to get rid of workers who reached this age. Workers retiring at this age receive a pension benefit called *primary insurance amount* and shortened as PIA in the US. Note that until 1996, in Hungary (as well as in most ex-communist CEE countries), the normal retirement (or full benefit) age was quite low: 55 for females and 60 for males. Then this parameter rose by a year in every second year until reaching the unified age 62 in 2009. (Of course, the male retirement age only rose until 2001.) And under the burden of the international financial and economic crises, a new rise was enacted in 2010: in every year between 2014 and 2022, the normal retirement age will rise by half a year until reaching 65. Probably this parameter should have been raised much earlier and more slowly.

PROBLEMS WITH EARLY VS. LATE RETIREMENT

Until now it was implicitly assumed that the individual retired at the normal retirement age. Conforming to the Hungarian and other countries' practice, we also assume that when

somebody retires, he stops working and immediately claims his benefits. Now we move beyond the PIA and outline the impact of early vs. late retirement on the initial benefit. Starting with the former, until 2011, early retirement was too easy in Hungary. For example, some years ago, about 92% of the newly retired workers had retired before reaching the normal retirement age. They could be classified into two groups. Those in the first group had sufficiently long employment records (40 years for males and somewhat less for females) and they received full benefits. Those in the second group had shorter records, and they suffered quite mild reductions. (The towering but thorny question of disability pensions is neglected.) Without going into the details of the transition matrix, which determined the deductions due to early retirement as a function of age and length of employment, we make the following remark: between 1996 and 2008, the effective retirement age hardly rose for males but quite steeply rose for females.

In 2012, a new rule came into existence. Males can no longer retire before reaching the full retirement age. Thus Hungary joined the club of those eccentric countries (e.g. Great Britain and Norway), where the minimal and the normal retirement ages are the same. This is poor economics, since it replaces the "price system" with a simple ban. Paradoxically, at the same time, females can retire at any age having reached 40 years of reference. For example, females working from age 18 to 58 can retire with full benefits. To prevent women with university education to retire at age 58, the university years do not count at all in this aspect. Nevertheless, a surprisingly high share of women below normal retirement age (including white collar workers obtaining their diplomas during work) was able to retire with full benefit, undermining the expected saving from rising normal retirement age. According to a quite optimistic recent government study, between 2013 and 2023, the rise in the normal retirement age will increase the activity rate by 1.6% points, the prevention of early retirement for males by 1.7% points, curtailing disability retirement by 1,2% points, while the exemption of females with 40 years rights diminishes it by 0.9% points.

Turning to the small minority of those who retire after reaching the normal age––following widespread international measures––quite impressive delayed retirement credit is paid out. Since 2004, every extra month (year) increases the average reference wage by 0.5% (6%). This is in harmony with the newer German or the US practice but can be criticized as follows: the later somebody retires, the longer will he live on average.

To substantiate this claim, we present Table 1 showing the relevant date of those Hungarian males, who died in 2004 and enjoyed old-age pensions. (The story of female retirement is more cumbersome and is skipped.) Though in this calculation, many different cohorts are mixed together, the bulk of the deceased retired when the normal retirement age was 60. Column 2 shows the age at retirement from 57 to 65 years. Column 3 displays their frequency in the population. Column 4 shows the average number of years spent in retirement. Column

1 is calculated as the sum of columns 2 and 4, presenting the life expectancy. For example, row 1 shows males who retired at age 57 (2), form 7.4% of the population considered (3), spent 12.3 years in retirement (4), summing up to 69.3 years (1). Column 5 shows the remaining life expectancy at the given age, regardless of being retired or not. Column 6 is equal to the difference of column 4 and column 5, the error in estimation. For example, males at age 57 had a remaining life expectancy of 18.0 years (5) and the estimation error was −5.7 years (6). Table 1 demonstrates the significant adverse selection, also discussed in Diamond and Mirrlees (1978): disability retirement and Diamond (2003): old-age retirement. As life expectancy rises, the error in estimation also steeply rises, although in a truly actuarial fair system, it should stay close to zero.

Table 1.

The expected lifespan and retirement age, males

Life expectancy (1)	Retirement age (2)	Relative frequency (3)	Expected pension span (4)	Remaining life expectancy (5)	Error in estimation (6)
69.3	57	7.4%	12.3	18.0	−5.7
71.5	58	6.0%	13.5	17.3	−3.8
73.2	59	4.6%	14.2	16.7	−2.5
77.2	60	60.5%	17.2	16.1	1.1
79.1	61	12.7%	18.1	16.4	1.7
82.9	62	3.9%	20.9	14.9	6.0
85.4	63	2.1%	22.4	14.3	8.1
86.4	64	1.6%	23.4	13.7	9.7
89.3	65	1.4%	24.3	13.1	11.2

On the basis of Eső, Simonovits and Tóth (2011), Table A.2.

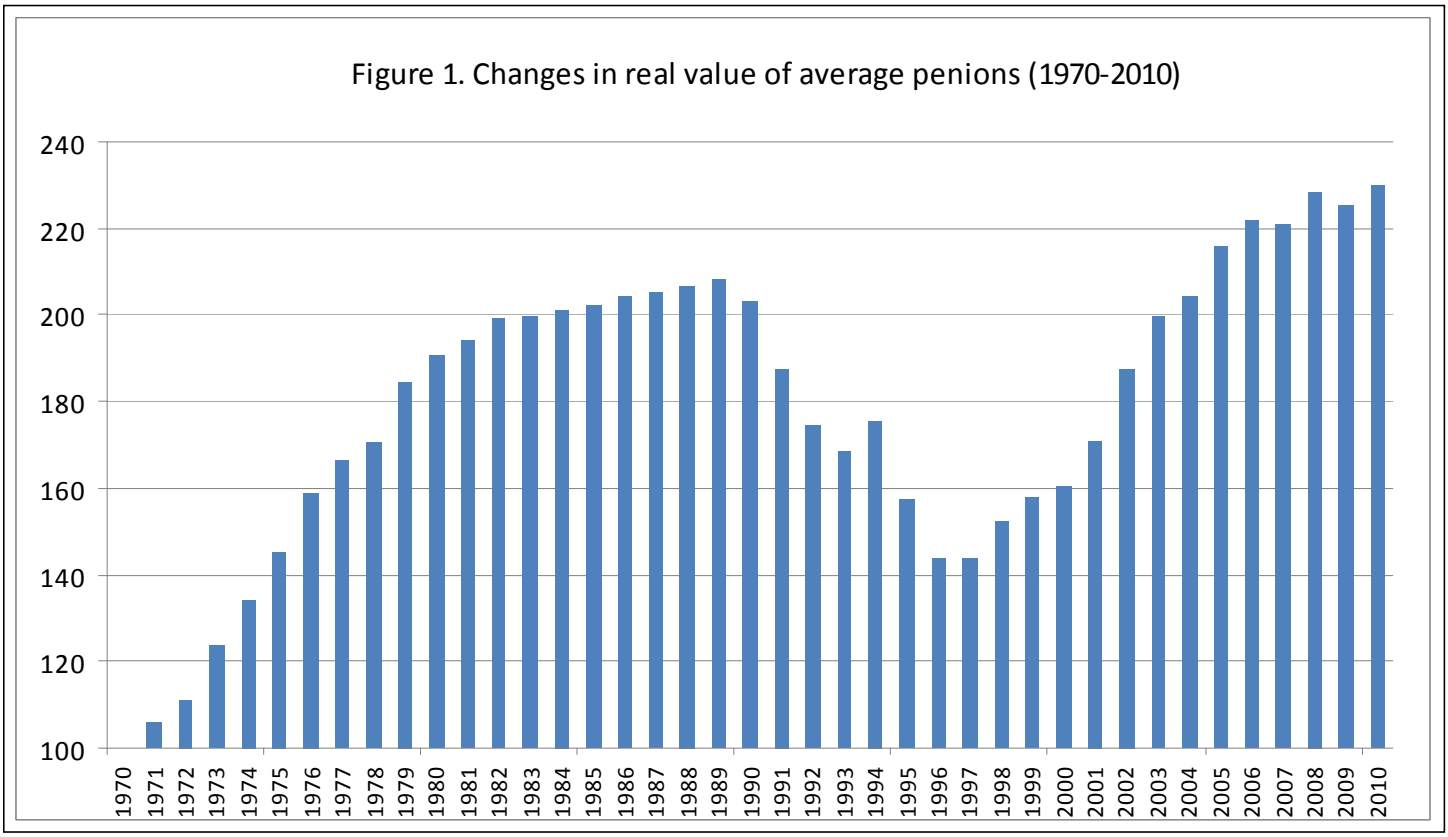
4. ILLUSTRATIONS OF SIMULTANEOUS IMPACTS OF DESIGN ERRORS

In this Section we shall present several simultaneous impacts of design errors in Hungary.

INDEXATION OF PENSIONS IN PAYMENT

Figure 1 shows the percentage change in real value of average pensions of a given year between 1970 and 2010. (Here the logical co-movement of the pensions and wages is mixed up with design errors.) Note that between 1970 and 1989, the real value of average pensions

more than doubled (while the real wages grew much less). During the transformational depression, between 1989 and 1996, this variable dropped just to return above the previous peak by 2004 and above. The elimination of the 13th month benefits (not shown in Figure 1) reduced them by 8%.



DEPENDENCE OF INITIAL PENSIONS ON RETIREMENT AGE

Table 2 shows how strongly and erroneously the value of the pension in a given month (November 1996) depended on the *date of retirement*. The contrast between the peak in 1990 (113%) and the trough in 1994 (90.4%) shows pathological sensitivity to retirement date and lack of consistency in the formula. It took ten years for the government to rectify the most absurd injustices between 2006 and 2008.

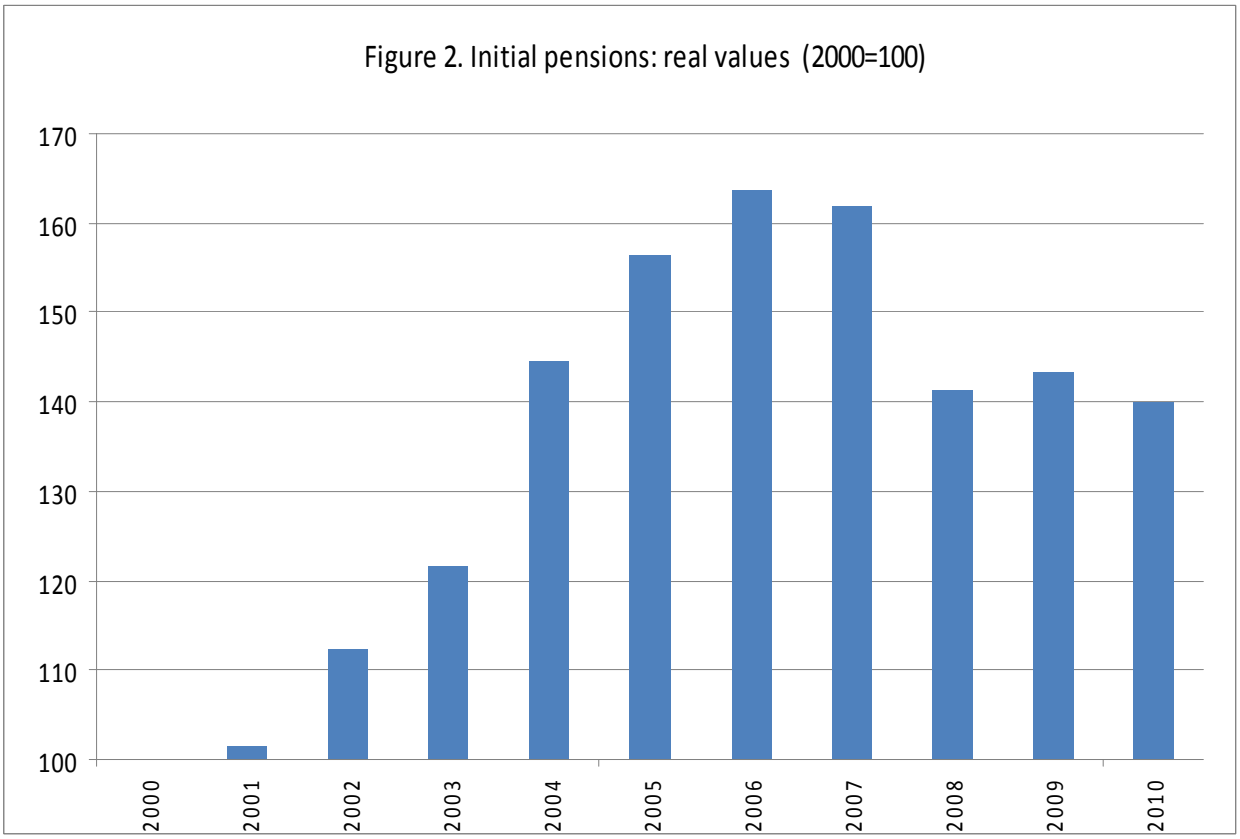
Table 2.

Dependence of Hungarian pensions on date of retirement, 1996:11

Date of retirement	Share of groups	Pension in terms of average
until 1970	2.2	95.7
1971–75	4.8	99.6
1976–80	11.4	98.5
1981–85	17.7	101.8
1986–89	18.1	105.8
1990	7.9	113.2
1991	8.3	98.1
1992	6.8	94.0
1993	6.7	93.3
1994	6.2	90.4
1995	6.8	93.9
1996	2.9	97.0

Source: Réti (1997, p. 42) Table 9 with a correction in Simonovits (2003, Table 4.4).

Figure 2 shows the spectacular rise of initial pensions in the mid 2000s. Between 2000 and 2006, the real value of initial pensions grew by 60%, while that of the average pensions (initial pension and pension in payment) grew "only" by 40%. There were several reasons behind this divergence: a) the first reason was the step-by-step phasing out of progressivity, raising the higher initial pensions. b) The second reason was the drop of inflation from 14% in 1998 to 3.6% in 2005. Due to the two-year lag in valorisation in the initial pensions mentioned above, this disinflation spectacularly raised the initial pensions. It took several years until the government finally reacted. The new rule of 2008 eliminated the delays. c) As was already mentioned, by negligence, until 2008, reference wage base also contained the contribution paid by the employee, weakening the progressivity of the system. In 2008, this anomaly was eliminated, and the so-called net-gross wage was replaced with the much lower net wage base. These corrections resulted in an immediate drop of 8% in the initial pensions.



THE DISTORTIONS IN PENSIONS BY PERSONAL INCOME TAXATION REFORM

Point c) also leads us to the impact of radically changing personal income taxation on the future initial pensions. For easier understanding, we confine ourselves to the analytical study of the interaction of the *proportional* personal income tax and the proportional pension benefit. We shall use the following notations: b = benefit, w = total wage cost, β = total accrual rate in terms of net wage, θ = personal income tax rate, τ = pension contribution rate in terms of wage cost and μ = system dependency rate. Then we have the following equations:

Pension: $b = \beta (1 - \theta - \tau)w$, balance equation: $\mu b = \tau w$. After substituting the pension equation into the balance equation, $\mu \beta (1 - \theta - \tau) = \tau$ obtains. It is easy to see that at the equilibrium, the accrual rate β is a function of the contribution rate τ as well as the personal income tax rate θ, both calculated in terms of he wage cost: $\beta = \tau/[\mu (1 - \theta - \tau)]$. For any fixed contribution rate τ, if the personal income tax rate θ drops, then the total accrual rate β should be reduced. Using $\mu = 0.7$, $\tau = 0.3$, $\theta = 0.2$ yield $\beta = 0.857$, while the reduced $\theta^* = 0.13$ implies $\beta = 0.75$. For the more realistic analysis of the process, one needs work with gross rather than total wage, take into account the heterogeneity of wages and extend the simplistic static modelling by a more sophisticated dynamic one (see Cseres-Gergely and Simonovits, 2011). But the punch line is clear: the significant reduction of personal income tax rate has a

strong and unfavourable impact on the balanced pension formulas and implies perverse redistribution from the lower paid to the higher paid.

5. CONCLUSIONS

We have outlined some design errors occurring in the Hungarian public pension system from 1968 to 2013 and beyond. Leaving aside the deeper problems of adequacy and sustainability, we only concentrated on the consistency of the pension system. Studying pensions in payment and initial pensions we have experienced a lot of design errors, concerning (a) indexation during working years, (b) calculation of initial pension, (c) increase in pension for a delayed start to benefit, (d) valorisation of pensions in payment, etc. Above the individual errors, we stress a basic pitfall: when the ruling government designed and implemented a pension reform, the experts and the politicians paid insufficient attention to certain consistency requirements. This attitude implied permanent reforms, and weakened the trust in the pension system. The overcentralisation, characterizing the post 2010 Hungarian government (Kornai, 2013), gives little hope to discuss and especially overcome these problems.

REFERENCES

Augusztinovics, M.; Martos, B. 1997. "Pension reform: calculations and conclusions", in *Acta Oeconomica*, Vol. 48, Nos. 1-2.

Augusztinovics, M.; Gál, R. I.; Matits, Á.; Máté, L.; Simonovits, A.; Stahl, J. 2002. "The Hungarian pension system before and after the 1998 reform", in E. Fultz (ed.), *Pension Reform in Central and Eastern Europe*, Vol. 1–2, Geneva, International Labour Office.

Barr, N., 1981. "Empirical Definitions of the Poverty Line", *Policy and Politics*, 9:1, 1–21

Barr, N. 2013. *The pension system in Finland: Adequacy, sustainability and system design*, Helsinki, Finnish Centre for Pensions.

Barr, N.; Diamond, P. 2008. *Reforming pensions: Principles and policy choices*, Oxford, Oxford University Press.

Casey, B. 2014, "From pension funds to piggy banks: (Perverse) consequence of the Stability and Growth Pact", *International Social Security Review*, 67:1, 27–48.

Cseres-Gergely, Zs., Simonovits, A. 2011. "The impact of personal income taxation reform on the public pensions", *Hungarian Economic Review (in Hungarian) 58*, 1029–1044,

Czúcz, O.; Pintér, M. 2002. "Transformation of old-age security in Hungary", in W. Schmähl; S. Horstmann (eds.). *Transformation of pension systems in Central and Eastern Europe*, Cheltenham, Edgar Elgar.

Diamond, P. 2003, Taxation, incomplete markets and social security, Munich Lectures, Cambridge, MA, MIT Press.

Diamond, P and Mirrlees, J., 1978, "A Model of Social Insurance with Variable Retirement", *Journal of Public Economics 10*, 295–336.

Eső, P., Simonovits, A. and Tóth, J., 2011, "Designing Benefit Rules for Flexible Retirement: Welfare and Redistribution", *Acta Oeconomica, 61*, 3–32.

Fultz, E. (ed.). 2002. *Pension reform in Central and Eastern Europe*, Vol. 1-2, Geneva, International Labour Office.

Gál, R., Iwasaki, I. and Széman Zs., 2008: *Assessing intergenerational equity*, Budapest, Akadémia.

Kertesi, G. and Köllő, J. 2002, Economic transformation and the returns to human capital, in: A. De Grip, J. Van Loo and K. Mayhew (eds): The economics of skills obsolescence, *Research in Labor Economics*, Vol. 23, *Elsevier*.

Kornai, J. 2013, "Centralization and market reform: an introductory study to Volume III of the work series", *Acta Oeconomica, 63*, 335–366.

Lovell, M. C. 2009, Social Security's five OASI inflation indexing problems, Economics: The Open Access, Open Assessed E-Journal, p. 1–40.

Müller, K. 1999. *The political economy of pension reform in Central-Eastern Europe*, Cheltenham, UK, Edward Elgar.

Orbán, G.; Palotai, D. 2005. *The sustainability of the Hungarian pension system: A reassessment* (Budapest, MNB Occasional Papers 40), Central Bank of Hungary.

Réti, J. 1996: "The basic calculations of the pension reform: the possibilities (in Hungarian)", Budapest. Pension Self Government.

Schmähl, W.; Horstmann, S. (eds.). 2002. *Transformation of pension systems in Central and Eastern Europe*, Cheltenham, Edgar Elgar.

Simonovits, A. 2003, *Modeling pension systems*, Oxford, Palgrave Macmillan.

Simonovits, A. 2011, "The mandatory private pillar in Hungary: an obituary". *International Social Security Review*, 64:3, 81–98.

Simonovits, A., 2013, Socially optimal cap on pension contributions, IE-CERS-HAS Working Paper, 36.

Valdés-Prieto, S. and Schwarzhupt, U. 2011, Optimal compulsion when behavioural biases vary and the state errs, CESifo Working Paper 3316.

World Bank. 1994. *Averting the old age crisis: Policies to protect the old and promote growth* (Policy Research Report), Oxford, Oxford University Press.