Unexpected Inflation and Public Pensions: The Case of Hungary

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Abstract

Public pensions are indexed to prices or wages or to their combinations; therefore, the impact of inflation on the real value of benefits can often be neglected, especially under indexation to prices. At high and accelerating/decelerating inflation like currently prevailing in Hungary, however, this is not the case. (i) With fast inflation of basic necessities, proportional indexation of benefits *in progress* devalues the lowest benefits, paying for above-the-average consumption share of these goods. (ii) Annual, lumpy raises in these benefits imply too high intra-year drop in the real value of benefits. (iii) With accelerating inflation, the declining real value of delayed initial benefits may incite immediate retirement. (iv) With unindexed parameter values (like progressivity bending points), the *initial* benefits' structure unintentionally changes.

Keywords: inflation, public pensions, indexation, progressivity of initial benefits, delayed retirement

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1 Introduction

For a long time, public pensions in progress have been indexed to prices or wages or their combination (Whitehouse, 2009). At moderate inflation, characterizing the last two decades, politicians and pensioners have been inclined to neglect the issues of pension indexation, especially under indexation to prices. This tranquility has been annihilated by the accelerating worldwide inflation. In December of 2022, the 12-month inflation rate reached 11% in EU27; surpassed 24% in Hungary and 16% in Czechia. The annual inflation was more modest, being 14% in Hungary and 15% in Czechia.

It is worth quoting some key observations of OECD (2022) on how inflation challenges pensions. (a) "[D]ue to falling real wages, price indexation has become a more favourable protection for pensioners than wage indexation, while being more costly than initially anticipated.." (b) "[A]lternatives for full price adjustment for all include a combination of: a flat rate payment; full adjustment up to a threshold and partial adjustment, potentially up to a cap beyond which no adjustment would apply."

From now on, we shall confine our attention to Hungary, mostly to recent developments. The unexpected acceleration of inflation in 2022 made the initial 5% raise of *benefits in progress* unsatisfactory, and it was completed by 3.9 and 4.5% in July and in November, respectively. Using a multiplicative rule, this has lead to a total raise of $1.05 \times 1.039 \times 1.045 = 1.140$, i.e. +14%, slightly lower than the final index.

Though the benefit raises are generally proportional to the last benefits, there are strong arguments for nonproportional raises for pensioners with low benefits when the prices of basic staff like food and household energy increase much faster than the average, while their shares are higher in the foregoing baskets than on average. For example, in December 2022, in Hungary the price levels of certain groups of goods were much higher than they were 12 months ago: food: 45%, energy: 62%, heating gas 121%, while the share of energy expenditure of the lowest quantile was 14 rather than the average 12%.

The real values of the *initial benefits* have also been affected by the accelerated inflation. On the one hand, the acceleration reduced or even eliminated the gain from delayed retirement. On the other hand, through nominally fixed progressivity bending points, inflation diminished high benefits relative to expectations or past benefits.

These changes justify the discussion of the following pension measures: (i) In addition to introducing special heating subsidies, low benefits deserve special raises. (ii) Smoothing out the real value of pensions in progress in a given year by frequent raises. (iii) Dampening the impact of accelerating inflation on delayed retirement with proper indexation. (iv) Making the real value of higher benefits inflation-free by reforming the progressive initial benefit formula. Adding up the impacts of these apparently minor measures may imply important changes.

Considering the literature, we start with Fischer (1982)'s classic paper on the *pros* and *cons* for indexation in general. We single out few earlier discussions of various issued of pension indexation: Simonovits (2003, Chapter 6) emphasized the obvious problem of backward- or forward-looking indexation of benefits in progress and the delayed valorization of initial benefits during the transition period in Hungary. Barr and Diamond (2008, Chapter 5) clearly differentiated between indexing initial benefits and benefits in progress; and analyzed the so-called overindexation of US Social Security benefits and of the UK state pension. Lovell (2009) very thoroughly examined various pitfalls in the indexation of US Social Security benefits. Though payday lending, namely short-term and very expensive loans (Stegman 2007) apparently lie far from pensions, it can be relevant to pensioners who cannot cope with the fast decreasing real value of monthly benefits within a year. Domonkos and Simonovits (2017) surveyed pension design problems of post-socialist countries. Simonovits (2020) studied the role of indexation in the relative devaluation of older pensions with respect to newer pensions and current wages. Checherita-Westphal (2022) is a latest analysis of the indexation of public pensions (and of public wages) in the current period of higher inflation.

The structure of the remaining part of the paper is as follows. Section 2 justifies special raises of low benefits. Section 3 compares actual annual and proposed monthly indexation. Section 4 evaluates the impact of accelerating inflation on the yield of delaying retirement. Section 5 studies the impact of wage and price inflation on the progressivity of a nominally framed initial benefit. Section 6 concludes. An Appendix discusses a slight distortion of the indexation.

2 Special raises of low benefits

For a long time, inflation rates have been moderate and quite uniform among the various categories. Since 2021, however, the general inflation has not only accelerated but the food and energy prices rose especially fast. Since these categories have a higher share in the consumption of households of lower incomes, these households deserve extra income support. Traditionally, low-income pensioners enjoy greater support than the average low-income population, therefore any pension study must tackle the issue. Table 1 displays the aforementioned tendency among the ten deciles for food and income and five quantiles for household energy in Hungary, in 2020. Note that as we move from the poorest to the richest decile and quantile, the shares of food and energy expenditures decline from 33 to 21% and from 14 to 9%, respectively.

Table 1. Shares of expenditure on food and household energy, HU, 2020, %

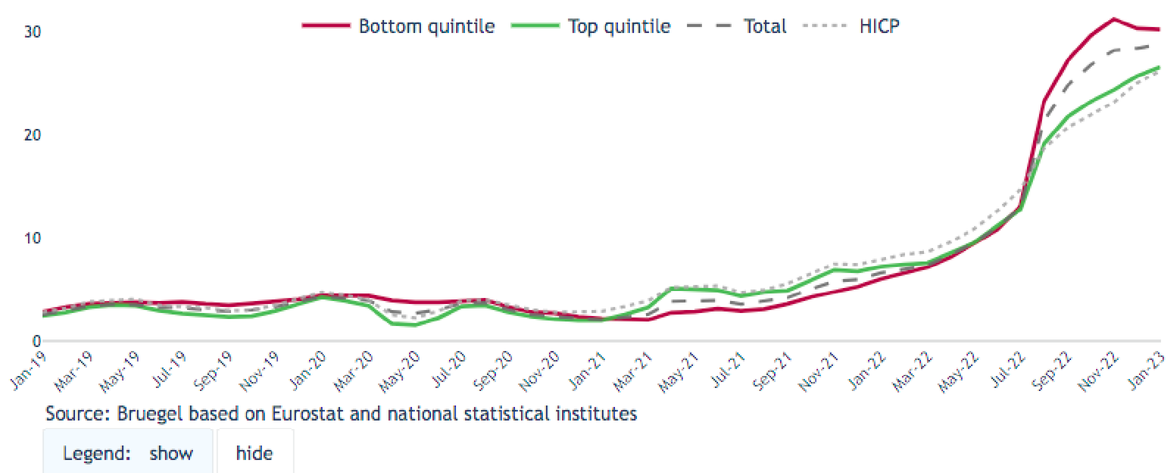
Decile	Food	Relative income	Household energy
1	33	41.2	
2	32	50.9	14
3	29	61.4	
4	29	75.4	13
5	28	87.7	
6	27	99.1	11
7	27	109.6	
8	25	124.6	11
9	24	150.0	
10	21	193.0	9
Average	26	100	12

Source. Central Office of Statistics (2021) and Eurostat HBS STR T223. The energy shares refer to quantiles rather than deciles.

The explosion of food prices is menacing but its treatment appears to be simpler than that of household energy prices. The government fixed the latter between 2012 and July 2022, but since last August, only the part of consumption below a cap has been supported, separately for energy and heating gas. Any unit of consumption above the corresponding cap costs twice as much for electricity and 7.6 times as much for heating gas. As a result, in September 2022, the average electricity and heating gas price grew by 29 and 121%, respectively. As a first approximation, we assume uniform distribution below and above the cap, then the average electricity and heating gas consumption grew by 14 and 16%, respectively. (In fact, $1 + 0.14 \times 2 = 1.28$ and $1 + 0.16 \times 7.6 = 2.16$, respectively.) It is evident that within every decile, a significant share of households are unaffected, while the remaining shares are heavily affected. It is a tricky question how to treat this problem. Perhaps heating should be taken out from the pensioners' price index and an additional heating support should be introduced but this needs a special study.

Claeys *et al.* (2023) report the impact of income-dependent consumption weights on the inflation of the lowest and the highest quantile's inflation in the EU in general, and Hungary in particular. Earlier the impact was quite small but from September 2022, the gap opened wide.

Figure 1: Inflation rates for top and bottom quantiles, Hungary (in %, year-on-year)



Source: Claeys *et al.* (2023)

From now on we shall neglect inflation inequality.

3 Indexation of benefits in progress

The indexation of benefits in progress is probably the most important single measure of the pension policy. And it becomes an especially hot topic when inflation is as high as is now. To understand the impact of accelerating inflation we must go beyond annual inflation.

We shall first describe the various inflationary indices and then discuss the benefit raises. We start from the monthly price index $p_{t,h}$, where t and h stand for the year and the month, respectively. We shall need the *price level* $P_{t,h}$, cumulating the monthly price indices from an arbitrary period, say year 0 and month 12, starting with $P_{0,12} = 1$, it is

$$P_{t,h} = \begin{cases} p_{t,1}P_{t-1,12} & \text{if } h = 1; \\ p_{t,h}P_{t,h-1} & \text{if } h = 2, 3, \ldots, 12. \end{cases}$$

We shall start from year $t = 2021$ and display the actual Hungarian data of 2021–2022 in Table 2 and supplement them by a forecast made by Éva Palócz (Kopint) for year 2023.

Table 2. Annual and monthly price indices (actual and forecast)

Year	Month	Monthly change	Monthly cumulated price level	12 months price index	Annual price index
t	h	$p_{t,h}$	$P_{t,h}$	$I_{t,h}$	P_t
2021	1	1.009	1.009	–	
2021	2	1.008	1.017	–	
2021	3	1.007	1.024	–	
2021	4	1.008	1.032	–	
2021	5	1.005	1.038	–	
2021	6	1.006	1.044	–	
2021	7	1.004	1.048	–	
2021	8	1.002	1.050	–	
2021	9	1.002	1.052	–	
2021	10	1.011	1.064	–	
2021	11	1.007	1.071	–	
2021	12	1.003	1.074	–	1.051
2022	1	1.015	1.090	1.081	
2022	2	1.011	1.102	1.084	
2022	3	1.010	1.114	1.087	
2022	4	1.016	1.131	1.096	
2022	5	1.017	1.151	1.109	
2022	6	1.015	1.168	1.119	
2022	7	1.023	1.195	1.140	
2022	8	1.018	1.216	1.158	
2022	9	1.041	1.266	1.203	
2022	10	1.019	1.290	1.213	
2022	11	1.018	1.313	1.226	
2022	12	1.019	1.338	1.246	1.147
2023	1	1.023	1.369	1.255	
2023	2	1.015	1.390	1.260	
2023	3	1.005	1.397	1.254	
2023	4	1.005	1.404	1.241	
2023	5	1.015	1.425	1.238	
2023	6	1.002	1.427	1.222	
2023	7	0.996	1.422	1.190	
2023	8	1.003	1.426	1.173	
2023	9	1.003	1.430	1.130	
2023	10	1.003	1.435	1.112	
2023	11	1.005	1.442	1.098	
2023	12	1.000	1.442	1.077	1.188

Columns 1 and 2 stand for the year and the month, respectively. Column 3 shows the monthly change in the price level. For example, 1.009 in row 2021:1 shows that the price level rose by 0.9% from 2020:12 to 2021:1.

Column 4 displays the accumulated price level $P_{t,h}$, $P_{2020,12} = 1$. For example, 1.442 in the last row shows that the price level is expected to be 44.2% higher in December 2023 than in December 2020.

Next we introduce the year-on-year inflation index of 12 months:

$$I_{t,h} = \frac{P_{t,h}}{P_{t-1,h}}, \qquad h = 1, \ldots, 12. \tag{1}$$

Entries of column 5 show these numbers. By the forecast, this indicator will drop from 1.245 (2022:12) to 1.077 (2023:12).

Finally, the arithmetic average of 12 monthly year-on-year indices is called the *inflation index* of year t:

$$P_t = \frac{1}{12} \sum_{h=1}^{12} I_{t,h}. \tag{2}$$

This index can be rationalized as follows: if in every month of years $t-1$ and t, the consumer buys quantity y, she spends P_t times more in year t than in year $t-1$. Column 6 displays this index. For example, 1.15 stands for the price index of 2022 to 2021. This plays a prominent role in macroeconomics in general and in pension economics in particular.

Turning from inflation to benefits, we repeat: the main problem with the lumpy annual raise is that it only preserves the purchasing power of the benefits spreading for the whole year but it tolerates steep declines within the year. Assuming that the annual forecast is perfect and no intra-year compensation is needed, the uniform monthly nominal value of the benefit in year t can be denoted by b_t. By definition,

$$b_t = b_{t-1} P_t, \qquad t = 1, 2, \qquad b_0 = P_0. \tag{3}$$

The next question is: how to define the *real values* of the monthly payments? One possibility to define them is to discount the nominal values to the last month of year 0:

$$\mathbf{b}_{t,h} = \frac{b_t}{P_{t,h}}, \qquad h = 1, 2, \ldots, 12. \tag{4}$$

We shall need the annual average of these benefits in real terms:

$$\mathbf{b}_t = \frac{1}{12} \sum_{h=1}^{12} \mathbf{b}_{t,h}. \tag{5}$$

Inserting (4) into (5) yields

$$\mathbf{b}_t = \frac{1}{12} \sum_{h=1}^{12} \frac{b_t}{P_{t,h}}. \tag{6}$$

In an Appendix we allude to a possible distortion overwriting the expected $\mathbf{b}_t = \mathbf{b}_{t-1}$.

Typically the price level rises every month, therefore the real value of the monthly benefits is decreasing except for January:

$$\mathbf{b}_{t,1} > \mathbf{b}_{t,2} > \cdots > \mathbf{b}_{t,11} > \mathbf{b}_{t,12}.$$

Table 3. Annual vs. monthly benefit raise, 2021–2023: counterfactual exact forecast

Year	Month	Nominal	Real	Nominal	Real
		annual		monthly	
		benefit raised			
t	h	b_t	$\mathbf{b}_{t,h}$	$\hat{b}_{t,h}$	$\hat{\mathbf{b}}_{t,h}$
2021	1	1.044	1.034	–	–
2021	2	1.044	1.026	–	–
2021	3	1.044	1.019	–	–
2021	4	1.044	1.011	–	–
2021	5	1.044	1.006	–	–
2021	6	1.044	1.000	–	–
2021	7	1.044	0.996	–	–
2021	8	1.044	0.994	–	–
2021	9	1.044	0.992	–	–
2021	10	1.044	0.981	–	–
2021	11	1.044	0.974	–	–
2021	12	1.044	0.971	–	–
2022	1	1.205	1.105	–	–
2022	2	1.205	1.093	–	–
2022	3	1.205	1.082	–	–
2022	4	1.205	1.065	–	–
2022	5	1.205	1.048	–	–
2022	6	1.205	1.032	–	–
2022	7	1.205	1.009	–	–
2022	8	1.205	0.991	–	–
2022	9	1.205	0.952	–	–
2022	10	1.205	0.934	–	–
2022	11	1.205	0.918	–	–
2022	12	1.205	0.901	–	–
2023	1	1.431	1.045	1.383	1.010
2023	2	1.431	1.030	1.404	1.010
2023	3	1.431	1.025	1.411	1.010
2023	4	1.431	1.020	1.418	1.010
2023	5	1.431	1.005	1.439	1.010
2023	6	1.431	1.003	1.442	1.010
2023	7	1.431	1.007	1.437	1.010
2023	8	1.431	1.004	1.441	1.010
2023	9	1.431	1.001	1.445	1.010
2023	10	1.431	0.998	1.450	1.010
2023	11	1.431	0.993	1.457	1.010
2023	12	1.431	0.993	1.457	1.010

We shall argue that in case of high inflation, to smooth out this drop, it is worth having a monthly raise, preserving the real value of the monthly benefits from 2023:

$$\hat{b}_{2023,h} = \hat{b}_{2023,h-1} p_{2023,h}, \qquad \hat{\mathbf{b}}_{2023,h} = \hat{\mathbf{b}}_{2023,1}, \qquad h = 2, 3, \ldots, 12,$$

where the real value of the reformed January benefit (bold) is the ratio of the nominal monthly benefit and the corresponding price level:

$$\hat{\mathbf{b}}_{2023,1} = \frac{\hat{b}_{2023,1}}{P_{2023,1}}.$$

Of course, the extraordinary raise in January should be determined to preserve the real value of the annual benefits. Having the equality of the past and future annual benefits in real terms, this yields

$$\frac{\hat{b}_{2023,1}}{P_{2023,1}} = \hat{\mathbf{b}}_{2023,1} = \mathbf{b}_{2022}.$$

With rearrangement,

$$\hat{b}_{2023,1} = \mathbf{b}_{2022} P_{2023,1}.$$

It is important to avoid any nominal drop in benefits: $\hat{b}_{2023,1} \geq b_{2022}$.

Like Table 2, Table 3 also has a double year and month index. Columns 3 and 4 display the traditional sequence of fixed nominal benefits and the resulting sinking real benefits, respectively. Note the great drop of the benefit's real value in December from January 2022: $0.901 < 1.105$. (It was a mixed blessing that due to the rough underestimation of the 2022 inflation, the actual loss was smaller.) Confining our attention to year 2023, columns 5 and 6 present the proposed monthly rise in nominal benefits and the resulting constant real benefits, respectively.

4 Delay of retirement

When the annual inflation rates were moderate and stable, the initial pension benefits followed the corresponding reported average real wage dynamics with a one-year lag with a good approximation (Simonovits, 2020). Between 2015 and 2020, the inflation was moderate and the average real wages rose by 7–10% per year, therefore, the initial benefits grew similarly (see Table 5 below). Though using a distorted sample of fully employed workers, the Hungarian Statistical Office significantly overestimated the real wage growth, the real growth of initial benefits was genuine. Because the individual benefits in progress have stagnated in real terms, the tension between newer and older beneficiaries has become stronger. This changed in 2021/2022, when the real wage dynamics slowed down and the inflation rate accelerated. (It is worth citing Fischer (1982, p. 169): "variability of inflation matters because uncertainty about the inflation rate creates as serious economic difficulties as those caused by high inflation itself.")

To model the problem, we consider an extreme case: the worker considers retiring either on the last day of year t or on the first day of year $t+1$. Denoting the growth index of the average nominal wage by G_t, and the inflationary index of the next year by P_{t+1} (apart from complications with progressivity, discussed in the next Section), the one-day delay multiplies the initial benefit by G_t (extra year of valorization) and divides it by P_{t+1} (lack of indexation as benefit in progress in the new year). Therefore, the simplest indicator of the delay's yield is

$$d_t = \frac{G_t}{P_{t+1}}.$$

If $G_t > P_{t+1}$, then the delay is advantageous; if $G_t < P_{t+1}$, then the delay is disadvantageous; if $G_t = P_{t+1}$, then the delay is neutral. Of course, most workers retire earlier than December 31 or later than January 1, but for our discussion, the analysis of this decision is sufficient. (In Hungary, since 2011/2012, there has not been early retirement except for Females with 40 years of entitlements, and very few employees work beyond the normal retirement age, therefore the actuarial reduction/addition can be safely ignored.)

Note that to forecast the annual inflation index can be difficult not only for the employees but also for the government. For example, as mentioned above, the subsequent 12-month rates have been increasing in 2022, eliminating the expected advantage of the one-day delay. Table 4 presents the calculation for three distinct months. Actual inflation rate was around 14%, turning the expected gain of $1.087/1.05-1 = +0.035$ into an actual loss of $1.087/1.14 - 1 = -0.046$.

Table 4. Three forecasts

Year: month t	Nominal wage index G_t	Inflation forecast $P^{\mathrm{e}}_{t,h}$	Delay impact d_t
2021	1.087	1.051*	–
2022:01	–	1.050	1.034
2022:08	–	1.089	0.998
2022:12	–	1.140	0.954

* Actual date, the others are forecasts.

Note, however, that in some of my earlier studies (e.g. Simonovits, 2020), I have been using a simpler estimator, naively replacing future inflation with past inflation. If P_{t+1} is estimated by P_t, then the corresponding yield collapses to the annual real wage index:

$$\hat{d}_t = \frac{G_t}{P_t} = \gamma_t. \tag{2}$$

Table 5 shows the difference between the 'rational' and naive estimations. It can be seen that according to the rational forecast, delay was advantageous even in 2012, when the naive forecast made delay disadvantageous. In 2021, it was the opposite. (In fact, here we neglect that underestimation of inflation in the period 2013–2016, mentioned above.)

Table 5. The estimations of the impact of delaying retirement, 2010–2022

Year	Nominal wage index	Price index	Rationally	Naively	Inflationary acceleration
	annual change		estimated impact of delay		
t	G_t	P_t	d_t	γ_t	π_t
2010	1.068	1.049	1.028	1.018	0.990
2011	1.064	1.039	1.007	1.024	1.017
2012	1.021	1.057	1.004	0.966	0.962
2013	1.049	1.017	1.051	1.031	0.981
2014	1.030	0.998	1.031	1.032	1.001
2015	1.043	0.999	1.039	1.044	1.005
2016	1.078	1.004	1.053	1.074	1.020
2017	1.129	1.024	1.092	1.103	1.010
2018	1.113	1.034	1.076	1.076	1.000
2019	1.114	1.034	1.078	1.077	0.999
2020	1.097	1.033	1.044	1.062	1.017
2021	1.087	1.051	0.945	1.034	1.094
2022	–	1.148	–	–	–

5 Progressivity of initial benefits under inflation

Already Fischer (1982, p. 170) underlined the cost of government's "failure to adjust the tax laws for inflation". This also applies to the real impact of inflation on the progressivity of Hungarian initial benefits. Let $t = 2012, 2013, \ldots$ stand for the index of year, w_t and w_t^* for the nominal average (reference) wage and bending point in year t, respectively. For a reference wage below or at the bending point, the initial benefit is proportional to the reference wage, $\beta_1 > 0$ being the accrual rate. For a reference wage above the bending point, a second, lower accrual rate enters: $0 < \beta_2 < \beta_1$. (In fact, there are two, close bending points with two lower accrual rates, but to simplify the exposition, we unify them into one and choose the lower accrual rate.)

With good approximation, the progressive nominal benefits first granted from early January of year t are described by

$$b_t(w_{t-1}) = \begin{cases} \beta_1 w_{t-1} & \text{if } 0 \le w_{t-1} \le w^*; \\ \beta_1 w^* + \beta_2(w_{t-1} - w^*) & \text{if } w_{t-1} > w^*. \end{cases}$$

We describe the real values of wages and benefits as functions of the corresponding nominal variables and the annual price level $\mathbf{P}_t$, recursively defined by $\mathbf{P}_t = \mathbf{P}_{t-1} P_t$, with $\mathbf{P}_0 = 1$:

$$\mathbf{w}_t = \frac{w_t}{\mathbf{P}_t}, \qquad \mathbf{w}_t^* = \frac{w^*}{\mathbf{P}_t} \qquad \text{and} \qquad \mathbf{b}_t = \frac{b_t}{\mathbf{P}_t}.$$

The 'real' benefit–real earning link is as follows:

$$\mathbf{b}_t(\mathbf{w}_{t-1}) = \begin{cases} \beta_1 \mathbf{w}_{t-1}/P_t & \text{if } 0 \le \mathbf{w}_{t-1} \le \mathbf{w}_{t-1}^*; \\ (\beta_1 - \beta_2)\mathbf{w}_t^* + \beta_2 \mathbf{w}_{t-1}/P_t & \text{if } \mathbf{w}_{t-1} > \mathbf{w}_{t-1}^*. \end{cases}$$

Column 2 of Table 6 displays the accumulated inflation index, ending at 1.65 in 2023. Column 3 presents the real average wage, rising from 100 (2012) to 163 (2023). Inflation depressed the relative value of the bending point from 277.8 (2012) to 199.6 (2022) (both in terms of the average wage in 2012). Compare two beneficiaries, having a reference wage equal to the average wage and its triple in year t, respectively; the corresponding benefits are denoted by $\mathbf{b}_t(1)$ and $\mathbf{b}_t(3)$, respectively. Those retiring in 2013, receive benefits of 78.7 and 232.5 units, respectively, their ratio being 2.95. Those retiring in 2022, due to the real wage explosion, receive benefits of 116.6 and 311.7 units, respectively, their ratio being 2.637, showing stronger progressivity than before. Moreover, the high initial benefit is lower than that rewarded a year before: $311.7 < 332.7$! In a certain sense, the accidental strengthening progressivity partially makes up for the elimination of the cap from 2013, though the cap concerns earnings in individual years, while progressivity concerns the average earnings of the assessment period.

Table 6. The impact of the declining real value of bending point on high initial pensions, HU, 2012–2023

Year	Cumulated price level	In terms of average wage, 2012		Benefit for	
		Average wage	Bending point	average wage	triple wage
t	$\mathbf{P}_t$	$\mathbf{Ew}_t$	$\mathbf{w}_t^*$	$\mathbf{b}_t(1)$	$\mathbf{b}_t(3)$
2012	100.0	100.0	277.8	–	–
2013	101.7	103.1	273.1	78.7	232.5
2014	101.5	106.5	273.7	82.7	242.2
2015	101.4	111.1	274.0	85.2	248.4
2016	101.8	119.3	272.9	88.6	256.2
2017	104.2	131.6	266.5	93.2	266.4
2018	107.8	141.6	257.7	101.8	285.5
2019	111.5	152.6	249.2	109.6	302.9
2020	115.1	162.0	241.3	118.2	322.2
2021	121.0	167.6	229.6	123.3	332.7
2022	139.2	167.6	199.6	116.6	311.7
2023	164.6	162.9	168.7	113.3	299.0

Remark. * stands for forecast.

6 Summary

At the end of the paper, we shortly summarize the conclusions. Accelerating inflation exposes certain errors in pension indexation rules in general and in Hungary in particular. (i) The higher shares of food and of energy expenditures of households with lower rather than higher incomes call for an extended government help when the prices of these basic items grow much faster than the average. (ii) With accelerating inflation the annual raises of benefits generate large intra-year drops in the real value of those benefits. This can be eliminated by a quarterly or monthly raise, simultaneously diminishing the lumpiness of the adjustment. (iii) Accelerating inflation may weaken or even undermine the incentives of delayed retirement. (iv) Though the strengthening of progressivity is welcome, it is illogical to make the real value of initial pensions depend on the accumulated inflation. It is disappointing that there is no official discussion of these problems and only an EU initiative requiring public discussion of the Hungarian pension system sheds some light for optimism.

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Appendix

In this Appendix, we shall look into a distortion $\mathbf{b}_t \approx \mathbf{b}_{t-1}$ due to index number problems. First we repeat (6) for $t-1$:

$$\mathbf{b}_{t-1} = \frac{1}{12}\sum_{h=1}^{12}\frac{b_{t-1}}{P_{t-1,h}}.$$

To make the subsequent average real benefits comparable, we insert (3) into (6):

$$\mathbf{b}_t = \frac{1}{12}\sum_{h=1}^{12}\frac{b_{t-1}P_t}{P_{t,h}}.$$

Also using (1) and (2), now we can make the comparison:

$$\frac{\mathbf{b}_t}{\mathbf{b}_{t-1}} = \left(\frac{1}{12}\sum_{h=1}^{12}\frac{P_{t,h}}{P_{t-1,h}}\right)\frac{\sum_{h=1}^{12}\frac{1}{P_{t,h}}}{\sum_{h=1}^{12}\frac{1}{P_{t-1,h}}}.$$

It is not clear if for realistic, mostly increasing double sequences $(P_{t,h})$, the ratio is always close to 1 or not.