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The present value of the future, or individual decisions behind superannuation investments

SUMMARY: In recent decades, there has been much debate on how a state can establish a pension system that takes into consideration the balance of the general government. In addition to the condition of an equilibrium, social security and the stability of the value of pensions should also be ensured. The Hungarian regulation, however, has compelled not only economic politicians, but also future pensioners make their choice several times. The aim of this paper is to study such choices and decisions. The authors demonstrate the effect mechanism of individual decisions through examples. They believe that decision-makers often do not consider the effect of their choices, and therefore the rightness of their steps is questionable.

KEYWORDS: pension system, portfolio choice, PAYG (pay-as-you-go) and PAYE (pay-as-you-earn) systems

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The establishment of a pension system covering the whole of society was an achievement of the 20th century in various countries in the world, including Hungary. However, by the end of the 20th century, the systems had to be restructured in an increasing number of countries. Frequent debates are going on in Hungary as well how the pension system could remain sustainable. These debates usually discuss how the state can participate in paying the pensions without public finances getting into trouble, and to what extent and in what form self-support should be given a role. In order to prop up their arguments, experts and decision-makers make projections of the changes expected in a number of variables. Social and political power relations and the developments in the econom-

ic situation have entailed innumerable amendments to the regulation recently.

In this paper, we intend to examine the changes themselves and their effects from a perspective that is different from the general approach. Namely, from the individual's point of view, whose pension and years spent in retirement depend on the changes of the regulation, but also on his/her own decisions. We do not intend to take a stand for or against any system. We are not really concerned with the specific figures that represent the changes in the rules, but rather with the demonstration of the effects for the individual.

In the late 1980s the pension system in Hungary had a simpler structure than today. Provision for the elderly was ensured by a single pillar, social security operating according to the pay-as-you-go principle, i.e. the public pension system. In this system, financing the social security provisions became increasingly difficult fol-

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lowing the democratic transformation. In this period, contribution revenues fell as a result of unemployment and a decline in employment. Life expectancy at birth is increasing, the number of births is low, which results in a growing percentage of elderly people within the total population. The ratio of active employees as opposed to those retired is declining. All these reasons, and the aging of society in particular, led to the pension reform in the 1990s.

In addition to the single public system, the system of voluntary pension funds, as a second pillar then, appeared from 1993 onwards. However, a radical change was only brought about by the establishment of private pension funds. *Starting from 1 January 1998 the Hungarian pension system switched over to mixed financing, i.e. within the mandatory system, the provision for pensioners is ensured by a private pension scheme in addition to the public social security pension system.* Private pension fund members have to pay contributions as a basis for the benefits payable by the fund.

In recent years, the regulation has allowed a new form of self-support: one may collect savings for his/her old-age years on a retirement savings account kept at a bank, utilising the relevant tax allowances. Schemes offered by insurance companies also allow savings for the years of retirement.

The next part of this study focuses on the two pillars of the mandatory system, the state system and the private pension funds. *We wish to demonstrate that even in a relatively narrow scope for action individual decisions may entail serious consequences for benefits to be paid later.*

The state pension system is based on the pay-as-you-go principle. Its operating principle, the pay-as-you-go principle, means that those who have declared income from work must pay pension contributions based on their income to cover the benefits of today's pensioners. In exchange for paying contributions, wage earners also become entitled to receive state pension in their

old age. Accordingly, the old (the pensioners) are always funded by payments of young people (active workers) in this system. If the total payments received remain below the amounts intended to be disbursed, the difference has to be made up for from other public revenues. This is why demographic and employment trends result in tensions in the system.

Private pension funds operate according to the pay-as-you-earn principle. Fund members receive their pensions from the private pension fund from the assets accumulated from their own contribution payments. When the system was launched, entry in a fund was proposed depending on one's age. However, for career-starters it was mandatory to join a private pension fund. Members compulsorily pay contributions from their earnings.

It means that the Hungarian mandatory system also became a mixed one. The greater portion of mandatory contributions was paid to the public pay-as-you-go system, while the remaining part was received by the private pension funds. Compared to the intentions in 1997, there was a change in the proportion of contributions paid to individual systems. The retirement age was modified. From the inception of the mixed system, successive changes in the regulation allowed those who had chosen a private pension fund to return to the social security system. The radical change in the mixed system in early 2011 made the choice between the public pay-as-you-go system and private pension funds much more critical than earlier. Other elements of the operating environment, such as determining the pension in the state system and the payments to the funds in the private system also underwent changes. *We believe that the effect of the changes on individuals was not transparent for the stakeholders.* In our opinion, this was not only caused by the uncertain future assessment of calculation variables. In order to prove this, we refer to some of the elements of the changes that took place in recent years.

THE EFFECT OF CHANGES IN THE STATE PENSION SYSTEM

The global economic crisis reached Hungary in 2008. This affected the assets of private pension funds, i.e. the value of savings accumulated on individual accounts. Public finances were in a critical situation in terms of funding, which indirectly affected the state pension system. As crisis management actions, the government took measures that had both short- and long-term effects on the pension system. These measures included the *termination of the thirteenth month pension and the raising of the retirement age*. At the same time, those who were close to retirement were allowed again to make a full return from private pension funds to the state pension system. The – maybe temporary – decrease in the assets of private pension funds as a result of the crisis served as a good opportunity to justify this latter arrangement. However, in the meantime it was not specified how the changes in the state pension system would modify the expectancies of individuals. *If an individual's lifetime wealth includes pensions received from the state system, it is affected by the termination of the thirteenth month pension or the raising of the retirement age.*

These effects are demonstrated by the following figures. Please note that this study is less concerned with the accuracy of parameters than with the presentation of the effect mechanism.

Take the withdrawal of the thirteenth month pension. Suppose that someone is five years before reaching the retirement age, and will live for ten years following retirement, i.e. will receive pension for 120 months. The individual's original pension is HUF 100,000 per month, for 13 months a year. The thirteenth month pension would be paid in the last month of the year. If you calculate the present value of the pensions paid for five years before retirement, discounted with a 4 per cent annual interest rate, the result is the following.

The formula for present value calculation:

$$Pv = \sum_{t=1}^n \frac{C_t}{(1+r)^t} = \frac{C_1}{(1+r)^1} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_n}{(1+r)^n}$$

where

values C_t are the disbursements in the t^{th} month,

r is the monthly proportion of the interest rate applied for discounting,

n is the number of months in the 15 years of the calculations.

The result:

$$Pv = \text{HUF } 8,751,147$$

The same calculated without thirteenth month pension:

$$Pv = \text{HUF } 8,089,307$$

The present value of pension disbursements declines by 7.56 per cent.

You can have a similar look of the effect of the change in the retirement age. Using the assumption in the above example, take the person who will retire in five years from now. Suppose that the individual will receive pension for ten years, for 12 months each year. Also using a 4 per cent interest rate, the above-calculated present value of the pensions paid will amount to:

$$Pv = \text{HUF } 8,089,307$$

An increase in the retirement age by three years means that one starts to receive pension three years later. Assuming an unchanged length of life, the years of retirement shorten to seven years. (Now you can disregard the additional contributions payable for three more years.)

The present value of pension disbursements with the raised retirement age:

$$Pv = \text{HUF } 5,315,281$$

The figures show that this change has a serious effect on the present value of disbursements, representing a fall of 34.3 per cent.

In our opinion, the effects have not appeared in a transparent manner until now, and thus were considered only by a few people when making decisions.

THE DECISIONS OF PRIVATE PENSION FUND MEMBERS AND THEIR CONSEQUENCES

Private pension funds place their members' accumulated assets in various investment instruments to preserve and increase their value. The possible ratios of instruments are regulated by law. Within determined frameworks, the holding of instruments depended on the decisions of pension funds. Since their establishment, funds invested their members' total savings as a single mass of assets. Members could not have any influence on what group of instruments their individual savings should be placed in. Members could only "vote for" individual asset management practices by leaving a fund and joining another one. Many experts proposed to change this by allowing the setting up of a framework that better matches members' age and risk willingness.

In line with statutory provisions, an investment system consisting of three optional portfolios was launched in private pension funds: first as an option from 1 January 2007, then as a mandatory scheme from 1 January 2009 onwards. *Now anybody can choose an investment portfolio in line with his/her age, yield expectation and risk willingness.* An investment portfolio is a "basket" compiled by asset managers of securities and other investment instruments of various types and risks and yields.

The amount of benefits paid by a private pension fund is greatly influenced by the success of the investment of contributions paid during 30–40 years. Therefore, it is important for everybody to choose an investment portfolio with adequate risks and expected yields for the period remaining until retirement. However, the choice of portfolio offered on the basis of one's age is an option and members may make other decisions. A member is only classified automatically if he or she does not give different instructions. The three portfolios are as follows.

Classical portfolio

This portfolio is recommended if five or fewer years remain until retirement. This portfolio is the investment basket that involves the lowest risk. It mostly contains safe government securities, so savings may increase steadily, without higher fluctuations, thus preserving the real value of pension savings.

Balanced portfolio

This portfolio is a good option for those who have 5–15 years until retirement. This portfolio, which mostly contains safe government securities, comprises domestic and international shares as well, which may significantly improve the investment results in the longer run.

Growth portfolio

From an investment point of view this portfolio carries the highest risk. In addition to bonds, it contains a higher proportion of domestic and international shares, which results in higher expected yields in the long run. This portfolio is a good option for those who have more than 15 years until retirement, and are ready to take risks for higher yields.

The portfolios reflect the investment experience that higher-risk instruments yield more than lower-risk ones in the long run. The risk is represented by the yield fluctuations of the instruments. Accordingly, the yield volatility of riskier instruments is higher than that of lower-risk ones. In the short run, there may even be a high loss, which is compensated in the longer run. The assets in the various fund portfolios result in different risk levels of the portfolios.

As mentioned above, the mandatory regulation that entered into force in early 2009 allowed members to influence the yields of their savings by choosing between portfolios, instead of being only passive onlookers. However, the question arises: Is this really a win for everyone?

As the compilation of the funds' portfolios has a relatively short history, we are trying to

demonstrate the effects of the decisions with similar portfolios. The masses of assets we chose to study are the investment funds. Their investment principles are similar to those of private pension funds. Indeed, some investment funds perform investments which correspond to individual pension fund portfolios.

In the next part of this study we examine what yields could have been achieved in 11 years on the basis of investments in the classical, balanced and growth portfolios and as a result of a best and worst series of choices if the choice among portfolios had been free starting from the launching of the private pension funds. The three optional portfolios are replaced by three investment funds, the portfolio compositions and risk ratings of which are similar to the classical, balanced and growth portfolios. Of course, if we had selected other funds, the results could have been different, but there are differences in the same portfolio categories across pension funds as well. The period under review is between 1 January 1998 and 31 December 2008.

The classical portfolio is replaced by OTP Optima Capital Guaranteed Bond Fund. The fund manager invested the assets in the OTP Optima Fund mainly in securities guaranteed by the Hungarian State. In addition to government securities (discounted Treasury notes, government bonds), which have a decisive share in the Fund, the Fund includes mortgage bonds which yield more than government securities, forint deposits and, to a minor extent, Hungarian corporate bonds that have the best credit rating. The investments are aimed at competitive yields compared to short-term (3-, 6- and 12-month) bank deposits. An important aspect of investment policy is to minimise the risks taken to ensure a stable course of rates, which is of primary importance.

The balanced portfolio is replaced by OTP Paletta Securities Fund. This Fund is recommended to investors who want to place their

savings for the medium term – for at least three years – in a fund that invests mostly in domestic and, to a lesser extent, in Central East European bond and stock markets. The objective of OTP Paletta Fund is to allow investment in a securities package comprising of bonds, treasury bills and shares, with an active investment policy, assuming medium risks. In the Fund, the share of stocks not covered by risk hedging transactions fluctuates around 35 per cent on average, and may not exceed 50 per cent. Most of the stocks were from the domestic market, but, with a lower weight, the portfolio also included stocks of the Czech and Polish markets.

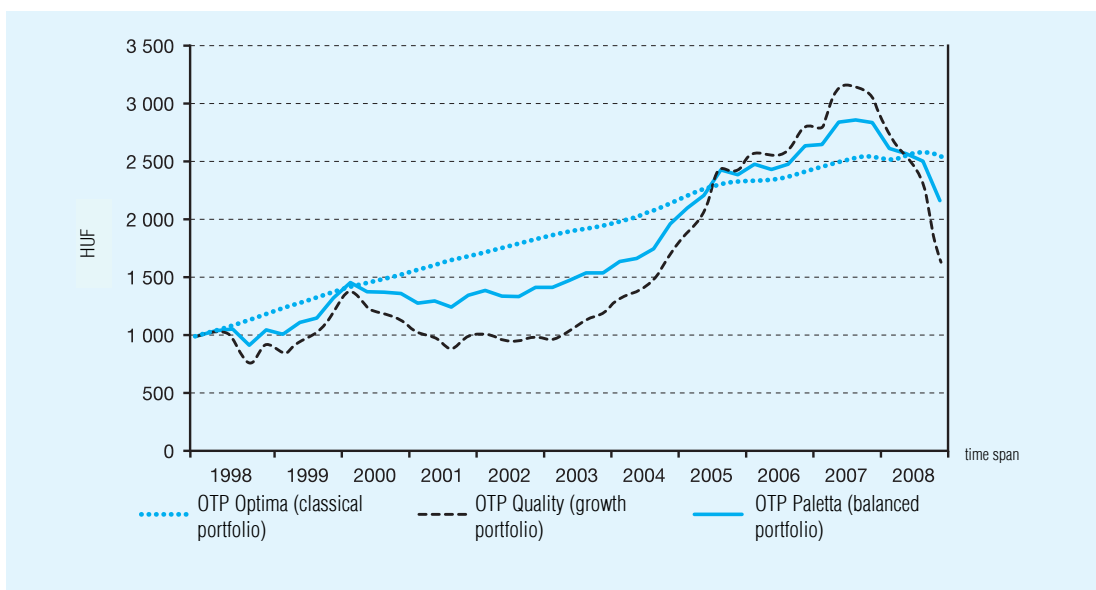
The growth portfolio is replaced by OTP Quality Open End Equity Fund. This Fund may be recommended to investors who intend to invest their savings for an extended period (at least five years) in Hungarian and other Central East European stock markets, undertaking temporary, even major, fluctuations in the value of their investments depending on rate movements in stock markets, in order to reach a higher yield. The objective of OTP Quality Fund is to allow investment in a fund mostly comprising of domestic and Central East European (Czech and Polish) equities, with an active investment policy, assuming high risks. The ratio of shares in the Fund is high, 85 per cent on average, but share exposure may fluctuate in the 50–95 per cent band, in line with market processes.

Suppose you invest one thousand forints in the funds on 1 January 1998. The changes in the value of your investment are shown in *Chart 1*.

The chart shows how the value of the one-off investment of one thousand forints changed during 11 years and also how much its value would have been after 11 years.

If you had invested your capital in OTP Optima (classical portfolio), the value of the investment of one thousand forints would have

DEVELOPMENTS IN THE VALUE OF THE INVESTMENT OF ONE THOUSAND FORINTS



increased to HUF 2,547.25 by the end of the period under review. Clearly, the value of investment has grown relatively steadily.

If you had bought OTP Paletta (balanced portfolio) mutual fund shares for your capital, you would have succeeded in increasing your one thousand forint investment to HUF 2,164.64 by 31 December 2008.

However, investing the same amount of capital in OTP Quality (growth portfolio) would have resulted in an available amount of HUF 1,633.57 by the end of the period under review. Apparently, the value of investment tends to be the most volatile in the case of this portfolio. A major fall took place at the end of the period chosen. This is the reason why the assumed conclusion that this portfolio would bring the highest yield over the long term cannot be read at the end of the investment period. Of course, this “unfortunate” value in itself does not refute the general assumption that the reward for a higher risk taken by the investor is a higher expected yield. The value that can be calculated at a particular point in time can be considered more as a manifestation of the risk.

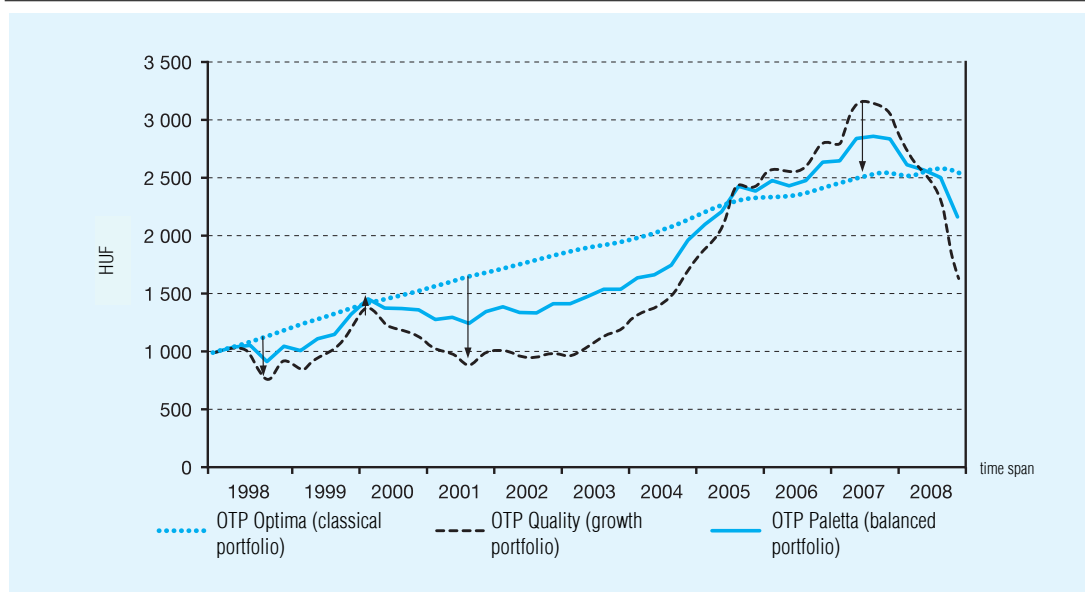
The regulation allowed members to change portfolios biannually. By this they can influence the movements in the value of their savings themselves. Let us see how the value of an investment of one thousand forints could have changed if it had been possible to change portfolios starting from early 1998. We are going to examine the results of the best and worst series of choices with the help of the three investment funds as portfolios.

Taking the above chart as a basis, you may read when a portfolio change would have been necessary to achieve the highest possible yield. The direction of the desirable change is also indicated. (See Chart 2)

You invest one thousand forints in OTP Optima (classical portfolio) with a yield which is expected to grow. For an investment of one thousand forints you can buy one thousand mutual fund shares. You let your capital grow in this fund until you get a chance for a higher increase in our investment in another portfolio, in this case in OTP Quality Open End Equity Fund (growth portfolio). The right date for this is 30 September 1998. Then you transfer

Chart 2

CHOICES RESULTING IN THE HIGHEST YIELD



your investment in OTP Optima, worth HUF 1,131.643 at the rate on 30 September 1998 (1.131643), to the OTP Quality portfolio, of which you can purchase 1,569.71 pieces calculated at the daily rate (0.720925). Now you leave your capital in this portfolio until you see that the investment rate stops growing. This takes place on 31 March 2000. At this point in time you convert your 1,569.71 mutual fund shares in OTP Quality (rate: 1.394899), worth HUF 2,189.59, to OTP Optima mutual funds shares, because the rate of the latter shows an increase. For the value of your investments you can buy 1,535.11 OTP Optima mutual fund shares. Now you let your capital grow in this portfolio, until the rate of the OTP Quality mutual fund shares starts to increase again. Then (on 30 September 2001) you convert your capital to this portfolio. From your 1,535.11 mutual fund shares (worth HUF 2,531.60) you can purchase 2,870.32 OTP Quality mutual fund shares at the daily rate (0.881992). Your capital continues to grow in this portfolio, until the rate of this mutual fund share starts to decline again. On 30 June 2007

you make another change, as OTP Optima promises a higher yield. At this time the value of your 2,870.32 mutual fund shares is HUF 9,076.38, of which you can purchase 3,640.07 OTP Optima mutual fund shares. Until the end of the period under review you let your capital grow in this portfolio; on 31 December 2008 the value of your capital is HUF 9,272.17.

As you can see, by alternating the various optional portfolios, you succeeded in reaching HUF 9,272.17 as a result of investing one thousand forints during 11 years. (Admittedly, it is easy to discover the good opportunities with hindsight.) *Chart 3* shows the increase in savings value.

Of course, the options may be used in a disadvantageous manner as well. The wrong decisions are basically tantamount to the worst changes in value. Accordingly, the dates and directions of the decisions are shown in *Chart 4*.

The worst decisions are taken at the worst possible moment. On 1 January 1998 you start an investment of one thousand forints in OTP Quality (growth portfolio) hoping to reach the expected highest yield, and you purchase one

Chart 3

CHANGES IN SAVINGS VALUE WITH THE BEST CHOICES

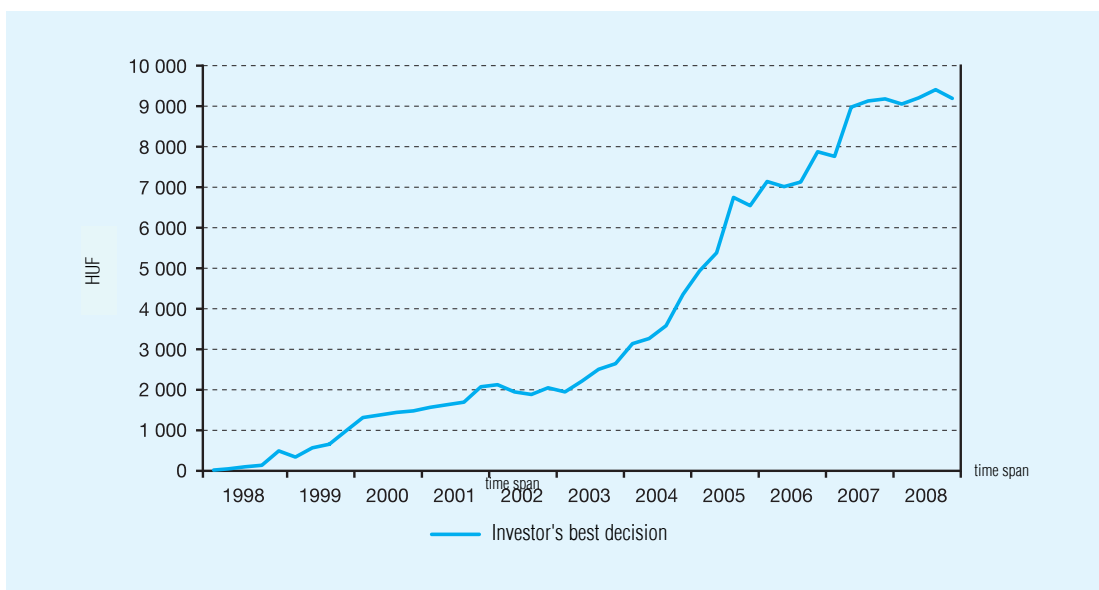
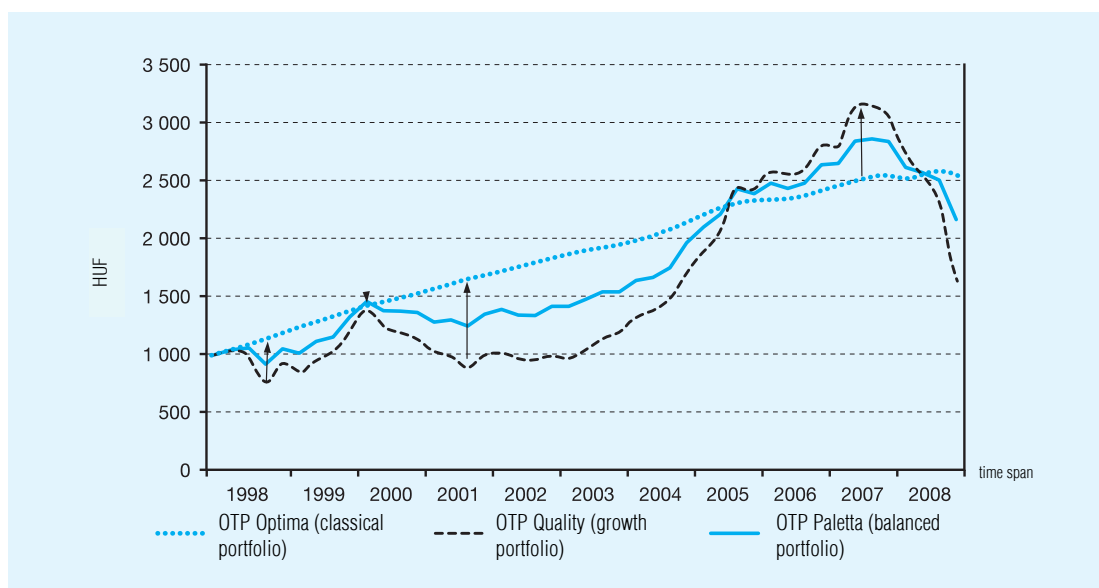


Chart 4

CHOICES RESULTING IN THE LOWEST YIELD



thousand mutual fund shares. Regrettably, the portfolio does not meet your expectations, and its rate declines steadily. When you cannot wait any longer for the rate to increase (30 September 1998), you convert your investment to OTP Optima mutual fund shares, buying

637.06 shares for HUF 720.93. Your capital increases in this portfolio, but to a very small extent. In the meantime, the OTP Quality rate has started to grow. When you see the portfolio rate surge (31 March 2000), you convert your mutual fund shares to this portfolio. At

this time you can purchase 651.42 OTP Quality mutual fund shares for your investment worth HUF 908.66. However, the rate of this portfolio begins to fall suddenly. You wait for another rise, but, unfortunately, this does not happen. To avoid further losses, you put your capital, amounting to HUF 574.55 on 30 September 2001, in OTP Optima mutual fund shares, of which you can purchase 348.39 pieces. In this portfolio, you succeed in slightly increasing your capital again, but you are still below the amount of the initial investment. The rate of the OTP Quality portfolio starts to grow again. You wait for a favourable opportunity to change portfolios. The portfolio reaches an exceptionally high yield, and you decide to change. You convert your mutual fund shares, worth HUF 868.71 on 30 June 2007, to the OTP Quality portfolio, and can purchase 274.72 mutual fund shares at a rate of 3.162153. Then you keep your capital there until the end of the period under review, but, regrettably, the

portfolio fails to meet the expectations again, and its rate declines steadily. Consequently, at the end of the period under review (31 December 2008) your 274.72 mutual fund shares are worth HUF 448.77 at a rate of 1.633567.

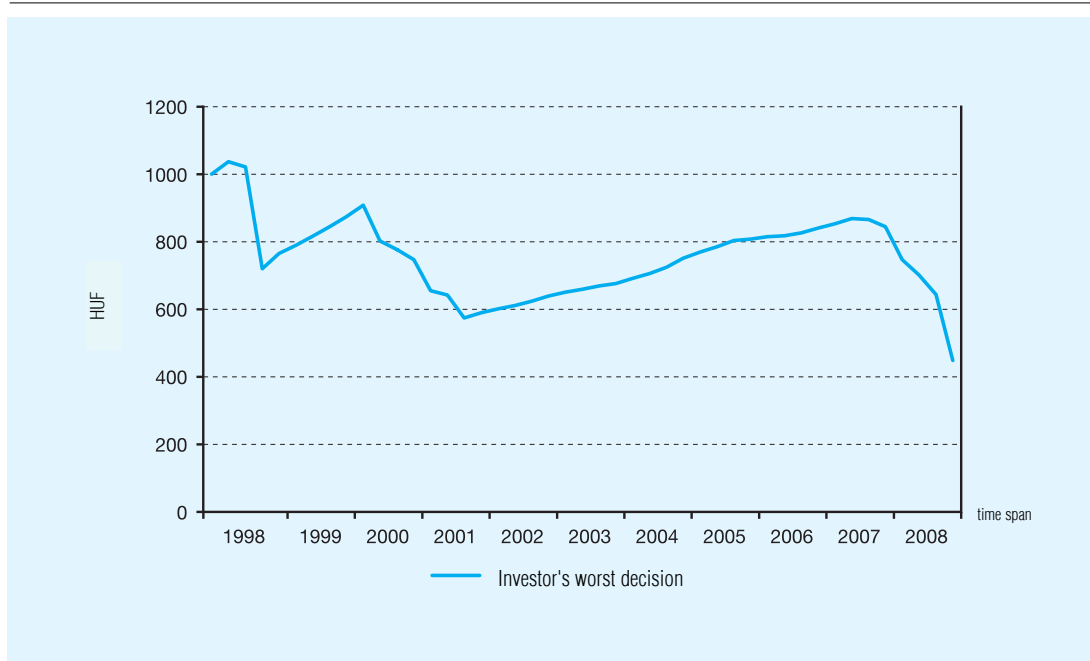
After 11 years, your capital not only failed to increase, but it decreased considerably, falling to less than half of your initial investment. *Chart 5* shows the changes in savings value.

EVALUATIVE NOTES

The Hungarian pension system has undergone successive changes in the last twenty years. The changes are in progress, and further restructuring is expected. *Regrettably, the changes do not always meet the requirement of long-term rationality; they are often exposed to momentary interests. Consequently, the effects are not transparent, even when it may seem that individuals have options.*

Chart 5

CHANGES IN THE VALUE OF SAVINGS WITH THE WORST CHOICES



The transparency of the pension system is improving in the case of some elements, but there is no progress in it elsewhere. The media itself tends to become subordinated to the mass psychosis, thus further strengthening delusions. Our examples intended to reveal effects that have remained in obscurity until now.

Seeing the results, one may ask whether the majority of people are good investment analysts. Surveys usually do not show a good picture of the financial awareness of average Hungarians. Would they be able to calculate the expected changes in the rates of not very simple portfolios? Not to mention the opinion

about the mass of “trembling-hand” small investors that they tend to sell their assets at the most disadvantageous moment. At the same time, they miss the advantageous moment of buying, and they notice the increase in rates when it is almost over. Do they perceive the future effects of the change in the public pay-as-you-go system?

Provision for the elderly and keeping their living standard at an adequate level constitute a major social problem. It may result in serious troubles if either the government or the individual, within his/her limits, takes the wrong decisions regarding the future.

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