Gábor P. Kiss: New Numerical Fiscal Rules for the Pension Balance[1]*

At the level of the individual, the pension system is characterised by the payment of contributions and the collection of benefits, both taking place over extended periods that are separated in time. On aggregate, in the coming decades the ageing of society will translate into more people receiving pensions, covered by the contributions of a decreasing number of contribution payers. In line with the EU's fiscal framework, the fiscal rules on the general government deficit include the annual balance of pension payments and contributions; consequently, they fail to provide a suitable incentive for decreasing longer-term imbalances. It may be justified to exclude the pension balance from the coverage of these fiscal rules and to regulate the balance in such a way to ensure that it is maintained over the long term. In this case, the bias for measures with immediate effects (such as an increase in contribution rates) would be eliminated, which, given that the current regulations are focussed on the short term, tend to overshadow other measures with long-term effects (e.g. raising the pension age). Circumvention of this flexible rule can be avoided only if the following two conditions are met. One is the projection of the pension balance in a reliable and controlled manner. The other is that the necessary adjustment cannot be postponed or be avoided by overestimating its effects. Efficient operation also requires a harmonisation of national regulations and the EU's fiscal framework. It is nevertheless important to stress that having separate fiscal rules apply to the pension balance would not mean that the pension system could be separately evaluated. The broader implications of cohort-specific distribution can only be assessed on the basis of on the so-called National Transfer Accounts research project, which records inter-cohort transfers as well.

INTRODUCTION

In any fiscal framework, numerical fiscal rules for debt, deficit or expenditures that apply to certain parts of or the entire general government play an important role. Ideally, these rules must allow for flexible adjustments should external shocks occur. For example, a budget deficit which is maintained year after year at close to three per cent of GDP does not allow for automatic stabilisers to operate in a period of economic downturn, because missing tax revenues must be offset immediately, either by restrictions on the expenditure side or tax hikes, which in turn could exacerbate the downturn even further. If, however, an indicator such as the cyclically adjusted deficit or structural deficit — which filters out effects of fluctuations in the economy — is specified as the target, no fiscal action would be required in response to the decline. The problem here lies in uncertainty: these indicators only function properly insofar as they provide a reliable estimate for the trend of economic output and it is actually the effects of fluctuation that are excluded. In fact, this is often not the case, as evidence of a trend having been overestimated sometimes becomes evident too late, thus preventing fiscal policy from taking corrective action in time.

Of similar importance is the requirement of efficiency, i.e. having fiscal rules contribute to a sustainable structure of revenues and expenditures. Whether we consider expenditure rules or sustainability indicators, uncertainty about trends in economic output can cause similar problems. Moreover, one weakness of the current fiscal rules is their inability to properly handle the parameters that sustainability largely depends on. In defining the medium-term budgetary objectives (MTO), the effects of ageing are taken into account to a certain degree, and thus any change in parameters does matter. At the same time, the future impacts of parameters are ignored when the deficit and the structural balance are determined. As a result, no exception from meeting the annual targets is permitted if, for instance, pension parameters are modified in a way that has no immediate impact on the deficit, but has considerable effects over the longer run. In a biased way, EU fiscal rules consider the differences between long-term and short-term effects only in case of transition to a private funded pension system, that is, when the deficit-increasing effects of contributions transferred to funded schemes are permanently recorded in the public pay-as-you-go system, only to gradually substitute a part of public pension decades later. A necessary condition for correction is to consider whether such a reform

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would improve sustainability over the long term without adding to the risks of a less favourable fiscal position in the medium term. The 2005 reforms instituted under the Stability and Growth Pact had made it possible for this negative effect to be taken into account on a linear degressive basis for a period of five years when assessing the deficit criterion. As part of the so-called six-pack that came into effect in 2011, adjustments for negative effects were permitted for the assessment of the debt and deficit criteria, provided that the deficit does not significantly exceed the 3 per cent limit and the general government debt remains below 60 per cent of GDP.

This article presents a proposal for having the balance of pension expenses and corresponding contribution revenues treated separately from fiscal rules both at national and EU level. This segregation clearly calls for the application of specific fiscal rules, the relevant aspects of which will be discussed in more detail. Our proposal can be used in any pension system and could therefore be applied in every EU member country.

CURRENT FISCAL RULES ARE NOT OPTIMAL FOR THE PENSION BALANCE

Throughout their life, individuals acquire and transfer various types of income. Children receive income/benefits from active members of their family and the government. During working age, individuals provide transfers to children and the government, and partly to elderly parents, while others receive transfers from their parents. The latter receive their income/benefits from the government and partly from working-age members of their family, while others transfer income to them. To describe such a broad range of transfers, the method of National Transfer Accounts (NTA) has been developed as a research project, distributing the national income between co-existing generations (Gál et al. 2014). Using the age profiles of labour income and consumption as the starting point, it is supplemented by the age profiles of various income transfers and capital incomes, ultimately determining how the consumption profile can be derived from the labour income profile. All of this can be used for assessing life-cycle financing, both in and outside households, as well as for developing new statistical indicators of sustainability and re-distribution between generations. The currently used system of generational accounting only deals with sustainability as far as the government is concerned, providing long-term projections on transfers and spending of various future generations in view of projected demographic changes (Auerbach et al. 1991). Projections in the European Union are prepared according to a standard methodology and published by the Ageing Working Group[2] (AWG) every two years. The latest AWG projections cover expenditures in education, healthcare, pension and social security, for the period up to 2060. Future developments in pension expenditures are decomposed according to various factors in order to allow for the separation of budgetary impacts of ageing, the labour market and the parameters of pension schemes.

The question arises as to whether, in view of numerical fiscal rules, a separate treatment of pension may be warranted. As a counter-argument, pension only constitutes a part of the national transfer accounts, which can consider the short-term ‘savings’ that result from families opting to have fewer children, together with the long-term consequence of having fewer working-age people around to support a proportionately larger elderly population. This latter applies not only to pension expenses but to the costs of healthcare and old-age assistance as well.

The main argument of this article is that, while the context of national transfer accounts is indeed worth considering, as far as fiscal rules are concerned it might still be justified to examine the pension system not only in its coherence but also on its own. As a common feature of all pension schemes, the contributions paid at the individual’s level and the collection of pension benefits both take place over extended periods that are separated in time. And while in different pension schemes the correlation between the two may vary, the future benefit is always well-defined, as opposed to other elements of generational accounting (such as healthcare or education). In funded pension systems, contributions during the decades of accumulation are invested to cover future pension payments. By contrast, pensions in a pay-as-you-go scheme are paid out of today’s contributions, according to various parameters. While these are presented in more detail in the Appendix, it should be noted here that parameters impact the pension balance over different time horizons. Selection between these temporally different parameters may be distorted by fiscal rules that focus on the financing requirement (and on debt), as their longer-term impacts remain hidden in this context. Neither the structural deficit indicator nor the expenditure rule can take into account the changes of pension parameters that affect future pension expenditures. This important piece of information would not be lost if the pension balance were to receive separate treatment.

What problems could arise in connection with numerical fiscal rules and what solutions would a separate treatment of the pension balance offer?

[2] The Working Group of Ageing Populations functions under the Economic Policy Committee (EPC).

1. According to budget balance rules, deficits must not exceed 3 per cent of GDP, not even in times of crisis. In the event of an economic downturn with the deficit close to 3 per cent of GDP, procyclical adjustment may be required. To avoid this, the deficit must be maintained at a safe distance from said 3 per cent. With our proposal, this 'safety margin' could be lowered by approximately 30 per cent, as that is the proportion of pension contributions to the total tax and contribution revenue.[3] Besides this practical consideration, another argument for separating pension contributions and payments could be that, to a certain degree, these are similar to financing items associated with an explicit obligation of the government.[4]

2. When the medium-term budgetary objective (MTO) is defined for each country, several aspects are taken into account. First of all, it must be ensured that the deficit remains below 3 per cent of GDP even at the bottom of economic downturns.[5] Moreover, a value is set with the intention to ensure sustainability by taking the initial level and future dynamic components (the difference between growth and interest) of debt into account, with the impacts of ageing being assigned a weight factor of 0.33 for expenses in education, healthcare, pension and social security in the period up to 2060. By contrast, our proposal focuses on pension being an obligation of the government — defined to a certain degree — over a time horizon (10-15 years) that can still be relevant in economic policy.

3. The structural deficit estimate includes the potential level of revenues consistent with potential output. This requires that trend and cycle be separated properly. However, experience shows that the potential (trend) value is often subject to revisions. In the case of a downward revision, additional measures might be needed to improve the budgetary position. If pension contributions were treated separately, the extent of such measures would be approximately 30 per cent lower. The pension balance, too, would need improvement, but not necessarily through measures with immediate effect but with parameters with a delayed impact, for instance.

4. According to the expenditure rule, primary expenditures are to be increased at a pace equal to that of potential output growth (and the inflation rate). Therefore, this rule is sensitive not to the level, but the growth rate of potential output. If potential growth rate estimations are adjusted downward, revenues will be automatically decreased and, as the expenditure rule provides less room for growth, the expenditures side will be adjusted as well. The problem is that, as far as spending is concerned, pension expenditures are pre-defined based on pension parameters and demographics. Their development is not aligned to the path of potential growth or inflation; steeper or less inclined changes are equally possible. By looking at the pension balance on its own, it becomes evident that estimations of potential growth rate do not have a neutral effect. Changes in contribution revenue are in line with estimated growth rates, but pension expenditures only follow suit if and to the extent that indexation is linked, besides inflation, to a real variable as well.

ILLUSTRATING THE SEPARATED PENSION BALANCE

Charts 1 and 2 present — somewhat extreme — scenarios to illustrate the distortions referred to in the previous section.

- The trend and cyclical fluctuation of contributions demonstrate that the nominal deficit is also distorted due to the cycle, and this could require procyclical deficit reduction in the case of recession.
- Neither the structural deficit nor the expenditure rule takes pension expenditure forecasts into account; for example a slower growth rate in expenditures that is caused by a gradual increase in the retirement age remains hidden (while gradual effects are shown on the charts).
- Chart 1 shows the uncertainty of the structural deficit that is caused by the actual estimations of potential output level.
- Chart 2 demonstrates possible distortions of the expenditure rule, caused by uncertainties surrounding the potential growth rate.

As seen in Chart 1, pension balance can be achieved with contribution trend #1 over a 15-year horizon. Problems can occur if it becomes evident that assuming a less favourable initial level for potential contributions is more realistic. This would require adjustments to some pension parameters in order to restore the balance. However, the actual balance is determined by the actual revenue, not the underlying trends. With the numerical values constructed in our example, up until year 5 it remains uncertain as to which trend (initial level) of contributions is consistent with the actual data.

[3] The budgetary impacts of the economic cycle are realised mostly through fluctuations in tax and contribution revenues and, to a much smaller extent, in changes in unemployment benefits.

[4] While debt is not discussed in our article, we do note that SNA2008 and ESA2010 contain new provisions regarding the statistical recording of implicit pension liabilities. For further details see: van der Wal (2013).

[5] Its value (safety margin) is estimated based on the volatility of output and determined by ensuring a low probability for the negative extreme of the output gap.

Chart 1
Pension balance projections in case of uncertainties in potential output

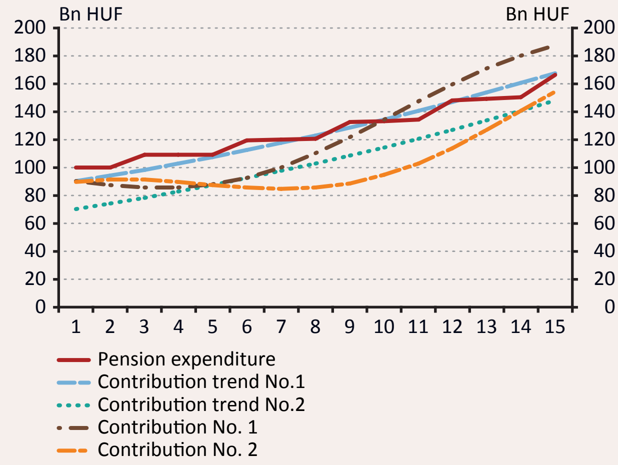
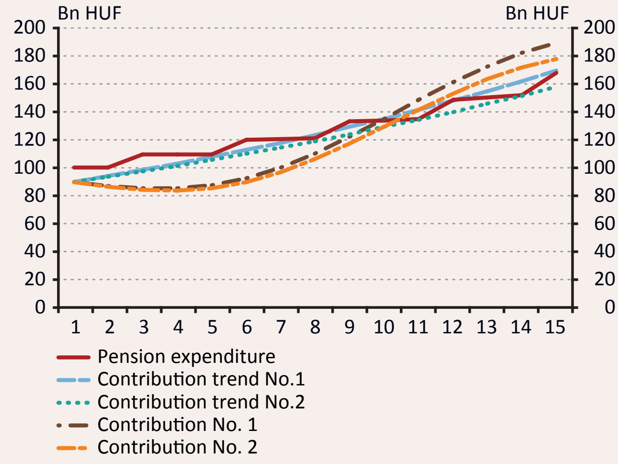


Chart 2
Pension balance forecasts with uncertainties surrounding the growth rate



The effects of uncertainty of the growth rate — and not the initial level of potential output — are shown in Chart 2. Here too, the pension balance is achievable at a 15-year horizon in the case of contribution trend #1. However, with trend #2 assumed, this cannot be achieved unless pension parameters are adjusted appropriately. It should be noted that the revenue/expenditure balances shown in the above two charts do not represent the accumulation or depletion of actual financial assets. They simply illustrate that the balance cannot and must not be compared with the balances of other budgetary items. In the case the pension balance turns into a surplus, for instance, the three per cent deficit rule should be met without this, which might require additional adjustments. In the opposite case, a deficit would not necessitate adjustments to other items, leaving more room for budgetary manoeuvre.

POSSIBLE RULES ON THE SEPARATED PENSION BALANCE

A separated pension balance can only be exempted from currently effective rules if, at the same time, a new set of fiscal rules is established, otherwise it could be circumvented. One option for circumvention is to extend the scope of rules to a wider range of parameters than those discussed, thereby covering certain social expenditures. The conditions of operation can also be manipulated, by having the time horizon re-defined, for instance. Another problem is that projections can also be deliberately biased. Finally, decisions required to ensure the pension balance may simply be delayed (for a variety of reasons), which can lead to constant incompliance with the rule. This section seeks to provide solutions to these practical problems.

Separating pension expenditures and revenues requires the following five key criteria:

1 The national rule shall be harmonised with the EU fiscal framework.
2 Pension balance shall include old-age provisions and, optionally, survivor's benefits. However, it may not comprise social benefits that are disbursed depending on an individual's health and social status (disability benefits and poverty benefits).
3 It shall be required to maintain the pension balance over a specific time horizon. The definition of the specific time horizon needs to be regulated at the Community level.
4 Whether balance is achieved within the specific time horizon — as well as the applicable methodology — shall also be assessed at the Community level.
5 Although ensuring a balanced position under the above conditions shall remain a national responsibility, each member state shall also operate an automatic correction mechanism in case this cannot be achieved.

Harmonisation of the national rule with the EU fiscal framework

At the national level, it is possible to have certain budgetary items excluded from regulations.[6] It is nevertheless important that national rules be harmonised with EU regulations, otherwise they would conflict with one another — in which

[6] In Sweden, for instance, the stability fund established to cover the bank bailout operations is included both in the deficit and the general government debt, but applicable expenditures are exempted from the Swedish spending rule.

case EU regulations may override the national rule, preventing its full effect. The easiest way to achieve harmonisation would be to have the national rule incorporated into the EU framework, with the latter regulating key parameters at the Community level (see conditions 3 and 4 above).

A proper definition for the separated pension balance

If possible, the pension balance should represent a clearly defined system that is used for re-distributions between contribution payers reaching various ages. Optionally, it may also include survivor's benefits, which are more closely related to old-age pension than to social benefits. However, other provisions such as disability benefits, which are disbursed due to impaired health, as well as other social benefits that are paid to combat old-age poverty, should be excluded from the pension balance.[7] Distinguishing these latter is not that simple, as beneficiaries include not only those who have not earned any entitlement (who thus solely receive social benefits), but also people having been paying the minimum contribution and are therefore entitled to pension, the amount of which might not, however, be sufficient to provide for one's living. It is recommended that supplementary benefits disbursed to this latter group are operated outside the pension balance. In some countries, the lack of entitlement and insufficient pension amounts can pose significant problems, whereas in others where a minimum pension is granted, old-age pensions also contain social elements.

Another definition issue can be identified in the case of contributions. Contribution allowances granted by the government should be recorded as imputed contribution.

Specifying the relevant time horizon

If the pension balance is no longer considered to be part of the deficit, it should be possible to respond to the ageing-induced balance deterioration not through revenue-increasing measures with immediate effect but by relying more on measures with a gradual effect. For similar considerations, the European Union's fiscal framework introduced the option to adjust the deficit with the balance-deteriorating effect of certain types of reforms in a linearly decreasing way in a period of 5 years. In our case, five years might not be sufficient, as changes in pension indexation is a measure with gradual effects that reach far beyond five years. Even the changes in regulation affecting retirement age exceed this period — here, it is life expectancy after retirement that determines when pension expenditure will be reach the new level. Since life expectancy after retirement in different countries may vary, this is regarded as a country-specific factor. Nevertheless, several arguments can be raised against a very long time horizon. Firstly, such long-term projections are surrounded by greater uncertainty. Secondly, over this time horizon, imbalances of such magnitude can be forecasted in a number of countries that would take significant measures to offset. A shorter time horizon could allow for a more gradual adjustment.

What methodology can be used to determine whether a balanced position has been achieved?

If we are to assess the pension balance over a specific time horizon, we must also determine how revenue and expenditure projections will be made, as well as the discount factor at which current price factors can be summed up. Using the results of the Ageing Working Group as a basis would seem appropriate for the projections. As for the discount factor, besides the nominal economic growth rate, the use of a higher index could also be considered. The reason for this lies in the uncertainty of the future, as it might be worth assigning a relatively larger weight to the balances of years less distant in time, which in turn can imply faster adjustments. However, as a counter-argument, this could reinforce the role of revenue-increasing measures with immediate effect (albeit this incentive is less strong than the one implied by the currently applied approach, which only focuses on deficit over the short term).

Automatic correction mechanism for achieving a balanced position

As mentioned earlier, a broader approach of generational accounting — one that also recognises intra-family transfers — is a complex method. There is no consensus as to how this can be taken into account when establishing the various parameters of the pension system. Moreover, decisions concerning the pension system affect the broadest segments of society. Obviously, this should remain in national competence; this field may not be restricted by the EU and cooperation could be based only on voluntary commitments.[8]

[7] At present, pension schemes in Europe are fundamentally different in their accrual methods used for old-age pension, which depends on wages and service time, and for social benefits. In the future, pension systems shifting towards basic benefits might be seen as an obstacle to having the pension system separated from social and healthcare expenditures.

[8] The only widely accepted regulation is the International Labour Organisation's Social Security (Minimum Standards) Convention, 1952 (No. 102), which has been ratified by numerous countries worldwide. Article 65 stipulates that, after 30 years of contribution or employment, a minimum replacement rate of at least 40 per cent shall be applied. In other words, both DB and DC pension schemes (see the Appendix) shall guarantee this minimum or, alternatively, a minimum accrual rate of 1.33 per cent of previous earnings for each year of contribution or employment.

At the same time, just as the necessary consolidation of the general government deficit can be delayed, so could adjustments of the pension position over the specified time horizon be postponed. To prevent this, an automatic correction mechanism needs to be introduced, which can take over if decisions cannot be made. This could be similar to the provisions of the fiscal compact that was approved by the Member States in late January 2012 stipulating that, in the case of significant observed deviations from the MTO or the adjustment path towards it, an automatic correction mechanism should be triggered. This mechanism should aim at correcting such deviations by implementing measures taken over a defined period. The common principles and applicable time frames of correction are set out by the European Commission by way of Directives.

CLOSING REMARKS

In different pension schemes, the impacts of ageing may vary. In a funded system, a slowdown in economic growth can gradually decrease capital gains, meanwhile those reaching retirement age can only expect to collect more modest pensions. In the pay-as-you-go scheme, it is the annual indexation of pensions that has an automatic effect, also impacting the long-term developments in total pension expenditure. There are some EU Member States where other pension parameters can be modified more or less automatically: for instance, retirement age may be linked to life expectancy, allowing for savings to be realised on the retiring population. However, it often depends on the discretionary decisions of fiscal policy as to what parameters will change or which cohort is to bear the burdens. Changes made to the parameters of the pension system must not be evaluated in terms of their fiscal impacts in the short term, but over a more extended time horizon. That, however, is not possible if the pension balance is subject to conventional fiscal rules. Our article has therefore summarised arguments both for and against the pension balance being a specific fiscal rule that is subject to separate treatment. Some of the arguments against the proposal are based on the possible circumvention of such rules. That is why we discussed in detail the conditions of regulation that may be considered as requirements for safe operation. For instance, while it is necessary to have a balanced pension position for the medium or long term, the applicable time horizon would need to be defined at the Community level, as would the estimation of imbalances over this period. We have established that decisions involving the pension system and its parameters should remain in national competence; however, in case these measures are delayed, automatic correction mechanisms must be triggered — likewise at national level. This could help prevent situations where decisions ensuring balanced position can be postponed for prolonged periods of time. In order for the proposed scheme to function appropriately, a harmonisation of the national rule with the EU's fiscal framework would be a priority. Nevertheless, it should be emphasised that having the pension balance be subject to separate fiscal rules cannot mean that the pension system could be evaluated outside the broadest approach of generational accounting. During their working years, pensioners were paying various other taxes and after retirement they remain entitled to healthcare and social benefits, while at the same time they continue to pay consumption-related taxes and even their pension might be taxable. According to a recent survey, while pensions in Hungary were the highest in all of the Visegrad Countries, the government provided fewer healthcare services to pensioners. At the individual's level, the range of health benefits actually used may vary greatly: people living longer can have access to more benefits but, due to the introduction of stricter indexation rules, their pension could gradually lag behind, in relative terms, when measured against the standard of living of active families. Moreover, the benefits received are also not proportionate to the contributions paid during one's active years, either — an observation in which tax avoidance makes a significant difference. The self-employed or those working in the shadow economy often pay only the minimum contribution requirement. As noted in the introduction, it is not practical to have generational accounting limited to government revenues and expenditures. At the individual's level, intra-family accounting can lead to even more pronounced differences, as the amounts spent on raising children vary across a wide range. A suitable framework for analysis can be provided by complete national transfer accounts that, broader in scope even than conventional generational accounting, also take intra-cohort transfers into consideration.

REFERENCES

European Commission, 2012 "The 2012 Ageing Report -Economic and budgetary projections for the 27 EU Member States (2010-2060)"

Auerbach, A.–J. Gokhale–L. Kotlikoff (1991): Generational accounts: a meaningful alternative to deficit accounting. *Tax Policy and the Economy,* 5. Cambridge, MA, MIT Press and the NBER.

Gál, Róbert Iván–Annamária Gáti–Miklós Szabó–Árpád Törzsök (2014): Generational accounts for Hungary.

Chun YJ (ed.): *Generational Accounting using National Transfer Account.*

Queisser, M.–E. Whitehouse (2006): *Neutral or Fair? Actuarial Concepts and Pension-System Design,* OECD.

Simonovits, A. (2013): Regressive intracohort redistribution in nonfinancial defined contribution pension. *Hungarian Academy of Sciences discussion paper.*

Drouin, A.–M. Cichon (2009): *Optimal financing and self-adjusting mechanisms for sustainable retirement systems – The social stabilisation of pensions in times of crises and beyond: A critical review of three decades of pension reform and their outcomes,* International Social Security Association (ISSA), Switzerland.

G.P. Kiss – R. Szemere (2009): Apples and oranges? A comparison of the public expenditure of the Visegrád countries. MNB Bulletin, May.

van der Wal, D. (2013): *The Measurement of International Pension Obligations – Have We Harmonised Enough?.* URL: http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=STD/CSTAT/WPNA(2013)11&docLanguage=En.

Appendix:
A brief overview of pension schemes

Our article discusses pensions from the perspective of fiscal rules. As a supplement to this, the following section contains a brief presentation of the types of pension schemes that are currently in use, as well as their key parameters. When compared with the accumulation of savings at the individual's level as a possible alternative, all pension schemes have the common feature that they provide some sort of "insurance" to the recipients.[1] Correspondingly, old-age pension can provide security to individuals reaching an above-average age, whereas survivor's benefit is intended for family members to cover the risks of being left alone. Although numerous pension schemes exist in international practice, with a little simplification they all can be classified according to the following two considerations. One has to do with the object of pension rules, as these can define either the service (benefits) or the contribution. According to the other consideration, it is assessed whether future expenditure is funded or not, in the latter case the actual contribution revenue will finance the actual pension expenditure. Based on these two considerations, four pension schemes can be distinguished.

Table 1
Types of pension schemes

	Defined Contribution (DC)	Defined Benefit (DB)
Funded	funded (DC)	not applicable to universal pension
pay-as-you-go	nonfinancial defined contribution (NDC)	public pension (DB, points system, PS)

Most funded pension funds are private funds

In a funded pension scheme, there is a relatively close relationship between payment and service: contributions paid at the individual's level are invested, after which pension is disbursed in the form of annuity according to a specific set of rules (DC). If the contribution payer dies before retirement, survivors can have inheritance rights over the remaining benefits. In order to solve the problem posed by society's ageing, funded pension schemes offer a continuously diminishing capital gain due to the slowdown in economic growth and, given the rising life expectancy, also decrease the annuity amount, thus people retiring will be receiving increasingly modest provisions. An exception is when there is a minimum level of benefits or capital gains guaranteed by the state. Calling this guarantee will increase the general government deficit, the offsetting of which requires measures by the government (e.g. tax hikes, spending cuts or lowering the guarantee level).

Public pension funds are typically unfunded

In a pay-as-you-go scheme, the link between contributions and service is weaker: at the individual's level it is not the contribution that defines the service and, by and large, all contribution revenues are used immediately to cover pension payments[2] Given that pay-as-you-go is unfunded, inheritance can be problematic: in this case, state pensions may be substituted by survivor (dependant) benefits but, if the contribution payer dies before retirement, all entitlement can be lost.

The notional, or nonfinancial, defined contribution (NDC) scheme is similar to its funded counterpart in that there is a direct relationship between the amount of pension that can be collected and the amount of contributions paid. However, since it is unfunded, an individual's notional capital balance is determined, instead of by actual investments, using specific

[1] The contributions paid will result in a person's entitlement to pension — this is an evident relationship between payments (contribution) and benefits that exists for virtually no other element of the general government budget (and is exactly what distinguished public from private – i.e. market - transactions, where, by definition, payments [price] and benefits [service] are closely related).

[2] As a special case of the pay-as-you-go scheme, contributions can be transferred to a fund where it is the sponsor, and not the individual, who enjoys the benefits and takes all the risks. In practice, the sponsor is usually not the government but the employer, as this scheme is mostly prevalent among corporate pension funds. Hungary's public sector experienced limited attempts at this in the 1990s, when securities were transferred from the budget to the Social Security Fund.

reference (benchmark) yields.[3] Government guarantees can also be provided by which to ensure a certain pension level.

In all other public pension systems, an individual's pension is determined by previous earnings.

- Pension (DB) is most frequently defined through the valorisation of earnings and based on a replacement rate (the proportion of pension to final wages before retirement). In this practice, degression can also be observed in case ceilings, minimums and differentiated valorisation (indexation) are applied.
- In some countries, entitlements are determined using a point system, whereby the pension amount represents the quotient of earnings and a continuously valorised score (PS).[4] Degression may be possible.

Given the ageing of society, these methods for calculating pension can lead to growing imbalances. For the sake of simplicity, the impact of ageing can be expressed as an increase in the proportion of the population above 65 compared to the 20-64 year old cohorts.[5] At the EU level, this could translate into a 2.2 per cent increase in pension expenditure as a percentage of GDP between 2010 and 2020, and another 2.4 per cent during the 2020-2030 period (European Commission, 2012). Balanced positions can be restored with the adjustment of various pension parameters — with different cohorts required to bear the associated burden. Other than the automatic annual indexation of pension, any other change in parameters is subject to discretionary decision; however, there are some EU countries where certain parameters are modified more or less automatically. Having the retirement age linked to life expectancy is a good example for this.[6] The so-called sustainability factor has a similar role, as it changes the size of the pension benefit depending on expected demographic changes such as the life expectancy at the time of retirement.[7] In view of the above, pension expenditure as a percentage of GDP in the EU27 can remain virtually unchanged between 2010 and 2020, with only a 0.6 per cent increase projected for the 2020-2030 period (European Commission, 2012). Therefore, if the pension balance were to be regulated in a forward-looking approach over a 15-year horizon, certain measures would be required in order to achieve a balanced position for the 15-year average. The problem lies in the fact that the EU average conceals the high rate of deviation in the changes (and even the sign) of pension expenditures, which can only be partially explained by the diverse effects of ageing itself. However, to a certain degree, it is the impacts of measures already taken, or automatisms already implemented, that make a difference, which could actually yield a surplus on a 15-year average in some countries. In the following, potential measures by which to adjust the pension balance will be described.

As regards the establishment of old-age (own right) pension, the three public pension schemes used in EU Member States (NDC, DB and PS) share the common feature that they all have entitlement defined, with the use of certain parameters, based on earnings (or the applicable contributions paid in NDC) in different years during employment. (For general formulae, refer to Queisser-Whitehouse, 2006.) The result can be expressed as the ratio of pension to pre-retirement earnings, also called the replacement rate. The retirement date is an important parameter, as early retirement (where permitted) is "penalised" (malus) and rewards are introduced for later retirement (bonus). (This is an automatic process in NDC, for more information on its impacts, see Simonovits, 2013.)

As an example, below are the parameters of the pay-as-you-go pension scheme, listed according to their impacts on the pension balance.

1. Measures with immediate and permanent effect, such as raising the contribution and the direct taxes (or contributions) on pension expenditure. Since the former affects the active population's tax burden and the latter involves the inactive cohort, their economic impacts vary.

2. Measures with immediate effect that are reversed over the medium and long term. These include the broadening of the contribution base (e.g. by eliminating the contribution ceiling), the effects of which will gradually — but not necessarily with the same size — reverse through the increases of newly established pensions.

3. Gradual measures that lead to stabilisation over time (when pensioners collecting their entitlement according to the

[3] Within the European Union, this type of public pension fund is used in Italy, Latvia, Poland and Sweden (AWG, 2012).
[4] Germany, Romania, Slovakia and, in part, France (AWG, 2012).
[5] Mitigating the impacts of ageing is the gradual trend that people are staying active longer and the elderly lose their work capacity at an increasingly later age.
[6] Spain, Italy, Czech Republic, Greece, the Netherlands and, subject to confirmation by parliament, Denmark (AWG, 2012).
[7] Germany, Finland, Spain, Italy, France, Latvia, Poland, Portugal and Sweden (AWG, 2012).

new regulations completely replace those having retired under previous rules). These include the parameters of newly established pensions — the pension formula, the rules of retirement, the proportion of survivor's benefit and the regulations concerning the duration and commencement of entitlement — for both own right and survivor's benefits.[8]

4. Measures with gradual effect that do not necessarily disappear at some point. For instance, inflation indexation applied to pensions will continue to generate savings as long as the economy is characterised by real growth and an increase in the real wage index.

[8] A similarly adjustable parameter in funded pension schemes is the level of government guarantees, which is subject to applicable conditions (pension amount is to decrease below the guaranteed level).