PUBLIC PENSIONS IN THE NATIONAL ACCOUNTS AND PUBLIC FINANCE TARGETS

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Abstract

Preparations are underway to revise national accounting to implement actuarial recording of pension liabilities for corporations and government as an employer. This paper extends this to unfunded public pensions with the help of 'implicit tax' in pension contributions. The clearest advantages of the revision appear in situations where pension liabilities are shifted from the corporate sector to government, and where part of the public pension system is privatised. The proposed revision raises public debt and deficit to new orders of magnitude. The paper provides a framework for setting the debt and deficit targets under both current and proposed definitions.

JEL classification: H1, H5, H6.

Keywords: pensions, public debt and deficit, implicit debt, national accounts.

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Views expressed are those of the author and do not necessarily reflect those of the European Commission.

1. Introduction

1.1. Background

The current *System of National Accounts 1993* (SNA-93) and, in parallel, the *European System of Accounts* (ESA-95), recognise the pension obligations as employer liabilities only if those obligations are funded, i.e. if they are (fully or partially) matched by segregated assets. As the nature of this obligation does not qualitatively depend on the mode of meeting it, and as such liabilities considerably affect the value of a firm, the main existing company accounting standards require their recording, whether funded or not. For example, from 2005 at the latest, all listed companies in the European Union are required to record all their pension liabilities according to the International Accounting Standards provision IAS19.

In 2001, the Intersecretariat Working Group on National Accounts (ISWGNA) requested the Statistics Department of the International Monetary Fund (IMF) to establish an Electronic Discussion Group (EDG) on recording pensions in statistics. Initially, the purpose of the EDG was limited to unfunded 'private' (employer) schemes, but was extended in autumn 2002 to all pension schemes, including public social security schemes. The EDG has been accessible to the public since October 2002 at: http://www.imf.org/external/np/sta/ueps/index.htm.

According to the Report by the Moderator of the group delivered in December 2003, work at the EDG is proceeding in stages. After active deliberations the Report recommends that changes to the *1993 SNA* be initially restricted to employer retirement pension schemes, leaving broader issues related to public pension systems (i.e. social security and social assistance) for further work (de Rougemont, 2003). Note, however, that the recommendations concerning the recording of employer pension obligations also apply to the government as an employer, thus the recommended changes would have a significant effect on government accounts regardless of whether social security pension rules be revised or not (see OECD Statistics Directorate, 2004, contribution on the EDG website).

1.2. The purpose of this paper

Applying the same principles to record the pension liabilities over all institutional sectors, including public pensions, can be argued on the grounds of similarity or at least parallelism: (1) in public pensions too, a link often exists between the pension contributions paid (by employer or employee) and future benefits, even though this link is not perfect in typical Defined Benefit (DB) schemes, (2) accumulated pension rights have to be met in future from government revenues or assets, and therefore (3) assessing the soundness of public finances requires examination of public pension liabilities, especially as we know that population ageing is leading to their significant increase under the current rules. In accounting terms, following the principles to be used in national accounts for corporations, public pensions should be recorded as pension rights are accrued, rather than waiting until payment is made. Consistent with this, contributions paid to the public pension system giving rise to pension liability – asset from the point of view of the person covered by the scheme – should be treated as a financial transaction, and the payment of pension as a depletion of this government liability. This is in contrast with the treatment under the current SNA/ESA rules where

public pension liabilities are not recorded, pension contributions are recorded as government revenue (under social contributions) and pensions as transfer payments to retirees.

Apart from the general aim of harmonising corporations and government sector rules to a maximum, an important practical reason also exists: pension liabilities are sometimes shifted from a corporation to the government against a compensatory payment, often a lump-sum; this has recently happened in cases of public corporations, especially in the context of their reorganisation or privatisation. In such cases, the way these transactions are recorded has a crucial impact on government deficit, which is why Eurostat - the statistical arm of the European Commission - has in the recent past dealt with such cases in the context of validating government deficit figures. It came to the conclusion that the most consistent way under the current rules is to record the payment received by the government as government revenue, thus with a positive impact on government budget balance. The problem is that the pension liability taken over by the government as the counterpart of the lump sum received is not recorded in the accounts (Eurostat news release of 21 October, 2003, on cases with an unfunded company scheme, and that of 25 February, 2004, on the corresponding cases where it is funded).

Pension liabilities can also be transferred in the other direction, causing similar accountancy problems of consistency. These cases appear under partial privatisation of the public pension system, as a portion of pension contributions is diverted to a private sector managed pension fund, thus causing an immediate decrease in government revenue, while public pension expenditure decreases gradually. Eurostat has recently dealt with this type of case and confirmed that such an operation has a negative impact on government budget balance (Eurostat news release of 2 March, 2004).

There is no ideal treatment of these cases under current national accounting rules, the basic problem being that they do not recognise the *accrued liabilities* stemming from certain cash transactions (regular pension contributions or lump sum payments). A reason for the current treatment could be that the commitment to pay a pension in future is typically not recognised as an IOU given to the future pensioner. In addition, its quantity may not be well defined but may depend on interpretation of the rules and various economic assumptions (future interest rate, for example).

However, statistics should not be confined to recording formal and legal obligations, but their purpose is also to lay a basis for economic analysis. This can be understood to be the reason behind the proposed rules for corporate pension schemes. Consequently, an extension of the same principle to public pensions would appear to be the only way to arrive at a framework that consistently captures the cases where pension liabilities are shifted between institutional sectors.

Against this background, the purpose of this paper is to present a framework to analyse both current and proposed national accounting rules for public pensions, albeit recognising the main differences between company pension schemes and public social security pensions. In the former, pension liability is a negative entry into the net worth of the corporation, whether segregated assets match this liability or not, and the pension contribution, whether explicitly paid or imputed, is recorded as a financial transaction, as explained above. A typical unfunded public pension scheme differs from a corporate one in that it is mandatory by law and its obligations are mostly covered by compulsory pension contributions or other taxes imposable by government. This paper will show that the concept of 'implicit tax' inherent in a public pure (or partially funded) Pay-As-You-

Go (PAYG) pension system is a key concept to arrive at a consistent accounting system for both corporations and governments.

The effect of the proposed explicit recording of public pension liabilities is naturally that the figures for public debt increase to a new order of magnitude. Consequently, as the framework needs to be consistent for flows, the newly defined government deficit will also be very different from the one under the current definition. Therefore, any policy rules linked to public debt and deficit need to be thoroughly reviewed. The present paper provides a framework for setting targets for these key public finance variables under both current and proposed definitions.

The need to become accustomed to a new order of magnitude for public debt and deficit and the practical problems of estimation of pension liabilities are probably the main difficulties in implementing the proposed changes to national accounting. Final conclusions cannot yet be drawn as to whether advantages of the change outweigh disadvantages. The main criterion in the final assessment should be the suitability of each accounting system to underpin policy design.

As the aspiration here is to avoid an unnecessarily high level of abstraction, the method used is to take examples based on stylised facts and specific assumptions on economic variables - notably on the interest rate - to illustrate the functioning of current and proposed accounting frameworks. The examples ensure that it should be relatively easy to see their application more generally.

2. Accounting for public pension systems under population ageing

2.1. Current SNA/ESA accounting with memorandum items

The attached table presents a few scenarios for pension systems under population ageing. To simplify coverage of the dynamics over generations, the unit period runs from one generation to the next – we can take it to correspond to 30 years, which is currently in EU countries the average childbearing age of women, and also, usefully for some applications, roughly the difference between the average age of a pensioner (70) and that of a worker (40).

The population is composed of children (E), workers (L) and retirees (R). The exercise starts with a stationary population, i.e. fertility at reproduction level, so that the number of people in each category is the same. The fact that in the real life the time in retirement is shorter than at work is taken into account by a correction factor. Until period 0, the ratio of time in retirement to time at work is assumed to be 0.45 (based on 18 and 40 years, respectively).

In period 1, fertility declines from 1 to 0.8. These figures roughly correspond to the 20% decline in the EU on average over a generation: the female generation born in the early 1940s, giving birth on average in the early 1970s, had fertility at the reproduction level of 2.1, while the most recent figure is 1.7. Also, for workers in period 1 and all subsequent generations, longevity is assumed to increase by five years. Assuming a fixed retirement age, the ratio of time in retirement to time at work increases to 0.575 (=23/40).

Unit wage in period 0 is set to 1. Real wage is assumed to increase by 70% in the unit period, corresponding to 1.78% per annum (p.a.) over 30 years. Inflation is assumed to

be at 50%, i.e., 1.36% p.a. Neither of these two assumptions matter for certain key results concerning stocks in relation to the wage bill or GDP (which stand for the size of the economy), but in all cases they significantly affect deficit figures. The interest rate, assumed to be uniform, is set at 50% (or 1.36% p.a.) above the rate of growth of the economy (increase in the wage bill and the GDP, assumed for simplicity to be equal). These assumptions mean that the real interest rate in the initial steady state is 3.2% p.a. and then declines to 2.4% when the rate of growth of GDP declines due to the demographic shock; these numbers broadly comply with the conventional assumptions for long-term scenarios.

The initial public pension system is assumed to be an unfunded, pure Pay-As-You-Go (PAYG) system with the replacement rate proper at 60%. This corresponds to an earnings-related, Defined Benefit (DB) system, under which 1.5 percentage points of the wage are accrued in each year over the assumed 40 working years, and pension rights are indexed to wages. Under such a system public sector liability can be clearly defined and measured. However, for the present analysis, the determination of pensions could be more nuanced as long as actuaries and statisticians can put a number on the liability.

In the initial steady state, the pure DB PAYG system requires a contribution rate of 27% (=60*18/40). The wage bill (net of pension contributions) is assumed to be 40% of GDP. This simple key is used to transform the results into percentages of annual GDP.[1] All numbers used are but rough stylised facts, but one can note that they correspond to pension expenditure at 10.8% of GDP (=0.4*27), close to current estimates for EU-15 on average.

In the attached tables, periods 0-3 describe the transition from the initial to the new steady state, driven by demographic change and pension system adjustments. The figures for periods -1 and 4 are displayed to show that the system moves from one steady state to another as none of the relative numbers change from period -1 to 0 or from period 3 to 4. The table first gives the figures in monetary units so that they can be inserted into a full accounting framework, and then as a percentage of the GDP to illustrate their economic meaning.

Scenario 1 displays *the pure PAYG system with no adjustment* for period 1. The new contribution rate required from period 2 onwards is 43.1%. Under the current SNA/ESA accounting, nothing interesting happens to the deficit or funding as the system is always by definition in balance: contributions are adjusted to cover the expenditure. Let's omit the memorandum items for the moment.

What should be noted in Scenario 1 is the increase in the required contribution rate. Apart from issues related to the effects of such an increase, the question of fairness can be invoked. Why should the generation of workers in period 1 which initiated the decline in fertility escape the increase in the pension contribution rate required from all future

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[1] The figures are given as a percentage of annual GDP. For stocks of financial variables this is done by multiplying by 30 as the unit period is 30 years. The budget balance figures are adjusted to be compatible with annual accounting by adjusting the denominator to be the average GDP over each 30-year period.

generations? If all generations with the same demographic characteristics are to be treated equally, the pension regime already needs to be changed for period 1 workers.

In *Scenario 2* the contribution rate is increased in period 1 to its permanent level of 37.75%. It is lower than future pension expenditure as a percentage of the wage bill thanks to the proceeds of the fund which reaches 129% of GDP (the algebraic formulas to calculate these numbers are presented in Oksanen, 2004). The underlying argument for this reform is solely fairness across generations: while a pure, unfunded fully matured PAYG system can be regarded as fair under a steady state where all current and future generations of workers are equal, it is not fair if the fertility and/or longevity change; coping with these changes requires adjustments to the rules. If the initial level of benefits is maintained, a move to partial funding is required.

Over period 1 - the first period of the demographic shock - the financial surplus of the system is 6.5% of GDP, and in the new steady state, 3.0%.

This is where conventional national accounting stops. However, economic analysis of pension systems provides a basis for memorandum items which add useful information about underlying variables. Firstly, the tables display the *Implicit Pension Debt* (IPD) which, for each period, is defined as the pension expenditure in the next period, discounted at the prevailing rate of interest. In a more general setting, this definition corresponds to IPD defined as the present value of pension rights accrued to date by current workers and pensioners (this should not be confused with other definitions of future pension liabilities, which may include an estimate of both future contributions and future accumulation of rights; see Holzmann, Palacios and Zviniene, 2004, for the alternative definitions).

The IPD thus defined is given on row 16 as a percentage of the annual GDP. The IDP with its negative sign plus the assets in the newly created Fund is displayed in monetary units on row 17, and as a percentage of GDP on row 18. For Scenario 2 the most essential issue is that the latter variable remains at 216% of annual GDP over the transition: this shows that, under the assumptions made, the prescribed policy rule implies neutrality across generations. This contrasts with the increase in the IPD in Scenario 1 from 216% to 345% of GDP, which is a measure of the future pension burden as no counterbalancing assets are accumulated.

Secondly, the *internal rate of return* for each generation of retirees defined as the rate earned on contributions in terms of pension benefits. As explained in the seminal paper by Samuelson (1958), in pure PAYG systems under a steady state this rate is equal to the increase in the wage bill. The scenarios here tackle the more interesting and relevant issue of what happens under ageing: in Scenario 1, period 1 workers receive, as retirees in period 2, an undue exceptionally high rate of return of 226%, after which it falls to 104% for all future generations. If this unfairness is eliminated, as in Scenario 2, by already increasing the contributions in period 1, the rate of return declines to its permanent level of 133% already for the first transitional generation (which, in the partially funded system, is a weighted average of the rate of change of the wage bill and the interest rate).

Table. Scenarios for population ageing and pensions

Common assumptions for all scenarios:

Initially,
- fertility preserves a constant population,
- 40 years at work and 18 in retirement,
- replacement rate proper 60%; pension expenditure 60*18/40=27% of the wage bill,
- pure PAYG system, thus contribution rate is 27%.

In period 1,
- fertility declines by 20% and remains at this level,
- longevity increases so that from period 2 onwards 23 years in retirement.

Economic assumptions:
- real wages increase 70% over the unit period of 30 years (1.78% per annum),
- price level increases 50% over the unit period of 30 years (1.36% per annum),
- unit period interest rate is 50% over the rate of growth of nominal wage bill,
- wage bill after pension contributions is 40% of GDP.

Demographic and economic variables common for all scenarios

	Period	**-1**	**0**	**1**	**2**	**3**	**4**
1	E children	100	100	80	64	51.2	41.0
2	L labour	100	100	100	80	64	51.2
3	R retired	100	100	100	100	80	64
4	W wage bill	39.2	100	255	520	1061	2165
4	Change in wb, %	155	155	155	104	104	104
5	Interest rate, %	283	283	283	206	206	206
6	Oadr (60+/20-59), %[1]	45.0	45.0	45.0	71.9	71.9	71.9

[1] = Old age dependency ratio: ratio of 60+ years old to those aged 20-59 years.

Scenario 1. Pure PAYG, replacement rate proper constant at 60%

	Period	**-1**	**0**	**1**	**2**	**3**	**4**
7	Pension expenditure	10.6	27.0	68.9	224.3	457.6	933.6
8	**Contribution rate**	**27.0**	**27.0**	**27.0**	**43.1**	**43.1**	**43.1**
9	Contribution revenue	10.6	27.0	68.9	224.3	457.6	933.6
10	Interest revenue	0	0	0	0	0	0
11	Fund assets ('-' indicates debt)	0	0	0	0	0	0
12	**Fund assets/annual GDP, %[2]**	**0**	**0**	**0**	**0**	**0**	**0**
13	Budget balance (SNA-93)	0	0	0	0	0	0
14	**Budget balance/GDP, %[3]**	**0**	**0**	**0**	**0**	**0**	**0**
Memorandum items							
15	- IDP (- indicates debt)	-7.1	-18.0	-73.3	-149.6	-305.1	-622.4
16	**- IPD/annual GDP, %[2]**	**-216**	**-216**	**-345**	**-345**	**-345**	**-345**
17	- IDP+Fund	-7.1	-18.0	-73.3	-149.6	-305.1	-622.4
18	**(- IDP+Fund)/annual GDP, %[2]**	**-216**	**-216**	**-345**	**-345**	**-345**	**-345**
19	**Internal rate of return, %**	**155**	**155**	**155**	**226**	**104**	**104**
20	**Implicit tax/wage, %**	**9.0**	**9.0**	**-1.8**	**14.4**	**14.4**	**14.4**
21	Implicit tax	3.5	9.0	-4.5	74.8	152.5	311.2
22	Contribution revenue - implicit tax	7.1	18.0	73.3	149.6	305.1	622.4
Proposed revised accounting							
23	Budget balance[4]	-4.3	-10.9	-55.3	-76.2	-155.5	-317.3
24	**Budget balance/GDP, %[3]**	**-6.6**	**-6.6**	**-13.2**	**-8.1**	**-8.1**	**-8.1**

[2] The ratio is transformed to a percentage of annual GDP by multiplying by 30.
[3] Adjusted to be compatible with annual accounting.
[4] = $(21)+(10)-((5)*(22)_{-1})$

Scenario 2. Partial funding, replacement rate proper constant at 60%

	Period	-1	0	1	2	3	4
7	Pension expenditure	10.6	27.0	68.9	224.3	457.6	933.6
8	**Contribution rate**	**27.0**	**27.0**	**37.8**	**37.8**	**37.8**	**37.8**
9	Contribution revenue	10.6	27.0	96.3	196.4	400.6	817.2
10	Interest revenue	0	0	0	56.5	115.2	235.0
11	Fund assets ('-' indicates debt)	0	0	27.4	55.9	114.1	232.7
12	**Fund assets/annual GDP, %**[2]	**0**	**0**	**129**	**129**	**129**	**129**
13	Budget balance (SNA-93)	0	0	27.4	28.5	58.2	118.6
14	**Budget balance/GDP, %**[3]	**0**	**0**	**6.5**	**3.0**	**3.0**	**3.0**
Memorandum items							
15	- IDP (- indicates debt)	-7.1	-18.0	-73.3	-149.6	-305.1	-622.4
16	**- IPD/annual GDP, %**[2]	**-216**	**-216**	**-345**	**-345**	**-345**	**-345**
17	- IDP+Fund	-7.1	-18.0	-45.9	-93.6	-191.0	-389.7
18	**(- IDP+Fund)/annual GDP, %**[2]	**-216**	**-216**	**-216**	**-216**	**-216**	**-216**
19	**Internal rate of return, %**	**155**	**155**	**155**	**133**	**133**	**133**
20	**Implicit tax/wage, %**	**9.0**	**9.0**	**9.0**	**9.0**	**9.0**	**9.0**
21	Implicit tax	3.5	9.0	23.0	46.8	95.5	194.8
22	Contribution revenue - implicit tax	7.1	18.0	73.3	149.6	305.1	622.4
Proposed revised accounting							
23	Budget balance[4]	-4.3	-10.9	-27.9	-47.7	-97.4	-198.7
24	**Budget balance/GDP, %**[3]	**-6.6**	**-6.6**	**-6.6**	**-5.1**	**-5.1**	**-5.1**

[2] The ratio is transformed to a percentage of annual GDP by multiplying by 30.
[3] Adjusted to be compatible with annual accounting.
[4] $= (21)+(10)-((5)*(22)_{-1})$

Scenario 3. Full DC fund; 60% replacement rate targeted: contributions raised from 18% to 28.75%

	Period	-1	0	1	2	3	4
25	**Contribution rate**	**18.0**	**18.0**	**28.8**	**28.8**	**28.8**	**28.8**
26	Contribution revenue	7.1	18.0	73.3	149.6	305.1	622.4
27	Interest revenue	7.8	19.9	50.9	151.0	308.1	628.5
28	Pension expenditure	10.6	27.0	68.9	224.3	457.6	933.6
29	Av. pens./av. wage, %	27.0	27.0	27.0	34.5	34.5	34.5
30	Fund assets	7.1	18.0	73.3	149.6	305.1	622.4
31	**Fund assets/annual GDP, %**[2]	**216**	**216**	**345**	**345**	**345**	**345**
32	**Budget balance/GDP, %**[3]	**6.6**	**6.6**	**13.2**	**8.1**	**8.1**	**8.1**

[2] The ratio is transformed to a percentage of annual GDP by multiplying by 30.
[3] Adjusted to be compatible with annual accounting.

Scenario 4. Public pension system scrapped for period 1 workers and onwards

	Period	-1	0	1	2	3	4
7	Pension expenditure	10.6	27.0	68.9	0	0	0
8	**Contribution rate**	**27.0**	**27.0**	**9.0**	**9.0**	**9.0**	**9.0**
9	Contribution revenue	10.6	27.0	23.0	46.8	95.5	194.8
10	Interest revenue	0	0	0	-94.6	-192.9	-393.5
11	Fund assets ('-' indicates debt)	0	0	-45.9	-93.6	-191.0	-389.7
12	**Fund assets/annual GDP, %**[2]	**0**	**0**	**-216**	**-216**	**-216**	**-216**
13	Budget balance (SNA-93)	0	0	-45.9	-47.7	-97.4	-198.7
14	**Budget balance/GDP, %**[3]	**0**	**0**	**-10.9**	**-5.1**	**-5.1**	**-5.1**
Memorandum items							
15	- IDP (- indicates debt)	-7.1	-18.0	0	0	0	0
16	**- IPD/annual GDP, %**[2]	**-216**	**-216**	**0**	**0**	**0**	**0**
17	- IDP+Fund	-7.1	-18.0	-45.9	-93.6	-191.0	-389.7
18	**(- IDP+Fund)/annual GDP, %**[2]	**-216**	**-216**	**-216**	**-216**	**-216**	**-216**
19	**Internal rate of return, %**	**155**	**155**	**155**	**-100**	**-100**	**-100**
20	**Implicit tax/wage, %**	**9.0**	**9.0**	**9.0**	**9.0**	**9.0**	**9.0**
21	Implicit tax	3.5	9.0	23.0	46.8	95.5	194.8
22	Contribution revenue - implicit tax	7.1	18.0	0	0	0	0
Proposed revised accounting							
23	Budget balance[4]	-4.3	-10.9	-27.9	-47.7	-97.4	-198.7
24	**Budget balance/GDP, %**[3]	**-6.6**	**-6.6**	**-6.6**	**-5.1**	**-5.1**	**-5.1**

Scenario 5. Replacement rate reduces from 60% to 37.6%: pure PAYG, DB or NDC

	Period	-1	0	1	2	3	4
7	Pension expenditure	10.6	27.0	68.9	140.5	286.5	584.5
8	**Contribution rate**	**27.0**	**27.0**	**27.0**	**27.0**	**27.0**	**27.0**
9	Contribution revenue	10.6	27.0	68.9	140.5	286.5	584.5
10	Interest revenue	0	0	0	0	0	0
11	Fund assets (- indicates debt)	0	0	0	0	0	0
12	**Fund assets/annual GDP, %**[2]	**0**	**0**	**0**	**0**	**0**	**0**
13	Budget balance (SNA-93)	0	0	0	0	0	0
14	**Budget balance/GDP, %**[3]	**0**	**0**	**0**	**0**	**0**	**0**
Memorandum items							
15	- IDP (- indicates debt)	-7.1	-18.0	-45.9	-93.6	-191.0	-389.7
16	**- IPD/annual GDP, %**[2]	**-216**	**-216**	**-216**	**-216**	**-216**	**-216**
17	- IDP + Fund	-7.1	-18.0	-45.9	-93.6	-191.0	-389.7
18	**(- IDP+Fund)/annual GDP, %**[2]	**-216**	**-216**	**-216**	**-216**	**-216**	**-216**
18b	**NDC accounts/annual GDP,%** [2]	**-324**	**-324**	**-324**	**-324**	**-324**	**-324**
19	**Internal rate of return, %**	**155**	**155**	**155**	**104**	**104**	**104**
20	**Implicit tax/wage, %**	**9.0**	**9.0**	**9.0**	**9.0**	**9.0**	**9.0**
21	Implicit tax	3.5	9.0	23.0	46.8	95.5	194.8
22	Contribution revenue - implicit tax	7.1	18.0	45.9	93.6	191.0	389.7
Proposed revised accounting							
23	Budget balance[4]	-4.3	-10.9	-27.9	-47.7	-97.4	-198.7
24	**Budget balance/GDP, %**[3]	**-6.6**	**-6.6**	**-6.6**	**-5.1**	**-5.1**	**-5.1**
24b	**NDC accounts BB bal./GDP, %**[3]	**-10.0**	**-10.0**	**-10.0**	**-7.6**	**-7.6**	**-7.6**

[2] The ratio is transformed to a percentage of annual GDP by multiplying by 30.
[3] Adjusted to be compatible with annual accounting.
[4] $= (21)+(10)-((5)*(22)_{-1})$

Thirdly, the figures for *implicit tax* (rows 20-21) complete the picture. It is best understood as the excess of the contribution rate in the pure (or partially funded) public pension schemes over that under a hypothetical fully funded system offering the same pension benefits (another expression: the implicit tax stems from the excess of the rate of interest in the financial market over the rate of change of the wage bill, levied on the IPD; see Sinn, 2000, Fenge and Werding, 2003a and 2003b and Oksanen, 2004, for the origin and applications of this concept). As the internal rate of return, implicit tax is also constant under a steady state, initially 9% of wages, and may change under population ageing. In Scenario 1 - the pure PAYG with constant benefits and retirement age - workers in period 1 gain considerably: their implicit tax is negative, -1.8%, which also explains why all subsequent generations have to pay a higher implicit tax of 14.4%. In Scenario 2 the unfairness is eliminated and everybody pays the 9% implicit tax.

Implicit Pension Debt and the consequent implicit tax are instrumental in analysing PAYG public pension systems. Note that we assumed above that, at the point in time we start to look at it, the system is a pure PAYG with no assets. This implies that, sometime earlier, a public pension system had been established and benefits had been given to one or more generation which had not contributed to the system at all or in any case less than the actuarial value of the pensions they received, i.e. they gained a return in excess of that on the market. They therefore received a transfer, i.e. for them the implicit tax was negative, and they left to the successive generations a burden, an IPD, and all successive generations collectively have to pay an implicit tax to serve that debt.

If no previous generation had been treated more favourably than another, the first pensions would have been determined on the basis of contributions previously paid to recipients and the return from their investment in interest yielding assets. The outcome would have been a fully funded pension scheme, where pension obligations are matched by assets. *Scenario 3* is such a pension scheme, providing the same benefits as in scenarios 1 and 2. Under the initial steady state the Fund assets are 216% of GDP, and as the economy is growing, the conventionally defined budget balance is positive at 6.6% of GDP. As the rate of interest is assumed to fall in line with the decline in the rate of growth of the economy, workers in period 1 must increase their contributions. Financial surplus increases for period 1 to 13.2% of GDP, bringing the fund to 345% of GDP, at which level it remains with the financial surplus at 8.1% of GDP. This scenario provides the benchmark contribution rate for the calculation of the implicit tax in the other scenarios, and it is also the prototype model for the possible fully funded pillar of a reformed multi-pillar system.

Scenario 4 provides an extreme case where the public pension system strictly follows the principle of intergenerational fairness, and where - compared to scenario 2 - the size of the public system for workers in period 1 and after is decided independently of its previous size. It is an extreme case where the system is scrapped altogether, while the acquired rights of period 1 retirees are fully respected. The outcome is that period 1 workers should pay in 9% of their wages, as will all future generations. As expenditure in period 1 is still 27% of the wage bill, the system borrows the missing 18%, or 10.9% of GDP over the 30-year period. This is thus the deficit in period 1, after which it falls to 5.1% of GDP, while the debt remains at 216% of annual GDP.

The payment of 9% of wages by all future generations for servicing the debt keeps the debt/GDP ratio constant. The IPD of 216% of GDP becomes fully explicit and the implicit tax becomes explicit, as it is paid without any pension benefits by all workers from period 1 onwards. The internal rate of return naturally falls to –100% as the tax is

paid for servicing the debt accumulated when the public PAYG system was established, without any pension benefits for future generations.

The extreme cases of Scenarios 2 and 4 and therefore, any of their combinations, comply with the benchmark for fairness across generations. One such is a case where the benefits accrued by workers in period 1 and thereafter are reduced exactly to the level which maintains pension expenditure at 27% of the wage bill, thus allowing the initial contribution rate of 27% to be maintained. This is *Scenario 5*, which preserves the pure PAYG system, respecting the benchmark for intergenerational fairness. It requires a reform to the DB PAYG system, such that the accrual rate is adjusted with the effect of reducing the replacement rate from 60% to 37.6%.

Interestingly, Scenario 5 can also be interpreted as a transition to a Notional Defined Contribution (NDC) system, where the fixed pension contributions are registered on notional individual accounts earning an administratively fixed rate of interest, and where the capitalised value at retirement is transformed to an annuity paid out as a pension. If the notional rate of interest is set as the rate of growth of the wage bill, pension expenditure and contribution revenue are equal in the long run (for further explanations, see Oksanen, 2004). In the simplified setting in the present paper, this is sufficient for full financial stability of the system. This can be understood by observing that pension expenditure (row 7) is equal to contributions paid in the previous period (row 9) plus the interest earned under the notional interest rate set equal to the increase in the wage bill. The budget balance under the current SNA/ESA is constantly zero and no assets or explicit debt is accumulated.

The memorandum items 17-18 and 20-21 are identical with those under Scenarios 2 and 4. We shall further explore the size of NDC account balances below.[2]

2.2. The proposed revision of accounting definitions

While the current SNA/ESA concepts, accompanied by the memorandum items based on current findings in pension economics, provide a useful framework for policy design, the next step is to discuss the application of the new accounting definitions proposed for corporate sector pensions (and for the government as an employer) to public social insurance pensions.

Let's look first into period 0, the initial pure PAYG system in any of the scenarios 1-2 or 4-5. Pensions paid to retirees are now defined as financial transactions, stemming from contributions paid in the previous period when the recipients were workers. Application of these definitions is not, however, entirely straightforward, because in a pure PAYG

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[2] The Scenarios assume a fixed retirement age of 60. The dramatic changes in either contributions or benefits caused by population ageing indicate that the retirement age will probably be increased, allowing a more favourable combination of contributions and benefits. These are not explored here as the three-period model is not sufficient to capture the dynamics, and the simplified examples above suffice for the purposes of analysing alternative national accounting rules. It is fairly straightforward to see that the results for the accounting definitions are valid in more complex circumstances, while, for example, estimating the IPD for a changing retirement age under a pension system which is not fully actuarially fair is, in practise, a complex task. Some illustrations with yearly data can be found in Oksanen, 2004.

system contributions are not invested in interest yielding assets, but used for pensions of the previous generation, so that there is no explicit financial revenue from the contributions.

As some of the key financial variables are not real and observable, they must be replaced by book-keeping entries imputed by actuaries and statisticians. The key to a consistent accounting framework is the concept of 'implicit tax'. The last two lines in the tables for Scenarios 1-2 and 4-5 give the outcome for budget balance. In each period the 'implicit tax' -part of the pension contribution is recorded as government revenue, while the rest is recorded as a financial transaction. Government revenue also includes interest on its assets, and expenditure includes the imputed interest (set to follow the market rate of interest) on part of the contribution, which was in the previous period recorded as a financial transaction. These three flows compose the budget balance.

The portion of pension contributions recorded as a financial transaction is by definition equal to the present value of the pension in next period. In other words, the pension paid out is a financial transaction composed of the principal and the imputed interest. The liability is thus entered into the government balance sheet and in parallel, should be recorded as an asset held by the households. This government liability is the same as Implicit Pension Debt under the memorandum items. Under the proposed system, it should no longer be called 'implicit' as the very idea under the proposed revision is to record it explicitly in the accounts. One possible expression for this liability, estimated by an actuary, is 'Imputed Pension Debt', still IPD for short. In current statistical terminology it is "Net equity of households on pension funds".

Row 24 for scenarios 2, 4 and 5 show the result for the deficit under the proposed accounting system. The deficit numbers are the same for all these scenarios, declining from 6.6% to 5.1% only because the economic growth rate declines as a result of the shrinking labour force (the deficit ratio which keeps the debt ratio constant is d*g/(1+g), where d is the debt ratio and g is the nominal rate of growth).

Two observations confirm that both accounting frameworks – the current SNA/ESA with the memorandum items and the proposed revision – are mutually consistent: in any scenario, calculating '–IDP+Fund assets' for each period as the sum of its amount in a previous period and the deficit defined according to the new definition gives the same result as row 17 in all scenarios, and in parallel, calculating the change of '–IDP+Fund assets' from one period to the next gives the same results as row 23 for the deficit according to the proposed system.

As for financial stocks under the revised accounting, assets held by the pension system are found on row 11 of the current accounting framework, liabilities on row 15 under the memorandum items, and net debt in monetary units on row 17 and as a percentage of GDP on row 18.

For Scenario 1, the memorandum items and the revised system considerably add to the information provided by the by-definition-zero-deficit according to the current SNA/ESA. The implicit debt increases from 216% to 345% of GDP, and the deficit according to the new definition first increases from 6.6% of GDP in the initial steady state to 13.2% in period 1 and then settles to 8.1% of GDP. These high numbers indicate that period 1 workers increase the burden to be left to future generations, though it should be understood that under the revised accounting the correct benchmark for

fairness is not zero deficit, but rather, the 6.6% for period 1 and 5.1% thereafter, derived from Scenarios 2, 4, and 5.

As already stated, Scenario 5 can be interpreted as a transition to an NDC system for period 1 workers onwards (or, for that matter, as an NDC system already from period -1). Under NDC logic, contributions are placed on NDC accounts, which are bookkeeping accounts without any real assets, and earn a return set as being equal to the rate of growth of the wage bill.

Note that the amount of money registered on the NDC accounts (which remains constant as a percentage of the GDP) differs from the IPD as the latter is defined as pension expenditure in the next period, discounted using the interest rate proper, which is assumed to be at the certain margin above the rate of growth of the wage bill (compare row 18b to 18). The same consequently holds for deficit figures: the change in the nominal amount of money on the NDC accounts is larger than the deficit under the revised national accounts (compare row 24b to 24). These are merely technical observations and we return to their interpretation further below.

3. Interpretation and use of the budget balance and debt variables

In addition to clarity and internal consistency, usefulness of any accounting framework depends on its information content for the purposes of policy analysis and on the requirements of data collection and the required imputation of unobservable variables.

A comparative assessment of the current SNA/ESA – possibly accompanied by the memorandum items – and the proposed revised system opens a number of issues. In the following, six areas are discussed.

1. Providing indicators for pension reform options under population ageing

The Scenarios above show that current SNA/ESA definitions for government deficit and debt lead to very different figures, depending on whether the benchmark for intergenerational fairness is followed or not and on the future size of the public pension system. Thus, in principle, it provides a framework to analyse a wide range of policy options, provided that the data on future pension expenditure and a projection on the interest rate are available.

The memorandum items spelled out above give further insight into the economic meaning of each option. It is useful, for example if one or other indicator directly indicates the relative position of each successive generation. ‘IDP net of Fund assets’ as a percentage of GDP serves this purpose as in Scenarios 2, 4 and 5 it is maintained at 216% of GDP over the demographic transition, while it increases to 345% of GDP in Scenario 1.

The internal rate of return gives essential information for comparing Scenarios 1 and 2, but it depends on the reformed size of the system, falling to -100% in Scenario 4.

Implicit tax also gives essential information to compare Scenarios 1 to all other scenarios, and it is the same in Scenarios 2, 4 and 5.

Thus, the first and the third of these indicators display a constant value for reform options which meet the benchmark for fairness. Correspondingly, a deviation from the constant is an indicator of putting less burden on one generation at the expense of the others (as in Scenario 1, on the workers in period 1), or vice versa: if benefits are drastically cut and the system is not allowed to go into debt, one generation may have to contribute more than others with similar demographic characteristics.[3]

Under the proposed revised accounting, in the initial steady state, budget deficit is 6.6% of GDP. This is consistent with rolling over the pension debt of 216% of GDP (row 16) from one period to the next. In Scenario 1, budget deficit increases to 13.2% of GDP in period 1 and then stabilises at 8.1%. Public debt ratio increases to 345% of GDP. In Scenarios 2 and 4 the debt ratio is maintained at 216%. The deficit decreases to 5.1% of GDP from period 2 onwards as a consequence of the decrease in the rate of growth of the GDP.

Thus, under the revised accounting, the debt ratio provides a benchmark for a reform, together with a deficit target, which is adjusted for the GDP growth factor.

The conclusion is that both conventional accounting – when appropriately complemented with the IPD and implicit tax as memorandum items – and the proposed revision provide a framework for analysing a wide range of pension reform options. Thus, if judged from this point of view alone, one is not clearly superior to the other, though the proposed framework is more coherent as it brings all the elements of the memorandum items into the picture and adds greatly to the information provided by the current SNA/ESA framework alone.

2. Setting targets for fiscal variables under population ageing

The conclusions above can be extended to cover the whole general government sector, notably from the point of view of setting targets for government deficit and debt as defined under the current SNA/ESA. This can be done by assuming that some (explicit) public debt existed in the initial steady state. Furthermore, any other ageing-related public expenditure could be added to pension expenditure. Under these additional assumptions, intergenerational fairness would have the additional meaning that not only the burden of implicit pension debt but also that of the initial explicit debt is shared equally across all current and future generations.

This extension would lead to a set of modified scenarios with the difference being that the initial debt/GDP –ratio would be added to all (gross and net) debt figures and, correspondingly, the deficit/GDP ratio would have an additional component (which, in all cases, changes due to the change in the GDP growth rate). Note also that under the interest rate assumption in all scenarios above (i.e. that its margin over the growth rate is

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[3] Note, however, that the notion of 'double burden' as it appears in pension economics can be misleading: it refers to moving to (partial) funding and highlights that one generation has to pay for the pensions of the current retirees and at the same time accumulate funds for their own pensions. The framework here provides advice on this issue by offering a key to calculate which combinations of contributions, benefits and therefore funding (including borrowing) are justified under the simple benchmark for fairness.

constant), the *change* in the debt ratio from the initial steady state to the new does not depend on the level of initial debt.[4]

Looking in this way into both the explicit public debt and the implicit pension debt highlights the parallelism between the two. As Diamond and Orszag (2004, pp. 37-38) put it, explicit public debt reflects the accumulated difference between the spending and revenue from the beginning of the nation to the present, and in parallel, under the pure PAYG system, implicit pension debt reflects the accumulated difference between pension benefits and revenue for previous and current beneficiaries. Both require that taxes (including pension contributions) are higher than in the case where expenditure was covered by revenue and pension benefits were pre-financed when rights were accrued (i.e. fully funded). The scenarios above illustrate that rolling over the total net debt (the sum of the explicit and implicit debt minus explicit assets) as a percentage of GDP gives a benchmark for sharing the burden across all current and future generations (under the assumption of a fixed margin between the interest rate and the rate of growth of the economy).

Thus, this benchmark for designing policy, resulting in setting targets for public debt and deficit, can be worked out with public debt and deficit as defined under the current SNA/ESA. However, recording the IPD explicitly and displaying the corresponding budget balance according to the proposed revision of national accounting helps to better clarify the underlying factors.

3. The proposed revision facilitates consistent treatment of employer schemes and public pensions

As explained in the Introduction, the treatment in national accounts of certain operations where pension liabilities shift from corporations to government have caused problems, which impact on implementation of EU public finance rules. Under the current rules there is no ideal solution for these cases, and the problem of consistency will remain under the proposed new rules for corporations as long as government liabilities are not recorded. Thus, only extending the same principles to all sectors solves the problems referred to above.

The recent Eurostat decisions confirm this conclusion. For cases where public corporations have made payments to the government in the context of the transfer to government of their pension obligations, the decision under the currently prevailing ESA-95 was that these transactions should be treated as capital transfers rather than financial transactions (Eurostat news releases of 21 October, 2003, and 25 February, 2004). In the decision on the "classification of funded pension schemes in case of government responsibility or guarantee", it was decisive that such schemes be classified

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4 As the latter result is not intuitively straightforward, it may help to explain it as follows: (1) under declining labour force the initial debt has to be served by fewer people; (2) we assume above that the rate of interest declines as a result of the negative effect of the labour force decline on GDP, thus alleviating the debt burden; under the assumptions made these two opposite effects cancel each other out; therefore, the resulting change in debt ratio is determined only by the increase in primary expenditure and the shape of the tax rate path, neither of which depend on the initial debt ratio. This result holds true also for more realistic cases, where age-cohorts overlap, adjustment is gradual and yearly data is used (for an application, see Oksanen, 2003).

outside the government sector (Eurostat news release of 2 March, 2004). This essentially means that, under a pension reform which moves towards (partial) funding and private management, government deficit and net debt increase and the corresponding decrease in future liabilities is not recognised. This follows from the simple fact that under this clarification of the rules, the accumulating surplus in the newly established pillar is not recorded as part of net government revenue.

These decisions by the Eurostat were not taken without problems. According to the majority of experts who gave their opinion during the deliberations, they were the best compromise solutions under the current framework. In both cases, however, a minority of one third of the experts took another view. In the former case they preferred the payments to be classified as financial transactions, and in the latter, they would have preferred to draw the line between government and financial institutions in such a way as to maintain the mandatory second pillar pension funds within government, thereby avoiding the effect on government deficit due to the pension reform in question.

Essentially, under current SNA/ESA definitions, no good solutions are available in such situations. It is hard to envisage any framework for a clear improvement other than the proposed revised SNA described above. Application of its principles, refined with the concept of implicit tax for public pension systems, solves both situations above. For the latter, privatisation (whether partial or full) would not influence the newly defined government debt and deficit as compared to the corresponding fully public system.[5]

One requirement for this outcome is that there be an agreement on a long-term interest rate to be used as the discount rate for calculating the pension debt and the implicit (or 'imputed') tax, and that it is the same over all sectors. Otherwise the problems above are not (fully) solved. There should be no serious obstacles to this, for three reasons: (1) a public sector long-term interest rate assumption is needed for any issues related to sustainability of public finances, under any accounting system; (2) a long-term discount factor is needed for the statistical treatment of defined benefit schemes in the private sector, and (3) there is no compelling reason why these should be different.

The special case of an NDC system, however, needs clarification and specific treatment. The internal rate of return in the prototype unfunded NDC system is the increase in the wage bill. This is the factor which links the future value of pensions to the money registered on NDC accounts. This book-keeping is internally consistent and correct, and would mean that no implicit tax is registered. Instead, the implicit tax would be hidden in the difference between the interest rate proper and the internal NDC rate.

Provided that national accounts cover the IPD and other related variables for other public pension system, comparable accounts should also be presented for an NDC system. Scenario 5 above spells out the difference between the IPD and accounting entry on the NDC accounts. With the numbers in the example the latter is 50% higher than the former. The source is simply the assumed difference between the two rates, which is 50 percentage points compounded over the 30 year period (1.36 p.p. per annum).

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5 This does naturally not exclude situations were adjustment to the total contribution and replacement rates are combined with privatisation. However, it should be possible to logically separate such different elements from each other. The proposed revised framework suits this purpose well.

NDC accounts give important information for people covered, who should be told, as is the case, that those accounts earn an administratively fixed rate of return which is normally lower than the market rate. While the system is therefore transparent, to compare pensions across countries the figures should be based on identical economic assumptions. Therefore, the IPD and related variables should be used for all. This would be most important, for example, if the budget deficit according to proposed revised SNA were to be used for assessing long-term sustainability of public finances, with possible agreed targets or benchmarks.

If the new accounting framework wins acceptance, it would probably be more logical to use the harmonised definitions in the accounts proper, and supply the NDC accounts figures as memorandum items.

4. Setting the discount rate

In the scenarios above the difference between the interest rate and the economic growth rate is was set at a certain constant level. This, combined with the defined benchmark for intergenerational fairness, led to certain neat results, notably on the IPD and the public debt ratio under the proposed revised SNA. Although the content and use of the accounting concepts explored here do not depend on this assumption, it is important to note how some of the results reported in the tables change if the interest rate follows a different pattern.

Firstly, changing the assumption on the interest rate premium would change all numbers, even if the assumption that it is constant thereafter is maintained. All stocks and flows would change, and statisticians would need to enter holding gains and losses to the respective sub-accounts to maintain consistency of the system over this revision. In terms of policy (or policy rule), the contribution or replacement rates would need to be changed.

Secondly, in the context of long-term projections, the real interest rate is often assumed to be fixed. Such reasoning can be based on a small open economy which takes the interest rate from the outside world, or it can merely be a simplistic starting point for an exercise (it might not have been widely understood that the assumption on a fixed margin over the growth rate leads to simpler results and could therefore serve better as a basic case). If the real interest rate is assumed to be fixed, all above scenarios are affected as the decline in the GDP growth rate causes an increase in the difference between the interest rate and the growth rate. The main results are: after the demographic change in period 1, (1) both the IPD and net total debt (-IPD+Fund assets) are lower than in the corresponding scenario above; (2) internal rate of return is higher in cases where funds are accumulated, and (3) implicit tax is higher.[6] As in the first case, all stocks would immediately change, and holding gains and losses would need to be recorded.

The change in the implicit tax means that it increases also in cases which comply with the benchmark for intergenerational fairness. Thus, the constant implicit tax, which, under the assumptions of the scenarios above, appeared to be the most straightforward indicator of fairness, no longer has this property. If, for example, the implicit tax increases in any given pension system simulation, the source is not necessarily self-

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6 For brevity, the results are not displayed here, but the corresponding scenarios can be made available at request.

evident: the current generation may be extracting more than fair benefits or the interest rate differential may have increased. Identifying the cause is indispensable for a correct assessment.

5. The assumption on inflation

A 50% price level increase was assumed above, corresponding to 1.36% p.a. As the assumption on the nominal rate of interest includes this component, it does not make a difference to the results for stocks in relation to GDP in any of the scenarios. It does, however, affect the outcomes for the most interesting flow, the budget balance, both in absolute terms and as a percentage of GDP (again, the reason is that the budget balance is the change in the nominal stock of debt from one period to the other, and therefore the inflation component enters the number).

Agreement on the inflation assumption is therefore indispensable to construct comparable budget balance scenarios across countries. Also, if the assumed future inflation rate differs from that in the past, comparison of the projected deficits to historical numbers might be distorted.

Furthermore, the inflation component of deficit depends on initial debt (or the stock of debt at any point in time): for example, in a country with explicit public debt at 60% of GDP (rough number for net public debt in EU-15 on average), and inflation is 1.36% p.a., it is under the current SNA/ESA accounting 0.6% of GDP (with zero net public debt it is naturally zero). Under the proposed revised SNA, public debt takes quite another order of magnitude. For example, if the country has explicit public debt at 60% and a pure PAYG system with IPD at 216% of GDP, the inflation component in the corresponding deficit is 2.7% of GDP.

6. Possible extension to all population-ageing-related public expenditures

The language so far in this paper has referred to earnings-related public pensions *à la Bismarck*, currently classified as social insurance: as a contribution payment gives rise to a pension right, the logic of financial transactions can easily be applied, with the help of the implicit tax concept. However, even largely Bismarckian systems may include or be combined with a flat rate pension system or any other social assistance for the elderly independently of their prior contribution payments.

Firstly, if these benefits are financed from contributions based on wages, the full amount is, from the point of view of any individual, a tax on wages, thus the inference above that only part of the contribution should be regarded as implicit tax is not applicable. However, this only applies for individuals, not for the financial relations between the generation collectively and the government. From this point of view, pension expenditure, as projected under the prevailing rules is a liability, regardless of whether or not intragenerational redistribution occurs simultaneously. The key parameter is the average replacement rate, defined as the share of average pension to average wage, even if, in the extreme, all pensioners receive the same pension. In this way, for the generation collectively, the implicit tax concept is still relevant as a measure of the cost of pensions given to previous generations which did not fully contribute to the system and therefore ended up with a pure or not fully funded PAYG system.

Including flat rate pensions in the estimates of public pension liabilities – and thereby to government deficit under the proposed accounting rules – leads to extending the coverage to all social assistance to the elderly. This would, among other things, be useful

to solve a problem which might otherwise arise in international comparisons: in some countries the line between social insurance and social assistance is not always clear-cut, and one and the same scheme may include both an earnings-related component and a means-tested flat rate, rendering the two functions inseparable in government accounts, while in other countries the two might be separated. If all these expenditures are included in the estimates for population-ageing-related expenditures, then the difficulties in drawing the line between the two would not matter.

If the broader approach is taken, looking into successive generations collectively, it can be extended to all population-ageing-related public expenditure, including, for example, that of health care.

Naturally, the wider coverage leads to more practical problems in estimation of future expenditure. It should be noted, therefore, that if one or the other expenditure component, according to the prevailing rules, is not very big and projected to be constant as a percentage of GDP, it would not matter very much how it is treated in the accounts. Only if significant and clearly dependent on the demographic structure of the population, should it be recognised in parallel with the liability in the earnings-related public pension system.

These issues need to be further clarified both conceptually and in terms of the practical problems in implementing the current SNA/ESA rules and the proposed revision.

4. Summary and conclusions

The present paper illustrates how alternative accounting rules function for a public DB PAYG pension system under ageing population and under a wide range of reform options. Examples are based on simplified assumptions and geared to a simple benchmark for intergenerational fairness, though the results are applicable more generally. For example, the principle of fairness is a benchmark, not a norm for policy nor a limitation of the accounting framework: the deviation of any indicator from its value under the benchmark scenario gives essential information about burden sharing across generations. Note also that the examples which follow this benchmark cover a wide range of options with regard to the size of the future pension system. In addition, the illustrations with the simplified three-period model are applicable for yearly data.

Above, it is shown how the principle of *accrual accounting* – which is about to be obligatorily implemented for pension liabilities in corporate accounts and has been proposed also under the SNA for employer pension schemes – can be extended to public pensions. The key to arriving at consistent accounting is ‘implicit tax’ inherent in public pension systems relying on mandatory contributions while being completely or partially unfunded.

The functioning and usefulness of the proposed SNA revision requires an estimate of the long-term interest rate in 30-50 years from now. As the observable interest rates do not currently extend far enough forward, actuaries and statisticians need to agree on a figure, or a rule on how to arrive at a figure or a set of figures. For full benefits from the new accounting, the commonly agreed figures should be applied for all sectors, and for all countries to be covered by international comparisons. This is demanding, and actuaries and statisticians probably need help from economists to agree on common assumptions.

Note, however, that this difficult question does not arise from the proposed new national accounting rules, but the same data is needed for any meaningful analysis of long-term financing of pensions, sustainability of public finances and public debt dynamics. Note also, that the proposed SNA revision contains clear rules for dealing with the possible changes in the assumptions on the future interest rate.

The proposed SNA revision requires that the prevailing public pension system rules be transformed to estimates on future pension rights. This is demanding, but again, not more so than any comprehensive pension reform option analysis.

While under the current SNA/ESA framework, long-term projections for pension expenditure may not need to make a distinction between rights accrued to date and future ones, the proposed system does so. It is important that under the revised accounting a change to the pension system rules which changes (the estimate of) the rights already accrued should be treated as a (partial) default of a promise to pay, and thereby recorded as leading to a holding gain or loss, whereas a change to the accumulation of rights today and in future affects the financial transactions without invoking holding gains or losses. To make this distinction between rights accrued in the past and in the future is essential and helps to clarify important aspects of any pension reform proposal.

Would it be harder to gain acceptance for reducing future pension benefits if an estimate of future pension rights were recorded in official statistics as being the liability of the government? This argument could have some relevance, but should be contrasted to not recording the projected increase in the pension expenditure at all, and the consequent difficulty in explaining that pension reforms are badly needed.

One may say that all these issues can be studied without changing the accounting system. While this is true, the advantage of the proposed SNA revision is that it brings these issues on the table under a coherent framework and feeds them into any procedure for setting targets for public debt and deficit.

The clearest advantage of the proposed SNA revision is that treating public pension liabilities with the same standards as pensions provided by corporations or the private sector in general facilitates handling situations where pension rights are shifted from one sector to the other, either in the context of one-off transfers or partially privatising the public system. In a typical partial privatisation, the government loses an important part of its revenue while the decrease in pension expenditure follows decades later. Although these effects can be taken into account in setting the public finance targets, this is not always the case, as the budget balance target defined according to the current SNA/ESA might be fixed by a rule or provision. In such a case pension reforms which contain an element of privatisation are discouraged. A clear advantage of the proposed SNA revision is that it removes this obstacle.

The second major advantage is that the proposed system warns of future pension expenditure increases already when the promise is made, and policy reaction can be linked to a relatively simple rule to maintain the total public debt constant as a percentage of GDP (and, correspondingly, to adjust the newly defined deficit according to the change in the rate of GDP growth). It is, however, true that the same conclusion for policy can be argued under the current SNA definitions if the tools of pension economics are used by establishing the link between actual transactions and accrual of future rights, and if the public finance targets are defined and set accordingly.

Finally, shifting to the proposed SNA would require everyone to become accustomed to a new order of magnitude for public debt and deficit. In the European welfare states it may rise from the current explicit debt of 60% of GDP to 280%, for example, and an acceptable figure, consistent with the simple benchmark for intergenerational fairness, for the deficit could be 6-8% of GDP, while the deficit could rise to well over 10% if pension reforms flounder and an increasing burden is passed to future generations. Extending the proposed national accounting treatment to public pensions is therefore a major issue, and its successful implementation requires that not only experts but also politicians and many others understand and accept the new accounting concepts.

Therefore, adopting the proposed SNA revision is a most demanding exercise, and it is still too early to make the final assessment of pros and cons of the new proposal and those aspects of it which will eventually turn out to be the decisive ones. However, it should be noted that even if a comprehensive revision of the SNA for public pension schemes were not implemented, applying the new rules to government as an employer would make an important change to public debt and deficit figures. As the wage bill of government employees in EU-15 is around 10% of GDP, and the stylised figures above assumed that the covered wage bill was 40%, the effects on debt and deficit would be about one quarter of the figures referred to above, i.e. the level of public debt would jump from 60% to 110% in the example above. This alone requires that moving from the current debt and deficit concepts is understood and accepted.

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