IMF STAFF DISCUSSION NOTE

April 12, 2011
SDN/11/09

A Fiscal Indicator for Assessing First and Second Pillar Pension Reforms

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INTERNATIONAL MONETARY FUND

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Fiscal Affairs Department

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April 12, 2011

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JEL Classification Numbers: E62, G23, H55, H62, J111

Keywords: Fiscal policy, explicit and implicit government debt, pension obligations and reforms, population aging

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[1]This note has benefited substantially from discussion with and comments by Adrienne Cheasty, Carlo Cottarelli, and Sanjeev Gupta; as well as comments received from Anthony Annett, Marco Cangiano, Dominique Desruelle, Hamid Faruqee, Przemek Gajdeczka, Anne-Marie Gulde-Wolf, Tim Irwin, Abdul Khan, Rafael Romeu, and the authorities of Hungary.

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EXECUTIVE SUMMARY

Traditional deficit and debt indicators focus on the health of public finances today but fail to capture the future impact of public programs. This weakness is evident in the treatment of pension reforms, which may strengthen the long-term fiscal outlook, but have adverse effects on the budget balance and government debt in the near term. This asymmetry has raised concerns that assessments based on traditional indicators could create incentives to delay or even reverse pension reforms. This issue has recently become a key concern in Central and Eastern Europe, where countries have diverted contributions back from funded private sector "second pillar" systems to the unfunded public sector "first pillar" systems.

This *Staff Discussion Note* proposes a new fiscal indicator—the "pension-adjusted" budget balance—which provides a level playing field for the evaluation of a country's pension policies and addresses these concerns. The usefulness of the proposed measure is illustrated by a number of stylized examples. Going forward, both overall and pension-adjusted balances should be monitored.

I. INTRODUCTION

Traditional deficit and debt indicators focus on the health of public finances today, but fail to capture the future impact of different public programs. This weakness is evident in the treatment of pension reforms, which often strengthen the long-term fiscal outlook but do not necessarily improve—and sometimes worsen—fiscal balance and debt indicators in the near term. This has raised concerns that assessments based on traditional deficit and debt indicators create incentives to delay or even reverse reforms.

This issue has become a key concern for fiscal policy, especially in Central and Eastern Europe. During 2008–2010, a number of countries in the region (Estonia, Hungary, Latvia, Lithuania, Poland, and Romania) diverted contributions from their private funded pension systems, which were created as part of their reforms in the 1990s to the early 2000s, back to the unfunded public system.[2] The diversion of contributions has helped reduce fiscal deficits over the short term but could worsen the long-term fiscal outlook. In this context, there is an urgent need to design a fiscal indicator that avoids providing perverse incentives for governments to undertake policies that might be damaging for their long-term fiscal health and fiscal transparency.[3]

This *Staff Discussion Note* (SDN) proposes a measure of budget balance that takes into account the long-term nature of pension obligations. The focus of this measure is on the fiscal sustainability of pensions—narrowly evaluated as whether the present value of the projected stream of pension contributions is higher than the present value of benefits. This "pension-adjusted" budget balance complements traditional indicators of fiscal health, such as the overall and primary budget balance and the level of gross government debt.

The pension-adjusted budget balance builds on other approaches that capture the long-term budgetary position of the government, including intergenerational accounting (Auerbach, Gokhale, and Kotlikoff, 1994), comprehensive measures of fiscal imbalances (Gokhale and Smetters, 2003) and fiscal gaps (Auerbach, Gale, Orszag, and Potter, 2003), sustainability indicators (EC, 2009c), and comprehensive public sector balance sheets (Buiter, 1983; Traa, 2009; and Velculescu, 2010). The proposed indicator thus takes account of the intertemporal pension balance rather than just the current balance of the pension system. The pension-adjusted budget balance can be monitored in the short run and captures the impact of pension reforms on long-term fiscal sustainability.

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[2]In the case of Hungary, the rollback of pension reforms also involved a transfer of pension fund assets back to the public system.

[3]For further discussion of accounting "stratagems" undertaken in recent years that have reduced fiscal transparency, see the forthcoming April 2011 edition of the IMF's *Fiscal Monitor*, Appendix 2.

II. Measures of Pension Obligations

Pension obligations can be viewed as implicit government debt. Like explicit debt, which reflects the future cost of debt service resulting from past borrowing, implicit pension debt measures future spending deriving from pension promises. Implicit debt is not, however, fully equivalent to explicit debt. For example, implicit debt is likely to have a lower cost of default—governments can (and often do) reduce their implicit pension debt through pension reform. Additionally, implicit debt does not need to be periodically rolled over. Of course, the concept of implicit debt is not limited to pensions. It can also be applied to government spending obligations in education, health or long-term care spending, or long-standing foreign-aid commitments.

Implicit pension debt can be calculated as the present discounted value of pension obligations. Three measures of implicit pension debt can be estimated:[4]

- *The shutdown (accrued) liability* is the value of already accrued entitlements to current and future pensioners and is therefore based on past promises only. This liability is the outstanding value of the pension obligations that would arise if the existing pension system were to be closed immediately and only accrued benefits were to be paid.[5]

- *The closed group liability* is the sum of the accrued liability and all future obligations projected to be accrued by current participants (contributors and pensioners). This liability represents the value of the obligations if the existing system were to remain open to current participants but no longer to new entrants.

- *The open group liability* is the sum of the closed group liability and the projected benefits to be accrued by all future entrants—the present value of all future pension spending. This liability assumes that the existing system will remain unchanged in the future, with new entrants entitled to the accrual entitlements set under current law.

For on-going systems—which continue accruing obligations—the most practical concept of liability takes into account future contributions which will be available to pay for at least part of the promised benefits.[6] This would also take account of the assets accumulated against these liabilities. The calculation of this net implicit liability is straightforward, subtracting the present discounted value of all future contributions corresponding to each implicit liability concept (Box 1).

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[4]See Diamond and Barr (2008).

[5]Recognizing the importance of pension obligations, the System of National Accounts 2008 proposes a supplementary table (Table 17.10) showing the accrued liabilities of social security systems. Reporting these obligations would facilitate cross-country comparisons (See EC and others, 2009).

[6]In this SDN, contributions refer to earmarked taxes (such as payroll taxes) intended to fund pensions.

Implicit pension debt is sensitive to the discount rate—measures of implicit liability are inversely related to the discount rate. For the purposes of this SDN, which is based on ratios to GDP, the discount rate is set at 1 percent. This discount rate is chosen for illustrative purposes and to ease cross-country comparisons.[7]

The time horizon considered in the calculation also affects implicit debt, with longer windows generally resulting in larger implicit liabilities. Time windows that are too short would fail to capture the long-term impact of pension reforms. On the other hand, too long a horizon, say to infinity, would include projections too far into the future to be reliable or to provide any practical implications for policy. In this SDN, the time horizon used in the calculations covers the period up to 2060.

Box 1. Concepts of Net Implicit Pension Liability[1]

$$(\mathbf{1})\boldsymbol{Net\ shutdown\ liability}(\boldsymbol{t}) = accrued\ liability(t)$$

$$(\mathbf{2})\boldsymbol{Net\ closed\ group\ liability}(\boldsymbol{t}) = accrued\ liability(t) + \sum_{i=t}^{T} \frac{new\ pension\ accruals\ of\ current\ participants(i)}{(1+r)^{i-t}} - \sum_{i=t}^{T} \frac{contributions\ of\ current\ participants(i)}{(1+r)^{i-t}}, (T = year\ by\ which\ all\ participant\ are\ dead)$$

$$(\mathbf{3})\boldsymbol{Net\ open\ group\ liability}\ (\boldsymbol{t}) = accrued\ liability(t) + \sum_{i=t}^{\infty} \frac{new\ pension\ accruals(i)}{(1+r)^{i-t}} - \sum_{i=t}^{\infty} \frac{contributions(i)}{(1+r)^{i-t}}$$

Alternatively, (3) can also be expressed in terms of spending,

$$(\mathbf{4})\boldsymbol{Net\ open\ group\ liability}\ (\boldsymbol{t}) = \sum_{i=t}^{\infty} \frac{pension\ spending\ (i)}{(1+r)^{i-t}} - \sum_{i=t}^{\infty} \frac{contributions(i)}{(1+r)^{i-t}}$$

$$(\mathbf{5})\boldsymbol{Net\ open\ group\ liability}\ (\boldsymbol{t}) = -NPV\ of\ pension\ balances\ from\ t\ to\ \infty$$

[1]The definitions here assume zero assets at time t.

III. THE FISCAL IMPACT OF PENSION REFORM

Many countries have reformed their pay-as-you-go pension systems aiming to increase the long-term sustainability of public finances. Reforms often include a combination of benefit cuts, increases in retirement ages, tightening of eligibility conditions, and increases in contributions. Advanced economies have generally relied on these parametric reforms to

[7]This is equivalent to assuming a differential between the interest rate and rate of growth of 1 percentage point. A similar assumption is made for longer-term projections in the IMF's *Fiscal Monitor*. The proposed framework can be easily adjusted for different discount rates.

reduce their net implicit pension liabilities. For example, France, Germany, and Italy have introduced several parametric reforms over the past 20 years that have reduced net open group liability of pension systems over 2007–2060 by more than 120 percentage points of GDP.

In other economies (including Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and the Slovak Republic), the reforms have also introduced mandatory, privately-funded individual accounts—the so called "second pillar." Because contributions to the second pillar are often carved out of payroll taxes and deposited in private accounts, the introduction of the second pillar generally involves a loss of revenues, which offsets some of the impact of parametric reforms.[8] Table 1 indicates that the revenue losses from the diversion to the second pillar offset nearly half of the reduction in liability from parametric reforms.[9] The overall impact of these reforms ranges from an increase in net open group liability of 48 percent of GDP (Latvia) to a reduction of 167 percent of GDP (Poland).

Table 1. Impact of Past Pension Reforms on Open Group Liability 2007–2060

(In percent of 2007 GDP)

	First pillar net open group liability (2007-2060)		Reduction in net open group liability from parametric reform	Revenue losses from diversion to second pillar	Reduction of net open group liability from overall
	Before reform	After parametric reforms			
Bulgaria	148	3	145	45	100
Estonia	35	-58	94	64	29
Latvia	-31	-82	51	99	-48
Lithuania	58	-22	81	43	38
Hungary	181	27	154	61	93
Poland	331	101	230	63	167
Romania	192	76	115	49	67
Slovak Rep.	184	25	159	53	106
Average	137	9	129	60	69

Source: IMF staff calculations.

Note: The "before reform" scenario assumes no diversion to the second pillar and projects spending by keeping both the benefit ratio and the coverage ratio fixed at their 2010 level (see page 85 of EC (2009a)). The "after parametric reforms" scenario uses the projected path of spending from Table A.60 of EC (2009b). Second pillar revenues losses are estimated from Graph 49 of EC (2009a). To estimate net group liability, projected pension balances (contributions-benefits) are discounted to 2007 and summed.

[8]Benefits accrued under the funded second pillar are, by definition, equal to the contributions. The impact on net implicit liabilities is due to the diversion of contributions from the first pillar, which worsens the NPV of current and future pay-as-you-go balances.

[9]Measuring the effect of second pillar reforms is complicated. In theory, the impact should be measured in terms of the change in net pension liabilities for workers who move from the first to the second pillar. However, the introduction of a second pillar has often been part of a package that included parametric reforms to the first pillar, such as increases in the retirement age. Table 1 reports the overall impact of reforms to both the first and second pillars.

However, traditional fiscal indicators (such as the primary budget deficit and gross debt) fail to reflect these substantial improvements in the fiscal stance. In fact, these indicators tend to worsen with the introduction of second pillar pensions because of the diversion of contributions. On average, the introduction of the second pillar accounted for more than half of the budget deficit in 2007 in the Central and Eastern European countries presented in Table 2. Thus, the use of traditional balances to assess fiscal health can introduce incentives to reverse these reforms.

Table 2. Impact of Pension Reform on Budget Balances, 2007

(In percent of GDP)

	Budget balance	Impact of reform on budget balance	Budget balance assuming reform reversal
Bulgaria	0.1	-0.7	0.8
Estonia	2.6	-1.3	3.9
Latvia	-0.3	-0.8	0.5
Lithuania	-1.0	-0.9	-0.1
Hungary	-5.0	-1.2	-3.8
Poland	-1.9	-1.3	-0.6
Romania[1]	-5.4	-0.3	-5.1
Slovak Republic	-1.9	-1.0	-0.9
Average	-1.6	-0.9	-0.7

Sources: EC (2009a); EC (2010); and IMF staff calculations.
[1]Romania figures correspond to 2008, the year the second pillar was introduced.
Note: The impact of the reform on budget balance is estimated as the revenues losses the introduction of the second pillar (Graph 49 of EC (2009a)).

Introducing the pension-adjusted budget balance

A slight modification of the budget balance can be used to take into account the intertemporal balance of the pension system rather than the current-period balance (equation 5, Box 2). This modification involves the estimate of a "pension-adjusted balance," which is calculated as the sum of the non-pension fiscal balance (the balance calculated without taking into account the pension system) and the intertemporal pension balance. The latter term is based on the net present value of all the pension imbalances from today to a certain date in the future, say 50 years. The intertemporal pension balance measures how much, on average,

fiscal balances will be affected by the divergence between pension contributions (assuming no revenues from accumulated assets) and expenditures.[10]

Box 2. Estimating the Pension-Adjusted Budget Balance

1. Assuming zero assets at time (t), a measure of the intertemporal pension balance at time (t) is one such that:

$$(1)\ \sum_{i=t}^{\infty} \frac{intertemporal\ pension\ balance(t)}{(1+r)^{i-t}} = NPV\ of\ pension\ balances\ (t-\infty)$$

$$(2)\ \sum_{i=t}^{\infty} \frac{intertemporal\ pension\ balance(t)}{(1+r)^{i-t}} = \sum_{i=t}^{\infty} \frac{contributions(i) - pension\ spending\ (i)}{(1+r)^{i-t}}$$

$$(3)\ intertemporal\ pension\ balance(t)(infinite\ horizon) = \frac{r}{r+1} * (\sum_{i=t}^{\infty} \frac{contributions(i) - pension\ spending\ (i)}{(1+r)^{i-t}})$$

$$(4)\ intertemporal\ pension\ balance(t)(from\ time\ t\ to\ time\ T): = \frac{1}{\sum_{i=t}^{T} \frac{1}{(1+r)^{i-t}}} * (\sum_{i=t}^{T} \frac{contributions(i) - pension\ spending\ (i)}{(1+r)^{i-t}})$$

2. Therefore, a measure of the overall balance at time (t) adjusting for the intertemporal pension balance at (t) is one such that:

$$(5)\ pension\ adjusted\ budget\ balance\ (t) = non\ pension\ fiscal\ balance(t) + intertemporal\ pension\ balance(t)$$

The pension-adjusted balance depends on the level of implicit liability—the higher the implicit liability, the lower the intertemporal pension balance and the lower the pension-adjusted balance. Mechanically, this calculation requires the following (all in percent of GDP):

- the current-period budget balance;

[10]Estimates of net implicit pension debt and the intertemporal pension balance should, ideally, include systems that cover government employees. In many countries, however, this implicit debt is difficult to estimate, because contributions, and pension expenditures, are not clearly identified in the fiscal accounts. These liabilities can be substantial: In the United States, for example, the increase in accrued liabilities associated with veterans' compensation and civilian and military health and pension benefits in 2010 was about 0.3 percent of GDP (IMF, forthcoming).

- the current-period pension balance of the first pillar (contributions minus pension spending); and
- the path for pension balances of the first pillar, including contributions and expenditures.

Table 3 shows the budget balance and the pension-adjusted budget balance for 2007.[11] Only for Poland is the pension-adjusted budget balance substantially stronger than the headline budget balance, reflecting substantial reforms that weaken balances now (due to the diversion of contributions to the second pillar), but improve fiscal balances in the future (due to the reform of the first pillar). For Hungary and the Slovak Republic the improvements are less marked. For all other countries, the intertemporal pension deficit is larger than the current pension deficit, reflecting large projected pension imbalances even after the recent reforms.

Table 3. Pension-Adjusted Budget Balance, 2007

(In percent of GDP)

	Budget balance (2007)	First pillar balance (2007)	Non pension budget balance (2007)	NPV of pension balances (2007-2060)	Intertemporal pension balance (2007-2060)	Pension-adjusted budget balance (2007)
Bulgaria	0.1	-0.6	0.7	-48	-1.1	-0.4
Estonia	2.6	0.5	2.1	-6	-0.1	2.0
Latvia	-0.3	1.4	-1.7	-17	-0.4	-2.1
Lithuania	-1.0	-0.2	-0.8	-20	-0.5	-1.3
Hungary	-5.0	-2.3	-2.7	-88	-2.1	-4.9
Poland	-1.9	-4.7	2.8	-164	-3.9	-1.1
Romania[1]	-5.4	-1.5	-3.9	-125	-3.0	-6.9
Slovak Republic	-1.9	-2.2	0.3	-78	-1.9	-1.6
Average	-1.6	-1.2	-0.4	-68	-1.6	-2.0

Source: IMF staff calculations; EC (2010).

[1]Romania figures correspond to 2008, the year in which the second pillar was introduced.

Note: Current period overall budget balances come from Table I.1.1 of Public Finances in EMU (EC, 2010); current-period and projected pension balances come from the Aging Report (contributions from Graph 49 of EC (2009a) and spending from Table A.60 of EC (2009b)). The intertemporal pension balance is the constant and permanent balance that in present value equals the net open group liability (see Box 2).

[11]The NPV of pension debt is highly sensitive to the discount rate—the average NPV of pension balances goes from -86 percent of GDP for a discount rate of 0 to -68 percent for a discount rate of 1 to -55 percent for a discount rate of 2.However, the pension-adjusted balance is relatively stable to changes in the discount rate because a higher discount rate lowers the NPV of pension balances but increases the conversion factor from NPV to an annualized intertemporal balance—the average intertemporal pension balance is about -1.6 percent of GDP for discount rates of 0, 1, and 2 percent.

One advantage of the pension-adjusted budget balance is that it eliminates incentives to adopt or dismantle particular systems (including second pillar systems with mandatory private accounts) to improve current-period indicators. The following examples are based on the average budget balances and reforms implemented by Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and the Slovak Republic over the past 15 years. These examples illustrate how the pension-adjusted budget balance levels the playing field across different countries and pension systems:

- *Example 1*. Countries A and B have the same budget balance (a deficit of 0.7 percent of GDP) and the same intertemporal pension balance (137 percent of GDP). Country B implements a parametric pension reform that reduces the intertemporal pension balance to 9 percent of GDP and Country A does nothing. In this example, the budget balance remains unchanged by the reform. That is, the budget balance does not account for the improvement in long-term sustainability of parametric reforms that affect the path of future spending. Therefore, using the traditional budget balance to assess the sustainability of these two countries would incorrectly treat countries A and B equally. In contrast, the pension-adjusted budget balance shows a large improvement in Country A after the reform, reflecting the substantial reduction in the net pension liabilities.

- *Example 2*. Countries C and D have the same budget balance (a deficit of 0.7 percent of GDP) and the same intertemporal pension balance (137 percent of GDP). Country D implements a parametric pension reform that reduces the intertemporal pension balance to 9 percent of GDP and diverts 5 percentage points of wages to the second pillar (for a net present value of revenue losses about 59 percent of GDP); Country C does nothing. In this example, the reform worsens the budget deficit from 0.7 to 2.2 percent of GDP for Country D. Using the traditional budget balance to assess the sustainability of these two countries would incorrectly indicate that Country C is in better fiscal shape than Country D after the reform, despite the large reduction in net pension liabilities in the latter. In contrast, the pension-adjusted budget balance shows a substantial improvement in Country D after the reform (from -3.8 to -2.1 percent of GDP).

- *Example 3*. Countries E and F have reformed their pension systems with parametric reforms and introduced a second pillar component. Country F dismantles the second pillar and returns contributions (5 percent of wages) back to the (reformed) first pillar. In this example, the budget balance improves noticeably in Country F after the reform reversal (from –2.2 to -0.7 percent of GDP) despite the large increase in net pension liabilities implied by the reversal of the reform. In contrast, the pension-adjusted budget balance worsens (from -2.1 to -3.0 percent of GDP). This example illustrates that the use of a traditional measure of budget balance creates incentives to implement pension reforms that worsen the long-term sustainability of public finances while the pension-adjusted budget balance does not.

By taking into account the long-term nature of pension obligations, the pension-adjusted budget balance is an important indicator of the impact of pension systems on long-term sustainability. In principle, it would possible to compute similar indicators for other spending obligations (such as education or health). However, the issues surrounding pension reforms, especially those involving the introduction of second pillar plans which might strengthen the long-term fiscal outlook but worsen fiscal indicators in the near term, are less likely to happen in other areas.

Of course, overall balances remain key for evaluating the risks surrounding short-term financing needs. Thus, the "pension-adjusted" budget balance should be viewed as a complement, rather than a substitute, for traditional budget balance indicators.

Table 4. Illustrative Examples

(In percent of GDP)

	Budget Balance	Nonpension balance	Pension balance	Net open group liability 2007-2060	Pension-adjusted budget balance
Example 1					
Country A	-0.7	-0.5	-0.2	137	-3.8
Country B					
Before reform	-0.7	-0.5	-0.2	137	-3.8
After reform	-0.7	-0.5	-0.2	9	-0.7
Example 2					
Country C	-0.7	-0.5	-0.2	137	-3.8
Country D					
Before reform	-0.7	-0.5	-0.2	137	-3.8
After reform	-2.2	-0.5	-1.7	68	-2.1
Example 3					
Country E	-2.2	-0.5	-1.7	68	-2.1
Country F					
Before reform	-2.2	-0.5	-1.7	68	-2.1
After reform	-0.7	-0.5	-0.2	107	-3.0

Source: IMF staff calculations; EC (2010).

Note: These illustrative examples are based on the average budget balances and reforms implemented by Bulgaria, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, and the Slovak Republic over the past 15 years.

IV. Implications for Fiscal Policy Design

- **The future impact of public programs should be taken into account as part of sustainability analyses.** This could include not only pensions, as described here, but spending on health care and other government-funded services. The IMF's *Fiscal Monitor*, for example, provides estimates of the net present value of expected increases in pension and health spending over the next 20 years. These increases, combined with the overall budget balance and the current level of debt, allow for a consistent approach to assess the sustainability of public finances.

- **Intertemporal pension balances should be assessed to gauge the sustainability of the fiscal stance.** Measures based on today's budget balance can give a misleading picture of the sustainability of public finances. The staff's suggested pension-adjusted budget balance provides a method to incorporate the effects of pension reforms on sustainability assessments.

- **Both overall and pension-adjusted balances need to be monitored.** The short-term macroeconomic consequences of non-pension and intertemporal pension imbalances are quite distinct. Thus, establishing ceilings for overall budget balances in the short and medium term is justified.

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