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Pension Obligations in the European Union: A Case Study for Accounting Policy

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Abstract:
Pension obligations constitute a critical issue for public finances and budgets. This is especially true for the European Union whose institutional mechanism aims to supervise Member States' spending through centralised budgetary rules based upon financial covenants. In this context, accounting methods of recognition and measurement of pension obligations become an integral and critical aspect of Europe's transnational budgetary and financial supervision. Drawing upon a comprehensive overview of pension management and regulation, this article aims to analyse the ongoing debate on accounting for pension obligations with a specific attention to the harmonization of European Public Sector Accounting Standards (EPSAS). While the European Commission has been favouring the 'indisputable reference' to the International Public Sector Accounting Standards (IPSAS), European Member States' practices and views remain inconsistent with the normative solution imposed by the IPSAS 25, which favours and facilitates Definite Contribution pension schemes. In this context, we do summarise the IPSAS position mimicking the IFRS, review the pension's accounting in national statistics and EPSAS debate, and provide some building blocks for a comprehensive model of accounting for pension obligations that admits and enables several viable modes of pension management.

Keywords: pension provision, pension benefit, pension liability, IPSAS, EPSAS, pension fund management, actuarial evaluation, public sector accounting regulation, public finances

JEL classification: G23, G28, H55, K23, M41, M48

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1 Accounting for pension obligations in the European Union: A case study for EPSAS and transnational budgetary supervision

1.1 Introduction

Pension obligations constitute a critical issue for public finances and budgets. This is especially true for the European Union whose institutional mechanism aims to supervise Member States' spending through centralised budgetary rules based upon financial covenants. To better achieve this supervision, since 2011, the European Union launched an ongoing project to harmonize European Public Sector Accounting Standards (EPSAS).

In this context, accounting methods of recognition and measurement of pension obligations become an integral and critical aspect of Europe's transnational budgetary and financial supervision. While the European Commission has been favouring the 'indisputable reference' to the International Public Sector Accounting Standards (IPSAS) – issued by the International Public Sector Accounting Standards Board (IPSASB) –, European Member States' practices and views remain inconsistent with the normative solution imposed by the IPSAS 25, which appears to favour and facilitate Definite Contribution pension schemes (see Box 1 for descriptive definitions). This normative solution bases upon a view of pension management as a funded financial placement on behalf of each single beneficiary. Accordingly, pension obligations are defined as referred remuneration that must be accounted for through an actuarial representation and added to the liability-side of the balance sheet of their sponsors or providing entities. This accounting method adopts then a stock basis of accounting consistent with an asset-liability accounting approach.

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According to Ryan et al. (2002, p. 143), case study research offers the possibility of understanding the nature of accounting representation in its socio-economic context, disentangling its technical (techniques, procedures) as well as its conceptual dimension (standards, models). This article focuses on the case study of pension obligations. According to Biondi and Sierra (2017), a variety of pension management modes coexists in the current state of pension affairs, in Europe and abroad. Accounting standards drive and are driven by representations that are related to these pension management modes. This article reviews various accounting positions expressed through the IPSAS, the IFRS, the national statistics and the EPSAS debates. It aims to develop a comparative analysis of accounting representations which have been suggested throughout the recent debate on public sector accounting for pension obligations, with specific attention to the ongoing European debate.

Our analysis contributes to these ongoing debates by suggesting several building blocks to develop a comprehensive model that admits and enables alternative viable modes of pension management. Our theoretical perspective disentangles some key features of existing practice and regulation (especially accounting standards), offering a frame of analysis – an accounting model for pension's funds and flows over time – to better understand current practice, to disentangle positions in standard-setting and to provide recommendations for an improved accounting representation. This model adopts a flow basis of accounting consistent with a revenue-expense accounting approach.

Our approach investigates the embedding of pension management in its socio-economic context along two distinctive dimensions: a political economic dimension concerned with the "horizontal" play of socio-political forces, including accounting standards-setting; and an ideational dimension concerned with the "vertical" connection that links pension representations and financial sustainability (Baker, Biondi & Zhang, 2010).

Accounting models of reference provide an illustrative example of both dimensions (Figure 1). Accounting standards-setting certainly constitutes a relevant field for confrontation among socio-political forces interested in organising pension management. At the same time, accounting models define the very notion of financial sustainability which depends indeed on the specific accounting model that is applied.

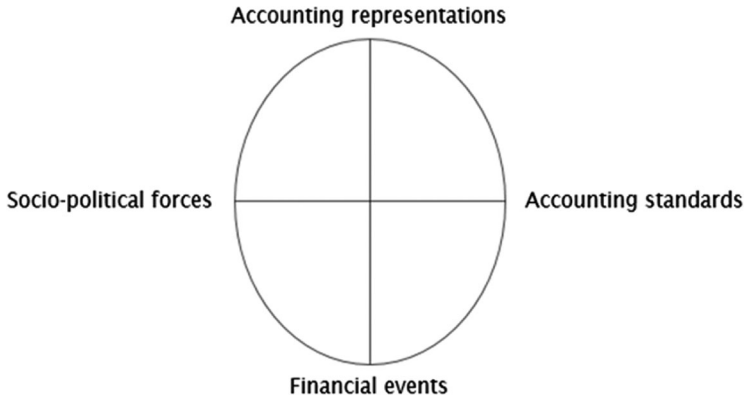

Figure 1: Understanding accounting in its socio-economic context.
Source: Baker, Biondi, and Zhang 2010

In this context, although our article focalises on financial accounting systems, including general purpose financial reporting, its analysis and implications may be useful to better address budgetary accounting, sustainability reporting, and macro-economic reporting.

The rest of the paper is organised as follows. The first section summarises the IPSAS position and its development, paying attention to the private sector standards which inspired the standards. The second section reviews the international and the EPSAS debates in national statistics, including the Eurostat's position, now in charge of the EPSAS. The third section develops some building blocks for a comprehensive model of accounting for pension obligations. This model admits and enables several viable modes of pension management. Accordingly, funding and sustainability are not necessarily linked, while application of current discounted values may be inconsistent with making pension managing entities accountable for sustainable pension provision over time. A summary of the main argument and results concludes.

2 Pension obligations under the IPSAS: Insights, issues and perspectives

The European Commission (2013a, p. 8) has been favouring the 'indisputable reference' to the International Public Sector Accounting Standards (IPSAS) to harmonize public sector accounting standards in Europe (EPSAS), including accounting standards for pension obligations. This section summarizes the IPSASB position,

overviews the private sector standards which the IPSAS draw upon, and pays attention to the debate around the IPSAS proposal, including responses to the IPSASB Exposure Draft on pension recognition.

2.1 Presentation of the IPSAS position

The International Public Sector Accounting Standards (IPSAS) are issued by the IPSAS Board (IPSASB) under the auspices of the International Federation of Accountants (IFAC). This privately-run body has been transplanting the IFRS developed by the International Accounting Standard Board (IASB) into the public sector. According to Chan (2008), by mimicking the IFRS, the Public Sector Committee (IPSAS Board's predecessor) spent resources over six years and incurred considerable opportunity costs. The IPSAS Board has been fostering a convergence between international public and private sector accounting standards, although a conceptual framework that is specific to the public sector is under development since November 2006 (IPSASB, 2015).

Since 2014, the IFAC, the six leading accountancy firms, together with international institutions such as the Organization for Economic Co-operation and Development (OECD), the International Monetary Fund (IMF) and the World Bank Group, established a coalition called "Accountability Now", in order "to help drive awareness of the critical need for high-quality, transparent, comparable public sector financial reporting [based on International Public Sector Accounting Standards], and of the importance of engaging citizens in the process of holding governments to account" (IFAC, 2015).

The influence of the private sector accounting representation of pension obligations has been fundamental in developing the IPSAS standard on the matter (Biondi & Boisseau-Sierra, 2017). For instance, Hoogervorst (2012),[1] chairman of the IASB, criticized "governments [using cash-based accounting to] give very incomplete information about the huge, unfunded social security liabilities they have incurred" and argued in favor of the adoption of the IPSASB standards that were only used "haphazardly".

Since 2002 (first exposure draft issuance) through 2008 (issued standard 25), the IPSAS Board approach to pension obligations has been fostering an actuarial representation of pension obligations. This normative solution bases upon a notion of pension management as a funded financial placement on behalf of each single beneficiary (Biondi & Sierra, 2017). Accordingly, pension obligations are considered as deferred remuneration that must be accounted for through an actuarial representation discounted back to the present time moment, and recognised on the liability-side of the balance sheet of their managing entities. This accounting method adopts then a stock basis of accounting consistent with an asset-liability accounting approach. Our Box 2 summarises the requirements for pension obligations as stated by the IPSAS 25.

Through this actuarial representation, according to Le Lann (2010, p. 17), accounting standards-making contributes to reshape ongoing pension reforms by establishing a "single mode of assurance through assets' financial accumulation". The ongoing and future fulfilment of pension obligations towards incipient and future beneficiaries is then expected to be assured by and through this financial accumulation process over time, as if pension funds were a sort of individual saving account managed on behalf of each beneficiary.

Issued in February 2008, IPSAS 25 deals with employee benefits in general, including pension benefits. Accordingly, accounting for pension obligations is based on a dual accounting treatment that disentangles Defined Contribution (DC) and Defined Benefit (DB) schemes. Accounting treatment for other schemes (such as multi-employers, including employers under common control, state plans and composite social security programs) must make reference to one of these two alternative treatments (see IPSAS 25, 32, 33, 25.43 and 25.47).

According to IPSAS 25, DC plans are defined in a way that excludes any current obligation to pay for future pensions (IN6; par. 28). For a pension scheme to be qualified as DC plan, the only obligation that exists and is then recognised is the current annual contribution paid by the reporting entity to existing employees as part of their current remuneration in exchange for service rendered by them. In fact, the series of future contributions may represent an implicit liability under constructive obligation, but the IPSAS standard excludes its recognition (par. 55). This accounting treatment for DC plans actually undermines accountability and responsibility of the reporting entity (i. e., the sponsor) for ongoing and future pension obligation fulfilment, since no pension obligation is assumed to exist under this accounting treatment. Therefore, if government were to adopt IPSAS 25, potential beneficiaries would not receive information concerning the ongoing accumulation of their contributions, and the foreseeable level of pension payment that has been reached and may be sustained under the ongoing DC scheme process. Moreover, beneficiaries would not receive information on ongoing investment policies and their past, current and foreseeable returns over time.

As long as some commitment to pay future pensions exists under legal or constructive obligations, including through informal practice and social expectation (par. 63), the DB accounting treatment should be adopted. Termination rights by the sponsoring entity do not exclude this constructive obligation (par. 64), while 'pay-as-you-go' pension schemes are explicitly considered as a kind of DB plans (par. 34 (a)).

In the case of DB schemes, pension obligations should be considered as 'deferred remuneration' while their outstanding liability should be included into the sponsor's balance sheet through an actuarial method of eval-

uation labelled 'Projected Unit Credit Method' (see paragraphs 77-78). This method applies a current value accounting approach, which relates to a stock basis of accounting. In particular, it applies fair value measurement to the dedicated assets that are accumulated to recover the carrying amount of the pension obligation. The recourse to qualified actuary's expertise is then encouraged (par. 68), while the reference to market expectations for choosing actuarial hypotheses is required (par. 90). The IPSAS Board's preference for full actuarial representation of pension obligations is clearly expressed by paragraph 61 of the IPSAS 25 (IPSASB, 2008):

> Accounting by an entity for defined benefit plans involves the following steps:
>
> a. Using actuarial techniques to make a reliable estimate of the amount of benefit that employees have earned in return for their service in the current and prior periods. [...]
>
> b. Discounting that benefit using the Projected Unit Credit Method in order to determine the present value of the defined benefit obligation and the current service cost (see paragraphs 77–79);
>
> c. Determining the fair value of any plan assets (see paragraphs 118–120);
>
> d. Determining the total amount of actuarial gains and losses and the amount of those actuarial gains and losses to be recognized (see paragraphs 105–111); (...)

Therefore, although the IPSAS standard does not address the funding issue, the representation of pension obligations points to a 'saving account' model represented through an actuarial approach. Among other, this accounting representation under this dualistic approach does not respond to the consolidation issue raised by a governmental sponsoring entity that delegates pension management (and related obligation) to another governmental entity. The former may apply the DC accounting option, while the latter may fall within the DB accounting option, raising specific consolidation issues and paving the way to possible structuring opportunities.

Public sector accounting standards prior to the IPSAS seem to have had very little influence on the IPSAS elaboration. Interestingly, in its basis for conclusions, the IPSASB (2008) candidly acknowledges that its requirements are inconsistent with widespread existing public sector practice, especially with budgets:

> BC17. The IPSASB acknowledged that applying the requirements of this Standard in relation to liabilities relating to obligations arising from defined benefit plans may prove challenging for many public sector entities. Currently, many public sector entities may not be recognizing liabilities related to such obligations, and may therefore not have the systems in place to provide the information required for reporting under the requirements of this Standard. Where entities are recognizing liabilities relating to obligations arising from defined benefit plans, this may be on a different basis to that required by this Standard. In some cases, adoption of this Standard might give rise to tensions with budgetary projections and other prospective information.

Both the IAS/IFRS and the IPSAS have adopted an asset-liability accounting approach (asset-liability accounting model), rejecting the revenue-expense accounting approach (Oulasvirta, 2008). Among others, Napier (2009) stresses the historical shift toward this balance sheet accounting approach: "early attempts to develop accounting standards were based on a cost orientation and reflected funding considerations. More recently, a balance sheet focus led to issues over identification and measurement of pension liabilities and assets." The IPSAS-Board has consistently maintained a balance sheet preference and focus over various amendments since 2002 to the final publication in February 2008.[2]

This IPSASB choice mimics the choice done for the standard IAS 19 issued for the private sector by the IASC (IASB nowadays) in the nineties. However, the specificity of public sector economy and finances casts doubts over this convergence regarding its technical feasibility and the overall consistency with governmental economy and finances. The following paragraph explores the influence of private sector standards over the IPSAS 25.

2.2 Influence of the IPSAS: The private sector standards

This 'saving account' model to account for DB plans (the only ones that assure future pension obligations) is consistent with the approach endorsed by the IASB for the private sector at least since the issuance of IAS 19 in 1998.[3]

In this context, it is important to remember that accounting representation has an impact on pension management, framing and shaping its purposes and behaviours. Josiah et al. (2014) investigate "migration from DB pension schemes focusing on this change's interface with accounting". They argue that "particularly from the

mid-1980s, there have been many significant changes in the concept and detail of pension provision in both public and private sectors. These changes are occasioned by government policy and influenced by capital markets". Along with this evolution of accounting representation, DB schemes have been closed or frozen (Atanasova & Hrazdil, 2010), including to reduce the likelihood of a downgrade by rating agencies. Moreover, this accounting transformation has fostered increased funding by pension schemes (Jones, 2013; Kiosse & Peasnell, 2009), as well as management delegation to independent financial intermediaries. Financial concepts and interests were then present and active in reshaping the accounting representation in a way which has favored the role of financiers in pension definition and management (Biondi & Sierra, 2017). The latter development is related to a broader phenomenon that has been analysed as "financialization" (Carruthers, 2015; Van Der Zwan, 2014), including the lobbying power of the financial industry.[4]

Street and Shaughnessy (1998) provide a historical review of private pension accounting in countries represented in the G4+1 working group.[5] Accordingly, "historically, pension accounting standards provided for flexibility in the choice of actuarial methods and assumptions (Skinner, 1987). However, in 1985, the US accounting standard setter, the Financial Accounting Standards Board (FASB) introduced an approach that has since been adopted by other G4+1 members." The US Financial Accounting Standard on Employers' Accounting for Pensions (FAS 87) issued in 1985 (FASB, 1985) superseded the Accounting Principles Board n. 64 (APB, 1966) which adopted a cost orientation and a revenue-expense approach to pension obligations for private sector entities.[6] Therefore, the US led the adoption of a balance sheet focus for pensions through the FASB statement n. 87, followed by the International Accounting Standards Committee (IASC) that proposed a single actuarial method in its ED 54 published in 1996 (eventually adopted in 1998 as IAS 19).

In this context, Glaum (2009) explains that "pension accounting has caused controversies ever since standard-setters started to regulate the recognition and valuation of pension-related liabilities, assets, and costs". He also states that the US Accounting Principles Board (APB) had to concede that, with the FAS 87, 'improvements in pension accounting were necessary **beyond what was considered practical at those times"** [(FASB, 1985) bold added]. He provides then a comprehensive analysis of harsh debate and resistance raised by this standard in the US private sector, echoing the overall lack of consensus on the legal-economic nature of corporate pension obligations (Blake et al., 2008; Klumpes, 2001; Napier, 2007).

Concerning the UK, the private pension's schemes accounting standard, UK Financial Reporting Standard 17 became mandatory in 2005 and was the UK equivalent of the IAS 19, forcing UK companies to recognize pension liabilities in their financial statements through a current value approach (Chitty, 2002; Slater & Copeland, 2005). Dixon and Monk (2009) argue that "accounting harmonization around the fair value method, as another layer, has catalyzed (threshold effect) ongoing processes of pension transformation" (p.634). They further mention a key difference between the US and the UK private pension transformation that can be of concern for the UK: the lack of replacement between DB closures with new DC schemes in the occupational pension funds (Munnell, 2006, p. 629).

Concerning Australia, Klumpes (1994) studied the politics surrounding the accounting rule-making for Pension Funds and found that in this case the accounting profession failed to gain acceptance of its professional rule-making activities. In this context, Gallery and Gallery (2004) reveal major inconsistencies between the new conceptual framework and the Australian accounting standard *AAS 25 – Financial Reporting by Superannuation Plans*. In particular, treatments of accrued benefits in a non-corporate entity such as a superannuation fund distorted accounting representation of financial position and performance of the sponsors.

The international accounting standard IAS 19, which inspired IPSAS 25, defines accounting for DB plans as follows:

> The measurement of a net defined benefit liability or asset requires the application of an actuarial valuation method, the attribution of benefits to periods of service, and the use of actuarial assumptions. [IAS19. (2011).66]
>
> The fair value of any plan assets is deducted from the present value of the defined benefit obligation in determining the net deficit or surplus. [IAS19. (2011).113]
>
> The present value of the defined benefit obligation should be determined using the Projected Unit Credit Method. [IAS19. (2011).67-68]

The IAS 19 – applied in the European Union since 2005 – aims to include this DB obligation in the sponsoring entity balance-sheet. Indeed, reporting entities are required to recognise the net DB liability (asset) in their statement of financial position, this net position being equal to the deficit (surplus) in the DB plan. The net interest on this net position is then recognised in profit or loss in the period in which they occur, together with past-service cost. Actuarial gains and losses are recognised among other comprehensive incomes.

The implementation of this financialised accounting representation has raised issues and concerns on sustainable pension provision. In particular, Arnold and Oakes (1998) show how, in US, "reductions in benefits

[…] occurred coincident with the passage of Statement of Financial Accounting Standard 106 requiring companies to accrue a liability for unfunded retiree health benefits." Baker and Stephan Hayes (1995) "investigate the negative effects on employee welfare as a result of actions taken by the management of a company which they attribute to the adoption of an accounting standard, focusing on McDonnell Douglas Corporation." In this context, pension accounting can lead to "some degree of expropriation of employee's wealth." According to Reiter and Omer (1992), "the accounting changes in the 1980s related to pension terminations changed distribution of wealth between shareholders and employees as corporate recapture of billions of dollar of pension surplus occurred". Concerning the US private sector, Thomas and Williams (2009) argue that the standards "have failed to satisfy the condition of neutrality" and show how the switch from DB to DC schemes have facilitated the shifting of economic risk from sponsors to employees. Gallery and Galley (2005, p.1) "advocate policy solutions consistent with libertarian paternalism where the government provides a competitive choice environment, but [it] actively intervenes to set suitable pension savings and investment defaults."

In line with criticism of IAS 19, the IPSAS 25 was also questioned by academics and practitioners, as summarised in the following paragraph.

2.3 Critiques of the IPSASB position

Some issues raised by the approach adopted by IAS 19 and IPSAS 25 are common to the private and the public sector (point i), while other issues do only concern the public sector (point ii).

On the one hand (point (i) above), some problems are common to both private and public sectors, as accounting is supposed to facilitate accountability and responsibility by the reporting entities. Indeed, technical problems occur with complexity, cost, subjectivity and volatility implied by the actuarial representation. These technicalities become especially sensitive for the public sector, which discloses and discusses budgets along with financial reports.

Among others, Ouslasvirta (2008, p. 231) argues that: "Even small changes in certain parameters (for instance, the discount rate and life expectancy) may cause tremendous changes in the amounts of liabilities in the balance sheet." Moreover, actuarial assumptions underlying the calculation of employee pension obligations are part of the least commonly disclosed items in online budgets (Bolívar, Pérez & López-Hernández, 2015) and may provide incumbent gubernatorial candidates with flexibility for manipulation (Kido, Petacchi & Weber, 2012).

Concerning the discount rate and the hazard of volatility attached to it, Lequiller (2014, p. 24), counsellor to the OECD Statistics Directorate at Eurostat, expresses concerns on the recognition of pension obligations in the balance sheet of EU countries:

> However, if it was decided one day that pension obligations were to be recorded on balance sheet in the EU, there would be two necessary technical conditions which would need to be implemented: (1) a common discount rate. Indeed, considering the massive impact of the choice of the discount rate on the amount of the estimated obligation, and its arbitrariness, it would be irresponsible to allow using different discount rates among Member States; (2) the headline surplus/deficit should be protected from the volatility of the changes in the estimate of pension obligations. If not, it would be made useless for fiscal target making.

On the other hand (point (ii) above), further concerns refer to the specific economic working of the public sector. Private sector entities are expected to go on allocating residual earnings to their shareholding recipients, period after period. It may then be consistent with their accountability and responsibility to include a fair estimation of pension obligations, in view to better protect beneficiaries against mismanagement and unsustainability over time. This estimated inclusion protects pension funds from being appropriated by incumbent shareholders. Biondi (2014a) argues for a similar approach to accounting for environmental liabilities. However, public sector entities are not expected to generate and distribute residual earnings. Inclusion of pension obligations as operating expenses is then less significant at the income statement level. Moreover, public finances systematically employ debt issuance and refinancing to cover for asset positions (Biondi, 2014b; Biondi & Boisseau-Sierra, 2016). Inclusion of pension obligations in the balance sheet may then raise undue financing costs and risks.

Academic scholars such as Oulasvirta (2008) and Bohn (2011) address the pension funding issue. Concerning pension benefit liabilities and social policy cash transfers, Oulasvirta (2008) concludes that "the way IPSAS standards handles liabilities is not as such optimal for government financial statement reporting". Bohn (2011) further develops an economic model "where most taxpayers hold debt and face intermediation costs", while "returns on pension assets are less than taxpayers cost of borrowing". Accordingly, "pension funding is costly" and hence "zero funding is optimal".

If public sector accounting standards put pressure over entities to include future obligations into their balance sheet, these entities may be encouraged or constrained to increase their debt position and incur additional cost to fund them, transforming their pension management into a speculative hedge fund strategy leveraged on debt. On this matter, Coeuré (2007, p. 6), French economist appointed to the Executive Board of the ECB since 2011, casts doubts about converting non-financial pension obligations into straight financial liabilities:

> Inclusion of pension commitments implies adding to the portfolio of financial debt another portfolio of pension obligations, of a gilt kind but with very long duration. In principle, this should lead to significantly reduce the duration objective for the financial debt. In other terms, does it valuable to increase very long-term governmental commitments through either gilts lasting thirty or fifty years, or interest rate swaps over similar duration, while the states are already committed to their employees over those time horizons? (our translation)

These and other issues have been raised throughout the public consultation process regarding the IPSAS 25. The next paragraph analyzes some comment letters to the Exposure Draft.

2.4 An overview of the consultation process of IPSAS 25

The consultation process to the Exposure Draft 31 on Employee Benefits gathered comment letters from thirty one constituencies, including The State of Geneva (2007), the Swedish Financial Management Authority (2007), the American Academy of Acturaries (2007) and the Quebec Ministry of Finance (2007). This section draws upon these latter to summarize critical issues raised by the IPSAS 25.

The State of Geneva (2007) "does not support, in general, the Exposure Draft", outlining that "the accounting treatments proposed do not correctly reflect the economic reality of public pension plans in Switzerland" and that, under its actuarial approach through profit and loss, "financial statements would give no warning signs to users when a public pension plan experiences real financial difficulties." Accordingly, "this treatment does not reflect the reality of the obligations of states regarding public pension plans, as mixed funding by capitalization and repartition has proven sustainable in the long run." To conclude:

> [The State of Geneva] believes that if there is one subject on which IPSAS should depart from IAS, it would be on pension plans, as the perenniality of states does change the economic reality of obligations on this matter compared to the private sector.
>
> [The State of Geneva] believes that the IPSASB should depart from the accounting treatments set by the IASB on pension funds and develop an approach that takes into account the specificities of public pension plans and their relationship with State Communities.

The Swedish Financial Management Authority (2007) argues that the "proposed Standard ED 31, according to postemployment benefit pensions, are not applicable for Swedish Central Government [as for its pension funds] don't have any plan assets according to the obligation and there is also very much uncertainty in e. g. demographic assumptions, rates for employee turnover, future salary and benefit level." Furthermore, according to the Swedish authority:

> [T]he actuarial assumptions decided by The Swedish Financial Supervisory Authority are sufficient to measure the amount of the post-employment defined benefit pension obligation in Swedish Central Government.
>
> On a general level [they] believe that the same reasoning is applicable to most countries. There are for example no economic implications for setting aside assets to meet specifically long-term employee benefits. The implications for the financial targets for a public sector organization are not the same as for a business organization. The targets are not linked solely to the single organization itself but to the society.

The American Academy of Acturaries (2007) argues that "the proposed standards in ED 31 represent[s] a significant departure from current United States accounting standards related to public-sector pension and other post-employment plans." Accordingly:

> Last year the Governmental Accounting Standards Board (GASB) in the US published their 2006 white paper "Why Governmental Accounting and Financial Reporting is – and should be – different" (2006) explaining their reasons why public pension plans should be treated differently than private sector pension plans.
>
> According to this White Paper (Governmental Accounting Standards Board, 2006):

> Governments are fundamentally different from for-profit businesses in several important ways. Their organizational purposes, processes of generating revenues, stakeholders, budgetary obligations, and propensity for longevity differ. These differences require separate accounting and financial reporting standards in order to provide information to meet the needs of stakeholders to assess government accountability and make political, social, and economic decisions.

The Quebec Ministry of Finance (2007) argues "that the new standards proposed for the public sector would be essentially those currently used in the private sector". It explains why "such a situation would not be appropriate, in the Ministry view" by referring to the perennial character of governments (limiting the risk associated with termination of retirement plans) and the different purpose of financial statements depending on the different economic nature of private enterprises and governments. In particular, the Quebec Ministry of Finance stresses that:

> [I]n the case of governments, the "market value" is an indicator that is not significant.
>
> For retirement plans offering equivalent benefits in the future, the actuarial liability of a public entity (estimated on the basis of the rate of central government bonds) would be greater than that of a private enterprise (estimated on the basis of the rate of high quality corporate bonds, which is higher than the rate of central government bonds). It is absurd that two identical retirement plans show different actuarial liabilities depending on whether one plan is in the public sector and the other in the private sector.

Notwithstanding this unsettled debate, the IPSAS Board decided to adopt an approach consistent with the 'saving account' model (Biondi & Sierra, 2017) by considering that the time value of money should be computed and that pension obligations are liabilities. This choice seems to imply that other approaches are no longer admissible. By adopting the IPSAS 25, the IPSASB has overridden the issue whether pension obligations should be funded, arguing against reasons for underfunding pension commitments and for excluding them from public sector balance sheets.

In sum, international accounting standards for both the private and the public sector are consistent with, and endorse the emergent trend toward pension as an individual saving account and a financial placement. To be sure, the IPSAS are not currently adopted by any major jurisdictions, although the IPSAS Board has been developing a professionally endorsed 'best practice' that has been having a significant influence on the ongoing public sector accounting debate and regulation (Brusca et al., 2015). Contrary to the IAS/IFRS (which have been adopted by the European Union), the IPSAS do not have compulsory authority to rule public sector accounting practice in Europe or abroad.

In fact, in 2013, the European Commission started a project to harmonize European Public Sector Accounting Standards (EPSAS), drawing upon the IPSAS experience. The question whether the standard IAS 19 should be applied to the public sector directly or through the IPSAS 25 has already been discussed by professionals of national statistics (De Rougemont, 2003).[7] Through the EPSAS project, this very discussion has shifted from national statistics to governmental accounting and reporting. The following section will address accounting for pension obligations in the context of ongoing harmonization of European Public Sector Accounting Standards (EPSAS) led by Eurostat.

3 Pension obligations under the EPSAS: Insights, issues and perspectives

The EPSAS project aims at bridging the gap that exists among the different public financial reporting systems and at minimizing incoherence between the micro-level public sector accounting and reporting framework and the European System of Accounts (ESA) macro-level financial system (Biondi, 2014b).[8]

This section summarises the critique of pension funding and pension liability recognition as raised by economists in the debate on national statistics standards, including the Eurostat's position, now in charge of the EPSAS project.[9] It also summarises the European Commission's previous work on pension obligations and it finally focuses on the EPSAS project and current pension recognition practice by Member States.

3.1 Review of the international debate on pension recognition in national statistics

The two main advocates of pension funding appear to be the World Bank with its 1994 report and the IMF with its report authored by Donaghue (2003). According to the World Bank (1994), "population aging, which is

predictable, makes it very costly to reduce poverty and replace wages though a single pillar that is pay-as-you-go financed." Therefore, the World Bank recommended "separating the saving function from the redistributive function and placing them under different financing and managerial arrangements in two different mandatory pillars – one publicly managed and tax-financed, the other privately managed and fully funded – supplemented by a voluntary pillar for those who want more." According to Le Lann (2010) and Donaghue (2003) provides a clear-cut illustration of the 'saving account' model while recommending the treatment of pension obligations as financial liabilities in national statistics (see also Feldstein (1997)). In particular, Donaghue (2003) focuses on the "passage of time" as the determinant of accruing liabilities.

Two reasons have been claimed to foster this pension reforms: On the one hand, the problem of the aging of the population which is supposed to imply financial sustainability issue for pension funds; on the other hand, a hidden but important reason is linked to the establishment and development of active global financial markets, both nationally and internationally.

As a consequence of these international positions, a debate on pension funding and liability recognition in national statistics emerged in the 1990s and continued in the 2000s.

In 1990, Rizzo (1990) criticised the analogy between unfunded pension promises and the issuance of governments bonds. This analogy justifies the inclusion of pension obligations in the liability side of governmental balance sheets. However, it has its limitations, summarised by Holzmann, Palacios, and Zviniene (2004) as follows:

> The creditors in a pay-as-you-go (PAYG) pension scheme do not enter into the agreement voluntarily, but rather are forced by law to participate. Furthermore, the return on the government bond is known (at least the nominal yield), while the ultimate value of a PAYG pension promise depends on a wide array of variables entering the defined benefit formula as well as the possibility that the government may change the formula itself in response to other fiscal demands.

In 2000, McKinnon and Charlton (2000) argue that the World Bank (1994) approach "essentially prioritising financial sector issues over social welfare considerations in pension reforms is problematic". According to the authors, "it is insecure in its increasingly, dogmatic prioritisation of private over public sectors (...) [and] it is short-sighted in its implicit assumptions that historical patterns of retirement provision have failed to consider the importance of the public private interface in financial sector development in general, in pension provision in particular".

In 2003, in response to Donaghue (2003)'s article, pension experts – among others, Bosworth, Petrie – argued against pension obligations to be recognized as liabilities in financial statements (Aaron et al., 2003). For instance, Bosworth argued that "at the national level, there is still a substantial interest in cash flow accounting to measure the short-term economic effects of fiscal actions" while stressing that "private firms game the system by choosing among about 15 different formulas for measuring the accrued liability" (Aaron et al., 2003).

Moreover, Petrie (Aaron et al., 2003), another pension expert, questioned the value added of this new recognition and further encouraged the IFAC (better, the IPSAS-Board) to comparatively assess existing different approaches on pension obligations:

> The [Donaghue 2003]'s paper fails to justify why pensions should be recognized when contingent liabilities should not. [...] The paper does not consider the practical effect of recognition on the value of the financial statements to users. [...] [Petrie] would expect that well-informed users would quickly strip out the "pension effect" and calculate some kind of "underlying deficit." In which case, what has been gained? Less well-informed users will find the reported deficit measure less informative. [...] There is arguably far less information disclosed from simple recognition on its own compared to the kind of detailed information that can be provided through supplementary reporting. [...]
>
> Perhaps IFAC should be encouraged to put out a discussion document that compares and contrasts different approaches to pension obligations, rather than an exposure draft of a standard they are heading towards.

Some international organizations servants stressed the limits of funding. Although advocating for funding, the World Bank's report prepared by Holzmann and Hinz (2005) highlighted its costs and limitations:

> While we claim that funding provides some (gross) benefits in many circumstances, we are also very much aware that it introduces new or additional costs, most importantly through additional risks (such as investment risks), higher transaction costs (such as fees), and fiscal transition costs (when replacing an unfunded scheme) (p.44).

Palmer (2002) argues that "countries in the OECD have been reluctant to make [the] transition [from pay-as-go schemes to individual financial-account systems] (...) due not only to the high initial cost for the transition generation, but also to the financial risk involved".

A joint work published by an academic, Ponds, together with two OECD servants, Severinson and Yermo (2011), deals with the funding issue in public sector pension plans and states, among other points, that if circularity in government funding occurs, pensions funding systems has little comparative advantage relative to a 'pay-as you-go' system[10]:

> First, to the extent that funding risks can be smoothed over time as they can be shared with future generations of tax payers, underfunding in market value terms may be an optimal strategy (Cui, Jong & Ponds, 2011; Munnell et al., 2010). Secondly, a funding surplus might also mobilize pressure to increase benefits which in turn leads in the longer term to higher funding costs and so underfunding. So for taxpayers it is rational to aim at underfunding rather than full funding or overfunding. Moreover, a funding surplus will enforce contribution cuts and once contributions are reduced, it is difficult to get them increased. The accountability horizon of pension fund management and politicians is much shorter than the horizon over which pension promises have to be met by adequate funding. This horizon gap may lead to pressure to underestimate costs and risks and to overestimate the earning capacity of assets. Thirdly, to the extent that prefunding leads to investment in domestic government bonds, a circularity in government funding may be created, with little added value relative to a PAYG system.

Eurostat, the EU statistical unit now in charge of the EPSAS project in name of the European Commission, took position in the pension recognition debate in national statistics standards, referring to the IPSASB work in that context. The next paragraph summarises the Eurostat's position together with the European Union's past work on pension obligation.

3.2 European Union's past work on pensions obligations

This section reviews the European Union's – European Commission and Parliament – positioning on pension obligations. First, it reviews its work prior the recent EPSAS proposal. Second, it takes into consideration the Eurostat's contribution to the national statistics debate on this matter.

3.2.1 European Commission's and European Parliament's actions on pension obligations

Already in 1997, the European Commission (EC) endorsed the 1994's World Bank « three pillar grid » policy framework, although the EC recognized that, at that time, 88 % of EU pension payments were covered by the first pillar which comprises 'pay-as-you-go' (PAYG) pension schemes (European Commission, 1997, p. 5).

In 2010, the European Commission's Green Paper (2010, p. 5) titled "Towards adequate, sustainable and safe European pension systems" acknowledges the ongoing shift from PAYG pensions towards more prefunded private schemes, which are often of a DC nature, in most but not all Member States, in order to lower the share of public PAYG pensions in total pension provision.[11] In fact, the Commission acknowledges that:

> Member States are responsible for pension provision: this Green Paper does *not* question Member States' prerogatives in pensions or the role of social partners and it does *not* suggest that there is one 'ideal' one-size-fits-all pension system design.

This same Green Paper (European Commission, 2010) aims strengthening the internal market for pensions, claiming that:

> Completing the internal market for pension products has a direct impact on the EU's growth potential and therefore directly contributes towards meeting the Europe 2020 objectives.

The Green Paper mentions that the 2003 Directive on Institutions for Occupational Retirement Provision (IORP) was a major achievement. This IORP Directive (European Parliament & Council, 2003) deals, in article 15, with technical provision and, in article 16, with the funding of technical provision. The Directive requires "a prudent calculation of technical provisions (…) calculated on the basis of recognized actuarial methods and certified by qualified persons" and "sufficient and appropriate assets to cover the technical provisions protect the interests of members and beneficiaries of the pension scheme if the sponsoring undertaking becomes insolvent." Full funding is required only for cross-border activity (Art. 28), while Member States can permit underfunding for national institutions, if a proper plan is established to restore full funding and without prejudice for protection of employees in the event of the insolvency of their employer (Council Directive 80/987/EEC of 20 October 1980).

In 2011, the European Commission worked on public and private pension systems in the EU and their contingent liabilities and assets. This report stated that "some pension reforms (…) induce front loaded costs

which will be accounted as Maastricht relevant government debt", acknowledging that the revised Stability and Growth Pact required "accounting for implicit pension debt in the computation of the medium term objective". Accordingly, "Member States with high implicit debt will have to run budget surpluses in the medium term" (European Commission, 2011, p. 77).

Concerning public sector accounting, the European Commission (European Commission, p. 6) claims that an accrual basis of accounting helps assessing fiscal sustainability:

> [T]he important advantage of accruals over cash accounting is that both assets and liabilities are consistently recorded, making it possible to have a complete and consistent picture of the real financial position and of whether it is sustainable.

In 2011, a European Parliament's report (2011, p.33 and Table 4) clearly indicates that a move from DB to DC occupational pension schemes would result in a loss of social security protection, since a number of significant risks are then transferred from the employer to the employee, including investment, inflation, longevity, and market timing risks.[12]

Another 2015 report by the European Parliament (European Parliament, p.28) points out that pension accounting can be the scene of important conflicting interests, focusing on the International Actuarial Association (IAA)'s influence within the International Organisation of Pension Supervisors (IOPS). This reports points out that "the increased role of standard setting entities [such as IOPS] is perceived as limiting for the EU the leeway for independently shaping policy" and calls for a greater involvement of the European Union within the IOPS. The same year, the European Parliament (2015b) also issued a briefing on the adequacy and sustainability of pension schemes in Europe.

In 2017, a revision of the IORP (Institutions for Occupational Retirement Provision) Directive of 2003, IORP II, has been adopted after long negotiations. As explained by the European Parliament's briefing (2017), "the proposal did not include provisions for a new harmonised solvency standard for IORPs which had been a long-standing and controversial part of earlier deliberations but was ultimately dropped from IORP II". "The variety of the variety of IORPs and their position as social (not just financial) entities" has been a crucial point to reach an agreement on this revised directive. Member States were granted with two years to transpose it into national law.

The European Commission and the European Parliament have been dealing with pension obligations through the 2003 IORP Directive, the 2010 Green Paper and the 2017 IORP II revised version. The European Commission – and more specifically its statistical unit, Eurostat – is now dealing with the specific issue of accounting for pensions obligations through the ongoing EPSAS project. In this context, is it relevant to investigate the Eurostat's contribution to the national statistics debate on this matter between 2004 and 2013.

3.2.2 Eurostat's position on national accounting for pension obligations

A recent national statistic debate shows the past Eurostat's position on: (i) the current international trend of integrating pensions as a liability in the balance sheets of national accounts, and (ii) the Eurostat's ruling on pensions.

Eurostat's opinion on the treatment of pension schemes in macroeconomic statistics (point (i) above) was included in the Eurostat communication to the Advisory Expert Group (AEG) on national accounts issued in 2004.[13] This Electronic Discussion Group (EDG) on the treatment of pension schemes was established because differences existed in treatments between different macroeconomic systems.[14] In particular, the *System of National Accounts 1993 (SNA 1993)* – the United Nations system – and the *European System of Accounts (ESA95)* – based on the SNA 1993 – do not include liabilities for government employee unfunded pension schemes, while the IMF's Government Finance Statistics Manual (GFSM) does (see GFSM (2001), paragraph 4.35).

In its communication to the AEG, Eurostat (2004)[15] summarises the EDG main proposal and expressed relevant reservations on it (bold in the original):

> The EDG main proposals for changes of the SNA are (1) to treat unfunded employer pension schemes similarly to funded schemes, (2) to use actuarial valuation for flows and stocks and (3) to allocate the net assets of pension funds to the sponsor.
>
> At the same time, it can be questioned whether unfunded or pay-as-you-go schemes are economically the same as funded schemes. This concerns the less solid nature of the claim—as its value can be unilaterally altered by the debtor. Moreover, it should be taken into account to what extent this value depends on all kinds of assumptions on uncertain future events and whether or not it can be estimated within narrow margins. In order to reconcile the importance of providing information on pensions liabilities in the SNA – and perhaps in the accounts themselves – with the hesitation to give to such liabilities the same status to others, some innovative alternative accounting option.

(...) **It is strongly suggested the EDG needs to examine more in detail the other identified options, with the aim to indicate the pros and cons of each of those options also in view of the concerns and borderline issues mentioned above**.

Interestingly, in 2004, Eurostat (2004, p.3) argued that the IPSASB invitation to comment on accounting for old age pensions does "not articulate the reasons whether and why civil servants unfunded employer pension schemes should be treated differently (i. e. treated as pension funds) from social security pensions". Eurostat (2004, p.3) further commented on the importance of the reference to the IAS in the IPSASB proposal as follows:

> It is noted that the International Public Sector Accounting Standards (IPSAS) of the [Public Sector Committee] (PSC) does not include guidance yet on the recording of civil servants' pensions. It is sometimes assumed that the International Accounting Standards Board (IASB) standards on pensions (IAS 19) applies (see the EDG contribution by IFAC PSC staff).

In this context, it is useful to remember the basic principles issued by Eurostat for national accounting, since current European requirements for the Member States (point (ii) above) focus on national accounts. These requirements include publication of "a special compulsory table [with] government pension liabilities". In 2008, the final report of the Eurostat/ECB Task Force on the statistical treatment of pension schemes summarised the agreement that was reached in the new SNA (Eurostat, 2008, p.17) by endorsing six "basic principles". The following two principles are relevant here:

> (iv) *Concerning government sponsored systems*: Pension entitlements of unfunded, pay-as-you-go government sponsored systems which provide the basic social safety net type of provision, sometimes referred to as pillar one type provision, will be only recorded in the supplementary table (but not in the core account);
>
> (v) The recommendation of the new SNA regarding the recording of unfunded pension schemes sponsored by government for all employees (whether private sector employees or government's own employees) will be flexible.

These principles were largely supported by senior statistical staff in summer 2006 (Eurostat, 2008, p. 17). In 2013, this supplementary table was included in the Chapter 17 dealing on "social insurance including pensions" in the ESA 2010 (Eurostat, 2013). This table provides detailed and reliable estimates of stock and flow data on both pensions which are included in core accounts and pensions which are excluded. Unfunded DB schemes were then excluded by core accounts:

> The [supplementary] table also covers stock and flow data not fully recorded in the core national accounts for specific pension schemes such as government-unfunded defined benefit schemes with government as the pension manager, and social security pension schemes (Eurostat, 2013, p. 379).

In this way, detailed and comparable information is provided at the level of each Member States, while impact on governmental accounts, affecting measurement of public sector deficit and debt, is excluded (Dabbicco, 2015).

3.3 The EPSAS project, pensions accounting and the Member states

Concerning the EPSAS project, the IPSAS were declared to be an "indisputable reference" (European Commission, 2013a, p. 8) for the ongoing process of harmonization of European Public Sector Accounting Standards by the European Commission which leads this project since 2013 (announced in 2011).

However, some countries express concerns and resistance. Especially Germany heralds the freedom for Member States to choose their accounting systems and maintain a cash basis of accounting. According to the Bundesrechnungshof (2014), the Supreme Audit Institution of Germany at the federal level, "introducing uniform accounting standards involves significant risks" and underlines that "up to now, the Commission has not supplied any justification on how harmonization can help solve the data quality problems it pointed out. Also so far no assessments are available substantiating that EPSAS will actually afford enhanced protection against manipulations".

The Germany's Supreme Auditing Institution, the Bundesrechnungshof (2014) notices that "Eurostat has not expressed any reservations about the reliability of German statistical data and the underlying accounts" and that "the data reported by Germany largely meet the requirements set by the European System of Accounts". Therefore, it deduces that " – with regard to data quality – there is no compelling need to introduce EPSAS".

The German Bundestag (2015), the German Federal Parliament, stressed that any harmonization "must take into account the constitutional principles of the sovereignty of the German Bundestag over the budget" and "should not be undertaken until after evaluation of the measures already introduced and once alternatives have been examined and also only on the basis of a thorough examination of the need for and effectiveness of introducing European standards". The German Bundestag (2015) expressed then a relatively clear-cut position:

> The German Bundestag calls on the Federal Government to ensure the freedom of choice which currently exists in Germany with respect to cash based and double-entry systems of budget planning, financial management and accounting is maintained; in the event of EPSAS being developed, there should be provision, on a voluntary basis if need be, for the introduction of double-entry and accrual accounting.

Moreover, according to the German Bundestag (2015), "it is doubtful that the benefits of introducing European accounting standards are in a reasonable proportion to the necessary costs." In the EPSAS project, accounting for pension obligations is especially relevant. According to the German Bundestag (2015):

> New European accounting rules only make sense if the collection and evaluation of assets and liabilities – particularly with respect to implicit indebtedness, which in particular has to fully reflect risks such as pension provision – guarantee transparency and comparability, for which purpose uniform standards must be defined.

According to the report prepared by PricewaterhouseCoopers (2014, p. 108) which examines existing accounting standards in Europe on behalf of the European Commission in the ongoing harmonization of European Public Sector Accounting Standards (EPSAS):

> Pension liabilities in respect of defined benefit schemes rank among the most significant areas in terms of impact on the opening balance sheet, when making the transition from a cash-based accounting system to IPSAS. (…) IPSAS 25 on employee benefits would require recognition of large pension liabilities on the balance sheet. This could lead to negative reactions from stakeholders if negative net assets are disclosed.

In the previous preparatory report (European Commission, 2013b, pp. 125-126), the IPSAS 25 was included among standards that "need adaptation, or for which a selective approach would be needed". Further technical discussion was then encouraged with a panel of accounting experts. This report further stated that "the difficult areas are pensions, and to a lesser extent, other long-term benefits such as long service leave, which represent a large problematic part of the standard."

It is then clear that accounting for pension obligations constitute one of the main issues underlying this accounting process of harmonization, although it was excluded by the main topics of the first survey led by Ernst & Young on behalf of Eurostat to provide supporting documentation for the EPSAS project.

In this context, it should be remembered that pension provision modes differ across Europe's Member States. Since the issuance of the IPSAS 25, very few European countries have adopted its actuarial accounting approach. As stated by the PriceWaterhouseCoopers (2014) report on behalf of the European Commission, "the average accounting maturity score" – which denotes compatibility with the IPSAS – "for employee benefits is only 25 %, which is the lowest score of all accounting areas."

Throughout Europe, most public sector pension expenses are paid by DB pension schemes that recognize those expenses when payment is made (Figure 2). According to PriceWaterhouseCoopers (2014) report:

> Out of 22 [Member States that confirmed that defined benefit pension schemes (or equivalent) have been granted to civil servants/government employees], only four countries recognise defined benefit pension liabilities in the statement of financial position. Three EU central governments recognized defined benefit schemes following the projected unit credit method, one follows another accrual basis of accounting.

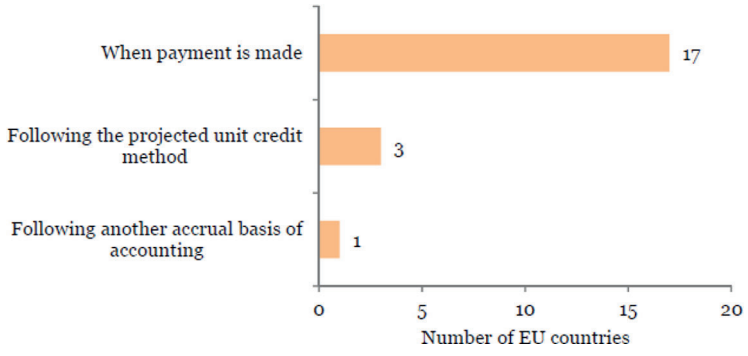

Figure 2: Timing of recognition of pension expenses for DB pension schemes.
Source: PricewaterhouseCoopers (2014, p. 108).

Countries responding to this PriceWaterhouseCoopers's survey explained the lack of liability recognition especially by the nature of the obligation, the complexity of actuarial calculations, the lack of expertise on the latter, and the potential impact on governmental net financial position. Moreover, "some argue that if such liabilities are recognised, one should also recognise future tax revenues on the balance sheet" (PriceWaterhouseCoopers, 2014). The very existence of this liability is contested as governments can unilaterally decide to modify pension terms and conditions over time.

In this context, Lequiller (2014, p. 24), argues that pension accounting is ultimately "political and it is typically one that should be decided upon, in the European context, by an appropriate governance body for public accounting."

Several viable alternative modes exist in current practice in Europe, moving from the individualistic saving account plans at one extreme of the pension world, toward unfunded 'pay-as-they-go'[16] schemes under collective responsibility at the opposite extreme (Biondi & Sierra, 2017). Governmental pension funds are still largely unfunded and based upon 'pay-as-they-go' schemes. Some countries in Europe such as Belgium, France, Germany, Ireland, and Luxemburg have separated unfunded schemes for civil servants pensions (Pinheiro, 2004). Drawing upon this empirical evidence, pension regulation may develop and enforce a set of clear and consistent options which enable various existing modes to fulfil their specific prudential and accounting needs for accountability and responsibility for pension management over time.

The following section develops some building blocks for a comprehensive accounting model for pension obligations. This model is based upon a flow basis of accounting that fits with a revenue-expense accounting approach, giving priority to revenues, costs, contributions and expenditures.

4 Toward a comprehensive accounting model for pension obligations

4.1 The need of a comprehensive frame of reference to cope with existing variety of pension management modes

The current state of pension affairs in Europe shows that the 'saving account' model that has been affirmed for accounting and management of pension obligations by the IPSAS Board is not consistent with all the existing practices that still characterise pension management and reporting across Europe's countries and jurisdictions. Moreover, unsettled debates still exist even within this 'saving account' model, especially concerning the preferred actuarial method to estimate remote and uncertain flows subject to unforeseeable change and hazard, as well as the appropriate discount rates of reference and related updating over time (American Academy of Acturaries, 2007; Bader & Gold, 2003; Dietz, 1968; Exley, Mehta & Smith, 1997; Keating, Settergren & Slater, 2013; Mortimer & Henderson, 2014; Waring, B, 2009).

Concerning harmonization through international private sector accounting standards for pension obligations, Gordon and Gallery (2012) contested that IAS 19 achieves inter-entity comparability within and across national borders, due to the varying institutional and regulatory frameworks across jurisdictions which impede efforts to achieve global comparability through one universal actuarial accounting model. This variety is also a distinctive feature of public sector pension obligations.

This section introduces a new conceptual frame of reference to comprehend the existing variety of pension management modes and to better cope with the funding and the sustainability issues. This frame is expected to improve on the general applicability of the IPSAS 25 model for accounting pension obligations, including its implications for ex-ante funding.

The rest of the section is organized as follows. The next paragraph (4.2) introduces a functional definition of the working of the pension scheme that must be accounted for. Its mission is tentatively described as the assurance of ongoing pension payments to beneficiaries over time at expected amounts. On this basis, we adopt a dualistic approach to compare the IPSAS model of actuarial representation (pointing to the individual saving account ideal-type), with its opposite ideal-type (pointing to a collective entity enabling and facilitating solidarity among members or citizens across space and through time). A specific attention is then paid paragraph (4.3) to the link between ex-ante funding and sustainability.

4.2 Functional definition of pension scheme

Existing variety of pension management modes invites to overcome the received opposition between DC and DB modes defined by the IPSAS 25. A more comprehensive model may then be elaborated to clarify and improve on pension protection. This model is based upon the following assumption or principle of reference

concerning the purpose for which every pension scheme is accountable for. Accordingly, pension management is expected to assure pension promises over time and circumstances. Accounting standards must then enhance the protection of this pension promises through control, reporting and disclosure. Accountability for pension management involves being accountable for this main managerial purpose, i. e., timely and continued provision of pension payments as they become due at their previously committed levels. Each pension scheme (and each related management mode) intents to achieve this purpose in its distinctive ways.

According to the IPSAS 25 view, pension provision is understood as an "individual saving account". This ideal-type is more akin with some form of DC plan, while DB plans should then satisfy further managerial and reporting obligations by showing a fund of dedicated assets equal to the sum of pension obligations "earned" to date by all employees and incumbent pension beneficiaries.

From this perspective, both DC and DB pension plans are defined through the notion of deferred remuneration, that is, a purely individual payment which is evaluated at its current value at each reporting date. In fact, this overarching definition does not fit the IPSAS definition of DC pension plan, since there is no future remuneration that is assured through an obligation by the sponsor to pay it in due course under this definition. The remuneration risk is entirely bear by the beneficiary European Parliament (2011) quoting Broadbent, Palumbo, and Woodman (2006). Therefore, the IPSAS 25 does not provide the latter plan with a consistent representation of the investment fund that is expected to discharge the future payments through time and circumstances.

Our frame of reference replaces that reference notion of deferred remuneration by focusing on the ongoing working of the reporting entity that is expected to fulfil the pension obligations over time.

Pension management generally occurs through organised entities that perform it on behalf of sponsors and beneficiaries. This entity dimension is not consistently included by the view of pension obligations as deferred remuneration held in an individual saving account. A saving account can exist independently from managerial delegation to a specialised financial entity, while an entity-held pension account does not necessarily feature all the characteristics – regarding appropriability, transferability, remuneration and so forth – that functionally define an individual saving account. For instance, an entity-held pension account may not be appropriable or transferable at will, while it may not be fully funded at every time.[17]

Separately incorporated or not, a financial entity specialised in pension management (generally labelled 'pension fund') is purposively devoted to pension obligation fulfilment over time. This fulfilment constitutes its constitutive mission. Perform this mission involves two complementary working processes to be accounted for:

i. One process does concern the series of cash (cash-receivable, and cash-promised) flows that pass through the entity from ongoing contributing members (including future expected beneficiaries and committed sponsors) to incipient and future beneficiaries. This process involves cash and non-cash financial funds and flows to be accounted for. It points to the financial dimension and this cash process of entity economy is consistent with a cash basis of accounting.

ii. The other process does concern the economic recovery of the outward flow of payments that are due over time to incumbent beneficiaries. This process involves recognition and measurement of ongoing payments and matching contributions, as well as capitalised cost, reserve provisioning, dedicated assets and outstanding liabilities that are generated by ongoing management of pension entity over time and hazard. It points to the economic dimension of entity economy and is consistent with an accruals basis of accounting.

From this perspective, an individual saving account approach to pension obligations involves a quite narrow view on both processes. Accordingly, each individual is expected to collect his own series of cash settlements, which, through financial placement, are the only way to get future pension payments by ongoing financial accumulation that is dependent on cumulated cash funds and proceeds.

To illustrate the application of our functional frame of reference, we adopt a dualistic approach which opposes an individualistic and fully funded pension fund (individual saving account model), to a collective and possibly unfunded pension fund (pay-as-they-go model). From this dualistic perspective, both DB and DC pension funds as defined by the IPSAS 25 may be understood as "individual saving accounts" based upon an individual deferred remuneration. This latter model is then contrasted with the 'pay-as-they-go' model, where pension payments depend on mutual commitments across members or citizens over time (Table 1).

Table 1: A dualistic analysis of alternative pension management modes.

Dimension of reference	Actuarial model (static) (defined contribution scheme)	Holistic model (dynamic) (pay-as-they-go scheme)

Economic process (contributions and expenses)	Individualistic	Collective
Financial process (cash inflows and outflows)	Funded	Unfunded
Accounting representation (concept and method)	Stock Basis of Accounting	Flow Basis of Accounting
Overarching definition (view, understanding)	Deferred Remuneration	Social Protection

According to this dualistic analysis (Table 1), the individual saving account model that has been recently affirmed corresponds to an individualistic approach which involves funded financial management and a stock basis of accounting, as for pensions are understood as deferred remuneration. At the opposite side, we can situate the entirely unfunded 'pay-as-they-go' model that has been generally adopted by public sector pension funds. This latter collective approach fosters an unfunded financial management, it prefers a flow basis of accounting and it understands pensions as social protection assured by the pension-purpose entity on behalf of the whole (pension fund membership, citizenship).

On the one hand, we define an 'actuarial model' which corresponds to an ideal DC scheme. This scheme is then completely funded and based upon an entirely individualistic risk-taking profile. It is then similar to a close monetary fund held on behalf of each beneficiary. On the other hand, we define a 'holistic model' that corresponds to an ideal pay-as-you-go scheme (labelled here as 'pay-as-they-go'): its working mechanism is based upon the continued matching between contribution inflows and payment outflows through time. It may then be unfunded and held on behalf of the whole (membership, citizenship). This dualistic perspective highlights the uncovered part by the IPSAS 25. In particular, the latter representation neglects the collective approach to pension management and it cannot then properly represent the 'pay-as-they-go' working mechanism.

This polar view on pension management opposes two understandings. Concerning the working mechanism, the first one is completely individualistic, the other one is completely collective. The first one is completely funded: pensions are paid by the financial investment accumulation process based upon the progressive reinvestment of contributions. The other one may be partly or completely unfunded, because it matches contributions with payments period after period. In the first case, dedicated asset portfolio refers to the very existence and accumulation of identifiable assets that are expected to pay for future pensions. In the second case, pension commitments stand as acknowledgement of stated promises of future payments by the entity that is held to be responsible for the fulfilment of those promises.

Concerning accounting representation, the first one is evaluated at its current value according to a stock basis of accounting, while the other one is accounted for through outflows and inflows according to a flow basis of accounting. In this context, a stock basis of accounting points to the notion and function of money as reserve and measure of value (Le Lann, 2010), while a flow basis of accounting points to the notion and function of money as symbol, means of payment and unit of account (Biondi, 2010).

All these differences point to two overarching definitions. According to the first model, pension is understood as deferred remuneration (following the IPSAS 25 for both DC and DB schemes); according to the other model, pension is understood as a form of social protection.

Each model addresses key concerns of representation, accountability and solidarity in its distinctive way.

Representation (Table 2) concerns the functional definition of the overarching working mechanism that is expected to fulfil pension obligations over time. From an actuarial model perspective, this assurance is based upon a financial investment return, while it is based on the mutual commitment among members or citizens from a 'pay-as-they-go' model perspective.

Table 2: Concerns of Representation according to a dualistic analysis.

	Actuarial model (static) (defined contribution scheme)	**Holistic model (dynamic) (pay-as-they-go scheme)**
Pension coverage by	Financial investment returns	Mutual commitment among members
Accounted for through	Discounting	Series of flows through time
Accounting method	Current values summed-up at the present instant through time value of money	Compensation between inflows and outflows over time

On the one hand, the actuarial model acknowledges the time value of money by applying discounting to estimation of current values. Assurance is then discharged through compensating the current value of pen-

sion obligations with the current value of a series of compounded financial returns from the dedicated assets portfolio.

On the other hand, in the holistic model, the working mechanism refers to the flow of time process, where actual inflows and outflows are transacted in view to compensate and match each other through time. Assurance is then discharged through continued matching of these inflows and outflows.

Both distinctive representations have direct implications on accountability (Table 3). Both ideal-types provide distinctive approaches and methods to hold the reporting entity accountable for its pension obligations.

Table 3: Concerns of Accountability according to a dualistic analysis.

	Actuarial model (static) (defined contribution scheme)	**Holistic model (dynamic) (pay-as-they-go scheme)**
Accountability focus	Financial investment exposure and return	Collective responsibility for incumbent beneficiaries
Main cost and risk	Financing cost and risk Investment cost and risk (including misallocation and misappropriation)	Coordination cost and risk
Transparency	Opacity of cash flows and funds (due to actuarial representation)	Received lack of transparency
Methods and related limits	Subjectivity and volatility of valuation Ongoing discount rates Long-term forecasts	(Possible) Disclosure of promised future flows

According to the actuarial model, the entity is made accountable for its financial investment process, including related exposure and return over time. Its working mechanism involves financing cost and risk along with investment cost and risk, including misallocation and misappropriation of existing funds by controlling parties. Due to the actuarial representation, opacity is introduced on actual cash flows and funds management, while subjectivity and volatility is introduced in valuations and revaluations of current values, including by estimation and update of discount rates and very long-term forecasts (Biondi, 2014b; Biondi et al., 2011). Therefore, its actuarial mode of accounting representation affords the danger to undermine control and accountability, as for the discounting/unwinding measurement method cannot track actual cash flows and funds that are involved in overarching managerial processes.

According to the 'pay-as-they-go' model, the managing entity is made accountable for its collective responsibility for incumbent beneficiaries over time, discharged on behalf of entity constituencies. This working mechanism involves coordination cost and risk, and was exposed to a received lack of transparency on its present and expected financial position and performance. However, it is possible to report and disclose on its working process based upon current and promised flows through time.

The last but not least concern is the distinctive way in which each model purports to achieve intergenerational solidarity (Table 4).

Table 4: Concerns of Intergenerational Solidarity.

	Actuarial view (static) defined contribution scheme	**Holistic view (dynamic) pay-as-they-go scheme**
Socio-economic perspective	Individualistic	Collective
Working process based upon	Financial Accumulation Process	Mutual Commitment and/or Redistribution

The actuarial model adopts an individualistic perspective where the financial accumulation process is expected to assure pension payments. These payments are then considered as a kind of financial return through time. Accordingly, intergenerational solidarity is directly related to financial investment dynamics – often coordinated by financial markets and financial portfolios – and only indirectly related to interdependency among members or citizens.

Quite the contrary, the 'pay-as-they-go' model adopts a collective perspective where organizational or political commitments are undertaken by the managing entity which organizes ongoing redistribution of resources among members or citizens. These commitments point to either mutuality missions or welfare state redistribution policies.

Concerning intergenerational solidarity, the actuarial model – which understands pension as an individual saving account – appears to be inconsistent with received social meaning of pension. This meaning has been related to protection granted to the old or the sick. In its pure form, the pension as saving account view holds each individual – independently from all the others – responsible for its own financial sustainability over old age, making it dependent on the hazardous results of the ongoing financial investment process. Legal or constructive obligation to care for other people's needs is then denied.

4.3 Disentangling funding and sustainability

Financial sustainability acquires a meaning which differs between funded DC schemes – when they operate as close monetary investment funds – and 'pay-as-they-go' schemes. Concerning the former, financial returns generated by dedicated financial investment portfolio are deemed to be a key factor to cover for pension obligations through time. Concerning the latter, demographic and economic evolution of membership is expected to be critical to its financial sustainability. To be clear, it does not depend only on demography, but also on the financial and economic capacity to maintain intergenerational solidarity among members through time.

As stated by Sauders (2006), "challenges exist, but to portray these as a 'crisis' does little to aid the search for sensible responses." From an economic perspective, Barr (2002, p. 8) deconstructs the myth that funding resolves adverse demographics. He argues that "demographic change is not a strong argument for a shift towards funding", while "the difference between pay-as-you-go and funding is second order." As well, Engelen (2003) does critically assess the claim that funded pension systems are not subject to 'demographic stress' especially for European countries. He does clearly link the request to fund pension obligations to the development of financial markets and institutions related to the financialization phenomenon.

According to our analysis, distinctive positions were argued and claimed for accounting and management of pension obligations. No such a thing as "one best way" has emerged and proved to cope with all the overarching concerns at the same time. In particular, unfunded "pay-as-they go" schemes have been sustainable over time and can be sustainable under some circumstances, although they may become unsustainable due to political reckless in exaggerating pension promises or other extra-financial events. At the opposite, funded DC schemes – when similar to close monetary investment funds – have been subjected occasionally to moral hazard and financial scandals. Financial shortcomings can also occur because their working mechanism is entirely based upon financial returns. Nowadays, the latter is one of the main policy concerns due to negative interest rates and exceptional monetary policies.

In this context, it is relevant to remember here the distinctive impact of interest rate decrease on alternative covering processes for pension obligations.

From an actuarial perspective, pension obligations are (expected to be) covered by the financial returns generated on the existing investment portfolio to be accumulated. A reduction of reference interest rates does increase then the current value of pension obligations as accrued on the liability side of the balance sheet, due to additional invested funds that are required to cover for those obligations – when dedicated funds are invested at the liability discount rate of reference.

From a 'pay-as-they-go' scheme perspective, pension obligations are paid and then funded when they become due. The financing need occurs then when pensions are paid. A decrease in the interest rate of reference does not generate an additional funding need, but an economic benefit due to reduced cost for financing pension obligations to be paid.

A parallel representational issue is raised by the amount to be accounted in the asset side.

From an actuarial perspective, the assets side should account for the dedicated investment portfolio that is expected to pay for pension obligations in the future. It may then be discounted to some rates of reference, either equal or different than the discount rate applied to pension obligations on the liability side. This representation is consistent with a balance sheet accounting approach (stock method).

From a 'pay-as-they-go' scheme perspective – when entirely unfunded –, the assets side may instead capitalize the cost of vested pension obligations, a cost that may be amortized over the pension time duration or another conventional time window. This representation is consistent with an income statement accounting approach (flow method).

Theoretically speaking, funding and sustainability are not necessarily linked. In this context, notwithstanding discredit that has been claimed against them, unfunded 'pay-as-they-go' schemes can be sustainable as long as current and future contributions from constituencies (including sponsors and future beneficiaries) go on matching current payments that become due to incumbent beneficiaries over time.

Funded schemes do not guarantee better provision and security of pensions. Shortcomings of funded schemes have been occurring especially in the aftermath of financial crises. For instance: in the UK, in 1992, the Maxwell scandal (Augusztinovics, 2002, p. 26); in 2000, the UK insurance company Equitable Life, and in

2007, the UK pension fund of Allied Steel and Wire. In France, the additional pension fund for civil servants named CREF ('caisse complémentaire de retraite de la fonction publique'), which was partly funded, incurred financial distress and was transferred in 2002 to the COREM under the supervision of the State[18] (Pouzin, 2014). In China, in 2006, the public discovered the maladministration of their social security fund "as the Shanghai municipal bureau of social security embezzled pension funds to invest in private companies owned by some senior official's cronies" (Hu, 2014, 496).

In sum, since unfunded 'pay-as-they-go' pension schemes can be sustainable, while partially funded, financial-return-based pension plans can be unsustainable, we can conclude that funding and sustainability are not necessary linked. According to Augusztinovics (2002, p. 26):

> Contrary to the new pension orthodoxy's major arguments, there is ample conceptual evidence in the literature to demonstrate that the method of finance and the type of management are no panacea (...).

According to our comprehensive frame of reference, the various positions concerning financial management and accounting for pension obligations can be reconsidered and accommodated through reporting and disclosure of standardized raw data. Our approach acknowledges alternative management modes and recommends allowing alternatives ways of accountability. Indeed, a supplementary disclosure of raw data concerning current and future flows and funds may be provided out-of-balance-sheet. On balance sheet reporting cannot be provided because evaluation methods – which are consistent with overarching working mechanisms – are logically and methodologically inconsistent. Respective measurements cannot be reconciled and would lead to incomparable reported amounts. A standardized disclosure of raw data which are prior to the application of respective evaluation methods is then recommended. Disclosure may be applied over various time windows, such as ten-years for liquidity analysis and a longer time period for sustainability.

For instance, Biondi and Sierra (2017) provide a supplementary table that may offer a common basis of disclosure to represent and make managing entities accountable on a comparable basis. Users or preparers may elaborate further estimations according to their preferred evaluation methods. Financial analysts may utilize raw data to perform sustainability assessment. This information may constitute a step toward meaningful accountability and, while 'empowering' futures pensioners through information, contribute to create 'active trust' (Ring, 2005).

In sum, an actuarial representation makes the pension provision sustainability dependent on the structure of financial returns related to positive and negative balances whose current values are computed in a way that neglects time, process and hazard.[19]

Quite the contrary, the flow representation basis is common to all and every management modes of pension obligations, providing information which is prior to distinctive evaluation methods. Under a standardised form, it may then be introduced as a supplementary table to be disclosed off balance sheet.

Our analysis shows that the 'one best way' representation as implemented by actuarial accounting model misrepresents the financial situation and sustainability of pension schemes, while introducing unnecessary subjectivity and volatility in accounting for pensions. As a result, funded schemes may turn out to be less sustainable, and unfunded 'pay-as-they-go' schemes can be more sustainable, than what their actuarial accounting representations would suggest. Overall, we show several dimensions that should be taken into consideration to develop a comprehensive perspective on the existing management modes for pension obligations. Adequate accounting representations for each kind of existing schemes is required to perform comparative assessment of, and to design a consistent regulatory framework for all these alternative management modes.

4.4 Conclusive remarks

According to Frericks, Maier, and De Graaf (2009),[20] two extreme directions are currently being taken concerning pension management in Europe, one toward privatization and the other one toward public control.

The overall concern of this article is the protection of pension promises through accounting and reporting. The article has reviewed several modes of management and accounting for pension's obligations and showed that funding and sustainability are not necessarily linked. These modes prove to be inconsistent with the 'actuarial view' that has been fostered by IPSAS 25. The ongoing debate on the latter further shows technical and conceptual difficulties with its actuarial representation of pension management. Moreover, throughout debates on private sector accounting and national statistics standards, international organisations, scholars and national accounting standards bodies stressed limits and concerns on pension funding and pension recognition in public sector balance sheets. Eurostat itself, now in charge of the EPSAS project, has expressed reservations on pension liability recognition in national accounts.

The accounting debate is a critical issue that is still unsettled for Europe's pension management. Accounting choices will definitely have an impact on which trend may eventually prevail and on the overarching socio-economic organisation of pension management in Europe.

Our analysis shows that existing practices are inconsistent with the requirements and underlying view adopted by the IPSAS 25 for pension accounting. Therefore, the IPSAS reference constitutes a fundamentally normative choice which would impact on citizens, governments and market confidence. Concerning citizens, Frericks, Maier, and De Graaf (2009) argue that the move toward a neoliberal Europe "redefines social rights, and therefore transforms social identity and citizenship". Concerning governments, a shift concerning pensions' accounting from 'pay-as-they go' to pre-funded pensions schemes and the implementation of an accrual basis of accounting would result in adding large liabilities for public sector bodies on governmental balance sheets. Herman Van Rompuy, the current President of the European Council, argues that "in Europe, [...] discussions about fiscal policy largely revolve around two key indicators of fiscal sustainability, deficit and debt" (Van Rampuy, 2013). As a consequence, including pensions in governmental deficit and debt figures may significantly alter perception of Member States' fiscal sustainability, with potentially unexpected consequences (Biondi, 2016b; Biondi & Boisseau-Sierra, 2016). Concerning market confidence, this novel accounting representation may lead to reconsider well-established practices of market-based governmental debt funding and refinancing, although these practices do not currently base upon accruals-based measurement of net assets (Biondi, 2016a). Moreover, if public sector accounting standards put pressure over reporting entities to include future obligations into their balance sheet, these entities may be encouraged or constrained to increase their debt position and incur additional costs and risks to fund them, transforming their pension management into a speculative hedge fund strategy leveraged on public debt. Induced pension policy may then be led to reduce established levels of pension payments for incumbent and future beneficiaries.

From a theoretical perspective (Oulasvirta, 2008, 2014), the fundamental accounting choice is between the two most general families of accounting models (Biondi, 2012): the stock versus the flow basis of accounting, to represent and account for overarching managerial processes. A stock basis of accounting adopts an asset-liability accounting approach which gives priority to recognition and measurement of assets and liabilities as they stand at the reporting point in time. The actuarial representation adopted by the IPSAS Board is consistent with this balance sheet accounting approach. However, our alternative model for supplementary disclosure adopts a flow basis of accounting which fits with a revenue-expense accounting approach, giving priority to revenues, costs, contributions and expenditures.

Both practice and theory show that several viable alternative modes exist for pension management in Europe. Drawing upon this finding, pension regulation may develop and enforce a set of clear and consistent options which enable various existing modes to fulfil their specific prudential and accounting needs for accountability and responsibility for pension management over time. Accounting standard-setting should be especially concerned with relevant and material issues raised by applying an actuarial representation based on discounting to measurement of pension liability and dedicated assets portfolio. Such a measurement proves to be particularly difficult and subjective to be performed. Off-balance sheet disclosure may then provide a better solution.

Accordingly, in order to make various alternative and viable management modes comparable by users of financial reporting and disclosure, accounting standard-setting may focus on supplementary disclosure of raw data on flows and funds that characterise the ongoing processes of pension management over time. A supplementary table that standardises this basic information and schedule may be more useful, reliable and financially stabilizing than a hazardous recourse to an ever-changing actuarial evaluation to be included in financial statements. This financial accounting disclosure solution echoes the solution which was retained for the ESA 2010. The latter includes a supplementary table on alternative pension systems while excluding their impact on the core accounts of public sector systems in national statistics.

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Appendix

Box 1
Glossary from the European Commission Green Paper
– *Defined benefit (DB) schemes*. Pension schemes where the benefits accrued are linked to earnings and the employment career (the future pension benefit is pre-defined and promised to the member). It is normally the scheme sponsor who bears the investment risk and often also the longevity risk: if assumptions about rates of return or life expectancy are not met, the sponsor must increase its contributions to pay the promised pension. These tend to be occupational schemes.
– *Defined contribution (DC) schemes*. Pension schemes where the level of contributions, and not the final benefit, is pre-defined: no final pension promise is made. DC schemes can be public, occupational or personal: contributions can be made by the individual, the employer and/or the state, depending on scheme rules. The pension level will depend on the performance of the chosen investment strategy and the level of contributions. The individual member therefore bears the investment risk and often makes decisions about how to mitigate this risk.
– *Funded scheme*. A pension scheme whose benefit promises are backed by a fund of assets set aside and invested for the purpose of meeting the scheme's liability for benefit payments as they arise. Funded schemes can be either collective or individual.
– *Hybrid pension scheme*. In a hybrid scheme, elements of both defined contribution and defined benefits are present or, more generally, the risk is shared by the scheme's operator and beneficiaries.
– *Pay-As-You-Go (PAYG) schemes*. Pension schemes where current contributions finance current pension expenditure.

Source: European Commission (2010) and Barr (2009)

Box 2
Accounting for DC and DB plans according to IPSAS 25
IN6. Under defined contribution plans, an entity pays fixed contributions into a separate entity (a fund) and will have no legal or constructive obligation to pay further contributions if the fund does not hold sufficient assets to pay all employee benefits relating to employee service in the current and prior periods. The Standard requires an entity to recognize contributions to a defined contribution plan when an employee has rendered service in exchange for those contributions.
IN7. All other post-employment benefit plans are defined benefit plans. Defined benefit plans may be unfunded, or they may be wholly or partly funded. The Standard requires an entity to:

a. Account not only for its legal obligation, but also for any constructive obligation that arises from the entity's practices;

b. Determine the present value of defined benefit obligations and the fair value of any plan assets with sufficient regularity that the amounts recognized in the financial statements do not differ materially from the amounts that would be determined at the reporting date;

c. Use the Projected Unit Credit Method to measure its obligations and costs;

d. Attribute benefit to periods of service under the plan's benefit formula, unless an employee's service in later years will lead to a materially higher level of benefit than in earlier years;

e. Use unbiased and mutually compatible actuarial assumptions about demographic variables (such as employee turnover and mortality) and financial variables (such as future increases in salaries, changes in medical costs and relevant changes in state benefits). Financial assumptions should be based on market expectations, at the reporting date, for the period over which the obligations are to be settled;

f. Determine a rate to discount post-employment benefit obligations (both funded and unfunded) that reflects the time value of money. The currency and term of the financial instrument selected to reflect the time value of money shall be consistent with the currency and estimated term of the post-employment benefit obligations;

g. Deduct the fair value of any plan assets from the carrying amount of the obligation. Certain reimbursement rights that do not qualify as plan assets are treated in the same way as plan assets, except that they are presented as a separate asset, rather than as a deduction from the obligation;

h. Limit the carrying amount of an asset so that it does not exceed the net total of:

(i) Any unrecognized past service cost and actuarial losses; plus
(ii) The present value of any economic benefits available in the form of refunds from the plan or reductions in future contributions to the plan;

a. Recognize past service cost on a straight-line basis over the average period until the amended benefits become vested;

b. Recognize gains or losses on the curtailment or settlement of a defined benefit plan when the curtailment or settlement occurs. The gain or loss should comprise any resulting change in the present value of the defined benefit obligation and of the fair value of the plan assets and the unrecognized part of any related actuarial gains and losses and past service cost; and

c. Recognize a specified portion of the net cumulative actuarial gains and losses that exceed the greater of:

(i) 10 % of the present value of the defined benefit obligation (before deducting plan assets); and
(ii) 10 % of the fair value of any plan assets.

The portion of actuarial gains and losses to be recognized for each defined benefit plan is the excess that fell outside the 10 % corridor at the previous reporting date, divided by the expected average remaining working lives of the employees participating in that plan.The Standard also permits systematic methods of faster recognition, provided that the same basis is applied to both gains and losses and the basis is applied consistently from period to period. Such permitted methods include immediate recognition of all actuarial gains and losses in surplus or deficit. In addition, the Standard permits an entity to recognize all actuarial gains and losses in the period in which they occur outside surplus or deficit in the statement of changes in net assets/equity for the year in accordance with paragraph 118 (b) of IPSAS 1.Cf. also Oulasvirta (2008)

Notes

1 The complete quotation reads as follows: "Public sector accounting also demonstrates the primitive anarchy that results without the discipline and transparency that good financial reporting provides. While the IPSASB has created good standards for the public sector, based on IFRS, they are used only haphazardly. Around the world, governments give very incomplete information about the huge, unfunded social security liabilities they have incurred. Many executives in the private sector would end up in jail if they reported like Ministers of Finance, and rightly so".
2 In November 2002, the Public Sector Committee (PSC) issued a draft on Employee Benefits for PSC Review. Then, a revision of this draft was prepared by John Stanford for the IPSASB Paris meeting and discussed on the 25 May 2006. In October 2006, the IPSAS Board published the Exposure Draft (ED) 31 for Employee Benefits. Comments on ED 31 were requested by 28 February 2007. As at 28 May 2007, thirty comments had been received. Then, an analysis of these submissions on ED 31 "Employee Benefits" by John Stanford is available online, date 29 May 2007, and was presented in July 2007 in Montreal meeting of the IPSASB. The final standard ISPAS 25 was published in February 2008.
3 IAS 19 concerns pension accounting and more precisely the determination of the cost of retirement benefits in the financial statements of employers having plans. This standard should be distinguished from the IAS 26 dealing with accounting and reporting by retirement benefit plans themselves. The IASC published its first Exposure Draft E16 on "Accounting for Retirement Benefits in Financial Statements of Employers" in April 1980, further issued as standard in January 1983. Actuarial methods were suggested for pension obligations since then.
4 According to Epstein (2001), financialization refers to the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and international levels. Consequently, financial practices and mind-sets have acquired an increasingly pervasive role in economy and society, across countries and jurisdictions, in recent decades.
5 The G4+1 was a working coalition of accounting regulators from the Anglo-Saxon world active in the 90's.
6 In this context, Cramer and Neymart (1980) develop an actuarial accounting framework for pension plans as a separate accounting entity, drawing upon the American Employee Retirement Income Security Act of 1974.
7 The treatment of pension schemes in macroeconomic statistics is analysed by Pitzer (2002).
8 Van Schaik and Haakman (2013) explore the differences between ESA and IPSAS.
9 Eurostat is a directorate general of the European Commission. Therefore, the terms Eurostat and Commission are used as synonyms.
10 As for as examples are concerned, Sauviat (2014) notes that Chili pension fund's portfolio is composed of national public debt and Holzmann and Hinz (2005, p. 46) mentions the circularity of the American Federal pension and social security plan.
11 A figure from this report presents "the share of occupational and statutory funded pensions in total gross theoretical replacement rates in 2006 and 2046" that will be rising for many countries such as Italy, Poland Belgium, Germany and Denmark, showing that "funded pensions will provide for a larger share of retirement income in 2046 than in 2006" (European Commission, 2010, p. 36). In Germany, the 2001 pension reform added to the former exclusively 'pay-as-you-go' publicly-financed system a capital funded private pillar. This private pillar is designed as a politically regulated welfare private provision (Lamping & Rüb, 2004).
12 The European Parliament's report allegedly assumes that DC schemes are always funded and individually transferable, although a DC scheme does not necessarily imply that cash is immediately provided upfront to cover for the current value of future pension liabilities. See also Biondi and Sierra (2017).
13 The AEG was the result of an Electronic Discussion Group (EDG), including social security and unfunded employer pension schemes established by the IMF Statistics Department. The discussions in this EDG resulted in a report that was presented in the February 2004 meeting of the Advisory Expert Group (AEG) on National Accounts.
14 Reimund Mink (2008), senior advisor at European Central Bank, summarises the main standards of the existing national accounts systems in a paper titled "General government pension obligations in Europe".
15 Lequiller (2004) personally supported Eurostat's Communication to the AEG.
16 Here and elsewhere, we may replace the usual expression 'pay-as-you-go' with 'pay-as-they-go', to highlight the collective dimension of this system, where current contributors pay for other people's pension period after period.
17 Bohn (2011) reflects on the ambiguous meaning of full funding, stating that there are several conceptually different ways to its interpretation.
18 Thousands of contributors claimed in court for compensation for their damages and were partially satisfied (Pouzin, 2014). Some lawsuits remain unsettled (Prache, 2008), while the new fund COREM has been reducing past pension promises as a consequence of the financial distress of 2002.
19 Biondi (2011) provides further theoretical analysis of discounting in capital budgeting.
20 The complete quotation reads as follows: "European welfare reforms transfer many services, needs, and responsibilities to the market [which corresponds to a neoliberal tendency]. However, there is also a contrasting and striking development toward solidarity, based on extensive regulatory policies [which corresponds to a neostatist tendency]. (...) On one hand, pension investments are more individualized, partly transferred to capital-funded investment funds, with the emphasis on self-responsible planning; on the other hand, possibilities to invest are more highly regulated."

References

Aaron, H., Barr, N., Bosworth, B., Disney, R., Holzmann, R., Gramlich, E., ... Petrie, M. (2003). Comments on "Recognition of Government Pension Obligations" from Brian Donaghue. Note presented by the group:"External Fiscal Experts of the Panel of the Fiscal Affairs Department", International Monetary Fund. American Academy of Acturaries. (2007). *Comments on IPSASB Exposure Draft 31 "Employee Benefits"*. Tech. rep., Americain Academy of Actuaries.

American Academy of Acturaries. (2007). *Comments on IPSASB Exposure Draft 31 "Employee Benefits"*. Tech. rep., Americain Academy of Actuaries.

APB. (1966). *Opinions of the accounting principles board. Accounting for the cost of pension plans. APB Opinion 08*. Tech. rep., American Institute of Certified Public Accountants.

Arnold, P., & Oakes, L. (1998). Accounting as discursive construction: The relationship between statement of financial accounting standards no. 106 and the dismantling of retiree health benefits. *Accounting, Organizations and Society*, *23*(2), 129–153.
Atanasova, C., & Hrazdil, K. (2010). Why do healthy firms freeze their defined-benefit pension plans?. *Global Finance Journal*, *21*(3), 293–303.
Augusztinovics, M. (2002). Issues in pension system design. *International Social Security Review*, *55*(1), 21–35.
Bader, L. N., & Gold, J. (2003). Reinventing pension actuarial science. *Pension Forum*, *15*, 1–13.
Baker, C., & Stephan Hayes, R. (1995). The negative effect of an accounting standard on employee welfare: The case of McDonnell Douglas Corporation and FASB 106. *Accounting, Auditing & Accountability Journal*, *8*(3), 12–33.
Baker, C. R., Biondi, Y., & Zhang, Q. (2010). Disharmony in international accounting standards setting: The Chinese approach to accounting for business combinations. *Critical Perspectives on Accounting*, *21*(2), 107–117.
Barr, N. (2002). Reforming pensions: Myths, truths, and policy choices. *International Social Security Review*, *55*(2), 3–36.
Barr, N. (2009). International trends in pension provision. *Accounting and Business Research*, *39*(3), 211–225.
Biondi, Y. (2010). *Money without value, accounting without measure: How economic theory can better fit the economic and monetary system we live in? In Money and calculation: Economic and sociological perspectives*. London: Palgrave.
Biondi, Y. (2011). Cost of capital, discounting and relational contracting: Endogenous optimal return and duration for joint investment projects. *Applied Economics*, *43*(30), 4847–4864.
Biondi, Y. (2012). Should business and non-business accounting be different? A comparative perspective applied to the French central government accounting standards. *International Journal of Public Administration*, *35*(9), 603–619.
Biondi, Y. (2014a). Better accounting for corporate shareholding and environmental protection. *European Company Law*, *11*(2), 1–5.
Biondi, Y. (2014b). Harmonising European public sector accounting standards (EPSAS): Issues and perspectives for Europe's economy and society. *Accounting, Economics and Law*, *4*(3), 165–178.
Biondi, Y. (2016a). The HM'Treasure's Island': The Application of Accruals-based Accounting Standards in the UK Government. *Accounting in Europe*, *13*, 81–102.
Bundesrechnungshof. (2014). *Report on the proposed implementation of harmonised European public sector accounting standards (EPSAS) in the Member States of the European Union pursuant to*. Tech. rep.
Biondi, Y. (2016b). Debt capacity and financial sustainability in central government. In A. Farazmand (Ed.), *Global encyclopedia of public administration, public policy, and governance* (1–6). New York: Springer 16.
Biondi, Y., Bloomfield, R. J., Glover, J., Jamal, K., Ohlson, J., Penman, S., … Wilks, T. (2011). A perspective on the joint IASB/FASB exposure draft on accounting for leases: American accounting association's financial accounting standards committee (AAA FASC). *Accounting Horizons*, *25*(4), 861–871.
Biondi, Y., & Boisseau-Sierra, M. (2016). Financial sustainability and public debt management in central government. In M. P. R. Bolívar (Ed.), *Financial sustainability in public administrations*. Basingstoke: Palgrave Macmillan Pub.
Biondi, Y., & Boisseau-Sierra, M. (2017). Accounting for employee benefits. In A. Farazmand (Ed. by), *Global encyclopedia of public administration, public policy, and governance* (1–10.). New York: Springer.
Biondi, Y., & Sierra, M. (2017). Pension management between financialisation and intergenerational solidarity: A socio-economic analysis and a comprehensive model. *Socio-Economic Review*, *0*(0), 1–32.
Blake, D., Khoranasee, Z., Pickles, J., & Tyrrall, D. (2008). *An unreal number: how company pension accounting fosters an illusion of certainty*. London: The Institute of Chartered Accountants in England and Wales.
Bohn, H. (2011). Should public retirement plans be fully funded? *Journal of Pension Economics and Finance*, *10*(02), 195–219.
Bolívar, M. P. R., Pérez, M. D. C. C., & López-Hernández, A. M. (2015). Online budget transparency in OECD member countries and administrative culture. *Administration & Society*, *47*(8), 943–982
Broadbent, J., Palumbo, M., & Woodman, E. (2006). The shift from defined benefit to defined contribution pension plans–implications for asset allocation and risk management. *Reserve Bank of Australia, Board of Governors of the Federal Reserve System and Bank of Canada*, 1–54.
Brusca, I., Caperchione, E., Cohen, S., & Manes-Rossi, F. (2015). *Public sector accounting and auditing in Europe. The challenge of harmonization*. Palgrave Macmillan.
Carruthers, B. G. (2015). Financialization and the institutional foundations of the new capitalism. *Socio-Economic Review*, *13*(2), 379–398.
Chan, J. (2008). International public sector accounting standards: Conceptual and institutional issues. In M. D'Amore (Ed.), *The harmonization of government accounting and the role of IPSAS*19–33). Milan: McGraw-Hill.
Chitty, D. (2002). FRS 17 – Is it the end?. *Accountancy*, *130*(9), 79.
Coeuré, B. (2007). Normes comptables et gestion de la dette publique. *Revue D'économie Financière*, *89*(3), 101–110.
Council Directive. (1980). Council Directive 80/987/EEC of 20 October 1980 on the approximation of the laws of the Member States relating to the protection of employees in the event of the insolvency of their employer.
Cramer, J. J., & Neymart, C. A. (1980). A conceptual framework for accounting and reporting by pension plans. *Abacus*, *16*(1), 3–16.
Cui, J., Jong, F. D., & Ponds, E. (2011). Intergenerational risk sharing within funded pension schemes. *Journal of Pension Economics and Finance*, *10*(01), 1–29.
Dabbicco, G. (2015). The impact of accrual-based public accounting harmonization on EU macroeconomic surveillance and governments' policy decision-making. *International Journal of Public Administration*, *38*(4), 253–267.
De Rougemont, P. (2003). Les activités du groupe de discussion électronique sur le traitement des régimes de pension dans les statistiques macro-économiques. *Direction Des Statistiques De L'ocde, Septembre*.
Dietz, P. (1968). Investment goals: A key to measuring performance of pension funds. *Financial Analysts Journal*, *24*(2), 133–137.
Dixon, A. D., & Monk, A. H. (2009). The power of finance: Accounting harmonization's effect on pension provision. *Journal of Economic Geography*, *9*(5), 619–639.
Donaghue, B. (2003). *Recognition of government pension obligations*. Tech. rep., International Monetary Fund. Retrieved from http://www.imf.org/external/np/sta/ueps/index.htm
Engelen, E. (2003). The logic of funding European pension restructuring and the dangers of financialisation. *Environment and Planning A*, *35*(8), 1357–1372.

Epstein, G. (2001). Financialization, rentier interests, and central bank policy. *Manuscript, Department of Economics, University of Massachusetts, Amherst, MA, December*.
European Commission. (1997). Supplementary pensions in the single market: A green paper. *Com*, *97*, 283.
European Commission. (2010). *Green Paper: towards adequate, sustainable and safe European pension systems. SEC (2010)830. COM (2010)365 final*. Tech. rep., European Commission.
European Commission. (2011). *Pension systems in the EU – contingent liabilities and assets in the public and private sector*. Tech. rep.
European Commission. (2013a). *Report from the commission to the council and the European Parliament. Towards implementing harmonised public sector accounting standards in member states. The suitability of IPSAS for member states*. Tech. rep.
European Commission. (2013b). *Commission Staff working document accompanying the document Towards implementing harmonised public sector accounting standards in Member States*. Tech. rep.
European Parliament & Council. (2003). Directive 2003/41/EC of the European Parliament and of the Council of 3 June 2003 on the activities and supervision of institutions for occupational retirement provision. *Official Journal*, *235*, 17–18.
European Parliament. (2011). Pension systems in the EU – contingent liabilities and assets in the public and private sector. Economic and Monetary Affairs. Retrieved from http://www.europarl.europa.eu/document/activities/-cont/201111/20111121ATT32055/20111121ATT32055EN.pdf
European Parliament. (2015a). The European union's role in international economic fora Paper 9: The IOPS. Draft directorate general for internal policies. Policy Department A: Economic and Scientific Policy. Retrieved from http://www.europarl.europa.eu/RegData/etudes/STUD/2015/542198/IPOL_STU(2015)542198_EN.pdf
European Parliament. (2015b). European union pension systems adequate and sustainable? Briefing. Retrieved from http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/571327/EPRS_BRI(2015)571327_EN.pdf
European Parliament. (2017). Briefing EU Legislation in progress occupational pensions. Revision of the institutions for occupational retirement provision directive (IORP II). Retrieved from http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/595899/EPRS_BRI(2017)595899_EN.pdf
Eurostat. (2004). *Pensions: Eurostat communication to the advisory expert group. Contribution to the electronic discussion group on pensions*. Tech. rep. Retrieved from http://www.imf.org/external/np/sta/ueps/2004/120304.pdf
Eurostat. (2008). *Final Report of the Eurostat/ECB Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government to the Committee on* Monetary, Financial and Balance of Payments Statistics *(CMFB)*. Tech. rep.
Eurostat. (2013). *European System of Accounts 2010*. Tech. rep., Eurostat.
Exley, C., Mehta, S. J., & Smith, A. (1997). The financial theory of defined benefit pension schemes. *British Actuarial Journal*, *3*(04), 835–966.
FASB. (1985). *Statement of Financial Accounting Standards No. 87. Employers' Accounting for Pensions*. Tech. rep.
Feldstein, M. (1997). Transition to a fully funded pension system: Five economic issues. NBER Working Paper No. 6149, Cambridge (MA), August
Frericks, P., Maier, R., & De Graaf, W. (2009). Toward a neoliberal Europe? Pension reforms and transformed citizenship. *Administration & Society*, *41*(2), 135–157.
Gallery, G., & Gallery, N. (2004). Applying conceptual framework principles to superannuation1 fund accounting. *Abacus*, *40*(1), 117–131.
Gallery, G., & Gallery, N. (2005). Paradox of choice in a mandatory pension savings system: Challenges for Australian retirement income policy. *Policy & Politics*, *33*(3), 519–532.
German Bundestag. (2015). *Resolution with respect to the Report from the Commission to the Council and the European Parliament "Towards implementing harmonised public sector accounting in Member States The suitability of IPSAS for the Member States"*. Tech. rep.
Glaum, M. (2009). Pension accounting and research: A review. *Accounting and Business Research*, *39*(3), 273–311.
Gordon, I., & Gallery, N. (2012). Assessing financial reporting comparability across institutional settings: The case of pension accounting. *The British Accounting Review*, *44*(1), 11–20.
Governmental Accounting Standards Board. (2006). *Why governmental accounting and financial reporting is – and should be – different?* White Paper.
Holzmann, R., & Hinz, R. (2005). Old-age income support in the twenty-first century. *Financial Crises: Lessons from the Past, Preparation for the Future*, *257*, 1–257
Holzmann, R., Palacios, R., & Zviniene, A. (2004). *Implicit pension debt: Issues, measurement and scope in international perspective* (Vol. 403). Social Protection, Labor Markets, Pensions, Social Assistance, World Bank.
Hoogervorst, H. (2012). Speech by Hans Hoogervorst, Amsterdam, June 2012: 'The imprecise world of accounting'. Given International Association for Accounting Education & Research (IAAER) conference in Amsterdam.
Hu, J. (2014). An empirical approach on regulating China's pension investment. *European Journal of Law and Economics*, *37*(3), 495–516.
IAS19. (2011). *International Accounting Standarts 19, Employee Benefits*. Tech. rep., International Federation of Accountants (IFAC).
IFAC. (2015). *News report on better public sector financial reporting. Greater citizen engagement. Accountability. Now. Coalition meets for first time to drive campaign*. Tech. rep.
IMF. (2001). *Government finance statistics manual 2001*. Tech. rep.
IPSASB. (2008). *International public sector accounting standard 25 – Employee benefits*. Tech. rep.
IPSASB. (2015). *Video: Overview of the conceptual framework for general purpose financial reporting by public sector entities*. Tech. rep. Retrieved from http://www.ifac.org/publications-resources/overview-conceptual-framework-general-purpose-financial-reporting-public-se-0.
Jones, D. A. (2013). Changes in the funded status of retirement plans after the adoption of SFAS No. 158: Economic improvement or balance sheet management?. *Contemporary Accounting Research*, *30*(3), 1099–1132.
Josiah, J., Gough, O., Haslam, J., & Shah, N. (2014). Corporate reporting implication in migrating from defined benefit to defined contribution pension schemes: A focus on the UK. *Accounting Forum*, *38*, 18–37.
Keating, C., Settergren, O., & Slater, A. (2013). *A financial analyst's view of the cost and valuation of defined benefit pension provision*. Tech. rep., The European Federation of Financial Analysts Societies (EFFAS).

Kido, N., Petacchi, R., & Weber, J. (2012). The influence of elections on the accounting choices of governmental entities. *Journal of Accounting Research*, *50*(2), 443–476.
Kiosse, P. V., & Peasnell, K. (2009). Have changes in pension accounting changed pension provision? A review of the evidence. *Accounting and Business Research*, *39*(3), 255–267.
Klumpes, P. (2001). Implications of four theoretical perspectives for pension accounting research. *Journal of Accounting Literature*, *20*, 30–61.
Klumpes, P. J. (1994). The politics of rule development: A case study of Australian pension fund accounting rule-making. *Abacus*, *30*(2), 140–159.
Lamping, W., & Rüb, F. W. (2004). From the conservative welfare state to an 'uncertain something else': German pension politics in comparative perspective. *Policy & Politics*, *32*(2), 169–191.
Le Lann, Y. (2010). La retraite, un patrimoine?. *Genèses*, *80*(3), 70–89.
Lequiller, F. (2004). *Comments on the paper "Pensions : Eurostat communication to the AEC"*. Tech. rep.
Lequiller, F. (2014). *Towards convergence between Government Finance Statistics and public sector accounting standards*. Tech. rep., Eurostat conference – The accounts of society.
McKinnon, R., & Charlton, R. (2000). Reaffirming public-private partnerships in retirement pension provision. *International Journal of Public Sector Management*, *13*(2), 153–168.
Mink, R. (2008). General government pension obligations in Europe. *Irving Fisher Committee Bulletin*, *28*(1), 199–209.
Mortimer, J., & Henderson, L. (2014). Measuring pension liabilities under GASB Statement No. 68. *Accounting Horizons*, *28*(3), 421–454.
Munnell, A. (2006). Employer-sponsored plans: The shift from defined benefit to defined. *The Oxford Handbook of Pensions and Retirement Income*, 359.
Munnell, A., Kopcke, R., Aubry, J., & Quinby, L. (2010). Valuing liabilities in state and local plans. *State and Local Plans Issue in Brief*, *11*, 1–12.
Napier, C. (2007). Pension accounting and fair value. Dans P. Walton (Éd.). The Routledge Companion to Fair Value and Financial Reporting.
Napier, C. (2009). The logic of pension accounting. *Accounting and Business Research*, *39*(3), 231–249.
Orenstein, M. (2011). Pension privatization in crisis: Death or rebirth of a global policy trend?. *International Social Security Review*, *64*(3), 65–80.
Oulasvirta, L. (2008). How should pension benefit liabilities and social policy cash transfer liabilities be presented in the government financial statements: Current presentation mode or the mode of international IPSAS standards?. *The Finnish Journal of Business Economics*, *2*, 223–237.
Oulasvirta, L. (2014). Governmental financial accounting and european harmonisation: Case study of Finland. *Accounting, Economics and Law*, *4*(3), 237–263.
Palmer, E. (2002). *Swedish pension reform: How did it evolve, and what does it mean for the future? Dans social security pension reform in Europe*171–210). University of Chicago Press.
Pinheiro, V. (2004). *Pension funds for government workers in OECD countries*. Tech. rep., mimeo, OECD.
Pitzer, J. (2002). The treatment of pension schemes in macroeconomic statistics. *Statistics department discussion paper*. Washington: International Monetary Fund.
Ponds, E., Severinson, C., & Yermo, J. (2011). *Funding in public sector pension plans-international evidence*. Tech. rep., National Bureau of Economic Research.
Pouzin, G. (2014). L'UMR ampute les rentes des retraités du Corem ! *Déontofi.com*.
Prache, G. (2008). *Les scandales de l'épargne retraite : Des millions d'épargnants abusés*. Broché.
PriceWaterhouseCoopers. (2014). *Collection of information related to the potential impact, including costs, of implementing accrual accounting in the public sector and technical analysis of the suitability of individual IPSAS standards*. Tech. rep.
Quebec Ministry of Finance. (2007). *Comments on IPSASB Exposure Draft 31 "Employee Benefits"*. Tech. rep., Quebec Ministry of Finance, Quebec Min.Swedish Financial Management Authority. (2007). *Comments on IPSASB Exposure Draft 31 "Employee Benefits"*. Tech. rep. Swedish National Financial Management Authority.
Reiter, S., & Omer, T. (1992). A critical perspective on pension accounting, pension research and pension terminations. *Critical Perspectives on Accounting*, *3*(1), 61–85.
Ring, P. J. (2005). Trust in UK pensions policy: A different approach?. *Policy & Politics*, *33*(1), 55–74.
Rizzo, I. (1990). *The" hidden" debt (Vol. Financial and monetary policy studies 19)*. (Financial, & m. p. 19, Éds.) Dordrecht: Kluwer Academic Publishers.
Ryan, B., Scapens, R. W., & Theobald, M. (2002). *Research method and methodology in finance and accounting*.
Sauders, P. (2006). Reviewing the role and structure of pensions in national context. *Policy & Politics*, *34*(4), 673–690.
Sauviat, C. (2014). Maria Chaves Jardim, Syndicats et fonds de pension durant le gouvernement Lula. *Travail Et Emploi*, *140*(4), 72–74.
Skinner, R. (1987). *Accounting standards in evolution: Holt, Rinehart and Winston of Canada*.
Slater, A., & Copeland, L. (2005). *The Failings of FRS 17 and the Impact of Pensions on the UK Stock Market*. Tech. rep., SEI Investments (Europe) Limited in Conjunction with Cardiff Business School.
Street, D., & Shaughnessy, K. (1998). The quest for international accounting harmonization: A review of the standard setting agendas of the IASC, US, UK, Canada, and Australia, 1973–1997. *The International Journal of Accounting*, *33*(2), 179–209.
Swedish Financial Management Authority. (2007). *Comments on IPSASB Exposure Draft 31 "Employee Benefits"*. Tech. rep. Swedish National Financial Management Authority.
The State of Geneva. (2007). *Comments on IPSASB Exposure Draft 31 "Employee Benefits"*. Tech. rep. Author
Thomas, P., & Williams, P. (2009). Cash balance pension plans: A case of standard-setting inadequacy. *Critical Perspectives on Accounting*, *20*(2), 228–254.
Van Der Zwan, N. (2014). Making sense of financialization. *Socio-Economic Review*, *12*(1), 99–129.
Van Rampuy, H. (2013). *Strengthening public sector accounting for sound fiscal policies in Europe. Keynote speech by Herman Van Rompuy at the Conference "Towards implementing European Public Sector Accounting Standards"*. Tech. rep.
Van Schaik, F., & Haakman, L. (2013). *ESA and IPSAS: Harmonization of Government Financial Reporting*. Tech. rep.

Waring, B. (2009). A pension rosetta stone: Reconciling actuarial science and pension accounting with economic values. *Prepared for the Public Pension Finance Symposium, hosted by the Society of Actuaries*.
World Bank. (1994). *Averting the old age crisis: Policies to protect the old and promote growth*. Tech. rep. London: Oxford University Press.