



Actuarial Liabilities and their impact on the Balance Sheet of the Federal Government

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ABSTRACT

The continuous growth of the social security expenditure has been worrying the Federal Government, especially because of the spending cap established by the New Tax Regime. In this context, the definition of the social security liabilities of the special social security scheme (*Regime Próprio de Previdência Social - RPPS*), with respect to the federal public servants, becomes essential for taking necessary measures for the long-term solvency of this scheme. Bearing in mind that the result of the actuarial evaluations of this RPPS has given support to the registration of the mathematical social security provision (*Provisão Matemática Previdenciária - PMP*) in the Federal Government's General Balance Sheet, this study intends to analyze the elements that compose the social security liabilities, and the accounting aspects that have underpinned the registration of this provision. The results found allowed to verify the obstacles faced, specifically in relation to the database, to perform the actuarial evaluation of the RPPS. Thus, this paper proposes two alternatives for the improvement of accounting data: a reclassification of part of the PMP in the contingent liabilities or a change in the actuarial costing method to allow future benefits to be fairly accounted for.

Keywords: RPPS, BGU, PMP, actuarial, accounting.



INTRODUCTION

Brazil's economic and fiscal situation in recent years has led to a stricter control of the Federal Government expenditure, mainly due to the limit imposed on the primary expenditure by the New Tax Regime established by the Constitutional Amendment no. 95/2016. In this context, according to Santos (2014), the cost of the social security has caused a great concern to government authorities at all levels in Brazil.

Annually, in compliance with the Fiscal Responsibility Law (LRF), the Federal Government prepares the actuarial evaluation of the special social security scheme (RPPS) of the Union. The Social Security Secretariat, linked to the Ministry of Finance, prepares said evaluation and its result guides the registration of mathematical social security provision (PMP), which is reflected in the General Balance Sheet (*Balanço Geral da União* - BGU) of the Federal Government.

Thus, within the scope of the Union, the definition of the social security cost of public servants is essential for assessing the long-term sustainability of the scheme and taking actions to secure the feasibility of the benefits of current and future insureds. The role of the actuarial evaluation and of fair accounting disclosure are relevant and deserve attention, especially in light of the ongoing discussions about social security accounting and its impact on the public accounts. Therefore, this study intends to analyze the actuarial and accounting aspects that have supported the calculation of the social security cost of the RPPS, over a period of 10 years (2006 to 2015), and guided the disclosure of the PMP in the BGU as of 2014, arising from the result of the actuarial evaluation of the Union's RPPS.

FINANCIAL AND ACTUARIAL EVALUATION OF THE SOCIAL SECURITY REGIMES

The Federal Constitution of 1988 implemented a major change in Brazilian social security. According to Santos (2014), the reform resulting from the new constitutional text established, among other aspects, the observance of the financial and actuarial balance, aiming at the regularity of the social security regimes.

In this respect, Supplementary Law No. 101, of May 4, 2000 (LRF), in its article 4, paragraph 2, IV, (a), determines that the Budgetary Guidelines Bill (PLDO) must contain an annex referring to the evaluation of the financial and actuarial situation of the social security regimes.

Plamondon et al. (2011, p. 45) say that “the actuarial report presents the feasibility of the plan under different economic and demographic scenarios, providing the funders of the system with an evaluation of the risks they face in relation to the sufficiency of the contribution indices.”

Nogueira (2011, p. 217), in turn, emphasizes that achieving the financial and actuarial balance in regimes organized before 1998, which already found themselves in a situation of chronic structural imbalance, is a very complex task that implies in the deconstruction of “models and structures erroneously consolidated for years or decades.”



SOCIAL SECURITY COST

Nóbrega (2006, page 71), establishes that social security cost is directly related to the number of benefits offered, corresponding “to the present (actuarial) value of future benefits of the mass of insureds at a given point in time,” noting that to this value it should be added the administrative expenses of the social security regime.

Nogueira (2011, p.191), in turn, defines social security cost as “the total amount of future commitments of the benefit scheme to honor the social security entitlements of its insureds.” To ascertain this cost, the following items are considered:

- a) regulatory basis of the benefits: it consists, as a rule, of the list of the benefits, the granting rules, the calculation methodology, etc.;
- b) registration database: of utmost importance for one to quantify the future RPPS benefits, it encompasses the individual characteristics of the insureds; and
- c) actuarial database, or actuarial assumptions: they determine significant effects on the calculation of the social security cost of RPPS (Nogueira, 2011).

Gushiken et al. (2002) say that the design of the RPPS is the major defining factor of the social security cost, while the trustworthiness of the calculation of this cost basically depends on the database accuracy. All in all, the actuarial assumptions are mere attempts to approach the reality, and need ongoing revaluation.

FUNDING REGIMES AND E METHODS

Once the social security cost is ascertained, it remains to be determined how it will be funded in the long term. Article 4 of MPS Ordinance no. 403, dated December 10, 2008, provides that the RPPS may use the capitalization, pay as you go, and terminal funding regimes.

According to Pinheiro (2005), the pay as you go regime does not establish any funds and is based on the budgetary balance for the period, in which the contributions are equivalent to the benefits, as shown in equations 1 and 2:

$$\int_{\alpha}^{\beta} N(x,t) \text{contribuição}(t)w(t)dx = \int_{\beta}^{\infty} N(x,t) \text{benefício}(t)w(t)dx \quad (1)$$

$$\frac{\text{contribuição}(t)}{\text{benefício}(t)} = \frac{\int_{\beta}^{\infty} N(x,t)dx}{\int_{\alpha}^{\beta} N(x,t)dx} \quad (2)$$

Where:

- $N(x,t)$ is the x years old population in the period t
- $\text{contribuição}(t)$ is the contribution in the period t
- $\text{benefício}(t)$ is the benefit rate in the period t
- $w(t)$ is the wage in the period t



- β is the age of retirement
- α is the age of entry into the labor market
- ω is the survival age limit

The capitalization regime, in turn, accumulates funds and is based on budgetary balances of cohorts, in which the amount of the benefits in the receipt period equals the total amount accumulated in the fund (Pinheiro, 2005), observing the equations 3 and 4:

$$\text{contribuição}(w)e^{j\beta} \int_{\alpha}^{\beta} p(x)e^{-jx} + js(x)dx = \text{benefício}(w)e^{j\beta} \int_{\beta}^{\omega} p(x)e^{-jx} + js(x)dx \quad (3)$$

$$\text{contribuição}(w) = \frac{\int_{\beta}^{\omega} p(x)e^{-jx}}{\int_{\alpha}^{\beta} p(x)e^{-jx}} \text{benefício}(w) \quad (4)$$

Where:

- $p(x)$ is the probability of survival from birth to age x
- $\text{contribution}(w)$ is the contribution
- $\text{benefit}(w)$ is the benefit rate
- w is the wage
- j is the real interest rate
- β is the age of retirement
- α is the age of entry into the labor market
- ω is the survival age limit
- $s(x)$ is the amount accumulated by a cohort up to the age x under a capitalization regime

Pugh (2006) notes that, among the possible actuarial funding methods, two categories stand out:

- accumulated benefits funding methods - they relate to services or years of contribution already incurred, until the actuarial evaluation date, and are focused on keeping a certain funding level. Safety-oriented, such methods cope with establishing and keeping a solid relationship between the assets of the fund and its accrued liabilities. The most important methods are the current unit credit and the projected unit credit; and
- prospective benefit funding methods - they relate to projected future services, and are focused on defining a certain level of contributions. Contribution-oriented, they have as their main goal the stability of such contributions. The most important methods are age of entry, age reached, and aggregate.



In Brazil, with respect to the RPPS, paragraph 4 of article 4, of MPS Ordinance no. 403/2008, provides that the funding method for actuarial evaluations will be the projected unit credit.

FUNDAMENTAL ACCOUNTING ASPECTS

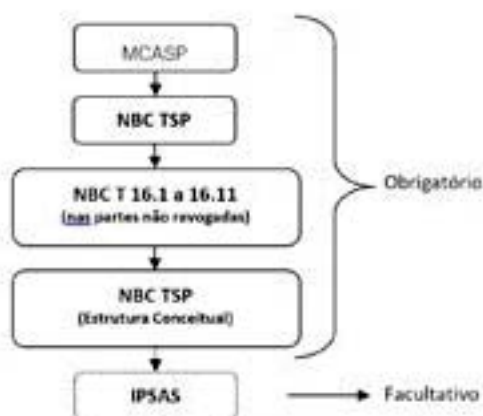
It is currently in force the 7th edition of the accounting manual applied to the public sector (MCASP), whose observance by federal entities is mandatory. The item 10.2.1 of MCASP provides that the provisions should be recognized if the following occurs concurrently:

- a) there is a present obligation resulting from past events that are independent of the entity's future actions;
- b) an outflow of funds that incorporate economic benefits or potential services for extinguishing the obligation is likely; and
- c) it is possible to reliably estimate the amount of the obligation.

Item 10.3 of MCASP provides that contingent liabilities should not be recognized on equity basis because they depend on the occurrence of events for the obligation to arise. They should be registered in control accounts and disclosed in explanatory notes.

Regarding the PMP, item 10.5.4 of MCASP stresses that the International Public Sector Accounting Standard (IPSAS) no. 39 (Employee Benefits) highlights the need to recognize the actuarial liabilities and to disclose them in the Balance Sheet.

However, it should be noted that the mentioned standard is still undergoing a convergence process. According to a joint work schedule of the National Treasury Secretariat (STN) and



Federal Accounting Board (CFC), this process is expected to be completed in 2018. Thus, the compliance with IPSAS 39 is optional and residual, as shown in Figure 1 .

Figure 1 - Regulatory Accounting Filter

Source: Prepared by the authors based on MCASP.



SOCIAL SECURITY ACCOUNTING

According to Lima and Guimarães (2009, p. 23), the social security accounting aims at

evidencing the economic and financial ability of the public entity to ensure an individual no longer capable of working the funds needed for the survival of the individual and the individual's dependents, in the proportion of the benefits determined by the legislation, from a sustainability perspective.

Therefore, especially for defined-benefit pension plans, there is a complex accounting, and there are numerous non-consensual issues in the literature. Additionally, it involves the estimation of values, based on actuarial assumptions, for the recognition of the respective liabilities, of the total costs to be distributed in the periods they are actually incurred, and of any existing assets (Glaum, 2009).

In Brazil, MPS Ordinance no. 509, dated December 12, 2013, provides that the accounting procedures applied to RPPS must comply with the provisions in MCASP. Item 10.5.4 of MCASP provides that “the social security mathematical provision, also known as an actuarial obligation, represents the present value of the total funds necessary to pay the commitments under the benefit plans, calculated on actuarial basis, on a given date” (MCASP, 226).

ANALYSIS OF THE ACTUARIAL EVALUATION OF THE RPPS

REGISTRATION DATABASE

Preliminarily, it should be highlighted that

the social security mathematical provisions present the sum of mathematical reserves of the RPPS, of the benefits granted and to be granted, meaning the net commitments under the benefit plan with a 150-year projection, which consider the servant replacement expectation. (General Balance Sheet of the Union, 2014, p. 598)

Chart 1 shows the Actuarial Present Value (APV) of the benefits granted, benefits to be granted, contributions and, consequently, the actuarial deficit for 2008-2017, according to data of the annex to PLDO for the respective year.

After reviewing it, it is possible to verify a substantial change in the behavior of the APV - from 2012 to 2013 - of the benefits to be granted and of the contributions, affecting the actuarial deficit trajectory, and a change of trend from 2014 to 2015. On the other hand, we verified a balanced behavior in the APV of the benefits granted. It is important to stress that the APV of the contributions is directly related to the mass of sponsors and to the rates charged, while the APV of the benefits to be granted is related to the total number of active servants.

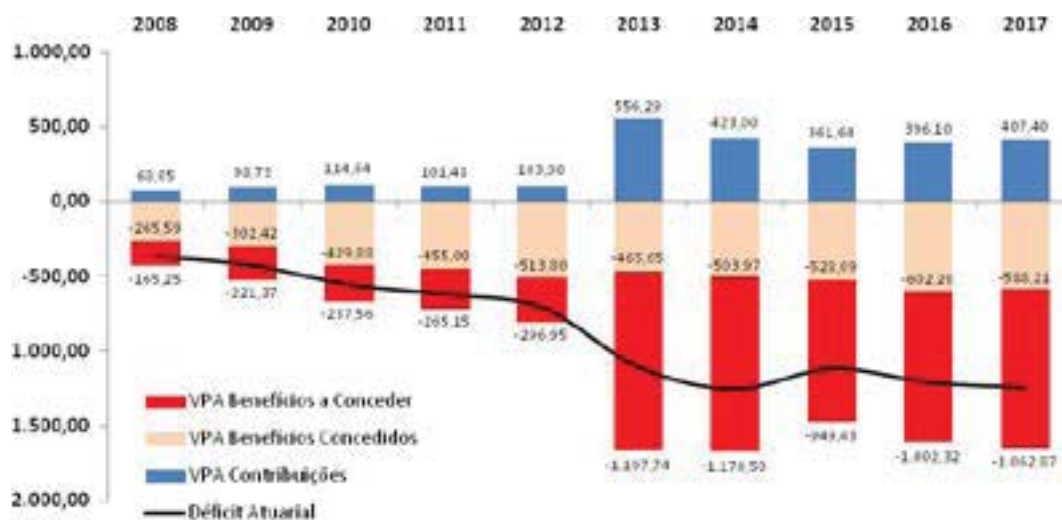


Chart 1 – Actuarial evaluation of the RPPS (Billions of BRL) – 2008 to 2017

Source: PLDO from 2008 to 2017.

Considering the stability of the APV of the benefits granted and the strong variation in the APV of benefits to be granted and of contributions, it is possible to verify the following hypothesis:

“H0 - There was an increase in the database of the active public servants in the PLDO of 2013.”

Table 1 - Number of federal servants (millions)

Source of data	Database year									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
	Year of the Budgetary Guidelines Bill									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
PLDO (1)	1.20	1.28	1.30	1.30	1.30	1.40	1.40	1.16	1.17	1.22
BEPS (2)	1.34	1.34	1.36	1.40	1.44	1.45	1.45	1.47	1.52	1.54
(1)/(2)%	89.40	95.39	96.28	93.21	90.87	96.61	96.19	78.44	77.17	79.65

Source: PLDO from 2008 to 2017 and BEPS 249.

Table 1 shows the number of servants disclosed in the PLDO from 2008 to 2017, compared to the figures disclosed in the Personnel and Organizational Information Statistical Bulletin (BEPS) no. 249, prepared by the Ministry of Planning, Development and Management. It is possible to verify that:



a) the PLDO database, from 2006 to 2012, corresponded, on average, to 94% of the BEPS data. However, it should be highlighted the decrease of this ratio in the period from 2013 to 2015;

b) to prepare the 2011 and 2012 PLDO, the MPS used the same database of 2008, alleging that this occurred due to the quality of the information received. This helps to explain the reduction of the relation between the data of the PLDO with the data of the BEPS, in the 2009 (93.21%) and 2010 (90.87%) databases, compared to 2008 (96.28%); and

c) comparing the database of 2011 to 2010, there is an increase, which may indicate the accuracy of the database used.

Thus, considering that the database of 2011 was used for the preparation of the PLDO of 2013, it is possible to conclude that the hypothesis is true (there was an increase in the database of the active public servants in the PLDO of 2013). Such a statement is also confirmed based on the data included in Table 2.

Table 2 - Comparative database (2010 - 2011)

Category	Database					
	2010			2011		
	PLDO (1)	BEPS (2)	(1)/(2)%	PLDO (1)	BEPS (2)	(1)/(2)%
Active	581,836	771,570	75.41	741,328	782,591	94.73
Retired	391,037	404,858	96.59	395,462	407,997	96.93
Pensioners	331,866	259,395	127.94	266,276	261,672	101.76
TOTAL	1,304,739	1,435,823	90.87	1,403,066	1,452,260	96.61

Source: PLDO of 2012 and 2013.

An increase of 159,492 active servants is verified in the database of 2011. Although untimely, this refinement helped to improve the estimate of the social security cost. However, two other facts stand out: the reduction of 65,590 pensioners in the database of 2011, and a relation of data of the PLDO exceeding 100% of the BEPS (127.94% in 2010 and 101.76 in 2011).



Table 3. Compared database (2006 to 2015)

Category	Active			Retired			Pensioners		
	PLDO (1)	BEPS (2)	(1)/(2)%	PLDO (1)	BEPS (2)	(1)/(2)%	PLDO (1)	BEPS (2)	(1)/(2)%
2006	551,065	691,604	79.68	411,527	397,939	103.41	237,746	253,127	93.92
2007	573,413	691,589	82.91	397,036	394,475	100.65	311,191	257,579	120.81
2008	581,836	701,582	82.93	391,037	392,686	99.58	331,866	260,947	127.18
2009	581,836	742,178	78.40	391,037	400,721	97.58	331,866	256,812	129.23
2010	581,836	771,570	75.41	391,037	404,858	96.59	331,866	259,395	127.94
2011	741,328	782,591	94.73	395,462	407,997	96.93	266,276	261,672	101.76
2012	737,175	779,719	94.54	395,462	413,199	95.71	266,276	261,342	101.89
2013	490,197	797,319	61.48	322,455	414,785	77.74	343,869	262,231	131.13
2014	533,708	840,876	63.47	333,983	418,049	79.89	306,955	263,180	116.63

Source: PLDO from 2008 to 2017 and BEPS 249.

Table 3 was prepared to verify the occurrence or not of a relation of the data of the PLDO and of the BEPS exceeding 100%, throughout the period studied. We verified that, with the exception of 2006, the entire period presented such a discrepancy. Based on this fact, and considering that pensioners are beneficiaries and sponsors of the RPPS, it is possible to infer that there is an overvaluation in the APV of the benefits granted and of the contributions, as well as in the estimated actuarial deficit.

With respect to the decrease in the ratio between PLDO and BEPS data, from 2013 to 2015, it is inferred that it results from the poor quality of the data on active servants received used to prepare the respective evaluations. Therefore, considering such employees are not yet beneficiaries of the scheme, this fact contributes to an undervaluation of the APV of the benefits to be granted and of contributions, also impacting the estimated actuarial deficit.

REGULATORY BASE OF THE BENEFITS

With respect to the financial regime, only in 2017 PLDO was the capitalization regime provided in MPS Ordinance no. 403/2008 used. However, the types of benefits evaluated were not detailed. The remaining evaluations used the pay as you go scheme. It should be highlighted that the capitalization regime is used on notional basis, since the RPPS of federal public servants is not capitalized.



Although the adoption of the projected unit credit method defined by MPS no. 403/2008, the actuarial evaluations for the period under analysis, the aggregate method was used. The actuarial reports do not provide any justification for using this costing method.

ACTUARIAL BASIS

The premises and hypotheses used in the actuarial evaluations were biometric tables; salary increase by merit; replacement of servants; standard family; age of entry into the labor market; turnover rate; interest rate; financial regime; and costing method.

For the period considered, changes were observed in the following parameters:

- a) as of the 2011 PLDO, IBGE's biometric boards were used; and
- b) from the 2013 PLDO: i) the servant replacement ratio was changed to 1:1 (the reasoning was to minimize the undervaluations of the mathematical reserves calculated until then); ii) the standard family began to be considered as a couple with the same age (there was a difference of 5 years between the spouses) and 90% of pension payment obligation (a 22-year younger child was defined); and iii) the turnover rate was disregarded (until 2012 PLDO, the rate was 1% pa).

It was then verified that the changes made were reflected on the calculation of the social security cost, especially in the 2013 PLDO, which reported a BRL 400 billion rise in the actuarial deficit. Thus, the deficit assessed in 2013 was 56% higher than that estimated in the 2012 PLDO.

ANALYSIS OF SOCIAL SECURITY MATHEMATICAL PROVISION ASSETS RECORD

As already mentioned, "liability" is an obligation that does not depend on the occurrence of other events to materialize. Thus, the benefits to be granted, relating to active servants, should not be considered liabilities, but rather as contingent liabilities, as they still depend on the occurrence of other events for their realization, according to MCASP. This situation was aggravated in the actuarial evaluations carried out under 2013 PLDO and thereafter, as the replacement ratio of servants changed to 1:1, thus computing costs of servants that did not even contribute to the social security scheme. The APV of benefits to be granted would be evidenced in explanatory notes, observing an adequate classification and disclosure of the accounting information. Table 4 shows the PMP amount that would be recognized following this understanding.

Table 4 - Social Security Mathematical Provision (PMP) (Billions of BRL)

BGU	PMP recorded	PMP suggested
2014	1,208.43	206.11
2015	1,243.69	180.82



BGU	PMP recorded	PMP suggested
2016	1,364.50	347.01

Source: Prepared by the authors.

On the other hand, by keeping the APV of the benefits to be granted under the PMP, it would be necessary to correct the actuarial costing method under a projected unit credit method, aiming at improving the accounting estimate, complying with MPS Ordinance no. 403/2008, and with the existing doctrine (Hendriksen & Van Breda, 1999; Pugh, 2006). Accordingly, it should be noted that, after the convergence process of IPSAS 39, the resulting NBC TSP will probably indicate this method of actuarial costing for the measurement and recognition of the PMP of post-employment benefits.

CONCLUSION

The actuarial deficit determined in a managerial report must be analyzed, from the accounting perspective, so that it is appropriately included in the financial statements. Notwithstanding the work performed by the Social Security Secretariat, which corroborates the fact that actuarial science proves itself suitable to measure long-term obligations, it is a prerogative of accounting science the correct classification of assets, so as not to unduly affect the public accounts.

This study has tried to evidence that the uncertainties surrounding the actuarial calculations are not constraints unreasonably pointed out by the doctrine. The volatility of the premises and hypothesis, as well as the absence of a reliable database, affect the measurement of these obligations. In any case, the disclosure of accounting evidence should be promoted for an appropriate transparency of the information provided to the society.

Therefore, aiming to improve accounting information, it seems feasible to adopt one of the alternatives presented here: an exclusion of the APV from the benefits to be granted from the PMP and inclusion of the respective amount in the contingent liabilities; or a change from the actuarial funding method to the projected unit credit method so that future benefits can be accounted for more accurately, contributing to the transparency of the Union accounts.

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Received in 15/01/2018

Approved in 15/05/2018