Fiscal Impacts of Social Security Reform in Brazil

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Resumo: Este artigo tem como foco a reforma previdenciária efetuada no ano de 2003 no Brasil. São estimados os impactos fiscais da proposta original do governo, da versão aprovada na Câmara e da versão final, aprovada no Senado. Também são calculadas as alíquotas de contribuição necessária e efetiva, tanto na situação anterior às mudanças, quanto nas três fases da reforma. Os resultados indicam que embora o impacto da reforma tenha se reduzido bastante em relação ao projeto original, foi feito um avanço razoável no sentido de reduzir o déficit da previdência e torná-la mais justa.

Abstract: This article focuses on the reform of Social Security in Brazil, initiated in 2003. We estimate the fiscal impact of the original government proposal, as well as of the proposal approved at the House of Representatives, and the final format approved at the Senate. We also estimated both, the balancing contribution rate and the effective contribution rate, in the three phases of the reforming process. Results indicate that although the final impact was considerably reduced from the initial project, a great deal of progress has been made towards both, the reduction of annual Social Security deficit and its transformation into a more equitable system.

Classificação JEL: H55

ÁREA 6: Economia do Trabalho, Economia Social e Demografia

I. Introduction

During the 1990´s, and particularly during the second half of the decade, Social Security in Brazil had deteriorated to a point that had transformed it into the most critical fiscal problem in Brazil. Increasing deficits, in both systems - INSS and Civil Servants – associated to a history of differences in rights and rules had moved the issue of Social Security reform to the top of the political and economic agenda in the country. In this context, the expression social security reform had become usual in the media. Apparently, the debate has produced a consensus over two points. First, it his accepted that the country needs a more fair and equitable system. Second, reduction of the Social Security deficit is one of the pre-conditions for the balancing of the government budgets and, as such, it is a critical pre-condition if the country wants to move towards a sustainable economic growth trajectory.

During the two periods of the FHC administration, the government tried to change some aspects of Social Security. However, attempts were not very successful, with the exception of Constitutional Amendment 20 (EC 20). The fact is that whenever a government proposes to change Social Security rules and rights, it is inevitable that the affected groups will resist. FHC administration was unable (or maybe even unwilling?) to face and to overcome resistance of affected groups against Social Security reform.

The picture changed during the first year of Lula administration. In April 2003, the government delivered a bill to the Congress, Constitutional Amendment 40 (PEC 40). Based on correct diagnosis of the situation, the proposal focused on the civil servants system, and had two main objectives. First, it aimed to reduce the huge deficits of the Civil Servants system. Second, to transform the rules and rights, making it more similar to the rules and rights of workers in the private sector, and by this way, improving equity and social justice of both systems. The bill was discussed in the House during four months. By late August, a modified text was approved and delivered to the Senate. By December, after introducing new changes, the Senate approved the final text – Constitutional Amendment Proposal 77 (PEC 77), which was finally sanctioned by the President and became Constitutional Amendment 40 (EC41).

The process of political negotiation, inherent to a democratic system of government, has changed most of the initial elements of the original proposal, both at the House and at the Senate. The resulting amendment has lost a significant of potential fiscal impact of the original bill. The changes reduced mainly the impacts on the present civil servants of both categories, the actives ones as well the retired. The most important measures will affect future civil servants. The reform was an important move, but its results will show up in the long run.

This paper evaluates the fiscal impacts of Lula reform of Social Security. After a brief review of the literature on the topic of Social Security reforms (Section 2), and a brief description of the Brazilian Social Security System (Section 3), we describe the data set (PNAD/IBGE Household Survey, 2001), and the procedures we have used to assign Social Security rules to each individual in the sample (Section 4). We then show how we have estimated individual wage and benefits lifecycle profiles, and we describe the reform measures and the respective procedures to simulate the reform (also, Section 4). Finally, we present the results on fiscal impacts (Section 5), and on balancing and effective contribution rates (Section 6). Concluding remarks are then presented (Section 7).

II. Social Security reforms

This paper is related to two groups of empirical works on Social Security systems. The first one is formed by studies focusing on fiscal aspects, which address the issue of balancing revenues and expenditures, and to long run sustainability[1]. Two classical works in this line of research are

[1] Goss (1999) lists possible methods of assessing solvency of Social Security Systems.

Kotlikoff (1995) and Feldstein and Samwick (19967). More recently, we may refer to Smetters (1999) and Lee and Yamagata (2003), who address the exhaustion of the American Trust Fund.

In the Brazilian, Schymura, Lannes and Perdigão (2000) have estimated the debt of the Brazilian state systems, and Oliveira and Beltrão (2000) have estimated the impacts of CA 20 on the Social Security debt, both for the INSS System (which covers workers of the private sector) and for the civil servants. Mascarenhas, Oliveira and Caetano (2004) in a study similar to ours, have used data of SIAPE (different from other studies that used PNAD/IBGE). They estimate that CA 41 will reduce the deficit by R$49 billions, in the 20-year period from 2003 to 2023. The authors have argued that Lula reform will reduce the deficit, but will not balance the system. The National Treasury will have to supply more than R$12 billions each year in the period.

The second group of studies focus on distributive and social justice issues. Giambiagi, Além and Pastorizza (1996) have estimated the implicit subsidy associated to pension provided under the length of service rule. Oliveira, Beltrão and Maniero (1997) estimate actuarially fair contribution rates according to gender, schooling and kind of social security benefit. Schwarzer (1999) estimates the impact on some groups of changes in the rules applied to determine the value of INSS benefits. Groups were formed according to gender, labor market position, and schooling. Fernandes and Grimaud (2003) used rules determined in CA 20 and estimate actuarially balancing contribution rates for civil servants, according to gender, schooling, region, and administration level. The results are quite high: the average contribution for the entire group of civil servants is about 73%. Fernandes and Narita (2003) provide similar estimates for workers covered by INSS (private sector), and their estimated average balancing contribution is about 33%.

Studies focusing on the estimation of rate of return of contributions also belong to this group. Leimer (1999) reviews this literature for the American cases. For the Brazilian case, Fernandes (1994) finds rate of returns below 4%, for all cohorts. In World Bank (1995), results are quite different: the estimated rates of returns are around the 15% and 7,5% figures, for length-of-service pensions, and age-pensions, respectively. An intermediate result is provided by Afonso and Fernandes (2003). They do not provide separate estimations for public and private sector, however.

III - The Brazilian Social Security System before the Lula Reform

This section describes briefly the Social Security in Brazil and presents some figures to illustrate the problems the country has been facing in the last years. It is a pay-as-you-go system financed with payroll taxes, and has two very different regimes – the private sector regime and the public sector regime.

The private sector regime is organized under INSS, which stands for National Institute of Social Security, and establishes a contribution rate according to wage levels. There is a mandatory minimum number of contributing years differentiated by occupations (in most cases 35 years) after which the individual is entitled to the retirement. The value of the retirement benefit corresponds to the average of 80% highest wages and salaries and its purchasing power should be kept constant over time. If an individual does not contribute to the system, he or she is entitled to a benefit equal to one Minimum Wage, after reaching an entitling age, which varies according to gender and rural or urban areas, and begins at 60 for rural workers. Thus, the INSS regime provides two kinds of benefits: length-of-service benefits, and age benefits. The later is a social assistance kind of benefit, rather than a contributive benefit. Both kinds of benefits are adjusted annually for inflation.

The public sector regime also establishes a contribution rate according to occupational group, level of administration (federal, state, and local). There is a mandatory minimum number of contributing years, which varies according to occupational groups. In most cases, it is 35 years, after which the individual is entitled to retirement. Brazilian civil servants are entitled to a right not provided to private sector workers: the value of their pension benefit is equal to the last and highest wage received (*integrality*). Salary increases given to active civil servants are automatically incorporated in the value of the retirement benefits (*parity*). Finally, both regimes establish

survivor benefits rules as well. After a beneficiary is deceased, the entire benefit goes to his or her survivor spouse. Graphic 1 shows the earnings and benefit profiles of a typical Brazilian worker.

Graphic 1
Earnings and benefit profiles: public and private sector worker

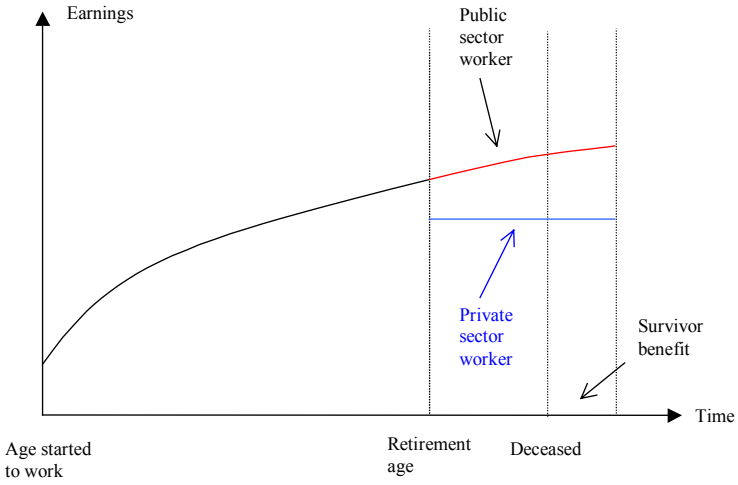


TABLE 1
INSS and Civil Servants figures (2001-2002)

Contributions, benefits and net results	2001		2002	
	R$ billions	% GDP	R$ billions	% GDP
INSS				
Contributions	62.5	5.3	71.0	5.5
Benefits	75.3	6.4	88.0	6.8
Results	-12.8	-1.1	-17.0	-1.3
Civil Servants				
Contributions	19.4	1.6	21.8	1.7
Benefits	56.4	4.8	61.6	4.7
Result	-37.0	-3.1	-39.8	-3.1
Federal Administration				
Contributions	7.0	0.6	9.4	0.7
Benefits	28.1	2.4	32.3	2.5
Result	-21.1	-1.8	-22.9	-1.8
State Administrations				
Contributions	11.0	0.9	11.0	0.8
Benefits	24.6	2.1	25.5	2.0
Result	-13.7	-1.2	-14.5	-1.1
City Administrations				
Contributions	1.4	0.1	1.4	0.1
Benefits	3.7	0.3	3.8	0.3
Result	-2.3	-0.2	-2.4	-0.2
Overall Result	-49.8	-4.2	-56.8	-4.4

Source: MPAS (2003a)

Table 1 presents revenues and expenditures of the two systems, INSS and Civil Servants (disaggregated according to administration level), and shows the huge structural imbalance of the situation. By 2002, both systems were running a deficit of more than 4% of GDP (this is the official government estimate, which in fact under estimate the deficit). This situation has deep roots in the past, although it has aggravated in the last years. For instance, up to 1993, state and city civil servants contributions were collected just to fund survivor benefits. Only in 1998, it was established the minimum age for retirement of civil servants, and even though, very low minimum age: 53 for men, and 48 for women. In the INSS system, there is not a minimum age for retirement.

Average retirement age in 2002 was 54 (49 in 1988). As a result of fast aging of Brazilian population, the ratio contributors/beneficiaries has decreased very quickly, from 2.5 in 1990 to 1.3 in 2001 (MPAS, 2002).

To complete the picture partially depicted in Table 1, it is necessary to add that the number of beneficiaries of both systems. By the end of 2002, there were about 2.8 millions beneficiaries in the civil servants system (about 1.0 millions of them are survivors), and about 5.2 millions active civil servants (MPS, 2004b: 40). In the same year, there were about 30 millions contributors of INSS, and about 21 millions beneficiaries in the private sector system (MPAS, 2003b: 16). This means that the per capita deficit in the public sector is much larger than the corresponding in the private sector. For this reason, Lula administration has decided to first reform the public sector system of Social Security.

IV – Methodology: Data set, Pension benefit rules, and estimation of wage/salary- and benefit profiles

Data used in this study come from the 2001 Brazilian Household Surveys (Pesquisa Nacional por Amostra de Domicílios - PNAD), provided by Instituto Brasileiro de Geografia e Estatística (IBGE), the Brazilian Census Bureau. PNAD is an annual population survey (similar to the Current Population Survey in the United States) that covers all urban areas and the majority of the rural areas in Brazil.

In order to evaluate the impact of the Social Security reform, we have used the closed population of PNAD 2001. That is, we have estimated the present value of contributions of current active workers in 2001 and the present value of their expected benefits, and the present value of the benefit flow of the retired and/or survivors. We have included as currently active workers all individuals over 15 years old, occupied in the week of reference of PNAD 2001, with strictly positive main job earnings. The retired workers and survivors (from now on designated as **inactives**) are the individuals who reported as retired workers or as survivors, with strictly positive benefit values.

We have applied the following five-step procedure: (i) we have assigned the corresponding social security contribution rate to the currently active workers; (ii) we have classified the inactive individuals as either public sector or private sector inactives; (iii) we have estimated the earnings growth rate through a log-wage equation; (iv) we have estimated the earnings profile for each active worker using the estimated wage growth rate; (v) we have estimated the contribution and benefit profiles for active workers using the estimated earnings profiles and applying the corresponding social security pension rules. The benefit profiles of the current inactive ones were estimated applying the social security rules over their reported benefits.

The non-behavioral micro-simulation consisted in applying the new social security rules over the estimated wage profiles. Its non-behavioral characteristic comes from the hypothesis that the wage profiles of the individuals do not change when social security rules change. That is, we assume that individuals keep the same labor market position before and after the changes.

(i) Assigning the social security contribution rate to the current active workers

The contributions to the social security system come from the Brazilian payroll tax system. The taxes to finance the social security system are divided into an employee tax and an employer tax. Among the currently active workers, PNAD gathers information if an individual contributes to the social security system and provides direct information such that we can divide them into two groups: public sector workers and private sector workers. Public sector workers are divided into federal, state, and local (municipality) workers. For each one, we assign the following tax rates:

a) Public Sector Workers

1) Workers of the Federal Government:
   - Employee: 11%
   - Employer: 0%
2) Workers of the State Governments:
   - Both rates differentiated by states
3) Workers of the Municipalities:
   - Both rates differentiated by municipalities
   - Hypotheses: we assign the rates of the state capitals to the other municipalities in the state
4) Militaries:
   - Employee: 8%
   - Employer: 0%

b) Private Sector Workers
1) Formal workers (*com carteira*):
   1.1) Urban:
   - Employee: 7.65% to 11%
   - Employer: 20% + additional of work accident insurance (1% to 3%) + additional of finance sector (2.5%)

   1.2) Rural:
   - Employee: 7.65% to 11%
   - Employer: It is not a payroll tax. It is a tax of the revenues differentiated by 621 activities and states. We estimate the average revenues and average payrolls of each 621 sectors by state using the *Censo Agropecuario* and RAIS. Then we apply the corresponding tax rates to estimate the implicit payroll tax rate. The overall average is 9.3%.

2) Self-employed (if contributes to the system):
   - We assume 20% of one minimum wage
3) Informal Workers (*sem carteira* and self-employed that does not contribute to the system):
   - Employee: 0%
   - Employer: 0%

(ii) Classifying inactive individuals into public sector and private sector inactives

For retired individual and for survivors, PNAD does not provide information about the sector were the individual had worked when he/she was an active worker. However, we do know that the ceiling of the benefit of private sector social security system (INSS) was R$ 1,430.00 in 2001. Thus, we could have assumed that everybody with a declared benefit above R$1,430.00 would come from the public sector. But when we have compared the results of this classification with the numbers of beneficiaries and the total value of the benefits with actual data, we have realized that this assumption would overestimate the figures in the public sector. Then, as an attempt to match with the actual numbers, we have applied the following rule:

- If the value of the retirement benefit is greater then 0,67*1,430 then the individual comes from the public sector. Otherwise he/she comes from the private sector.
- If the value of the survivor benefit is greater then 0,5*1,430 then the individual comes from the public sector. Otherwise comes from the private sector.

(iii) Estimating the earnings growth rate with a log-earnings equation

We have estimated an OLS regression of log-earnings on time in the labor market and other controls. The dependent variable is the main job earnings. PNAD provides information about the age the individual entered the labor market. We have defined time in the labor market as age minus age the individual entered the labor market. We have included among the controls variables dummy variables for the individual position in the labor market. Each position corresponds to different sets of social security rules. Positions are: civil servant, military, formal wage worker

(*com carteira*), informal wage worker (*sem carteira*), formal domestic worker, informal domestic worker, formal self-employed (contributes to the social security system), informal self-employed, formal employer, informal employer, and professor in the public sector. Reference dummy for position in the labor market is formal worker. Additional controls are the full interaction of the years of schooling and age started to work and their squared values, and gender, race and locality indicator variables (North region is the reference dummy). Table 2 shows the regression results.

Table 2
OLS Log-Earnings Regression

Variable	Coeff.	Standard Error
Intercept	4.8878	0.0217
Time	0.01315	0.0002
Position in the labor market		
Militaries	0.2549	0.0269
Civil servants	0.1782	0.0079
Informal workers	-0.3365	0.0053
Formal private household workers	-0.0885	0.0126
Informal private household workers	-0.5294	0.0085
Self-employed (contribute)	0.2601	0.0105
Self-employed (does not contribute)	-0.3859	0.0054
Employer (contribute)	0.7943	0.0120
Employer (does not contribute)	0.4628	0.0132
Teacher	-0.2347	0.0102
Years of Schooling	0.0583	0.0032
(Years of Schooling)^2	0.0045	0.0001
Age Started to Work	0.0611	0.0020
(Age Started to Work)^2 Squared	-0.0010	0.0000
Schooling*Age St. to Work	-0.0046	0.0002
(Schooling*Age St. to Work)^2	0.00001	0.00000
Non-White Dummy	-0.1437	0.0041
Female Dummy	-0.4593	0.0043
Location Dummies		
Rural Dummy	-0.1170	0.0066
Metropolitan Areas	0.1516	0.0040
Northeast region	-0.3024	0.0067
Southeast Region	0.0336	0.0067
South Region	-0.0019	0.0076
Central west region	0.1250	0.0078
Agricultural Sector	-0.2579	0.0075
Obs	142713	
R-Squared	0.5326	

We are mainly interested in the estimated coefficient for the return on time in the labor market (measured in number of years). The estimated coefficient is 0.01315, indicating that on the average, individual earnings growth by 1.315% per year. We have used this growth rate to forecast the wage profile of each individual. for the remaining years in the labor market, until retirement..

(iv) Estimating the earnings and benefit profiles for each active worker using the estimated earnings growth rate

We know the individual main job earnings in 2001, his or her age that started to work and estimated the earnings growth rate in 1.315% a year. If we define W_{01} the predicted earnings in 2001 obtained from the parameters estimated of the above regression, we can obtain the present value (in 2001) of predicted earnings in time t by using the equation $W_t = W_{01} \exp\{(0.01315-r)*t\}$ where r is an assumed discount rate and $t = 0$ is the year 2001. We use different values for r: 0.03, 0.04, 0.05, and 0.06.

The total time of the individual in the labor market is assumed to be the number of years between the age the individual declared to have started to work and the his or her age of retirement. The age of retirement is obtained by assuming that the individual does not change over the years his or her position of occupation in 2001. Given the individuals' position of occupation, we can indicate his or her expected age of retirement by using the current social security rules to his or her particular position of occupation. For example, if an individual is a 30 year-old male formal wage worker in 2001 that declares to have started to work at the age of Twenty, we assume that he has been a formal wage worker since 20 years old and will stay a formal wage worker until he retires. It means that we assume that he will have to contribute to social security system for 35 years to be eligible to a benefit. Assuming that he started to contribute to the social security system when he was 20 years old, he will then retire when he is 20 + 35 = 55 years old. Similar procedures are applied to all other positions of occupation.

Also, we assume that each individual will survive his or her life expectancy given his or her age in 2001. We use the life expectancy tables of IBGE, which differentiates the life expectancy by age and gender. Furthermore, if a male individual is married in 2001 we give him a five-year additional time to take into account the additional survivor benefit years of his spouse. Five years seems to be the average years for a widow benefit in Brazil.

(v)Estimating the contribution and benefit profiles for active workers using the estimated earnings profiles and applying the social security rules

Finally, knowing the earnings profile of each worker, his or her position of occupation, his or her age of retirement and life expectancy, we can estimate the contribution to the social security system and the benefit value accordingly. If an individual is in the public sector, we assign the value of the earnings at the age of retirement as the benefit. Given the public sector rules, we assume that this benefit grows at the same rate of the earnings growth rate. On the other hand, if an individual is in the private sector, we calculate his or her benefit value that corresponds to the rules of the social security system. For instance, if the individual is a formal wage worker, we assign the average of the highest 80% earnings. If the individual is in the informal sector, we assign as a benefit one minimum wage.

III. The Social Security Reform

The social security reform proposed by the Brazilian Federal Government in April 2003 to the House of Representatives had the following proposed changes:

Public Sector Regime:

- End of integrality and parity. The value of the benefits is the average of the 80% highest wages up to a ceiling of R$2,400.00 (the same formula used in INSS).
- Unification of contribution rate (11%).
- Earnings ceiling is set at R$ 17.170.
- For the new civil servants, benefits ceiling set at R$ 2400,00.
- For the retired and new civil servants, survivor benefits ceiling is 70% of the survivors benefit.

- Minimum age of retirement: 60 (men) and 55 (women). Civil servants hired prior to 1998, may retire at 53 Men) or 48 (women), with a reduction of 5% on the benefit value for each year of anticipation, up to 35% ceiling in the reduction of benefit value.[2]
- 11% contribution rate for pensions above R$900,00.
- Current and future civil servants will contribute 11% of their salaries, for a complementary, fully funded pension fund.

Private Sector Regime (INSS)

- The ceiling of the wage/salary contribution and benefit is raised to R$ 2,400.00.

The House of Representatives approved the bill, with a very important change: it removed the provision that had ended the parity and integrality right. Thus, current civil servants kept the right to retire with full salary, and also kept the right to adjust benefits in the same proportion of adjustment of salaries for active civil servants. For new entrants, however, the House kept the R$2.400,00 ceiling on the value of benefits. The modified proposal was sent to the Senate where it a new change was added: for each additional year of contribution above 35 years, the public servant can reduce a corresponding one year from the minimum age of retirement.[3]

V - The Micro-Simulations: Fiscal impacts

In order to simulate the fiscal impacts of these measures, we calculate the sum of all individuals' present value of their contributions as well as the sum of all individuals' present value of benefits. Their difference is the *Net Present Value*[4]. The graphics 2 and 3 below illustrate this for both actives and inactives. The difference between the sum of all individuals' (actives and inactives) present values of benefits and the sum of all actives present values of contributions is the implicit surplus or debt of the system.

The fiscal impact of the reform is obtained by performing the following counterfactual exercise: what would be the new present value of contributions and benefits of all individual (actives and inactives) of the "closed population" of PNAD 2001 if the measures proposed were implemented from 2001 and on? We compare these results with the current situation.

The impacts of each measure of the original reform and the overall impact are presented in Tables 3a-3d below. Each Table corresponds to the use of discount rate from 3% to 6% a year, respectively. Tables 4a-4d present the results for the reform approved in the House of Representatives and Tables 5a-5d, the results for the reform approved in the Senate.

The impacts are measured in units of Brazil 2001 GDP. The first three columns show the impacts on the private sector regime; the next three columns present the impacts on the public sector regime, and the last column show the overall impact. Each line presents the *ceteris paribus* impact of a measure, and the last three lines the total impact of all measures together. Note that the last line presents the impacts on percentage of the total debt. For instance, Table 3a shows the results of the original proposal when the discount rate of 3% is used. Its first line presents the results for the current situation, that is, the debt of the current system before the reform. The implicit debt in the private sector regime is 1.74 GDPs. Of this total, 1.01 corresponds to the implicit debt of the active workers and 0.73 is what should be paid the current inactives in this

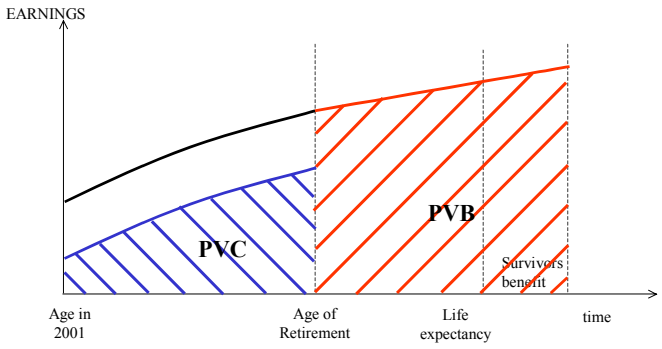
[2] Civil servants hired after the passage of the reform may retire according to CA 20 provisions: 35 years of contribution and minimum age of 60 (men) or 55 (women).

[3] For a detailed explanation of the original bill, and of the versions passed in the House of Representatives and in the Senate, see respectively MPAS (2003b), MPAS (2003c) e MPS (2004a).

[4] This concept is analogous to the concept of *Net Social Security Wealth*, presented in the classic text by Feldstein (1974).

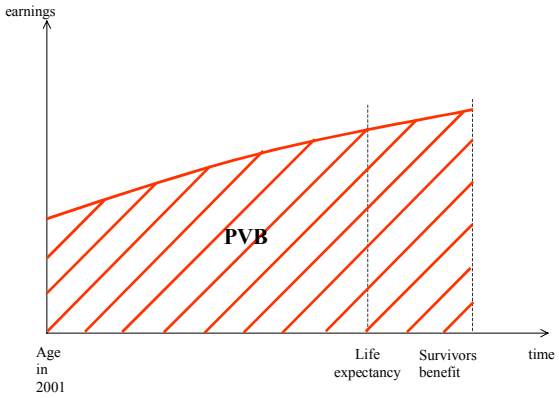
system. Also, the total implicit debt of the public sector regime is 1.41 GDPs and the total implicit debt of the system is 3.15 GDP (last column).

Graphic 2
Contributions and benefits for active workers



NetPV = PVB - PVC

Graphic 3
Benefits of inactives



Among the initial measures proposed, the end of the integrality and parity, and the change in the minimum age of retirement are the ones with the greatest impact on reducing the implicit debt (0.20 and 0.15 GDPs, respectively). At the end, there is a reduction of 0.43 GDPs of the implicit debt, which corresponds to a decrease of 13% of the total implicit debt of the closed population of 2001.

Tables 4a-4d and 5a-5d introduce the changes made in the House of Representatives and in the Senate, respectively. There is a reduction on the overall impacts. The proposal approved in the House of Representatives would have had an impact of 10.6% decrease in the total implicit debt and the reform approved in the Senate has an impact of 8% decrease in the total implicit debt. Changes in the House and in the Senate reduced the fiscal impact of the original government proposal by 21,5% and 40,7% respectively. Note that the bulk of the impacts occur in the public sector regime and the use of different discount rates changes the levels of the impacts but not the relative impact of the implicit debt. Even though the initial impact was considerably reduced, the gains of the reform are not little, at all. When taken into consideration only the Civil Servants

System, the reduction in the implicit debt would have been 31,3% in the original proposal, and was reduced to 24,9% in the House, and to 19% in the Senate. Thus, Lula reform has reduced the implicit debt in the Civil Servants System by about 1/5th, which is an expressive result, probably never reached in any other Social Security Reform in the world.

TABLE 3a
Fiscal Impact of the Original Reform (# of GDPs)
(Discount Rate of 3%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	1.01	0.73	1.74	0.72	0.69	1.41	3.15
- End of Integrality and Parity				-0.20		-0.20	-0.20
- Minimum Age of Retirement				-0.15		-0.15	-0.15
- Contribution of Inactives				-0.03	-0.08	-0.10	-0.10
- Reduction of the Survivor Benefit				-0.02	-0.01	-0.03	-0.03
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.02		0.02				0.02
Debt after reform	1.03	0.73	1.76	0.36	0.61	0.97	2.73
Impact (GDPs)	0.02		0.02	-0.36	-0.08	-0.44	-0.43
Impact (%)	1.6	0.0	0.9	-49.8	-12.0	-31.3	-13.5

TABLE 3b
Fiscal Impact of the Original Reform (# of GDPs)
(Discount Rate of 4%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.75	0.67	1.41	0.58	0.63	1.20	2.62
- End of Integrality and Parity				-0.16		-0.16	-0.16
- Minimum Age of Retirement				-0.13		-0.13	-0.13
- Contribution of Inactives				-0.02	-0.07	-0.09	-0.09
- Reduction of the Survivor Benefit				-0.01	-0.01	-0.02	-0.02
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.76	0.67	1.43	0.29	0.55	0.84	2.27
Impact (GDPs)	0.01		0.01	-0.29	-0.07	-0.36	-0.35
Impact (%)	1.8	0.0	1.0	-50.1	-11.9	-30.2	-13.4

TABLE 3c
Fiscal Impact of the Original Reform (# of GDPs)
(Discount Rate of 5%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.55	0.61	1.16	0.47	0.57	1.04	2.21
- End of Integrality and Parity				-0.12		-0.12	-0.12
- Minimum Age of Retirement				-0.12		-0.12	-0.12
- Contribution of Inactives				-0.02	-0.06	-0.08	-0.08
- Reduction of the Survivor Benefit				-0.01	-0.01	-0.02	-0.02
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.56	0.61	1.18	0.23	0.51	0.74	1.91
Impact (GDP's)	0.01		0.01	-0.24	-0.07	-0.30	-0.29
Impact (%)	2.0	0.0	0.9	-50.5	-11.8	-29.2	-13.3

TABLE 3d
Fiscal Impact of the Original Reform (# of GDPs)
(Discount Rate of 6%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.41	0.57	0.97	0.38	0.53	0.91	1.88
- End of Integrality and Parity				-0.10		-0.10	-0.10
- Minimum Age of Retirement				-0.11		-0.11	-0.11
- Contribution of Inactives				-0.01	-0.06	-0.07	-0.07
- Reduction of the Survivor Benefit				-0.01	-0.01	-0.01	-0.01
- Unification of Contribution Tax Rate							
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.42	0.57	0.98	0.19	0.46	0.65	1.64
Impact (GDPs)	0.01		0.01	-0.20	-0.06	-0.26	-0.25
Impact (%)	2.2	0.0	0.9	-51.0	-11.7	-28.3	-13.2

TABLE 4a
Fiscal Impact of the Reform Approved in the House of Representatives (# of GDPs)
(Discount Rate of 3%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	1.01	0.73	1.74	0.72	0.69	1.41	3.15
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.24		-0.24	-0.24
- Contribution of Inactives				-0.02	-0.08	-0.10	-0.10
- Reduction of the Survivor Benefit				-0.01	-0.01	-0.02	-0.02
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.02		0.02				0.02
Debt after reform	1.03	0.73	1.76	0.45	0.61	1.06	2.82
Impact (GDPs)	0.02		0.02	-0.27	-0.08	-0.35	-0.33
Impact %	1.6	0.0	0.9	-37.3	-12.0	-24.9	-10.6

TABLE 4b
Fiscal Impact of the Reform Approved in the House of Representatives (# of GDPs)
(Discount Rate of 4%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.75	0.67	1.41	0.58	0.63	1.20	2.62
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.20	0.00	-0.20	-0.20
- Contribution of Inactives				-0.02	-0.07	-0.09	-0.09
- Reduction of the Survivor Benefit				-0.01	-0.01	-0.01	-0.01
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.76	0.67	1.43	0.35	0.55	0.91	2.33
Impact (GDPs)	0.01		0.01	-0.22	-0.07	-0.30	-0.28
Impact %	1.8	0.0	1.0	-38.6	-11.9	-24.7	-10.9

TABLE 4c
Fiscal Impact of the Reform Approved in the House of Representatives (# of GDPs)
(Discount Rate of 5%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.55	0.61	1.16	0.47	0.57	1.04	2.20
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.17	0.00	-0.17	-0.17
- Contribution of Inactives				-0.02	-0.06	-0.08	-0.08
- Reduction of the Survivor Benefit					-0.01	-0.01	-0.01
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.56	0.61	1.18	0.28	0.51	0.79	1.96
Impact (GDPs)	0.01		0.01	-0.19	-0.07	-0.25	-0.24
Impact %	2.0	0.0	0.9	-39.9	-11.8	-24.5	-11.0

TABLE 4d
Fiscal Impact of the Reform Approved in the House of Representatives (# of GDPs)
(Discount Rate of 6%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.41	0.57	0.97	0.38	0.53	0.91	1.88
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.14		-0.14	-0.14
- Contribution of Inactives				-0.01	-0.06	-0.07	-0.07
- Reduction of the Survivor Benefit					-0.01	-0.01	-0.01
- Unification of Contribution Tax Rate							
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.42	0.57	0.98	0.22	0.46	0.69	1.67
Impact (GDPs)	0.01		0.01	-0.16	-0.06	-0.22	-0.21
Impact %	2.2	0.0	0.9	-41.4	-11.7	-24.2	-11.2

TABLE 5a
Fiscal Impact of the Reform Approved in the Senate (# of GDPs)
(Discount Rate of 3%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	1.01	0.73	1.74	0.72	0.69	1.41	3.15
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.15		-0.15	-0.15
- Contribution of Inactives				-0.02	-0.08	-0.10	-0.10
- Reduction of the Survivor Benefit				-0.01	-0.01	-0.02	-0.02
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.02		0.02				0.02
Debt after reform	1.03	0.73	1.76	0.54	0.61	1.14	2.90
Impact (GDPs)	0.02		0.02	-0.18	-0.08	-0.27	-0.25
Impact %	1.6	0.0	0.9	-25.6	-12.0	-19.0	-8.0

TABLE 5b
Fiscal Impact of the Reform Approved in the Senate (# of GDPs)
(Discount Rate of 4%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.75	0.67	1.41	0.58	0.63	1.20	2.62
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.13		-0.13	-0.13
- Contribution of Inactives				-0.02	-0.07	-0.09	-0.09
- Reduction of the Survivor Benefit				-0.01	-0.01	-0.01	-0.01
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.76	0.67	1.43	0.42	0.55	0.97	2.40
Impact (GDPs)	0.01		0.01	-0.16	-0.07	-0.23	-0.22
Impact %	1.8	0.0	1.0	-27.1	-11.9	-19.2	-8.3

TABLE 5c
Fiscal Impact of the Reform Approved in the Senate (# of GDPs)
(Discount Rate of 5%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.55	0.61	1.16	0.47	0.57	1.04	2.20
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.11		-0.11	-0.11
- Contribution of Inactives				-0.02	-0.06	-0.08	-0.08
- Reduction of the Survivor Benefit					-0.01	-0.01	-0.01
- Unification of Contribution Tax Rate				-0.01		-0.01	-0.01
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.56	0.61	1.18	0.33	0.51	0.84	2.01
Impact (GDPs)	0.01		0.01	-0.13	-0.07	-0.20	-0.19
Impact %	2.0	0.0	0.9	-28.7	-11.8	-19.4	-8.7

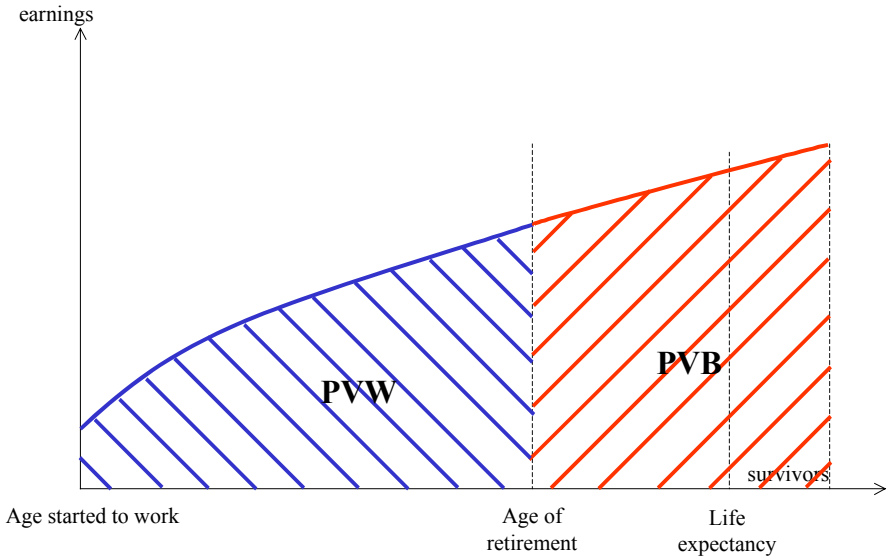
TABLE 5d
Fiscal Impact of the Reform Approved in the Senate (# of GDPs)
(Discount Rate of 6%)

Measures	Private Sector Regime			Public Sector Regime			Total
	Actives	Inactives	Total	Actives	Inactives	Total	
Current Situation	0.41	0.57	0.97	0.38	0.53	0.91	1.88
- End of Integrality and Parity							
- Minimum Age of Retirement				-0.10		-0.10	-0.10
- Contribution of Inactives				-0.01	-0.06	-0.07	-0.07
- Reduction of the Survivor Benefit					-0.01	-0.01	-0.01
- Unification of Contribution Tax Rate							
- Ceilings for Wages and Benefits							
- Ceiling of the private sector regime	0.01		0.01				0.01
Debt after reform	0.42	0.57	0.98	0.27	0.46	0.73	1.71
Impact (GDPs)	0.01	0.00	0.01	-0.12	-0.06	-0.18	-0.17
Impact %	2.2	0.0	0.9	-30.5	-11.7	-19.6	-9.0

VI - Estimation of balancing and effective contribution rate

The next exercise is to estimate the contribution rate that would balance the system. That is, the contribution rate that would equalize the present value of the contributions and the present value of the benefits. The present value of the wages and earnings is calculated since the individual entered the labor market until his or her age of retirement. The Graphic below illustrates how the contributions and benefits are obtained[5].

Graphic 4
Balancing Contribution Rate



Balancing Contribution Rate= PVB / PVW

We have estimated the balancing contribution rate for the current situation (before Lula Reform), for the system approved in the Senate for the current workers, and for the system approved for the new entrants. The last two simulations answer the following question: how balanced would be the system if it had existed since the current closed population entered the labor market? Both simulations assume the occupation structure and earnings profiles are the same as the ones observed in the population 2001 and do not change due to the social security reform. Tables 6a to 6d present the results for the discount rates of 3% to 6% percent, respectively. For comparison purpose, we also included the effective contribution rate actually paid in each case. The effective rate is the present value of the contributions divided by the present value of the earnings.

In the current situation, informal workers do not contribute (effective tax rate is 0%) and the balancing tax rate would be 7.7%, using the discount rate of 3%. The private sector regime pays 22.5% and would required 17.1%. The public sector regime pays 15.5% and would require 67.3%. Clearly, the public sector regime is imbalanced, and the private sector regime is not imbalanced if the benefits for the informal workers were not included in this regime.

The Senate reform reduces the discrepancies in the public sector regime for the current workers rules, but the system is still not balanced. The public sector regime system adopted for the new entrants seems to be almost balanced.

[5] The procedure is similar to the one used by Desmet el al. (2003), to estimate the impact of changes in Social Security in Belgium.

Table 6a
Balancing and effective contribution rate
(Discount rate of 3%)

	Current Situation		Senate Reform		New Entrants	
	Balancing	Effective	Balancing	Effective	Balancing	Effective
Informal	7.7%	0.0%	7.7%	0.0%	7.7%	0.0%
INSS	17.1%	22.5%	17.3%	22.5%	17.4%	22.6%
Publ. Serv.	67.3%	15.5%	47.3%	18.9%	22.7%	17.2%
-Judiciary	59.1%	14.6%	42.0%	18.6%	22.0%	16.3%
-Legislative	57.7%	13.9%	40.9%	16.5%	22.0%	14.6%
-Executive	69.3%	16.2%	48.2%	19.6%	23.0%	17.8%
-Military	56.9%	8.5%	43.0%	11.0%	20.3%	11.0%
-Others	55.9%	19.4%	42.9%	23.8%	23.0%	22.1%

Table 6b
Balancing and effective contribution rate
(Discount rate of 4%)

	Current Situation		Senate Reform		New Entrants	
	Balancing	Effective	Balancing	Effective	Balancing	Effective
Informal	5.5%	0.0%	5.5%	0.0%	5.5%	0.0%
INSS	12.7%	22.5%	12.9%	22.5%	12.9%	22.6%
Publ. Serv.	49.8%	15.5%	34.8%	18.9%	16.5%	17.2%
-Judiciary	43.6%	14.6%	31.1%	18.6%	16.0%	16.3%
-Legislative	42.6%	13.9%	30.3%	16.5%	16.1%	14.6%
-Executive	51.3%	16.2%	35.5%	19.6%	16.7%	17.8%
-Military	42.0%	8.5%	31.9%	11.0%	14.8%	11.0%
-Others	41.0%	19.4%	31.4%	23.8%	16.6%	22.1%

Table 6c
Balancing and effective contribution rate
(Discount rate of 5%)

	Current Situation		Senate Reform		New Entrants	
	Balancing	Effective	Balancing	Effective	Balancing	Effective
Informal	3.9%	0.0%	3.9%	0.0%	3.9%	0.0%
INSS	9.4%	22.5%	9.5%	22.5%	9.5%	22.6%
Publ. Serv.	36.7%	15.5%	25.5%	18.9%	11.9%	17.2%
-Judiciary	32.0%	14.6%	22.9%	18.6%	11.6%	16.3%
-Legislative	31.3%	13.9%	22.3%	16.5%	11.7%	14.6%
-Executive	37.9%	16.2%	26.0%	19.6%	12.1%	17.8%
-Military	30.9%	8.5%	23.4%	11.0%	10.6%	11.0%
-Others	29.8%	19.4%	22.8%	23.8%	11.9%	22.1%

Table 6d
Balancing and effective contribution rate
(Discount rate of 6%)

	Current Situation		Senate Reform		New Entrants	
	Balancing	Effective	Balancing	Effective	Balancing	Effective
Informal	2.7%	0.0%	2.7%	0.0%	2.7%	0.0%
INSS	6.9%	22.5%	7.0%	22.5%	7.0%	22.6%
Publ. Serv.	27.0%	15.5%	18.6%	18.9%	8.6%	17.2%
-Judiciary	23.4%	14.6%	16.8%	18.6%	8.3%	16.3%
-Legislative	22.9%	13.9%	16.3%	16.5%	8.4%	14.6%
-Executive	27.9%	16.2%	18.9%	19.6%	8.7%	17.8%
-Military	22.5%	8.5%	17.1%	11.0%	7.6%	11.0%
-Others	21.6%	19.4%	16.4%	23.8%	8.4%	22.1%

VII - Final Remarks

Results provide two main conclusions. First, the reform originally proposed by the government has lost a significant part of its impact during the passage in the Congress. Particularly two changes have made the great part of the losses: the on that kept integrality and parity (in the House of Representatives), and the one that introduced a transition rule for minimum age of retirement (in the Senate). Even though, CA 41 will allow for a reduction in the implicit debt of about 8%. Taking into account the prevailing imbalances prior to reform, this reduction may be regarded as an expressive gain for the government and a progress towards transforming Brazilian Social Security into a more equitable system in the long run. Furthermore, it should be remarked that the reform was reached in the first year of Lula administration, a small period, when compared to previous attempts of other administrations.

Second, prior to the reform, balancing contribution rates in the public sector contrasted sharply with the effective rates. This is the hidden face of the deficit in the public sector system. After the reform, the balancing contribution rates have been reduced, particularly for the new entrants, and the resulting system will be a smaller burden to public finance. Thus, an important step has been made to introduce fairness in the Social Security system in Brazil.

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