

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Generational Accounting around the World

Volume Author/Editor: Alan J. Auerbach, Laurence J. Kotlikoff and Willi Leibfritz, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-03213-2

Volume URL: <http://www.nber.org/books/auer99-1>

Publication Date: January 1999

Chapter Title: Argentina's Generational Accounts: Is the Convertibility Plan's Fiscal Policy Sustainable?

Chapter Author: Marcelo F. Altamiranda, Laurence J. Kotlikoff, Willi Leibfritz

Chapter URL: <http://www.nber.org/chapters/c6687>

Chapter pages in book: (p. 103 - 140)

Argentina's Generational Accounts: Is the Convertibility Plan's Fiscal Policy Sustainable?

Marcelo F. Altamiranda

5.1 Introduction

In this chapter a set of generational accounts is constructed for Argentina. Subsequently, the resulting generational accounting framework is used to identify policies to achieve intertemporal government budget balance, the fiscal role played by the country's recent privatization program, and the fiscal impact of Argentina's recent social security reform.¹

Argentina's generational accounts indicate a huge intertemporal imbalance that is robust to reasonable variation in assumptions and implies that the nation's current fiscal policy put forward under the convertibility plan is unsustainable. Correcting this imbalance will require substantial cuts in government consumption and pension payments—cuts that are far beyond anything currently being debated.

The analysis of the generational accounting effects of the social security reform concludes that, most likely, the crisis in Argentina's long-term finances will not be solved solely by this reform. This is due to the fact that the social security reform constituted, to a large extent, simply a reclassification of government liabilities in which implicit government IOUs were made explicit; that is, the reform did not fundamentally reduce the government's long-term expenditure commitments.

Further, this chapter's generational accounting shows that the manner in which Argentine privatization receipts were spent dissipated a large amount of

Marcelo F. Altamiranda is Financial Manager for the AMCAM region at Philip Morris International, Inc.

The author thanks Laurence Kotlikoff for his helpful comments and constant support. He also thanks Alan Auerbach and Jan Walliser for their time, comments, and suggestions.

1. A more detailed study can be found in Altamiranda (1997).

government net wealth and has significantly contributed to the country's long-term generational imbalance.

5.2 Argentine Economic Policy

The current administration of President Menem took office on 9 July 1989, after the disastrous finale of the previous government of President Alfonsín. Alfonsín's electoral results, as well as his resignation, were intimately associated with the economic situation.

Argentina's economy suffered in 1989 its first hyperinflation caused by the lack of sustainable fiscal and monetary policies. In fact, we can say that Alfonsín's administration consistently failed to control public finances and trusted, instead, in heterodox policies. These policies produced, with low political costs, short-lived periods of low inflation. However, once economic agents learned from past errors these periods became shorter and finally hyperinflation and chaos hit the economy.

The first attempts of the present government to manage the fiscal situation were also unsuccessful (see table 5.1). As a result, the economy again got out of hand and the country was bashed by a second hyperinflation in 1990 (see table 5.2).

Finally, during 1991 the current—convertibility—stabilization plan, put forward by Domingo Cavallo as economy minister, was able to stabilize inflation. We turn now to a more detailed description of this plan and of its key fiscal policy tools.

5.2.1 The Convertibility Plan

The economic plan implemented in March 1991 was based on a law that established the convertibility of the austral at a rate of 10,000 australes per U.S. dollar and required full international reserve backing of the monetary base.² It is important to remark that the implication of this "full backing" requirement is that, once satisfied, the public sector must produce the necessary funds to meet total services and repayment of the internal debt, as well as of the external debt.³

The fiscal situation did not improve as fast as needed, but Cavallo was able to comply, on an "accounting basis," with the law by increasing the central

2. The central bank's holdings of U.S. dollar-denominated government bonds (BONEX) were included in the definition of reserves. This loose end, eventually, provided a way to create money to finance the public sector deficit. In September 1991, backing of the monetary base through these securities was limited to 10 percent of it.

3. These funds may come from overall operational balance (surplus), increases in the internal debt stock (which will affect its future servicing and repayment), and the sale of public sector assets. The external debt is net of external flows not associated with money creation like international reserve interest payments and loans from the International Monetary Fund (IMF), World Bank, or other multilateral organizations. Note also that the latter inflows affect future servicing and repayment of the external debt.

Table 5.1 Consolidated Nonfinancial Public Sector Accounts 1990–94 (percent of GDP)

	1990	1991	1992	1993	1994 ^a
Revenues	16.5	18.8	21.0	21.6	21.3
Federal government and enterprises ^b	13.8	15.8	17.2	17.4	17.3
Provincial governments ^c	2.7	3.0	3.8	4.2	4.0
Expenditures	20.6	22.0	21.4	21.5	22.5
Federal government ^d	16.5	18.3	17.4	16.4	17.8
Provincial governments	4.1	3.7	4.0	5.1	4.7
Wages	6.6	7.4	7.8	8.1	8.1
Pensions	4.0	5.0	5.6	5.1	5.4
Interest ^e	3.3	2.6	1.5	1.1	1.2
Other current	3.9	4.7	4.6	4.9	4.9
Capital	2.8	2.3	1.9	2.3	2.9
Overall balance	-4.1	-3.2	-0.4	0.1	-1.2
Federal government	-2.7	-2.5	-0.2	0.9	-0.5
Provincial governments	-1.4	-0.7	-0.2	-0.8	-0.8
Privatization receipts in cash	0.4	1.2	0.8	1.5	0.3

Source: International Monetary Fund.

Notes: Prior to 1994, only the balance of various social security operations is included on the revenue side of the national nonfinancial public sector. Since 1994, revenue and expenditures of these operations are included separately. Similarly, prior to 1994, the National Employment Fund is excluded from the accounts, but it is included since 1994. From 1994 onward, contributions to private pension funds are excluded.

^a1994 data for provincial governments are preliminary estimates.

^bIncludes enterprises' operating results; excludes privatization receipts.

^cOwn-revenue only, excludes revenue transfers received from federal government.

^dIncludes federal government transfers to provinces.

^eDoes not include capitalized interest on BOCONs (debt consolidation bonds).

Table 5.2 Inflation: Consumer Prices, 1989–94 (percent)

Month	1989	1990	1991	1992	1993	1994
January	8.92	79.20	7.70	3.04	0.83	0.10
February	9.59	61.57	26.99	2.15	0.73	-0.00
March	17.01	95.53	11.04	2.10	0.75	0.14
April	33.37	11.37	5.51	1.29	1.05	0.24
May	78.47	13.61	2.80	0.67	1.29	0.35
June	114.47	13.90	3.12	0.78	0.72	0.39
July	196.63	10.83	2.59	1.73	0.32	0.92
August	37.86	15.34	1.30	1.50	0.02	0.21
September	9.36	15.68	1.77	1.03	0.82	0.68
October	5.60	7.69	1.35	1.27	0.57	0.32
November	6.52	6.18	0.39	0.46	0.06	0.23
December	40.07	4.68	0.65	0.28	-0.01	0.22
Year	4,923.6	1,343.9	84.0	17.5	7.4	3.9

Source: Techint (various issues).

bank's BONEX⁴ holdings. However, compared with past experience, the imbalance size was not out of control.⁵ Furthermore, soon after the convertibility launching the government made clear its strategy of expanding and accelerating the privatization program to finance its deficit.⁶

The political scenario began to exert a strong influence on economic policy during 1992 because the government started to work toward presidential reelection. The reason was that the reelection implied as a prerequisite a constitutional amendment. Thus it created a climate of negotiation between Congress and the executive that slowed not only the approval of needed economic laws but also the degree of adjustment of public sector finances. However, public sector accounts improved as a result of the enhancement of tax collection, the revenues coming from the privatization of public enterprises, and the extremely low level of capital expenditure (see table 5.1).⁷

During 1992, the distribution of federal taxes between the federal government and the provinces was affected by a series of laws and decrees aimed at providing funds to increase social security payments.⁸ The changes had more impact on the provinces that relied heavily on federal funds.⁹ The issue was settled with an agreement signed in September that guaranteed for the provinces a minimum level of funds coming from federal taxes, established limits to provincial expenditure increases, and financed with federal government funds the increase in social security payments.

The public sector accounts showed better results in 1993 than in previous years thanks to improvement in the overall balance of the federal government and the increasing pace of the privatization program (see table 5.1). Furthermore, the tax reform continued to have beneficial effects on tax collection levels, as well as on tax composition; for example, the percentage of value-added tax (VAT) and income taxes in the total gross federal fiscal pressure went from 18.5 percent in 1989 to 48.2 percent in 1993.¹⁰

In 1994, the combination of public expenditure increase and revenue decline worsened public sector accounts (see table 5.1).¹¹

4. These bonds have a 10-year maturity date with an 18-month grace period and are repayable in quarterly installments with an interest rate equal to the six-month London Interbank Offer Rate.

5. E.g., BONEX holdings amounted on average during the first six months of the plan to 0.5 percent of GDP, which in light of the recent history of the public sector budget deficit was certainly an achievement.

6. A new currency, the convertible peso, began to circulate on 1 January 1992, replacing the austral. The replacement rate was 1 convertible peso per 10,000 australes.

7. External debt service also contributed to this situation as it experienced relief due to real exchange rate appreciation and the downward trend of international interest rates.

8. The provinces reached the point of initiating legal action in the Supreme Court of Justice regarding these decrees. These modifications were regarded as politically motivated.

9. The tax distribution change also benefited the Buenos Aires province.

10. A major step in this direction was the federal fiscal pact signed between the federal government and the provinces, which, among other things, implied the end of the turnover tax, its future substitution by a sales tax, and the reduction of employers' social security contributions.

11. Moreover, the upward trend in international interest rates limited government action regarding external financing.

In July, a new social security system that would replace the previous public pay-as-you-go system became operational. The new Integrated Pension System included an optional private capitalized pension system and a public pay-as-you-go system.

To summarize, we could say that the current government, perhaps motivated by necessity rather than by ideology, thoroughly addressed the fiscal problem. Fiscal policy during this administration attacked several fronts, among others: tax revenues, especially tax simplification and evasion; social security reform; privatization of state-owned enterprises; rationalization of the central government's administration; and provincial finances.

5.2.2 The New Integrated Pension System

The new Integrated Pension System (IPS) was enacted by law 24.241 on 23 September 1993 after a long and clumsy legislative process initiated on 2 June 1992, when the executive sent to the lower house of Congress its proposal to reform the social security system.¹² Throughout this process, representatives introduced several changes into the original version and the executive was obliged to accept various political compromises in order to speed up its approval, weakening the effectiveness of the reform.

The provincial and municipal social security systems were not affected by the sanctioned reform, which was designed for the National Social Security System.¹³ However, the provinces and the Municipality of Buenos Aires were invited to join the new system by the federal pact signed in August 1993.

The IPS became operational on 15 July 1994 with the following characteristics:¹⁴

- I. Affiliates: Participation is compulsory for dependent¹⁵ and self-employed workers.
- II. Retirement age: This was increased to 65 years for men and 60 years for women.¹⁶
- III. Revenues
 - A. Contributions:¹⁷ The employee's contribution to social security was raised to 11 percent. The employer's contribution remained at 16 percent (see previous percentages in table 5.3). However, it was reduced

12. For a detailed treatment of this legislative process, see Isuani and San Martino (1993, 1995a, 1995b).

13. The National Social Security System provides about 86 percent of Argentina's total pension benefits, see Administración Nacional de la Seguridad Social (ANSeS 1994, 5).

14. We include here the changes introduced to law 24.241 by the Social Security Solidarity Law (24.463), enacted 23 March 1995.

15. Except for the armed and security forces.

16. The previous retirement age requirement (men, 60 years; women, 55 years) is to be increased gradually until the year 2001.

17. The law establishes a minimum and a maximum social security taxable base equivalent to 3 and 60 times the Average Compulsory Pension Contribution (ACPC; Aporte Medio Previsional Obligatorio). For details about the ACPC, see n. 22 below.

Table 5.3 Contributions to the Social Security System, 1993 (percent)

	Employee	Employer	Total
Social Security	10.0	16.0	26.0
Pensioners' Health Insurance	3.0	2.0	5.0
Active Workers' Health Insurance	3.0	6.0	9.0
Family Allowances	–	7.5	7.5
National Employment Fund	–	1.5	1.5
Total	16.0	33.0	49.0

Note: The contribution of self-employed workers was 26 percent calculated on an earnings scale for activity categories established by government. Also it was deposited monthly. Notice that this is equivalent to fixed-amount monthly payments.

afterward, following the federal pact, in a differentiated manner for some sectors and/or regions of the country.¹⁸ Employees' contributions went to the systems chosen by them, while employers' contributions went in all cases to the public system.¹⁹

B. Earmarked taxes: These are entirely destined for the public system and consist of the following.

1. Personal assets tax
2. 11 percent of the VAT²⁰
3. 20 percent of the earnings tax net of the amount allocated to the operating expenses of the National Tax Office (Dirección General Impositiva)
4. 15 percent of coparticipation funds²¹

C. Additional revenues: These are determined annually by Congress in the National Budget Law.

IV. Public pension system

A. Basic Universal Pension (BUP; *Prestación Básica Universal*): Every worker has a right to the BUP, but subject to a minimum eligibility requirement of 30 years of contributions. The BUP goes from 27.5 percent of the average covered wage for 30 years of contributions to a maximum of 31.6 percent for 45 years of contributions.²²

18. It is estimated that the average value of the employer's contribution for 1995 was 14.4 percent.

19. The self-employed worker's contribution was raised to 27 percent, of which 16 percentage points went to the public system and the rest to the system chosen by the contributing worker.

20. Net of export drawback (tax rebates).

21. Coparticipation is the scheme for distributing federal taxes between the federal government and the provinces. In this case, to obtain the value to which to apply the 15 percent we need to deduct from the total amount of federal taxes that are shared the following items: VAT for social security, earnings tax for social security, and a further 16 percent of the earnings tax that is destined directly for the provinces.

22. The BUP is calculated as 2.5 times the ACPC. In turn, the ACPC is calculated twice a year (March and September) by dividing total contributions by the number of affiliates, but with a six-

- B. **Compensatory Pension (CP; Prestación Compensatoria):** The CP compensates workers for past contributions to the old system. It is calculated as 1.5 percent of the average indexed covered salary of the past 10 years before retirement for every year of contribution to the old system, with a maximum of 35 years; that is, the highest CP can be 52.5 percent of said average. Originally, the maximum CP was established at one times the ACPC per year computed of contribution to the old system. However, after the promulgation of the Social Security Solidarity Law, the role of the ACPC fundamentally changed, and consequently, the same happened to the maximum and minimum pension limits based on it. This law stated in its third article: "The National Budget law will determine the minimum and maximum amount of the public system pensions." Although there is no practical experience yet with the new pension system, one could anticipate that the limits established by the original law (24.241) will hold inasmuch as they fall in the range defined by the minimum and maximum values that will be set by the National Budget Law.
- C. **Additional Public Pension (APP; Prestación Adicional por Permanencia):**²³ The APP is for workers who choose to remain in, enter (in the case of new active workers), or return to the public system.²⁴ It is calculated as 0.85 percent per year of contribution to the new system using the same methodology as for the CP. This system also provides disability, survivorship, and advanced age pension benefits.
- V. **Public/private pension system:** Workers who choose to join the private pension funds managed by Pension Fund Administrators (PFAs; Administradoras de Fondos de Jubilaciones y Pensiones) will receive the following.
- A. BUP
 - B. CP (if applicable)
 - C. **Ordinary Pension (OP; Jubilación Ordinaria):** The OP functions as a defined-contribution scheme with individual capitalization accounts. It will be paid basically either in the form of a life annuity or as scheduled withdrawals based on the cumulative balance of each individual

month lag. Because the employee's contribution is 11 percent, one can say that the ACPC will amount to 11 percent of the average covered wage, and thus we get the mentioned 27.5 percent. Furthermore, since the BUP will increase by 1 percent for every additional year of contributions over 30 years up to a maximum of 45 years, the highest BUP possible is 31.6 percent of the average covered wage. However, note that as we comment below these maximum and minimum levels and their relationship with the ACPC were affected by the Social Security Solidarity Law.

23. A literal translation of this term would be "Additional Pension for Continuance." However, as new workers entering the labor force also have the choice of going to the public system and receiving this pension, we considered it more appropriate to call it the Additional Public Pension.

24. The last case refers to workers who, having chosen the private system, want to return to the public system. This option will be possible only, according to current legislation, until July 1996.

account. This system also provides disability and survivorship pensions in the form of defined-benefit payments, covered by group disability and term life insurance and paid in the same way as the OP.²⁵

VI. Indexation: Public system pensions will be adjusted annually according to National Budget Law guidelines.

VII. National guarantee: This guarantee covers the public pension system up to the amount provided for its financing by the National Budget Law.

5.2.3 The Privatization Program

The privatization of the public enterprise sector was not only a major component of current government economic reforms but also a core subject of its fiscal policy. Traditionally, this sector had an important share of the cash-flow public deficit. Moreover, public enterprises had been a key tool for government policy related to subsidies, employment, and prices.²⁶

By the end of the 1980s there were about 300 public enterprises, and 90 percent of them belonged to the nonfinancial sector. More than half of these firms were under federal jurisdiction and the rest under provincial and municipal jurisdiction.

The privatization program gained momentum in the 1990s, becoming ample in scope and expeditious in results. This process included sectors such as communications; commercial aviation; petrochemicals; oil production, refining, and distribution; electricity generation and distribution; natural gas transmission and distribution; defense; water and sewage; and others.²⁷

Privatization took the form of either transfer of ownership or granting of concessions. Moreover, employees remaining on the payroll of the privatized firms were eligible to participate in the Employee Ownership Program (Programa de Propiedad Participada—PPP) by means of which they could receive a percentage of the shares of those companies.²⁸ Additionally, a fraction of the privatization revenues was earmarked for the social security system, and provincial governments received shares of the restructured oil company, as well as a portion of the privatization revenues.

25. Disability and survivorship benefits for workers who switch to the private system will be prorated with the public system in proportion to the number of years of contribution to each system.

26. Subsidies were explicit and implicit; i.e., they originated either in government transfers of fiscal funds to cover public enterprises' deficits or in their pricing policies. Employment policies included public enterprises' regular staffing as well as politically nominated managers at several levels and political favors in the form of employment positions. The prices of public enterprises had been a major tool of most stabilization efforts; in this context, they generally were the first to be frozen and the last to be freed.

27. See Instituto Nacional de Estadística y Censos (INDEC 1995b) for a detailed list. The communications, oil, electricity, and natural gas sectors constituted the majority of the privatization transactions.

28. The percentage earmarked for employees was in most cases 10 percent, except for those companies whose size was too large relative to the number of employees, e.g., the natural gas company and hydroelectric power stations.

Several factors motivated the privatization policy, and certainly, none of them alone suffices to explain it. Among these factors we should mention efficiency; revenues;²⁹ elimination of explicit and implicit subsidies; easing of the public debt restraint; signaling to the domestic and international communities the political will to reform, modernize, and deregulate the economy; social attitudes toward the “perennial” inefficiency of Argentinean public enterprises;³⁰ and politicians’ time preferences, which favored the privatization revenue motive.³¹

In table 5.4 we present an overview of the privatization process. Total cash proceeds for the period 1990 to October 1994 are estimated at \$18.7 billion (U.S. dollars). This figure is composed of \$9.9 billion cash, \$6.2 billion cash-equivalent public debt reduction, and \$2.7 billion transferred liabilities. The face value of the public debt retired amounted to \$14.9 billion, implying an average discount of 41 percent.³²

Argentina’s privatization program revenues—\$18.7 billion—were concentrated mainly in four sectors: oil (32 percent), electricity (23 percent), telephones (19 percent), and natural gas (19 percent)—see table 5.4.

Table 5.5 shows the breakdown of capital ownership calculated on the basis of the net wealth value of the privatized companies. We observe that the federal and provincial governments still have stakes in those firms amounting to \$5.1 billion, about 19 percent of the total public net wealth privatized. Notice also that concessions represented approximately 50 percent of said net wealth. Finally, almost a quarter of the total public net wealth privatized was in the form of shares sold in local and foreign markets.

5.3 The Data

5.3.1 Population Projections

We obtained two sets of projections, one from the Argentinean government, prepared by the National Statistics Office (INDEC), and the other from the

29. Including the increase in taxes paid under private ownership by the new firms created from the former state companies.

30. The government’s inability to control public enterprises; public enterprises’ policy of zero investment, even for maintenance—aimed at controlling the fiscal accounts; and widespread problems with public enterprise services were together the straw that broke the camel’s back.

31. Politicians are in general deemed to have short-term planning horizons. By the 1990s, after the two hyperinflation episodes, politicians in Argentina might certainly have had shorter time horizons than elsewhere and, accordingly, stronger incentives to maximize immediate fiscal receipts. This might help to explain why, motivated by the short-run fiscal benefits, they favored the privatization program. See Castelar Pinheiro and Ross Schneider (1995) for a detailed presentation of this issue for Argentina, Brazil, Chile, and Mexico.

32. Note that total revenues considering the public debt retired at nominal value were \$27.5 billion. In addition, the estimated total net wealth value of the privatized companies was \$26.9 billion, calculating the ownership transfer as if it had been 100 percent.

Table 5.4 Privatization Program Results Overview, 1990 to October 1994 (millions of U.S. dollars)

Sector	Transfer Method	Cash	Cash Value Debt Securities	Transferred Liabilities	Total	Nominal Value Debt Securities	Total ^a	Net Wealth Value ^b
Telephones	Sale of shares	2,270.9	1,257.0	–	3,527.9	5,000.0	7,270.9	3,919.9
Airlines	Sale	260.0	483.0	–	743.0	1,610.0	1,870.0	891.6
Railroad	Concession	–	–	–	–	–	–	–
Electricity ^c	Sale/sale of shares	867.0	1,931.3	1,556.4	4,354.7	3,769.0	6,192.4	6,813.9
Ports	Concession/sale	9.8	–	–	9.8	–	9.8	9.8
Maritime transport	Sale	14.6	–	–	14.6	–	14.6	14.6
Roads ^d	Concession	–	–	–	–	–	–	–
Television and radio	Concession	–	–	–	–	–	–	–
Oil	Association/concession	2,060.2	–	–	2,060.2	–	2,060.2	3,220.3
National oil company	Sale of shares	3,040.0	884.0	–	3,924.0	1,271.1	4,311.1	6,710.8
Natural gas ^e	Sale/sale of shares	820.6	1,541.1	1,110.0	3,471.7	3,082.1	5,012.7	4,476.1
Water and sewage ^f	30-Year concession	–	–	–	–	–	–	–
Meat processing	Sale	1.9	–	–	1.9	–	1.9	1.9
Petrochemicals	Sale of shares	55.7	28.4	–	84.1	133.6	189.3	262.9
Shipbuilding	Sale	59.8	–	–	59.8	–	59.8	59.8
Steel	Sale	143.3	22.1	–	165.4	41.8	185.1	166.9
Electrical conductors	Sale	12.4	2.6	–	15.0	3.5	15.9	15.0
Other military plants	Sale	11.3	–	–	11.3	–	11.3	11.3
Financial sector	Sale	86.3	–	–	86.3	–	86.3	135.6
Buildings	Sale	202.5	–	–	202.5	–	202.5	202.5
Other	Sales	3.7	2.4	–	6.1	12.0	15.7	6.1
Total		9,920.0	6,151.8	2,666.4	18,738.2	14,923.1	27,509.5	26,919.0

Source: MEyOySP (1995a).

^aSum of cash; transferred liabilities and nominal value of debt securities.

^bTotal financial result calculated as if the transfer had been 100 percent.

^cIncludes sales of shares for \$230.6 million.

^dThe concessionaire must undertake investments.

^eIncludes sales of shares for \$520.6 million.

^fAwarded to bidder that offered the larger discount over the existing residential tariff (26.9 percent).

Table 5.5 Privatization Program: Capital Ownership in Privatized Companies, October 1994

Capital Ownership	Net Wealth Value	
	U.S. dollars (million)	%
Concession ^a	13,345	49.6
National firms	6,117	22.7
Foreign firms	7,026	26.1
Not classified ^b	203	0.8
Shares	5,848	21.7
Local market	3,192	11.9
Foreign markets	2,656	9.9
Other	7,726	28.7
PPP (Employee Ownership Program)	1,745	6.5
Federal and provincial government	5,097	18.9
BOCON exchange	884	3.3
Total	26,919	100.0

Source: MEyOySP (1995a).

^aIncludes transferred liabilities.

^bIncludes the sale of 999 government buildings.

World Bank.³³ The government's projections extend until the year 2050 and are available by age range (from ages 0–4 to 80+) and sex every five years starting in 1995. The World Bank's projections extend until the year 2150 and are available yearly by single age (from age 0 to 75+) and sex starting in 1995.³⁴

INDEC's data are based on more optimistic assumptions about population growth that include higher rates of fertility and life expectancy at birth and a positive net migration rate for part of the projected period. Thus the total population projected by INDEC for the year 2050 is 8.7 percent higher than the World Bank's projection.³⁵

We chose to use the World Bank's projection for Argentina's generational accounts because it covers a longer period of time. However, we still had to extend it until the year 2200 and disaggregate single ages from 75 up to 90+. In order to undertake this task we assumed first that fertility and mortality rates as well as the age structure after 2150 equal those projected for that year. We assumed next that the 1991 age structure for single ages from 75 to 90+ will

33. See INDEC (1994, 1995a, 1995c) and Bos et al. (1994). Note that the last population census in Argentina took place in 1991.

34. I wish to thank Eduard Bos from the World Bank for providing special and updated demographic tabulations for Argentina and Alejandro Giusti and Alberto Karmona from INDEC for providing the Argentinean government's projections.

35. The differences for the male and female population projections are 8.6 and 8.9 percent.

Table 5.6 Demographic Projections for Selected Age Ranges and Years

Year	Population (thousands)				Dependency Ratio (%)		
	Age 0-17	Age 18-64	Age 65+	Total	Elderly	Child	Total
1991	11,737	17,985	2,893	32,616	16.1	65.3	81.3
1994	11,831	19,174	3,213	34,218	16.8	61.7	78.5
1995	11,959	19,381	3,247	34,589	16.8	61.7	78.5
2000	11,554	21,122	3,541	36,215	16.8	54.7	71.5
2005	11,293	22,726	3,827	37,839	16.8	49.7	66.5
2010	11,130	24,291	4,184	39,603	17.2	45.8	63.0
2015	11,137	25,562	4,658	41,361	18.2	43.6	61.8
2020	11,533	26,248	5,220	43,006	19.9	43.9	63.8
2025	11,587	27,095	5,793	44,478	21.4	42.8	64.1
2030	11,482	27,933	6,376	45,796	22.8	41.1	63.9
2035	11,334	28,718	6,961	47,009	24.2	39.5	63.7
2040	11,301	29,115	7,728	48,148	26.5	38.8	65.4
2045	11,369	28,985	8,851	49,202	30.5	39.2	69.8
2050	11,449	28,880	9,811	50,137	34.0	39.6	73.6
2055	11,462	28,778	10,692	50,934	37.2	39.8	77.0
2060	11,425	28,740	11,410	51,574	39.7	39.8	79.5
2065	11,387	29,009	11,576	51,975	39.9	39.3	79.2
2070	11,384	29,213	11,664	52,261	39.9	39.0	78.9
2075	11,407	29,227	11,846	52,478	40.5	39.0	79.6
2080	11,423	29,156	12,096	52,674	41.5	39.2	80.7
2085	11,422	29,112	12,373	52,915	42.5	39.2	81.7
2090	11,410	29,164	12,577	53,153	43.1	39.1	82.2
2095	11,405	29,251	12,696	53,347	43.4	39.0	82.4
2100	11,404	29,308	12,792	53,506	43.6	38.9	82.6
2110	11,421	29,310	13,100	53,829	44.7	39.0	83.7
2120	11,410	29,337	13,356	54,101	45.5	38.9	84.4
2130	11,404	29,375	13,478	54,265	45.9	38.8	84.7
2140	11,410	29,375	13,597	54,386	46.3	38.8	85.1
2150	11,401	29,391	13,703	54,504	46.6	38.8	85.4
2160	11,427	29,458	13,734	54,628	46.6	38.8	85.4
2170	11,453	29,525	13,766	54,753	46.6	38.8	85.4
2180	11,479	29,593	13,797	54,878	46.6	38.8	85.4
2190	11,505	29,660	13,829	55,003	46.6	38.8	85.4
2200	11,532	29,728	13,860	55,129	46.6	38.8	85.4

be the same throughout the projection period (INDEC 1993). Population data for the base year 1994 were obtained following a similar procedure.

Table 5.6 contains a summary of the population data. The share in the total population of people over age 65 goes from 9.4 percent in 1995 to 25.1 percent in 2200, and the dependency ratio goes from 0.17 in 1995 to 0.47 in 2200. Thus, while in 1995 there are about six active workers per pensioner, the projected figure for 2200 decreases to about two active workers per pensioner.³⁶

36. Note also that the share in the total population of people under age 17 decreases from 34.6 percent in 1995 to 20.9 percent in 2200.

We will analyze the impact of this projected aging of Argentina's population when performing the sensitivity analysis.

5.3.2 Government Revenues, Consumption, and Net Wealth³⁷

We excluded from our definition of the total public sector the municipalities³⁸ and social works institutions (*obras sociales*).³⁹ The main reason for this exclusion is that we could not obtain reliable statistics on their revenues. Table 5.7 presents in detail government revenues and expenditures.⁴⁰

When implementing Argentina's generational accounts, we will impute the federal stamp tax and the permanent component of both other taxes and nontax revenues as negative government consumption. Further, we will not consider the capital revenues originating from the privatization program; thus we will be assuming that they will not be replicated in the future.

Finally, we estimated government net wealth at $-\$78.3$ billion. This estimate deducts from the stock of total public debt at the end of December 1994 ($\$83.4$ billion)⁴¹ the value of the privatized public enterprises in the hands of the federal and provincial governments ($\$5.1$ billion).⁴²

5.3.3 Tax and Transfer Profiles

Argentina has a household survey (Encuesta Permanente de Hogares) that is conducted twice a year, May and October, interviewing 4,512 urban households located in the capital city, the suburbs, and 26 upcountry cities.⁴³ The sur-

37. I wish to thank Guillermo Barris from Dirección Nacional de Investigaciones y Análisis Fiscal and Cynthia Moskovits and Nuria Susmel from Fundación de Investigaciones Económicas Latinoamericanas (FIEL) for providing the data used in this section.

38. Except for the Buenos Aires province municipality, whose revenues and expenditures in the official statistics are reported jointly with those of the provinces themselves.

39. Social works institutions are mostly private; however, their revenues come from tax proceeds. Thus the health services to active workers that they provide should be considered part of the government's health transfers.

40. It should be remarked that unlike public revenues, there is more ample information on government expenditures. See Flood, Gasparini, et al. (1994) and Ministerio de Economía y Obras y Servicios Públicos (MEyOySP [1994a], [1994b], [1995b]). We included on the revenue side the seigniorage that the government collects on private holdings of money balances. We measured it as the change in the nominal M1 stock between December 1994 and December 1993. Note that the seigniorage is usually measured by the change in the central bank's noninterest bearing liabilities, i.e., the monetary base. In Argentina, due to the existence of high and remunerated reserve requirements, M1 is generally used instead of the monetary base to calculate seigniorage.

41. See MEyOySP, Secretaría de Hacienda (1994:IV). We assumed for the baseline case that the debt with pensioners originating from the legally challenged underpayment of pension benefits was totally consolidated after the payments made by the government in 1991 and 1993.

42. See MEyOySP (1995a). Note that we are not considering the value of public infrastructure and of public enterprises that are still completely in the government's hands. Thus we are using a sort of net financial wealth measure. As mentioned by Auerbach, Gokhale, and Kotlikoff (1994), this is not a serious omission because we include neither the value of the assets nor the value of their implicit rents, and they offset each other.

43. The sample was selected by a two-stage probabilistic process. Its starting size of 6,328 households reduces to 4,512 once uninhabited households and households that did not want to participate are discounted. For details, see INDEC (1990, n.d.).

The 26 upcountry cities include almost all provincial capital cities. The surveyed areas contain about 60 percent of Argentina's population.

Table 5.7 Total Public Sector: Revenues and Expenditures, 1994
(billions of pesos)

Revenues		Expenditures	
Current	60.3	Pensions and other benefits ^c	19.8
Tax revenues	54.7	Pensioners: health and other benefits	2.6
Federal taxes	45.1	Health	4.1
Income	5.8	Education	8.9
Assets	0.4	Housing	1.2
VAT	16.2	Government consumption	24.7
Excise	2.4	Other social and human resources	6.3
Foreign trade	2.9	Government administrative	13.0
Federal stamp	0.1	Public enterprises and infrastructure	5.4
Personal assets	0.2	Public debt	4.5
Liquid fuels	2.1		
Electricity consumption	0.2		
Social security contributions	12.7		
Special tobacco fund	0.2		
Other	2.0		
Provincial taxes	9.6		
Nontax revenues	5.6		
Federal	3.9		
Provincial	1.8		
Capital	1.2		
Federal ^a	0.8		
Provincial	0.3		
Other revenues ^b	0.8		
Seigniorage	2.1		
Deficit	1.5		
Total	65.9	Total	65.9

Sources: MEyOySP ([1994b], [1995b]); Dirección Nacional de Investigaciones y Análisis Fiscal (National Direction of Fiscal Research and Analysis); FIEL.

Note: Exchange rate used throughout chapter is 1 peso per U.S. dollar.

^aPrivatization cash revenues.

^bIncludes Pensioners Institute (PAMI).

^cOther benefits include discounts on utilities and public transportation and waiver of municipal taxes for certain pension-income groups, burial subsidy, etc.

vey covers six topics, gathering demographic, employment, migratory, housing, educational, and income information.

Income data is net of taxes and social security contributions. Income sources, differentiated in the questionnaire but not reported, are wage, self-employment, profits, rents, return on financial assets, dividends, pensions, and other. Income is used in the survey mainly to classify other information in order to assess the population's socioeconomic situation. Several tables using income in this manner are published; however, data by age and sex are not released. Nevertheless, with access to the database, it is possible to cross-match publicly available information on sex and age from the family questionnaires

Table 5.8 Tax and Transfer Profiles

Tax or Transfer	Profile
Tax	
Labor income	Argentina's income
Capital income	Argentina's income
Assets	Argentina's income
Personal assets	Argentina's income
Seigniorage	Argentina's income
VAT	West Germany's VAT 14%
Excise	West Germany's excise
Special tobacco fund	West Germany's excise
Foreign trade	Thailand's import duties
Liquid fuels	New Zealand's fuel
Electricity consumption	Argentina's income
Social security contributions	Argentina's income
Provincial	Argentina's income
Transfer	
Pensions and other benefits	Argentina's pension payments
Pensioners: health and other benefits	Argentina's pension payments
Health	New Zealand's health
Education	New Zealand's education
Housing	New Zealand's housing

and income from the individual questionnaires. From this information we were able to construct income profiles.⁴⁴

It is important to remark that the problem associated with income information obtained by any survey in Argentina is under/overstatement by the participants. Moreover, income data are in general questioned on statistical significance grounds, and government officials frequently claim that this is the reason they are not published regularly. We tried to ameliorate these problems by working with a weighted average of series from three consecutive surveys.⁴⁵

Regarding transfers, the only available figures are the average pension payments by age range and sex constructed by the social security secretary of the Ministry of Labor and Social Security. From these figures we constructed the average profiles.

Table 5.8 summarizes the assignment of profiles. In the case of taxes and transfers that did not have profiles available to assign we used those for similar

44. In Argentina individual information from the questionnaires is confidential by law. For this reason, access to the database is restricted and the information provided is limited.

It was not possible to obtain income information disaggregated by source. I wish to thank Silvia Montoya and Andrés Teach from IEERAL–Fundación Mediterránea for providing the income data by age and sex used to construct these profiles. Note that we are talking about average profiles across all members of the generation alive in the base year.

45. The average is weighted by the number of observations.

concepts available for other countries that have had generational accounts performed to date.⁴⁶

5.3.4 Labor and Capital Income Tax

The net income tax is levied on companies, individuals, and undivided states' earnings. It can be considered, in practice, a tax on labor and capital income. Although only the total revenue figure is reported (\$5.82 billion for 1994), 62 percent of it can be classified as tax on capital income—specifically on individual capital income and corporate profits.

As explained, we have neither profiles for capital and labor income taxes nor profiles for capital and labor income separately. However, as we can differentiate between capital and labor income tax revenues, we will consider these taxes separately in the calculation of the baseline generational accounts and use Argentina's total income profile to allocate them.⁴⁷ We will also perform a sensitivity experiment using the U.S. capital income tax profile and Argentina's total income profile for capital income tax and labor income tax, respectively.

Additionally, we will analyze within the latter sensitivity experiment the impact of the capital income tax adjustment. This adjustment accounts for the fact that taxes on capital income require the consideration of factors that imply differential tax treatment of new relative to existing capital assets.

Using the formula derived by Auerbach et al.,⁴⁸ we estimate that the 1994 flow of capital income taxes overstated the capital income tax burden on new investment by \$0.285 billion and that the capitalized value of excess taxes on existing assets amounts to \$40.7 billion.⁴⁹ These figures are calculated by multiplying the value of the capital stock (\$503.3 billion)⁵⁰ by our estimates of the correction from average to effective tax rates (0.057 percent) and of the tax-based discount on existing assets (8.1 percent). These calculations are based on the following data: (1) investor's marginal tax rate, 28 percent; (2) investor's required after-tax return, 4 percent; (3) investment economic rate of depreciation, 5 percent; (4) investment growth rate, 3.3 percent; and (5) inflation rate, 4 percent.⁵¹

46. I wish to thank Jan Walliser for providing these profiles.

47. Note that this experiment is in line with the adjustment suggested by Fehr and Kotlikoff (chap. 3 in this volume) for a small open economy.

48. See Auerbach et al. (1991, 67–69 and appendix) for a detailed exposition of this method.

49. In the sensitivity experiment, we subtract the \$0.285 billion figure from current capital income taxes and assign the \$40.7 billion amount as a one-time tax to 1994 cohorts according to the corresponding profile.

50. The value of Argentina's total capital stock for 1994 is \$909.2 billion. This figure includes capital equipment, residential capital, industrial buildings and structures, and public infrastructure. We deducted the amounts that correspond to public infrastructure (27 percent of the total) and to owner-occupied housing (17.6 percent of the total) in order to estimate the value of capital stock used for the capital income tax adjustment. The first figure is based on FIEL's estimations, and the second assumes, based on data from the population census (see INDEC 1995b), that 84 percent of residential capital is occupied by owners.

51. The investment economic rate of depreciation (3) corresponds to the annual average depreciation rate of the capital stock considered; the investment growth rate (4) corresponds to the annual average capital growth rate.

Table 5.9 Generational Accounts: Central Assumptions (present values in thousands of U.S. dollars)

Generation's Age in 1994	Net Payment		
	Total	Males	Females
0	13.9	21.8	5.7
5	15.7	25.1	6.1
10	20.3	31.7	8.5
15	26.3	39.9	12.4
20	30.8	46.2	15.2
25	31.6	49.1	13.7
30	28.2	46.6	9.8
35	21.6	39.8	4.0
40	12.6	28.8	-2.8
45	1.5	15.0	-11.7
50	-11.3	-0.8	-21.5
55	-25.2	-17.9	-32.0
60	-39.9	-37.5	-42.1
65	-42.9	-42.1	-43.5
70	-43.0	-41.6	-44.0
75	-41.2	-40.0	-42.0
80	-34.3	-32.0	-35.8
85	-32.5	-28.8	-34.4
90	-7.1	-6.6	-7.3
Future generations	24.3		
Percentage difference	74.8		

Note: Central assumptions are a growth rate of 1.5 percent and a discount rate of 5 percent.

5.3.5 Discount and Productivity Growth Rates

On top of the central assumptions used in this book, we will analyze a particular baseline case for Argentina that assumes an 8 percent discount rate and a 1 percent growth rate. This real discount rate is between the real internal rate of return on the BONEX 89 and the real prime lending rate in U.S. dollars, both for 1994; and the productivity growth rate is in line with the evolution of average productivity during the past two decades.

5.4 Basic Findings and Sensitivity Analysis

5.4.1 Basic Results

Tables 5.9 through 5.12 present 1994 generational accounts for the central assumptions and the special baseline cases. These tables were constructed, as said above, for real discount rates (r) of 5 and 8 percent and growth rates (g) of 1.5 and 1 percent and under the assumption of no social security reform.⁵² The rationale for the latter assumption is that the new IPS became operational

52. All 1994 dollar values were expressed in 1995 dollars using the U.S. CPI.

Table 5.10 Composition of Generational Accounts: Central Assumptions (present value of receipts and payments in thousands of U.S. dollars)

Generation's Age in 1994	Tax Payments								Transfer Receipts				
	Net Payment	Labor Income Taxes	Capital Income and Assets Taxes	Seigniorage	VAT	Excise, Fuel, and Electricity Taxes	Duties	Social Security Contributions	Provincial Taxes	Social Security Benefits	Health	Education	Housing
0	13.9	1.4	2.7	1.3	12.9	3.2	2.2	8.0	6.1	11.0	3.1	8.8	0.8
5	15.7	1.6	3.1	1.5	13.0	3.7	2.4	9.4	7.1	12.5	2.8	9.7	1.0
10	20.3	2.0	3.7	1.9	13.7	4.4	2.6	11.3	8.5	15.0	3.1	8.4	1.2
15	26.3	2.4	4.3	2.2	14.1	5.2	2.7	13.4	10.1	17.0	3.4	6.3	1.4
20	30.8	2.6	4.9	2.5	13.5	5.7	2.6	15.1	11.4	19.2	3.4	3.2	1.5
25	31.6	2.9	5.3	2.7	13.6	5.9	2.6	16.6	12.5	23.3	3.6	2.0	1.5
30	28.2	2.9	5.4	2.7	13.1	5.9	2.5	16.8	12.6	27.0	3.7	1.5	1.4
35	21.6	2.8	5.1	2.6	12.6	5.4	2.3	15.9	12.0	31.1	3.8	1.2	1.2
40	12.6	2.6	4.7	2.4	12.2	4.9	2.1	14.6	11.0	36.0	3.8	0.9	1.0
45	1.5	2.2	4.1	2.1	11.3	4.3	1.9	12.7	9.6	41.3	3.9	0.5	0.9
50	-11.3	1.9	3.4	1.6	10.2	3.6	1.6	10.4	7.8	46.8	4.0	0.2	0.7
55	-25.2	1.4	2.7	1.3	8.9	3.1	1.4	8.3	6.3	53.9	4.1	0.0	0.6
60	-39.9	1.1	2.3	1.1	7.6	2.5	1.2	6.8	5.1	62.8	4.3	0.0	0.5
65	-42.9	0.9	1.7	0.8	6.1	1.9	1.0	5.4	4.1	59.9	4.5	0.0	0.4
70	-43.0	0.7	1.4	0.7	4.5	1.3	0.8	4.3	3.2	55.6	4.0	0.0	0.3
75	-41.2	0.6	1.0	0.5	3.4	1.0	0.7	3.3	2.5	49.9	4.1	0.0	0.2
80	-34.3	0.4	0.7	0.4	2.3	0.6	0.5	2.3	1.7	40.2	3.1	0.0	0.2
85	-32.5	0.3	0.6	0.3	1.9	0.5	0.4	2.0	1.4	36.8	2.9	0.0	0.2
90	-7.1	0.1	0.1	0.1	0.4	0.1	0.1	0.3	0.2	7.8	0.6	0.0	0.0
Future generations	24.3												
Percentage difference	74.8												

Note: Central assumptions are a growth rate of 1.5 percent and a discount rate of 5 percent.

Table 5.11 Generational Accounts: Special Baseline (present values in thousands of dollars)

Generation's Age in 1994	Net Payment		
	Total	Males	Females
0	5.1	7.3	3.0
5	6.4	9.5	3.3
10	10.5	14.9	5.9
15	16.5	22.7	10.0
20	23.4	31.7	15.0
25	27.1	37.6	16.5
30	27.1	39.1	15.2
35	24.5	37.1	12.2
40	19.3	31.1	8.1
45	11.6	21.7	1.7
50	1.6	9.5	-6.0
55	-10.5	-5.1	-15.5
60	-25.8	-24.9	-26.6
65	-31.2	-31.9	-30.6
70	-33.9	-33.8	-33.9
75	-34.3	-34.1	-34.4
80	-30.1	-28.4	-31.1
85	-29.8	-26.7	-31.6
90	-7.1	-6.6	-7.3
Future generations	12.7		
Percentage difference	146.1		

Note: Special baseline assumptions are a growth rate of 1 percent and a discount rate of 8 percent.

by law on 15 July 1994. Thus, not only because of the nature of the reform implied by the IPS but also because of the way in which it took place, we can safely assume that the fiscal statistics of 1994 do not reflect any major change due to it.

Afterward, we will simulate a case that assumes the social security reform fully operational. In this way, comparing the two cases, we will be able to study the effects on generational accounts of the social security reform.

The accounts in tables 5.9 and 5.11 indicate the average amount an individual belonging to a specific age cohort will pay in net taxes (net payment) over the rest of his or her life. For example, under the central assumptions the projected present value net payments of 40-year-old individuals are \$12,600, \$28,800, and -\$2,800 for the total, males, and females, respectively. The corresponding values for the special baseline case are \$19,300, \$31,100, and \$8,100.⁵³

Moreover, these tables show that net payments present a life cycle pattern,

53. The difference in net payments between males and females arises because the latter earn less and therefore pay less income taxes and social security contributions.

Table 5.12 Composition of Generational Accounts: Special Baseline (present value of receipts and payments in thousands of U.S. dollars)

Generation's Age in 1994	Net Payment	Tax Payments							Transfer Receipts				
		Labor Income Taxes	Capital Income and Assets Taxes	Seigniorage	VAT	Excise, Fuel, and Electricity Taxes	Duties	Social Security Contributions	Provincial Taxes	Social Security Benefits	Health	Education	Housing
0	5.1	0.4	0.7	0.4	6.5	0.9	1.0	2.3	1.7	1.2	1.5	5.8	0.3
5	6.4	0.5	1.0	0.5	6.7	1.3	1.1	3.1	2.4	1.6	1.1	7.1	0.4
10	10.5	0.7	1.4	0.7	7.3	1.9	1.4	4.4	3.4	2.3	1.3	6.7	0.5
15	16.5	1.1	2.1	1.0	7.8	2.7	1.5	6.2	4.7	3.1	1.5	5.1	0.7
20	23.4	1.4	2.7	1.3	7.8	3.2	1.5	8.2	6.3	4.1	1.5	2.6	0.9
25	27.1	1.7	3.2	1.6	8.0	3.6	1.5	9.9	7.5	5.8	1.7	1.5	1.0
30	27.1	1.9	3.5	1.7	7.9	3.8	1.5	10.7	8.0	7.8	1.9	1.2	0.9
35	24.5	1.9	3.5	1.7	7.9	3.6	1.4	10.7	8.0	10.6	2.0	1.0	0.8
40	19.3	1.7	3.3	1.6	8.0	3.4	1.4	10.2	7.6	14.5	2.1	0.8	0.7
45	11.6	1.6	3.0	1.4	7.8	3.1	1.2	9.2	6.9	19.4	2.2	0.5	0.6
50	1.6	1.3	2.5	1.2	7.3	2.7	1.1	7.6	5.8	24.8	2.4	0.2	0.5
55	-10.5	1.0	2.1	1.0	6.6	2.4	1.0	6.2	4.7	32.4	2.6	0.0	0.5
60	-25.8	0.9	1.7	0.8	5.9	2.0	0.9	5.2	3.9	43.8	2.9	0.0	0.4
65	-31.2	0.7	1.4	0.7	4.9	1.5	0.8	4.3	3.3	45.1	3.4	0.0	0.3
70	-33.9	0.6	1.1	0.6	3.7	1.1	0.7	3.6	2.7	44.6	3.2	0.0	0.2
75	-34.3	0.5	0.9	0.4	2.9	0.8	0.6	2.8	2.2	41.8	3.5	0.0	0.2
80	-30.1	0.3	0.6	0.3	2.1	0.6	0.4	2.1	1.5	35.3	2.7	0.0	0.2
85	-29.8	0.3	0.6	0.3	1.6	0.5	0.4	1.9	1.3	33.8	2.7	0.0	0.2
90	-7.1	0.1	0.1	0.1	0.4	0.1	0.1	0.3	0.2	7.8	0.6	0.0	0.0
Future generations	12.7												
Percentage difference	146.1												

Note: Special baseline assumptions are a growth of 1 percent and a discount rate of 8 percent.

characterized by younger generations making positive payments to the government over their remaining lifetimes and older generations being net beneficiaries of government transfers. Note that under the central assumptions, males aged 50 or older and females aged 40 or older have negative generational accounts; that is, in present value they can expect to receive more from future transfers than they pay in taxes.⁵⁴ The change of sign in the generational accounts occurs at age 55 for males and age 50 for females in the special baseline case.

Tables 5.10 and 5.12 present in detail the present values of each of the various tax payments and transfer receipts. From them, we can further qualify 40-year-old total net payments. In the central assumption case, the generational account (\$12,600) reflects the difference between total projected present value of tax payments (\$54,500) and total projected present value of future transfers (\$41,700).⁵⁵ For the special baseline assumptions these figures are \$19,300, \$37,300, and \$18,100.

In addition, we estimate that under the central assumptions newborn generations in 1994 will pay \$13,900 in present value over their entire lifetimes while future generations will pay a (estimated) growth-adjusted amount of \$24,300, which is about 75 percent larger. The corresponding amounts for newborn and future generations in the special baseline case are \$5,100 and \$12,700, with an imbalance of 146 percent. These differences indicate that—in both cases—under our assumptions regarding Argentina's fiscal policy, there is a huge generational imbalance. This imbalance implies that future Argentinean generations will have to pay on average net taxes that are 1.8 to 2.5 times larger, after adjusting for growth, than the ones current generations are estimated to pay if they continue to be subject to the 1994 fiscal policy for the rest of their lives.

5.4.2 Sensitivity Analysis

Discount and Growth Rates

In table 5.13 we present the percentage difference between newborns' and future generations' net payments for different combinations of discount rate and growth rate. As the table indicates, the extent of the generational imbalance is quite sensitive to discount and growth rate assumptions. For discount rates larger than 5 percent we observe that the larger the discount rate the larger the difference between accounts of current and future generations, while the effect of growth rates does not show a clear trend. Thus, according to these results, future generations of Argentineans will pay, in present value, net taxes that range from 1.7 to 7.5 times the amount 1994 newborn Argentineans are expected to pay, given the current policy. Note that all the combinations confirm the imbalance of Argentina's fiscal policy.

54. Note that social security benefits are the main factor that explains the change in sign of the generational accounts.

55. Here and in similar comments below, differences are due to rounding off.

Table 5.13 Sensitivity Analysis: Net Tax Payments of Newborn and Future Generations (thousands of U.S. dollars)

	<i>g</i> = 0.5					<i>g</i> = 1					
	<i>r</i> = 3	<i>r</i> = 5	<i>r</i> = 7	<i>r</i> = 9	<i>r</i> = 11	<i>r</i> = 3	<i>r</i> = 5	<i>r</i> = 7	<i>r</i> = 8	<i>r</i> = 9	<i>r</i> = 11
Present generation	16.5	10.8	6.0	3.2	1.6	17.0	12.3	7.0	5.1	3.8	2.0
Future generations	30.9	18.9	13.4	11.8	12.3	35.0	21.4	14.3	12.7	11.9	12.1
Generational imbalance (%)	88.3	76.2	123.4	272.3	645.3	105.4	73.7	104.0	146.1	217.0	508.8
	<i>g</i> = 1.5					<i>g</i> = 2					
	<i>r</i> = 3	<i>r</i> = 5	<i>r</i> = 7	<i>r</i> = 9	<i>r</i> = 11	<i>r</i> = 3	<i>r</i> = 5	<i>r</i> = 7	<i>r</i> = 9	<i>r</i> = 11	
Present generation	16.5	13.9	8.2	4.4	2.4	13.8	15.3	9.6	5.2	2.8	
Future generations	39.0	24.3	15.6	12.2	11.9	42.5	27.7	17.3	12.7	11.8	
Generational imbalance (%)	137.3	74.8	90.1	174.6	402.0	207.8	79.7	80.9	142.4	318.6	

This table also shows that the *sizes* of generational accounts are sensitive to the values assumed for the discount and growth rates. The sizes of generational accounts are lower in absolute value the higher the discount rate. For growth rates the relationship again is not as clear.

Other Assumptions

Table 5.14 presents sensitivity results for changes in several assumptions. This analysis is performed for the central assumptions and the special baseline case.

The first experiment analyzes the case that uses the U.S. profile for the capital income tax. Although the size of the generational imbalance is sensitive to this change of profile, our conclusion that Argentina's fiscal accounts show a huge generational imbalance is robust to it. Then the inframarginal capital income tax adjustment is performed,⁵⁶ resulting in a reduction of the generational imbalance. Nevertheless, the size of this imbalance is still very significant. Finally, this adjustment is examined for the case that uses Argentina's total income tax profile for the capital income tax, with similar results.

The second experiment considers the effects of assuming no future demographic change will occur in Argentina; that is, we assume the population age distribution will be constant after 1994. This experiment helps to explain the impact of the aging process, the main feature of the Argentinean population's future development. The conclusion is that if the population structure were to remain constant, younger generations would be better off and the generational imbalance would be significantly smaller in the central assumption case and smaller, though still huge, in the special baseline case.⁵⁷

Third, we analyze the impact of government debt. If we assume no government debt, the generational imbalance is much smaller in the central assumption case, while in the special baseline case the reduction is so important that the imbalance changes sign and is in absolute value almost the same as for the central assumptions.

The last sensitivity test studies the impact of considering government educational expenditure as part of government consumption instead of a transfer. This increases the burden of the newborn generation relative to future generations and, thus, reduces the imbalance in both cases, though more in the special baseline case.

56. The adjustment calculated here was intended as a maximum. This is due mainly to the assumed level of the investor's required after-tax return, which is low in view of the high risk that international investors still assign to Argentina. Note that a 10 percent after-tax return implies a capitalized value of excess taxes on existing assets of about \$10 billion.

57. Note that in the cases where the population structure is not constant, younger generations will bear the fiscal burden of the demographic change.

Table 5.14 **Sensitivity Analysis: Other Assumptions (thousands of U.S. dollars)**

	Central Assumptions			Special Baseline		
	Present Generation	Future Generations	Generational Imbalance (%)	Present Generation	Future Generations	Generational Imbalance (%)
Base case	13.9	24.3	74.8	5.1	12.7	146.1
Capital income tax						
U.S. profile	13.6	23.3	72.1	4.9	12.3	149.8
U.S. profile and inframarginal adjustment	13.5	21.6	61.2	4.9	8.2	68.7
Argentina total income profile and inframarginal adjustment	13.7	22.5	63.9	5.1	8.6	68.8
Population structure	14.7	15.0	1.7	4.6	10.2	119.8
Zero debt	13.9	19.6	41.0	5.1	3.2	-38.0
Government educational expenditure as government consumption	22.7	36.1	58.6	10.9	20.1	84.4

Table 5.15 Burden Equalization Experiment: Central Assumptions

Policy	Required Adjustment (%)
All taxes ^a	8.7
VAT	30.0
Social security contributions	34.6
Provincial taxes	45.9
Labor and capital income taxes	75.7
Capital income tax	122.1
Labor income tax	199.3
All transfers	11.0
Social security benefits ^b	17.7
Government consumption	29.1

^aThe required adjustment for all taxes including the seigniorage is 8.4 percent.

^bIncludes pensions and other benefits; see table 5.7.

5.5 The Generational Impact of Alternative Policies

5.5.1 Impact of Policies Needed to Achieve Generational Balance

In this section we will calculate the magnitude of the immediate and permanent increase in alternative tax revenues, or reduction in alternative transfers or government expenditure, required to achieve generational balance (or intertemporal budget balance).⁵⁸ Note that these adjustments are alternative ways to evaluate the size of the generational imbalance.

In tables 5.15 and 5.16 we present a list of alternative policies, relative to our central assumptions and baseline projected time path of revenues and expenditures, required to restore Argentina's generational balance. For example, in the special baseline case of the VAT an increase in revenues of 22.8 percent is required for this purpose.⁵⁹ It is important to remark that the adjustment needed is in revenues and that the target can be attained not only by increasing the average taxation rate but also by reducing the degree of tax evasion, or by a mix of both effects.⁶⁰

The list of policies also considers increases in all taxes, in social security contributions, in provincial taxes, and in different combinations of income taxes, as well as reductions in all transfers, social security benefits, and government consumption. The magnitude of the required adjustments is, obviously, associated with the weight of the policy instrument chosen within total reve-

58. Note that this is a partial equilibrium statement. In other words, it ignores the effect that changes in taxes, transfers, or government expenditure might have on the country's economic performance, as well as the feedback impact of any modification of this performance on said variables.

59. Note that this huge increase in VAT revenues, equivalent in 1994 to 1.3 percent of GDP, will just restore generational balance.

60. Tax evasion still plays a crucial role in Argentina's fiscal accounts.

Table 5.16 **Burden Equalization Experiment: Special Baseline**

Policy	Required Adjustment (%)
All taxes ^a	6.7
VAT	22.8
Social security contributions	27.2
Provincial taxes	36.1
Labor and capital income taxes	59.5
Capital income tax	96.0
Labor income tax	156.6
All transfers	9.4
Social security benefits ^b	16.1
Government consumption	22.0

^aThe required adjustment for all taxes including the seigniorage is 6.5 percent.

^bIncludes pensions and other benefits; see table 5.7.

nues or expenditures. Furthermore, while the impact on future generations is fairly similar whichever policy instrument is used, the distribution of the additional net payment burden across current generations is sensitive to the choice of tax or transfer instrument.

One interesting feature to note is that the huge Argentinean generational imbalance is associated with adjustments needed for certain policy instruments that are not reasonable. In this sense, for example, the increases in labor or capital income taxes alone are certainly not feasible. Likewise, the increases required for provincial taxes, social security contributions, and VAT are huge enough to raise doubts about the reasonability of applying them in practice.

Thus we are left with few choices, mainly social security benefits and government consumption.⁶¹ Regarding these instruments, on the one hand, the social security benefits issue was already addressed by current economic authorities with the social security reform, and we will analyze it below. On the other hand, the huge reduction needed in government consumption, about 1.3 percent of GDP in 1994, needs further qualification. First, government expenditure in Argentina proved to be extremely—"politically"—rigid downward even after the numerous "announcements" of reductions and reforms made by the current government. Second, our concept of government consumption includes primarily salaries, and thus its required reduction implies a drastic head count cutback. Third, the social consequences of such adjustment should be taken into consideration, and a comprehensive program would unquestionably be required. Finally, expenditure reductions applied to provincial finances would have to take into account their individual situations and would imply complicated political maneuvers; their net impact is difficult to assess.⁶²

61. Note that we are also implicitly discarding either increases of taxes or decreases of transfers across the board.

62. The scope of this problem is well beyond the limits of our work. However, the issue is highlighted here to remark the difficulties of the aggregate policy adjustment required to attain

5.5.2 Generational Account Effects of the Privatization Program

In terms of the government's intertemporal budget constraint we have two effects of the privatization program: first, a change in government net wealth—equation (1); second, a variation in the present value in year t of all future net tax payments—equation (2):

$$(1) \quad \Delta W_t^G = \Delta A_t^G - \Delta L_t^G,$$

where ΔW_t^G is change in government net wealth in year t due to the sale of public enterprises. ΔA_t^G is change in government assets in year t ; this term will decrease by the value of the public companies sold and increase by any cash withheld by the government. ΔL_t^G is change in government liabilities in year t ; this term will decrease by the value of the repaid public debt.

$$(2) \quad \Delta N_{t,k} = N_{t,k}^{PO} - N_{t,k}^{GO},$$

where $\Delta N_{t,k}$ is change in total net payments to the government, $N_{t,k}^{PO}$ is net payments to the government under private ownership of public enterprises, and $N_{t,k}^{GO}$ is net payments to the government under government ownership of public enterprises.

Equation (2) captures the elimination of explicit and implicit public enterprise subsidies when they are privatized, as well as the difference in future taxes and dividends paid to the government by these companies under the distinct ownership-type assumptions. The latter concept includes not only taxes paid by the privatized firms that were not paid before by these companies (for whatever reason) when they were under government ownership but also the increase in taxes and dividends due to the change in the profitability and scale of the new private enterprises.⁶³

Estimation of the total effect of the privatization program as measured by equations (1) and (2) is not possible with the available statistical data, especially in the case of equation (2). For this reason, we will only address the change in government net wealth associated with this program.

First, considering that by 1994 most of this process had already been concluded, we can assume that both the net tax payment and government net wealth impacts were by that time included in the fiscal accounts. In this sense, our calculation of Argentina's generational accounts has taken care of these effects, and they are also included in the generational imbalance found.

generational balance. Consider, e.g., that currently there are no reliable statistics on provincial finances.

63. Note that when we set up Argentina's generational accounts we did not address either the efficiency of the government's transfers or of its current expenditure because they were beyond the scope of our work. Similarly, we are not evaluating the effect of the change in the quality of services provided by the privatized firms vis-à-vis the former state enterprises. Furthermore, we will not attempt to measure the impact of other aspects of the privatization program, such as the increase in market competition, technological improvements, the adequacy of the price paid for the companies sold by the government, etc.

Second, we can isolate in the generational accounts the government net wealth impact from the rest by means of the following reasoning. If all the privatization revenues had been used to cancel outstanding public debt, this impact would have been zero; otherwise it would have been negative, implying a reduction in government net wealth.⁶⁴ The problem is that changes in the stock of public debt also respond to other causes. We propose to sort out this problem by ascribing all the estimated reduction in the stock of public debt during the period under analysis to the privatization program. Then, comparing the net wealth value of the state firms sold less the current government's share of them with our estimate of the reduction in the stock of public debt, we will obtain the effect on government net wealth. Finally, incorporating this effect into the generational accounts, we will be able to calculate its impact on the size of the generational imbalance.⁶⁵

In table 5.17 we present the stock of public debt at the beginning of the current administration and for our baseline year. The nonconsolidated debt figure for 1989 includes debt with pensioners, suppliers, and other creditors originated and accrued before that year,⁶⁶ while the figure for 1994 encompasses the estimated public debt pending consolidation by then.⁶⁷ We obtain an estimated total reduction in the stock of public debt for the period 1989–94 of \$11.8 billion dollars by comparing total figures (in 1994 dollars) for these years.

The estimated net wealth value of the public enterprises that the government sold net of the current government's share of them amounts to \$21.8 billion (see table 5.5). Thus the negative effect on government net wealth is \$9.98 billion.

Subsequently, we need to plug this last figure into our accounts to calculate its impact on the generational imbalance. As said before, this effect was already included in our calculations, so for our purposes we will need to simulate an increase instead of a reduction in government net wealth.

The result of this simulation is that future generations will pay to the government (estimated) growth-adjusted amounts⁶⁸ of \$23,800 (central assumptions) and \$11,600 (special baseline) in net taxes, which are about 70.7 and 124 percent larger than the net payments of newborn generations. These figures compare with our base-case outcomes: \$24,300 and \$12,700; 74.8 and 146.1 per-

64. We can safely assume that the government did not withhold any privatization cash revenues.

65. Note that the privatization's net wealth impact is analyzed with reference to a country's generational imbalance that already includes the (most likely positive) net tax payment effect of this program.

66. The public debt figures exclude provinces and public (government owned and managed) banks—except for the central bank. The current government began to consolidate previously originated and accrued public debt as of April 1991.

67. We assume for 1994 the same amount Melconian and Santángelo ([1996]) assumed for 1995. We also adopt their criterion regarding the nonconsolidated debt; i.e., this debt is considered as debt of the period when it was accrued but for the value that it was consolidated.

68. Generational account currency figures are in 1995 dollars.

Table 5.17 Stock of Public Debt (billions of U.S. dollars; end of December)

Debt	1989	1994
Registered public debt	63.7	83.4
Nonconsolidated public debt	25.7	5.0
Public enterprises liabilities	3.0	–
Foreign exchange adjustment	4.1	–
Other	–	0.6
Total	96.5	89.0
Total in 1994 U.S. dollars	100.9	89.0
Difference (1994 vs. 1989)	–11.8	

Sources: IMF, *International Financial Statistics*, annual volume (Washington, D.C., 1995); Melconian and Santángelo ([1996]); MEyOySP, Secretaría de Hacienda, *Boletín Fiscal*, annual volume (Buenos Aires, 1995).

Note: To express the 1989 public debt in 1994 U.S. dollars we adjusted the index used by Melconian and Santángelo ([1996]) by the U.S. inflation rate, producer prices, during 1995.

cent. Thus the negative effect on government net wealth of the privatization program net of its contribution to government tax revenues implied increases in Argentina's generational imbalance of 2 and 10 percent, respectively.⁶⁹

5.5.3 Generational Effects of the Social Security Reform

In this section, we will set up a theoretical case in which the social security reform is fully functional as of 1994. In this way, we will be able to analyze whether the reduction in social security expenditures associated with the reform could be enough to restore generational balance or whether additional austere fiscal policies are required. The need for additional policies in this theoretical case will certainly reinforce the need for such policies in the actual case, which will produce its eventual benefits gradually and further in the future.

Our strategy will be first to determine the government's total debt with current pensioners. Then we will aim at finding out what should be the reduction in pension payments needed to restore generational balance and at appraising its empirical feasibility as single fiscal policy tool.⁷⁰

In other words, we are making explicit the government's implicit liabilities with current pensioners. Therefore, the resulting reduction in pension payments required to restore generational balance will have two parts: one required to restore the original imbalance and the other to match the increase in public debt generated by this reclassification of liabilities.

In order to estimate the actuarial debt, which is the main component of the

69. From 70.7 to 74.8 percent and from 124 to 146.1 percent, respectively.

70. Note that first we will add the burden of the total debt with current pensioners to our base-case generational accounts, and then we will analyze the reduction in pension payments needed to restore generational balance.

government's total debt with current pensioners, we make the following assumptions: (1) debt is discounted and adjusted for growth in the same way as our central assumption or special baseline case generational accounts; (2) the base-year relationship between total payments obtained from the data of the social security secretary of the Ministry of Labor and Social Security with both total payments of the National Social Security System and the Total Social Security System is assumed constant throughout;⁷¹ and (3) as we do not have pension payment data by single ages, we will make additional assumptions on the number of future years during which each cohort will receive these payments.⁷² Our estimates of the actuarial debt amounts are \$160.1 billion for the central assumption case and \$125.8 billion for the baseline case.⁷³

Another element of the total debt with current pensioners, though a minor component compared with our previous figure, is the amount originating from legal actions taken by them against the government.⁷⁴ We will assume that the \$5.0 billion of nonconsolidated public debt estimated in the preceding section all corresponds to debt with current pensioners of the kind just described. We consider that this is most likely the case because the majority or perhaps the totality of public debt with suppliers and other creditors accrued before 1989 should have been consolidated by 1994.⁷⁵

Consequently, adding these two components we obtain our estimates of the total debt with current pensioners. These estimates, for the cases under analysis, are \$165.1 billion and \$130.8 billion.

Next, we plug these debt figures as liabilities into government net wealth and run the policy experiment that entails reducing pension payments while maintaining social security contributions at their baseline level to restore generational balance.⁷⁶ The needed reductions are 33.5 and 47.8 percent for the cases under analysis.

71. The Total Social Security System includes the National Social Security System, provincial and municipal social security systems, and other activity-specific social security systems. The base-year relationships mentioned in assumption 2 are 71 and 87 percent, respectively. See Cristini (1995) and FIEL—Consejo Empresario Argentino (1995).

72. Specifically, we will assume that (1) 0–18-year-old pensioners will be paid until they are 18 years old; (2) 18–85-year-old pensioners will be paid until they are 80 years old in the case of males and until they are 85 years old in the case of females; and (3) 80+-year-old males and 85+-year-old females will be paid only for one year.

73. FIEL estimates this debt at \$140.9 billion using a 4 percent discount rate and not adjusting for growth. This figure is in line with our estimations provided we take into account the different discount rate and growth rate assumptions. See FIEL—Consejo Empresario Argentino (1995), in 1994 dollars.

74. This is the debt with pensioners pending consolidation originated by the legally challenged underpayment of pension benefits.

75. If we only include this debt in our baseline accounts the results change in the following manner: the generational imbalance increases from 74.8 to 77.1 percent in the central assumption case, and from 146 to 158 percent in the special baseline case.

76. The item of the fiscal accounts database that we are reducing is pensions and other benefits. It encompasses pension payments; benefits such as discounts on utilities and public transportation, waivers of municipal taxes for certain pension-income groups, and burial subsidies; and overhead

These reductions seem likely to suffice as single fiscal policy if we consider that by 1995 a third of all social security affiliates were in the public pension system and the rest were in the mixed (public/private) system. However, a more detailed analysis of the data may lead us to a completely different conclusion.

First, consider, for example, that the percentage reduction required in our baseline case implies annual pension and other benefit payments of \$10.3 billion. Then assume that the government pays the BUP to all pensioners, that is, that the new IPS is fully functional. The total annual BUP payment will be about \$8.4 billion.⁷⁷ The remaining funds, net of overhead expenses,⁷⁸ are \$1.5 billion and seem scarcely enough for the government to be able to meet the rest of its social security commitments. These commitments are the other benefits classified under social security expenditures and the payments to workers who chose the public system, namely, the APP and the disability, survivorship, and advanced age pension benefits.⁷⁹

Therefore, this conclusion reinforces the need for additional austere fiscal policies to complement the social security reform and restore generational balance. In addition, it highlights the fact that considering government fiscal programs separately may be misleading. In other words, the social security system may attain balance or even a small surplus as a result of the reform; however, this is not enough to guarantee the balance of the overall government intertemporal budget.

Along this same line of thought, it is important to remark that 58.2 percent of the funds deposited with PFAs by the end of 1995 were invested in public bonds (see Superintendencia de Administradoras 1995). Therefore, the reform channeled workers' social security contributions to the private PFA funds, and these institutions, in turn, used more than half of the funds to purchase government bonds. This process provided additional government borrowing that will be used over time to meet public expenditures, among them the pension benefits of retirees who opted for the public system, as well as the BUP of all retirees. In government intertemporal budget terms the present value of net taxes was reduced but the public debt was increased, and thus, as Kotlikoff (1994) points out, it amounts to a "change of words," specifically social secu-

expenses associated with all these payments. The details of this item are not published in the official statistics, but we estimate that pension payments are 90 percent or more of it.

Note that maintaining social security contributions at their baseline level is in line with the change introduced in Article 13 of the Social Security Solidarity Law. This article established that social security contributions could be reduced only if their reduction was offset by an increase in the collection of other taxes or by transfers from the Treasury.

77. This assumes a total number of affiliates of 3.8 million; an ACPC of \$63 (this was actually the value of the ACPC from April to December 1994); and an average BUP of 2.7 times the ACPC. Consider also that there are 13 pension payments during the year, 12 monthly payments and an extra payment paid half in July and half in December.

78. We estimate annual overhead expenses of \$0.4 billion. See FIEL-Consejo Empresario Argentino (1995).

79. Similar reasoning applies to the central assumption accounts.

rity contributions are changed—partially—into loans to the government (see also Kotlikoff, chap. 1 in this volume).⁸⁰ Note that this “change of words” is also applicable to our above reclassification of government liabilities.

Another characteristic of the PFA portfolio composition that needs to be highlighted, although it is not the object of our present analysis, is the low percentage participation of investments in foreign markets. Specifically, by the end of 1995, only 0.8 percent of the funds deposited with PFAs were invested in foreign government bonds and 0.6 percent in foreign securities (see Superintendencia de Administradoras 1995). This situation was caused mainly by the influence of government regulations and incentives oriented toward fostering domestic savings and protecting investors, justified by the standard arguments associated with developing countries’ capital market characteristics.⁸¹ The cost of this policy is that Argentinean investors do not benefit from the reduced risk associated with international diversification of their portfolios.

The other economic changes associated with the social security reform process, whose analysis requires the utilization of a more comprehensive model, are beyond the scope of this work. However, we will briefly consider some of their likely implications from Argentina’s perspective.⁸²

In Argentina, before the introduction of the IPS, the perceived linkage between social security benefits and contributions was practically zero; that is, workers regarded contributions entirely as a marginal tax on their labor supply. Furthermore, ever escalating inflation, together with the government’s constant manipulation of the indexes used to adjust pension payments and policies that diverted social security funds to other purposes, may have resulted in very low actual linkage.⁸³ Thus, concerning the benefit-tax linkage, chances should be high that the reform will bring about an efficiency gain. However, given the profound impact that the social security crisis had on workers this effect will probably be gradual.

In addition, Argentina has nonregistered employment in the so-called informal sector of the economy that is estimated at about 20 percent of total employment. For this reason, we can expect that the reform will produce an additional efficiency gain related to the relative reduction of the incentive to work in the informal sector, which does not pay, among others, labor taxes. Nevertheless, this gain will be of a smaller magnitude and come at an even more gradual pace than the previous one.⁸⁴

80. See Kotlikoff (1995) for a detailed discussion in these terms of the paradigmatic Chilean social security reform.

81. These percentages are below the legal maximum (10 percent), which gives an idea of the influence of PFAs’ financial planning policies.

82. For an analysis of these changes applied to the U.S. economy and using the Auerbach-Kotlikoff model, see Kotlikoff (1995, 1996a, 1996b) and references therein.

83. We could not obtain statistics on this linkage.

84. Note that there are still employers’ contributions, and consequently, there is incentive to work in the informal sector on these grounds. Note also that a worker can contribute as self-employed and still work in the informal sector.

A last point to consider with respect to the efficiency gains mentioned here is that they need to be calculated together with the potential distortions that the fiscal mechanisms used to finance the transition might produce in the economy (e.g., they may distort, themselves, the labor supply). Argentina's method is not clear. It changed substantially since the draft law project up to the rulings of the law, and subsequently with the Social Security Solidarity Law. However, we may safely state that it will largely involve deficit financing by increasing the public debt and selling the government's remaining share in public enterprises.

Finally, note that initial generations must stay at least in the same welfare situation following the reform. If this is not the case, long-run gains may be originated basically at their expense. By the same token, certain policies like short-term deficit financing of the transition may help to protect initial generations from the negative impact of the reform. However, if these policies get out of control, the opposite situation will arise; that is, they will make initial generations better off and future generations worse off. In this sense, the calculation and payment of the government's total debt with current pensioners play key roles. These issues are ambiguous in Argentina, with most of the ambiguity originating after the promulgation of the Social Security Solidarity Law.

5.6 Summary and Conclusions

In this chapter we used the generational accounting technique to assess the sustainability of the convertibility plan's fiscal policy and to analyze two fundamental aspects of it, namely, the public enterprise privatization program and the social security reform.

We found, under the central assumptions, a significant generational imbalance of 75 percent, and the imbalance turned out to be as huge as 146 percent for the special baseline case. This implies that future Argentinean generations will have to pay on average net taxes that are 1.8 to 2.5 times larger, after adjusting for growth, than the ones current generations are estimated to pay if they continue to be subject to the 1994 fiscal policy for the rest of their lives.

Therefore, based on this imbalance, we conclude that the convertibility plan's fiscal policy is not sustainable as it implies that future Argentinean generations will have to pay intolerably high net taxes (taxes minus transfers).

This result is robust to reasonable variations in the discount rate and growth rate assumptions. In particular, we detected large imbalances for all combinations of these variables. According to these imbalances, future generations of Argentines will pay, in present value, net taxes that range from 1.7 to 7.5 times the amount 1994 newborn Argentines are expected to pay, given the current policy.

We also tested the robustness of the above baseline results to our choice of capital income tax profile and to the inclusion of the inframarginal adjustment of this tax to account for differential treatment of new and old investment. In

both cases all our results are confirmed. However, we should remark that in the latter instance, as the adjustment allocates the burden of the capital income tax away from future generations, the generational imbalance is reduced. Moreover, the size of this reduction is fairly large. This point notwithstanding, the imbalances are still significant and in several cases huge.

Then we analyzed the impact of the aging of Argentina's population. We concluded that if the population structure were to remain constant, younger generations would be better off and the generational imbalance would be significantly smaller in the central assumption case and smaller though still huge in the special baseline case.

Another result of the sensitivity analysis highlights the importance of government debt, whose hypothetical cancellation would reduce drastically the generational imbalance. Finally, the alternative treatment of government educational expenditure as government consumption also reduced the size of the generational imbalance as it implied an increase in the tax burden of newborn generations relative to future generations.

A study of the alternative policies needed to achieve generational balance, which included the calculation of the immediate and permanent increase in alternative tax revenues or reduction in alternative transfers or government expenditure, led us to the following conclusions. First, the magnitude of the required adjustment is, obviously, associated with the weight of the policy instrument chosen within total revenues or expenditures. Second, the huge Argentinean generational imbalance implies adjustments for certain policy instruments that are not reasonable. Third, we are left with few choices, mainly social security benefits and government consumption, and fourth, in view of the size of the required adjustments, a mix of policy instruments should be used rather than a single one of them.

We identified two potential generational account effects of the privatization program, namely, a change in government net wealth and a variation in the present value in year t of all future net tax payments. With the statistical information available we were able to address the first of these changes. We concluded that the privatization program had an estimated negative impact on government net wealth of \$9.98 billion (about 3.5 percent of 1994 GDP) implying 2 and 10 percent increases in Argentina's generational imbalance under the central and special baseline assumptions, respectively.

Subsequently, we assessed the generational account effects of the social security reform. In particular, we studied the magnitude of the reduction in pension payments required to achieve generational balance and to match the increase in public debt generated by the reclassification of liabilities associated with this reform. We concluded that after this reduction (34 or 48 percent), the remaining funds seem scarcely enough for the government to be able to meet the BUP benefit, the payments to the workers who chose the public pension system (APP, disability, survivorship, and advanced age pension benefits), and the other pensioners' benefits classified under social security expenditures.

Thus this reinforces our previous conclusion that a mix of policies is needed to restore intertemporal budget balance.

Additionally, it is necessary to remark that about 60 percent of the funds that workers deposited with PFAs were in turn invested in public bonds. Therefore, in government intertemporal budget terms the present value of net taxes was reduced but public debt was increased. Specifically, social security contributions were changed—partially—into loans to the government, that is, a “change of words.”

Finally, we must highlight that while based on the cash-deficit approach multilateral organizations and international investors considered the convertibility plan within a stabilization paradigm, the results of the generational accounting technique introduced a series of doubts about it and, in particular, allowed us to judge its fiscal policy unsustainable.

References

- Altamiranda, Marcelo F. 1997. Argentina's stabilization experience: Orthodoxy and the Primavera plan; sustainability of the convertibility plan's fiscal policy. Ph.D. diss., Boston University, Boston.
- ANSeS (Administración Nacional de la Seguridad Social). Ministerio de Trabajo y Seguridad Social. 1994. Breve análisis del sistema nacional de previsión social Argentino en el período 1983–1993 y proyecciones al 2000. Informe Técnico no. 23. Buenos Aires: Subgerencia General Económico Financiera. Mimeograph.
- Auerbach, Alan J., Bruce Baker, Laurence J. Kotlikoff, and Jan Walliser. 1995. Generational accounting in New Zealand: Is there generational balance? Boston: Boston University, Department of Economics. Mimeograph.
- Auerbach, Alan J., Jagadeesh Gokhale, and Laurence J. Kotlikoff. 1991. Generational accounts: A meaningful alternative to deficit accounting. In *Tax policy and the economy*, vol. 5, ed. David Bradford, 55–110. Cambridge, Mass.: MIT Press.
- . 1992. Generational accounting: A new approach to understanding the effects of fiscal policy on saving. *Scandinavian Journal of Economics* 94:303–18.
- . 1994. Generational accounting: A meaningful way to evaluate fiscal policy. *Journal of Economic Perspectives* 8:73–94.
- . 1995. Restoring generational balance in U.S. fiscal policy: What will it take? *Federal Reserve Bank of Cleveland Economic Review* 31:2–12.
- Auerbach, Alan J., Jagadeesh Gokhale, Laurence J. Kotlikoff, and Erling Steigum, Jr. 1993. Generational accounting in Norway: Is Norway overconsuming its petroleum wealth? Ruth Pollak Working Paper Series on Economics, no. 24. Boston: Boston University, Department of Economics.
- Auerbach, Alan J., and Laurence J. Kotlikoff. 1987. *Dynamic fiscal policy*. Cambridge: Cambridge University Press.
- Bos, Eduard, My T. Vu, Ernest Massiah, and Rodolfo A. Bulatao. 1994. *World population projections: Estimates and projections with related demographic statistics, 1994–95*. Baltimore: Johns Hopkins University Press.
- Broda, Miguel Angel M., and associates. Monthly. *Carta Económica*. Buenos Aires.
- Castelar Pinheiro, Armando, and Ben Ross Schneider. 1995. The fiscal impact of privatisation in Latin America. *Journal of Development Studies* 31:751–85.

- Cristini, Marcela. 1995. Crisis y reforma del sistema previsional Argentino. Buenos Aires: Fundación de Investigaciones Económicas Latinoamericanas. Mimeograph.
- Durán, Viviana. 1993. La evasión en el sistema de seguridad social Argentino. Serie Política Fiscal, no. 50. Santiago: Naciones Unidas, Comisión Económica para América Latina y el Caribe.
- FIEL—Consejo Empresario Argentino. 1995. *El sistema de seguridad social: Una propuesta de reforma*. Buenos Aires: Manantial.
- Flood, M. Cristina V. de, Leonardo Gasparini, M. Marcela Harriague, and Benigno Vélez. 1994. El gasto público social y su impacto redistributivo. Buenos Aires: Ministerio de Economía y Obras y Servicios Públicos, Subsecretaría de Programación Económica.
- Flood, M. Cristina V. de, M. Marcela Harriague, Laura Lerner, and Leticia Montiel. 1994. Educación y salud: Resultados de mediciones sobre acceso y cobertura. Serie Gasto Público, Documento de Trabajo no. GP/04. Buenos Aires: Ministerio de Economía y Obras y Servicios Públicos, Subsecretaría de Programación Económica.
- Franco, Daniele, Jagadeesh Gokhale, Laurence J. Kotlikoff, and Nicola Sartor. 1994. Generational accounting: The case of Italy. In *Saving and the accumulation of wealth*, ed. Albert Ando, Luigi Guiso, and Ignazio Visco, 128–60. Cambridge: Cambridge University Press.
- Gokhale, Jagadeesh, and Laurence J. Kotlikoff. 1994. Passing the generational buck. *The Public Interest* 114:73–81.
- Gokhale, Jagadeesh, Bernd Raffelhüschen, and Jan Walliser. 1995. The burden of German unification: A generational accounting approach. *Finanzarchiv* 52:141–65.
- IMF (International Monetary Fund). Various issues. *International financial statistics*. Washington, D.C.: International Monetary Fund.
- INDEC (Instituto Nacional de Estadística y Censos). Ministerio de Economía y Obras y Servicios Públicos. 1988. Encuesta de gastos e ingresos de los hogares. Estudios no. 11. Buenos Aires: Instituto Nacional de Estadística y Censos.
- . 1990. Encuestas de hogares: Errores de muestreo y efectos de diseño. Estudios no. 19. Buenos Aires: Instituto Nacional de Estadística y Censos.
- . 1993. Censo nacional de población y vivienda 1991: Resultados definitivos, series B. Buenos Aires: Instituto Nacional de Estadística y Censos.
- . 1994. Estimaciones y proyecciones de población 1950–2050. Total del país. Estudios no. 23. Buenos Aires: Instituto Nacional de Estadística y Censos.
- . 1995a. Estimaciones y proyecciones de población—Total del país (versión revisada) 1950–2050. Serie Análisis Demográfico, no. 5. Buenos Aires: Instituto Nacional de Estadística y Censos.
- . 1995b. *Statistical yearbook: Republic of Argentina, 1995*. Buenos Aires: Instituto Nacional de Estadística y Censos.
- . 1995c. Tabla completa de mortalidad de la Argentina por sexo 1990–1992. Serie Análisis Demográfico, no. 3. Buenos Aires: Instituto Nacional de Estadística y Censos.
- . n.d. Encuesta permanente de hogares: Marco teórico y metodológico de la investigación temática. Buenos Aires: Instituto Nacional de Estadística y Censos.
- Isuani, Ernesto A., and Jorge A. San Martino. 1993. *La reforma previsional Argentina. Opciones y riesgos*. Buenos Aires: Miño y Dávila Editores.
- . 1995a. El nuevo sistema previsional Argentino: Punto final a una larga crisis? part 1. *Boletín Informativo Techint* 281 (January–March): 41–56.
- . 1995b. El nuevo sistema previsional Argentino: Punto final a una larga crisis? part 2. *Boletín Informativo Techint* 282 (April–June): 43–67.
- Kakwani, Nanak, Laurence J. Kotlikoff, Mehdi Krongkaew, Sudhir Shetty, and Jan Walliser. 1995. Generational accounting in Thailand. Boston: Boston University, Department of Economics. Mimeograph.

- Kotlikoff, Laurence J. 1992. *Generational accounting: Knowing who pays, and when, for what we spend*. New York: Free Press.
- . 1994. A critical review of the World Bank's social insurance analysis. Boston: Boston University, Department of Economics. Mimeograph.
- . 1995. Privatization of social security: How it works and why it matters. Boston: Boston University, Department of Economics. Mimeograph.
- . 1996a. Privatization of social security at home and abroad. Boston: Boston University, Department of Economics. Mimeograph.
- . 1996b. Privatizing social security in the United States: Why and how? Burch Working Paper no. B96-18. Berkeley: University of California.
- Kotlikoff, Laurence J., and Philip Oreopoulos. 1995. Restoring generational balance in Canada. Boston: Boston University, Department of Economics. Mimeograph.
- Kotlikoff, Laurence J., and Jan Walliser. 1995. Applying generational accounting to developing countries. Boston: Boston University, Department of Economics. Mimeograph.
- Leibfritz, Willi. 1995. Generational accounting: An international comparison. Paris: Organization for Economic Cooperation and Development. Mimeograph.
- Melconian, Carlos A., and Rodolfo A. Santángelo. [1996]. El endeudamiento del sector público Argentino en el período 1989-1995. United Nations Development Program Project no. ARG/91/R03.
- MEyOySP (Ministerio de Economía y Obras y Servicios Públicos). [1994a]. *Argentina en crecimiento. La reforma económica y sus resultados: 1989-1993. El programa "Argentina en Crecimiento 1994-1996."* Buenos Aires: Ministerio de Economía y Obras y Servicios Públicos.
- . [1994b]. *Argentina en Crecimiento 1995-1999. Proyecciones macroeconómicas*. Buenos Aires: Ministerio de Economía y Obras y Servicios Públicos.
- . 1994c. *Argentina un país para invertir y crecer*. Buenos Aires: Ministerio de Economía y Obras y Servicios Públicos.
- . 1995a. *Argentina un país para invertir y crecer*. Buenos Aires: Ministerio de Economía y Obras y Servicios Públicos.
- . [1995b]. *Financiamiento de la transferencia de los regímenes previsionales provinciales*. Buenos Aires: Ministerio de Economía y Obras y Servicios Públicos. Photocopy.
- . Secretaría de Hacienda. Quarterly. *Boletín Fiscal*. Buenos Aires.
- Rofman, Rafael. 1995. Moving social security toward fully funded schemes: Who pays the cost. Paper presented at the Seminar on Intergenerational Economic Relations and Demographic Change sponsored by the IUSSP Committee on Economic Demography and the East-West Center Program on Population, Honolulu, September.
- Schulthess, Walter Erwin. 1994. La reforma de la previsión social en la República Argentina. Buenos Aires. Photocopy.
- Superintendencia de Administradoras de Fondos de Jubilaciones y Pensiones. 1995. *Boletín estadístico*. Buenos Aires: Superintendencia de Administradoras de Fondos de Jubilaciones y Pensiones, December.
- Techint. Monthly. *Boletín Informativo*. Buenos Aires.
- Tendencias Económicas—Business Trends. *Yearbook* (in Spanish and English). Buenos Aires.
- U.S. Office of Management and Budget. 1994. *Budget of the United States government: Analytical perspectives, fiscal year 1995*, chaps. 3 and 21-31. Washington, D.C.: Government Printing Office.
- World Bank. 1994. *Averting the old age crisis: Policies to protect the old and promote growth*. World Bank Policy Research Report. New York: Oxford University Press.

This Page Intentionally Left Blank