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Social Security Issues in Developing Countries:
The Latin American Experience

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Abstract

The paper surveys the major economic, financial, and administrative issues that confront social security systems in Latin America. The larger systems have contributed substantially to public sector financial disequilibria. Expenditures of the younger systems with more limited coverage could increase dramatically as the pension plan matures, life expectancy increases, and coverage is broadened, but the narrow revenue base will force a tradeoff between broader coverage and the generosity of benefits. Most plans are pay-as-you-go, and the case for full or partial funding is not found to be compelling. The inflationary environment can have a substantial effect on the financial balance, even under full indexation.

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Summary

This paper surveys the major economic, financial, and administrative issues facing social security systems in Latin America. In recent years, the finances of the larger systems, which are an important component of general government operations, have come under serious strain as a result of the generous level of their benefits, broad coverage, the maturation of the pensions component of the system, the decapitalization of reserves, and the erosion of the revenue base. The systems' financial difficulties have contributed to public sector financial disequilibria. Measures to improve their finances have included the less than full and timely indexation of benefits and delays in benefit processing, as well as significant increases in the rates of payroll and other taxes earmarked for the systems.

The smaller systems, whose coverage is generally confined to the salaried workforce of the larger cities, have not yet had to confront these difficulties. Nonetheless, their expenditure could increase dramatically as the pensions component matures and pressures to increase coverage intensify. Because benefits for each insured person are relatively generous and the revenue base is narrow, broader coverage will require that benefits be scaled back.

The majority of Latin American public pension systems are financed on a pay-as-you-go (PAYG) basis. There are some advantages to funding, but in the Latin American context the case against PAYG is not compelling. To realize the advantages of funding, the systems' reserves must not be used to finance an increased public-sector deficit.

Demographic trends do not portend a substantial increase in the dependency ratio in the next ten-to-fifteen years, but in subsequent years the ratio could rise sharply. In the countries with young systems, this will reinforce the effects of pension-plan maturation to intensify upward pressures on expenditures.

High and variable rates of inflation have caused substantial variation in real benefit levels and have created strong incentives to delay remittances of payroll taxes. Social security systems are shown to remain vulnerable to inflation even under full and frequent indexation of benefits. In respect of administrative issues, administrative costs are found to be generally high, in part because of bureaucratic incentives that militate against rationalization of benefits expenditure.

I. Introduction

Social security systems in Latin American countries mobilize significant quantities of resources. ^{1/} In some countries, such as Argentina, Costa Rica, and Uruguay, the revenue and expenditure of social security systems account for a large share of general government revenue and expenditure, and their share of gross domestic product (GDP) approximates the shares of some member countries of the Organization for Economic Cooperation and Development (OECD). The coverage of the social security system in these countries is broad, albeit not yet universal, and the level of benefits is generous. In most of the other countries of the region, social security systems do not represent as large a share of GDP, but have the potential to do so, because coverage is generally low and could be expanded, and because the pension component of the system is not yet mature.

The aim of this paper is to survey the principal issues of fiscal policy, financial adjustment, and structural reform that can confront Fund economists and policymakers in Latin America concerned with social security systems. Many problems and issues of financial, economic, and administrative policy arise in connection with the functioning of social security systems in Latin America. In the countries with extensive systems, the financial imbalance of the social security system has been responsible for serious disequilibria in general government, with expenditures sometimes increasing by several percentage points of GDP in just a few years. In other countries, the system may not as yet be large enough to create such problems, but has the potential to expand; the question then arises of the implications of current demographic trends for the financial stability of social security schemes.

In addition to the problems a rapidly growing system may pose for financial stability, there are other financial and economic issues of a more structural character that need to be addressed. Among these is one issue of particular importance: namely, the need to choose between a partially or fully funded system--where expected future claims on the system net of expected contributions are covered by the system's reserves either for a given period or indefinitely--and the more conventional pay-as-you-go (PAYG) system, where current claims

^{1/} The International Labour Office (ILO) includes in its coverage of social security the schemes or services that have the following three objectives: the provision of curative or preventive health care; the maintenance of income in the case of involuntary loss of all or a large part of income, including income lost as a result of retirement; and the granting of a supplemental income to persons having family responsibilities. The following nine benefits are distinguished: medical care; sickness benefit; unemployment benefit; old-age benefit; employment injury benefit; family benefit; maternity benefit; invalidity benefit; and survivors' benefit. These definitions were used to compile the data that underlie Table 1. See ILO (1985), pp. 1-2.

(expenditures) are just matched by current contributions. The choice may have implications for the the rates of economic growth and capital formation, because there is some indication that a PAYG system depresses private saving.

The choice between pay-as-you-go and funding can also have more immediate financial implications. Specifically, with a PAYG system, the government can adopt policies requiring substantial increases in expenditure in the future without being required to secure adequate financing for it at the outset. In addition, if a funded rather than a PAYG system is adopted, then a policy for the investment of the system's reserves must be formulated.

Another issue of some importance in the Latin American context is that of the inflationary environment. In particular, it is important to consider how a social security system's financial position may be affected by inflation, and whether and to what extent expenditures and contributions should be indexed to conserve their real value.

The possible expansion of the system in countries where coverage is low raises questions related to the appropriate source of financing. Should it be exclusively a payroll tax--that is, a combination of employee and employer contributions? Or, should social security be treated like any other government program, and financed out of general revenues, as certain countries in Latin America have opted to do? Finally, would exclusive reliance on payroll taxation limit the possible expansion of social security?

Another structural issue is the effect of social security systems on the distribution of income. Do such systems simply represent a government-run insurance system against the risks of old age, disability, illness, and other misfortunes, or are there important effects on income distribution? If so, who benefits the most?

In many countries, the reaction against the growth of the size of government has affected thinking about the role of government in providing social security. Chile is one of the few countries to have privatized its public pension and health insurance schemes. It is natural to inquire if its example can or should be emulated by its neighbors.

Finally, the study of social security systems in Latin America also raises many administrative issues, including that of the competition that often exists between the medical services of the social security system and the ministry of health. This competition has led to wasteful duplication of services in a number of countries. A second important issue is the revenue lost from evasion and delays in remitting contributions.

The organization of the paper is as follows. Section II offers a brief discussion of the rationale for the state's intervention in the

provision of pensions, health insurance, and medical services, and insurance for related contingencies. It illustrates the functions social security systems can serve. It also leads one to consider possible private sector alternatives. Section III provides an overview of the most important features of Latin American social security systems. These sections prepare the ground for the more extensive Section IV, which discusses the most important financial, economic, and administrative issues raised in previous sections. Section V summarizes the paper's findings. Appendix I discusses the recent evolution of the Uruguayan social security system. The developments in Uruguay nicely illustrate many of the issues discussed in Section IV, particularly those that arise in the countries with extensive systems. Appendix II offers a technical discussion of the impact of different indexation rules on the real value of expenditures in an inflationary environment.

II. Rationale for Social Security Systems

Through social security systems, governments provide their citizens some degree of protection from the risks entailed by or associated with old age, sickness, and occupational and other hazards. In the pension component of the system, participants and their employers are typically required to make contributions related to their salary level, and these resources, and possibly others, finance old-age pensions. The health component of the system provides for some medical treatment and may also provide income to compensate for any income loss resulting from sickness.

In obliging individuals to participate in these plans, the state is performing a function that could, in principle, be performed by private institutions. Why is it necessary or desirable for the private sector's role to be supplanted? State intervention has traditionally been justified on one or more of four different grounds: first, the failure of private financial markets to provide financial instruments that would permit an adequate degree of insurance for the contingencies of old age, sickness, and disability; second, a paternalistic concern that individuals left to their own devices would undersave or underinsure; third, a belief that compulsory savings and insurance schemes may be more efficient than the alternatives available in the private sector; and fourth, a wish to redistribute income. 1/

Compulsory participation in pension schemes has been justified by the existence of various market or institutional failures. One important failure that is common in countries with rudimentary financial systems is the lack of saving vehicles that offer positive real rates of return. Thus, the rates of return offered by banks and other saving institutions may be substantially negative in real terms, because

1/ See Creedy and Disney (1985), Chapter 1, and Diamond (1977) for discussions of this topic.

nominal rates are fixed well below the prevailing rate of inflation. In consequence, the holding of financial assets by households is discouraged. Whether total savings would be less than they would be if real rates of return to financial assets were positive is not certain, but saving could take unproductive and costly forms: the holding of excessive inventories or stocks of gold, for example. 1/

When financial systems are well developed and free of excessive regulation, it is usually possible to find saving instruments offering positive real rates of return. However, even the most sophisticated financial markets typically do not offer annuities whose annual payment is defined in real terms, nor are "defined benefit" private pension plans usually defined in real terms. It follows that there will be no financial hedge against the risk that a person lives so long that his retirement savings are exhausted. In any case, private pension plans inevitably exclude persons who work part time, or persons who are frequently unemployed. Even with a highly developed financial system, these persons may easily be left without adequate financial resources in their old age. Another difficulty with most private plans is their lack of portability; that is, years of service in one plan cannot be converted into service in another. As a final instance of market failure, it is extremely difficult for the market to provide insurance against the risks of diminished earnings capacity or enforced early retirement. 2/

The paternalistic argument for compulsory participation in public pension plans asserts that people are either too shortsighted or too financially unsophisticated to make adequate provisions for their old age. Certainly, the decisions involved in personal financial planning in a developed economy can be complex, although it can be argued that expertise in such matters can be purchased, at least by those who can afford it. However, some people are clearly improvident. Whether improvidence is extremely common is hard to determine. Diamond has argued that data on the wealth-income ratios of older persons in the

1/ It has been argued that the extended family system found in many less developed countries is itself a kind of unfunded social security system. Parents rear and educate their children, thus making a kind of investment, in the expectation that their children will provide for them in their old age. Conversely, it can be argued that the introduction of compulsory social security tends to erode traditional family kinship structures because children no longer need to provide directly for their parents. See Kopits and Gotur (1980) and Kotlikoff and Spivak (1981).

2/ See Diamond (1977), pp. 280-81. Diamond states that "...any attempt to insure this risk faces severe moral hazard and adverse selection procedures." In other words, persons expecting to retire early--high-risk groups--will sign up in disproportionate numbers for this kind of insurance, thus increasing its cost, and the risk of early retirement will be increased by the fact of being insured.

United States suggest that it is. 1/ Another version of the paternalist argument holds that if society feels obliged to help the destitute, it also has the right to protect itself from improvident behavior, and making a public pension scheme compulsory is one way of doing so. 2/

A government pension plan can be used to redistribute income, both among persons of the same generation and across generations. The first sort of redistribution can be achieved by setting pensions at some minimum level, while making contributions a function of income. Assuming that the effective incidence of contributions is on the contributor, low-income earners will contribute less to the plan, on average, than they receive. A government plan can also redistribute income in favor of persons who would not be able to participate in private sector pension plans, for example, persons who frequently change jobs, or who are frequently unemployed. Distribution across generations can be achieved through a pay-as-you-go scheme with no requirement that its beneficiaries have contributed for a minimum number of years. The first generation of retirees then receives a windfall gain in income financed by persons still working and contributing to the plan.

The use of a public pension plan as an instrument of income redistribution has been justified on the grounds that the tax-transfer mechanism of social security can achieve distributional goals that other fiscal instruments cannot achieve. This argument can be countered with the assertion that the distributional component of a social security program can and should be made into a separate program, like welfare. This restriction in the scope of social security has been criticized in its turn for attaching a stigma to recipients of transfers from the separate program.

In sum, public pension plans have been justified on the grounds that they protect individuals or the society of which they are members from the consequences of their shortsightedness; that they can provide an alternative to inefficient saving vehicles; that they can provide an income in retirement for persons who would not be able to participate in a private sector pension plan; and that they can achieve distributional objectives unattainable by other measures.

The provision of health insurance is also affected by market failures, even when insurance markets are as well developed as they are in a few industrial countries. For example, certain high-risk groups may be excluded from coverage altogether, and it may be difficult to find plans that insure against certain specific risks. Some families may simply not be able to afford medical coverage, especially if family members are in a high-risk group. However, government intervention in this area is typically justified out of either redistributive or paternalistic considerations. Paternalistic considerations could

1/ Diamond (1977).

2/ See Tobin (1987).

justify compulsory participation in order to protect uninsured persons and their children.

III. Some Basic Features of Latin American Social Security Systems

1. Relative size and coverage

The relative size and degree of development of the social security system vary substantially among Latin American countries. In Argentina, Chile, Costa Rica, and Uruguay, the ratio of social security expenditure to GDP has, in recent years, approached or exceeded 10 percent and has accounted for between 25 percent and 40 percent of general government expenditure. At the other extreme, in Guatemala and most other Central American countries, the ratio of total social security expenditures to GDP has been on the order of 2 percent or less (Table 1).

The differences in the relative size of the social security systems can be related to a number of different features of the systems, and reflect important differences in the economic structure of the countries as well as the political environment. 1/ Of particular importance are differences in the degree of coverage of the population. For example, in Uruguay, the pension scheme is estimated to cover about 80 percent of the labor force (economically active population), and the sickness/maternity system about 70 percent. By contrast, the corresponding figures for Guatemala are 33 percent and 14 percent (Table 2), and coverage is even lower in other Central American countries. 2/ Differences across countries in the number of risks covered and the relative generosity of benefits per contributor are of lesser importance. All Latin American countries have old-age pension schemes, sickness/maternity health plans, and disability schemes. Some countries have no family allowance systems, and only a few have unemployment plans. 3/

The relative size of social security is also related to the relative importance in total expenditure of the pension scheme: thus, the pension scheme accounted for 80 percent of total benefit expenditure in Uruguay in 1980 compared with 5 percent in Guatemala. Nonetheless, this relationship is not extremely tight; one exception is Costa Rica, where the pension scheme, although it has grown in importance, accounted for only 15 percent of total benefit expenditure in 1980 (Table 3).

1/ This section draws heavily on Mesa-Lago (1985). The main results of this study are summarized in Mesa-Lago (1986a), pp. 127-52, and (1986b).

2/ The estimates of coverage are uncertain for a number of countries for a variety of reasons, including the lack of accurate records of the number of dependents and some duplication of coverage. See Mesa-Lago (1985), pp. 10-13 and Table 2, p. 270.

3/ Mesa-Lago (1985), p. 10.

Table 1. Selected Latin American Countries:
Total Expenditure of Social Security System as a Percent of GDP

	1970	1971	1972	1975	1978	1979	1980
Argentina	...	...	...	6.4	7.5	8.1	9.3
Bolivia	...	...	2.4	2.1	2.7	3.2	2.9
Colombia	1.5	...	...	2.2	2.7	2.7	2.8
Costa Rica	2.7	...	...	4.2	6.0	6.7	7.1
Chile	...	16.6	...	10.6	10.6	10.4	10.8
Ecuador	...	...	...	...	2.3	2.4	2.9
El Salvador	1.8	...	...	2.3	1.2	1.3	1.5
Guatemala	1.3	...	...	1.2	1.1	1.1	1.2
Nicaragua	2.5	...	...	2.6	2.4	2.5	2.3
Panama	...	...	6.5	6.5	6.9	6.7	5.9
Uruguay	...	...	...	9.7	9.1	7.7	8.2
Venezuela	1.9	...	...	1.2	1.3	1.1	1.3

Sources: ILO, The Cost of Social Security, Eleventh Annual Inquiry, 1978-80 (1985); International Monetary Fund, International Financial Statistics Yearbook, 1986; and Fund staff calculations.

Table 2. Selected Latin American Countries:
Coverage of Programs, 1980

	Sickness/Maternity (as percent of total population)	Pensions (as percent of economically active population)
Argentina	78.9	69.1
Bolivia	25.4	18.5
Colombia	11.6	22.4
Costa Rica	76.0	68.3
Chile	67.3	61.7
Ecuador	7.9	23.2
El Salvador	6.2	11.6
Guatemala	14.2	33.1
Nicaragua	9.1	18.9
Panama	50.3	45.6
Uruguay	68.5	81.2
Venezuela	45.2	49.8

Source: Mesa-Lago, Carmelo, El Desarrollo de la Seguridad Social en América Latina.

Table 3. Selected Latin American Countries: Components of Benefit Expenditure, 1980
(In percent of total)

	Sickness/ Maternity	Work Injuries	Pensions	Unemployment	Family Allowance	Total
Argentina	24.1	...	58.1	--	17.8	100.0
Bolivia	56.6	6.0	36.3	--	1.1	100.0
Colombia	55.4	2.8	22.4	--	19.4	100.0
Costa Rica	79.8	5.1	15.1	--	--	100.0
Chile	24.0	4.9	43.9	4.3	22.9	100.0
Ecuador	14.7	2.2	76.7	6.4	--	100.0
El Salvador	87.9	...	12.1	--	--	100.0
Guatemala	49.6	45.4	5.0	--	--	100.0
Nicaragua	74.8	6.5	18.7	--	--	100.0
Panama	55.3	4.7	40.0	--	--	100.0
Uruguay	6.3	4.7	79.9	1.6	7.5	100.0
Venezuela	65.8	... <u>1/</u>	34.2	--	--	100.0

Source: ILO, The Cost of Social Security, Eleventh Annual Inquiry, 1978-80 (1985).

1/ Included under sickness/maternity.

The relationship between the relative size of the whole system and the importance of the pension component is probably attributable to the degree of maturity of the pension scheme. In Latin America, as elsewhere, a person's eligibility for a pension and the value of the pension are typically based on the number of years he has contributed to the scheme, as well as the age at which he retires and some measure of past earnings. In consequence, the share of the elderly population eligible for a pension and the average amount of an individual pension increase with the number of years the plan is in operation. The pension schemes of Uruguay, Chile, and Argentina have been in place longer than those of the Central American countries, so that the share of the population at or above retirement age that would be eligible for a pension is greater in the former group of countries than in the latter. The demographic structure of these countries also influences the size of the pension scheme: the share of the population aged 65 or older is much higher in the former group than in the latter. Finally, the older systems often permitted retirement at an early age and after a relatively short period of participation in the plan. For example, in Uruguay, until the reforms of 1979, it was possible for men to retire at the age of 55, and certain occupational groups are still able to retire after only 20 years of service. 1/

The substantial variation in coverage among Latin American countries is related to differences in the relative size of the organized sector of the economy. In the countries where coverage is broad, a substantial share of the work force is salaried and works in the organized industrial or service sector. In Costa Rica, the agricultural sector is relatively organized, and the rate of coverage is high. In those countries where coverage is low, a substantial share of the labor force will typically be found in the unorganized rural sector, with a high proportion of either self-employed or unpaid family workers. These groups are hard to include in conventional social security programs financed through salary-based employer/employee contributions.

It was noted above that those countries where the social security programs were the largest in relation to GDP had introduced their programs much earlier than other countries. An important feature of certain of these countries' programs that does not emerge from a comparison of aggregate statistics is the degree of stratification of the system. Certain occupational groups participated in social security programs early on, and other groups were gradually included, not in the original plans but in entirely different and separately administered schemes. In addition to the administrative inefficiency of such a development, substantial inequalities existed across plans. These inequalities and disparities have been the object of reform in both Chile and Uruguay in recent years.

1/ Appendix I discusses this and other aspects of the Uruguayan social security system in more detail.

2. Financing

Social security programs in Latin America, as in most countries, are financed mainly through payroll taxes. Typically, the employer's share is larger than that of the employee, although if the labor supply is relatively inelastic the incidence of both taxes is on the worker. Other taxes are an important source of finance in a number of countries; for example, in Argentina, a substantial share of revenues from the value-added tax (VAT) is earmarked for the social security system. In addition, transfers from the central government or other levels of government are important in Chile and Uruguay (Table 4). Neither of these countries can finance social security expenditures from payroll taxes alone, and without other sources of revenue, the revenue shortfall would be substantial. The share in total revenue of income from capital is generally low, although it contributes more to revenues in some Central American countries where the pension schemes are relatively young, and have been able to accumulate reserves.

Social security expenditures relative to GDP in the group of Latin American countries in the 1970s did not evolve uniformly. Expenditures as a percentage of GDP declined or were more or less stable in the countries with less extensive systems. The ratio of expenditure to GDP increased in Argentina and Costa Rica but declined in Uruguay after a series of reforms were launched in 1979 (Table 1). Taking a somewhat longer perspective, the expenditure ratio has risen since the 1960s. One motive force for this secular trend has been the substantial increase in life expectancy that has taken place since 1960 in most countries, which has affected pension expenditures of the system. The aging of the population has also increased the demand for medical services, although this effect has been partly offset by the decline in the demand for pre- and post-natal care resulting from a declining birth rate.

The lack of a uniform pattern also characterizes the evolution of the ratio of revenue to GDP in the 1970s. Revenue increased in Costa Rica, where the system was still expanding at a significant rate, and also in Argentina, but declined in Chile and Uruguay (Table 5). ^{1/} In view of the lack of a pronounced trend in either revenue or expenditure, it is not surprising that the deficit did not evolve in the same direction in most countries (Table 6). Nonetheless, although comparable data for the period since 1980 are lacking, the available information suggests that in a number of countries the deficit has continued to grow. ^{2/}

^{1/} The revenue data underlying the calculations of Tables 5 and 6 exclude central government transfers to the social security system.

^{2/} This was certainly the case in Uruguay, where aggregate data for the system and other pertinent information are available (see Appendix I).

Table 4. Selected Latin American Countries: Components of Social Security Receipts, 1980
(In percent of total)

	Contributions			Special Taxes	State Participation	Income from Capital	Other Receipts
	Insured	Employer	Total				
Argentina	38.4	49.4	87.8	2.8	7.4	2.0	--
Bolivia	28.7	53.6	82.3	6.2	--	7.9	3.6
Colombia	16.0	49.8	65.8	--	16.2	6.4	11.6
Costa Rica	27.6	45.9	73.5	18.6	1.8	5.2	0.9
Chile	20.5	38.3	58.8	1.4	32.8	2.0	5.0
Ecuador	37.0	43.0	80.0	--	0.1	19.9	--
El Salvador	23.4	63.0	86.4	--	0.9	11.8	0.9
Guatemala	31.6	53.1	84.7	--	8.2	6.9	0.2
Nicaragua	21.2	58.0	79.2	13.6	2.6	2.5	2.1
Panama	28.6	45.1	73.7	0.5	3.8	9.6	12.4
Uruguay	25.1	34.0	59.1	8.1	30.2	1.5	1.1
Venezuela	26.8	53.5	80.3	--	6.8	12.7	0.2

Source: ILO, The Cost of Social Security, Eleventh Annual Inquiry, 1978-80 (1985).

Table 5. Selected Latin American Countries: Total Revenue of Social Security System as a Percent of GDP 1/

	1970	1971	1972	1975	1978	1979	1980
Argentina	...	...	...	7.1	7.8	8.1	8.9
Bolivia	...	...	2.6	2.4	...	3.4	...
Colombia	1.7	...	...	2.2	2.5	2.7	2.8
Costa Rica	3.4	...	...	5.7	7.3	7.9	8.1
Chile	...	12.5	...	9.6	9.0	8.3	8.7
Ecuador	...	...	...	...	4.1	4.5	4.6
El Salvador	1.8	...	...	1.9	1.7	1.9	1.9
Guatemala	1.4	...	...	1.2	1.6	1.6	1.6
Nicaragua	2.6	...	...	2.6	2.5	3.1	3.2
Panama	...	...	6.6	7.7	7.9	8.3	7.8
Uruguay	...	...	...	8.5	8.6	7.4	7.4
Venezuela	1.1	...	...	1.5	1.6	1.3	1.6

Source: ILO, The Cost of Social Security, Eleventh Annual Inquiry, 1978-80 (1985).

1/ Central government contributions are excluded from revenues.

Table 6. Selected Latin American Countries: Social Security System
Surplus or Deficit (-) as a Percent of GDP 1/

	1970	1971	1972	1975	1978	1979	1980
Argentina	--	--	--	0.7	0.3	-0.0	-0.4
Bolivia	--	--	0.2	0.3	0.0	0.2	0.0
Colombia	0.2	--	--	-0.0	-0.2	-0.1	-0.0
Costa Rica	0.7	--	--	1.6	1.4	1.2	1.0
Chile	--	-4.1	--	-1.0	-1.7	-2.0	-2.0
Ecuador	--	--	--	--	1.8	2.1	1.7
El Salvador	-0.0	--	--	-0.3	0.6	0.6	0.4
Guatemala	0.1	--	--	-0.0	0.4	0.5	0.4
Nicaragua	0.1	--	--	-0.0	0.0	0.5	0.9
Panama	--	--	0.1	1.2	1.0	1.7	1.9
Uruguay	--	--	--	-1.2	-0.5	-0.3	-0.8
Venezuela	-0.7	--	--	0.3	0.4	0.2	0.3

Source: ILO, The Cost of Social Security, Eleventh Annual Enquiry, 1978-80 (1985).

1/ Central government contributions are excluded from revenues.

IV. Issues

1. Pay-as-you-go versus funded pension systems

The larger pension plans in Latin America are now financed on a pay-as-you-go basis, in which current contributions pay for current benefits, with any shortfall being met either out of reserves or via a transfer from other levels of government. The original pension plans were funded at the outset, but suffered a decapitalization of their reserves that created strong pressures for the adoption of pay-as-you-go financing. One reason for this decapitalization was the erosion by inflation of the real value of financial investments, mainly government bonds, that took place when nominal returns failed to keep pace with inflation. Investment policy in some countries took no account of the inflationary environment. Another reason was the extension of social security systems to encompass groups that were poor actuarial risks, and the introduction of benefits that could not be financed by payroll contributions from the intended beneficiaries, for example, minimum pensions for low-income workers. Finally, a substantial share of reserves was allocated to public investment projects--public housing, for example--where the real rate of return proved to be low or even negative. 1/

Would there be advantages for countries with relatively well-developed systems, like Uruguay, to convert their pension systems to funded systems? Should the countries whose systems are just now expanding and maturing eschew the pay-as-you-go method? Many economists have argued that pay-as-you-go plans depress saving and capital formation, but the extensive debate on this issue does not point clearly in one direction or another, and the empirical evidence--most of which pertains to the United States--is inconclusive. 2/

1/ These points are made in a discussion of investment policy in Chile's social security system in Wallich (1983).

2/ Boskin (1986), p. 80, who argues that the PAYG system in the United States has depressed private saving and capital formation, has nonetheless stated that "...the evidence is far from conclusive." Aaron (1982), p. 51 states, that "using the best that economic theory and techniques have to offer, [economists] have produced a series of studies that can be selectively cited by the true believers of conflicting hunches [about the effect of an unfunded social security system on saving] or by people with political agendas they seek to advance." This work surveys the empirical problems involved in estimating the impact of social security on saving. A survey of empirical studies and a tabulation of their conclusions may be found in Break (1981).

The basis for the view that a pay-as-you-go system depresses saving can be derived from a simple model in which there are two generations: workers and retirees. The introduction of social security results in a windfall increase in the incomes of the current generation of retirees, and they respond by increasing their consumption. The workers, meanwhile, must pay the contributions that finance this extra consumption, but assume that they will receive a pension equal to the present value of their current contribution payments when they retire. This crucial assumption implies that these workers act as though their stock of wealth is unchanged. Their consumption will also be unchanged, because consumption is assumed to depend on wealth rather than current income. In consequence, the workers will reduce their saving to finance the social security contributions they must pay. Hence, total consumption increases.

This argument presupposes that all retirement income is consumed, and the conclusion that savings are reduced does not necessarily hold when a "bequest" motive for savings is introduced. 1/ In any event, all of the theoretical discussions assume that additions to the reserves of a funded plan give rise to capital formation of an equal amount. Yet the surplus could simply be used to finance additional expenditures by the rest of the public sector, which might well have a current expenditure component. 2/

These various considerations, which do not pertain exclusively to Latin American countries, do not establish that the introduction or expansion of a PAYG system depresses saving and capital formation. However, among other considerations, the adoption of a PAYG system can obscure the long-run financial implications of a pension program, particularly when a country's demographic structure is changing.

The government that introduces a pension scheme commits itself to future expenditures that must be financed by some means. If the pension scheme is financed on a pay-as-you-go basis, and if an increase in the dependency ratio is projected, then contribution rates will have to increase to maintain the average pension as a given proportion of the average wage. 3/ If a pension program relates the size of the pension to the number of years in which participants make contributions,

1/ A discussion of the impact of different social security financing schemes on saving can be found in Squire and Shome (1983).

2/ This need not take place through an outright transfer of funds. Instead, the social security program could simply invest its surplus in government securities.

3/ The dependency ratio is the ratio of the number of pensioners (P) to the number of contributors (C). The total value of pensions in a given period is P times the average value of pensions A. Under a pay-as-you-go system, $t w C = P A$, where t is the contribution rate and w the average wage. If A/w is a constant, then t varies directly with P/C, the dependency ratio.

expenditures can be expected to rise rapidly in the initial years of the program, because the average number of years of participation in the plan of retirees increases as the system matures.

An advantage of a fully-funded system--if the projections on which it is based are sound--is that the possible unpleasant surprise of an increase in the contribution rate is avoided. Under a funded system, the contribution rate is set initially at a level that produces a surplus. A related argument is that if it is difficult to change social security contribution rates once they are set, then they should be set high enough initially to generate sufficient resources for the expenditure programs over a long period of time. To put it another way, a funded system conveys the right kinds of signals about the future costs of a pension program. ^{1/} The relevance of either of these arguments depends on the rapidity with which changes in rates are required.

An important consideration in the Latin American setting is the impact of inflation on a funded system. A high and variable rate of inflation will substantially increase the variance of the rate of return to the fund's reserves, unless its investments are indexed. Furthermore, an unexpected surge in inflation could wipe out the real value of the reserves. The problem of inflation is mitigated by the development of sophisticated financial instruments and may not be a serious problem in a stable financial environment. Nonetheless, a pay-as-you-go system is not vulnerable to inflation in the same way.

These various considerations do not constitute a strong case for a funded system in most Latin American countries. The argument that a PAYG system depresses saving may be totally irrelevant if confidence in the pension system is low, because consumption will not be stimulated if individuals do not expect to have their contributions returned to them in the form of pensions. In any case, PAYG systems have proved to be politically attractive.

If a country opts for a fully or partially-funded system, but uses the system's reserves simply to finance additional current expenditure by the government, any possible advantages of the choice of this type of system are lost. However, the appropriate policy for the government to adopt will depend on how the private sector reacts to a funded scheme. If it views its contributions as a kind of saving, albeit forced, then the social security system's savings could conceivably substitute for other forms of saving, leaving private consumption unchanged. In this case, any expenditure financed by the surplus has an expansionary impact on the economy. Unless the stance of fiscal policy before the introduction of the program was overly tight, this would be inappropriate policy. If the stance was right then the central government should act as if the surplus were not available to finance expenditure increases or

^{1/} This argument is discussed in Halter and Hemming (1987).

tax reductions. One appealing option would be to invest the reserves in the central government debt and thereby reduce the deficit of the consolidated central government. 1/

If contributions to a funded system are viewed as a tax, then the introduction of the program should give rise to some offsetting reduction in taxation or increase in expenditure unless the stance of fiscal policy before the introduction of the program was too loose. If the rate of investment in the economy is deemed to be too low, the reserves should finance public investments chosen for their social rate of return.

2. Financing sources

Social security has traditionally been financed primarily from payroll taxes in both the developed and the developing world. Payroll taxation has been seen as an equitable means of financing social security, because it relates an individual's cost of participation in social security to the benefits he will receive in a manner analogous to the relationship between the value of premiums in a private pension plan and average benefits.

This line of reasoning presupposes that the effective incidence of payroll taxation is on the insured, that is, that the introduction or increase in a payroll tax does not affect employers' labor costs, but reduces employees' pay after both the employer and employee portions of the tax are deducted. In any case, the relationship between the value of contributions made by, or on behalf of, different individuals and the expected value of future benefits can be pretty tenuous. For example, often when social security programs are introduced they are immediately extended to the current generation of retirees, who cannot have made any contributions. Additionally, a program will typically contain a redistributive component, so that the expected value of the benefits received by low-income groups will exceed the value of their contributions, even when the system is mature.

A related argument in favor of using payroll taxes to finance social security, either in part or in full, is that their use imposes financial discipline on the social security system. Undue and costly

1/ For example, if the deficit of the central government before consolidating the financial operations of the social security system is 5 percent of GDP, and a funded social security program is introduced that initially generates a surplus equal to 2 percent of GDP, the surplus could be invested in government bonds, on the assumption that the government's operations are unaffected by the presence of the social security system, so that the deficit of the consolidated central government declines to 3 percent of GDP. In a closed economy, the private sector would have a surplus of 5 percent before the introduction of the social security system and a surplus of 3 percent afterwards.

expansion in the benefits offered by the system will be checked, because the burden of the contributions is effectively borne by the contributors. Finally, the use of the payroll tax has been justified on the grounds of administrative ease.

However, in many Latin American countries, exclusive reliance on payroll taxation is simply not feasible for a social security system that aspires to broad coverage. The base of a payroll tax is effectively limited to the organized sector of the economy and, as has been noted, this sector is relatively small in many countries.

The assumption that the incidence of the payroll tax falls effectively upon the insured is also open to question and, if the tax is borne largely by either the final consumer or the employer, then the payroll tax is not necessarily the most appropriate financing source. Because of institutional rigidities in wage-setting and oligopolistic market structures in the organized sector, the tax could simply be passed on to consumers. One example of institutional rigidity is the regulation in Mexico's social security laws that employers of workers receiving the minimum wage are obliged to pay both the employer's and the employee's share of payroll taxes. 1/ This provision may be expected to result both in higher prices to the consumer and in a lower level of employment than would result from the minimum wage alone. A study of social security and other government programs in Chile revealed that prices were determined by average cost plus a markup, suggesting that costs, including payroll taxes, are simply passed on to the consumer. 2/

If the payroll tax is not effectively borne by the contributor, then it must increase the cost of labor. In turn, this will have some impact on employment, on the assumption that labor and other factors of production are to some extent substitutable. If this is the case, then a switch from the payroll tax to a value-added tax or some other tax that would have less of an impact on the relative cost of labor could generate additional employment. The shift away from payroll taxes to value-added taxation that took place in Uruguay and Argentina in 1978-79 was in part prompted by the view that high rates of payroll taxation were depressing the level of employment. 3/ A recent study calculated a range of estimates for the impact on employment in Mexican manufacturing that would be generated by a switch from payroll to value-added taxation. This impact ranged from 1.7 percent to 12.5 percent. 4/ Nonetheless, it should be noted that the estimates of elasticity of substitution of capital for labor and the other relevant parameters are subject to a very large margin of error.

1/ See Wilson (1985).

2/ Cited in Wilson (1985), p. 262.

3/ The Uruguayan experience is discussed in more detail in Appendix I.

4/ Wilson (1985), pp. 267-69.

The question of the effective incidence of the payroll tax is thus of considerable importance. If the burden of the tax does not fall on those who benefit from the tax, then there is no reason, on purely economic grounds, why social security programs should not be financed from general revenues. Moreover, there may be a case for reducing payroll tax rates if an alternative financing source is available.

The administrative simplicity of the payroll tax has not prevented a substantial degree of evasion in many countries. Evasion is encouraged by the incentive of both the employer and employee to understate earnings and employment. By contrast, value-added taxation creates no such incentives for underreporting and, in consequence, could be an attractive alternative to payroll taxation, in spite of its greater administrative complexity.

3. Financial implications of demographic trends

The social security systems of OECD countries have had to confront the financial implications of an increase in the dependency ratio brought about by the increased life expectancy of older persons, the declining birth rate, and the systems' maturation. Similar developments are evident in Uruguay, and declining mortality rates in Chile and Costa Rica have contributed to an increase in the dependency ratio in these countries as well. ^{1/} Further increases in the dependency ratio in these countries could create serious financial pressures, because pension expenditures are already a significant share of GDP. If life expectancy increases rapidly in those countries where it is now low, a substantial increase in pension expenditure is likely to result. At the same time, the aging of the population could require a substantial increase in medical expenditure for the treatment of the degenerative diseases associated with old age. In consequence, it is useful to consider what would happen to the composition of the population--and to the dependency ratio--if the present trends of a falling birth rate and an increasing life expectancy were to continue.

The World Bank's population projections for virtually all countries are based on the assumption that these trends will continue. ^{2/} By computing the ratio of persons at or above a standard retirement age to the number of persons of working age, a crude proxy for the dependency ratio may be derived. The ratio thus derived cannot take into account changes in the rate of labor force participation, but it gives a rough indication of the impact of demographic change on the financial requirements of a pension system.

^{1/} In Uruguay, net emigration of persons of working age in many years has also contributed to the slow growth of the labor force. See Appendix I.

^{2/} The 1985 projections are contained in Vu (1985).

The base projections of the World Bank do not show any great variation in the ratio of the retirement-age to working-age populations between 1980 and 2000 for any of the Latin American countries with the possible exception of Chile (Table 7). In some countries, the ratio even declines slightly. Thus, increases in the rate of growth of the elderly population owing to increased longevity and decreases in the rate of growth of the working-age population stemming from a falling birth rate would by themselves have little impact on the dependency ratio in the foreseeable future, if the assumption on which the World Bank's projections are founded proves valid. However, beyond the year 2000, the impact of the projected decline in the birthrate on the relative size of the working-age population begins to make itself felt. The increase is particularly marked in some of the Central American countries, as well as in Colombia and Venezuela. Moreover, the combination of a relatively rapid increase in the elderly population of these countries and the extension of coverage to the bulk of the population could cause expenditures to increase enormously.

4. Alternatives to public pension and health insurance systems and the experience of Chile

Section II pointed out that a public pension plan could be justified by a number of different considerations, including failures by the financial system to provide appropriate saving vehicles, and a paternalistic concern for those people who fail to make adequate financial provisions for their old age. These arguments tend to suggest a stark dichotomy between a fully state-controlled and state-administered system and the untrameled workings of a private financial system, where the state plays no role whatsoever. Yet a median solution is possible, and one was in fact implemented in Chile in the reforms of 1979. It is instructive to examine the Chilean experience, because it illustrates some of the possibilities open to other Latin American countries who might seek an alternative to the traditional model of the pension component of social security.

The Chilean reforms were intended to replace the old social security system with what could be termed a compulsory private sector savings plan, under which the State's role would be reduced to one of regulation. Under the new scheme, the employer's contribution has been eliminated and individuals are required to deposit some 10 percent of their salary in one of a group of eligible financial institutions--the Administradoras de Fondos de Pensiones, or AFPs--that the individuals can choose themselves. These institutions, or funds, which are required to specialize completely in the management of the savings entrusted to them, must restrict their investments to a range of financial securities. 1/

1/ A discussion of various aspects of the new scheme can be found in Arellano (1985), Chapter III.

Table 7. Selected Latin American Countries: Projections of
Dependency Ratio, 1980-2030 ^{1/}

(In percent)

	1980	1990	2000	2010	2020	2030
Argentina	24.1	26.3	26.0	26.1	28.6	30.7
Bolivia	12.7	13.2	12.9	13.0	14.0	16.3
Brazil	13.8	13.8	14.6	16.4	21.5	27.9
Chile	16.7	17.2	19.0	22.8	29.3	36.3
Colombia	12.9	12.7	13.2	15.5	21.1	29.7
Costa Rica	12.6	12.9	14.2	16.6	23.9	33.2
Ecuador	13.4	12.3	12.0	12.5	15.4	20.3
El Salvador	13.1	12.6	11.8	11.7	14.3	18.9
Guatemala	11.1	11.5	11.8	12.5	15.3	19.4
Mexico	13.3	11.9	11.9	13.0	16.6	23.2
Nicaragua	10.5	10.7	10.3	10.3	12.7	16.2
Panama	14.8	14.5	14.8	17.3	22.7	30.4
Uruguay	29.5	32.9	33.9	32.3	33.5	38.7
Venezuela	10.6	11.4	12.3	14.2	19.4	25.5
Average ^{2/}	14.5	14.3	14.6	16.0	20.3	26.2

Source: Vu, My T., World Population Projections 1985, Short- and Long-Term Estimates by Age and Sex with Related Demographic Statistics (Washington: IBRD, 1985); and staff calculations.

^{1/} The dependency ratio is calculated by expressing the population aged 60 or more as a percentage of the population aged between 20 and 59.

^{2/} Calculated by weighting each country's dependency ratio by its share of the group's total projected population.

Each participant in this savings plan has a personal account with his chosen fund, and his share of the net earnings of the fund--its investment income net of commissions--accrues to his account. Pensions are determined by the capitalized value of each person's contributions to the plan; upon retiring, each participant may choose to invest the accumulated value of his contributions and their earnings in his account in a life annuity purchased from an insurance company. The annuity is expressed in real terms--unidades de fomento--which are linked to the consumer price index. 1/ The reforms also provided for a minimum pension for persons with at least 20 years of work experience. If the accumulated capital in an individual's account is insufficient to provide this minimum pension, the Government makes up the difference. 2/

The measures implemented in 1979 included a provision that allowed Chileans covered by the old public system to switch to the new scheme at any time between 1981 and 1986. Subsequently, the deadline for transfer was extended indefinitely. Persons opting for the new system would have their accounts in the new scheme credited at the time they retired by an amount related to their accrued contributions under the old public system. 3/ After December 1982, all new entrants to the labor market except the self-employed, whose participation was voluntary, were required to join the new scheme. In order to foster competition, and hence more efficient management, participants in the new scheme were allowed to switch from one fund to another.

The reforms also included increases in the retirement age, to 60 for women and 65 for men. This increase in the retirement age strengthened the finances of the old system, and could have permitted a reduction in the contribution rates without weakening the system's financial position, *ceteris paribus*. However, rates were not changed, and were higher than the rates of the new system. As a result, a substantial incentive to switch to the new system was created, because the percentage of income involuntarily saved in the new system did reflect the new retirement ages, and was in consequence less than the

1/ Individuals retiring under the new system may also pick the programmed retirement option, which entitles them to monthly payments directly from the AFP. This second option does not guarantee a constant real payment to the pensioner, as the first option does. The Chilean system is similar in some respects to a proposed reform of the U.S. social security system. See Boskin, Kotlikoff, and Shoven (1985).

2/ An additional obligatory deduction of about 3.5 percent is used to purchase disability and survivor's insurance from an insurance company.

3/ Upon an individual's retirement, his account is credited with a bono de reconocimiento, a "recognition bond," by the government.

contribution rate of the old system. Under these circumstances, it is not surprising that the majority of contributors in the old system switched to the new. 1/

The old and new systems will coexist for some time. The old system will continue to receive contributions as long as there are persons who entered the labor market before December 31, 1982 who did not opt for the new system, and it will continue paying pensions until the last of the current generation of workers that did not opt for the new system dies.

The Government plays an important regulatory role in the new system, because it oversees the performance and functioning of the private funds. However, its role goes beyond that of strict regulation, inasmuch as it also insures that contributors to the new system receive a minimum rate of return. This rate is defined as the lesser of 50 percent of the average rate of return for all the funds, and the average rate less two percent. This guarantee does not apply to the funds themselves, which do not receive any subsidy.

The method of determining an individual contributor's pension differs radically between the old and the new systems, and this difference is crucial to one's understanding of the two systems' relative merits. Under the old system, an individual's pension was determined by the number of years he contributed and his average salary in the period immediately before he retired. Pensions were adjusted from time to time, but were not subject to any automatic indexation rule, and their real value fluctuated substantially in the 20 years before the reform was instituted. 2/

Under the new system, the value of a pension will be determined by a contributor's savings and the average rate of return of his fund, subject to a minimum rate of return determined by the Government. Consequently, there is no guarantee that pensions will bear any given relationship to a contributor's earnings, nor that a pension will maintain its value in real terms over the retirement period. The funds conceivably may not be able to achieve positive real rates of return, so that the Government might be compelled to intervene. As was noted in Section IV-1, public pension plans in Chile and other countries that were once funded experienced a substantial decapitalization of their reserves.

1/ Arellano (1985, p. 145) estimates that the number of persons contributing to the old system declined from 1,695,000 in 1980 to 449,000 in 1983, and that the number of individuals contributing to the new system reached 1,106,000 by the end of 1984. Mesa-Lago has estimated that 83 percent of insured persons were participating in the new system at the end of 1986 (Mesa-Lago, personal correspondence, 1987).

2/ Arellano, p. 79.

The more stable the financial environment, the more successful management of the funds is likely to be; the existence of the new system is also likely to create additional incentives for just such an environment. Nonetheless, although 1981-86 was not a stable period, the funds earned rates of return that were high in real terms.

In Section IV-1 a funded system was compared with a PAYG system as a generator of savings but neither system was found to be conclusively superior to the other. Many economists would conclude that Chile's new system should be preferred because of its ability to generate savings. Nonetheless, it remains critical that the contributions to funds not be used to finance additional current expenditure by the Government.

The new system has been touted as more efficient than the old, although this could be verified only if the administrative expenditures of the old system were examined in detail and compared with the operating costs of the private funds. The existence of substantial economies of scale in the administration of public savings plans could mean that a unified public system would be potentially less costly than the new privatized system. However, the old system was far from unified, and in 1980 administrative expenditure was estimated at about 7 percent of total expenditure by the Chilean social security system, a high figure by the standards of the industrialized countries, but about average for Latin American countries. ^{1/} Private sector operations would presumably have more incentive to minimize their operating costs than would a public bureaucracy, and the Chilean Government's guarantee of a minimum rate of return to the contributors is not a guarantee that it will rescue a fund in financial difficulty. Hence, the regulation of the industry does not appear to create a disincentive to cost minimization.

Nonetheless, it is not clear that the new system is less costly than the old. One observer has drawn attention to the funds' apparently high level of promotional and advertising expenditures in their first few years of operation. ^{2/} These expenditures can be attributed to "start-up" expenditures, designed to familiarize potential customers of the funds with their existence, but they are not necessary for the operation of the public system. In addition, the coexistence of the two systems must substantially increase the amount of resources devoted to the administration of savings plans.

^{1/} ILO (1985), Table 1. The average for the 12 countries in Latin America shown in Table 1 is 12 percent.

^{2/} Arellano (1985, p. 170), estimated that marketing and sales costs amounted to 39.8 percent of total operating costs exclusive of depreciation and amortization in 1982, and 30 percent in 1983. The 1983 figure is substantially higher because the sales campaigns were launched in that year.

The switch to a regulated private and funded system has had the effect of substantially increasing the deficit of the financial operations of the consolidated Central Government, because revenues of the public social security system fell with the transfer of contributors to the private system--although the old system still had to pay the pensions of persons who had retired under that system--and because the Central Government now had to pay the bono de reconocimiento of each transferee to the new system as he retired. 1/

The question arises as to whether the increase in the deficit resulting from the reforms, which has been estimated at about 5 percent of GDP in 1983, should be regarded as an expansionary shift in the stance of fiscal policy. 2/ To the extent that payroll tax contributions to the public social security system are simply replaced by contributions to a private and compulsory savings plan, while the public social security system goes on making pension payments to retired contributors to the system, the increase in the deficit would not appear to be expansionary. The private funds could invest their monies in public bonds and treasury bills, and the increase in the public sector deficit is offset by an increase in the savings of the private sector, with no increase in expenditure, either investment or consumption. Only if the savings entrusted to the funds lead to an increase in expenditure--for example, by being invested in private securities that give rise to an increase in investment--is the increase in the deficit associated with an expansionary shift in the fiscal stance.

The reforms of 1980-81 also affected the health and medical component of the social security system. Under the previous system, public hospitals, whose services were largely free and which catered mainly to the blue-collar worker, existed side by side with a voucher system, whose participants could choose among a variety of health care providers. The social security system financed 50-70 percent of the cost of the vouchers, with users financing the remainder. 3/ The health expenditures of the social security system were financed through contributions of 4 percent of workers' taxable earned income.

The new system is also financed by a payroll tax, whose rate was raised to 6 percent in 1983, and subsequently to 7 percent. However, individuals who do not wish to rely on the services of public hospitals can opt to become members of providential health institutions (Instituciones de Salud Previsional, ISAPRES), which receive the 7 percent contribution from their membership. Each ISAPRES accepts only

1/ Another measure taken in the reform, but not discussed previously, that had the effect of increasing the deficit was the reduction in the rate of contribution for the family allowance and cesantía (early retirement subsidy) component of social security, which continued to be publicly administered.

2/ See Yañez (1985).

3/ See Foxley, Aninat, and Arellano (1979), p. 106.

persons whose annual income is above a certain minimum. At the end of 1984, this minimum varied from Ch\$ 40,000 to Ch\$ 120,000, and was several times the average income of the contributors remaining with the old system.

These changes to the health component of the system were not as far reaching as the reforms made to the pension component, and have affected fewer people. At the end of 1983, some 108,000 persons were registered in some 15 different ISAPRES, some of which restricted membership to employees of a single large enterprise. However, the new system has some interesting implications. In particular, it has had the effect of reducing the revenue of the public system, because the contributions of the individuals who registered with the ISAPRES are now made to these institutions instead of to the social security system. Health expenditures have also been reduced. However, because the persons registered at the ISAPRES were among the better off, they were undoubtedly subsidizing the group of persons remaining with the public system. The result is that the financial balance of the health component has been reduced, and its redistributive role has been lessened substantially. 1/

5. Effects of social security on income distribution

The introduction and expansion of social security programs can affect the distribution of income in a significant way. Many social security programs aim to provide a minimum standard of medical care or income support for which all participants are eligible, regardless of their income level. Even in the pension component of the system, when both benefits and contributions vary in some manner with the contributor's income, the correspondance between the value of contributions and the expected value of benefits can be tenuous.

There are a number of studies of the incidence of Latin American social security systems, that is, the effect of the system on the distribution of income, in which the share of income excluding social security operations accruing to different income groups is compared with the share of income including social security operations. The studies use the same kinds of methods as employed in studies of the incidence of taxes and government expenditure. Well-known difficulties, both empirical and theoretical, attend these studies. 2/ For example, they usually assume that the distribution of income gross of tax is unaffected by the imposition of taxes and by the expenditures these taxes finance. If the public sector is relatively large, this assumption is untenable. This particular difficulty may not be of such

1/ Arellano (1985), pp. 188-91.

2/ A discussion of these problems of method may be found in Bird and De Wulf (1973).

great importance for the analysis of the incidence of social security, because it is only a component of the public sector, albeit a significant one.

Another important difficulty is that the results of the studies depend on assumptions regarding the effective incidence of taxation that are inevitably arbitrary. Finally, the results may be affected dramatically by the definition of income they employ, for example, the choice of family income gives one result, while income per capita can give another. The empirical difficulties stem from the fact that few countries possess the kind of data base necessary for the accurate calculation of incidence. Nonetheless, one can make some general observations on the likely incidence of social security systems provided one makes the necessary assumptions and bears these caveats in mind.

Two characteristics of Latin social security systems are particularly relevant in any assessment of the effects of social security on income distribution: namely, their coverage, which is often quite low, and the important financing role often played by transfers from the central government, in the form of either earmarked revenues or general budgetary support.

When coverage is not universal, the incidence of the social security system depends critically on the financing source and its incidence. 1/ There is typically a correlation between the degree of urbanization and industrialization and the extent of coverage (discussed in Section III). Those excluded from coverage are generally found in the rural and unorganized urban sectors, where the incidence of extreme poverty is the highest. Those covered often form a relatively privileged group. 2/

Under these circumstances, the incidence of the system could be broadly neutral if social security expenditures were financed entirely by payroll taxes whose effective incidence, regardless of legal incidence, fell on employees, and if an individual's benefits were related to his contributions. However, as discussed in Section IV-2, there is some reason to believe that the consumer bears at least part of the effective incidence of payroll taxes. Thus, persons not participating in the system could be paying, in the form of higher prices, for the benefits that accrue to a relatively privileged minority. Within the participating group, some transfer of income from

1/ The incidence of the system as a whole is said to be regressive if the net transfer it creates increases in proportion to income as income increases. Typically, a system will be neither regressive nor progressive over the entire range of income.

2/ Mesa-Lago notes that in the countries where social security was pioneered, such as Chile, Argentina, and Uruguay, the first groups to be covered were generally relatively well-off workers in the mining enclave, transport sector, or public sector. See Mesa-Lago (1983).

one income class to another could also take place. If the system has a minimum pension, then those who are better off are paying a subsidy to those who are worse off: this provision has a progressive incidence. Conversely, a cap on the absolute value of contributions has a regressive incidence if no similar cap affects pensions.

By contrast, if coverage is universal, or at least does not exclude those at the lowest end of the income scale, then the incidence of the payroll tax is less important. If employers pass on the tax in higher prices, the group bearing the effective incidence of the tax, the general population, is also benefiting from the expenditures the tax finances.

When coverage is limited and social security expenditure is at least partly financed out of general revenues, then its effective incidence is likely to be regressive, even if the employed contributors bear the burden of the payroll tax component of the system's revenues. The general revenue component is partially borne by participants who benefit from the system's expenditures; the greater burden of general revenues is borne by the rest of the population, which does not. But, as has been noted, the relatively poor typically do not contribute and do not benefit. If coverage is universal, this is not a consideration. It can be tentatively concluded that the incidence of the social security system is regressive in most of Central America, and also in relatively affluent countries like Colombia and Venezuela, because coverage in these countries is low.

Interestingly, two recent studies of countries where coverage is relatively broad by the standards of the region found that the incidence of social security was either neutral or slightly progressive. 1/ A study of the Costa Rican system as of 1973 found that even with 50 percent coverage, the system's incidence was slightly progressive. Specifically, the share of income received by the bottom 40 percent of the income distribution was increased by 1 percentage point, the share of income by the middle 50 percent was increased by 2 percentage points, and the share of the top decile was reduced by 3 percentage points. The progressivity of the incidence of the system's health component, which was found to be distributed quite evenly regardless of income level, offset the regressivity of a ceiling on income subject to contributions and the regressive impact of less than universal coverage. (The degree of coverage has increased substantially since 1973.) 2/ A study of Chile in the early 1970s found that the incidence of the system was broadly neutral for the insured group. 3/ But for the population as a whole, the incidence could be regressive.

1/ These studies are cited in Mesa Lago (1983).

2/ See Wilner-Green (1977).

3/ See Foxley, Aninat, and Arellano (1979).

6. Problems posed by an inflationary environment

An inflationary environment complicates the administration of social security and the social security system itself. As an important component of general government, the social security system can play an important role in sustaining or generating inflationary pressures, or in resisting these pressures, depending on the indexation policies it adopts.

Consider first the impact of inflation on the financial balance of a social security system whose sole revenue source is the payroll tax. A revenue system that is neutral with respect to inflation is defined here to mean one where a change in the rate of inflation does not affect the ratio of revenues to GDP. For neutrality to hold the following set of conditions is sufficient: first, the built-in elasticity of tax revenues with respect to their tax base--the wage bill--must be unity; and second, the elasticity of the wage bill with respect to GDP must also be unity, that is, the share of the wage bill in GDP is constant. If the second condition holds, the built-in elasticity of payroll tax revenues with respect to the wage bill will be unity when the tax is a fixed percentage of wages with no ceiling on contributions and no lag in collection.

Lags in collection reduce the ratio of taxes to their base when the rate of inflation increases, because the base is raised by inflation before the yield of the tax is raised. 1/ In practice, there will always be some lag, although in the case of the payroll tax it should be relatively short if the degree of the contributors' compliance is sufficiently high. However, the inflationary process can create strong incentives for enterprises to delay their tax remittances, unless the penalty for doing so varies directly with the rate of inflation and with the period of the delay. For example, if the rate of inflation is 100 percent, and the penalty for a delay of three months is 25 percent, then firms can enjoy an approximately interest-free loan for three months by delaying their remittances (assuming compounding is ignored). If the rate of inflation is higher than this, the three-month loan has a negative real rate of interest.

If the penalty for late remittances cannot be adjusted promptly when inflation accelerates, it should be set at a very high level: otherwise, the acceleration of inflation can create serious problems for social security finances, even if the tax is a fixed percentage of wage income, and there is no ceiling on taxable income. 2/ If the financial position of enterprises deteriorates along with the acceleration of inflation, the incentive to delay remittances will be all the greater,

1/ See Tanzi (1977).

2/ Setting the penalty at a high level can cause problems too: when the rate of inflation is low, a penalty rate high enough to deter late remittances at high rates of inflation will be punitive.

especially if the compliance of contributors is not strong to begin with. In summary, in some circumstances an increase in the rate of inflation can significantly reduce the ratio of social security revenue to GDP.

The ratio of the social security system's expenditure to GDP will depend on the indexation policy the system follows. Specifically, the ratio will depend on the frequency of adjustment, the lag in adjustment, the relationship between the price index in the indexation formula and the GDP deflator, and the elasticity of real expenditures with respect to GDP. Even with full indexation, an increase in the rate of inflation will lower the ratio of expenditure to GDP, unless the adjustment lag is zero and the adjustment is continuous.

Assuming that the indexation formula relies on the consumer price index (CPI), that the CPI increases at the same rate as the GDP deflator, and that the elasticity of real expenditures with respect to real GDP is unity, the expenditure to GDP ratio will vary directly with the frequency of adjustment, inversely with the lag in the adjustment, and inversely with the rate of inflation. In other words, accelerating inflation reduces the ratio more if the adjustment lag is long, and if the frequency of adjustment is low. For example, with an initial ratio of expenditure to GDP of 10 percent, an increase in the rate of inflation from zero to 50 percent reduces the expenditure ratio to 8.7 percent even when expenditure is adjusted quarterly with a quarterly lag. When adjustment takes place once instead of four times a year, the ratio falls to 7.5 percent. ^{1/}

The choice of an automatic or discretionary approach to the indexation of the pension component of social security expenditures depends to some extent on the index used. A policy of full indexation to the CPI implies that one social group receives special protection from shocks to the economic system that entail a decline in real income. Pensioners are protected against any real income loss when the economy suffers a substantial terms-of-trade loss, such as the one induced by the oil price shocks of 1973-74 and 1979-80. In such circumstances, this kind of indexation may forestall the adjustment in real incomes necessary to restore external balance.

Some might argue that pensioners deserve such protection, because it is part of an implicit bargain between them and the government, or because they are in a position of dependency, or because their incomes are already less than they were when the pensioners worked. In response, pensioners in Latin America can be a relatively privileged group, and maintaining the income of pensioners relative to the income of active labor force participants may be more appropriate. Moreover,

^{1/} See Appendix II, which provides illustrative calculations of the impact of lags and frequency of indexation on the expenditure-GDP ratio.

attempts to preserve the real incomes of pensioners when those of the rest of the community are declining can ultimately threaten the social security system. Exempting pension expenditure from austerity measures can only reduce the probability of success of a financial stabilization policy, particularly when such outlays are a significant component of general government expenditure.

In consequence, a policy of indexation to the CPI would be misguided in some circumstances. Indexing pensions on wages would be a better rule for financial stabilization. But could a policy of complete discretion be even better? The argument for discretion is that no single rule would always be appropriate. If real wages are rising at an unsustainably rapid pace, then wage-based indexation would not be appropriate. Yet it may be argued that the long-term functioning of a social security system may require that contributors can expect a certain stability in their benefit entitlements. The periodic adjustment of pensions in line with wages can thus be seen as the expression of an implicit contract that pensions will normally be related to earned incomes, even if pensioners will not always be protected from declines in their real income.

7. Administrative issues

a. Evasion and delays in remitting contributions

Evasion of payment of social security contributions appears to have been significant in a number of Latin American countries, although it is difficult to ascertain its extent. ^{1/} It is likely to be more prevalent in the rural and unorganized urban sectors, because enterprises in these sectors typically do not keep accounting records and because, given their small size, administrative surveillance is often not cost effective. Additionally, evasion is likely to be more prevalent in systems in which there is little or no relation between a participant's contributions (including contributions made on his behalf by his employer) and the benefits he enjoys. For example, the incentive for workers to collude with employers to evade contributions would be greater if pensions were not related to the value of contributions, or if the contributions financed medical care and payments for income lost while workers were sick. ^{2/} One advantage of the type of pension system introduced in Chile is that evasion clearly reduces, and is seen to reduce, future benefits.

The temptation to evade may increase in periods of recession, and it must certainly increase when the rate of inflation increases if, as

^{1/} Appendix I assesses the importance of evasion in Uruguay, noting that it has increased the ratio of pensioners to contributing workers in the pension system.

^{2/} This assumes that contributors would not discount future income excessively.

has been the case in many countries, penalties for evasion are a fixed percentage of the value of contributions not remitted. Finally, the rate of the payroll tax itself is related to the incentive to evade.

Clearly, evasion will be a problem if the social security institution cannot command the administrative means to ensure a reasonable degree of compliance. In a system where benefits do depend on an individual's contributions, the incentive to cheat is probably greater when no adequate records of an individual's contributions are maintained. Such records are imperative, not just to reduce evasion, but to ensure that benefits are fairly evaluated.

Substitution of the value-added tax for the payroll tax has been seen as a remedy for the problem of compliance, because with the credit-invoice system of the VAT, there is no incentive to underinvoice at either the wholesale or manufacturing stage of production. However, the VAT is considerably more difficult to administer than the payroll tax, and effective compliance requires sophisticated random sampling procedures that would strain administrative resources in many countries. Moreover, as McClure (1981) notes in a discussion of the possible introduction of a VAT as the chief source of revenues for the U.S. social security system, if it does not fully replace the payroll tax, there is no saving from the dismantling of the administrative apparatus of the payroll tax.

Tardy remittances have also been a problem. In some countries, because of inadequate penalties for late remittances, business enterprises have enjoyed a loan from the social security regime at a negative rate of interest. Either periodic adjustments of the penalty for late payment or a constant, very high, penalty rate is necessary to resolve this problem when the rate of inflation is high and variable. Finally, late remittances are tacitly encouraged if the government is late in making its own contributions to the social security system, or in establishing and settling claims to pensions.

b. General administrative issues

The stratification of social security schemes in the countries that first introduced social security must have contributed to substantial administrative inefficiency in the past. Because of the large number of plans, administrative resources were duplicated. Moreover, the lack of coordinated administration was responsible for serious inequities, including the nontransferability of years of participation under one scheme to another; and the possibility of an individual's receiving two pensions at excessively generous terms because benefits were not coordinated when contributory service in one plan was transferred from another.

The reform measures implemented recently in Chile and Uruguay, where the number of different plans with different regimes was greatest, have substantially increased the unification of the systems.

Nonetheless, the process is not yet complete, and there is evidence that some advantages of a unified system have yet to be exploited fully; for example, a comprehensive statistical base has not yet been created. 1/ The lack of a unified system is not an issue in the Central American countries, or in Venezuela, where the coverage of the system is limited essentially to the urban work force.

Whether the system is completely unified or not, administrative expenditures in Latin American countries are high in relation to OECD member countries if the ratio of administrative expenditures to total expenditures is taken as the index of relative cost (Table 8). In Bolivia and Ecuador, this index is high by any standard. Interestingly, within Latin America, there is no obvious correlation between relative cost and degree of stratification: in other words, the cost index is no higher in Chile and Uruguay than in other countries. This could reflect in part the exclusion from the figures of certain specialized funds, as well as the achievement of a higher degree of coverage, when economies of scale in administration exist. Such economies of scale could explain the lower cost of the OECD programs if these programs were generally larger than programs in Latin America. However, Denmark, Ireland, and Norway, all with relatively small programs, have cost indices lower than any Latin American country (Table 8). 2/

Mesa-Lago (1985) has drawn attention to the lavishness of social security administrations' headquarters, and has argued that payrolls and benefits of the administrative staff have typically been excessive. One indicator of this is the number of administrative personnel for each 1,000 contributors, which in 1981 reached 13 in Costa Rica, although administrative expenditures in that country are not high by the standards of the region.

The health expenditure component of social security systems, particularly the medical services component, presents special administrative problems. In many countries, parallel hospital systems exist: one for social security contributors, another--operated by the ministry of health--for the rest of the population not relying on private clinics. Typically, the social security's medical program covers a minority of the population--a small minority in a number of Central American countries--mainly blue- and white-collar workers in the cities (Table 3). The rural population and indigent city dwellers are largely covered by the system operated by the ministry of health. Despite its smaller coverage, the social security medical care system usually has a larger budget than the medical care component of the

1/ See Mesa-Lago (1985), p. 199.

2/ A further possible explanation is that some of the capital equipment used by administrative agencies in Latin America may be as expensive as that used by OECD countries, while the value of benefits per capita is much lower, given the much lower per capita income levels in Latin America to which benefits are scaled.

Table 8. Selected Latin American and OECD Countries:
Social Security Administration Expenditures
as a Percentage of Total Expenditure, 1980

Latin America		OECD	
Argentina	4.4	Belgium	4.1
Bolivia	19.3	Canada	2.5 <u>1/</u>
Colombia	12.4	Denmark	2.7
Costa Rica	6.9	France	3.9
Chile	7.5	Germany	3.1
Ecuador	28.0	Greece	4.5
El Salvador	14.2	Ireland	4.7
Guatemala	12.1	Italy	4.3
Nicaragua	11.6	Japan	2.0 <u>1/</u>
Panama	5.2	Netherlands	3.4
Uruguay	7.7	Norway	2.1
Venezuela	14.0	Portugal	9.9
		Spain	2.7
		Sweden	2.5
		Turkey	4.1
		United Kingdom	2.8 <u>1/</u>
		United States	3.1 <u>1/</u>

Source: ILO, The Cost of Social Security, Eleventh Annual Enquiry, 1978-80 (1985).

1/ 1979-80.

ministry of health, and its per capita expenditure is much larger. ^{1/} This difference reflects the relatively privileged position of the minority of the population covered by social security.

The services of the two institutions have not been coordinated in a number of countries, leading to a considerable duplication of services; an example is two hospitals serving the same community where one would suffice, so that in many countries the occupancy rates of hospital beds have been as low as 50 percent. ^{2/} Efforts to improve the coordination of services have generally met with little success. One source of difficulty has been the preference of contributors to social security for a separate hospital system because of the poorer quality of service in the public system. ^{3/} However, not all countries face this type of problem. In Costa Rica, for example, the Ministry of Health is responsible for public health programs and for medical care in rural areas not covered by the social security system, while the social security system is responsible for the bulk of medical care services. The two services are being gradually integrated.

The dominance of the social security medical system may conceivably have resulted in an excessive emphasis on curative rather than preventive medicine. The concentration of social security's resources in the cities and the financial constraints imposed on the budgets of health ministries imply that a significant proportion of the rural population has limited or no access to modern medical care. These inequalities cannot be eliminated by an extension of the coverage of the social security system at its present level of benefits per capita, because this would require an enormous increase in the financial resources mobilized by the system.

V. Summary

1. Recent developments and prospective trends

The social security systems of some Latin American countries are large enough that their financial imbalances can have serious macroeconomic consequences. In one country, the deficit of the social security system has risen to as much as 7 percent of GDP in recent years, and large imbalances have also occurred in other countries. These imbalances reflect the influence of the erosion of the payroll tax base on account of falling employment, as well as the secular influence of an aging population on the finances of the system's pension component. In order to forestall the emergence of more serious financial disequilibria, a number of countries have had to allow a

^{1/} See Ugalde (1985), p. 111.

^{2/} Mesa Lago (1985), p. 26.

^{3/} This is discussed in International Social Security Association (1982), Chapter 3.

marked erosion in the level of social security expenditure in real terms. This reduction has been accomplished by various means, including by less than full and timely indexation of pension benefits and increases in minimum retirement ages.

The social security systems of most Latin American countries now absorb only a small share of GDP, essentially because the coverage of the systems is low, even though expenditure per participant can be quite high. However, as the pension component of their systems matures--as a greater share of the elderly population, having contributed for a longer time, becomes entitled to more benefits--the share of expenditure in GDP can be expected to grow, even without a marked expansion in the system's coverage. The reported accounting surplus in the pension system in some of these countries most likely disguises an actuarial deficit: benefits promised under current legislation in the years to come will not be financeable from the system's income from reserves and contributions at current rates of contributions from the system's participants. An additional problem confronts these countries; namely, any significant expansion of the system will not be feasible at the current level of expenditure per participant, so that there will be a tradeoff between the generosity of benefits and the degree of coverage of the system.

Although demographic forces have contributed to the upward pressure on social security expenditures in the last 25 years, their influence should abate in most countries in the near future, inasmuch as no marked increase in the ratio of elderly persons to working-age persons is projected to take place in the next 20 years. However, in the more distant future, a further decline in the birth rate and some further increase in life expectancy could push the dependency ratio up again, putting pressure on pension expenditure. At the same time, the increase in life expectancy and demands for high-technology medical care will create pressure on medical expenses.

2. Funding versus pay-as-you-go

With one exception, no country in the region has a fully-funded pension system. The exception is the new, private system in Chile. A number of prominent economists have argued that pay-as-you-go systems reduce national saving and capital formation, but evidence to support this view is not conclusive. It is not possible to make a blanket recommendation in favor of one or the other of the two systems. Funded systems are vulnerable to inflationary shocks if they are not able to invest in indexed financial instruments, as well as being vulnerable to misguided investment policies. Latin American systems that were once at least partially funded suffered a decapitalization of their reserves as a result of such policies. However, a funded system could be successful in a stable financial environment.

The reserves of a funded system should not normally be used to finance increases in government expenditure or tax reductions, so that the introduction or expansion of a funded system should reduce the

deficit of the consolidated central government. An exception to this rule can be made if the private sector views its contributions to the system as a tax, rather than as a kind of forced saving.

3. Revenue sources and their distributional effects

The main but not exclusive source of finance for Latin American social security systems is the payroll tax. The base of this levy is considerably less broad than it is in most OECD countries, because of the smaller share of salaried employees in the Latin American labor force, so that exclusive reliance on it would impose a stringent limit on the size of the system. The payroll tax is a relatively simple levy to administer and if its effective burden rests on participants in the social security system, then it has the additional advantage that those who benefit from the system pay for it.

When coverage is less than universal, as it is in virtually all Latin American countries, and the system is partly financed out of general revenues, the incidence of the system is probably regressive, because persons excluded from coverage will bear part of the burden of the taxes that finance it. This conclusion is strengthened if the burden of the payroll tax is shifted forward to the consumer.

The narrow base of the tax means that its rates must be high to finance an extensive system, and if the tax is not borne by labor but results in higher labor costs, these rates can encourage capital-intensive production methods and reduce employment. If the base of the tax cannot be broadened to finance the expansion of the system, then both equity and efficiency considerations suggest that additional revenue must be sought from a tax or combination of taxes whose incidence is less regressive and more neutral in its impact on factor costs.

4. Alternatives to conventional social security programs

Alternatives to the traditional model of social security are possible in Latin America, as the reforms in Chile demonstrate. The new system preserves some basic features of the old public system but reduces the direct role of the Government. Thus, the new pension system obliges the current generation of young adults to make contributions to a kind of individual retirement account managed by a private financial institution under public supervision. If its participants completely trust the new system, it will have the merits of lessening the incentive to evade the making of contributions, and of creating a more solid and transparent link between the value of contributions and the value of benefits that contributors will ultimately receive. The system's start-up expenditures have been large, but the public system, which is being phased out, is extremely costly. However, the successful operation of a Chilean-style plan requires both a well-developed system of financial intermediation and a stable financial environment.

5. Impact of inflation

The inflationary environment of Latin America complicates the management of social security systems, particularly their pension component. Accelerating inflation tends to reduce both revenues and expenditure relative to GDP. Its effect on the overall financial balance of the system depends on certain properties of the system: in particular, the lag in the collection of revenues and the frequency of adjustment of ceilings on individual contributions--if there are any-- and the lag, frequency, and degree of indexation of expenditure. A high and volatile rate of inflation can produce sizable swings in the real value of benefits and their share of GDP even if the frequency of adjustment is fairly high and the lag in adjustment short. However, with a significant lag in revenue collection, and prompt and timely indexation, the deficit could grow as a share of GDP. A good understanding of the dynamics of social security revenues and expenditures and of indexation policies will contribute to a better design of macroeconomic adjustment programs.

6. Administrative issues

Finally, social security systems in Latin America are often beset by serious administrative problems. Administrative expenditures are high by comparison with OECD countries: they are raised by excessive staffing levels and by bureaucratic competition over the supply of medical services between social security institutions and ministries of health. The vestiges of systems having numerous benefit plans and institutions that cover different occupational and social groups also contribute to administrative duplication and inefficiency in a number of countries. In consequence, the potential for cost savings is great. However, progress in this area and others can face serious opposition from special interest groups having considerable political power.

An Extensive Social Security System: The Case of Uruguay

Uruguay's social security system is one of the largest in the region. In common with Argentina and Chile, where social security programs were introduced late in the nineteenth or early in the twentieth century to selected groups, the Uruguayan system expanded by creating new and separately administered funds as new occupational groups came to be covered. By 1969, there were more than 50 different funds, including 10 pension funds, 16 health insurance funds, 16 family allowance funds, 6 unemployment funds, and a variety of maternity programs. There were large differences across plans in the scale of benefits, even though they were not entirely financed by contributions from participants and their employers; moreover, the plans with more generous benefits tended to receive larger contributions. Total expenditures of all the plans in 1969 were estimated to amount to well over 10 percent of GDP, and the sum of employer/employee contribution rates ranged from 15 percent to 65 percent of gross salary. 1/

The first move toward a unification of the system took place in 1967, when the three principal pension funds--the plan for industrial/commercial employees, that for rural and domestic workers, and that for public sector and academic employees--were placed under the administration of the Banco de Previsión Social (BPS). Between 1973 and 1982, there was a gradual integration under the Central Government of the main body of the system, and a major reform took place in 1979 with the creation of the Dirección General de Seguridad Social (DGSS), which replaced the BPS. 2/

The reforms of 1979 did not entirely unify the system. The pension plans for some seven occupational groups, as well as the military pension plan, remained outside the system. Even within DGSS, there remained the three separate pension plans noted above. Nonetheless, the bulk of the country's pension system is now managed by the Central Government, and expenditures of the three plans have, in recent years, accounted for more than 75 percent of total expenditures of all programs under the DGSS. 3/ In principle, the three pension funds should cover anyone not in one of the independent funds outside the DGSS system. Moreover, the participation of the self-employed is compulsory.

The package of measures introduced in 1979 also included a substantial modification to the financing of the social security system. Before 1979, the system had been financed largely from payroll tax contributions from employees and their employers. Only a small share of revenue came from income on capital, and the reserves of the pension funds served only to smooth out short-term fluctuations in revenue and expenditure.

1/ See Fortuna (1985), p. 10.

2/ In 1986, the DGSS was replaced in turn by the BPS.

3/ Uruguay 1983: Anuario Estadístico, Table 5.01.

It was felt that the very high payroll tax rates of some of the funds substantially increased the cost of labor, encouraging the use of capital-intensive methods of production and depressing employment. The highest contribution rates had already been reduced substantially in 1973, and the lowest rates had been increased. A further reduction in the dispersion of rates and in the highest rates took place in 1979. 1/ The revenue loss entailed by these measures was compensated for by a broadening of the base of the value-added tax, which was felt to be neutral in its effects on employment, and the transfer to the social security system of the additional revenue raised. Between 1979 and 1981, collections from the VAT increased by 1.7 percentage points of GDP, more than compensating for a decline of 0.4 percentage points in regular social security contributions, from 6.5 percent to 6.1 percent of GDP. Notwithstanding increases in the payroll tax rates in 1982 and in 1984 that increased the median rate of employees' and employers' contribution rates to 34.5 percent and thereby reversed most of the decline that took place in 1979, the system still requires a substantial transfer of revenue from the Central Government (Appendix I, Table 9). 2/

Despite increases in the retirement age and the elimination of several early retirement privileges in 1979, the pension plans remain quite generous, and they offer a wide range of benefits. The basic retirement pension is available at a relatively early age: 60 for men and 55 for women who have worked for 30 or more years, but for persons aged 70, only 10 years of service is required. Certain occupational groups--in particular, members of the judiciary, university professors, and politicians--are able to retire after only 20 years of service. Professors must be 50 or older to avail themselves of this benefit, but there is no age limit for the other groups. The benefits also include a survivors' pension for relatives of insured persons who have died, as well as an old-age pension available to anyone over 70, regardless of the number of years worked. 3/

Most of the remaining expenditure of the social security system is accounted for by the sickness/maternity program and the family allowances program, both of which are unified. The medical plan's expenditures are relatively low, because many Uruguayans are covered under a system of private cooperatives.

1/ Of the 35 percentage points of total contributions in 1984 from industrial and commercial sector workers, 23 points went to the pension fund, 7 to sickness/maternity, and 5 to occupational risks. The family allowance program is entirely financed by the government. Cf. Mesa-Lago (1985), Table 68, p. 338.

2/ In December 1987, the basic rate of the VAT was increased from 20 percent to 21 percent, and specific rates on new automobiles were increased to provide additional financing for the system.

3/ Cf. Fortuna (1985), pp. 28-35.

Table 9. Uruguay: Operations of the Social Security System, 1978-86

(In percent of GDP)

	1978	1979	1980	1981	1982	1983	1984	1985	1986
Total revenue	7.4	6.5	5.6	6.1	5.9	5.5	5.0	5.7	6.9
Of which:									
Contributions	5.9	5.8	5.2	5.8	5.6	5.2	4.7	5.4	6.3
Employee	2.1	2.1	2.2	2.9	1.9	2.7	2.4	2.6	3.2
Employer	3.7	3.6	2.8	2.7	3.5	2.3	2.1	2.7	3.0
Self-employed	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Total expenditure	8.5	7.0	8.3	10.0	12.2	10.2	8.7	8.3	9.2
Balance (- deficit)	-1.1	-0.6	-2.7	-3.9	-6.3	-4.7	-3.7	-2.7	-2.4
<u>Memorandum items:</u>									
Central government									
VAT receipts	4.4	4.4	5.7	6.1	5.4	4.6	4.6	5.8	5.9

Source: International Monetary Fund, Government Finance Statistics Yearbook, 1987.

The share of expenditure in GDP fluctuated markedly between 1978 and 1986, first declining from 8.5 percent in 1978 to 7.0 percent in 1979, then increasing to a high of 12.2 percent in 1982 before falling to 8.3 percent in 1985 (Appendix I, Table 9). It increased to 9.2 percent the following year. These fluctuations resulted from the combination of the lag in the adjustment of pensions for cost of living increases, the deceleration of inflation between 1979 and 1982, and its reacceleration in subsequent years. Because of the lag between price increases and the adjustment of pensions to those increases, an increase in the rate of inflation increased the value of nominal GDP before it increased the value of pensions. Hence, the ratio of pensions to GDP fell in a period of accelerating inflation, and it increased in the period of decelerating inflation. When inflation accelerated after 1983, this indexation mechanism resulted in a substantial decline in the real value of pensions. 1/

These year-to-year fluctuations in expenditure can obscure the influence of underlying trends. The population of Uruguay has been aging at a significant pace for a number of years. Thus, while the total population grew at an annual rate of only 0.7 percent between 1960 and 1975, the number of persons 60 and over increased at an annual rate of 2.1 percent. Between 1975 and 1980, total population grew again by 0.6 percent, but the number of persons 60 and over grew by 3.3 percent.

However, because the number of persons receiving pensions of some kind grew even faster than the number of elderly persons in both of these periods, the number of pensioners increased at an average annual rate of 4.0 percent between 1960 and 1975, and 3.8 percent between 1975 and 1980. Moreover, the average annual growth rate increased to 4.3 percent between 1980 and 1983. 2/

The marked difference in the rates of growth during 1960-75 in the number of pensioners and the number of persons at or above retirement age could reflect the extension of the system's coverage in earlier years and the maturing of the pension scheme. As the scheme matured and as the extension of coverage made its effects felt, a greater proportion of older persons became eligible for a pension. Another possibility is that the statistics on the number of pensioners are distorted by the inclusion of persons receiving two pensions. It is interesting that the difference in the rates of growth of pensioners and older persons narrowed considerably between 1975 and 1980. This development could mean that the system had matured by this point. The gap widens again between 1981 and 1983, but this is largely due to the impact of the 1979 reforms, which, among other things, increased the retirement age from 55 to 60 for men, and from 50 to 55 for women, but at the same time

1/ Appendix II discusses in more detail the impact on expenditures of an increase in the rate of inflation under different indexation mechanisms.

2/ The estimates for the number of pensioners are from Mesa-Lago (1985), Table 66, p. 336.

provided for a transitional period during which persons whose age was below the new limits could retire.

The available data for Uruguay on pensioners and contributors give some indication both of the demographic burden the system must carry and the extent of evasion, although the estimates of the number of contributors and pensioners may be misleading because both can involve double-counting. In 1983, there were an estimated 680,000 pensioners, or about 23 percent of the total population, while persons aged 55 and above numbered 635,000, or 21 percent of the population. Persons contributing to the plan numbered 827,000, or 28 percent of the population--down from more than 1 million in 1969--compared with a labor force estimated to be approximately 1,125,000, or 37 percent of the population. ^{1/} Thus for each pensioner, there were only 1.2 contributors (or contributions). Moreover, despite the high average rate of the payroll tax, the system had to rely on substantial transfers from the Government.

The decline in contributors probably reflects increases in both evasion and unemployment, but the available data suggest that evasion is a substantial problem. The labor force is estimated to have increased from about 1,100,000 in 1969 to 1,150,000 in 1980 and to have declined to about 1,125,000 in 1983. On the assumption that the unemployment statistics for Montevideo, where approximately one half the labor force works, give a reasonably accurate estimate for the country as a whole, total employment would have increased by about 35,000 between 1969 and 1980, and to have fallen by about 70,000 in the subsequent three years. Yet the number of contributors is estimated to have fallen by 123,000 between 1969 and 1980. It fell again by 85,000 between 1980 and 1983, or by slightly more than the estimated fall in employment.

The decline in contributors that took place in the 1970s suggests that there was an increase in evasion, which is said to be high among small enterprises, particularly those using seasonal or part-time labor. Among other possible explanations, the number of persons holding two part-time jobs and making two contributions to the system may also have declined, and the decline in employment in the country as a whole may have exceeded the decline in Montevideo. Finally, the labor force may have been reduced by unrecorded emigration. ^{2/}

^{1/} The estimates of the labor force are based on estimates from Table 1313 of Statistical Abstract of Latin America, Volume 25, 1985. Data on contributors and pensioners come from Mesa-Lago (1985), Table 66, p. 336.

^{2/} Cf. Mesa-Lago (1985), p. 199.

Indexation Rules and the Impact of Inflation
on the Expenditure-GDP Ratio

In some circumstances, accelerating inflation can have a substantial impact on the real value of government expenditure or its share of GDP, because government expenditure is typically programmed and budgeted in nominal terms. What may be less well appreciated is that an increase in the rate of inflation can have such an impact even when expenditure is indexed, as is often the case for transfers to households such as social security pension expenditure. Using a simple model, this appendix illustrates how the impact of an acceleration of inflation on the ratio of such expenditure to GDP can depend on the indexation rule the government follows.

When expenditures are indexed automatically, a mechanism or rule of indexation must be chosen. The rule must specify how often expenditures are to be adjusted--the frequency of adjustment--as well as the lag between the end of the period of time over which the price index used for the indexation varies, and the period when adjustment takes place. For example, expenditure could be adjusted every quarter on the basis of the increase in the price index over the quarter ending three months previously. Thus, expenditure in June would be adjusted on the basis of the rate of inflation for the three-month period ending in March. If the lag of adjustment were one month instead of three, expenditure would be adjusted on the basis of the rate of inflation for the three-month period ending in May. As an additional example, if expenditures were adjusted monthly with a lag of 12 months, expenditures in January 1988 would be adjusted on the basis of the rate of inflation for the 12-month period ending in January 1987.

Let us assume for the moment that in some hypothetical economy, both social security transfer payments and GDP are fixed in real terms with social security expenditures representing 10 percent of GDP. We will also assume that the rate of change of the CPI, to which expenditures are to be indexed, always equals the rate of change of the GDP deflator. If it were possible to adjust social security expenditure continuously in order to maintain its real purchasing power under such circumstances, then the ratio of these expenditures to GDP would never vary. However, when adjustment is less than continuous and when it is based on the rate of inflation over some past period, an acceleration of inflation will always reduce the ratio of expenditure to GDP.

To illustrate the impact an acceleration of inflation can have under various indexation formulas, it is assumed that inflation, which is initially zero, increases permanently from one month to the next, with the new rate varying from 10 percent to 200 percent a year. The impact of the increase in inflation on the expenditure-GDP ratio is calculated for the second year following the acceleration: more precisely, if the increase in inflation were to take place in January 1988, the effect on the ratio of expenditure to GDP would be calculated for 1989.

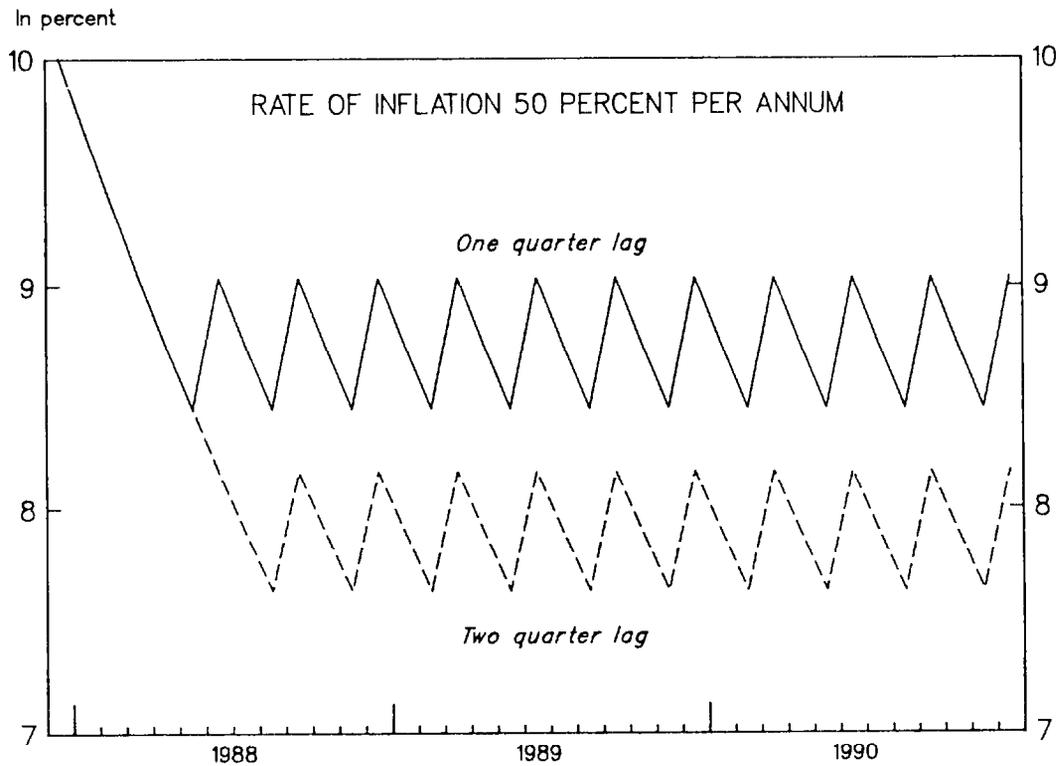
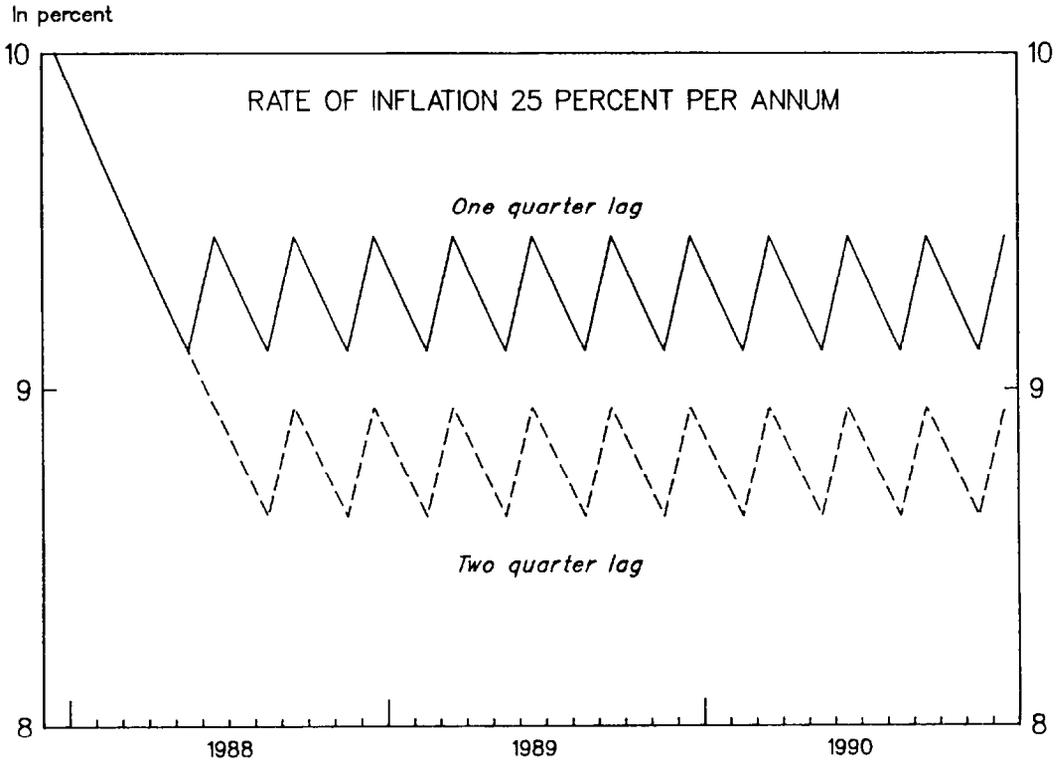
As would be expected, the lower the frequency of adjustment and the greater the lag of adjustment, the lower the ratio, whatever the acceleration of inflation that takes place (Appendix II, Table 10). With a modest acceleration of inflation from zero to 10 percent, infrequent adjustment and a longer lag do not have a truly marked impact on the expenditure ratio, although it does decline to 8.7 percent with an annual adjustment and a 12-month lag. However, with an acceleration of inflation from zero to 25 percent--a modest increase in the inflation rate in the historical experience of many Latin American countries--the expenditure ratio can fall noticeably even when adjustment is frequent and its lag is short. Specifically, with a quarterly adjustment and a quarterly lag, the expenditure ratio falls to 9.3 percent (Appendix II, Table 10 and Chart 1a).

When inflation increases to 50 percent or more, the ratio of expenditure to GDP can fall sharply despite fairly prompt and frequent indexation. Thus, if inflation increases to 50 percent, the ratio falls to 8.7 percent, or by more than 1 percentage point of GDP, even with quarterly adjustment and a quarterly lag. With an acceleration of inflation to 100 percent and this rate of adjustment and lag structure, the ratio declines to 8.0 percent; with acceleration to 200 percent, the ratio declines to 7.0 percent. When adjustment is infrequent--no more than once a year--or the adjustment lag is six months or longer, increases in inflation to 100 percent or more can push the ratio to well below 5 percent (Table 10 and Charts 1a and 1b).

These experiments show how sensitive the ratio of expenditure to GDP--and by implication the real volume of expenditure--can be to fluctuations in the rate of inflation, particularly when indexation is infrequent and the adjustment lag is long. It should be added that a deceleration of inflation will have the same kind of effect, but in the opposite direction.

If frequent adjustment is not feasible administratively, and if the process of preparing the price index does not permit timely adjustment, then any backward-looking indexation rule will entail substantial fluctuations in the real volume of expenditure when the rate of inflation is high and volatile. One possible remedy for this shortcoming would be overcompensation; that is, the proportional increase of expenditure would exceed the increase in the price index since the last adjustment to expenditure. The amount of the increase would be calculated on the basis of a projected increase in prices and could be calibrated so as to maintain the average value of pensions in real terms at some given level over the period of time elapsing before the next adjustment. Such a procedure would call for a fairly sophisticated adjustment rule, and would give no guarantee that real expenditure would in fact be maintained at the targeted level, given the high variance of the rate of inflation that typically occurs when the average rate of inflation is high.

CHART 1A
IMPACT OF INDEXATION ON EXPENDITURE WITH QUARTERLY
ADJUSTMENT AND LAGS OF EITHER ONE OR TWO QUARTERS



11
12



CHART 1B
IMPACT OF INDEXATION ON EXPENDITURE WITH QUARTERLY
ADJUSTMENT AND LAGS OF EITHER ONE OR TWO QUARTERS

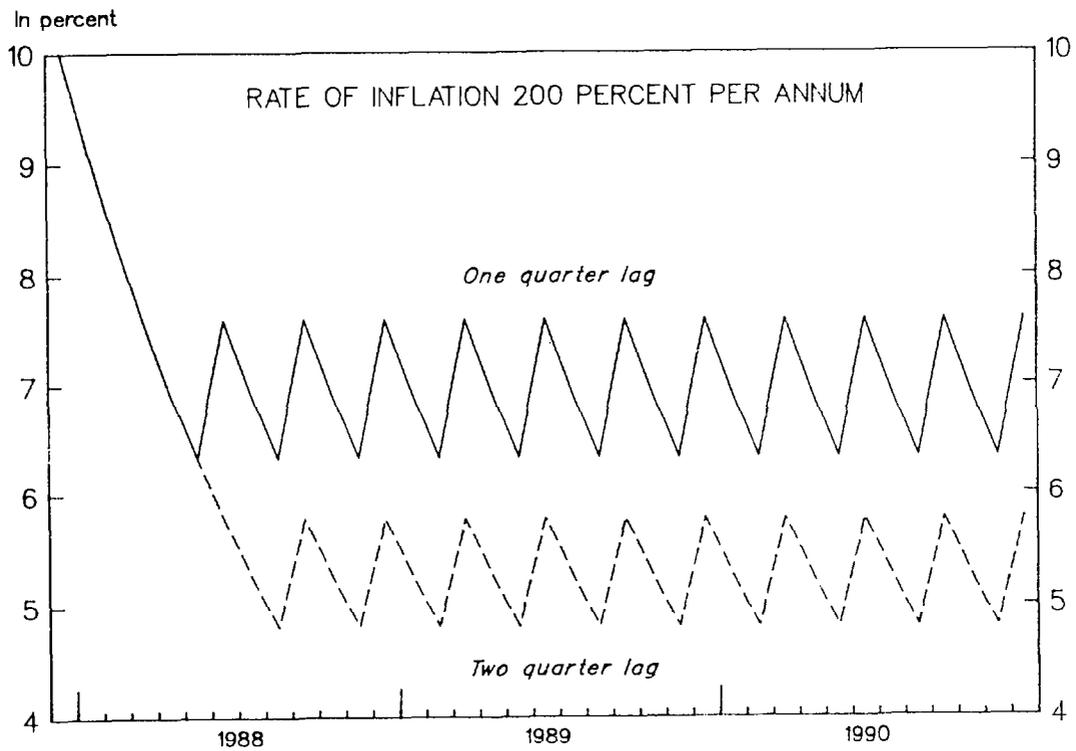
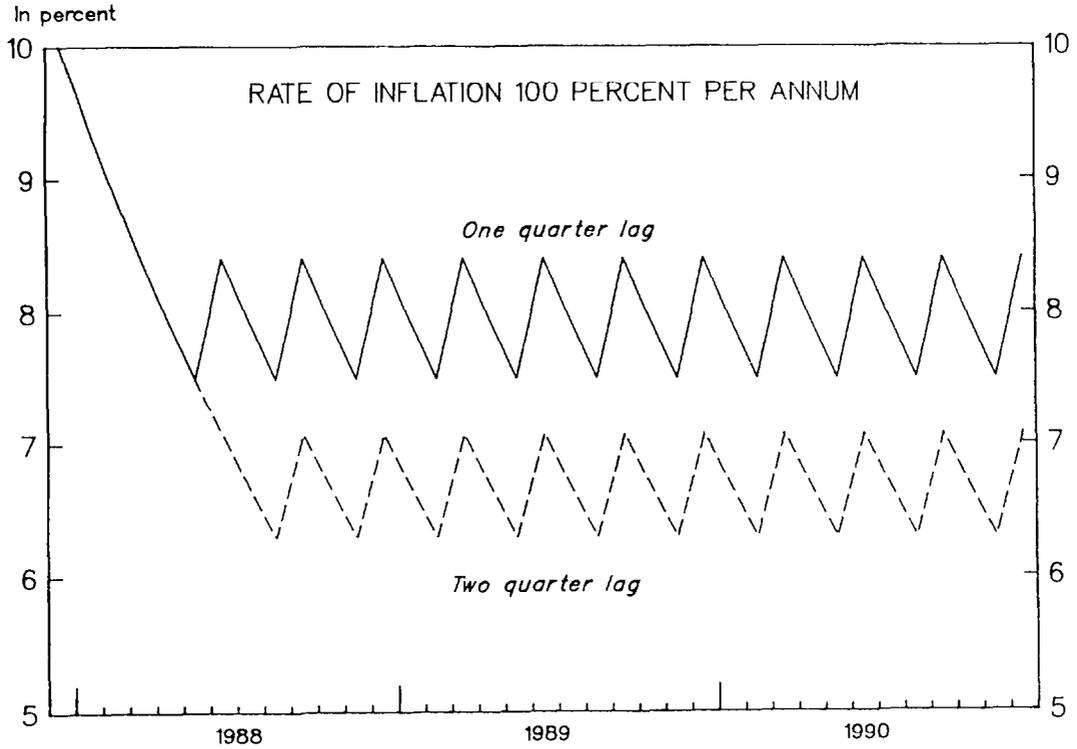




Table 10. Effect on Expenditure-GDP Ratio of Different Indexation Mechanisms

(Inflation of 10 percent per annum)

Frequency of Adjustment in Times per Year	Lag in Months			
	1	3	6	12
1	9.5	9.3	9.1	8.7
4	9.8	9.7	9.5	9.0
6	9.9	9.7	9.5	9.1
12	9.9	9.8	9.5	9.1

(Inflation of 25 percent per annum)

Frequency of Adjustment in Times per Year	Lag in Months			
	1	3	6	12
1	8.9	8.5	8.1	7.2
4	9.6	9.3	8.8	7.9
6	9.7	9.4	8.9	7.9
12	9.8	9.5	8.9	8.0

(Inflation of 50 percent per annum)

Frequency of Adjustment in Times per Year	Lag in Months			
	1	3	6	12
1	8.0	7.5	6.8	5.5
4	9.4	8.7	7.9	6.5
6	9.5	8.9	8.0	6.6
12	9.7	9.0	8.2	6.7

(Inflation of 100 percent per annum)

Frequency of Adjustment in Times per Year	Lag in Months			
	1	3	6	12
1	6.9	6.1	5.2	3.6
4	8.9	8.0	6.7	4.7
6	9.2	8.2	6.9	4.9
12	9.4	8.4	7.1	5.0

(Inflation of 200 percent per annum)

Frequency of Adjustment in Times per Year	Lag in Months			
	1	3	6	12
1	5.6	4.7	3.5	2.0
4	8.4	7.0	5.3	3.1
6	8.7	7.3	5.5	3.2
12	9.1	7.6	5.8	3.3

Source: Staff calculations.

If a government is able to practice a policy of long-lagged and infrequent indexation of transfer payments, then the benefits it enjoys from the inflation tax are increased. The decline in the ratio of expenditure to GDP that occurs when the rate of inflation increases constitutes a kind of inflation tax, as does fiscal drag. 1/ But political pressures from pensioners and other transferees could militate against such a policy, just as the civil service could seek to prevent a similar kind of policy from being applied to its compensation.

1/ Tanzi (1977), discusses the analogy between the inflation tax--the extra financing the government can command from monetization of the deficit when the demand for cash balances is sufficiently inelastic with respect to the rate of inflation--and the impact of inflation on the tax system.

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