



# REFORMING THE CUBAN SAFETY NET SYSTEM

By

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*Mr. Hicks is a private economist who retired from the World Bank in 2003. Mr. Pérez is a senior advisor in the International Monetary Fund. The views expressed in this paper are those of the authors and do not represent the official views of the World Bank or the International Monetary Fund. Parts of this paper are updated versions of an earlier article in the CEPAL Review by Hicks and Quentin Wodon (Hicks and Wodon, 2001) and of a paper by Cuevas and Pérez presented at the 1999 Annual Convention of the Allied Social Science Associations in New York City. The paper also draws on the information provided about Cuba in the writings of Dr. Carmelo Mesa-Lago and benefited from comments of Messrs Ernesto Hernández-Catá, Ricardo Martínez, and Mohammad Shadman-Valavi.*

## Executive Summary

The government of Cuba under Fidel Castro expanded its provision of highly subsidized social services with the help of massive economic assistance from the former Soviet Union. The termination of subsidies caused disastrous consequences for the island's social services. This report analyzes what we consider the *safety net system* in Cuba: its commodity distribution system, public sector employment, unemployment benefits, and social security benefits. Our research also examines possibilities for reform in light of the theory of safety nets and other transition economies' experiences. The report ends with recommendations for reforming the safety net system, and in so doing, attempts to strike a balance between providing a minimum safety net and maintaining fiscal sustainability.

### *The Safety Net System in Cuba*

*A commodity distribution system* at below market prices was instituted in Cuba in 1962 to address increasing price pressures and growing scarcities, associated with the output disruption caused by the increased nationalization of the means of production. The distribution of foodstuffs and other basic commodities through this program declined progressively throughout the years, and, as of 2004 and into 2005, the monthly allotments of the ration book clearly have not been sufficient to meet the demands of the population. Food items and other commodities were available in dollar stores, but only those who had access to dollars could buy items in these stores—until the end of 2004. (See update in endnote 2.) Household consumption has to be supplemented with purchases in the open market or with commodities acquired through barter.

As the state took over the means of production, Cuban workers became increasingly employed by the state—the share of *active workers employed by state entities* peaked at almost 94 percent in 1989, before it declined to less than 80 percent in recent years, as more self-employment has been permitted. However, the Castro government widened the role of the public sector in 2004, which will increase the percentage of workers employed by state entities. The public sector has guaranteed employment for decades, but the safety net benefit provided by secured public sector employment has declined sharply in recent years. The United Nations

Economic Commission for Latin America and the Caribbean (ECLAC, or Comisión Económica para América Latina y el Caribe, CEPAL) estimated that average real salaries declined by 45 percent during the 1990s. Those workers who lose their employment are entitled to *unemployment insurance* based on the number of years worked.

Cuba's *pension system* is a defined-benefit, pay-as-you-go (PAYG) system. Cuba's budgetary figures show that the level of social security payments has declined in real terms over the years. The system is already running a cash deficit, and actuarial evaluation of the current rules shows that to make the pension system sustainable, the contribution rates would need to be raised more than three times the 10 percent contribution rate. At the same time, pensions are low and do not permit pensioners to buy the basic necessities of life.

### *Possibilities of Reform*

International experience, including that of Latin America, suggests that there are a *number of programs that can be put in place to ameliorate the impact of an economic crisis*: emergency employment programs, social funds to finance small-scale public works, nutrition and food interventions targeted to vulnerable groups, direct cash transfers targeted to the poor, and unemployment programs. These programs should be targeted specifically to the poor affected by the crises with clear eligibility and termination rules. They should be counter-cyclical and fiscally sustainable and should complement, not substitute for, private safety net programs. These initiatives should be capable of being scaled back when the crisis is over.

The *Central and Eastern Europe and Central Asian countries started their transition process with an economic system similar to that of Cuba and with comparable social programs*. The transition itself produced large shocks and increased poverty. In response, in countries that did not have them, unemployment benefits were introduced based on payroll taxes; attempts were made to preserve and pay pension obligations; housing and utility subsidies were reduced gradually; and various forms of welfare systems, some mean-tested and some defined by categories, were introduced. In general, these countries have slowly moved away from generalized or categorical subsidies that in the past did not target the poor. The generosity of pension benefits was reduced as the number of con-

tributors declined, and there was a weakening of tax compliance. Subsequently, contribution rates were raised. Some countries have introduced more systemic reforms, such as the introduction of private pension funds.

### *Proposals for Reforming Cuba's Safety Net*

The reform of the social safety net will have to be part of a comprehensive strategy to transform the Cuban economy from a socialist system with large economic distortions to a market economy. A number of steps could be taken:

- A strategy needs to be formulated to open opportunities for the development of the private sector as the main source of growth and job creation. The size of the public sector will need to be reduced, and a privatization program will need to be put in place that gives priority to opening places of work without getting bogged down in delays associated with the resolution of property claims.
- Resources will need to be devoted to compensate workers displaced from their jobs in the civil service or public enterprises for a limited time without discouraging them from looking for jobs in the private sector. Restrictions on private sector employment should be eliminated right away. Retraining programs will be needed for dismissed public sector employees.
- Workfare programs and social investment funds set up with the help of foreign donors can play a role in providing jobs and improving the dilapidated infrastructure.
- As a permanent feature of the social safety net, a system of unemployment insurance can be maintained that pays benefits lower than the prevailing market wage and is limited in duration, thus providing an incentive to search for employment.
- Universal subsidies for housing, transport, and utilities should be phased out, particularly for the non-poor. These should be replaced by a system of well-targeted cash grants for the poor. The commodity distribution system may need to be maintained for a transitional period, while there is a supply response from a



liberalized agricultural sector. Some cash compensation for the elimination of the commodity distribution program may be necessary to make it more politically acceptable.

- The transition strategy should institute/expand a school feeding program that provides school breakfast and lunch.
- The social security system will need to be reformed to provide a basic minimum pension for the elderly, while making it fiscally sustainable. A combination of an increase in the retirement age, a rise in the social security contribution, and a reduction in replacement rates will have to be implemented. The rights of the existing pensioners or of those close to retirement will need to be respected. Adjusting pensions by cost of living will need to wait until the financial situation of the social security system is at a more sustainable level.

## Introduction

This paper analyzes what we consider the safety net system in Cuba and proposes steps to reform it to improve its efficiency and make it fiscally sustainable. The Castro government, which took power in 1959, expanded the provision of highly subsidized social services (with the exception of housing) for the next three decades at increasing fiscal costs. Some of these services, like the commodity distribution program (*libreta de racionamiento* or ration card), were necessary to offset the negative effects of the government's economic policies, and others, such as the expansion of educational services, had a strong political component. The expansion of social services was made possible by large subsidies provided by the Soviet Union and other socialist countries, which allowed Cuba to provide a level of social services considerably more extensive than what was provided by other countries with similar per capita incomes (CEPAL 2000, 274–276). With the breakdown of the Soviet Union, its subsidies to Cuba ceased, with disastrous consequences for the Cuban people.

This paper defines the safety net system for Cuba as the programs that aim at maintaining a minimum standard of living, such as the commodity distribution system; public sector employment; unemployment benefits; and social security benefits, that is, old age benefits, permanent disability benefits, and survivor benefits. We have included public sector employment as part of the safety net because for many years the state guaranteed employment for all Cuban workers. Normal procedure for safety net analysis excludes the health care and educational sectors, where Cuba made substantial progress before suffering significant reversals in the 1990s. Another paper prepared for the Cuba Transition Project addresses the rehabilitation of the educational sector (Cruz-Taura 2003). The first section of this paper discusses the experience of safety net programs in Cuba. The second section discusses possibilities for reform and the general theory of safety nets. The third section discusses safety net experience in transition economies. The last section provides recommendations of what should be done to reform the safety net system in Cuba.

## **Developments in the Safety Net System in Cuba**

Prior to 1959, Cuba had relatively high social indicators by Latin American standards in terms of infant mortality, number of physicians and hospital beds, literacy rates, and pension coverage of the labor force (Mesa-Lago 2003b). However, the distribution of social services was skewed in favor of urban areas and heavily concentrated in the capital city of La Habana, where about one fourth of the population lived. The same was probably true for the nutritional standards of the population. Beginning in 1960, the Castro government quickly nationalized the means of production and took over the provision of social services, while it excluded religious and private cooperatives, such as urban medical cooperatives, that had been active in the provision of social services. Over the years, the state became almost the sole employer, except for a very small share of the agricultural labor force, and there were scarcities of consumer goods and foodstuffs similar to those in the Soviet Union when the state took over the means of production.

### **Commodity Distribution System**

Beginning in 1962, to address the pressures on prices of consumer goods and foodstuffs associated with growing scarcities, the prices of some basic commodities were controlled, and their consumption was increasingly rationed through a commodity distribution program in peso food stores (*bodegas*) at below-cost prices. The commodity distribution program included monthly personal allotments of beef, fish, rice, beans, edible oils, eggs, sugar, coffee, and soap (Table 21 in Alonso, Donate-Armada, and Lago, 1994, provides information on the monthly allotments from 1962 through 1989). These data show that the allotments declined markedly during this period notwithstanding the Soviet aid. For example, the amount of beef given in 1962 was 3 pounds per person, and by 1989 it had been reduced to three quarters of a pound. The distribution of rice, condensed milk, coffee, and soap through ration cards also declined markedly during this period. The only item whose supply rose markedly through 1989 was beans. After 1989, the distribution of commodities continued to decline, and apparently the amount of commodities distributed now only meets the needs of the population for about 10 days (Mesa-Lago 1993 and 2003).

The monthly allotments of the ration book are clearly not sufficient to meet the demands of the population. In certain months, peso food stores are able to sell food items at prices significantly higher than the regulated ones when there is an excess supply of a particular food item, after the allotments designated by the ration books have been met. Food items were also available in dollar stores and in open food markets, which were authorized in 1994, where products are sold by private farmers. Cooperative farms and the farms that produce food for the military can also sell their produce directly to consumers if they have been able to meet their supply quotas to the official channels of food distribution. However, for consumers to be able to benefit from these other sources of commodity supplies, they have to have higher levels of income and/or access to dollars or other foreign currency or be able to draw down their saving balances. In practice, the availability of dollars was indispensable to meet basic needs and, as a result, two classes of consumers existed: those with access to dollars, who had a noticeably higher living standard, and those who do not have access and are living in poverty conditions.<sup>2</sup> Reportedly, many people also resort to barter trade to acquire consumer goods.

Another response to the crisis of the 1990s has been an increase in the number of small gardens grown by urban dwellers to improve their diets and sometimes to create alternative sources of income (Driggs 2003). However, despite these additional sources of food, it appears that the Cuban population is suffering from undernourishment. Mesa-Lago (2003a) notes that Cuban economists have reported that the average daily calorie consumption is 10 percent under the minimum level required. The Food and Agriculture Organization estimated that 13 percent of the Cuban population were chronically undernourished from 1998 through 2000.<sup>3</sup>

All in all, it is difficult to judge, based on available information, to what extent the basic consumption needs of the population are being met. It appears that the benefits of the commodity distribution program have declined over time and that the program does not guarantee minimum levels of consumption with negative implications for those living in poverty.

## Employment and Unemployment Benefits

As the state took over the means of production beginning in the 1960s, increasing numbers of Cuban workers were employed by the state. By 1989, almost 94 percent of the 3.7 million active workers were employed in state entities, with about 4 percent in the private sector and the rest in cooperatives.<sup>4</sup> As a result of the relaxation of the restrictions on private economic activities during the “special period” of the 1990s, the share of active workers in state entities declined and by 1998 was only 75 percent. At this time, the share of cooperative jobs increased to almost 9 percent of total jobs, and the remaining jobs were in the private sector. The authors do not have recent information on the distribution of jobs in Cuba. Moreover, with the crackdown on self-employment through punitive taxes and licensing restrictions beginning in 1996, the share of jobs in the private sector might have declined since 1998.<sup>5</sup> Over all, it is clear that in developing a strategy for the transition of Cuba to a market economy, policies to promote job creation in the private sector need to receive paramount attention.

For decades, workers have been guaranteed employment in Cuba. It is noteworthy that CEPAL (2000, Table A 46) reports that even during the years 1990–1993, when the economy contracted by over 35 percent, the open (declared) unemployment rate did not exceed 8 percent.<sup>6</sup> It appears, thus, that public sector employment was a key part of the safety net during those four years, but many of the workers who were maintained at their jobs most likely functioned at very low, if not negative, levels of productivity. In addition, another explanation for the low level of open unemployment has been advanced by Mesa-Lago (2003a, 56). He cites official Cuban information that notes that open unemployment declined from an average of 7.9 percent during 1989–1995, to 4.5 percent in 2001, and 3.3 percent in 2002. However, Mesa-Lago notes that there is substantial disguised unemployment in Cuba. He notes that a Cuban press report indicates that workers listed as employed in 2002 included 92,000 sugar workers who had been displaced and were studying and some 320,000 workers who worked part-time in urban gardens. If these two groups had been counted, the unemployment rate would have trebled to close to 12 percent. Moreover, as in many other developing countries, the unemployment rate in Cuba is likely to be higher if one takes into account the existence of disguised unemployment.

At the same time, the safety net benefit provided by secured public sector employment has declined sharply in recent years. CEPAL (2000) estimated that average real salaries declined by 45 percent between 1989 and 1998, a factor that must have contributed to a noticeable increase in poverty in Cuba. Mesa-Lago (2003a) reports findings of Cuban economists Togores and Garcia (2003) and Triana (2003) that show a decline in monthly nominal salaries of 37 percent between 1989 and 2000—from 131 pesos to 83 pesos (the latter was equivalent to \$4 at the peso/dollar exchange rate used in official exchange houses). To offset this trend, the government began paying bonuses in dollars in 1994 to workers in strategic sectors. Cuban economists report that these bonuses were significant in 2000—about \$19 per month for approximately one-fourth of the labor force; in addition, some 1.5 million workers received compensation in kind (Rodriguez 2000; Triana 2000). Notwithstanding these additional incentive payments, the remunerations in the public sector are considerably lower than the earnings of workers in the underground economy, which developed in the 1990s. For example, based on interviews with Cubans who had recently left the island, Mesa-Lago (2003a, Table 7) estimated that the salaries of engineers and physicians working for the government range from \$12 to \$25 per month, while a truck driver who uses his truck to transport passengers earns between \$385 and \$770, and a private farmer between \$75 and \$1,925.

Another aspect of the current safety net in Cuba is unemployment insurance. Workers who lose their jobs are paid 100 percent of their salaries during the first month after being dismissed and, subsequently, 60 percent of their salaries for a period that is a function of the number of years worked. To receive unemployment benefits, workers have to be willing to accept new jobs offered to them, and they lose their benefits if they decline a number of offers.

## **Social Security Benefits**

In the 1920s, Cuba was one of the first countries in the world to introduce a pension scheme, and on the eve of the Cuban Revolution in 1958, the country had one of the most developed pension systems among countries with similar levels of income.<sup>7</sup> However, there was no general pension program, and pension coverage was fragmented among 52 autonomous programs (mostly private) that only covered certain groups in the urban

areas, although there was also an important pension program for sugar workers. Each of the programs had its own regulations and financing, and there was no coordination among the programs. The coverage of the pension programs totaled 55 to 63 percent of the economically active population (the second or third highest coverage in Latin America) but excluded the poorest segments of the population, such as rural workers, the self-employed, domestic servants, and the unemployed.<sup>8</sup>

The Castro government carried out a number of important and largely positive reforms in the pension field. By 1962, a process of unifying the benefits and contribution rates of existing programs had been completed. A 1963 law widened the coverage of the pension system to all the salaried labor force and made the financing of the system a direct responsibility of the government. Between 1964 and 1983, the coverage was made essentially universal, as other groups of workers were incorporated into the pension program: the self-employed, small entrepreneurs, members of agricultural cooperatives, and small farmers who had given up the titles to their land to the state. The armed forces and members of the internal security apparatus of the state were the only groups not covered by the general program, but they enjoyed even more generous pension benefits.

The retirement age in Cuba is currently 55 years for women and 60 years for men who have been employed for 25 years (see Table 1). If the last 12 years of employment (or 75 percent of the total work period) was in dangerous or arduous work, the retirement age becomes 55 years for men and 50 years for women. There is a reduced pension after 15 years of employment (at age 65 for men and age 60 for women). The fact that the retirement age in Cuba is lower than in most countries in Latin America (Cuevas and Pérez 1999, Table 1) and that Cuba has a higher life expectancy than in most Latin American countries results in longer retirement periods.<sup>9</sup>

Cuba's pension system is a defined-benefit, PAYG system. Employers (that is, the government, public enterprises, and a limited number of private enterprises) currently pay 14 percent of the wage bill to finance pension benefits. This is a significantly lower rate than other centrally planned countries paid in the early 1990s at the beginning of their transition periods. Employees do not have to pay, while the self-employed pay a tax equivalent to 10 percent of their earnings. Given that almost all of the economically active population is employed by the state, in principle there should not be a serious problem of tax evasion.

The central government covers the cash deficit of the pension system, and the pension tax payments are part of the general tax revenues of the central government.

The retirement pension is equivalent to 50 percent of average earnings during the highest five of the last 10 years of employment (the portion of earnings above 3,000 pesos per year is reduced by half for purposes of this calculation), plus 1 percent of earnings for each year of employment beyond 25 years. Pensions increase between 1.5 percent to 4 percent for each year of delayed retirement between the ages of 60 and 65 for men and between ages 55 and 60 for women and 1 percent per year thereafter. The maximum pension is 90 percent of average earnings. However, pensions are not indexed. Members of the armed forces and internal security personnel have a privileged system. They can retire with 25 years of service, there is no minimum age requirement, and a more generous average salary base is used to calculate pensions. At the other end of the spectrum, those who are self-employed have a less generous pension system.

Cuba's budgetary figures show that levels of social security payments have declined over the years. In 1981 prices, social security expenditure peaked at 1,365 million pesos in 1992 but declined to 1,089 million pesos in 1998—a level equivalent to 6.6 percent of gross domestic product (GDP) but 20 percent lower in real terms.<sup>10</sup> Old-age and survivors' pensions account for over 80 percent of the payments, and disability payments and social assistance for the rest (the latter is a relatively small amount). At the same time, social security revenues declined in real terms. As a result, the cash deficit of the pension system grew from about 2 percent of GDP in 1989 to 2.6 percent of GDP 1998. The estimated deficit for 1998 is rather surprising because if the contribution rate is 14 percent and the dependency ratio is 1:4 (see explanation below) then, in principle, the system should be able to provide an income replacement rate of 56 percent, which is more than the pension for a person retiring after 25 years. This situation may be explained in part by the fact that about 20 percent of the contributions go to pay disability pensions. However, the deficit still appears to be on the high side unless most of the pensions are close to the maximum 90 percent replacement rate.

An actuarial evaluation of the pension system also shows the unsustainability of the pension system under the current rules. Donate-Armada (1994) calculated that contribution rates from current active participants



of the pension system need to be increased sharply to finance both existing old-age retirement pensions and their future old-age pensions. With reasonable assumptions about interest rates, increases and inflation, combined with the assumption that the pension rules will not change, Donate-Armada estimated that the contribution rate would have to increase in 1995 from 10 percent (the rate prevailing at that time) to 36 percent to make the system sustainable.

The contribution rate was calculated as the ratio of the actuarial present value of future old-age pension payments to the actuarial present value of salaries of the current participants of the system. A contribution rate of 20 percent was needed to pay the current pensions, with an additional 16 percent required to accumulate a fund to pay future pensions of current active participants. Based on 1997 data, a contribution rate of 24 percent (assuming no decline in compliance) would be required simply to eliminate the cash-flow deficit of the system without accumulating any prefunding.

**Table 1. Cuba: Old-Age, Disability, and Survivors' Pension Program**

**First Laws**

Numerous laws and decrees established separate pension systems for over fifty different occupations; superseded and unified by 1963 law. Self-employed, liberal art professions, charcoal makers, and members of fishery cooperatives brought into consolidated system in 1964.

*Current law*

1979

Type of program: Social insurance system.

*Coverage*

All wage earners.

Special system for members of armed forces, Ministry of the Interior, self-employed, artists, and agricultural cooperatives.

*Source of Funds*

Insured person: None. (10 percent of earnings if self-employed).

Employer contributes an amount equivalent to 14 percent of payroll.

Government: Makes up deficit and contributes as employer. Above contributions finance sickness and maternity and work-injury programs.

*Qualifying Conditions*

Old-age pension: Age 60 (men) or 55 (women) with 25 years of employment; 55 and 50 if last 12 years or 75 percent of employment was dangerous or arduous work. Reduced pension, age 65 (men) or 60 (women) with 15 years of employment.

Retirement unnecessary, but total current income cannot exceed former income. Not payable abroad. Disability pension: full pension, physical or mental inability to work. Partial pension, inability to perform usual work. Employed when incapacity occurred and under age 23. If age 23 or over, number of years of employment needed to qualify increases with age. Partial pension at age 28 or older, requires three years of employment. Survivor pension: Deceased was employed or pensioner at death or employed within six months thereof and for three-fourths of adult life.

*Old-Age Benefits*

Old-age pension: 50 percent of average earnings (that portion of earnings above 3,000 pesos a year is reduced by 50 percent) during highest 5 of last 10 years, plus 1 percent of earnings for each year of employment beyond 25 years (1.5 percent if dangerous or arduous work). Increments of 1.5 percent to 4 percent for each year between the ages 60 and 65 for men and between the ages 55 and 60 for women for each year of deferred pension, 1 percent a year thereafter. Reduced pension, 40 percent of average earnings, plus 1 percent of earnings for each year of employment beyond 15 years.

**Table 1. Cuba: Old-Age, Disability, and Survivors' Pension Program**

Minimum pension varies depending on level of average earnings and number of years of employment. Minimum pension: 59 pesos per month or 79 pesos per month or 80 percent of wages, depending on average level of earnings and number of years of employment. Maximum: 90 percent of average earnings.

**Permanent Disability Benefits**

Disability pension: 40 percent of average earnings (that portion of earnings above 3,000 pesos a year is reduced by 50 percent) during highest 5 of last 10 years, plus 1 percent of earnings per year of employment beyond 15 years. Minimum and maximum pensions: Same as old-age pension. Partial disability: 30 percent to 50 percent (40 to 60 percent in case of work injury or occupational disease) of lost earnings depending on number of years of employment up to 25 years, increased 1 percent for each year of employment above 25 years. During rehabilitation, 70 percent of former earnings.

If unable to find employment, 50 percent of former earnings in first year, 25 percent thereafter.

*Survivor Benefits*

Survivor pension: If deceased was employed at the time of death, pension will be 100 percent of earnings the first month and 50 percent for the next two months; if deceased was receiving a pension, then 100 percent of pension of insured for three months. Thereafter, 70 percent, 85 percent, or 100 percent of pension of insured for 1, 2, or 3 or more dependent survivors, respectively (80 percent, 90 percent, or 100 percent if pension of insured is less than 60 pesos a month). Divided equally among eligible dependents. Eligible dependents: Widow or female that had permanent relationship and is single, needy widower or male that had permanent relationship and is single, age 60 or disabled, orphans under age 17 or disabled, and needy parents. Maximum pension for working widow: 25 percent of survivor pension.

Nonworking widow under age 40 and without dependents receives full pension for two years.

Widows age 40 or above who are unemployed receive complete pension.

*Administrative Organization*

Ministry of Labor and Social Security, administration of program through its Social Security and Social Assistance Directorate. Municipal social security offices and work centers process applications. Pensions paid through the Popular Savings Bank.

Source: U.S. Social Security Administration, Office of Research, Evaluation and Statistics, *Social Security Programs through the World – 1997*, Research Report No. 65 (August 1997).

The pension system's financial situation is serious, considering the aging trend of the population. Mesa-Lago estimated that the retirement age population would reach 1.82 million in 2000 and 2.34 million in 2010, compared with 1.45 million in 1990 and 0.68 million in 1960. As a result, the working age population's ratio of economically active to inactive would drop from 4:1 to 3:1. Unless reforms are adopted, the financial situation of the pension system will undoubtedly worsen, in light of this trend.

At the same time, it has to be noted that pensions in peso terms are low and that the purchasing power of pensions declined drastically in the 1990s, since the collapse of the economy after Soviet subsidies were eliminated and average real salaries in the formal economy declined by 45 percent, as discussed above. In the past, pension income was combined with the availability of rationed foodstuffs and other essential items to provide pensioners with a minimum standard of living (albeit at a fairly low level). As the economic crisis worsened during the nineties, goods increasingly became less available through official rationing channels, while they were increasingly available in the informal market for those who had U.S. dollars. Anecdotal information indicates that prices of goods available for sale in pesos have increased sharply, although it is impossible to know exact amounts because no price statistics are available.

To sum up, under the existing pension system, pensioners cannot buy the basic necessities of life. It appears that the pension system fails to provide adequate living standards for the old, particularly as the quality of health care, which is provided free of charge, has also deteriorated sharply in recent years. At the same time, the pension system is already running large cash deficits and building up a large contingent liability for the government.

## **The Possibilities of Reform and the General Theory of Safety Nets**

A transition to a market economy in Cuba is likely to entail the same kinds of social adjustment costs that were experienced in other transition economies in Eastern Europe and Central Asia (see World Bank 2002) and that have been addressed by various safety net programs in Latin

America (Hicks and Wodon 2001). Thus, the objective should be to put into place a safety net that protects the poorest and those most affected by the transition, while being fiscally affordable.

Safety net programs generally have two broad objectives: programs to assist the *permanent* poor and programs to help the transient poor. The permanent poor include the mentally and physically disabled, the aged, orphans and others who cannot be expected to participate in the labor market, and those who are in more or less permanent need of public sector assistance. The transient poor are those who are affected by some sort of external shock that has temporarily reduced their income to below the poverty line. These shocks can include loss of employment; lower nominal and real wages; lower income as a result of adverse price movements for products, as in the case of farmers; or lower incomes from falling demand, in the case of the self-employed poor. In this paper, we focus mostly on programs designed to help the transient poor during periods of adjustment. First, we outline the broad principles of a good safety net system, and then we analyze various safety nets that have been used in Latin America, which might be adopted by Cuba during the transition.

In general, publicly funded or mandated social protection programs and safety nets represent an attempt to protect the poor against the risks that arise from shocks, whether the shocks are foreign or domestically induced and whether they are covariant or idiosyncratic. An economic crisis produces a *covariant shock*, whereby many people are affected at the same time. But even in normal times, households can be affected by idiosyncratic shocks, such as a death, an illness, or a loss of employment. In many cases, private safety nets, including family and local community networks, can deal with *idiosyncratic shocks*, although public programs are also useful. Generally speaking, only public sector interventions can provide programs that are specifically designed to help large numbers of poor people suffering from temporary, adverse covariant shocks (World Bank 1999).

Among the programs designed to deal with covariant shocks, one can identify a number of alternatives. These include the following:

- Emergency employment programs involving public works, often using labor intensive methods, commonly called *workfare*;
- *Social funds*, which establish special programs, usually in rural

areas, for financing small scale public works identified by local community groups;

- *Nutrition and food interventions*, particularly those targeted at vulnerable groups, such as children and pregnant women. These may take many forms, including food distributions, food stamps, and food served in schools or community kitchens;
- Systems of *direct cash grants* targeted to the poorest, which may be conditioned on favorable behavior, such as school attendance and/or health center visits;
- *Unemployment programs*, including mandating severance payments by private firms upon termination of employees, and government unemployment insurance, usually financed by a wage tax on the employed.

Pension programs are often one of the largest components of social expenditures. Although, they are not targeted at the transitional poor, they are important for keeping the elderly and disabled from falling into poverty, and for this reason they are treated in this paper as part of the safety net.

Within Latin America and the Caribbean, at present almost all countries have some mix of the above programs in varying degrees. However, very few if any programs completely fulfill the criteria of an ideal safety net, which should have the following characteristics:

- It should be based on a sound analysis of who is likely to be affected the most by crises and what kinds of coping mechanisms are normally used by those affected;
- It should provide sufficient coverage of the population to be reached, particularly the most vulnerable and excluded groups;
- It should be well targeted to the poor with clear eligibility and termination rules, so that access is simple and predictable;
- It should be supervised by well functioning institutions already in place;
- It should be counter-cyclical (that is, receive more funding when there is an economic crisis) and in some cases implemented automatically according to pre-agreed triggers, such as a rise above some level in unemployment or poverty;

- It should be fiscally sustainable, particularly during a crisis when resources are likely to be constrained;
- It should be able to provide benefits quickly, with as large as possible a share of the costs resulting in net increases in incomes;
- It should complement, not substitute for, private safety net programs and other social protection mechanisms;
- It should be capable of being scaled back when the crisis is over.

## **Common Types of Safety Nets and Social Protection Programs in Latin America**

### *Workfare programs*

Workfare programs provide employment through specifically designed public works projects. The classic example is Trabajar in Argentina, now called Programa Jefes de Hogares, World Bank 2003. In this program, projects are identified by local governments, nongovernmental organizations (NGOs), and community groups, and can provide employment for no more than 100 days per participant. Project proposals are reviewed by a regional committee, and projects with higher poverty and employment impacts are favored. Workers hired by the project are paid by the government, specifically the Ministry of Labor. The other costs are financed by local authorities. Examples of eligible projects include the construction or repair of schools, health facilities, basic sanitation facilities, small roads and bridges, community kitchens and centers, and small dams and canals.

The projects financed by Trabajar are limited to poor areas as identified by a poverty map. Moreover, wages are set to be no higher than 90 percent of the prevailing market wage, so that the workers have an incentive to return to private sector jobs when these are available. Thus, the program involves self targeting apart from geographic targeting. Overall, targeting of the poor under Trabajar II (the second round of the project) has been reported to be quite good, with 75 percent of the funds reaching those in the bottom 20 percent of the income distribution, and 40 percent reaching the bottom 5 percent. However, the supply of jobs in the program depends on budgetary allocations as well as the ability of local com-

munities to identify viable projects. As good as it is, Trabajar has provided employment to no more than 1 or 2 percent of the labor force, at a time when unemployment has ranged from 13 to 18 percent of the labor force.

Large workfare programs were also implemented by the government of Chile during the 1975–1988 period. The twofold objective of these programs was to absorb workers displaced from the public sector and to reduce unemployment during the adjustment period. As with Trabajar, these programs provided employment in emergency public works, including maintenance and repairs to roads and schools, construction of parks, forestry projects, and so on. The programs in Chile were administered by municipalities and gradually built up to a peak in 1983, when they employed about 13 percent of the total work force (over 500,000 workers), while the unemployment rate was at 17 percent. The programs were gradually reduced as private sector employment increased and finally phased out completely in 1988. The two largest programs offered manual labor at very low wages to ensure self targeting. Most of the workers were unskilled; they received one-fourth of the then current minimum wage (about one-half of the market wage). One out of every four participants was a woman. However, while the program was considered successful in reducing poverty and the social impact of unemployment, the quality of the public works produced was notably low, particularly as the program expanded in size. In addition, it is not clear that all the workers in the program would have been unemployed without the program. An evaluation found that 32 percent of the participants had no work experience prior to participating in the program, and 46 percent had retired voluntarily before joining the program. Many of those with no experience were women who went to work for the first time (Universidad de Chile 1992).

The advantages of workfare programs include their ability to expand quickly during a crisis, once the basic mechanisms have been established, and to reach the poor through area targeting and, within poor areas, through self targeting due to the low wages offered. But a problem with these programs is that the cost of generating one dollar in additional income for the poor through public works is typically large, in the range of three dollars or more.



## *Social Investment Funds*

Social investment funds (SIFs) were the original World Bank response to the social aspects of adjustment programs, and some of the earliest funds (for example, Bolivia's Emergency Social Fund created in 1991) were designed primarily to provide employment (see Rawlings, Sherburne-Benz, and Van Domelen 2004 for a general review of social funds). In fact, SIFs were started in part to avoid the problems associated with emergency public works (workfare) programs. Yet, almost all SIFs now have evolved into programs designed to provide small-scale social assistance and infrastructure, particularly in rural and poor areas, using projects generated and executed at the local level. Therefore, social funds are not safety nets per se. Note that unlike workfare programs, some social funds also finance programs that do not involve construction or maintenance, such as nutrition programs, technical assistance, and micro credit. When construction work is involved, it is not rare to see social funds using skilled manpower paid at market wages. This is because the quality of the infrastructure built is considered more important than the provision of employment for the poor. This is the case with the Honduras social fund, which originated from the transformation of an employment generation program in the early 1990s but does not consider the objective of employment creation as its main priority now. On the other hand, most social funds are usually targeted to poor areas through the use of a poverty map or, in some cases, through the use of a map of unmet basic needs.

While both workfare and social fund programs build projects in the public sector, there are important differences. The social fund finances the material and labor costs of a project, although some local labor may be donated as a community contribution. This varies across SIFs and countries. A workfare program generally finances the labor cost of a project at the national or federal level and asks that local governments or agencies provide for the material costs. Thus, there is a clear incentive in workfare programs for the local agency to find labor-intensive methods of construction and choose labor-intensive projects. Since SIF projects are bid out to the private sector, often the most modern and capital-intensive construction methods are used, although in some cases social funds specify minimum employment levels to be attained in their operations.

Most social funds are agencies independent of line ministries, often attached to the office of the country's president, which reviews and funds

projects submitted by NGOs, local governments, and other sponsoring agents. Their strong points include local community involvement and the ability to respond to local perceptions of needs, especially in rural areas where normal government expenditures often do not reach the poor. Social funds also are better equipped to avoid corruption and “make work” projects. But they are not very good at providing safety nets, and they do not normally expand during a crisis to provide more employment. In fact, the amount of employment and income generation provided by social funds historically has been low. For instance, a review of social funds found that 10 major social funds provided employment on average equal to only 4 percent of the labor force (Goodman et al. 1997). Likewise, the monetary contribution of wages was judged to be small, as well as the poverty reduction impact coming from the projects themselves. Social funds are better at improving the supply of health, education, and basic infrastructure services, in some cases with impacts on outcomes such as school enrollment rates, age-for-grade, and the frequency of illnesses.

Still, one of the clear advantages of social funds is that they have strong organizations that exist with relatively good systems for project management and monitoring. These organizations can be used in times of crisis for the delivery of social safety nets. The existing social fund in Honduras, for instance, has proved highly valuable in directing emergency assistance to local villages after Hurricane Mitch. One possibility, therefore, is to work with social investment funds to modify their operations during a crisis, such as by putting more emphasis on labor-intensive projects, and by having the fund involved in new, hard hit areas. Thus, it is a good idea to identify labor-intensive projects in advance of a potential crisis, so that these are ready for funding should a crisis come about.

### *Food and Nutrition Programs*

Food and nutrition programs take a variety of forms. Research by Subbarao and colleagues (1997) has identified about 30 countries using food policies with redistributive aims. Among these countries, price subsidies are used as often as feeding programs and food for work requirements and are used much more often than food quantity rationing and food stamps. In fact, many workfare programs now providing wages in cash initially started as “food-for-work” programs. As for direct feeding

programs, they provide food to needy recipients through direct delivery of unprepared foods from a program warehouse, delivery of prepared food from a community kitchen, or the provision of a lunch or breakfast to children in school.

Evaluations of nutrition programs generally indicate that there is only a small, marginal improvement in nutrition compared to the cases in which the family receives an equivalent cash grant, because families may substitute free food for their own purchases and largely use the savings for other purposes. However, even if a food program is roughly equivalent in effect to a cash grant, there are fewer possibilities of diversion of funds, as food is less likely to be misappropriated than cash. In addition, food is more likely to go to women and be used to improve the welfare of the family, while cash is more likely to be used by men for lower priority activities.

An intermediate alternative between cash and food are food stamps. Food stamps have the added benefit of not requiring a complicated system of storage and transport of food, while making use of the already existing private food distribution network. In Honduras in the past, the food stamp program also covered medicines and school books. In Jamaica, the food stamp program was introduced in place of general food subsidies and has proved effective in raising the incomes of the poor (Grosh 1992).

A common way of targeting food programs is by linking distribution to a health program, particularly maternal and child health care. In this way, the food serves as an incentive to attend the program, and nutrition education can help improve the use of the food given out. Giving food to women also lessens the possibilities of it being diverted for sale in the market. Food programs can be designed to be self targeted, if the food products given out are those consumed by the poor and not by the middle class. Alternatively, food distribution can take place at centers located in poor neighborhoods. Such approaches can reduce the administrative burden of targeting programs, but they increase the possibility of leakage to the non-poor. School lunch and breakfast programs are also difficult to target at the individual level if administrators are to avoid stigmatizing some students within the school as being "poor." In many countries, schools from poor areas are targeted, but completely untargeted national programs are also common. Two benefits of these programs are the incentive to keep the children in school in order to have them fed and improved

learning abilities resulting from better nutrition while in school (see Wodon and Siaens 1999a for an evaluation of the Mexican school breakfast program; and Miller Del Rosso 1999 on the impact of school feeding programs on learning). From a nutritional point of view, the prime beneficiaries of these programs are often other members of the family if the children are not fed at home because the parents know that they will receive a school lunch.

### *Conditional Cash Transfers*

As food is fungible with money, one could argue that cash grants are the simplest and most direct way of providing safety net assistance. The use of cash grants also avoids the utility losses associated with in-kind support. In developed countries and some advanced Latin American countries, cash payments to select households are slowly becoming more common. Unconditional cash payments and similar forms of social assistance are usually targeted to women with dependant children, the disabled, the aged, and those unable to work. However, the problems of targeting and controlling cash payments make this approach problematic in poorer countries that lack good administrative arrangements.

An attractive alternative is to link cash grants with school attendance or other desirable behavior. This has been introduced in various degrees in such countries as Brazil (Bolsa Familia), Argentina (Beca Secundaria), Mexico (Progresa, now called Oportunidades), and Honduras (PRAF), among others.<sup>14</sup> These programs are not safety nets per se, or at least they were not originally designed to function as compensatory safety nets during crises. Yet the programs do provide valuable benefits that households can rely upon during crises, and these benefits can be increased during a recession if need be. In other words, as was the case for job training programs and social investment funds, existing programs providing conditional cash transfers can be expanded and modified to serve as safety nets during a crisis. In general, however, school-related grants will offer only a partial response to crisis situations, if only because the programs are targeted to families with children already in school, so that some of the poorest who cannot afford to send their children to school are excluded from the programs' coverage.

School-based conditional cash transfers programs reduce the opportunity costs for poor parents of keeping their children in school.

Opportunity cost is essentially the loss in children's wages or in the value for the parents of the domestic work done by the children that cannot be enjoyed when the children go to school. In many cases, the opportunity cost of schooling is difficult to estimate, and it is not obvious that the grants must be equal to the opportunity cost for the parents to send their children to school (see Wodon, Gonzalez, and Siaens 2000; Ravallion and Wodon 2000). Indeed, it is reasonable to think that parents have an intrinsic interest in having their children go to school, either for altruistic motives or for future benefits that intergenerational transfers provide once the children reach adulthood. In some countries, however, the level of the conditional grants appears to be high. For Progresa in Mexico, for example, to justify the relatively high level of the Progresa grants, it has been argued that apart from providing incentives to accumulate human capital, they also improve the families' overall quality of life. Yet, there may be more cost-effective ways to improve the quality of life of the program's beneficiaries. However, more work would be needed to measure the trade-offs.

At what level of schooling should the grants be provided? This depends on the characteristics of the country. In Brazil and Argentina, the programs focus on secondary school, as these children are more likely to be pulled out of school during a crisis. In Honduras, the program focuses on the last few years of primary school. In Mexico, the program covers the end of primary schooling and the lower secondary school cycle. In Venezuela, the program covers primary school children. In some cases, these programs are tied not only to attendance but also to school performance, including passing on to the next grade. While this approach may provide valuable incentives, one has to make sure that such conditions do not exclude the poorest, who may have more difficulties in succeeding at school.

How should the grants be targeted? The Progresa program uses a three-stage targeting mechanism (Skoufias 2001). First, poor rural localities are selected for participation. Second, poor families are selected within participating communities, using a multivariate discriminant analysis. Third, local communities may review the Progresa's selection staff and reclassify poor families as non-poor and vice versa. This targeting mechanism is basically sound, and the results appear to be good. One concern is that the level of community involvement remains marginal. The targeting process is centralized, in part due to the desire to avoid

political interference in the choice of beneficiaries. Nevertheless, more efforts could be made to promote the role of communities in targeting. Another relevant question relates to the need for targeting within poor communities. The higher the proportion of the poor in a community, the less the need to target within that community, especially if targeting is costly, not so much administratively but rather in terms of social cohesion (those who do not get the program may envy those who benefit from it). In Honduras, where the PRAF program is being modified in part on the basis of Progresas's experience, it has been decided to provide support to all the families residing in the poor communities that participate.<sup>15</sup>

Conditional cash transfer programs can also be used to promote good health practices, including the consultation of local health providers. This is again the case with Mexico's Progresas, where eligible families receive a transfer (both in cash and in kind through a nutritional supplement) for health purposes apart from the transfers related to schooling. That is, Progresas aims at providing a coordinated intervention for education, health, and nutrition, with the hope that the impact of the whole program will be larger than that of its individual parts. Of course, with Progresas as with the other programs, in maximizing the impact of the school- and/or health-based interventions, it is important to take care of supply-side issues. For example, Progresas has been successful in raising school enrollment and attendance at health care centers, but this has led to tensions on the supply side. Steps have been taken to coordinate Progresas's action with that of other ministries, such as the Ministries of Education and Health, but more may be needed to optimize demand and supply-side interventions.

### *Unemployment Compensation*

Unemployment insurance is common to Europe and North America but relatively rare in Latin America, in part because of its high cost. On the other hand, the current labor legislation in many Latin American countries mandates a severance payment on termination that is a function of the number of years worked. Normally, this is about one month's salary for every year of service, up to some maximum. This may be supplemented by an unemployment insurance scheme (as in Argentina and in Brazil for formal sector workers), in which monthly contributions from payrolls and/or the employer entitles the worker to a monthly payment

over a limited time horizon, with the payment set low enough to reduce disincentive effects. But since the formal sector in many countries is less than half of the total work force, the coverage of unemployment insurance/severance payments is far from complete, and the exclusion of the informal and rural sectors means that these mechanisms miss those areas containing many of the poor.

Severance payment systems are common in Latin America and less common in other regions (see Gill et al. 2002). They impose a high cost on employers, which serves as a disincentive to hiring new workers. In a recession, employers tend to fire workers with lower severance obligations, which tends to discriminate against younger and female workers. In a few countries (for example, Colombia) the mandatory severance payments are separately funded, but in most they are an unfunded contingent liability of the employer. In the case of firm bankruptcy, the worker is apt not to receive his full severance payment or any payment at all. During the recent crisis in Argentina (World Bank 2003), it became common for employers to negotiate with workers for a payment substantially less than the legal requirement. Workers tended to accept these reduced immediate payments rather than undertake protracted legal actions with an uncertain likelihood of receiving more. Thus, severance payments are an uncertain safety net even for workers in the formal sector because they cannot rely on receiving them, particularly during periods of covariant shocks, when the firm is likely to be under severe financial distress and unable to pay.

Moving from a severance pay system to an unemployment insurance system could be beneficial if it reduces labor costs and makes the employment compensation system more reliable. However, unemployment insurance can also create moral hazard problems by subsidizing unemployment, as compared with workfare programs, which subsidize employment. One important element here is to ensure that unemployment benefits are not so generous as to discourage job search. For this, both the level of the payments and the length of time workers can receive benefits must be monitored. For a review of the Organization for Economic Cooperation and Development's (OECD) experience with labor market rigidities and unemployment insurance, see Nickell 1997.

## Targeting

One element of a viable strategy—actually, one of the key parameters of the cost effectiveness of safety nets—is to protect programs that have good targeting mechanisms for reaching the poor. Untargeted or universal welfare programs are often fiscally impossible to sustain, particularly during a crisis. It is true that targeting beneficiaries by complicated means of testing, that is, intensive questioning over income and wealth, can be costly and not very reliable. This is why many programs funded by the World Bank have relied on geographic targeting even though this can lead to substantial leakage, meaning errors of commission and/or omission in determining who should receive assistance. But an alternative approach is the *proxy means test*, whereby likely recipients are interviewed and respond to questions concerning their living conditions, such as the type of housing in which they live, the availability of water, the types of appliances possessed by the household, and so on. Wodon (1997) has shown that these indicators are powerful for avoiding the errors of identifying as poor a non-poor household (inclusion error) and as non-poor a poor household (exclusion error). For any given budget, good targeting also helps to improve coverage among the poor (such as what percentage of the poor actually receive program benefits), which is an important advantage in Latin America where *coverage* has often been low. In some cases, it may be preferable to accept a certain degree of inclusion errors as a trade-off necessary to increase coverage.

Variants of means-testing systems have been used, among others, for the Fischa CAS in Chile, SISBEN in Colombia, SIFAM in Argentina, and Progresá in Mexico. In practice, people who apply for assistance are interviewed, and the score on the questionnaire determines eligibility. The weights for the various indicators included in the questionnaire are based on estimated econometric relationships between the poverty status of a representative sample of households and their indicators. Grosh (1994) has estimated that the cost of targeting through proxy-means testing or geographic targeting of poor areas need not be much higher than the cost of universal distribution (a reasonable mark-up would be from 3 to 8 percent), while producing substantial benefits. In a sample of untargeted programs, only 33 percent of the benefits accrued to the lowest 40 percent of the population, whereas 72 percent of targeted programs' benefits reached the lowest 40 percent.



## Experience with Safety Nets in Transition Economies

When Cuba begins the transition from a socialist to a market-based economy, it has much to learn from similar experiences of the transition economies of Central and Eastern Europe and Central Asia (CECA), including Russia and the states that formerly made up the Soviet Union. These countries started with an economic system similar to Cuba's and with a system of social programs loosely designed to help the poor. These programs included a variety of subsidies and grants that were general in nature. Among these, the most important were low cost housing and utilities; subsidized transportation and energy; and largely free social services, such as health, education, and child care (Fox 2003; Andrews and Ringold 1999). In addition, there were cash payments to households with children and generous pensions to the disabled and aging. As in Cuba, many of the legal entitlements were not paid or were paid late in order to reduce fiscal problems of the states, and the quality of the "free" services was often low. Since jobs were guaranteed, the concept of a "safety net" was unknown.

The transition itself produced severe shocks and a substantial increase in poverty. Poverty rose for this group of countries from 2 percent to 28 percent between 1988 and 1998, using a \$2.15 per day poverty measure (World Bank 2002). This was a direct result of a severe output shock, a shock that was most severe among the poorest countries. For the wealthier former "satellite" countries of Eastern Europe, the output decline lasted about four years and averaged about 22 percent. For many of these countries, including Romania, Poland, and Hungary, output by 2000 was well above 1990 levels. In the poorer countries of the former Soviet Union, the situation was worse. The output decline lasted 6.5 years on average, with a cumulative average decline of 50 percent. Conflict-ridden countries, such as Moldova, Armenia, and Azerbaijan, lost over 60 percent of 1990 levels, and by 2000 GDP had recovered to only 63 percent of 1990 levels.

In response, most countries followed four main policy lines:

- unemployment benefits were introduced, based on payroll taxes;
- attempts were made to preserve and pay pension obligations, although this was not always a success;
- housing and utility subsidies were reduced gradually; and

- various forms of welfare payments, some means-tested and some defined by categories, were introduced.

Unlike Latin American countries, the CECA countries have had less success with proxy means testing, in part because greater income equality makes it difficult to segregate poor and non-poor households on the basis of assets. In general, however, countries have slowly moved to a higher reliance on means testing and moved away from generalized or categorical subsidies. In comparison with Latin America, however, it is interesting to note that CECA countries have not implemented workfare kinds of programs, principally because of the association of these types of programs with forced labor camps (Fox 2003). Another reason for the lack of workfare programs has been the scarcity of financial resources in these countries.

The reform of pension systems in transition economies also provides insights for pension reform in Cuba, because their pension systems and social spending policies were similar to those of Cuba before the demise of central planning. The public pension systems currently in place in the Baltics, Russia, and other countries in the former Soviet Union (BRO) and in Eastern Europe were introduced originally as contributory pension schemes with universal coverage based on PAYG financing. Castello Branco (1998) notes that this scheme was part of a public welfare system designed to provide “cradle-to-grave” protection to the population, including a myriad of social protection arrangements, ranging from the provision of health and education to the delivery of subsidies, cash benefits (including pensions and various allowances), benefits provided in kind (such as housing), and guaranteed employment. Under this system, pension benefits were only loosely linked to contributions, the same way wages were often unrelated to workers’ productivity. As the budgetary situation deteriorated in these countries, guaranteed employment and direct subsidies to the population were virtually eliminated, and the provision of the social benefits promised under the old system became increasingly burdensome, especially in light of competing demands from other expenditures necessary to carry forward the transition process.

System dependency ratios—defined as the ratio of pensioners to working population—were already high at the beginning of the transition, and they increased further (Cuevas and Pérez 1999, Table 3) as employment fell. The incidence of early retirement increased, and in a few countries, it increased as populations aged. Some Central and Eastern European countries have intentionally used early retirement and disabili-

ty pensions as a safety net to prevent a sharp increase in unemployment, adding to the financial pressures. At the same time, financial weakness of enterprises, a rise in private and informal sector activities, and an inefficient collection system resulted in a decline in contributions.

Most BRO countries responded to the declining number of contributors and the weakening in tax compliance by initially reducing the generous levels of benefits. During the initial, high inflation phase of the transition period, the lack of formal indexation mechanisms resulted in significant erosion of the real value of pensions. Subsequently, the use of sporadic indexation and modifications in the benefit formula, in particular changing the way the initial pension was determined, flattened the pension benefit structure in most countries (Castello Branco 1998, 28–29). For example, the average replacement rates—defined as the average pension in terms of the average wage—fell by more than 10 percentage points in Albania, Croatia, and Romania during the years 1991–1993, and benefit levels were also compressed in Russia. In some cases, the benefit levels were reduced to just slightly above the poverty line, and in some instances, below it. Pensioners in these countries seem to have survived through transfers provided through extended family arrangements, income from informal activities, and sales of personal assets. Under these circumstances, Castello Branco points to the fact that these pension systems became crude social safety nets, providing small amounts of benefits to a large section of the population. In the poorest countries, like Armenia and Georgia, the official safety nets became largely irrelevant for household income. In recent years, with progress achieved in macroeconomic stabilization, there have been attempts to increase the level of benefits, but funds have been insufficient to do so.

Despite the reduced benefits, pension funds began to run cash budget deficits. Moreover, most of these countries, except Albania and some countries in the Caucasus and Central Asia, faced the prospect of aging populations, which added to the financial strains of their pension systems. To address the growing financial imbalances in the pension funds, contribution rates were raised significantly. Payroll taxes are now in excess of 30 percent of wages; they were as high as 52 percent in Ukraine in 1996. However, the increase in contribution rates apparently has discouraged compliance in a significant way. At the same time during the transition period, arrears have accumulated both in contributions and in payments of pension benefits.

In addition to the short-term responses of compressing benefits—but not the number of beneficiaries—increasing contribution rates, and accumulating arrears, several BRO countries adopted piecemeal reform measures to correct some of the distortions existing in their PAYG systems. Notably, they introduced amendments to the existing legislation to change the benefit structure and eligibility criteria and made efforts to improve targeting of benefits and strengthen tax collection. A few countries, such as Armenia, Azerbaijan, Estonia, Kazakhstan, and Lithuania, initiated a process of gradually increasing retirement ages, but in Georgia in February 1996, the retirement age was raised by five years immediately. Some countries have reduced or eliminated benefits for working pensioners. BRO countries are also trying to improve the collection of contributions to the pension systems. To try to improve the disappointing collections of contribution rates, Armenia, Georgia, and Ukraine decided to cut contribution rates gradually in an attempt to increase compliance over time. Countries like Ukraine took steps to harmonize contribution rates by raising rates for some privileged categories, and others, such as Russia and Ukraine, attempted to broaden the tax base by including some previously untaxed nonwage income.

A number of countries are considering more systematic pension reforms and are in some cases preparing the introduction of private pension funds. Others, like Kazakhstan and Latvia, and Hungary and Poland in Central Europe, have taken steps to adopt a multipillar system, as recommended by the World Bank. The Kazakh reform plan that became operational in January 1998 envisages a transition toward a new system, based on the Chilean model, in which the first pillar will play a minimal role. All current and new workers will immediately participate in the funded system of individual accounts. In Hungary, Latvia, and Poland, the first pillar retains a more important role and continues to provide benefits partially linked to contributions. These three countries are also taking a more gradual approach toward introducing the privately managed pillars, and Hungary and Poland offer those currently working and within a certain age range the option to continue participation in the old system.

Congiano, Cottarelli, and Cubeddu (1998) discuss how these countries are attempting to dampen the financial risks associated with private pension funds through the imposition of a regulatory framework that specifies asset portfolio management and the provisions of government guarantees on minimum pension payments.

## Conclusions – What Should be Done in Cuba?

Given all of the above, including its past history with social programs and best practices in other countries, what should the Cuban government do during a transition in terms of creating a viable safety net? Clearly, the answer to that question will depend on the volume of internal resources for these kinds of programs and the amounts of external assistance available. The reforms of the social safety net system will have to be part of a comprehensive strategy to transform the Cuban economy from a socialist system with large economic distortions to a market economy. We recommend that a number of steps be taken:

1. First, a strategy has to be formulated to open opportunities for the development of the private sector as a source of economic growth and jobs. The strategy will have to involve the creation of necessary institutions (key among them is the appropriate legal framework to ensure property rights). The size and scope of the public sector need to be reduced, and loss-making public enterprises should be closed—both of which will increase unemployment in the short run. The latter is a tall order, given the current importance of the public sector as an employer. In 2002, the Castro government was forced by economic conditions to start taking some steps in this direction by closing more than half of the 156 sugar mills. The promotion of private sector activity will need to involve the implementation of a privatization program that gives priority to opening places of work as soon as possible and avoids delays associated with the resolution of property claims.
2. Resources will need to be devoted to compensate workers displaced from their jobs in the civil service or public enterprises. However, the length of the compensation period will have to be of limited duration to ensure that workers will seek work in the private sector as soon as possible. Arbitrary restrictions on private sector employment should be eliminated right away. Resources for retraining programs as well as financing for small businesses will be needed too.
3. Workfare programs that employ people, paying salaries lower than the prevailing market wage, on projects that provide new or rehabilitated public infrastructure, such as schools, roads, and water supply, can address the urgent needs of creating employ-

ment and begin rebuilding the dilapidated infrastructure. Social investment funds can be set up in Cuba with the help of foreign donors to renovate the infrastructure and create jobs. This is an area where Cuban authorities could seek international assistance once the political obstacles have been removed.

4. As a permanent feature of the social safety net, a system of unemployment insurance can be maintained, based on a tax on salaries paid by employers, that would pay benefits that are lower than the prevailing market wage and limited in duration, thus providing protection while also providing an incentive to search for employment.
5. Universal subsidies for housing, transport, and utilities should be phased out, particularly for the non-poor. These should be replaced by a system of well-targeted cash grants for the poor, particularly those permanent poor, such as disabled people, who are unable to work. In instituting a cash grant system, some compensations should be included for the elimination of the commodity distribution system, but it may be necessary to keep the commodity program at least for a transitional period to avoid imposing an unduly large burden on the population at large in the short run.
6. Institute/expand a school feeding program that provides breakfast and lunch. If foreign food aid is available, this should be monetized (sold in the free market), and the revenues would be used to purchase locally available food, rather than incur the costs of large-scale shipping and storage of imported food.
7. Undertake a reform of the social security system that provides a basic minimum pension for the elderly that is fiscally sustainable and provides for future financing in line with future costs. In addition, some combination of an increase in the retirement age, a rise in social security contributions, and a reduction in replacement rates would have to be implemented. Once the financial situation of the social security system is put on a more sustainable basis, an effort should be made to adjust pension levels by the cost of living to prevent a further deterioration in real pensions, as economic conditions improve and public finances strengthen. The following Appendix lists specific steps that could be taken in this respect.

## **Appendix: The Reform of the Pension System<sup>16</sup>**

As in previous transition economies, reforming the pension system in Cuba is in many ways a more difficult task than in industrial and developing countries. The difficult situation of public finances, the large competing expenditure needs, and the lack of financial markets and regulatory frameworks create very serious constraints to reform. At the same time, on political and ethical grounds, there is a need to provide a minimum protection to pensioners who may not live to enjoy future improvements in macroeconomic performance yet expect the government to honor its promise of an adequate pension.

To address the pension and other serious economic problems of Cuba, it is clear that a medium- to long-term macroeconomic program would need to be put in place with a strong emphasis on carrying out needed structural reforms to eliminate distortions in and generate a strong supply response from the economy. It is imperative to increase economic growth to raise living standards and generate resources to reform the pension system. With higher rates of growth in the future, the PAYG finances would improve significantly.

Concerning the reform of the pension system, Cuba faces the double problem that the system is already running a large cash deficit, which will increase over time as the population ages, while the pension system does not maintain an adequate income for the elderly who have been poor most of their lives and now face a dismal future at the current levels of pensions. Neither does the current system provide an adequate vehicle to save a share of income of the active population for their old age needs or provide insurance against disability or protection to survivors. To come up with specific recommendations on how to reform the pension system, one would need to have comprehensive information about the state of public finances and about demographic trends in Cuba. In addition, in Cuba there are likely to be large amounts of off-budgetary transactions that would need to be brought into the budget before the real fiscal situation and how much leeway the government has in meeting its pension obligations could be assessed.

At the outset of the reform of the Cuban pension system, it appears that there is little choice but to try to reform the existing PAYG system and implement piecemeal reforms to correct some of the most obvious distortions. It is clear that the retirement age would need to be raised,

preferably to 65 years for both men and women, given that the latter group tends to have a longer life expectancy. Contribution rates will need to be increased, although it would be important to be mindful of the limits that exist before serious evasion problems arise; actuarial calculations will be a key input in determining by how much to increase retirement age and contributions.

The rules for early retirement would need to be tightened and the targeting of the benefits improved by means testing (except that for some time the introduction of means testing is unlikely to have strong payoff, given how widespread poverty is). Stronger surveillance would also be needed over disability claims to reduce abuses to the system. The cost of all noncontributor benefits should be transferred to the budget and the special retirement program of the military, and others should be integrated with the general pension program. A decision will have to be made about indexing existing pension benefits, preferably to the consumer price index instead of wages, given that the increase of the latter will tend to reflect increases in productivity in better functioning labor markets.

The more difficult question would have to be what to do about the level of pensions. One possibility would be, instead of having a basic public pension (on a universal or means-tested basis), to have a minimum flat rate, which, while higher than the current level, would still be relatively low, plus a limited earnings-related pension scheme. The option of developing private pensions should not be excluded, and the result of the pension reforms in the transition countries in Europe and Asia should be examined as more experience is gained with these reforms. However, it is evident that significant progress would have to be made in creating a financial system and an appropriate regulatory framework before a serious program of privatization of pensions could be considered.

A quantitative analysis of possible reforms of the Cuban pension system can help to assess the results of steps that could be taken incrementally to put the system on a more financially sound basis. Cuevas and Pérez (1999) constructed a baseline scenario of the social security system to project the evolution of the existing system over the long term, into the year 2050. In light of the great degree of uncertainty regarding Cuba's long-term economic prospects, these results should only be viewed as illustrative. The tentative nature of the results is also due to limitations in the data used to generate the projections. The scenarios described below show what happens to the current account balance of the pension system



(current revenues minus pension payments) over time. To produce such scenarios, assumptions had to be made about a set of macroeconomic and demographic variables. Up to 1997, the data used was the macroeconomic data published in the CEPAL study of the Cuban economy or estimates based on those data, as well as the information on the pension system published in that study.

The key macroeconomic variables to project are prices and real wages. The real interest rate, normally a key variable in this type of exercise, was less important in the simulations of the *current* pension system because the system does not generate any surpluses during the projection period and is, therefore, unable to accumulate any reserves. Cuevas and Pérez also made a projection of GDP with the purpose of producing a yardstick against which to measure the future financial balances of the pension scheme. Although this is a partial equilibrium exercise without any feedback from the pension system to the macroeconomy, an effort was made to keep the wage and labor force simulations roughly consistent with our GDP projections. The main assumptions applying to the majority of the projection period are a real growth rate of GDP of 2.75 percent, an average real wage growth rate of 2.7 percent, and an inflation rate of 3 percent, which becomes less important as pension benefits are allowed to be indexed to the price level, according to Cuevas and Pérez (1999, Table 4). The assumption of a real interest rate of 4 percent was made only to allow the evaluation of the present value of the streams of balances of the social security system under alternative scenarios.

The second step in the simulation process is the generation of demographic projections. The starting point was the distribution of the Cuban population by age and by sex in 1991, the base year for the exercise. The projection of the population distribution in subsequent years was constructed in the standard way: deaths were obtained by applying age- and sex-specific mortality rates to the initial population distribution, and births were obtained by applying age-specific fertility rates to the distribution of women. The initial population distribution and the initial age- and sex-specific mortality rates were taken from Donate Armada (1994); mortality rates were then allowed to decline slowly during the projection period, implying an increase in life expectancy at birth from 72 years in 1991 to 77 in 2050. Age-specific fertility rates for 1991 and 1998 were obtained from the U.S. Census Bureau website, and total fertility

was projected to follow an upward path. The result of these assumptions is that total fertility, after plummeting to about 1.5 children per woman in 1998 (far less than necessary for the replacement of the population) is projected to recover slowly until, by the end of the projection period, fertility rates are back at replacement level. Table 5 in Cuevas and Pérez (1999) presents the basic demographic parameters employed to generate population projections.

The next step in the simulations was the derivation of the populations of contributors and beneficiaries of the pension system and their impact on its finances. Given the universal coverage of the pension scheme, effective contributing populations were obtained by multiplying the number of individuals in each age and sex group and the specific labor participation and employment rates of that group.<sup>17</sup> In this manner, a series of distributions of contributors by age and sex for each year were included in the projection. A conjectural wage scale was constructed, indicating the multiple of the average wage that a worker of a certain age and sex is assumed to earn. This wage scale was used to incorporate a premium for experience or education and a male-female differential, given the likelihood that female-dominated occupations may be not be as well remunerated as male-dominated occupations. Multiplying the average wage, these scales, and the distribution of contributors, and then adding the results across the different age and sex groups, the covered wage bill upon which pension contributions are levied was estimated.

The population of beneficiaries was simpler to calculate: given the universality of the system, all individuals of retirement age and older were considered beneficiaries. The amount of benefits paid had to be calculated in different ways for new and old retirees. Old retirees are those who retired before the start of the projection period, and only the total value of the benefits they received on that year is known. These benefits were projected to decline as the pensioners in this initial group die. According to current rules, no offsetting increase can be projected on account of indexation, because benefits are fixed in nominal terms. New retirees are those individuals who retire during the projection period, and their benefits had to be estimated fully from simulated data. The average pension paid to new pensioners varied according to their cohort, age, and sex, given that the benefit formula involves both the length of the contribution period—in turn affected by retirement age—and the wages earned during a portion of the working life of the individual. As the lack of an

indexation mechanism under present rules results in the rapid erosion of the value of benefits, it was decided gradually to allow the indexing of benefits to prices starting in 1999 (with full indexation being attained only in the year 2020). Total pension expenditure consisted of the sum of the cohort- and sex-specific benefits just described over all the cohorts of male and female beneficiaries. (Given the unavailability of reliable data, we did not simulate the population of children receiving survivor benefits).

The final step in the preparation of the Cuevas-Pérez projection model was the calibration of a key remaining parameter: the effective collection rate. From the projections of beneficiaries, contributors, and wages, we obtained a first round of projections of the revenues and expenditures of the pension system. The authors then compared this first round of estimates against the actual revenues and expenditures on social security over the 1991–1997 period reported in the CEPAL study. Finally, we calibrated the model in such a way that the projections, based on the economic and demographic data described above, could resemble actual outcomes for the 1991–1997 period. To bring our initial projection of revenues in line with the data for 1991–1997, we adjusted the effective collection rate. It turns out that reported revenues were about half as large as revenues projected in the first round of simulations. Thus, the authors adopted an effective collection rate of 50 percent for the period through 2000 and then gradually raised this parameter to 60 percent by 2020 and to 70 percent by 2050.

Two points must be raised regarding the calibration process. First, the type of adjustment needed is one indication of the crisis of the social security system. One must conjecture that the under-performance of observed revenues relative to their potential level could be the result of a combination of higher levels of unemployment than officially reported, lower wages, evasion (the underreporting of work and income), and administrative deterioration. All of these factors were summarized in the low “collection rate.” Associated with this crisis is the present impossibility of introducing a mechanism that may prevent the deterioration of real benefits as a result of inflation. The stagnation of nominal benefits cannot be addressed without attacking the weaknesses in revenue collections. In the simulations, it was assumed that eventually collection rates increase and that benefits become protected from the increase in prices. These assumptions, however, involve some measure of optimism,

because they imply significant improvements over current circumstances. In any event, the assumptions were kept constant across the different scenarios, so that they do not affect the *relative* performance of different contribution rates or benefit formulas.

The second point has to do with the *level* of the balances in the simulations. Because the model was calibrated by comparing its outcome over 1991–1997 to that of social security, the simulations are likely to have a negative bias. The deficits of social security include disability and other payments in addition to old-age pension payments, but Cuevas and Pérez were unable to ascertain which proportion of the overall deficit was accounted for by the old-age pension component alone. In the belief that the finances of the social security system are dominated by developments in the old-age pension system, the old-age model was calibrated with the financial results of social security as a whole. Thus, the deficits of the pension system throughout the projection period may have been overestimated. This bias, however, could not be quantified.

The simulation results show the deterioration of the dependency rates in Cuba and in its pension system expected to take place over the next several decades (see Chart 1 in Cuevas and Pérez 1999). Largely as a result of a marked decline in fertility, the Cuban population will age rapidly, with the proportion of individuals of retirement age (55 and over for women and 60 and over for men) growing from less than 15 percent in 1991 to approximately 36 percent of the population by the year 2050. Correspondingly, in 1991 each active worker had to finance 0.34 retirees; if the current retirement ages were maintained, each worker would have to maintain slightly more than one retiree by 2050.

The pension system is already losing money on a regular basis (Chart 2). The situation will become considerably worse as the dependency rates of the system deteriorate, with deficits exceeding 8 percent of GDP for the last 25 years of the simulation period and stabilizing at about 12 percent of GDP toward the end of the projection period. Using a real discount rate of 4 percent, the sum of the discounted values of the deficits between 1999 and 2050 is 36.1 billion pesos (in 1991 prices). This is more than twice as large as the 1991 GDP (17.5 billion pesos).

The worsening of the balance shown in Chart 2 also reflects the assumption of a gradual introduction of an indexation mechanism for benefits (full indexation to prices is attained by 2020 in our simulations). In a separate simulation, the absence of an indexation mechanism—that

is, the maintenance of the status quo in this area—reduces the deficit in about 4 percentage points of GDP per year relative to the one discussed above, still leaving over half of the deterioration in the social security balance to be explained in other ways. In fact, the most important factors behind the deterioration in the balance of the social security in our baseline scenario are demographic. In this scenario, the number of pensioners increases by 137 percent between 1998 and 2050, while the number of contributors, although growing for several years, suffers an overall decline between 1998 and 2050.

The previous discussion highlights the importance of raising retirement ages for improving the pension system's finances. Gradually increasing the retirement age to 65 for both men and women affects the dependency ratios (Chart 3). Relative to the baseline case, this measure reduces the proportion of individuals of retirement age significantly. For example, the fraction of the population represented by this group by the end of the projection period falls from almost 40 percent to about 27 percent, while the number of beneficiaries per contributor in the year 2050 falls from 1 to about 0.6. Moreover, the dependency ratios actually fall during the period 2000–2020, when the gradual increase in the retirement age reduces the number of people taking retirement. Even so, the ageing of the population is still clearly visible in the deterioration of the dependency ratios observed after 2020, when the retirement age ceases to increase.

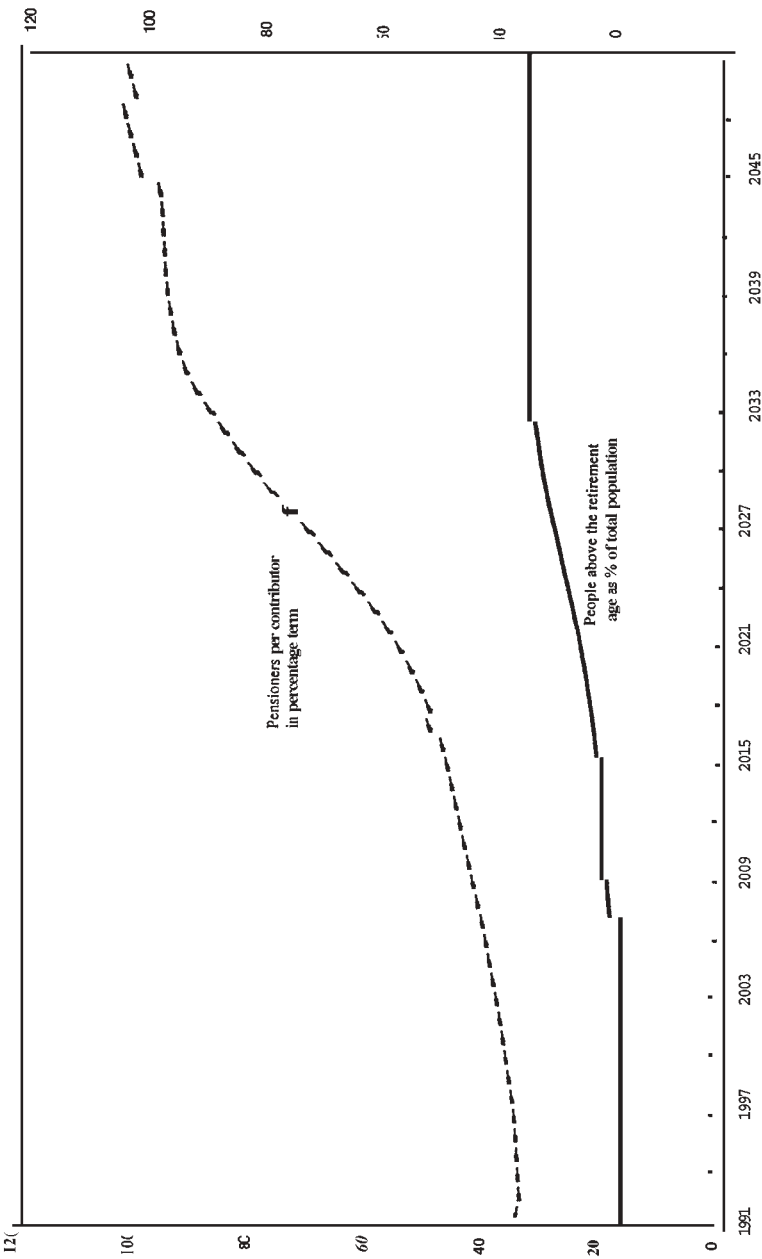
An increase in retirement ages significantly affects the finances of the pension system (Chart 4). An improvement is immediately noticed following the start of the phasing-in of the new retirement ages, as many individuals postpone retirement. The deficit falls to a moderate level and stays at around 2 percent of GDP for the space of two decades. After the retirement age settles at 65 years for all individuals, however, a deterioration ensues, and although the deficit never reaches the extremes observed in the baseline case, it stabilizes at 8 percent of GDP by the end of the projection period. Again, using a real discount rate of 4 percent, the discounted value of the sum of deficits between 1999 and 2050 under this scenario is 18.7 billion pesos (in 1991 prices). This is about half as large as the corresponding figure in the baseline scenario, but it is still a very high number. Thus, increasing the retirement age to 65 is not enough to solve the financial problems of the pension system.

Two alternative scenarios were also considered in Cuevas and Pérez

(1999). First, in addition to increasing the retirement age to 65, the effect of increasing the contribution rate from 14 percent to 25 percent of wages starting in the year 2000 was considered. The increase in contributions permits the system to run a surplus during the transition to the higher retirement ages, but that surplus disappears shortly after 2020 and turns into sizable deficits by the end of the projection period. If the initial surpluses were invested at a constant real interest rate of 4 percent, the deficits of the second portion of the simulation period could nearly be financed with the savings made through 2029. Those savings, however, would have been exhausted by the end of the simulation horizon. This is reflected in the fact that the discounted value of the balances of the system between 1999 and 2050, valued at 1991 prices, is a deficit of 2.8 billion pesos. Thus, this situation would be unsustainable in the very long run—not to mention the undesirability of increasing the contribution rate so dramatically.

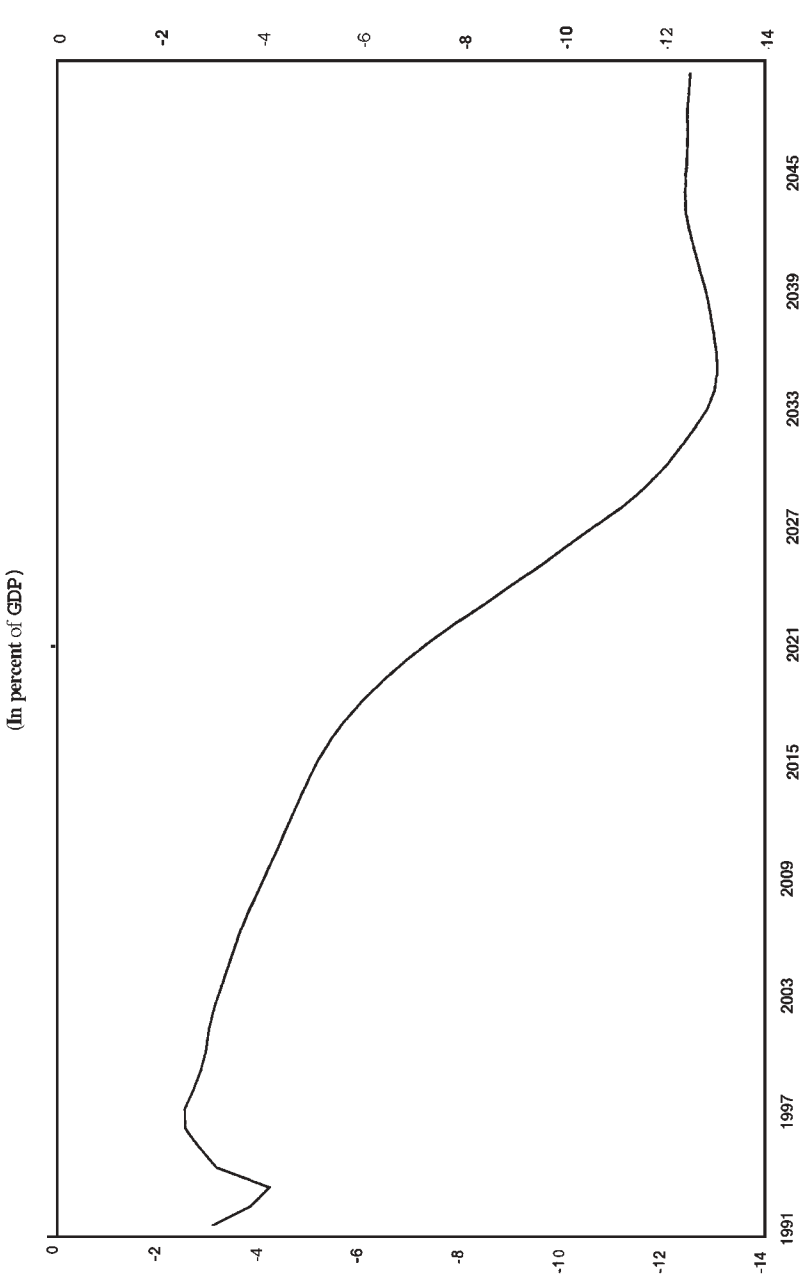
The second alternative appears somewhat better: besides increasing the retirement age to 65 as before, the contribution rate was raised to 20 percent of wages and simultaneously decreased the basic replacement rate from 50 to 33 percent of average wages for new pensioners starting in the year 2000. In this case, the net discounted value of all surpluses and deficits between 1999 and 2050 is minus (-) 1.2 billion pesos (in 1991 prices). Now, a somewhat lower amount of savings as in the previous scenario is generated during the transition period, before the system moves into deficits for the last two decades of the projection period. In this case, however, these deficits are smaller, and the savings accumulated in the surplus years are used up more slowly than before. This is the effect of the lower replacement rate, which becomes a more important policy parameter as the population ages. Thus, although this option generates almost the same amount of saving as the increase in contribution rates to 25 percent of wages, the savings will finance the pension system for a longer time and will introduce a smaller distortion in the labor market. The downside, of course, is the lower level of benefits offered to retirees.

**Chart 1. Cuba: Dependency Ratios Under the Current System, 1991 -2050**



Source: Demographic simulation results.

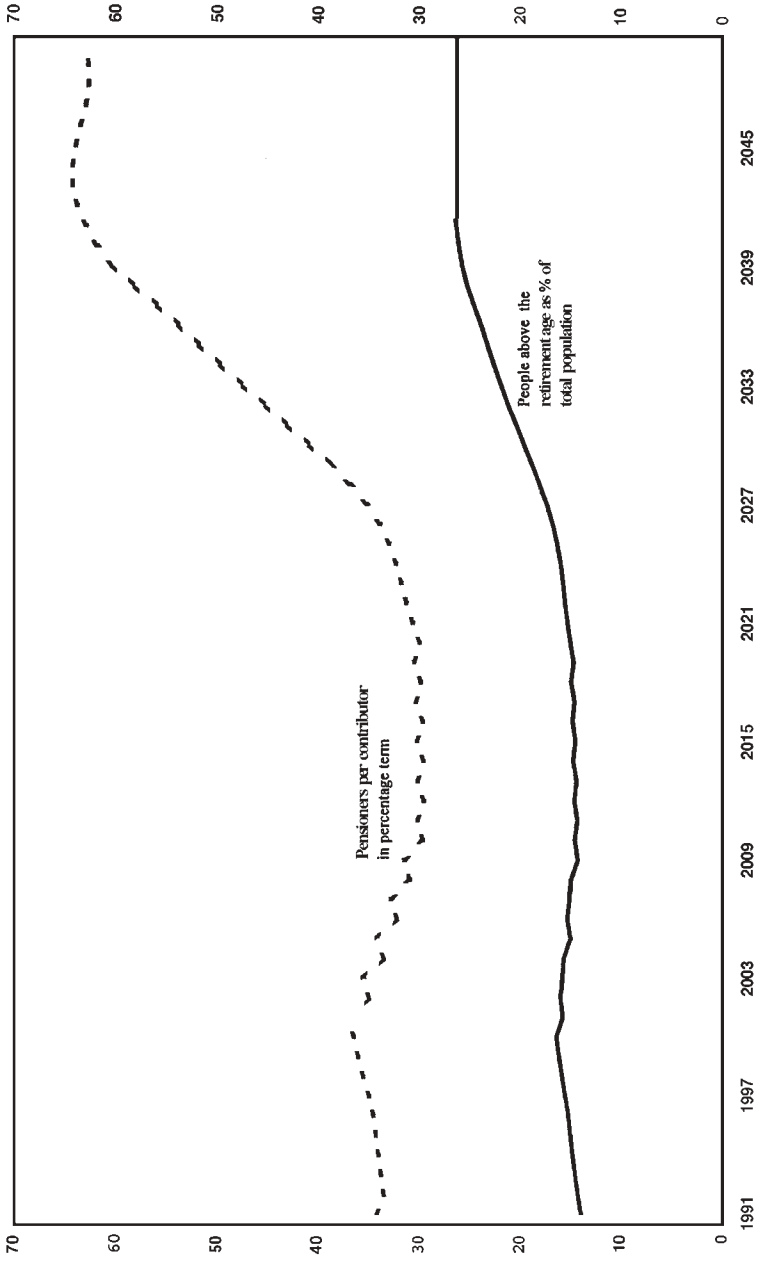
**Chart 2. Cuba: Current Account Balance Under the Existing System, 1991 -2050**



Source: Demographic simulation results.

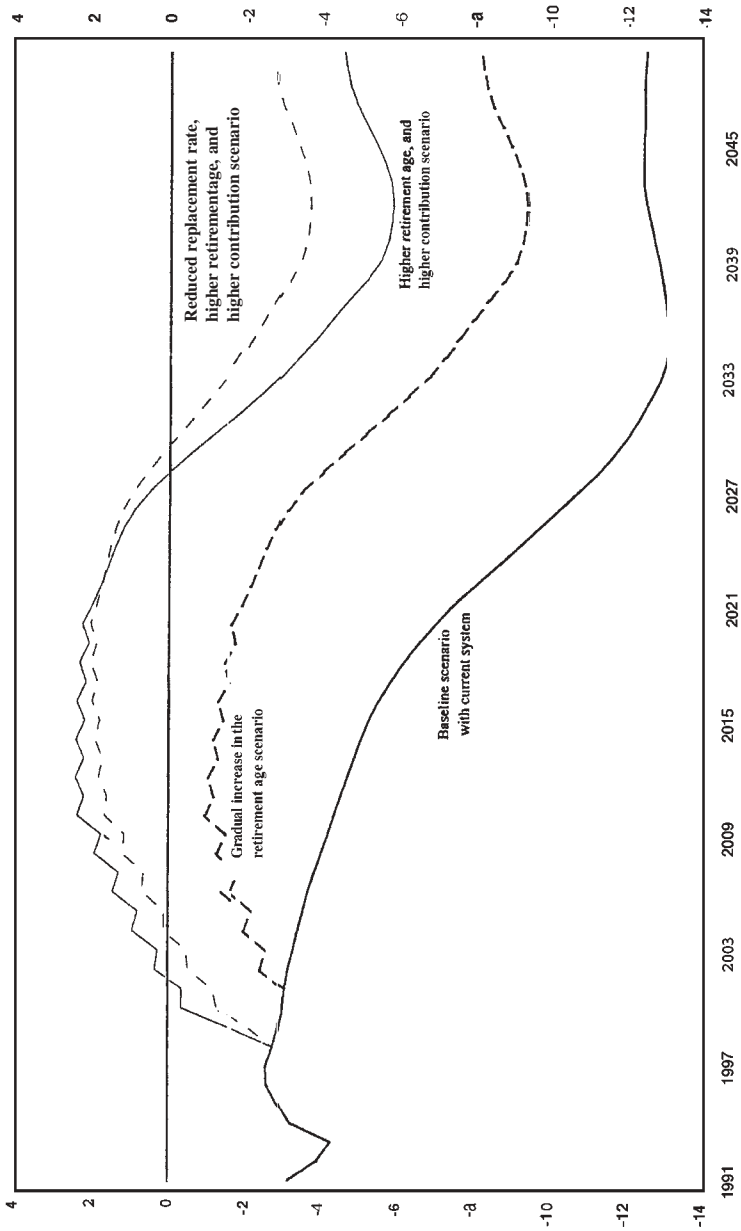


**Chart 3. Dependency Ratios Under the Assumption that the Retirement Age Increases to 65 Years Old, 1991 -2050**



Source: Demographic simulation results.

Chart 4. Cuba: Current Account Balance As Percentage of GDP Under Different Scenarios, 1991-2050



Source: Demographic simulation results.

## Notes

<sup>1</sup> Driggs (2003) notes that the current availability of commodities distributed in the ration book is far from certain, given the irregular resupply of food stores and small neighborhood markets that distribute rationed items.

<sup>2</sup> This paper was written before the end-2004 measures taken by the Cuban government to prohibit the circulation of U.S. dollars in Cuba. The conclusions of the paper still apply regarding the advantages that consumers with access to foreign exchange (other than U.S. dollars) have.

<sup>3</sup> CEPAL 2000, Table A54, reports a United Nations Development Programme (UNDP) 1996 daily calorie intake statistic for Cuba of 2,357, compared with an average of 2,425 for Central America and Panama, and an average 2,597 for Barbados, Haiti, Jamaica, and Trinidad and Tobago.

<sup>4</sup> CEPAL 2000, Table A48.

<sup>5</sup> *The Financial Times* reported on March 14, 2004, that a new government decree (circular 04/2004) calls for the cessation of secondary businesses of public sector enterprises and suspension of payments in hard currency for services that do not correspond with the main functions of these enterprises. Apparently, the Castro government has embarked on a new attempt to increase central planning and has also reduced the number of private businesses allowed and increased regulations on foreign investment.

<sup>6</sup> It is not clear what definition of “unemployed” was used to calculate the statistics reported by CEPAL and whether “unemployed” includes all those looking for employment.

<sup>7</sup> For more information on the social security system of Cuba than contained in this section, see Carmelo Mesa-Lago, 1996, *La seguridad social y la pobreza en Cuba, en La Seguridad Social en America Latina, Seis experiencias diferentes* (Buenos Aires; Alemania: Konrad-Adenauer-Stiftung-CIEDLA).

<sup>8</sup> Mesa-Lago 1996, 52–53.

<sup>9</sup> Mesa-Lago, *op. cit.*; Cuba's retirement age, on the other hand, is similar to that of the Baltic and former Soviet Union countries.

<sup>10</sup> CEPAL 2000, Tables A13 and A14.

<sup>11</sup> Mesa-Lago 1996, Table 8.

<sup>12</sup> For a fuller discussion of criteria, see Grosh 1995.

<sup>13</sup> These activities are fairly similar to those financed by social investment funds. (The next section of this paper discusses these funds.) One of the differences between a social fund project and a workfare project is that the workfare project is likely to be supervised by local authorities, rather than by independent agencies, and construction is typically not contracted to the private sector but is carried out by the sponsoring agency, which can include local and provincial governments, private groups, and national organizations. Another difference is that workfare programs have the generation of employment and income as their priority, while social funds focus more on the quality of the infrastructure produced.

<sup>14</sup> A rigorous evaluation of Mexico's Progresa has been prepared by the Progresa staff with support from the International Food Policy Research Institute; see Skoufias 2001 for a synthesis report and various other reports available on the IFPRI webpage: <http://www.ifpri.org/themes/progresa>.

<sup>15</sup> It is important when feasible to use distributional weights in the evaluation of the targeting of social programs and other interventions. For such an analysis, see, for example, Ravallion and Wodon 2000.

<sup>16</sup> This Appendix is based on research done by Cuevas and Pérez 1999. Note that Charts 1, 2, 3, and 4 referred to in this Appendix appear in their entirety at the end of the appendix.

<sup>17</sup> The participation and employment rates were calibrated in 1991 to determine the average participation (73 percent) and employment (92.3 percent) rates reported in the CEPAL study of the Cuban economy. The age-specific participation and employment rates were selected so that, when multiplied, they produce a distribution of employed individuals by age and sex similar to that implied by Table II of Donate Armada 1994.

Following the CEPAL study, Cuevas and Pérez assumed a slight decline in unemployment rates by the end of the 1990s. However, they did not assume any explicit change in participation rates over time. Again, this is a conservative assumption, as the participation rates of women should be expected to increase. In some sense, however, the simulations do incorporate an exogenous improvement in revenue collections, which have an effect similar to that of increased participation, as explained below. The average wage in 1991 was obtained from the CEPAL study.

<sup>18</sup> If indexation is eliminated, the inflation assumption becomes critical, as it becomes the effective rate of reduction in real benefits.

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