BEFORE IT'S TOO LATE: DEMOGRAPHIC TRANSITION, LABOUR SUPPLY, AND SOCIAL SECURITY PROBLEMS IN BRAZIL

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One of today's central debates about the demographic transition focuses on the relationships that connect changes in population age structure to economic growth. Demographers and economists alike are interested in examining the extent to which interactions between population age structure and both fertility and mortality declines yield increases in aggregate income levels. This phenomenon, usually called the *demographic dividend* or *demographic bonus*, has recently been presented as a combination of two separate dividends (see Mason, in this volume, and Mason and Lee, forthcoming). The *first dividend* is usually related to a temporary increase in the share of the population that is of working age and can be effectively measured by increases in the ratio of producers to consumers in the population (Mason and Feng, 2005). The *second dividend,* which has gone virtually unnoticed among most scholars, follows after the first dividend and is related to the creation of wealth that arises in response to population ageing. The magnitude of this effect depends largely on how wealth is created. Rapid capital accumulation or larger transfers from younger generations, private and public, can meet consumption demands of an increasing older population. Only in societies where capital deepening prevails will the effects of population ageing ultimately increase the output per effective consumer (Lee, Mason and Miller, 2003).

The demographic dividends are not automatic; they depend on institutions and policies to transform changes in population age structure into economic growth (Bloom and Canning, 2001). Therefore, it comes as no surprise that some emerging economies that could benefit substantially from the demographic transition are also the ones that are more likely to fail in taking advantage of this process. Rigid labour market regulations, low investments in human capital, tax evasion, socioeconomic inequality, and lack of well regulated capital markets are some of the constraints that limit the ability of developing countries to benefit from changes in population age structure. Despite consensus among scholars about most of these issues, additional research is still needed on the linkages between the policy environment and demographic transition.

Among the critical policy areas are social security and other forms of old-age support based on pay-as-you-go (PAYGO) schemes. Weaknesses in the governance and management of PAYGO pension programmes lead to negative effects for the demographic dividends. For example, if greater tax evasion or real increases in social security benefits offset increases in the share of working age population, the fiscal capability of governments to invest in human capital will be reduced. In turn, efficiency loss may lower the effect of the demographic transition on both future productivity and economic growth. At the same time, declining social security support ratios (i.e., the ratio of social security taxpayers to beneficiaries) can represent a fiscal burden for future working age population, reducing the ability of workers to save for future consumption and thus putting at risk the second demographic dividend.

Brazil provides an important context for elaborating linkages between demographic transition and public policies. In a recent analysis of the first demographic dividend, Rios-Neto (2004) used income data from Brazilian municipalities to demonstrate that the association between growth of working age

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population and income growth was positive and significant during the period 1991-2000. It remains unclear, however, how much greater the economic growth would have been if Brazil had stronger institutions and more appropriate policies in place.

Brazil is distinct because, compared to other emerging economies, a relatively large public sector coexists with a rapidly ageing population. Public welfare support, across all levels of government, reached about 21 per cent of GDP in 2002 (Brasil, 2003), an amount that is comparable to social expenditures in most developed countries. While social security benefits and other forms of old-age support represented about 12 per cent of GDP, public expenditures on education and health amounted to 5.5 per cent and 3.5 per cent of GDP in 2002, respectively (Camargo, 2004). The size of the public sector and, in particular, the amount of transfers to older persons suggests that economic implications of demographic changes depend to a great extent on how public policies are designed.

In an influential study published a decade ago, Carvalho and Wong (1995) pointed out the need for policymakers to respond ahead of time in order to boost the benefits of temporary increases in the working age population in Brazil. In a more recent analysis, Turra and Rios-Neto (2001) combined several age schedules of public and family transfers with population forecasts to demonstrate that fiscal gains from demographic changes are transitory and may not last for more than ten years. While the political arena has been slow to act upon this information, the debate on the dividend continues among social scientists. Despite the lack of appropriate economic policies, however, some improvements in public education have been made as a result of lower fertility rates. Literacy levels and measures of enrolment and educational attainment have significantly improved in the last decades (Saboia, 1998). Literacy rates jumped from 60 per cent in 1960 to 87 per cent in 2000 (Pinto and others, 2000) and in the last five years almost all children aged 7-14 have been enrolled in school (Schwartzman, 2003). Unfortunately, public education suffers from competition for resources with public programmes for the older population (Turra and Queiroz, 2005). Budget constraints have limited the government's ability to improve the quality of schooling and to reduce grade retention and school drop-out -- problems that might reduce potential productivity growth.

This paper provides empirical evidence to support the thesis that the absence of appropriate policies can mitigate temporary benefits of population changes and aggravate adverse effects of population ageing. By demonstrating that the Brazilian social security system works less efficiently than desired, this paper intends to contribute to the debate on how critical policy areas might reduce the potential economic impact of demographic changes. Although the study does not directly test for the effects of the financial adequacy of social security on economic growth, it aims to shed light on the roles played by demographic policy and economic changes on social security problems and, in turn, on potential limits for the demographic dividends by using counterfactual projections of the social security support ratios. In addition, the study addresses the following issues: (i) to what extent fertility and mortality declines have favoured the social security system through temporary increases in the working-age population; (ii) how the effects of population age structure mitigate the adverse effects of population ageing; and (iii) how changes in labour supply as well as both social security contributions and benefits preclude or favour the effects of demographic changes. In order to demonstrate potential policy applications, the study also offers a snapshot of what the social security support ratios in Brazil would look like if social security rules of the United States were applied in Brazil. Motivations for comparing the U.S. with Brazil are manifold. First, as in many other developed countries, compliance with social security requirements is high in the U.S. (Manchester, 1999), thus providing valuable insights on the performance of the social security system in Brazil. Second, despite socioeconomic differences between the two countries, Brazil shares some similarities with the United States, including a relatively young population, unequal distribution of wealth, large expenditures on public pensions, and the dominance of public transfers directed towards the elderly. Finally, data are readily available for the U.S., which makes the analyses feasible.

A. THE SOCIAL SECURITY SYSTEM IN BRAZIL

The pension system in Brazil consists of three main segments: (i) the general system (private workers), (ii) the civil servants system, and (iii) other several private funded systems. Most pension systems are based on the PAYGO scheme. The country also has a large non-contributory system with means-tested eligibility that provides benefits for low-income older persons.

The social security system for private workers (general system) is an unfunded defined-benefit programme. There is still debate regarding when it began. In 1888, some measures were taken to provide pension benefits to postal workers and employees of the national press. In the following years, retirement benefits were extended to railroad workers, employees of the Ministry of Finance and the Ministry of the Interior, and army forces. In 1923, a legislation (Lei Eloi Chaves) was approved to regulate social security for both civil servants and private workers. This law decentralized the pension system, as each company was responsible for its own employees. The first reform happened in 1933, when the pension funds became structured by professional category (Leite, 1983). The general pension system was centralized only in 1966, when the House of Representatives approved the Social Security Ordinary Law. The National Social Security Administration (INPS) incorporated all the revenues and expenditures from sector-specific programmes as well as its assets and liabilities. Another major change during this time was in the scheme of the programme, which changed from a capitalization system to a PAYGO schemes (Leite, 1983).

The last major change in regulation happened with the 1988 Constitution, which extended mandatory social security coverage to most of the excluded groups, including rural workers, without requiring equivalent increases in revenues from contributions. There were other measures that made the system more generous than before, such as establishing the minimum wage as the lowest benefit paid by the system, indexing all pensions to the minimum wage, and reducing the minimum age of retirement (Stephanes, 1998).

Until 1998, full pension benefits were granted to all workers who had contributed for 10 years to the system, had reached normal retirement age through the old-age pension benefit (65 years for men and 60 years for women), or could prove that they had been working for a certain number of years under the length of service pension benefit (35 years for men and 30 years for women, but without the requirement of contribution for the same period of time). In addition, special retirement schemes existed that granted proportional retirement benefits for men who had worked for 30 years and for women who had worked for 25 years. The benefits were computed based on the last 36 months of activity (Brasil, 2002). The level of benefits was relatively high, with the recipients of old-age benefits receiving, on average, 3 times the minimum wage, and with the length of service benefits being 2.5 times higher than the old-age benefits (Queiroz, 2005).

In 1998, after years of political debate, a significant reform was approved in order to help solve the programme's fiscal imbalance. The main change was the introduction of a new methodology to calculate pension benefits based on an actuarial rule. The new benefit computation is based on the Swedish Notional Defined Benefit Programme and takes into account longer earnings history, the life expectancy at the age of retirement, and a coefficient that creates disincentives to early retirement. However, a minimum retirement age has not yet been approved for workers in the private sector. (Brasil, 2002).

The general system was conceived when rapid population growth and low life expectancy combined to sustain the programme. In recent years, however, the system has been facing budget shortfalls, which have gradually increased after the changes implemented in the early 1990s. In 1996, the deficit was equal to 0.1 per cent of the GDP, but it increased to 1.7 per cent in 2004 (Giambiagi and others, 2004). The

implicit debt, a long-term measure of the system's financial adequacy, was also large and amounted to about two times the GDP (Bravo, 2001).

Alongside the general pension system, civil servants have their own pension programme, which is also an unfunded PAYGO defined-benefit programme. Although smaller in absolute numbers when compared to the general programme, expenditures of the civil servants programme are not trivial, reaching 4.7 per cent of GDP in 2002 (Medici, 2004). According to Medici, the programme is a complex chain of federal, state and local systems, including special programmes for different civil servant categories. Benefits are more generous in the civil servant system than in the general system as the replacement rates are higher and the period of contribution to receive full pension benefits is shorter. The programme deficit is high and has been increasing over the past decade, having reached about 3.6 per cent of the GDP in 2004 (Giambiagi and others, 2004).

B. METHODS

To estimate what the social security support ratios (i.e., the ratio of social security taxpayers to beneficiaries) in Brazil would look like under different demographic and economic scenarios, we projected the population of 1970 using the cohort-component method of projection in five-year intervals of time and age (Shryock and Siegel, 1973; Preston and others, 2001). We then calculated taxpayers and beneficiaries at the beginning of each five-year period by applying age- and sex-specific (i) labour force participation rates, (ii) taxpayer rates, and (iii) beneficiary rates. In this paper, taxpayer rates are defined as the proportion of workers in the labour force who pay social security taxes by age and sex while beneficiary rates are defined as the proportion of individuals receiving any social security benefit from the general system by age and sex.

To capture the full effects of demographic transition on social security support ratios, the projection period was extended to the year 2045. Actual demographic and economic rates were used from 1970 to 2000 while the projected rates were applied for the period 2000-2045. For purposes of this exercise, it was assumed that the Brazilian population was closed to migration during the period of analysis. It was further assumed that demographic and economic rates were independent and, therefore, did not affect each other. Such models that focus on first-order effects have been used in previous demographic analyses (e.g., White and Preston, 1996).

The first question was how changes in fertility and mortality rates (demographic effects) impact on social security support ratios. This estimate was made by projecting forward the social security support ratios under the actual and projected fertility and mortality rates, but assuming that economic rates were fixed at the 1970 levels. Both the total demographic effects – mortality and fertility rates varying together – and the separate effects for each demographic variable are presented. To highlight the effects of population momentum on dependency ratios, an additional set of projections is shown, using the age distribution of stable-equivalent populations for each five-year interval. The stable equivalent populations are the underlying populations that would emerge had the fertility and mortality rates for each time interval remained constant for a long period of time (Preston, Heuveline and Guillot, 2001).

Next, the effects of changes in the labour force participation (LFP) rates on the support ratios were examined. To do this, the social security support ratios were projected forward under the actual and projected LFP rates, but assuming that demographic rates and the other economic rates were fixed at the 1970 levels. Given the well-documented sex differentials in LFP rates, the effects were separated by sex. Then, the so-called "evasion effect", which is the impact of changes in taxpayer rates on the support ratios, was estimated. The definition of tax evasion refers to that of Manchester (1999). The term is broadly defined to include both tax evasion and tax avoidance by working in the informal sector. The estimate was made by projecting forward the social security support ratios under the actual and projected

taxpayer rates, but assuming that demographic rates and the other economic rates were fixed at the 1970 levels. Further, it was estimated the impact of changes in beneficiary rates on the support ratios in a manner analogous to that previously described for the other components. It was called the "generosity effect". Together, the "evasion" and the "generosity" effects reflect the rules that have governed the social security system in Brazil. In order to emphasize the idiosyncrasies of the social security system in Brazil, a final scenario was projected using actual and projected demographic and LFP rates for Brazil and beneficiary rates for the United States in 2001, and assuming that 95 per cent of the workforce contributes to the system.

The hypothetical scenarios discussed in the foregoing were compared to two main time series: one that uses actual and projected demographic and economic rates, and the other that keeps all rates fixed at the 1970 levels.

C. DATA

The actual and projected mortality and fertility estimates used in the counterfactual projections were prepared by the Population Division of the United Nations (2003) and the United States Census Bureau (2005). In addition, population figures for 1970 were taken from the 5 per cent sample census data for Brazil available in the Integrated Public Use Microdata Sample (Sobek and others, 2002).

Data from the Pesquisa Nacional por Amostra de Domicilio (National Household Survey) or PNAD (Instituto Brasileiro de Geografia e Estatística, 2005) were used to estimate actual social security taxpayer rates and beneficiary rates. To estimate projected rates, it was assumed that rates remained fixed at the 2002 levels. The PNAD is a nationally representative stratified random sample of the Brazilian population collected annually since the late 1970s. The PNAD contains a comprehensive and comparable set of demographic and socioeconomic variables, including detailed information on employment status, occupation, income, and education for all members of the household. The survey asks respondents whether they contribute or not to the social security system and whether they receive social security benefits. Data limitations prevented the analysis of the different types of social security benefits. For example, for those receiving retirement or survival benefits it was not known whether the retirement benefit was due to old age, length of service, disability, or social assistance. However, the conclusions are assumed not to be substantively affected by these limitations. A comparison of estimates with those based on official data from the Social Security Administration Office in Brazil showed that the two sets of estimates produced the same conclusions regarding the levels and trends of social security support ratios.

Both census (Sobeck and others, 2002) and household survey data (PNAD) were used to estimate labour force participation rates. The projected labour force participation rates were prepared by the International Labour Organization (ILO, 2005) and the Economic Commission for Latin America and Caribbean (ECLAC, 1999). Labour force participation rates are defined by ILO as the proportion of the population, usually between ages 16 and 65 years, who are able to work and are either working or actively seeking work.

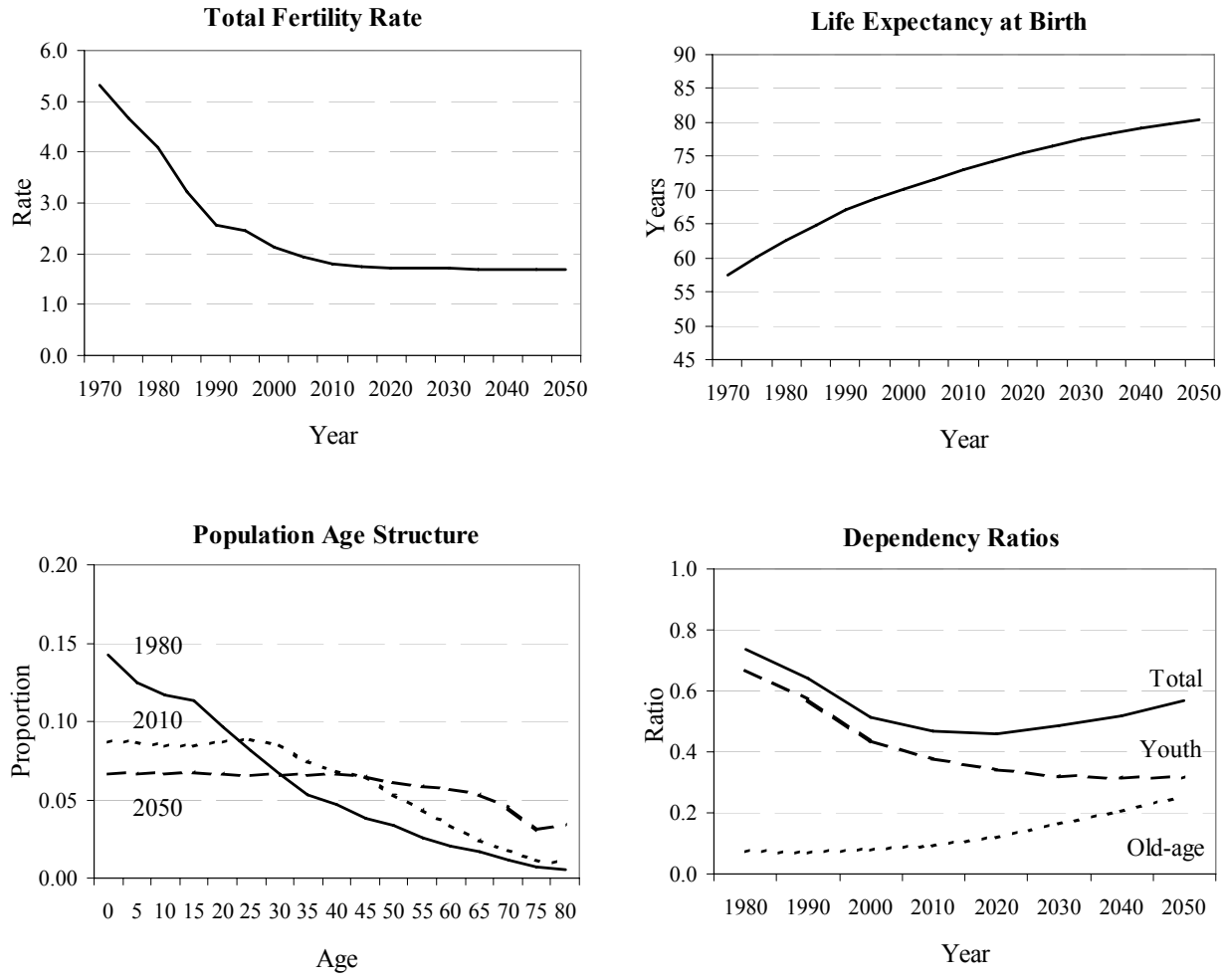
D. TRENDS FOR VARIOUS PROJECTION COMPONENTS

Demographic variables

The panels of figure 1 display some of the main features of demographic changes that have occurred in Brazil over the last decades. Figure 1 also depicts future demographic scenarios. The demographic transition started with mortality improvements in the 1930s, which were followed by fertility declines in the later 1960s. Despite the delayed onset, the demographic transition in Brazil has been characterized by rapid demographic changes (Wong and Carvalho, 2005). The total fertility rate has declined by more than

half since 1970 (from 5.3 to 2.13 children per women in 2000), and life expectancy at birth has improved steadily from 57.5 years in 1970 to 70.3 years in 2000. These trends have interacted to transform the population age structure. From a young quasi-stable age structure in 1970, the age distribution has gradually shifted to an older distribution. Until 2000, the most important changes were the decline in the share of the young and a rise in the share of the working-age population. Significant increases in the elderly population are expected to occur only in the next decades. The projections indicate that by 2050, the population aged 65 and older will represent about 16 per cent of the total population compared to 3 per cent in 1970. These shifts in the age structure can be seen in the dependency ratios, which follow a well-documented pattern: the total dependency ratio will decline until 2010 due to the decline in the young dependency ratio. The trend will then shift upwards as increases in the old-age dependency ratio became more important.

Figure 1. Demographic transition in Brazil, 1970-2050



Sources: Instituto Brasileiro de Geografia e Estatistica (2005); United Nations (2003); Sobek (2002).

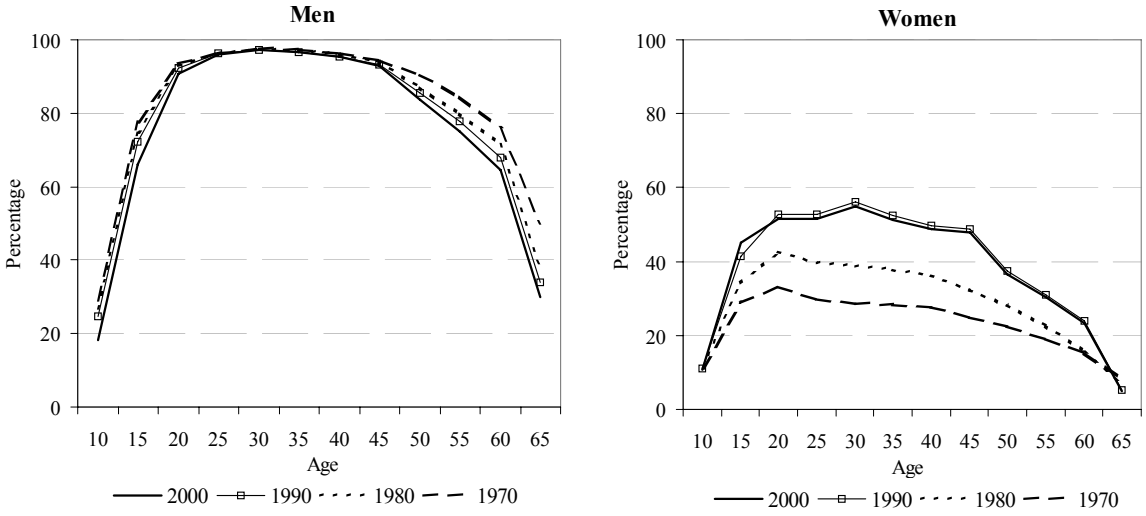
Labour supply

Figure 2 depicts some of the changes in the age- and sex-specific LFP rates since 1970. For men, it is clear that the length of working life has fallen over time due to both increases in educational attainment (younger workers) and changes in retirement behaviour (older workers). In 1970, almost 76 per cent of the male population aged 60-64 years was in the labour force; this number declined to 65 per cent by 2000. The fall in economic participation was even greater for older workers (65 and over), of whom 30 per cent were in the labour force in 2000 compared to 60 per cent in 1970. Indeed, a summary indicator of early retirement, defined as the age in which less than 50 per cent of the population is out of the labour force, shows that the median retirement age for males declined from 69 years in 1960 to 63 years in 2000, a decline of 1.5 years on average per decade[1] (Queiroz, 2005).

Among women, LFP rates showed a different trend, increasing steadily from 13.5 per cent in 1950 to 44 per cent in 2000. As shown in figure 2, the rapid increase in female rates was driven mainly by rising participation of prime-age women (aged 20-60), while LFP at the youngest and oldest ages changed little between 1970 and 2000. Economic development, higher educational levels, decline in fertility rates, and changes in social norms towards women are some of the factors that explain this pattern (Rios-Neto and Wajnman, 1994; Costa, 1990). However, the rapid increase in female LFP was highly concentrated in the informal sector, so that the impact of female labour force on social security finances would be smaller than what one might otherwise expect (Wajnman and others, 1998).

In fact, another important aspect of the labour market in Brazil is the decline in the share of workers in the formal sector, which is defined as the sector that complies with labour market regulations. The formal market declined from 70 per cent in the mid-1980s to about 60 per cent in 2000. In general, labour market segmentation and/or economic recession explain the increase of the informal sector in developing economies. In Brazil, during the 1980s, the size of the informal sector was negatively correlated with the economy's growth rate, following closely the business cycle in that decade. The informal sector increased during the recession years as workers looked for work in the informal sector, while decreased during

Figure 2. Labour force participation rates by age and sex, Brazil, selected years



Source: ILO (2005).

economic expansion when part of the labour force was absorbed by the formal labour market. The 1990s, on the other hand, observed a structural growth of the informal sector, a behaviour that is inconsistent with traditional economic theory (Loayza, 1997; Carneiro and Henley, 2001; Soares, 2004). The segmentation of the labour market is clear; a formal sector and an informal sector coexist, as in many developing countries. Only those employed in the formal market, or the registered workers, are covered by labour market regulations, including social security coverage. Workers in the informal sector work without formal labour contracts and normally do not pay taxes and are not covered by welfare regulations[2] (Soares, 2004; Ulyssea, 2005).

Social security participants

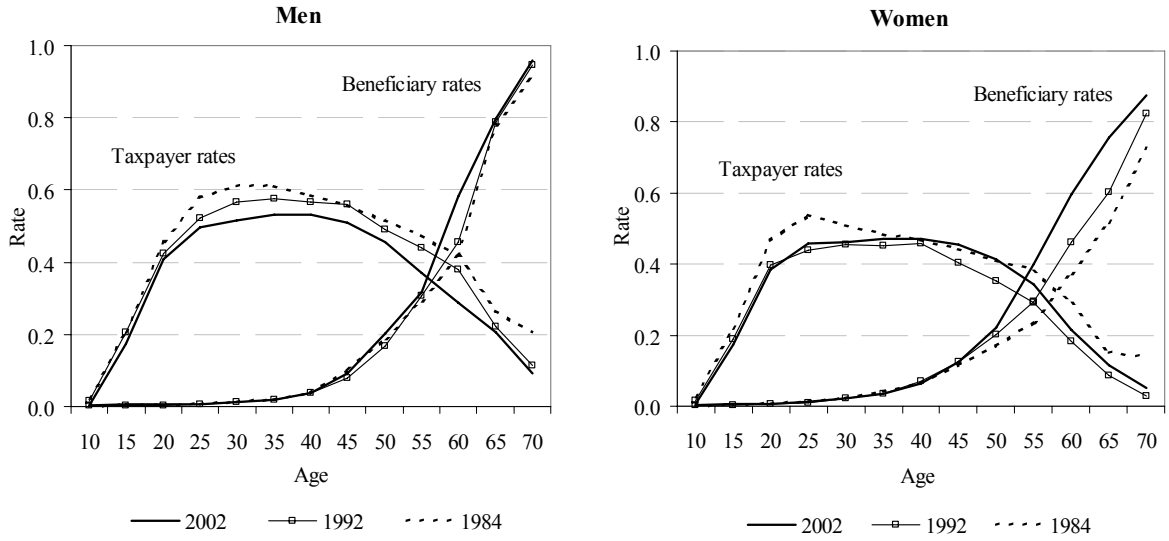
Social security benefits are the most important sources of income for older Brazilians. As discussed above, the system has been characterized by generous benefits and low contribution rates. About 77 per cent of the population aged 60 or over received some sort of pension benefits by 2002. Figure 3 reveals important trends over the last decades. On the one hand, beneficiary rates increased for all age groups. At age 50, for example, about 20 per cent of the population received benefits in 2002 compared to 17 per cent in the early 1980s, which corroborates the finding that the average age at retirement has declined. On the other hand, taxpayer rates declined for both men and women. Among men, only 50 per cent of those in the labour market made contributions in 2002 compared to 65 per cent twenty years earlier. These results also hold true for women, in general, even though their LFP has increased.

E. RESULTS

Demographic effects on social security support ratios

Not surprisingly, if all economic and demographic rates had remained at the 1970 levels, social security support ratios would be roughly constant throughout the period of analysis, declining slightly from 3.33 in 1970 to 2.85 in 2045 because of the initial effects of the demographic transition (figure 4 and

Figure 3 Age- and sex-specific tax payer and beneficiary rates, Brazil, selected years

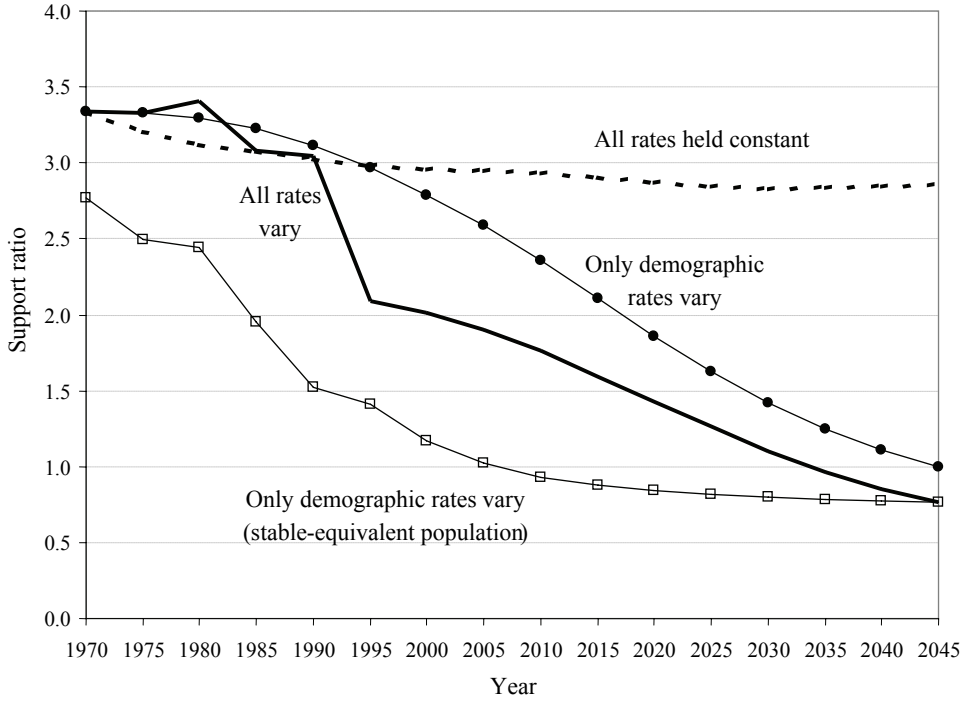


Source: Pesquisa Nacional por Amostra de Domicilios.

table 1). If, instead, the demographic rates had varied, holding everything else constant, increases in the share of the working-age population would initially produce a demographic bonus in the social security system that would last for about 20 years (1970-1990). Although the bonus looks small – the ratio would be about 5 per cent higher than when demographic rates are held constant – it is not negligible, given the size of the social security programme in Brazil and the challenges that it will face in the future. Eventually, demographic changes would have a negative impact on the support ratios, which would decline to 2.86 in 2000 and reach 1.0 in 2045, because of fertility and mortality reductions alone. However, the estimates based on stable-equivalent populations suggest that the effect of these changes would be noted much earlier if past fertility and mortality had not played a central role. Without the effects of population age structure, support ratios would reach 2045 levels (0.8 taxpayers for each beneficiary) between 2005 and 2010. Expectedly, most of the demographic effects are due to changes in fertility. Table 1 shows that the effect of mortality declines on social security support ratios is minimal, indicating that the proportionate impact of mortality improvements on the population age structure is fairly neutral during the period of analysis.

A comparison of the "all rates" and "only demographic rates" scenarios in figure 4 also shows that actual support ratios would have been declining faster than expected if based only on changes in the demographic rates. The reasons for this pattern are discussed in the following sections.

Figure 4. Social security support ratios, Brazil, 1970-2045: demographic effects



Source: Authors' calculations.

NOTE: The demographic rates are mortality and fertility rates; the economic rates are labour force participation rates, taxpayer rates and beneficiary rates.

TABLE 1. SOCIAL SECURITY SUPPORT RATIOS UNDER DIFFERENT SCENARIOS - BRAZIL, SELECTED YEARS

			Demographic Effects				Changes in Labor Supply		Institutional Effects		Policy Simulations (US Social Security Rates)	
	All rates vary	All rates held constant	Only fertility rates vary	Only mortality rates vary	Both rates vary	Both rates vary (stable equivalent)	LFP rates vary	Only female LFP rates vary	"Evasion" Effect	"Generosity" Effect	All rates vary	All rates held constant
1975	3.33	3.21	3.21	3.21	3.33	2.50	3.21	3.21	3.21	3.21	7.22	6.92
1980	3.41	3.13	3.13	3.12	3.29	2.45	3.23	3.23	3.13	3.13	7.29	6.68
1985	3.08	3.08	3.08	3.09	3.23	1.95	3.22	3.22	3.03	2.84	7.10	6.51
1990	3.05	3.03	3.03	3.04	3.12	1.53	3.21	3.21	2.78	3.04	6.80	6.36
1995	2.09	2.98	2.96	2.99	2.96	1.41	3.22	3.20	2.41	2.42	6.46	6.28
2000	2.01	2.96	2.86	2.97	2.79	1.17	3.26	3.22	2.41	2.37	6.12	6.27
2005	1.90	2.95	2.71	2.97	2.59	1.02	3.30	3.25	2.40	2.36	5.75	6.29
2010	1.76	2.94	2.51	2.97	2.36	0.93	3.35	3.29	2.39	2.35	5.30	6.28
2015	1.60	2.91	2.28	2.96	2.11	0.87	3.37	3.30	2.36	2.33	4.77	6.20
2020	1.43	2.87	2.04	2.94	1.86	0.84	3.39	3.31	2.33	2.30	4.21	6.10
2025	1.26	2.85	1.81	2.94	1.62	0.82	3.42	3.32	2.31	2.28	3.68	6.00
2030	1.10	2.83	1.60	2.94	1.42	0.80	3.40	3.31	2.31	2.27	3.16	5.97
2035	0.96	2.84	1.42	2.96	1.25	0.79	3.41	3.31	2.31	2.27	2.74	6.00
2040	0.85	2.85	1.28	2.99	1.11	0.77	3.42	3.33	2.32	2.28	2.41	6.04
2045	0.77	2.85	1.16	3.01	1.00	0.76	3.43	3.34	2.32	2.28	2.14	6.05

Source: Authors' calculations.

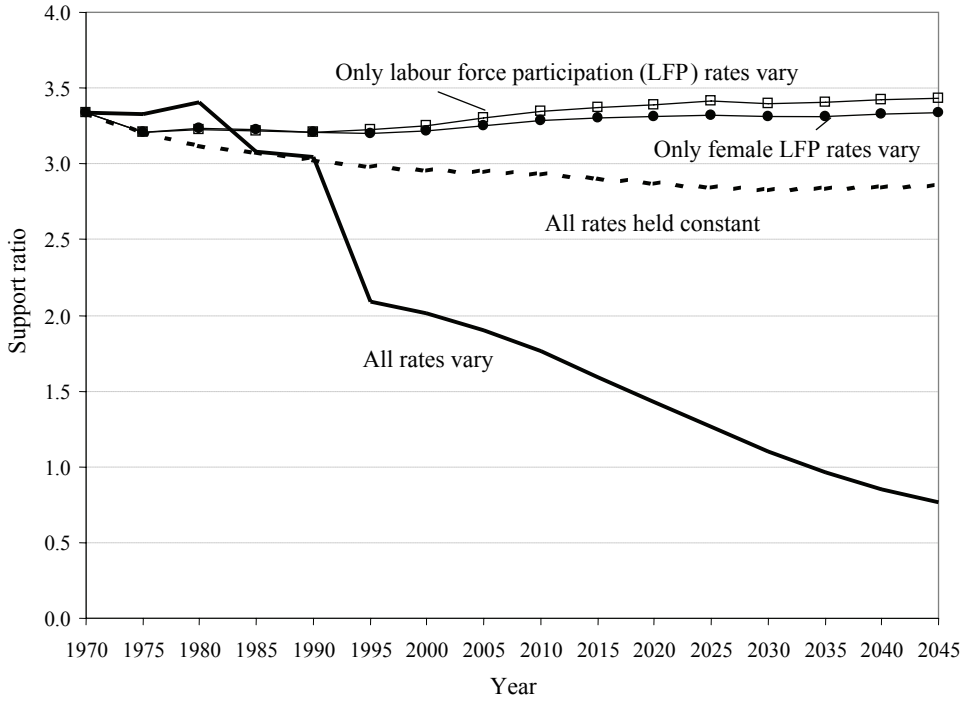
Effects of changes in labour supply on support ratios

A comparison of the support ratios for the scenario that assumes that only LFP rates varied (holding everything else constant) with the two baseline models – (i) all rates held constant, and (ii) all rates vary – indicates the significance of increases in labour supply to the social security system. The results are shown in figure 5. Changes in LFP would increase the support ratios by about 5 per cent in the first three decades (1980 to 2010), while they would produce support ratios 20 per cent larger in the last decades of the analysis (2025 to 2045). Most of the effect comes from increases in female LFP, reflecting structural aspects of the labour market that were discussed previously. Although increases in labour supply have favoured social security by slightly augmenting the demographic bonus (results not shown) as well as by mitigating the adverse effects of population ageing, the magnitude of these effects is much smaller than that of the demographic effects.

Effects of changes in taxpayer and beneficiary rates on support ratios

Have public policies and institutions improved the financial adequacy of the social security system in recent decades? Unfortunately, neither policies nor institutions have been able to ameliorate social security finances. Figure 6 shows what the social security ratios would look like if only the taxpayer rates had varied, holding everything else constant. Following the growth of the informal sector, support ratios would decline steadily until 2000 due to the declining share of the population in the labour force paying social security taxes. The "evasion effect" would reduce support ratios significantly, by about 30 per cent, from 3.33 in 1970 to 2.41 in 2000. In addition, when changes in tax rates are projected together with demographic changes, the bonus is shortened by five years, ending in 1985 (results not shown). Because

Figure 5. Social security support ratios, Brazil, 1970-2045: effect of changes in labour supply



Source: Authors' calculations.

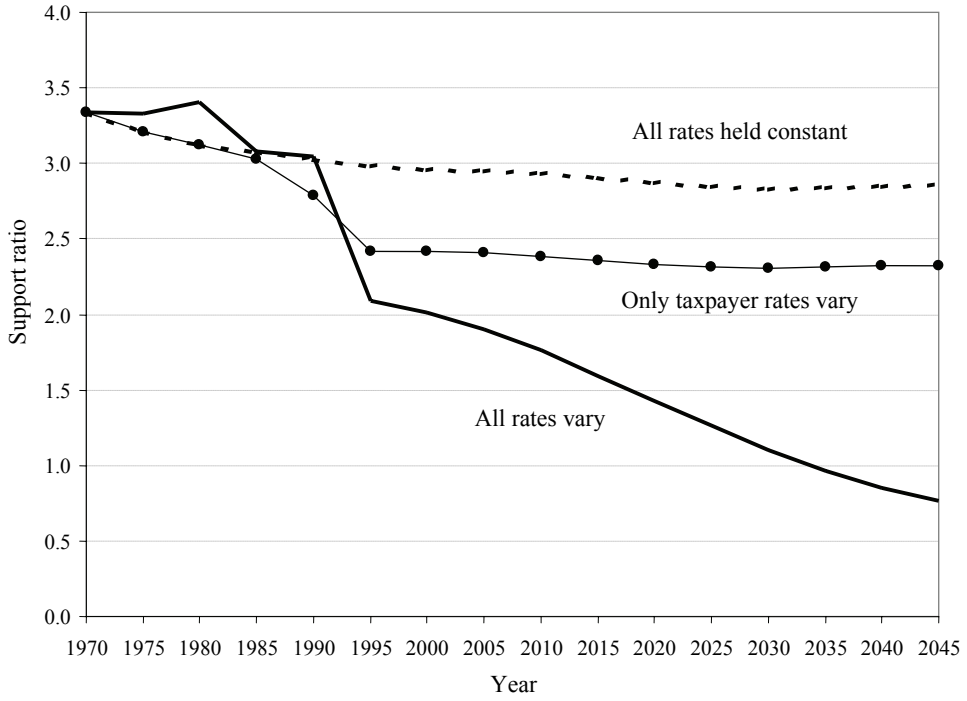
NOTE: The demographic rates are mortality and fertility rates; the economic rates are labour force participation rates, taxpayer rates and beneficiary rates.

the projected taxpayer rates are assumed to be fixed at the 2000 levels, the counterfactual projections are not very informative for years thereafter. Yet, it is indisputable that tax evasion will play a key role in social security deficits over the next decades. Given the low rates of tax paying, legislation to stimulate the formalization of the labour market could mitigate substantially the effects of population ageing.

The simulation described above has been repeated, this time varying only beneficiary rates and holding everything else constant. A comparison of the support ratios under this projection is informative in showing that the new regulations approved in the 1988 Brazilian Constitution worsened the social security support ratio and consequently, the fiscal balance[3]. Figure 7 shows that the "generosity effect" is very similar in magnitude to the "evasion effect" (figure 6). As a consequence of the "generosity effect", ratios would decline from 3.33 in 1970 to 2.37 in 2000. Together, the "evasion" and "generosity" effects would be responsible for having reduced potential social security support ratios by about 50 per cent since the late 1990s.

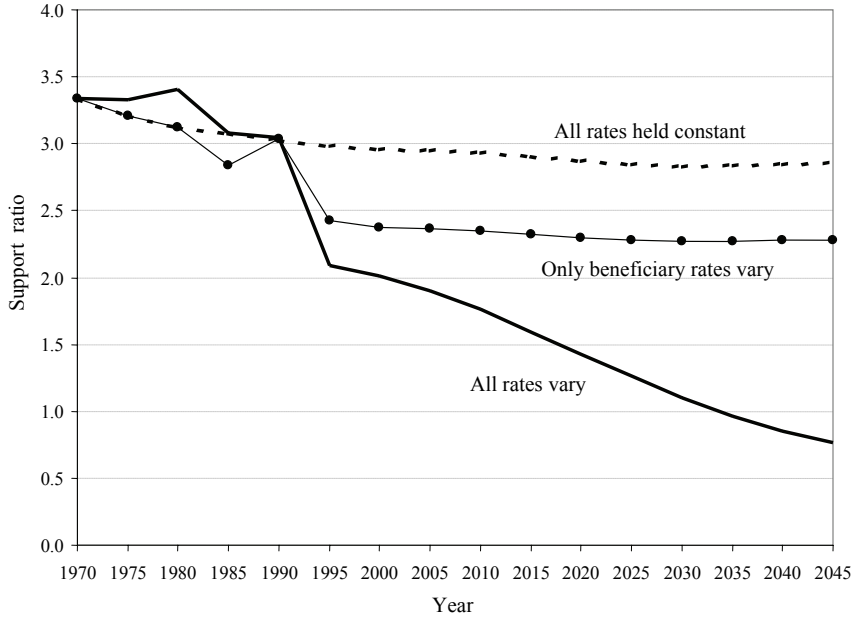
To the extent that the "evasion" and "generosity" effects were already high in 1970 compared to international standards, the results presented in the previous simulations would underestimate the true effects. Thus, a final set of projections for social security support ratios in Brazil were prepared, by applying the beneficiary rates for the United States in 2001 and assuming that 95 per cent of the work force pays social security taxes (figure 8). The results are striking. If both tax evasion and early retirement were eliminated in Brazil, social security ratios would change drastically. For example, in 2000, the ratio would be about 3 times higher than the actual ratio. In addition, the ratios would remain above 2 until the year 2045, despite the negative effects from changes in demographic rates. Finally, the demographic bonus would have been two times larger had appropriate policies been in place in Brazil since 1970.

Figure 6. Social security support ratios, Brazil, 1970-2045, given change in taxpayer rates: "evasion effect"



Source: Authors' calculations.
NOTE: The demographic rates are mortality and fertility rates; the economic rates are labour force participation rates, taxpayer rates and beneficiary rates.

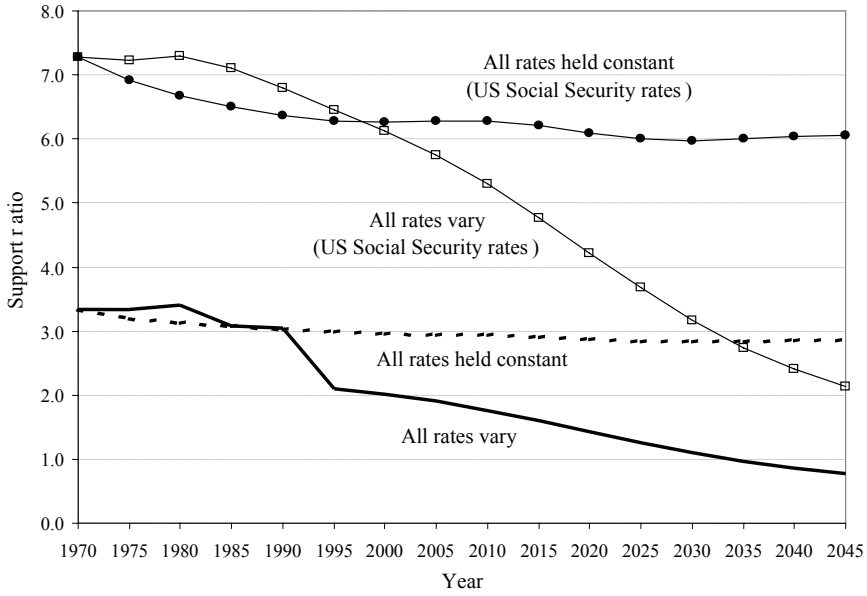
Figure 7. Social security support ratios, Brazil, 1970-2045, given change in beneficiary rates: "generosity effect"



Source: Authors' calculations.

NOTE: The demographic rates are mortality and fertility rates; the economic rates are labour force participation rates, taxpayer rates and beneficiary rates.

Figure 8. Social security support ratios, Brazil, 1970-2045: policy simulations



Source: Authors' calculations.

NOTE: The demographic rates are mortality and fertility rates; the economic rates are labour force participation rates, taxpayer rates and beneficiary rates.

F. CONCLUDING REMARKS

A growing literature has examined the importance of changes in population age structure for economic growth. Although there is evidence to support the view that the demographic transition leads to an income boost, the gains from this association depend on several conditions, including the ratio between producers and consumers, the degree of capital deepening, and the existence of appropriate institutions and economic policies. In this paper, it was argued that some developing countries have been neglecting the opportunities that changes in population dynamics can bring to the economy by maintaining domestic policies that are less efficient than desired. In that sense, the case of Brazil is remarkable because of the historically low levels of educational attainment and the increasingly large pay-as-you-go pension systems. In 2004, the public pension systems transferred about 12 per cent of the GDP from the working age population to the elderly in Brazil, a significant amount for a country where only 6 per cent of the population is aged 65 years or over.

The analysis examined social security support ratios under several counterfactual scenarios to provide insights into how institutional and policy issues reduce the potential economic impact of population changes. The findings revealed that Brazilian policymakers have made decisions that are poorly grounded on a technical basis and overlooked the temporary nature of the demographic transition. By granting new forms of benefits without requiring contribution (e.g., inclusion of rural workers in 1988) and by not approving reforms to encourage tax payments, policymakers have reduced the benefits of the demographic transition and aggravated financial issues from population ageing. This myopic view has also buffered fiscal gains from increases in labour supply.

Two other findings in the present analysis should be interpreted as warning signs. First, the effects of age structure on the pace of population ageing (i.e., population momentum) provide an extra time of about 30 to 40 years for social security until support ratios reach levels that would be too low to avoid a financial crisis. Second, policy simulations suggest that increasing the minimum age at retirement and eliminating evasion could boost social security support ratios, help honour obligations, and create future conditions for economic growth by producing surpluses to be invested on human capital and relieving the burden facing future generations. However, implementing these changes will not be an easy task in Brazil. For example, reducing tax evasion requires law enforcement measures, the flexibility of the labour market and a thorough reform of the social security system to encourage participation among workers who were left in the informal sector. Answers for these challenges facing Brazil should be increasingly discussed in the political arena, if old-age security for current and future retirees is to be preserved without putting economic growth at risk.

NOTES

[1] Similar measure for females is not very informative because of different trends in labour force participation rates over the period of analysis.

[2] Despite the increase in tax evasion, however, low-income workers from the informal sector can still claim retirement benefits when they become old in Brazil.

[3] Some small variations were found in the beneficiary rates, particularly, a decline in the rates during the period 1980-1985 (see figure 7). Although there is no apparent reason for these changes, it may be explained by a combination of factors including the macro-economic environment (recession and high inflation in the 1980s) and data quality issues in the PNADs (e.g. weights). These variations are of a too small magnitude, however, to affect the conclusions about the "generosity effect".

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