FOR AGENDA

SM/97/262

CONTAINS CONFIDENTIAL INFORMATION

October 27, 1997

To: Members of the Executive Board

From: The Secretary

Subject: **New Zealand—Selected Issues**

This paper provides background information to the staff report on the 1997 Article IV consultation discussions with New Zealand, which was circulated as SM/97/257 on October 17, 1997.

Mr. M. Stone (ext. 36532) or Mr. Callen (ext. 38873) is available to answer technical or factual questions relating to this paper prior to the Board discussion.

Unless the Documents Preparation Section (ext. 36760) is otherwise notified, the document will be transmitted, in accordance with the procedures approved by the Executive Board and with the appropriate deletions, to the WTO Secretariat on Tuesday, November 4, 1997; and to the Asian Development Bank (AsDB), the Food and Agriculture Organization (FAO), and the Organisation for Economic Cooperation and Development (OECD), following its consideration by the Executive Board.

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INTERNATIONAL MONETARY FUND

NEW ZEALAND

Selected Issues

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Approved by the Asia and Pacific Department

October 27, 1997

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I. Saving Trends and Issues[1]

A. Introduction

1. The recent widening of the current account deficit has raised the question of whether more can and should be done to raise national saving in New Zealand. While national saving has risen since the early 1990s, it remains below the levels recorded in the early 1980s, and the increase has been insufficient to finance the additional investment expenditure that has been encouraged by the strong economic performance in recent years. Further, national saving in New Zealand remains below the OECD country average, as it has been throughout the 1980s and 1990s. This is despite the fact that fiscal consolidation has led to a significant increase in public saving. Of particular interest is the household saving rate, which has fallen dramatically in recent years, and is currently one of the lowest in the OECD.

2. Despite the importance of the saving issue, there have been few recent studies of saving behavior in New Zealand. Consequently, it is difficult to determine the factors that have driven recent developments, and what policies could help to improve the saving performance. This paper begins to fill this void. Estimates from a recent study of household saving behavior in OECD countries (Callen and Thimann, 1997, forthcoming) are applied to New Zealand. The results suggest that the relatively low level of household saving in New Zealand can be explained by the favorable public saving performance, the poor growth performance during the 1980s, and the structure of the tax and social security and welfare system. The decline in household saving is due to higher public saving, the significant improvement in inflation performance, and to the expansion of the welfare system. The paper is organized as follows. The broad trends in saving and investment at both the aggregate and sectoral levels are outlined in Section B. Section C focuses on the reasons for the decline in household saving. Section D assesses the outlook for national saving, and Section E concludes.

B. Saving and Investment Trends

3. **Gross national saving** declined sharply in the late 1980s and early 1990s, reaching a low of 13¾ percent of GDP in 1992 (Chart I.1).[2] It has since rebounded strongly and, in 1996, stood at 18½ percent of GDP. However, it remains below the levels of the early 1980s, and below the OECD country average, as has been the case throughout the 1980s and 1990s.

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[1]Prepared by Tim Callen.

[2]In this paper, March-year data is used, for example, 1996 refers to the year to March 1996.

4. Developments in national saving have been largely driven by the **public sector** (Chart I.2).[3] Public saving declined sharply between 1987 and 1992, but has since risen strongly to 5½ percent of GDP in 1996. General government saving has been largely responsible for these swings, declining by nearly 4 percent of GDP between 1989 and 1992, but rising by 8 percent of GDP between 1992 and 1996. Saving of public enterprises has fallen gradually, partly because privatization has transferred public enterprise saving to the private corporate sector.

5. **Private saving** (including unidentified saving) declined slightly in the late 1980s, rose strongly between 1990 and 1994, but has declined sharply over the past two years. Within the total, **household saving** has fallen significantly and, in 1995 and 1996, was less than 1 percent of GDP, while **corporate saving** has risen, boosted, in part, by privatization.

6. Meanwhile, **investment** has recovered strongly from the lows of the 1990s, and is currently above the OECD average (Chart I.3). The recent strengthening in investment has been driven by growth in plant and machinery investment, which has averaged 15 percent per annum since 1993 as firms have sought to increase efficiency and replace capital stock made obsolete by the reforms. Also, the surge in immigration has resulted in increased demand for housing and strong investment in the residential sector.

7. Consequently, **the saving/investment imbalance** which had started to narrow during 1990–91, narrowed further in 1992–93 as the increase in saving initially out paced the rise in investment (Chart I.4). However, it has subsequently widened as investment has continued to rise, while saving has remained broadly unchanged.

8. At the sectoral level, the significant increase in public saving has seen the public sector move from a position where it was investing more than it saved, to one where its saving currently exceed its investment (by 3 percent of GDP in 1996). However, the private sector has moved in the opposite direction, with the saving/investment balance deteriorating to 6½ percent of GDP in 1996 as saving has fallen and investment risen. Within this, the household sector has moved from a position of broad balance in the late 1980s, to one where investment exceeded saving by 4½ percent of GDP in 1996.[4]

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[3]Data on the sectoral composition of saving is available for the period 1987–96 in the recently published *Institutional Sector Accounts*. This data, however, is labeled "experimental" by Statistics New Zealand (SNZ), and its interpretation is hampered by a large unidentified component which SNZ has been unable to allocate to a sector (in recent years, this component has swung from positive 2¼ percent to negative ¾ percent of GDP). It is more plausible that this unidentified component is part of private, rather than public, saving, although in Chart I.3, private saving is shown both including and excluding the unidentified component.

[4]In terms of household net lending, the deterioration has been less pronounced as net capital

(continued...)

C. Explaining Household Saving

9. While the remarkable improvement in the fiscal position in recent years has been well documented elsewhere (see Scott, 1996), much less attention has been paid to developments in the private sector. This section concentrates on one component of this, household saving, and assesses the main factors behind its decline, and whether it is a cause for concern.

Household saving in New Zealand

10. The decline in **household saving** in New Zealand has been much more pronounced than in most other OECD countries, and the saving rate is currently one of the lowest in the OECD (Chart I.5).[5] Since the early 1980s, the household saving rate has fallen from 13 percent to only 1½ percent at present, with the decline largely concentrated in two periods, 1982–84 and 1992–95.

11. An alternative approach to measuring the flow of household saving is to measure the change in the outstanding stock (household net worth). The largest component of household net worth in New Zealand is the stock of dwellings (home ownership rates in New Zealand are among the highest in the OECD at around 75 percent, and the importance of housing wealth in New Zealand is likely to be greater than in most other OECD countries). Household net worth tells a different story to the flow measure of saving (see Cook, 1996). While net worth declined between 1989 and 1993, it has since risen quite strongly. This difference reflects the inclusion of capital gains in the stock measure. Asset prices have risen strongly since 1992, resulting in large capital gains for their owners.

12. Of course, the two measures of saving are closely related, with additional saving in any period adding to the existing stock. Further, changes in the value of the stock of savings are likely to be an important element of the current saving decision. Over the past few years, the increase in net worth is likely to have been an important factor explaining the decline in the saving rate (see later). However, while net worth is an important concept for an individual in terms of the potential resources available for financing future expenditures, it is the flow of saving that is important from the perspective of the macro economy to finance investment and reduce the demand on foreign saving. Consequently, this measure is the focus in the rest of this section.

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[4](...continued)
transfers to the household sector have increased sharply in recent years (reaching 2 percent of GDP in 1996). These transfers have been associated with the strong immigration flows, and are one reason for the strong rise in dwelling investment.

[5]There are a number of issues in the measurement of household saving over time and across countries that may affect the interpretation of this data (see Elmeskov and others (1991) for a detailed discussion).

Empirical analysis of household saving in New Zealand

13. There has been little recent empirical research into the determinants of household saving in New Zealand, both because of the quality and availability of data, and because the extent of structural change in the economy over the past decade is likely to have resulted in significant changes in economic relationships. More generally, the nature of the saving decision suggests that the usefulness of a time-series investigation over a relatively short time period may be limited. Saving represents an intertemporal decision on the part of the household to delay consumption today in favor of consumption at some future date and is based on a number of motives, which often depend on life-cycle considerations. As such, the information contained in the available time-series data is unlikely to be rich enough to adequately capture the influences on lifetime saving decisions, while the lack of time-series movement in variables such as demographics and the tax structure mean they are unlikely to be significant in a single country time-series regression (the small number of observations available in countries like New Zealand may also lead to degrees of freedom problems in time-series estimation). The estimation of panel regressions using a data set from a number of countries can to some extent overcome these problems. The different saving experiences across countries will enrich the information contained in the data set and may help shed some light on the determinants of saving performance. Further, by adding more data points to the analysis, more precise coefficient estimates will be obtained.

14. A number of recent studies have looked at household (or private) saving in a cross-country framework (see Aghevli and others (1990), Bosworth (1993), Masson and others (1995), and Callen and Thimann (1997, forthcoming)). These studies have found a number of factors to be important determinants of saving behavior. A brief description of the behavior of these factors in New Zealand in recent years is provided below (with the exception of government and corporate saving and household net worth which have already been discussed):

- **Income growth** was anemic during the 1980s, averaging only 1¾ percent (in real terms) per annum (about 1¼ percent in per capita terms) (Chart I.6). It has picked up in the 1990s, averaging 3½ percent per annum since 1991, as the economy has reaped the benefits of the reform program. Given New Zealand's poor growth performance over the 1970s and 1980s, **income levels** have fallen relative to the rest of the OECD since the early 1970s, and are only about two-thirds of those in the United States.

- **Real interest rates** were negative for long periods in the 1970s and early 1980s, but increased following the removal of interest rate controls in the mid-1980s. In recent years, real interest rates have been high at around 6–7 percent.

- **Inflation** rose sharply in the mid-1970s, reaching nearly 16 percent in 1977, and remained around this level until the early 1980s. However, the inflation performance has improved significantly in recent years, averaging only 2 percent since 1992.

- The **unemployment rate** remained quite low by international standards until the late 1980s, but increased to nearly 11 percent in 1991. However, it has subsequently fallen to around 6½ percent.

- **Financial deregulation**. Significant liberalization of the financial sector began in 1984, and this has resulted in greatly increased access to credit for the household sector. The outstanding stock of credit to the household sector (as a ratio to GDP) has risen steadily since the mid-1980s.

- The **tax system** may influence saving by both changing lifetime wealth and by affecting the rate of return on saving (under an income tax saving is effectively taxed twice, while a consumption tax applies only once). Further, the tax system may impact on aggregate household saving because income taxes are progressive and fall primarily on the working-age population. Consequently, the high-saving groups in the population are affected more by income taxes than by consumption taxes, which are distributed more evenly across income and age groups. While the tax system in New Zealand is relatively free of distortions, the government relies heavily on direct taxes, which could be expected to reduce saving.[6] The introduction of a goods and services tax (GST) in 1986 (which replaced the existing wholesale sales tax system) has resulted in an increase in indirect tax revenues, but direct taxes still account for about two-thirds of tax revenue (compared to three-fourths in 1985). Australia, Canada, and the United States have tax structures similar to New Zealand. However, the position is significantly different in many European and Scandinavian countries, where less than one-third of tax revenue is raised from direct taxes (Chart I.7, top panel).

- The **social security and welfare system** may adversely affect household saving by reducing the incentives for self provision. Its impact, however, will depend on a number of features, including its generosity, coverage, and financing. The latter is important because tax financing shifts the financing burden toward high-income earners, compared with social security contributions.[7] In New Zealand, social welfare spending is financed from general government revenues, rather than from social insurance contributions and, consequently, net government transfers to households (as a percent of GDP) are the highest in the OECD, and the difference between gross and net transfers is small (Chart I.7, middle panel). In common with most other OECD countries, government transfers to households have risen steadily in

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[6]Despite this reliance on direct taxes, marginal income tax rates in New Zealand are among the lowest in the OECD.

[7]Social security contributions are generally levied as a fixed proportion of income, whereas taxes are progressive, while contributions also generally begin at very low income levels and are capped at high incomes. The generosity of the social security system can be measured by gross transfers (defined as government benefits paid to households through the budget or the social security system), while its financing can be measured by net transfers (defined as gross transfers net of social security contributions paid by households).

New Zealand since the mid-1970s, partly due to demographic factors and the rise in structural unemployment, but also due to the increase in the comprehensiveness and generosity of the welfare system (Chart I.7, bottom panel). Social welfare expenditure increased from under 7 percent of GDP in 1975 to a peak of 16 percent of GDP in 1993, while expenditure on health and education also rose (Chart I.8).[8] However, major reforms to the welfare system since 1991 have reduced benefit levels and tightened eligibility criteria, including through a phased increase in the retirement age to 65. Together with the favorable economic developments, these reforms have reversed the upward trend in social security and welfare expenditures, which, since 1993, have declined by 2½ percent of GDP to 13½ percent of GDP.[9]

• **The demographic structure**. New Zealand has a slightly younger population than the OECD average. While the old-age dependency ratio rose by nearly 2 percent (from 16¾ percent to 18½ percent) in the late 1970s, it has risen only slightly further since (Chart I.9). The proportion of the working-age population in the 35–64 age group, who are likely to be the higher savers, has also risen since the early 1980s.

15. Callen and Thimann (1997, forthcoming) looked at the determinants of household saving in 21 OECD countries over the period 1975–95 using both cross-section and panel data estimation techniques.[10] Their results are reported in Table I.1 (first two columns).

16. Applying the cross-section results to New Zealand suggests that a number of factors explain the relatively low household saving rate compared to the OECD average (third column of Table I.1): the relatively favorable public saving performance; the poor growth

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[8]Major social expenditure initiatives during this period were the introduction of the domestic purposes benefit in 1973 (for single parents, with the number of recipients increasing from around 7,000 in 1973 to 110,000 currently), the accident compensation (ACC) scheme in 1974, and the national superannuation scheme in 1977. The superannuation scheme was not means-tested, and was available to all those over 60 years of age. The ACC scheme is an earnings-related compensation scheme which was supposed to be self-funded. However, by 1990, expenditure on compensation exceeded $NZ 1 billion, of which over 10 percent was funded from general taxation.

[9]There may also be other features of the New Zealand system that are important in influencing saving incentives, but that are not easy to measure. These include the impact of means-testing benefits, how effectively work tests are enforced, and the duration over which some benefits are available.

[10]In this study, the ratio of direct taxes to total government revenue and the ratio of indirect taxes to total government revenue are used to proxy the structure of the tax system. Gross transfers from the government to households are used as a measure of the generosity of the social security and welfare system, while net transfers are used as a measure of its financing (whether from social security contributions or from tax revenue).

performance; the structure of the tax system, with the much greater reliance on direct taxes; and the size of net transfers to the household sector from the government. However, the relatively low income level compared to the United States and the younger-than-average population should have been positive factors for household saving in New Zealand.

17. The estimated coefficients from the panel regressions (and the estimated fixed effect for New Zealand) can be used to derive estimates of household saving in New Zealand over time (Chart I.10). As would be expected with an equation that effectively averages the experiences of 21 countries, the fit for an individual country is far from perfect. The equation struggles to explain the rise in household saving in the 1970s, but broadly tracks the decline since the early 1980s, although it does not pick-up the extent of the fall over the past three years. This may be because it excludes three factors (due to data limitations) that are likely to have had an important impact on household saving during this period: the increase in household net worth; expectations of higher future lifetime incomes, which may have reduced saving rates within the working population, as the benefits of structural reforms for the economy's potential growth rate became apparent; and the continuing impact of financial deregulation, which has increased the ability of households to borrow against future income.

18. The equation suggests that much of the decline in household saving can be accounted for by the impact of positive economic developments on the need for households to save. Particularly:

- the **large fiscal consolidation** is the most significant reason for the decline in household saving. Since 1992, the increase in public saving is estimated to have reduced household saving by 2½ percent of GDP as households have adjusted their saving behavior in anticipation of lower future tax liabilities. Of course, while depressing household saving, the fiscal consolidation has acted to boost national saving.

- the **decline in inflation** and associated economic uncertainty is estimated to have reduced household saving by 1½ percent of GDP since the mid-1980s.

19. Other factors that have had an important influence on household saving are:

- the **expansion of welfare spending** between the mid-1970s and early 1990s which depressed household saving by around 2 percent of GDP. However, the recent reforms have encouraged greater self provision, and have added around ½ percent of GDP to saving since 1993.

- the **decline in the direct tax burden** following the introduction of the GST in the mid-1980s is estimated to have boosted household saving by ½ percent of GDP.

- the pickup in **growth** since the early 1990s has boosted saving by around ½ percent of GDP.

- the increase in **real interest rates** since the mid-1980s has boosted household saving by ¼–½ percent of GDP.

- the increase in **corporate saving** in recent years has reduced household saving by around ¼ percent of GDP.[11]

D. Saving Outlook

20. Official data on national saving is not yet available for 1997. However, the quarterly investment and current account data suggests that national saving declined during the year, perhaps by around 1½ percent of GDP.[12] The public sector is likely to have been the main contributor to this decline, with general government saving declining by 1¼ percent of GDP as the budget surplus narrowed.

21. Looking ahead, the 1997/98 budget projections suggest that government saving will be only slightly higher in 2000 than in 1997. However, some increase in household saving seems likely, given its recent sharp decline. The equation outlined in the previous section suggests that household saving will increase by around 1 percent of GDP by 2000 as households adjust their saving behavior to reflect the recent fall in public saving, and the continued decline in the direct tax burden and government transfers to households (the latter due in large part to continued restraint in superannuation expenditures as the progressive raising of the retirement age to 65 is continued) act to encourage higher saving. Further, the recent flattening off in house prices, and increased uncertainty about future incomes, given recent weakness in the labor market, may also encourage higher saving. Lastly, the recent superannuation referendum has focused attention on the issue of retirement saving, and it is likely to have made people more aware of the need to save for retirement.

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[11]Chart 2 suggests a closer relationship between household and corporate saving in New Zealand than is obtained in the panel regression results. This relationship is facilitated by the close integration of the individual and corporate tax systems. Substantial differences in the integration of the tax system across countries, or in foreign ownership of the corporate sector between countries, would weaken the case for estimating a common coefficient, as in the panel regression.

[12]The current account deficit widened to 4¾ percent of GDP in 1997 from 3¾ percent in 1996, while investment is estimated to have declined by around ½ percent of GDP in 1997. However, there is a significant discrepancy in the quarterly accounts between the production and expenditure measures of GDP in 1997. This may be due to the under recording of expenditure, and it is possible there may be an upward revision to the investment estimates. If so, the fall in saving may not be as great as implied by the quarterly numbers.

E. Conclusions and Policy Implications

22. The economic recovery has resulted in a significant increase in investment in recent years, with beneficial effects on the economy's longer-term growth potential. However, with national saving failing to improve to the same extent, despite the large increase in public sector saving, the reliance on foreign saving to finance this investment has risen, adding to the existing stock of external liabilities (which are already high by industrial country standards). A higher level of national saving which reduced the reliance on foreign financing would be beneficial. The most direct way of achieving this would be for the government to reverse the deterioration that has occurred in its own saving performance during the past two years. The experience over the period 1992–96 has shown that raising public saving is the surest way of increasing national saving.

23. One area where New Zealand does stand out by international standards is in its low, and sharply declining, household saving rate. This decline has importantly been influenced by favorable economic developments, particularly the strong public saving performance and the decline in inflation. However, this paper has argued that the structure of the tax and social security and welfare system are further factors that help to explain the low level of household saving, and while important reforms have already been undertaken in these areas, more could be done. Particularly, this could entail a further reduction in the current reliance on direct taxation, and further reform of the welfare system to reduce government transfers to households, thereby encouraging greater self provision. By providing expenditure savings, the latter would also contribute to higher public saving. Reform of the ACC scheme would have similar positive benefits. Also, in the longer term, further structural reform that boosts the growth potential of the economy is likely to lead to higher saving although, as has possibly been the case recently, it may initially lead to a reduction in saving as households adjust to the expectations of higher future incomes.

References

Aghevli, B.B., J.M. Boughton, P.J. Montiel, D. Villanueva, and G. Woglom, 1990, *The Role of National Saving in the World Economy: Recent Trends and Prospects*, IMF Occasional Paper No. 67 (Washington: International Monetary Fund).

Bosworth, B., 1993, *Saving and Investment in a Global Economy* (Washington: Brookings Institute).

Callen, T., and C. Thimann, 1997, "Empirical Determinants of Household Saving: Evidence from OECD Countries," IMF Working Paper (forthcoming).

Cook, D., 1996, "Household Saving: Data Sources for Household Saving in New Zealand," Report for the Office of the Retirement Commissioner, New Zealand Institute of Economic Research.

Elmeskov, J., J. Shater, and W. Tease, 1991, "Savings Trends and Measurement Issues," Economics and Statistics Department Working Papers No. 105 (Paris: OECD).

Masson, P., T. Bayoumi, and H. Samiei, 1995, "Saving Behavior in Industrial and Developing Countries," *Staff Studies for the World Economic Outlook*, pp. 1–27 (Washington: International Monetary Fund).

Scott, G.C., 1996, *Government Reform in New Zealand*, IMF Occasional Paper No. 140, (Washington: International Monetary Fund).

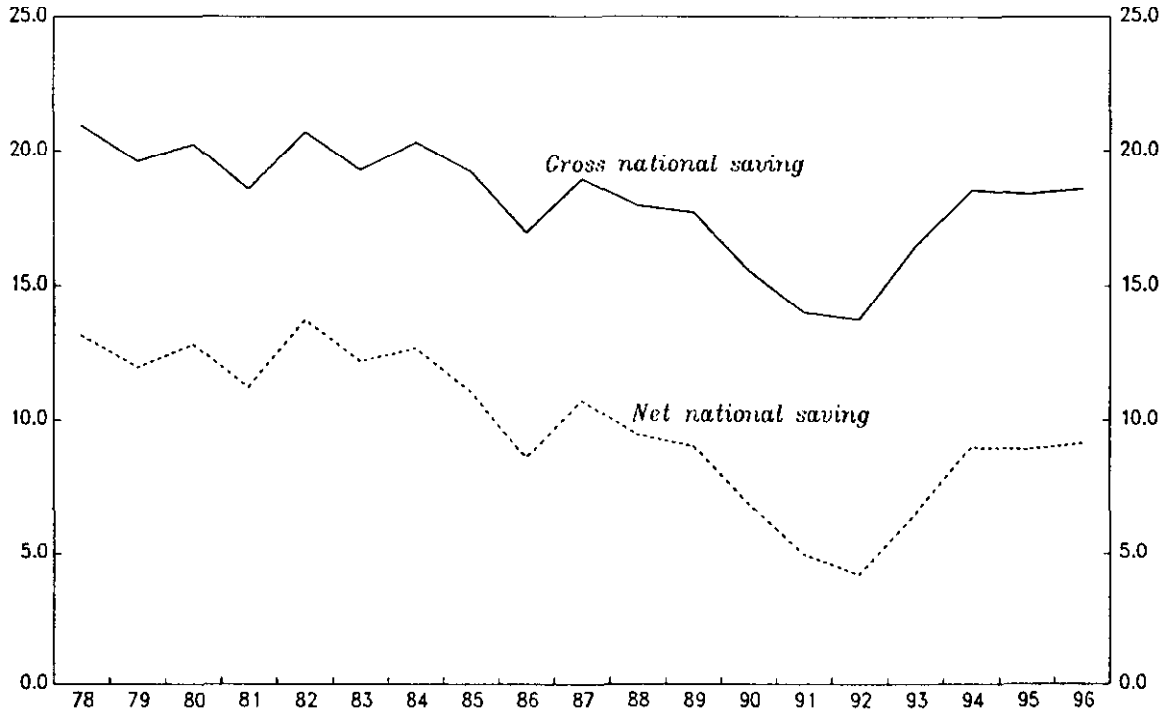
Statistics New Zealand, 1997, New Zealand Institutional Sector Accounts: Issues and Experimental Series 1987–96.

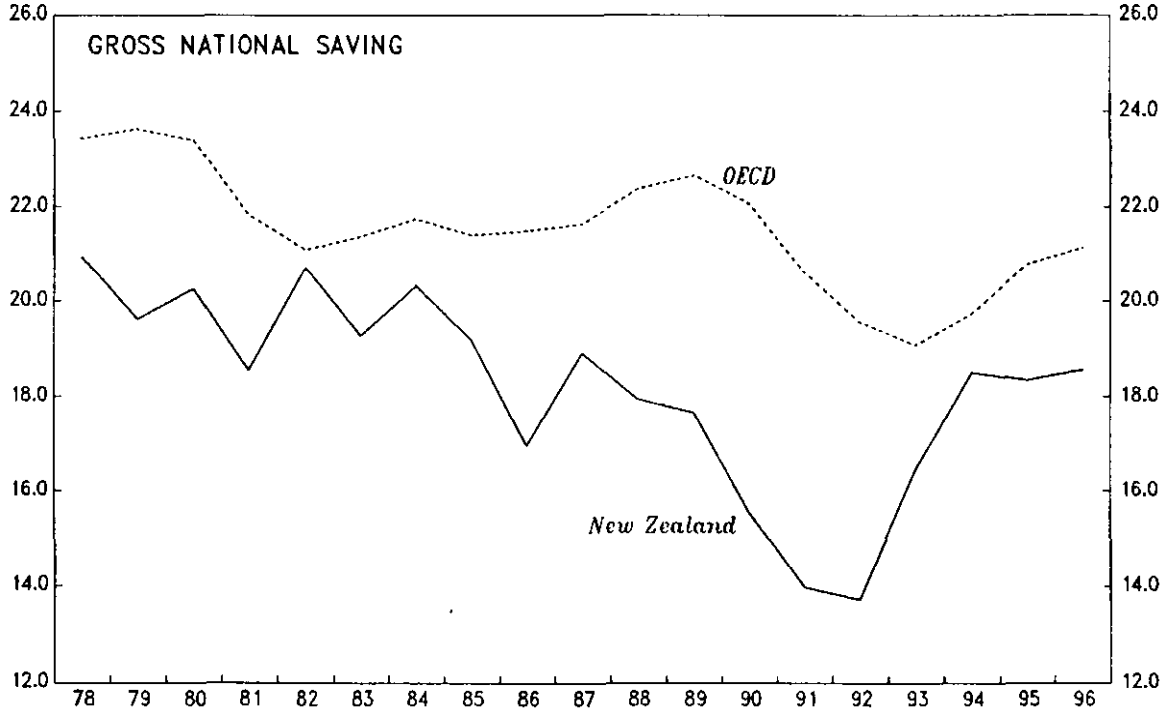
CHART I.1

NEW ZEALAND

NATIONAL SAVING, 1978-96

(In percent of GDP)





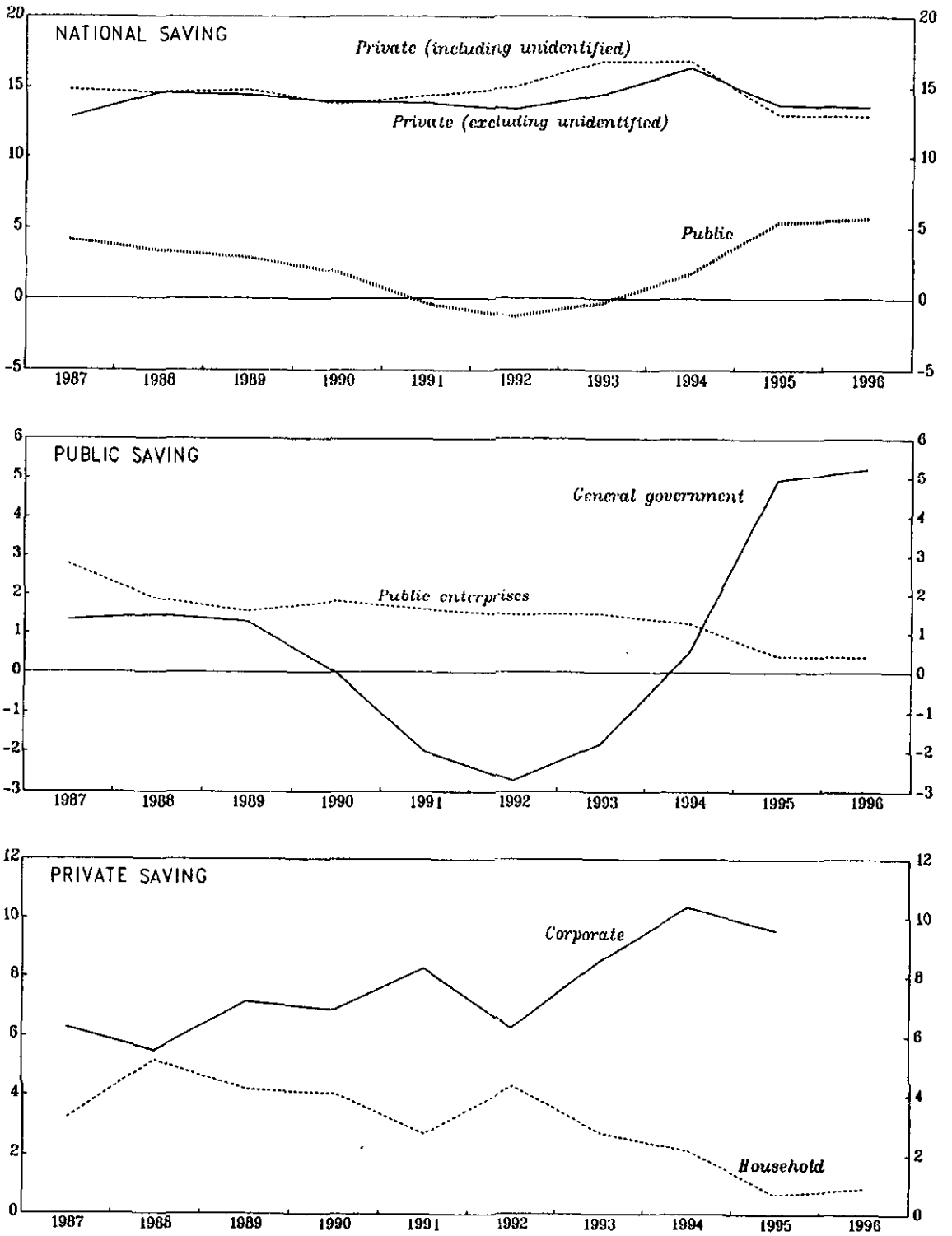
Sources: Statistics New Zealand; and International Monetary Fund, World Economic Outlook.

CHART I.2

NEW ZEALAND

COMPONENTS OF SAVING, 1987-96

(In percent of GDP)

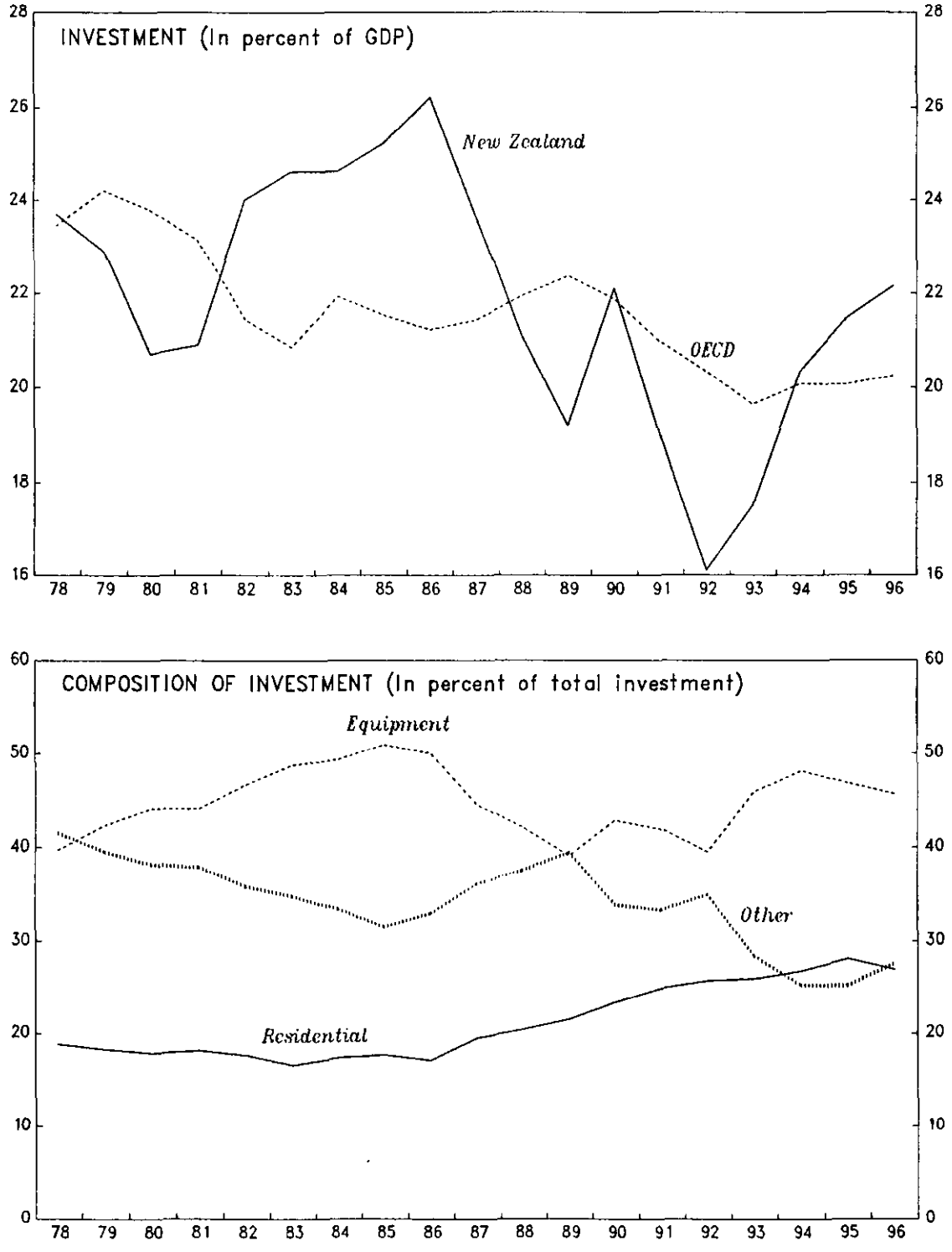


Sources: Statistics New Zealand; New Zealand Institutional Sector Accounts; and Fund staff estimate for public enterprises in 1996.

CHART I.3

NEW ZEALAND

INVESTMENT, 1978-96



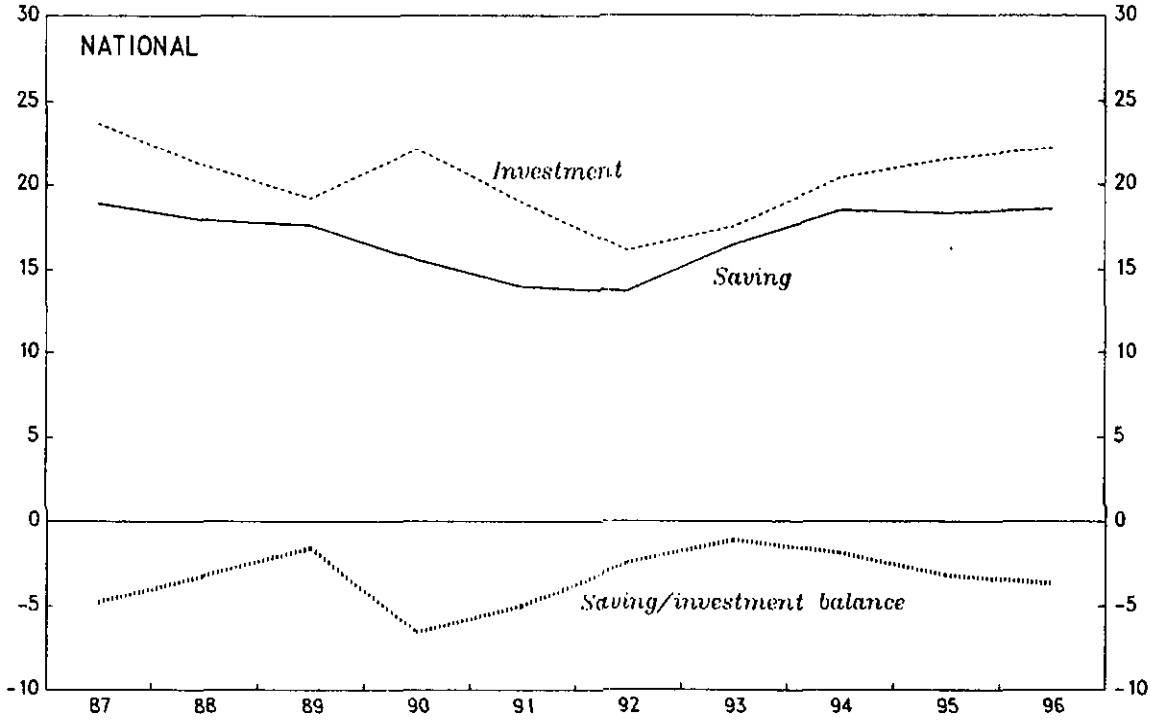
Sources: Statistics New Zealand; New Zealand Institutional Sector Accounts; and International Monetary Fund, World Economic Outlook.

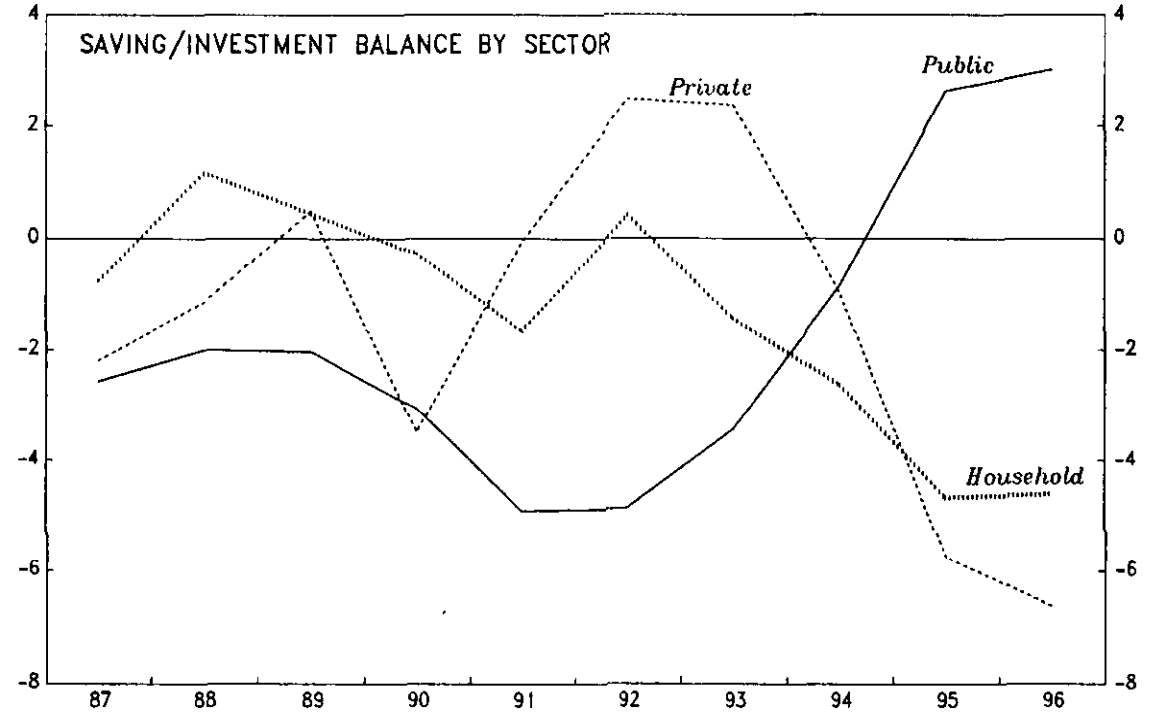
CHART I.4

NEW ZEALAND

SAVING AND INVESTMENT, 1987-96

(In percent of GDP)



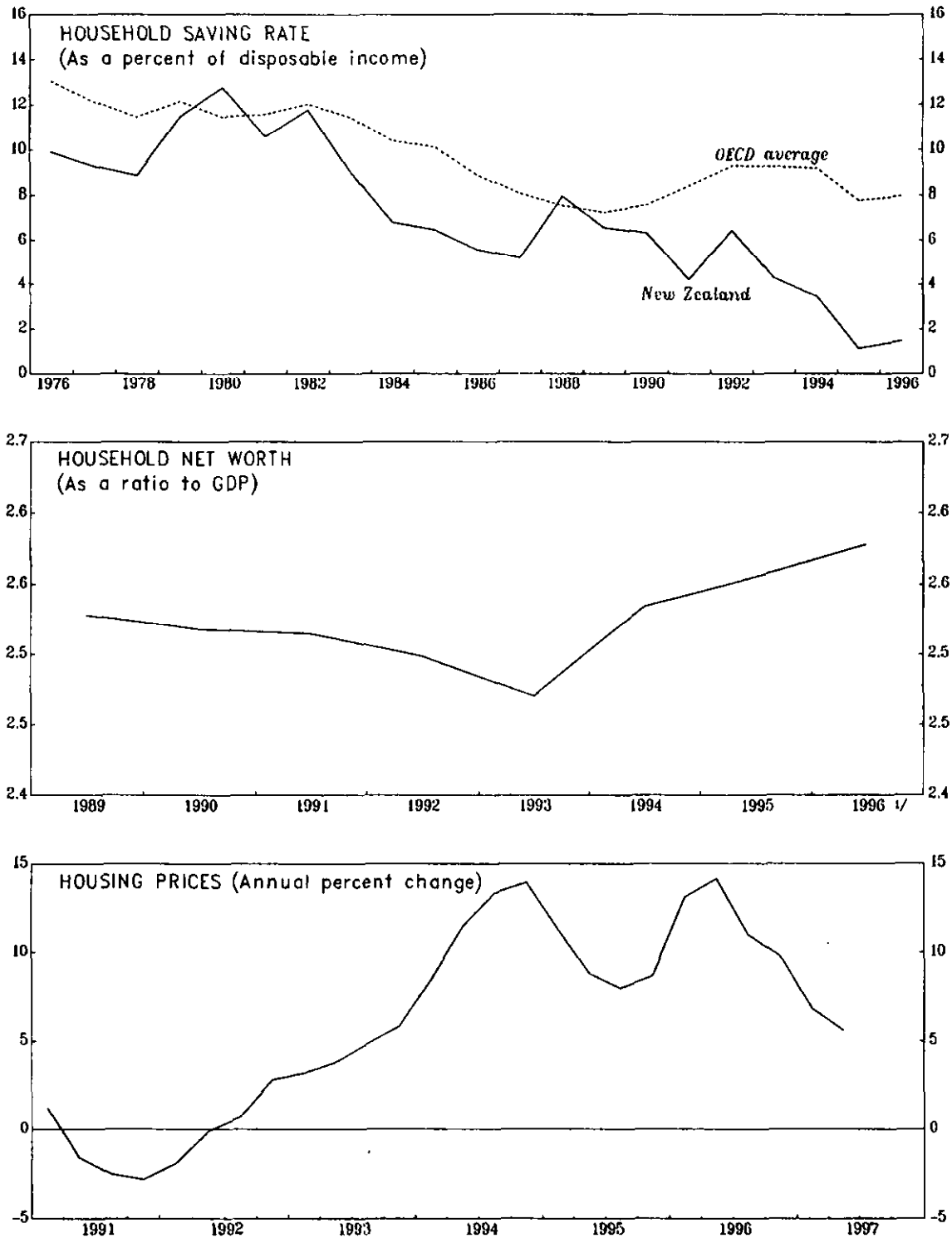


Sources: Statistics New Zealand; and New Zealand Institutional Sector Accounts.

CHART 1.5

NEW ZEALAND

HOUSEHOLD SAVING AND NET WORTH, 1976-97

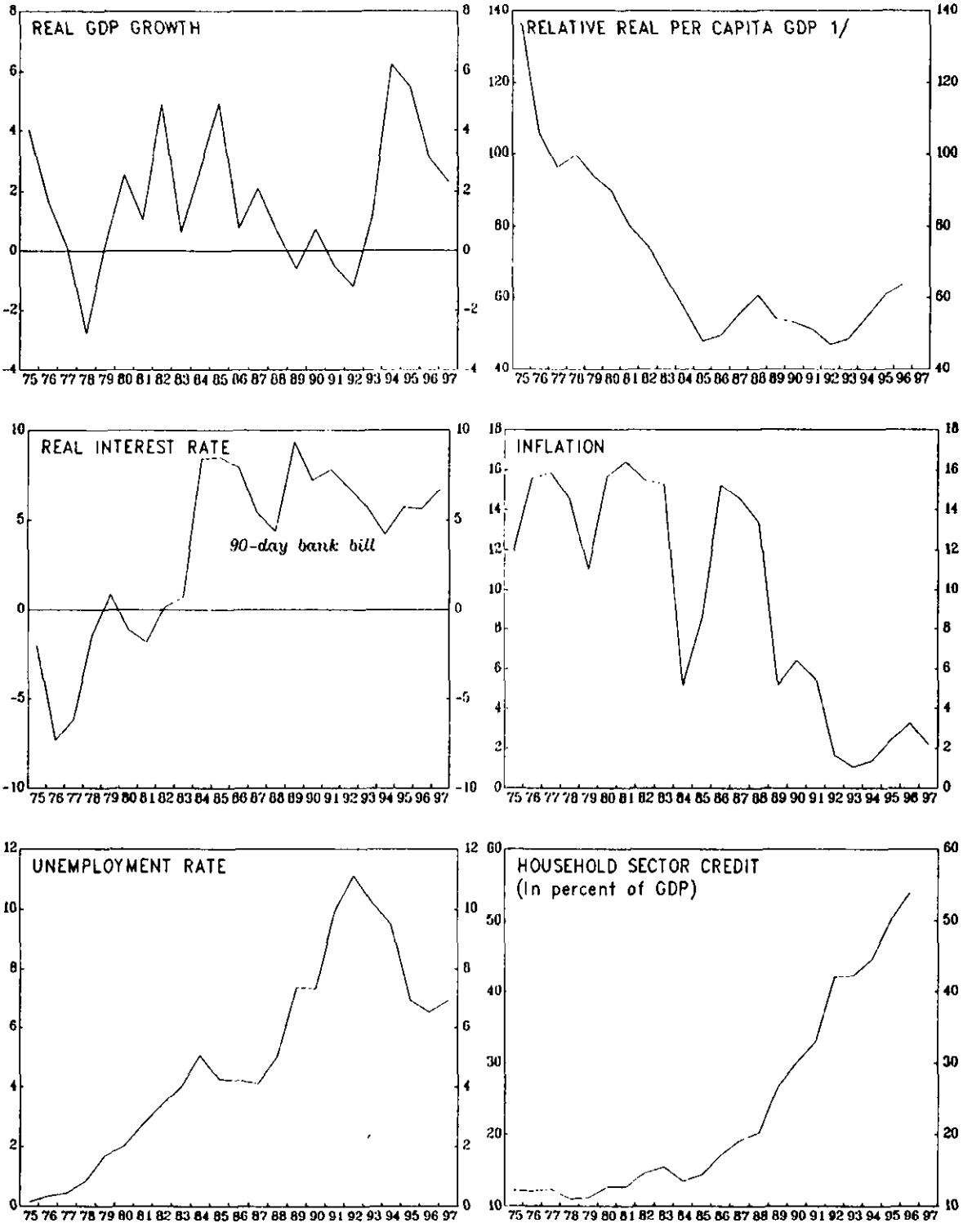


Sources: Statistics New Zealand; Household Income and Outlay Account; New Zealand Institute of Economic Research; and International Monetary Fund, World Economic Outlook.

CHART 1.6

NEW ZEALAND

MACROECONOMIC DEVELOPMENTS, 1975-97

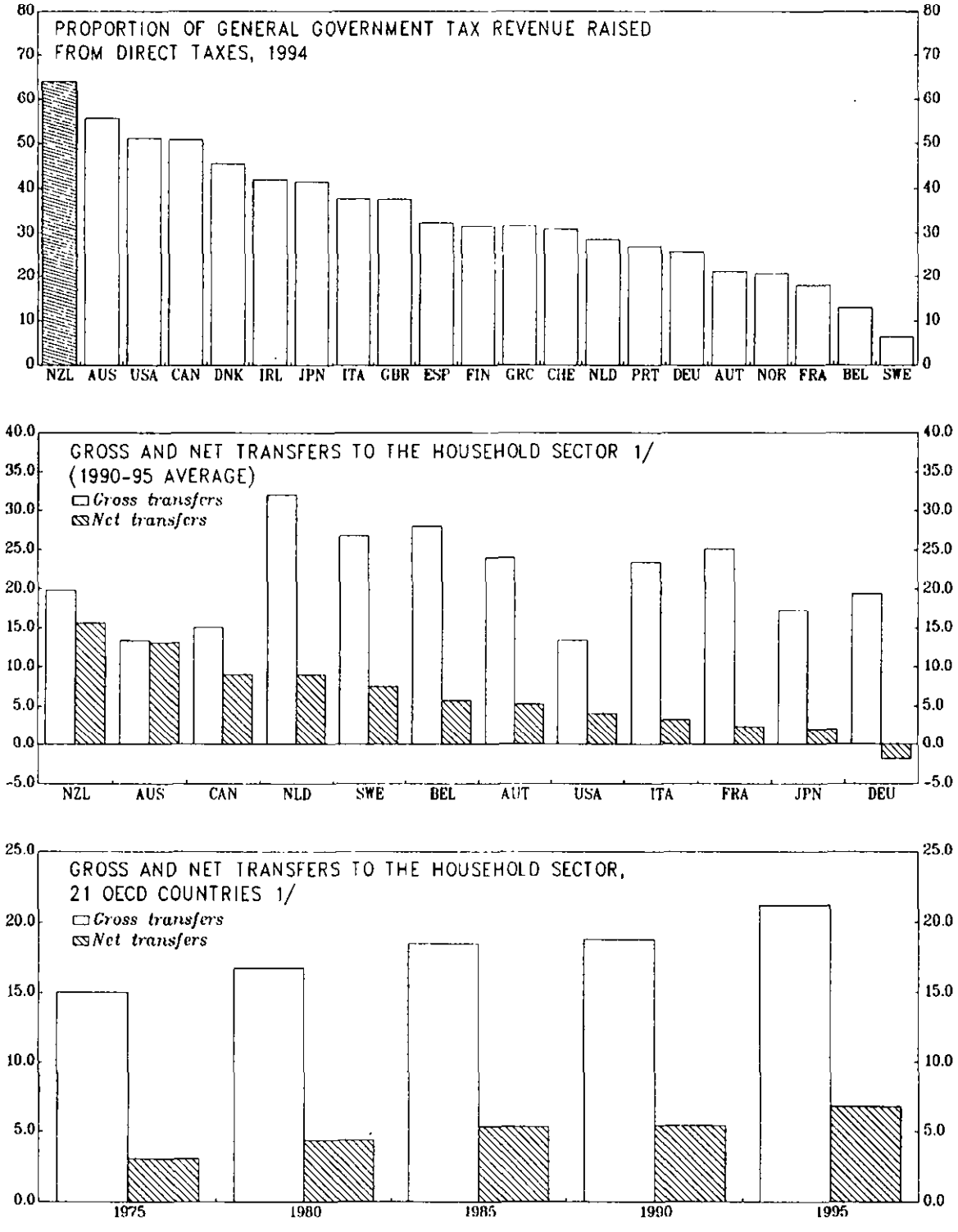


Sources: Statistics New Zealand; International Monetary Fund, World Economic Outlook; and Organization for Economic Cooperation and Development, Financial Sector Accounts.
1/ Ratio of New Zealand real PPP-adjusted GDP per capita to the United States.

CHART I.7

NEW ZEALAND

STRUCTURE OF THE TAX AND TRANSFER SYSTEMS



Sources: International Monetary Fund, Government Finance Statistics; and Organization for Economic Cooperation and Development, Financial Sector Accounts.

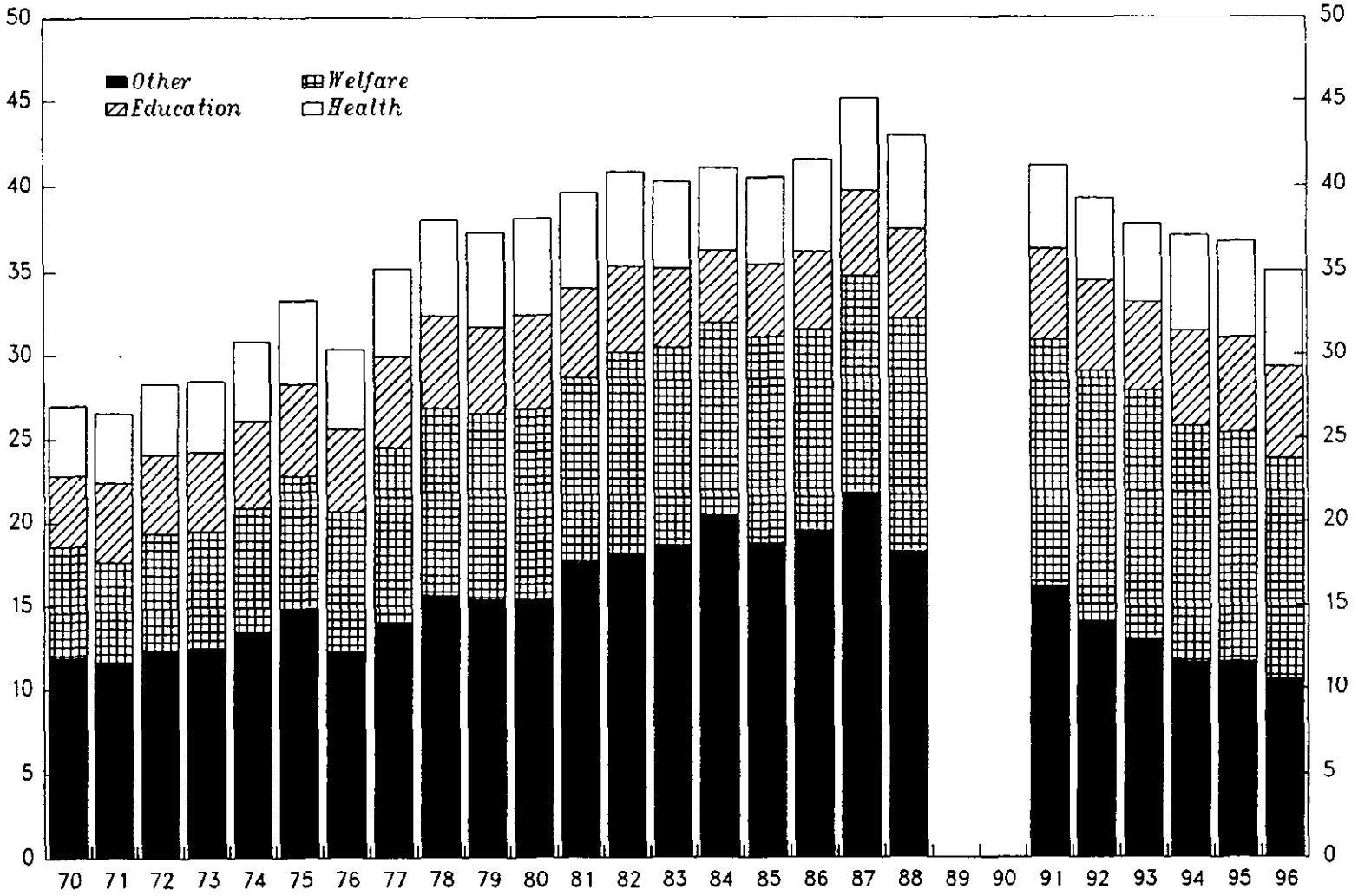
1/ Net transfers, defined as gross transfers net of social security contributions paid by households, indicate the amount of transfers financed from general tax revenues.

CHART I.8

NEW ZEALAND

GOVERNMENT EXPENDITURE, 1970-96 1/

(In percent of GDP)



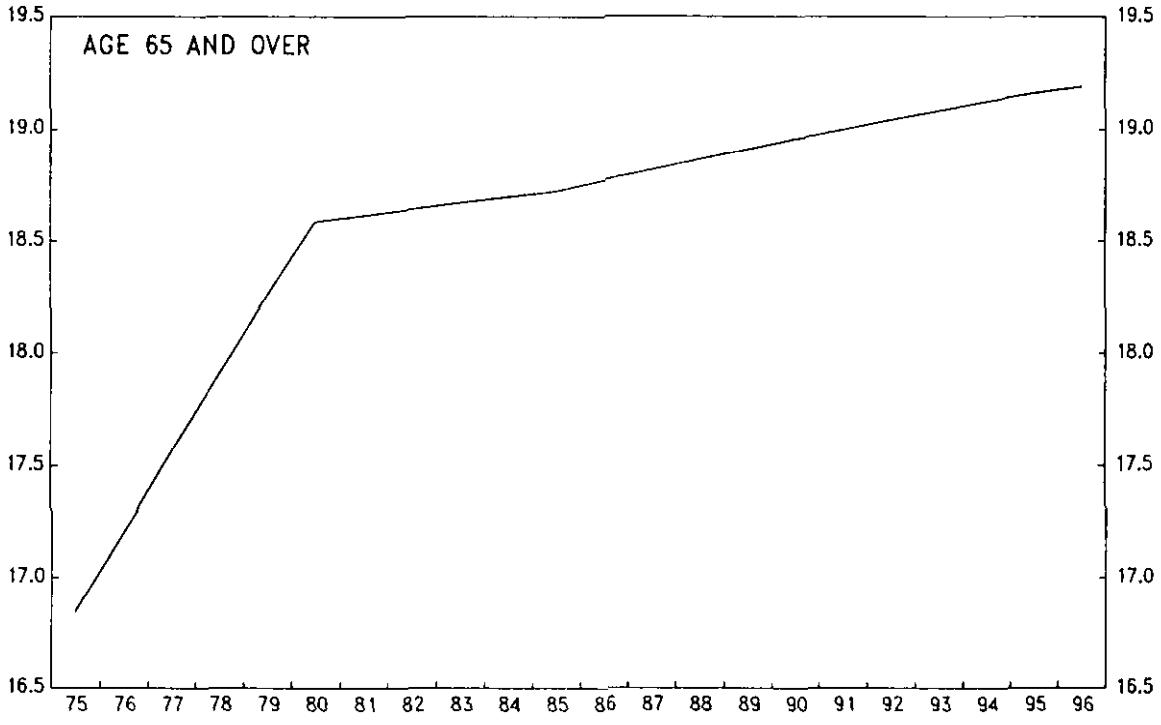
Source: International Monetary Fund, Government Financial Statistics.
1/ Years ending June. Data not available in GFS for 1989 and 1990.

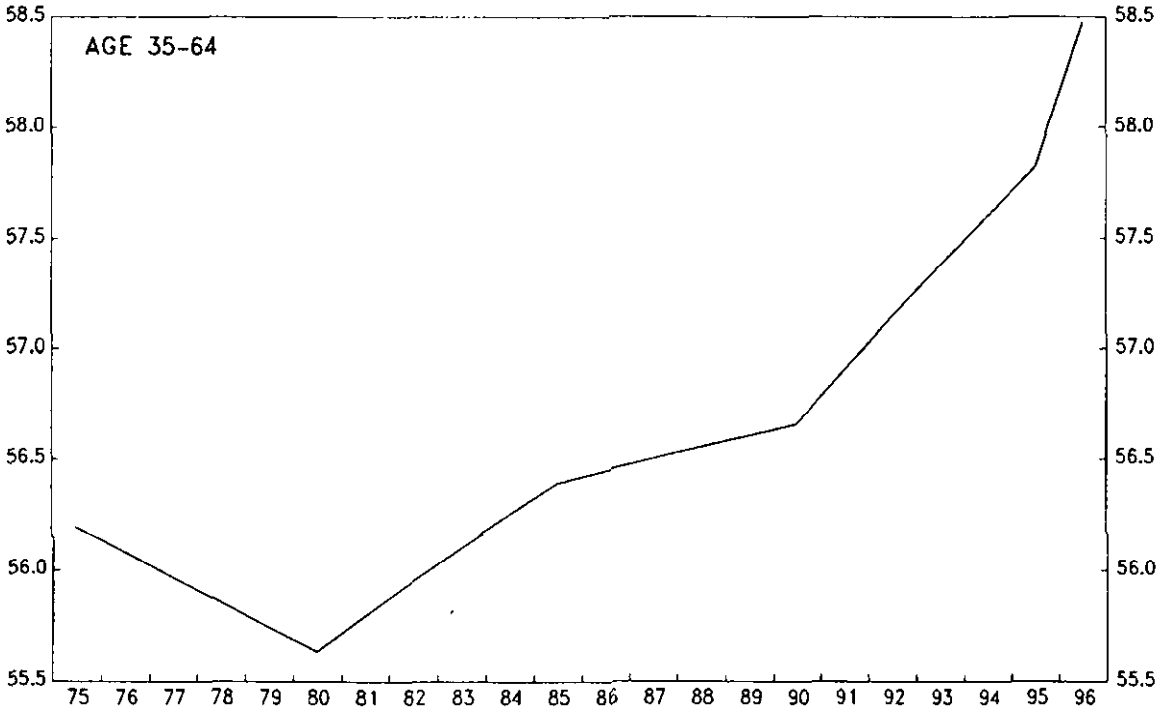
CHART 1.9

NEW ZEALAND

DEMOGRAPHIC TRENDS, 1975-96

(In percent of working population)



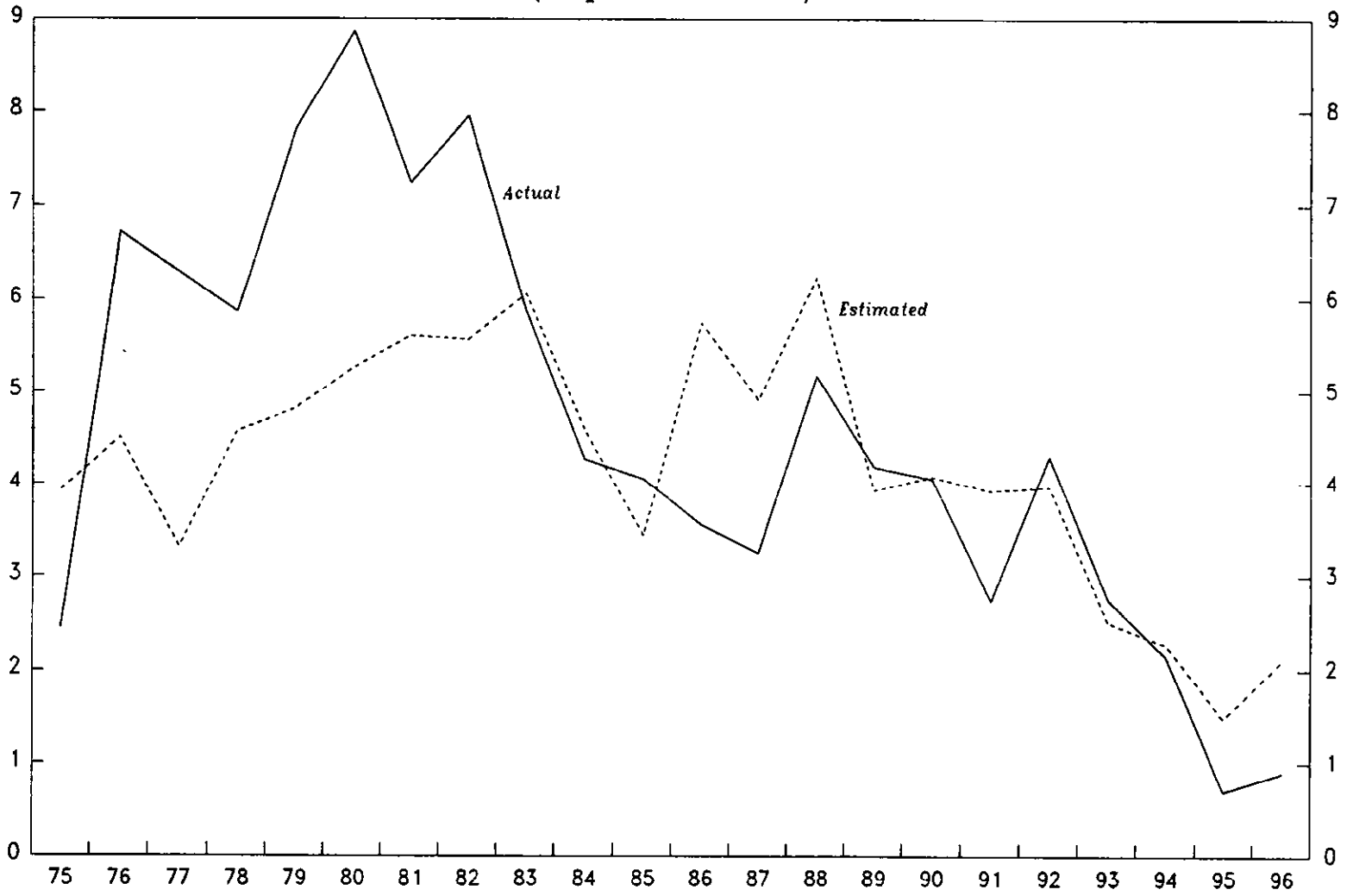


Source: United Nations Population Database.

CHART I.10

NEW ZEALAND

HOUSEHOLD SAVING, 1975-96
(In percent of GDP)



Sources: Statistics New Zealand; and Fund staff estimates.

Table I.1. Regression Results for Household Saving

Dependent Variable: Household Saving/GDP
Sample: 21 OECD Countries, 1975-95

	Panel[1]	Cross-Section	Estimated Contribution to Difference Between New Zealand and OECD Average Household Saving
General government saving/GDP	-0.37** (-10.4)	-0.90** (-6.9)	-2.10
Corporate saving/GDP	-0.14** (-3.1)	-0.61** (-5.0)	1.81
Income growth	0.15** (4.0)	1.35** (2.7)	-1.53
Income level (relative to the United States)	...	-0.06** (-2.4)	0.38
Inflation	0.16** (4.8)	...	...
Real interest rate	0.06* (1.7)	...	...
Unemployment rate	...	-0.49 (-5.0)	1.08
Old-age dependency ratio	-0.20** (-2.6)	-0.70** (-5.0)	2.81
Direct taxes/total taxes	-0.09** (-4.8)	-0.09** (-2.6)	-2.88
Indirect taxes/total taxes	-0.02 (-1.0)	0.05 (1.2)	-0.27
Gross transfers to households/GDP	-0.26** (-4.2)	...	...
Net transfers to households/GDP	...	-0.22** (-2.5)	-1.74
Unexplained			-0.80
Difference between New Zealand and OECD average household saving	...	...	-3.24
Number of observations	424	21	
Adjusted R^2	0.90	0.94	

Source: Callen and Thimann (1997, forthcoming).

Note: t-ratios in parentheses; ** (*) indicates significance at the 5 (10) percent level.

[1]Estimated using the fixed effects model.

II. Pension Reform in New Zealand[1]

Summary

The existing pay-as-you-go government pension scheme (the New Zealand superannuation) faces a serious challenge in the years ahead: because of adverse demographic dynamics, it is likely to pose a growing burden on the fiscal and external positions. In addition, the system has other important drawbacks. For example, because benefits are not linked to contributions, it causes disincentives for work; and because old-age pensions are publicly provided, private saving is discouraged.

During 1997, the government proposed replacing the existing scheme with a new private scheme (the retirement savings scheme). The proposed scheme was a combination of: (i) a pure "defined-contribution" compulsory scheme with private accounts being managed by competing funds; and (ii) a public top-up scheme with additional funds provided by the government to guarantee a minimum pension. However, this scheme was decisively rejected in September 1997 in a national referendum.

This paper first examines the challenges facing the existing pension system. Although the focus of the analysis is on fiscal and saving effects of the long-term aging, other key issues such as distortions to work are also discussed.

The paper then discusses the referendum proposal, explaining how it would have addressed these challenges. Although the scheme would have been superior to New Zealand superannuation in a number of ways, it would have done little to increase saving, would have imposed a larger initial fiscal burden, and would have also entailed higher administrative costs and greater uncertainty.

The paper also examines further reforms to the existing system. The rejection of the proposed reform in the referendum implies that, for the foreseeable future, New Zealand will continue to rely on its public pension system. Consequently, the reform of the current superannuation scheme becomes the top priority, in order to ensure that the scheme is fiscally sustainable, its pressure on macroeconomic performance is moderate, and intergenerational transfers are not excessive. The reform should occur as early as possible. Parametric adjustments to the current scheme can be achieved by reducing the level of benefits (possibly through raising the retirement age or through changes in the indexation system), by building up financial reserves (through channeling short- and medium-term government surpluses into a public fund in order to smooth future pensions expenditure), or by some combination of these approaches.

The proposed pension reform in New Zealand carries some wider lessons for other countries that consider reforming their public pension systems. The paper discusses some of these lessons.

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[1]Prepared by Michael Sarel.

A. Introduction and Conclusions

1. The aging of the New Zealand population in the decades ahead has profound implications for the current public pension scheme, the New Zealand superannuation (NZS). The two main implications are:

- The increase in the number of retirees will lead to a substantial increase in government pension expenditure. Such expenditure is expected to more than double (as a percent of GDP) during the first half of the 21st century, and to further increase during the second half.

- This increase comes on top of other increases in projected fiscal costs related to demographic dynamics—such as health expenditure—putting additional pressure on the fiscal position and possibly also on the already large external current account deficit.

2. Besides the projected increase in the fiscal burden, there are also other problems inherent in a pay-as-you-go pension scheme, such as NZS (in which current expenditure on pensions is financed by taxes on current income). These problems include: disincentives to work and to save; diminished development of private capital markets and financial instruments; intergenerational redistribution; risk of political interference; and risk limitations, which severely restrict the rate of return which can be earned by individuals on their savings (see Appendix II.1).

3. Given these substantial problems with the pay-as-you-go system, many industrial countries, which currently use this system, are starting to examine possible ways to reform their pension schemes. However, a system based on private defined-contribution pension schemes (the main alternative to the pay-as-you-go system) also faces serious problems and challenges. These problems, which are discussed in more detail in Appendix II.1, include: high administrative costs; increased private and fiscal uncertainty; reliance on the development of well functioning annuity markets; complex regulatory mechanisms; and a transition period which might impose significant costs on the current generation (and might also lead to a deterioration in the fiscal position and a decline in saving). Given these problems with the main alternative to the pay-as-you-go system, and especially the last one, it is understandable that the introduction of such an alternative system may prove to be very unpopular.

4. New Zealand's public pension system and the problems it is facing—including the rapid aging of its population—are not much different than those in many other industrial countries. In fact, the aging problem in New Zealand is less severe than in many other OECD countries. The main difference is the willingness of New Zealand to acknowledge the importance and the severity of these problems and to seriously consider possible steps to

address them, in the context of an open public debate.[2] In this respect, New Zealand's experience can provide an important lesson for the rest of the world.

5. Probably the most important problem facing the pension systems in New Zealand, and in other countries, is the fiscal sustainability of the system, given current levels of benefits and projected demographic trends. In general, countries with public pension arrangements facing rapidly aging populations have four possible ways to address the resulting fiscal stresses:[3]

- Through developing a significant fully funded defined-contribution scheme.
- Through parametric adjustments of the current pension system, possibly combined with building up financial reserves.
- By undertaking broader fiscal adjustments not related to public pensions.
- By encouraging greater labor force participation or immigration.

6. In the case of New Zealand, the initial conditions prescribe that the main choice is between the first two channels, although some improvements can also be achieved through the latter two channels.

7. Recognizing these options, New Zealand's government recently decided to present a detailed proposal aimed at implementing the first alternative. This proposed retirement savings scheme (RSS) was publicly debated and, in a national referendum in September 1997, was rejected by a large majority of voters.

8. The RSS proposal had the following key characteristics: it was a fully-funded defined-contribution compulsory private scheme; funds were managed by the private sector; savings had to be locked away until retirement age and had to be taken out as an annuity; and the government was to provide a top-up to private savings in order to guarantee a minimum pension.

9. The main purpose of this paper is to examine the topic of pension reform in New Zealand, both in the context of the RSS scheme and in the context of future possible pension reforms. An additional objective of the paper is to derive some general lessons from the experience of New Zealand, that may benefit other countries considering pension reform. After discussing the key problems with the current public scheme (the NZS), and especially

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[2]This approach reflects the Fiscal Responsibility Act, which requires a forward-looking perspective in the formulation of fiscal policy.

[3]See Chand and Jaeger (1996) for a more in-depth discussion of these issues.

the negative effect of demographic dynamics on its fiscal implications, this paper examines the following two key questions:

- Would the proposed scheme have solved these problems?

- Given that the scheme has been rejected, what are the remaining policy options to solve the problems?

10. This paper uses long-term simulations of the New Zealand economy in order to compare alternative scenarios: a continuation of the existing scheme, the adoption of the RSS, and alternative reforms to the existing NZS.

11. The main conclusions of the paper are the following:

- The RSS would have been superior to NZS in a number of ways. However, it would have done little to increase saving and work incentives, would have imposed a larger initial fiscal burden, and would have also entailed higher administrative costs and greater uncertainty. Many of these problems could have been addressed by an improved design of the top-up part of the RSS.

- Following the rejection of the RSS, the reform of the current superannuation scheme is now the top priority, in order to ensure that the scheme is fiscally sustainable, its pressure on macroeconomic performance is moderate, and intergenerational transfers are not excessive. The reform should occur as early as possible. Parametric adjustments to the current scheme can be achieved by reducing levels of benefits (possibly through raising the retirement age or through changes in the indexation system), by building up financial reserves (through channeling short- and medium-term government surpluses into a public fund in order to smooth future pension expenditure), or by some combination of these approaches.

12. The structure of the paper is as follows: Section B presents the long-term aging problem facing New Zealand and examines its effects on the existing superannuation scheme. Section C presents some theory and evidence on privatizing pension schemes, including lessons from the experience of three countries: Australia, Chile, and Singapore. Section D inspects the proposed scheme and its ability to solve the key problems. Section E examines further reforms. Section F discusses possible lessons that other countries can draw from New Zealand's experience.

B. The Long-Term Aging Problem (and its Effects on the Current Superannuation Scheme)

The demographic outlook

13. The old-age dependency ratio (defined as the ratio of people at age 65 and older to people at ages 15–64) is forecast to increase sharply during the first half of the next century, and to more than double during 2005–40. The increase in the old-age dependency ratio is projected to continue during the second half of the 21st century, but at a slower pace.[4]

Fiscal and external sustainability

14. Demographic changes will put significant pressure in the years ahead on the existing pension scheme—the New Zealand Superannuation (NZS).[5] A key issue regarding NZS is its fiscal sustainability. Assuming no change in current policies, simulation results show the following:[6]

- Gross fiscal costs of NZS will increase from 4.9 percent of GDP in 2000 to 9.9 percent of GDP in 2050 (and to 11.5 percent of GDP in 2100).[7]

- The increase in costs occurs mainly during the period 2005–40, as a result of doubling of the old-age dependency ratio (from 17.5 percent to 35.3 percent). After 2040, fiscal costs would continue to increase, but at a much slower rate.

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[4]The demographic projections are based on the latest World Bank's projections, and are presented in Table II.1. They were done in June 1997 and were kindly supplied by Eduard Bos.

[5]The main features of NZS are described in Appendix II.2.

[6]Detailed simulation results for the future of NZS are presented in Table II.2. More generally, the projections presented in this paper are derived from a long-term model of the economy (explained in a latter section) and from the World Bank's demographic projections. They are also based on a specific set of assumptions regarding individual behavior and responses. Therefore, these projections do not necessarily coincide with the official projections of the authorities. Furthermore, the projections in this paper cover the period up to 2100, while most official projections in New Zealand go only as far as 2050.

[7]These projections are in broad agreement with the World Bank study by Polackova (1997), the New Zealand Institute of Economic Research (NZIER) study by Cook and Savage (1995), and the Todd-St. John projections published by the Periodic Report Group (1997). A comparison with these projections is provided in Table II.2.

- The sharpest increase occurs during 2010–30 (from 5.1 to 8.8 percent of GDP).

15. The expected increase in government expenditure on pensions is significant for at least two reasons:

- **It comes on top of other increases in projected fiscal costs related to demographic dynamics**. For example, Polackova (1997) projects that health expenditure will increase from 5.5 percent of GDP in 2000 to 11.8 percent of GDP in 2050.[8] According to her projections, other major expenditure items, including education, will remain roughly constant or will slightly increase (as a percent of GDP), and the total public expenditure on other items, besides pensions and health care, is projected to increase from 15.2 percent of GDP in 2000 to 15.7 percent of GDP in 2050. As a result, the total projected increase in fiscal expenditure during 2000–50 is almost 12 percentage points of GDP (5.0 percentage points increase in pensions, 6.3 percentage points increase in health care, and 0.5 percentage points increase in other expenditure categories).

- **It would put considerable pressure on New Zealand's external position**. The New Zealand economy has large net external liabilities (currently 81 percent of GDP) and a large current account deficit. The public saving-investment balance, which now is in surplus, partly offsets the private deficit. Assuming no perfect Ricardian equivalence, a significant deterioration of the public balance would put considerable pressure on the external current account deficit.

16. Some have pointed out that this situation is no worse than in other industrial countries.[9] Although this argument may be technically correct, its relevance for the future of

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[8]These estimates are slightly higher than a previous study by NZIER's Cook and Savage (1995). They projected an increase in health expenditure from 5.7 percent of GDP to 10.3 percent of GDP during 2000–50.

[9]For example, the Periodic Report Group (1997, p. 194) reports that the old-age dependency ratio in 2050 has been projected to be 33 percent in New Zealand, compared with 38 percent in Australia, 36 percent in Canada, 56 percent in Japan, 37 percent in Sweden, 38 percent in the United Kingdom, and 34 percent in the United States. However, these projections are not very recent and, at least for New Zealand, they had been substantially revised. The World Bank now projects a dependency ratio of 36 percent in 2050, while according to Statistics New Zealand (mid-projections), the ratio will reach 42 percent. In any case, the expected increase in pensions expenditure in most OECD countries is very significant (for a cross-country comparison, see, e.g., the OECD paper by Roseveare and others (1996)). Even in the case of the United States, where the old-age dependency ratio will increase less than in most other industrial countries, Feldstein and Samwick (1997, p. 2) report that the total cost of

(continued...)

New Zealand and its policy implications are not apparent. In any case, the external position faced by New Zealand provides less room for fiscal deterioration, compared with other countries.

Intergenerational transfers and welfare implications

17. The changing demographic structure—caused by the sharp increase of the old-age dependency ratio after 2000—amplifies the general problems inherent in a pay-as-you-go scheme. Equally important, it challenges the equity and impartiality on which the pay-as-you-go system rests. In a changing demographic environment, the intergenerational transfers are strongly dependent on the relative size of each specific generation, because each generation has to contribute (through taxes) to finance the retirement of the previous generation. In particular, people in New Zealand who are now in the labor force need to pay only modest taxes, compared with taxes facing people that will be in the labor force around the middle of the 21st century.[10]

C. Theory and Evidence on Privatizing Pension Schemes

Introduction

18. Most industrial countries, and a substantial number of developing countries, are now using defined-benefit public pension schemes as their main instrument of providing income during retirement. In principle, such schemes can be fully funded. In practice, most schemes are approximating a "pay-as-you-go" system. Such a system has serious problems (as discussed in Appendix II.1). Because of these problems (but mainly because of the problem of fiscal sustainability in face of adverse demographic dynamics), many of the countries that currently use a pay-as-you-go public scheme are considering a shift to a different pension system.

19. The main alternative to the public pension scheme is a system based on a defined-contribution private scheme, in which individuals contribute a specific fraction of their income

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[9](...continued)
social security and Medicare programs is now projected to increase from its current level of 8.4 percent of GDP to 18 percent of GDP by 2050. They also note that many experts consider these official projections too optimistic.

[10]Assuming as a reasonable approximation that pensions are proportional to average wages, that participation rates (for the population at working age, on average) are constant, and that average wages do not depend on the size of the workforce, the percentage change in the tax rate required to finance pensions in each period are proportional to the change in the old-age dependency ratio (ratio of retirees to working-age population). This ratio, as described in Table II.1, is projected to more than double during 2010–40.

or wages to private savings accounts, and can withdraw their savings, including interest and profits, during their retirement. This system appears to offer several important advantages over a public scheme: a significantly higher rate of return to participants; a more efficient labor market (with higher participation rates); more competition in the financial system (potentially leading to more efficiency, innovation, and growth); and, possibly, a higher saving rate in the economy (meaning a stronger external position and perhaps a higher growth rate). It is quite clear, however, that a system based on a defined-contribution private scheme has its own potential problems and drawbacks (as discussed in Appendix II.1).

20. This section surveys some of the recent theoretical papers that examine switching from a public to a private scheme, and discusses some lessons that can be drawn from selected country experiences.[11]

Theoretical literature

21. The switch from a pay-as-you-go defined-benefit public scheme to a defined-contribution private scheme (also called a "privatization" of the pension system) has been examined in many theoretical papers. Recent papers include Feldstein (1995), Feldstein and Samwick (1997), Kotlikoff (1995), and Chand and Jaeger (1996).

22. Feldstein (1995) derives the theoretical conditions under which a debt-financed privatization of a pay-as-you-go pension system results in a higher level of welfare. The idea is that there are two offsetting effects on welfare: (i) the future rate of return in a private scheme (which depends on the marginal product of capital) is usually much higher than the rate of return in a public pay-as-you-go scheme (which depends on the growth rates of the labor force and of wages); and (ii) the privatization increases the stock of government debt (through the issue of "recognition bonds" to current participants), and the service of this additional debt requires additional resources in the future. Feldstein shows that the mathematical conditions for a welfare-enhancing privatization are such that they are easily satisfied under most possible parameters. He estimates the net present value of the net social welfare gain as a result of privatization using parameter estimates for the United States. Feldstein finds that the potential gain is very large and can reach (in present value terms) 2.5 times current GDP. When using alternative assumptions, which he views as very conservative, he estimates a gain slightly greater than GDP.

23. Feldstein and Samwick (1997) examine this argument in a simulation framework. Using detailed census and social security information for the United States, they model a transition from the current pension system to a fully funded system based on mandatory

[11]Three case studies of the experience of Australia, Chile, and Singapore, are presented in Appendix II.3.

contributions to individual accounts. They estimate that the transition could raise wages (net of income and payroll taxes) by more than 35 percent in the long run.[12]

24. Kotlikoff (1995) simulates the welfare gain from privatization of the pension system in the United States. However, unlike Feldstein and Samwick (1997), which emphasize the potentially higher rate of return in a privatized system, Kotlikoff stresses the endogeneity of labor supply and concentrates on potential efficiency gains as a result of reducing distortions associated with labor taxation in the pay-as-you-go system. He finds that, even after the current generation is fully compensated for the transition costs it incurs, future generations will experience a significant increase in welfare. The respective long-run increases in capital stock, output, and wage are 8.5 percent, 8.1 percent, and 0.1 percent.[13]

25. Chand and Jaeger (1996) examine the fiscal aspects of pension reform in selected industrial countries (the G-7 countries and Sweden). Their conclusion is that the fiscal costs of undertaking a shift to a privatized fully funded scheme may be very high and it may be preferable to "fix" the existing public schemes, by adjusting levels of benefits and contributions. However, this result appears to depend on the sample of countries and the horizon period that is being considered. First, the cost of required fiscal adjustment largely reflects the cost of servicing the "recognition" bonds to current members in the scheme which, in turn, depends on how generous the current scheme is. For example, in Italy the current scheme is very generous (high pensions and low retirement age), implying a huge cost of transition to a fully funded system.[14] Second, the horizon period considered by Chand and Jaeger is only up to 2050. This period, although it appears long by fiscal planning standards, is quite short in terms of demographic dynamics, which are the main force driving the fiscal costs of pensions. Limit-

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[12]These very large gains, however, depend on their projected values of the rate of return and the rate of growth. Their specific projections assume, perhaps unrealistically, that the rate of growth will decline by 2 percentage points (compared with past values), while the rate of return will remain unchanged.

[13]These figures, however, are simulated assuming an initially large degree of distortion in the pay-as-you-go system (no tax-benefit linkage) and an efficient transition to a privatized system. Changing these assumptions strongly reduces the potential gains that can be achieved by privatizing the pension system. In the extreme case, if there is full tax-benefit linkage in the existing system, privatizing it makes future generations worse off.

[14]This point raises a more general question—if it is relevant to compare the fiscal costs of a transition to a privatized system (that usually implies full recognition of current levels of benefits) with fiscal costs of a public system after parametric adjustments (that implies a significant reduction in levels of benefits).

ing the horizon period to 2050 understates the magnitude of the problem with the pay-as-you-go scheme and also the potential long-term gains from switching to a fully funded system.[15]

International experience

26. Defined-contribution pension schemes have been tested in several countries. Some of these countries introduced the scheme as their only old-age pension, avoiding a public scheme altogether, while others started with a defined-benefits public scheme, but then switched to a defined-contribution private scheme. Naturally, the experience of these countries is the focus of much interest, especially among countries that are now contemplating reforming their pension system. First, the international experience can help them decide whether or not to reform their pension system. Second, assuming they decide to go ahead with reform, they can use the previous international experience in their reform design, in order to avoid problems that earlier reformers did not anticipate.

27. International experience appears to confirm some of the merits of privatizing public pension schemes, but also points out some important problems. The remainder of this section summarizes the main lessons that can be learnt from the experience of three countries: Australia, Chile, and Singapore (more detail is provided in Appendix II.3).

28. The **Chilean** experience is, in general, very positive. In particular, the rates of return in the privatized scheme are very high, providing support for the Feldstein thesis. Equally important, it provides a strong degree of stability and continuity, which the old system lacked. Although the short-term fiscal costs were high, the discipline that the pension reform helped to impose on other fiscal expenditure probably contributed to fiscal consolidation in the long term. The effects on private saving, work participation, and growth rates were probably beneficial, although it is difficult to separate the effects of pension reform from the other measures taken in the context of structural reform and stabilization policies that preceded the Chilean economic miracle. Two important lessons that appear to emerge from the Chilean experience are: (i) the strict rules of the pension funds market, designed to protect individual contributors, can easily slip into overregulation that inhibits competition, increases costs, and limits personal choices; and (ii) the design of the publicly provided minimum pension needs to be done carefully, taking into account possible disincentives to work and saving.

29. The **Singaporean** experience is not really with a "privatized" pension system, given that in the past (and to a large degree also in the present) the pension funds were centralized and invested in risk-free government bonds. The Singaporean system, nevertheless, includes privately owned defined-contribution based individual accounts. The main lesson from the Singaporean experience is that it is possible to use a pension system to significantly increase saving rates. However, this requires very high contribution rates and strict withdrawal rules;

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[15]This point is also recognized by Chand and Jaeger (1996, p. 30).

once these are relaxed, individuals offset much of the pension saving by adjusting other voluntary saving.

30. The **Australian** experience is quite recent and, at this stage, it is difficult to draw definite conclusions. However, the general impression so far has been of some disappointment regarding the effects of the scheme on private saving (which was one of the key reasons for adopting the scheme). The main lessons appear to be two: (i) to raise national saving, it is important to abstain from large tax concessions which are intended to increase private saving (because it is difficult to accurately estimate private responses which are based on unknown offset coefficients); and (ii) despite the reform, future policy decisions that change the rules of the game are almost inevitable (and, in this sense, the degree of stability in a privatized scheme is limited).

D. The Proposed Scheme: Could It Have Solved the Problems?

Introduction

31. The government's proposed RSS is described and analyzed in this section. Although rejected in a national referendum in September 1997, the RSS warrants analysis because it was designed as a possible solution to New Zealand's demographic pressures and can be regarded as a departure point for other future policy reforms in New Zealand, as well as for future pension reform in other industrial countries.

32. The proposed RSS was designed to achieve the following objectives: enhance income in retirement; ensure intergenerational equity; enhance national saving; introduce stability into retirement incomes policy; and increase labor participation and employment.

33. The most important characteristics of the RSS were the following:[16]

- It was based on a fully funded defined-contribution compulsory private scheme.
- Funds were managed by the private sector.
- Savings had to be locked away until retirement age (unless they exceed 110 percent of "target savings") and had to be taken out as an annuity.
- The government provided a top-up to the private savings (cover any shortfalls from the prespecified "target savings" level).
- There was a long period of transition (40 years) during which the existing NZS was supposed to be phased out, and the public benefit was supposed to be a weighted

[16]For a full description of the proposed scheme and the transition procedure, see the official proposal by the New Zealand Government (1997).

average between the NZS benefits and the top-up benefits (with weights that change over time).

34. The top-up part was intended to ensure a minimum income during retirement, and its magnitude for each individual depended on the balance accumulated in the personal fund at the time of retirement.[17] Therefore, it is analytically easier to examine the scheme by dividing it into two distinct stages:

- A private saving scheme (compulsory, universal, defined-contribution, fully funded).
- A public top-up scheme.

The private saving scheme

35. The main assumptions underlying the simulations of the private saving scheme are fully consistent with the RSS proposal (the first five assumptions, in particular, are key points of the official proposal), but also include several additional assumptions which are required for simulating the long-term dynamics of the scheme:

- Full participation in the scheme of all income earners, with the first $NZ 5,000 of wages being exempted from contributions, and small contributions (of less than $NZ 2) being excused.
- A gradual increase in the contribution rates, starting from 3 percent of gross wages in July 1998 and increasing up to 8 percent of gross income after April 2003.
- A parallel gradual reduction in tax rates, up to 5 percent of gross income.
- A gradual transition from the existing NZS to the new RSS system, with an overlapping period of 40 years.
- The retirement age is 65, and retirees fully invest their savings at retirement in annuities.
- All males live for 15 years after retirement, and all females for 19 years.

[17]It is important to notice that, as a result of the public top-up scheme, the proposed RSS is not a typical fully funded defined-contribution private scheme.

- The (gross) real rate of return on private savings is equal to the real rate of interest in the economy, determined by the marginal product of capital and the depreciation rate.[18]

- The market for annuities is perfectly competitive.

- The real interest rate earned (both through the savings accounts during the preretirement period and through the annuity accounts during the retirement period) is taxed at an average rate of 33 percent.[19] There is no additional taxation of the stream of withdrawals during retirement, and there are no tax concessions for contributions to the scheme.

- Participation rates by age and gender, in both full-time and part-time employment, remain constant at their 1995 levels. Also, hours of work remain constant for full-time and part-time workers, by gender.

- Relative hourly wages by age and gender, and by full- and part-time participation, remain at their 1995 levels.

36. The economic assumptions (used to predict growth of wages and of GDP) broadly follow the steady state of the neoclassical growth model with exogenous labor-augmenting technological progress. The rate of technological progress is assumed to be initially high and to decrease over time, gradually bringing the New Zealand economy to a level of productivity that asymptotically approaches the level of productivity in the United States.[20] The level of productivity (per worker, adjusted for demographic effects) in the United States is assumed to initially be 43 percent higher than in New Zealand, and its annual growth rate is assumed to be 0.742 percent (and to stay at that level in the future). The rate of convergence of the productivity level in New Zealand to that in the United States is assumed to be 2.5 percent per year, implying that the growth rate of productivity in New Zealand (adjusted for demographic

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[18]The marginal product of capital is itself determined by the growth rate of productivity (as described below), and it decreases over time.

[19]This, of course, implies a lower taxation rate of nominal interest earnings (e.g., in the case of an inflation rate of 2 percent and a real interest rate of 3 percent, 33 percent tax rate on real interest implies about 20 percent tax rate on nominal interest). This assumption approximates the RSS proposal of taxing interest income at existing personal marginal tax rates.

[20]This assumption captures the idea that a technological catch-up is partly responsible for the faster current growth rates in New Zealand. This "technological convergence" assumption avoids "leapfrogging" in productivity levels across countries.

dynamics) is currently around 1.5 percent (and is gradually decreasing).[21] The rate of growth of productivity can be divided into two components, an exogenous rate of technological progress and an endogenous rate of accumulation of capital per effective worker.[22] The growth rate of wages for a specific type of worker (say, a 50-year old male in full-time employment) is determined by the exogenous productivity rate. The average wage in the economy is determined, in addition to productivity, by the changing demographic structure of the labor force.[23] The share of total wages in GDP (including implicit wages of self-employed) remains constant (around 52 percent). The capital/output ratio and the real rate of return are assumed to behave according to the steady-state values of the neoclassical growth model with logarithmic preferences.[24]

37. The results of the simulations are presented in Table II.3. The main results are:

- Contributions to the scheme (as a percent of GDP) will increase gradually, following the phasing-in of the scheme. By 2004, they stabilize at 3.8 percent of GDP.

- Withdrawals from the scheme will be very small during the scheme's first 20 years. Afterward, they will gradually increase, reaching 3.2 percent of GDP by 2050 and 3.7 percent of GDP by 2100.

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[21]These assumptions are based on results estimated during previous work by Sarel (1995) and Sarel (1996). These studies converted output per person to output per person adjusted for demographic dynamics. Potential productivity growth in the United States is derived from the average growth rate of output per person adjusted for demographic dynamics during the periods 1985–95 and 1990–95, and is assumed to remain constant in the future. The same variable was calculated for New Zealand. The rate of convergence of New Zealand productivity to U.S. productivity is estimated using the two numbers and the gap between the levels of productivity in the two countries in 1995.

[22] The first component is the dominant one, and it accounts for around 90 percent of the increase in productivity. The second component reflects the dependence of the output/capital ratio in the steady state of the neoclassical growth model on the rate of technological progress (this issue is discussed in Sarel (1994)).

[23]This effect comes from differences in levels of productivity of workers at different ages. This demographic effect is currently strong in New Zealand, resulting in a positive effect on productivity of around 0.4 percent per year. It is projected to decline in the future, becoming insignificant after 2020.

[24]The rate of return is equal to the population growth rate, plus the rate of time preference (assumed to be 1 percent), plus the rate of labor-augmenting technological progress. The capital/output ratio is equal to the capital share (one-third) divided by the sum of the depreciation rate (5 percent) and the rate of return.

- Total assets in the scheme—including both savings assets (which workers accumulate in their private accounts until they reach the retirement age) and annuity assets (which generate the stream of monthly payments during the retirement)—will increase quickly, reaching 74 percent of GDP by 2020, and 112 percent of GDP by 2050. After 2050, they will remain roughly constant (as percent of GDP).

- Net increase in assets—the key variable with respect to the potential of the new scheme to increase private saving—will increase to 4.3 percent of GDP by 2010, and then decline to less than 1.5 percent of GDP after 2050. The net increase in assets includes net accumulation (contributions less withdrawals) and reinvested after-tax profits. While in the short term the first component dominates, in the long term (when the scheme matures and the demographic dynamics approach a steady state) the net increase in assets is generated mainly by reinvested profits.

- The average retirement pensions generated by the scheme are likely to be very modest during the first 20–30 years, because the gradual phasing-in of the scheme and the short contribution period for retirees graduating from the scheme. In the long run, the average pension for men that can be generated by the scheme is comparable to the current (unreformed) superannuation pension. It is important to remember, however, that these are averages per person, not per worker. The people that retire after a life-time of work (and contributions to the scheme) are likely to accumulate significantly larger amounts than these averages suggest.

- There is a large difference between men and women: the average pension accumulated by men will be about 2.5 times its average for women. This difference reflects mainly higher labor participation rates and higher earnings history for men, but it also reflects a shorter retirement time (because men have a lower life expectancy, they can buy a larger annuity for the same amount).

The public top-up scheme

38. The proposed public top-up scheme addressed the obvious inadequacy of the private saving scheme to cover the retirement needs of many people with low income or who do not have a long earning history when they retire. It effectively complemented the private compulsory defined-contribution scheme with a means-tested minimum pension. The top-up scheme required the government to supplement the savings accumulated through private contributions and reinvested profits up to a certain predefined level. The predefined level was intended to enable the retiree to purchase a "standard" annuity (given the market conditions at the time of retirement). The standard annuity was defined as being equal to 33 percent of average net wages during the first year of retirement, and indexed to inflation thereafter. It also needed to

include a guarantee to make payments during the first ten years after retirement (from age 65 to 75), even if the retiree dies before age 75.[25]

Fiscal effects of the RSS

39. The net fiscal expenditure on the RSS scheme (described at the bottom of Table II.4) is projected to stay around 4 percent of GDP during the next century.[26] This masks two opposing trends:

- The costs of pensions to current retirees, which dominate in the short term, are declining over time.

- The costs of top-up to new retirees, which are initially small, increase over time.

40. These projections compare favorably with the projected net expenditure on the existing NZS (also described at the bottom of Table II.4) which are expected to increase from 4 percent of GDP in 2000 to 9 percent of GDP by the second half of the 21st century.

41. However, the net fiscal effect goes beyond the difference in projected net expenditure. The reason is that the contributions to the RSS were planned to be partly offset by reductions in taxes. For example, in 2003, when the contribution rates reach the top level of 8 percent of gross income (less the $NZ 5,000 exemption), the planned reduction in taxes reaches 5 percent of gross income (with no exemptions). At the same time, public expenditure on the existing NZS would continue almost unchanged. As a result, the government's total stock of debt would increase faster (or decrease slower) than in the absence of the RSS system. In addition to this effect, there is also an opposite effect: the difference between the expenditure on the RSS scheme and the (larger) expenditure in the absence of the RSS scheme can be invested (or used to repay debt), generating additional savings over time, especially in the long term.

Main scenario

42. A full calculation of the net fiscal effects of RSS over NZS reveals the following results:[27]

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[25]The approximate cost of such án annuity for men would be around four times the average net annual wages. Cost for women would be about 20 percent higher than for men.

[26]This expenditure includes allowances for singles and the costs on the existing superannuation scheme during the phasing-out period.

[27]These projections and the underlying calculations are summarized in the top section of Table II.4.

- The total net fiscal effect of RSS (compared with NZS) is negative until 2050.

- The negative effect reaches 3 percent of GDP in the early 2000s, and peaks around 2010, at 3.1 percent of GDP.

- After 2050, the net fiscal effect is positive and is increasing (reaching almost 2 percent of GDP by 2100).

43. These results are caused by the interaction of several factors:

- The cuts in taxes on income come into effect during the first few years of the new scheme, but there are virtually no reductions in expenditure until close to 2010.

- The taxes on interest earnings from the private schemes are relatively small in the first few years, increasing only gradually before reaching around 0.8 percent of GDP in 2030.

- Until 2030, the government runs primary deficits (or smaller surpluses), generating an increase (or a smaller decrease) in the stock of public debt. The interest payments on the additional public debt, which reach 1.6 percent of GDP by 2030, more than offset (until 2050) the primary surplus generated by the new scheme.

An alternative scenario

44. An alternative scenario of analyzing the net fiscal effect of the RSS would be to assume that the tax cuts that formally were part of the RSS proposal would be given in any case, with or without the introduction of the RSS. The rationale for this scenario is that the New Zealand budget is at present in surplus, and it would be politically difficult to abstain from cutting taxes in the short term, even if the fiscal balance is projected to worsen in the longer term.[28] Results of simulations using this alternative scenario are described in Table II.4. Under this alternative scenario, the net fiscal effect of the RSS would be positive and very large, increasing gradually to 7 percent of GDP by 2050 and to 14 percent of GDP by 2100.

Effects on national saving

45. The net effects on national saving (also described in Table II.4) are likely to be positive, but modest. The range of possible projections depends on the effects of the new private pension scheme and of changes in public saving on private saving. International

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[28]Many people in New Zealand view independent tax cuts as a viable option. For example, the proposed scheme was criticized on the grounds that it is unfair to force people to save for their retirement when the government can instead cut their taxes and let them choose their own saving priorities.

experience suggests that it is reasonable to expect some effects, but it is difficult to pinpoint specific offset coefficients.

46. Our central scenario regarding effects on national saving assumes a coefficient of 50 percent offset on private saving of both compulsory pensions and changes in public saving. In this case, the net increase in national saving are projected to be about 0.5–0.7 percent of GDP during 2000–50, and then to increase to 1.7 percent of GDP by 2100.

47. The assumption of 50 percent offset coefficient of compulsory pension saving is used as an approximation for the aggregate effect (alternatives are discussed below). The individual offset coefficients, however, are likely to differ according to income levels. While high-income individuals are likely to significantly reduce contributions to other saving instruments, low-income individuals, who do not save much in the first place, would find it difficult to offset the compulsory saving.

48. Given the high degree of uncertainty regarding the private saving offset coefficients, Table II.4 also presents four alternative scenarios. These scenarios cover the most extreme values of offset coefficients. They suggest that the main uncertainty concerns the period until 2030: while it is possible that national saving will increase by as much as 4 percent of GDP, a decrease of 3 percent of GDP also cannot be ruled out during this period. In the long term, however, the range of possible results is much narrower. By 2050, the possible net effect on national saving ranges from zero to +1.5 percent of GDP, and by 2100 from zero to +3.3 percent of GDP.[29]

Disincentives for work

49. The disincentives for work implied by the top-up scheme are significant. Because the top-up scheme simply complements existing savings, the effective marginal tax rate on income for people who would need top-up is 8 percentage points higher than in the absence of the top-up scheme. The reason is that, on the margin, every dollar earned in gross wages will result in 8 cents' contribution to the private saving scheme; during retirement, however, the government will reduce its top-up contribution by exactly 8 cents (converted to their net present value). Therefore, these 8 cents would be regarded by the individual wage-earner as pure income tax.[30] This calculation, however, does not apply to the high-income people whose

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[29]The intuition is probably the following. In the short term, fiscal effect is negative, and compulsory saving positive. If the offset coefficients to these factors are very different (say, zero and one, or one and zero), then the total effect on saving can also be significantly different. In the long term, both fiscal effect and compulsory saving are positive, and differences in offset coefficients matter less.

[30]This analysis abstracts from potentially important noneconomic factors, such as the possibil-

(continued...)

retirement savings will exceed the target level and will not be given top-up assistance.[31] For them, the contributions made for each additional dollar in gross income will increase one-for-one their retirement pension.[32]

50. In general, it is difficult to obtain accurate estimates of labor elasticities, which are necessary in order to project the impact of tax rates on labor supply, and estimates vary across different studies. In one major study of labor markets in New Zealand, Chiao and Walker (1992, p. 165) estimate that the average labor supply elasticity in New Zealand (with respect to gross wages) is 0.38, with females having a much higher elasticity than males (0.64 compared with 0.22).[33] Chiao and Walker's estimates can be used for a rough calculation. Assuming for simplicity a uniform tax rate of 30 percent for men and 20 percent for women, a reduction of 8 percentage points in income tax rates would increase net wages by 11.4 percent for men and by 10 percent for women, increasing labor supply by 2.5 percent for men and by 6.4 percent for women. Assuming constant average working hours, the net effect of an 8 percentage point reduction in income taxes would be to increase labor force participation (for ages 15–64) from 77.1 percent to 79 percent for men, and from 59.9 percent to 63.7 percent for women.[34]

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[30](...continued)
ity that people will try to avoid getting a top-up, because of the stigma attached to it.

[31]The RSS proposal is very clear regarding the fact that individuals are not required to continue to contribute to the scheme if their savings reach a certain predefined level (110 percent of "target savings"). However, the proposal is not very clear regarding the applicability of the tax cuts for individuals that reach the savings limit and stop contributing to the scheme. Here, it is assumed that tax cuts are given only to contributors, and people will keep contributing even after they reach the savings limit, in order to continue to benefit from the tax cuts.

[32]As a result, the profile of the marginal effective tax rate on wages will not be monotonous: it will first increase until the wage level reaches a certain point which would suffice to cover the minimum required retirement pension, and drop by 8 percentage points at that point (and, possibly, increase again at higher levels of wages, if the tax system is progressive).

[33]These elasticities are for gross wages. They would be true also for net wages, if tax rates would be uniform. They are generally in line with international estimates. For example, Housman (1981) estimates for the United States an elasticity of around zero for men, around 1 for married women, and around 0.5 for unmarried women.

[34]An important issue is whether it is valid to use coefficients estimated for individual behavior in order to project aggregate elasticities. For example, Gwartney and Stroup (1983) examine this issue and conclude that "it is invalid to generalize from the individual work-leisure analysis to the economy as a whole when analyzing the impact of changes in tax rates on the

(continued...)

51. It is interesting to compare the disincentives for work in the top-up scheme with those in the current superannuation scheme in the short term. The envisioned tax cuts (up to 5 percent of gross wages on the margin) do not cover the full amount of contributions to the scheme (up to 8 percent of gross wages on the margin). As a result, the effective marginal tax rate will increase by 3 percentage points for many wage earners. Only for the top earners will the effective marginal tax rate decrease, by 5 percentage points. The net effect on aggregate labor supply depends on the relative elasticities of labor supply across different sectors of the labor force. For example, if low-wage earners have low elasticity and high-wage earners have high elasticity, then the new scheme may increase aggregate labor supply. However, if the elasticity is uniform across income groups, then the new scheme is not likely to generate a significant increase in labor supply, and it might even decrease it. In the simulations discussed in this section, it is assumed that the introduction of the RSS would have no net effects on the labor supply.

Other potential problems with the RSS

52. Other potential problems with the RSS include the usual array of problems inherent in every transition to a defined-contribution privately managed pension system (as discussed in Appendix II.1): increased administrative costs, increased compliance costs, increased uncertainty, a transition which might be quite costly for the current generation, and potentially large fiscal costs as a result of fraud, incompetent management, or excessive exposure to risk by the privately run investment funds.

53. Although it is impossible to completely eliminate these problems, a clever design of the scheme and the regulatory framework can go a long way toward reducing their magnitude. In these issues, learning from the experiences of other countries can be beneficial.[35]

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[34](...continued)
supply of labor." However, Gwartney and Stroup's analysis appears to suggest that the aggregate response to tax cuts may be actually stronger than the individual response. The intuition for this result is that the individual response to higher wages depends on two conflicting effects: the substitution effect (the opportunity cost of leisure is higher) and the income effect (more demand for leisure, assuming leisure is a normal good); in the aggregate, however, the income effect is questionable (because the economy as a whole, as opposed to an individual, in general cannot consume both more leisure and more other stuff simply because the government changes its tax policy). Using this argument, it is possible that the positive macroeconomic effects of higher net wages on labor supply could be much stronger than those calculated above.

[35]The experience of Chile, in particular, is extremely valuable in this respect. See previous section, as well as Appendix II.3, for a discussion of the Chilean experience and its lessons.

54. The RSS seemed to be well designed, with one exception: the combination of the generous top-up scheme (which will provide a public top-up to a significant number of retirees) and the almost unlimited freedom of individuals to choose their investment funds and investment strategy (subject only to some very general diversification criteria) seemed to raise two problems:

- Individuals that are not likely to reach the savings target (probably the majority) will not particularly care about their investments in the scheme, because they will end up in any case with the same amount of pension. As a result, there will be no market mechanism to ensure that the investment funds manage the savings of these individuals in a responsible and efficient way, or that they charge reasonable management fees.

- Furthermore, such individuals may choose (in a perfectly rational approach) to expose themselves to the maximum possible risk. The reason is that, in taking extreme chances, they can only gain, since their minimum savings level at the time of retirement is guaranteed through the top-up scheme.

Possible improvements to the RSS

55. Identifying and discussing possible improvements to the RSS design may benefit other countries which are likely to propose similar schemes in the near future. The main problems with the RSS were caused by an ineffective design of the top-up scheme. As explained in previous sections, the proposed top-up scheme suffered from several major problems. These problems can be constructively addressed, without fundamentally changing the basic motivation for the top-up scheme—providing a safety net for old-age people with insufficient earnings history. The key elements of addressing these problems are:

- Reducing the minimum top-up ceiling.[36]

- Establishing a significant link between contributions to the scheme and net investment earnings, on the one hand, and levels of pension benefits, on the other hand.

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[36]Although the design of the top-up's benefit and indexation effectively reduces pension benefits by 15 percent from existing NZS levels, alternative reforms that are being proposed are more significant. For example, the Periodic Report Group (1997) proposes to reduce replacement rates for couples from 65 percent to 50 percent of average wages, an effective reduction of about 23 percent from existing NZS levels. The general point, of course, is that benefits of the top-up scheme should be compared with fiscally sustainable reforms of NZS, not with NZS as it exists today.

56. One simple way to achieve these elements is to replace the horizontal top-up ceiling with a diagonal ceiling.[37] This change would guarantee a reasonable minimum pension level to the very-low-income earners, and still provide a strong incentive for low- and middle-income earners to maximize their savings in the RSS, through greater contributions (meaning more labor participation) and improved net returns on investments (meaning a more careful choice of investment funds, according to their investment skills and management fees, and a more responsible investment strategy). This second channel also provides a natural mechanism to increase demand for efficient and responsible management of these funds, and increase their overall efficiency and financial sophistication. In addition, such a change in the top-up scheme would improve the fiscal position (and this improvement could be partially used to address possible adverse effects on income distribution). Finally, by reducing the overall level of publicly provided pensions, this change probably would also increase voluntary private saving (as individuals will adjust their life-time profile of consumption) and, therefore, also improve the external position.

E. Further Reforms

Introduction

57. The existing public pension scheme (NZS) suffers from three main problems: disincentives for work, disincentives for private saving, and, most importantly, fiscal sustainability. These problems were not affected by the rejection of the proposed RSS. However, the public debate and the referendum on pension reform achieved two important results: (i) they focused the attention of the public and of the policymakers on this problem and on the need to address it in a timely manner; and (ii) they dramatically narrowed the possible channels of addressing the fiscal sustainability problem.

58. A previous section of this paper discussed the main two alternatives of addressing the problem of fiscal sustainability of public pension schemes in countries facing adverse demographic dynamics: establishing a private defined-contribution scheme and reforming the existing pay-as-you-go public scheme. It is now clear that the first alternative has been strongly rejected in New Zealand, and is very unlikely to be proposed again, at least for a very long time. Therefore, the remaining alternative, reforming the existing NZS, has now become the main priority.

59. The fiscal sustainability problem can be successfully addressed by reforming some parameters of NZS, without changing the basic principles of the system. Furthermore, reforming the scheme by reducing the benefit levels of the public pension can also go at least some way toward addressing the other two main problems (work and saving incentives).

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[37]For example, the ceiling could increase from 80 percent to 100 percent of the proposed top-up ceiling, as a positive function of income received during retirement through the private saving scheme.

Addressing the fiscal sustainability problem

60. A simple way to describe the fiscal sustainability problem is to say that in the long run current tax rates will not be enough to finance current levels of benefits. One obvious solution to this problem is to increase taxes in the future as much as needed to cover fiscal costs in each period. However, this solution has three critical disadvantages. First, it generates significant intergenerational transfers.[38] Second, it causes economic inefficiencies as a result of nonconstant tax rates.[39] Third, and most importantly, it ignores the fact that tax rates will need to be raised in any case in order to finance the growth in other government programs (such as health care), and there is a practical limit to the rates of taxation that can be effectively levied on the income-earners.

61. Another possible option is means-testing (for example, reinstituting the tax surcharge on additional income). This option, however, would obviously have strong negative effects on incentives to work and save. In addition, it is perceived as unfair, because it introduces a very visible inequality in benefits that are viewed as an universal entitlement.

62. Therefore, other possible ways of addressing the fiscal sustainability problem need to be examined. The two main alternative solutions are either to adjust the level of benefits in the future in order to reduce fiscal liabilities, or to prefund these liabilities.[40] A third possibility is,

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[38]For example, because the dependency ratio is projected to double between 2005 and 2040, the people that will work in 2040 would pay about twice the amount of taxes (for retirement purposes) compared with people that will work in 2005. The two groups, however, will receive a similar amount of pension during their retirement.

[39]As argued by public finance text books, the distortion created by taxes increases with the tax rate. Therefore, a constant tax rate will create less distortion than a nonconstant tax rate, even if they both generate the same amount of revenue in present value terms.

[40]A possible adjustment in the level of benefits was explored by the Periodic Report Group (1997). This Group, chaired by Jeff Todd, was set up as part of the Superannuation Accord (see Appendix II.2). Its first (interim) report was issued in July 1997. The specific possibilities of reform described below (an increase in the retirement age from 65 to 68 and a reduction in the levels of pensions from 65 percent to 50 percent of average wages) closely follow the proposals of the Group. The Group, however, did not propose implementing both reforms simultaneously, and also did not propose prefunding pension expenditure.

of course, to implement some combination of the two approaches.[41] The fiscal effects of possible reforms are described in Table II.2.[42]

An increase in the retirement age

63. A significant increase in the retirement age has some attractive features. First, it significantly reduces fiscal costs of pensions, while still providing a safety net for elderly people and fully insuring against unexpected longevity. Second, it creates an important role for private saving (requiring individual provision of savings for the first few years of retirement, assuming people will still prefer to retire at age 65). Third, it encourages greater labor participation (both by young people, in order to accumulate the necessary savings, and in particular by people older than 65). Fourth, there is a clear rationale for such an increase because of the expected increase in life expectancy.

64. An increase in the retirement age from 65 to 68, phased in gradually from 2015 to 2027, is examined. Such an increase in the retirement age would reduce net fiscal expenditure on "basic" superannuation by 1.4 percent of GDP per year after 2027.

A temporary change in the method of pension indexation

65. Changing the indexation system can significantly reduce fiscal costs and provide incentives for private saving, while providing a minimum guaranteed basket of consumption during retirement. Another (less radical) possibility is to index the pensions to wages across cohorts, but to prices during the retirement period of each cohort (as was suggested in the RSS proposal).

66. A temporary change in the method of pensions indexation is examined. The change is assumed to involve indexation to the average of prices and wages (instead of full indexation to wages) during the period 2015–50. After 2050, the pensions will again be fully indexed to wages. The effect would be to reduce pension levels after 2050 by around 23 percent,

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[41]A potential additional possibility is to increase immigration rates, in order to reduce the rate of increase of the old-age dependency ratio. However, given the sensitivity analysis with respect to immigration rates described in Table II.2, it appears that such an increase needs to be very large in order to have a significant fiscal impact. Such a large increase is probably unlikely to overcome social and political constraints.

[42]The simulations in Table II.2 report net expenditure on "basic" superannuation, excluding allowances for singles and recollected taxes (total gross expenditure are about 36 percent higher). Total savings as a result of possible reforms will also be proportionately higher than the numbers reported here. An additional fiscal improvement, as explained in a previous section, can be achieved by interest earnings from investing the resulting fiscal savings (or using them to reduce public debt).

compared with what they would have been if no change in indexation had occurred. Such a temporary change in the indexation method would reduce net fiscal expenditure on "basic" superannuation by 1.7 percent of GDP per year by 2050 (and by 1.9 percent of GDP per year by 2100).

Implementing both reforms

67. The total effect of implementing both reforms (raising the retirement age and changing the method of indexation) can be significant. It would reduce net fiscal expenditure on "basic" superannuation by 2.7 percent of GDP per year by 2050 (and by 3.0 percent of GDP per year by 2100).

Prefunding

68. Adjustments in pension benefits can go some way toward reducing the mounting fiscal pressure resulting from demographic dynamics. However, they can only make a modest contribution in this regard. This is particularly clear when one takes a more general view on future fiscal liabilities, including expenditure on other major programs, and especially on health care.[43]

69. Another possibility to address the problem caused by the deteriorating demographic structure is to set up (or contract) a fund which will accumulate assets during the "good" years and use the returns from these assets during the "bad" years. In the short term, this approach requires the government to renounce or significantly scale back any planned cuts in taxes and increase in expenditure. In the medium term, it requires the government to manage a large investment fund.

70. Table II.2 presents a possible scenario of the prefunding approach, assuming that it comes on top of the other two measures discussed above (raising the retirement age and changing the indexation method).[44] The scenario assumes that the objective of the government is to limit pension-related fiscal outflows (net expenditure on "basic" superannuation and net transfers to the fund) to 4.8 percent of GDP.[45] The government gradually increases its fiscal

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[43]Some broader fiscal projections are presented in Table II.4.

[44]This scenario is only illustrative, and other scenarios are certainly possible. In general, the government has to decide on two parameters: what is the desired ceiling on total fiscal outflows, and how fast they get there from current levels. Because total assets in the fund should probably be kept at a positive but modest level in the long run, there is some trade-off between the two parameters.

[45]This ceiling has to be compared with the projected expenditure on superannuation in the

(continued...)

outflows from 3.6 percent of GDP in 2000 to 4.8 percent of GDP in 2006, an increase of 0.2 percentage point of GDP a year. The funds that are not needed for current expenditure on superannuation are deposited in an investment fund, which will presumably invest mainly abroad. After 2010, the net transfers to the fund start to decrease (as a percent of GDP), and after 2060 they become negative (the government starts to withdraw money from the fund). Because of reinvested profits, the fund continues to grow, until it reaches about 40 percent of GDP in 2080.[46]

71. One important potential problem with the prefunding approach is the low likelihood that the rate of return achieved by a government-run investment fund would match the rate achieved by private investors. Based on experience from other countries (e.g., Singapore's Government Investment Corporation), it is possible that such a government-run fund would undertake a conservative strategy and will invest mainly in assets with minimal risk. Although investment in a more diversified portfolio is certainly possible, this might not happen, because of lack of competition (in achieving higher rates of returns) and a high degree of risk aversion (incurring losses might cause political difficulties).

F. Tentative Lessons From New Zealand's Reform Experience

72. The experience of New Zealand's attempt to reform its pension system will probably receive a fair amount of attention in coming years. In particular, future studies will need to explain why the proposed scheme was rejected by such an overwhelming majority of voters. At this very preliminary stage, an explanation appears to include the following tentative lessons:

- **There was no clear alternative to the proposed scheme**. The voters were not presented with the real alternative to the scheme, namely the significant adjustments in the level of benefits that will be needed in the existing public scheme. By default, they compared the proposed scheme with the current scheme, and they saw a large reduction in benefits for most retirees.

- **There was no strong political support for the scheme**. Most Members of Parliament rejected the scheme and actively campaigned against its approval. The public is

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[45](...continued)
absence of funding (described in Table II.2). It increases above 7 percent of GDP by 2040, and reaches 8.5 percent of GDP by 2100. In case the government decides to smooth the total on old-age pensions (including allowances for singles), such a fund would be somewhat larger.

[46]Of course, an alternative way to prefund would be to first pay the existing public debt (currently about 20 percent of GDP). In this case, the positive accumulation in the public fund which will be required in the future would be much lower.

unlikely to endorse a painful and risky reform if the political leadership is not united in supporting it.

- **There was a significant confusion regarding the "sustainability" of the current scheme**. The proposed scheme was advanced mainly on the ground that the existing scheme is not fiscally sustainable. However, during the public debate, it became clear that the existing scheme is sustainable, if "sustainability" is defined broadly enough to include possible adjustments to the scheme's parameters.

- **The proposed scheme was labeled and perceived as "compulsory."** The official characterization of the proposed scheme as "compulsory" strongly reduced its popular support. The extensive public debate that preceded the referendum somehow failed to demonstrate that it was no more compulsory than the existing public scheme and, at least, it allowed some consumer choice regarding possible investment alternatives.

73. A pension scheme is expected to provide income insurance for old-age people, to be fair, to avoid excessive distortions and disincentives, to be fiscally sustainable, and to be compatible with national saving targets. Designing such a scheme is not an easy task. In addition, because most industrial countries already have a pension scheme in place, replacing it with a new scheme necessarily requires a very careful design of the transition procedure.

74. Paradoxically, the main weakness of the existing pay-as-you-go pension schemes and the main argument for replacing them with new and better schemes, namely the fiscal sustainability problem, makes it extremely difficult for the current generation to embrace a change. The reason is that if future liabilities are explicitly recognized, the adverse demographic dynamics make terminating a pay-as-you-go scheme an extremely expensive affair, and the current working generation must carry a significant part of the cost; and if these liabilities are not recognized, then the current working generation must lose a significant part of the benefits which it already "paid for" through large tax contributions in the past. In any case, the current working generation needs to make a significant sacrifice when replacing a pay-as-you-go system.

75. For these reasons, governments are in general slow to seriously address the issue of pension reform, and they are extremely reluctant to propose a clear-cut reform plan. The government of New Zealand proved to be a remarkable exception in this respect. The scheme that it proposed, despite its significant drawbacks (in particular, an imperfect design of the top-up part of the scheme), was a reasonable one and, at least, it successfully addressed the problem of fiscal sustainability.

References

Carling, Robert, and Geoffrey Oestreicher, 1995, "Singapore's Central Provident Fund," IMF Paper on Policy Analysis and Assessment 95/11 (December) (Washington: International Monetary Fund).

Chand, Sheetal K., and Albert Jaeger, 1996, *Aging Populations and Public Pension Schemes* IMF Occasional Paper No. 147 (December) (Washington: International Monetary Fund).

Chiao, Yen-Shong, and Ian Walker, 1992, "Labour Market Behavior of Prime Age Individuals," Paper Five in Prebble and Rebstock (eds.), *Incentives and Labor Supply: Modeling Taxes and Benefits* (Wellington: The Institute of Policy Studies).

Cook, Diana, and John Savage, 1995, "The Fiscal Impacts of an Aging Population: Report to the Office of the Retirement Commissioner," NZIER Working Paper No. 95/33 (October) (Wellington: New Zealand Institute of Economic Research).

Costello P., and J. Newman, 1997, *Savings: Choice and Incentive*, Statement by the Treasurer, Treasury, Canberra (May).

Diamond, Peter, and Salvador Valdes-Prieto, 1994, "Social Security Reforms," Chapter 6 in Bosworth, Dornbusch, and Laban (eds), *The Chilean Economy: Policy Lessons and Challenges* (Washington: The Brookings Institution).

Economist, The, 1997, "Pension Reform: A Model Shows Its Age," (September 13), p. 78.

Edwards, Sebastian, 1996, "The Chilean Pension Reform: A Pioneering Program," NBER Working Paper No. 5811 (November) (Cambridge, Massachusetts: National Bureau of Economic Research).

Feldstein, Martin, 1995, "Would Privatizing Social Security Raise Economic Welfare?," NBER Working Paper No. 5281 (September) (Cambridge, Massachusetts: National Bureau of Economic Research).

———, and Andrew Samwick, 1997, "The Economics of Prefunding Social Security and Medicare Benefits," NBER Working Paper No. 6055 (June) (Cambridge, Massachusetts: National Bureau of Economic Research).

Gallagher, P., 1997, *Assessing the National Saving Effects of the Government's Superannuation Policies*," Retirement Income Modeling Task Force paper, Treasury, Canberra (June).

Gwartney, James, and Richard Stroup, 1983, "Labor Supply and Tax Rates: A Correction of the Record," *American Economic Review*, Vol. 73, No. 3, pp. 446–51 (June).

Holzmann, Robert, 1997, "Pension Reform, Financial Market Development, and Economic Growth: Preliminary Evidence from Chile," IMF *Staff Papers*, Vol. 44, No. 2, pp. 149–78 (June) (Washington: International Monetary Fund).

Housman, Jerry A., 1981, "Labor Supply," in Aaron and Pechman (eds.), *How Taxes Affect Economic Behavior* (Washington: Brookings Institution).

Husain, Aasim M., 1995, "Determinants of Private Saving in Singapore," Chapter VII in Bercuson (ed.), *Singapore: A Case Study in Rapid Development*, IMF Occasional Paper No. 153 (Washington: International Monetary Fund).

Kotlikoff, Laurence J., 1995, *Privatization of Social Security: How it Works and Why it Matters*, NBER Working Paper 5330 (Cambridge: National Bureau of Economic Research).

Mackenzie, G.A., Philip Gerson, and Alfredo Cuevas, 1997, *Pension Regimes and Saving*, IMF Occasional Paper No. 153 (August) (Washington: International Monetary Fund).

New Zealand Government, 1997, "You and Your Retirement Savings: The Proposed Compulsory Retirement Savings Scheme."

Roseveare, Deborah, Willi Leibfritz, Douglas Fore, and Eckhard Wurzel, 1996, *Ageing Populations, Pension Systems and Government Budget: Simulations for 20 OECD Countries*, OECD—Economics Department Working Papers No. 168.

Periodic Report Group, 1997, "1997 Retirement Income Report: A Review of the Current Framework," Interim Report (July).

Polackova, Hana, 1997, "Population Aging and Financing of Government Liabilities in New Zealand," World Bank Policy Research Working Paper No. 1703 (February).

Sarel, Michael, 1994, "On the Dynamics of Economic Growth," IMF Working Paper No. 94/138 (Washington: International Monetary Fund).

———, 1995, "Demographic Dynamics and the Empirics of Economic Growth," *Staff Papers*, Vol. 42, pp. 398–410 (June) (Washington: International Monetary Fund).

———, 1996, "Growth and Productivity in New Zealand," *New Zealand—Selected Issues and Statistical Appendix*, IMF Staff Country Report No. 96/144 (Washington: International Monetary Fund).

World Bank, 1994, *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth* (New York: Oxford University Press).

Table II.1. New Zealand: Demographic Projections

	1995	2000	2005	2010	2020	2030	2040	2050	2060	2100
					(In thousands)					
Total population	3,599	3,768	3,920	4,061	4,301	4,484	4,586	4,644	4,697	4,836
0-14	827	858	851	852	853	857	854	856	855	855
0-4	277	287	281	281	287	285	285	286	285	285
5-9	289	280	289	282	285	286	284	285	285	285
10-14	261	291	281	289	281	286	285	285	285	285
15-64	2,351	2,479	2,613	2,708	2,774	2,750	2,759	2,790	2,788	2,806
15-19	262	264	293	282	283	285	285	283	285	285
20-49	1,620	1,656	1,676	1,684	1,671	1,681	1,686	1,687	1,691	1,697
50-64	469	559	644	742	820	784	788	820	812	824
65+	421	431	456	501	674	877	973	998	1,054	1,175
65-69	134	123	138	159	219	262	247	238	254	262
70-74	113	118	110	126	191	233	229	225	249	252
75+	174	190	208	216	264	382	497	535	551	661
					(In percent)					
Population growth rate	0 9	0 9	0.8	0 7	0 5	0 4	0.2	0 1	0 1	0.1
(Statistics NZ - mid projections) 1/		(0 8)	(0 7)	(0 5)	(0.5)	(0 3)	(0 0)	-(0.1)	.	...
(Statistics NZ - high migration) 2/		(0.9)	(0.8)	(0 7)	(0 6)	(0 4)	(0 2)	(0.1)		..
Old-age dependency ratio (65+ / 15-64)	17 9	17 4	17 5	18.5	24.3	31.9	35 3	35 8	37 8	41.9
(Statistics NZ - mid projections) 1/	(17 9)	(17 9)	(18.7)	(19.6)	(25.5)	(34.2)	(40.6)	(42 2)	..	.
(Statistics NZ - high migration) 2/	(17.9)	(17.8)	(18 5)	(19 3)	(24.9)	(32 9)	(38 7)	(40.4)		..
Persons over 65 (as percent of total)	11 7	11 4	11 6	12 3	15 7	19.6	21 2	21 5	22.4	24 3
Males	5 0	5.0	5.1	5 4	6.9	8.4	9.0	9 2	9 9	10.8
Females	6 7	6 4	6.5	6.9	8.8	11.2	12 2	12 3	12 6	13.5
Persons 70+ (as percent of persons 65+)	68.2	71 5	69 7	68.3	67.5	70 1	74.6	76 2	75 9	77 7
School-age dependency ratio (5-19 / 20-64)	52.1	50 7	49 3	46 7	45 6	46.3	46 0	45 4	45 5	45 2
Very-young dependency ratio (0-4 / 20-49)	17.1	17.3	16 8	16 7	17.2	17 0	16.9	17.0	16.9	16.8

Sources. Statistics New Zealand; and World Bank

1/ Assuming medium fertility, medium mortality, and annual net migration of 5,000.
2/ Assuming medium fertility, medium mortality, and annual net migration of 10,000.

Table II.2. New Zealand: Projected Expenditure on the Public Pension Scheme

(As percent of GDP)

	1995	2000	2005	2010	2020	2030	2040	2050	2060	2100
Current scheme 1/										
Total gross expenditures on superannuation 2/	5 7	4 9	4 8	5 1	6 8	8 8	9 7	9.9	10 4	11 5
Net expenditures on "basic" superannuation 3/	4 2	3 6	3 6	3 8	5 0	6 5	7 2	7.3	7 7	8 5
Additional reforms										
(1) Transition from 65+ to 68+ during 2015-27	4 2	3 6	3 6	3 8	4 5	5 1	5 8	6 0	6 3	7 1
(2) Reduction in benefits by 23 percent during 2015-50	4 2	3 6	3 6	3 8	4 8	5 9	6 0	5 6	5 9	6 6
(3) Both (1) and (2)	4 2	3 6	3 6	3 8	4 3	4 6	4 8	4 6	4 9	5 5
Pre-funding in addition to Reform option (3)										
Net transfers to fund	0 0	0 0	1 1	1 1	0 5	0 3	0 0	0 2	0 0	-0 6
Total expenditures (including net transfers to fund)	4 2	3 6	4 6	4 8	4 8	4 8	4 8	4 8	4 8	4 8
Total assets in fund	0 0	0 0	3 6	9 7	17 6	25.3	28 7	32 8	37 8	38 5
Higher immigration rates 4/	4 2	3 6	3 5	3 7	4 8	6 0	6 5	6 7	7 0	7 8
Comparison to other studies										
This study - Total gross expenditures 2/	5 7	4 9	4 8	5 1	6 8	8 8	9 7	9 9	10 4	11.5
(Polackova (1997) projections)	(5 7)	(4 7)		(5 1)	.	(8 8)	. .	(10 2)		
(NZIER (1995) projections)	(5 7)	(4 5)		...	...	...	.	(9 4)	...	
(Todd-St John (1997) projections) 5/	(5 7)	(4 9)	(4 8)	(5 0)	(6 4)	(8 6)	(10 4)	(10 8)	...	
Average benefit per retiree (in 1995 $NZ)										
Current scheme (and also Reform option (1))	7,698	8,440	9,153	9,834	11,156	12,538	14,047	15,571	17,130	24,226
Reform option (2)	7,698	8,440	9,153	9,834	10,788	11,298	11,732	11,977	13,177	18,635
Old-age dependency ratio (in percent)	17 9	17.4	17 5	18 5	24 3	31 9	35 3	35 8	37 8	41 9
(Statistics NZ - mid projection)	(17 9)	(17 9)	(18 7)	(19 6)	(25 5)	(34 2)	(40 6)	(42.2)		
(Statistics NZ - high migration)	(17 9)	(17 8)	(18 5)	(19 3)	(24 9)	(32 9)	(38 7)	(40 4)	...	...
Memorandum item: assumptions (percent per annum)										
Productivity growth.	1 9	1.8	1 6	1 4	1 2	1 1	1 1	1 0	0 9	0 8
Real GDP potential growth	3 1	2 9	2 6	2 1	1.2	1 1	1 2	1 0	0 9	0 8

Source: Authors' simulations

1/ Includes a transition from 62+ to 65+ during 1995-2001

2/ Includes recollected taxes, allowances for singles, and other costs

(Singles receive about 10 percent more if sharing accommodations, and about 15 percent more if living alone.)

3/ Excludes recollected taxes, allowances for singles, and other costs

4/ Assuming constant net migration rates of 10,000 per year after 2000, instead of diminishing rates

5/ Figures are approximate, based on Figure 6.1 in Periodic Report Group (1997)

Table II.3. New Zealand: The Proposed Private Scheme

(As percent of GDP)

	2000	2002	2005	2010	2020	2030	2040	2050	2060	2100
Total contributions	2.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Total withdrawals	0.0	0.0	0.0	0.1	0.8	1.9	2.7	3.2	3.5	3.7
Total assets, end of year	5 2	12.1	23.3	41.4	74 3	97.0	107.1	111.8	113.7	114.7
Savings	5.2	12.1	23.0	40.0	66.5	80.5	86.3	88.7	88.3	88.6
Annuities	0.0	0.0	0.2	1.4	7.8	16.5	20.8	23.0	25.4	26.1
Net increase in assets	2.8	3 9	4.2	4.3	3.8	2.7	1.9	1.5	1 2	1.4
Taxes on interest earnings	0.0	0 1	0 2	0.4	0 6	0 8	0.8	0 7	0 8	0.7
Average withdrawals at age 73										
Males										
In 1995 $NZ	0	0	0	0	2,756	6,641	10,583	14,221	16,691	23,783
(As percent of GDP/person)		(0.0)	(0.0)	(0.0)	(7.9)	(17.6)	(25.5)	(31 1)	(33 5)	(34.5)
(As percent of current (unreformed) superannuation scheme)		(0 0)	(0.0)	(0.0)	(24 7)	(53.0)	(75.3)	(91.3)	(97.4)	(98 2)
Female										
In 1995 $NZ	0	0	0	0	911	2,600	4,199	5,600	6,620	9,436
(As percent of GDP/person)		(0.0)	(0.0)	(0.0)	(2.6)	(6.9)	(10.1)	(12.2)	(13.3)	(13.7)
(As percent of current (unreformed) superannuation scheme)		(0.0)	(0.0)	(0.0)	(8.2)	(20.7)	(29.9)	(36.0)	(38.6)	(38.9)
Memorandum items:										
Retirement savings target in 1997 (to buy annuity equal to superannuation):			males:	108,377	females	132,240				
Assumptions (percent per annum)										
U.S productivity growth (adj. for demog.):	0.7	0.7	0.7	0.7	0 7	0 7	0.7	0.7	0 7	0.7
N.Z. productivity growth (adj. for demog.).	1 5	1 5	1.4	1.3	1 2	1.1	1.1	1.0	0.9	0.8
N.Z. productivity growth (total, incl. demog.):	1.9	1.8	1.6	1.4	1.2	1.1	1.1	1.0	0.9	0.8
Real GDP potential growth:	3.1	2 9	2.6	2.1	1 2	1.1	1.2	1.0	0.9	0.8
Real rate of return	3.4	3.3	3.1	2.9	2.7	2.4	2.2	2.1	2.0	1.9

Source: Author's simulations.

Table II.4. New Zealand: Macroeconomic Effects of the Proposed Scheme

(As percent of GDP)

	2000	2002	2005	2010	2020	2030	2040	2050	2060	2100
Net fiscal effect over New Zealand superannuation (NZS)										
Total effect	-1.6	-2.9	-3.0	-3.1	-2.8	-1.7	-0.5	0.0	0.4	1.9
Direct effect	-1.6	-2 7	-2.6	-2.3	-1.4	-0.1	1.0	1.3	1.5	1.9
Reduction in expenditure	0.0	0.0	0.1	0.2	0.9	2.1	3.1	3.4	3.7	4.1
Reduction in taxes 1/	1.6	2.7	2.7	2.5	2.3	2.1	2.1	2.2	2.1	2.2
Secondary effect (through accumulated interest earnings)	-0.1	-0.2	-0.4	-0.8	-1 4	-1 6	-1.5	-1.3	-1.1	0 0
Total effect, assuming tax cuts are given in any case	0.0	0 1	0.3	0.7	1.9	3.8	5.6	6.8	8.3	14.3
Net increase in national saving										
Total increase, central scenario	0 6	0.5	0.6	0.6	0.5	0 5	0.7	0.7	0.8	1 7
Increase in public saving	-1 6	-2.9	-3.0	-3.1	-2.8	-1.7	-0.5	0.0	0 4	1.9
Increase in private saving	2 2	3.4	3.6	3.7	3.3	2 2	1.2	0.8	0.4	-0 3
Caused by increase in private pension assets 2/	1 4	1 9	2 1	2.1	1 9	1.4	1.0	0.7	0 6	0 7
Caused by an offset to the change in public saving 3/	0 8	1 4	1 5	1.6	1.4	0.8	0.3	0.0	-0 2	-1 0
Alternative scenarios for increase in national saving										
Scenario A 4/	1.2	1 0	1.1	1.2	1.1	1 1	1.4	1.4	1.6	3.3
Scenario B 5/	0.0	0.0	0.0	0.0	0 0	0.0	0.0	0.0	0.0	0 0
Scenario C 6/	-1.6	-2.9	-3.0	-3.1	-2.8	-1.7	-0.5	0.0	0.4	1.9
Scenario D 7/	2 8	3.9	4.2	4.3	3.8	2 7	1.9	1.5	1.2	1 4
Broader fiscal projections										
Total net fiscal costs of pensions and other major programs 8/										
Existing NZS	23.2			23.8		30.0		34.3		37 6
Proposed retirement savings scheme (RSS)	24.8			26.9		31.6		34.4		35.7
Memorandum items:										
Net fiscal expenditure on the existing NZS (incl. on singles)	4.0	3.9	3.9	4.2	5.5	7.2	7.9	8.0	8.5	9.4
Net fiscal expenditure on the proposed RSS (incl. on singles) 1/	4.0	3.8	3.6	3.6	4.0	4.3	4.0	3.9	4.0	4.6

Source: Author's simulations.

1/ Adjusting for taxes collected on interest earnings
2/ Assuming each additional dollar in private pension assets increases private savings by 50 cents.
3/ Assuming each additional dollar of decrease in public savings increases private savings by 50 cents.
4/ Zero offset of both public savings and private pensions.
5/ Full offset of both public savings and private pensions
6/ Zero offset of public savings, full offset of private pensions.
7/ Full offset of public savings, zero offset of private pensions.
8/ Using projections of Polackova (1997, p. 15); includes health, education, unemployment, domestic purposes, other social welfare, and defense; estimate for 2100 based on figures, assuming growth rate of health expenditures similar to growth rate of pension expenditures.

TYPICAL PROBLEMS WITH PUBLIC AND PRIVATE PENSION SCHEMES

Besides the projected increase in the fiscal burden, there are also other problems inherent in a pay-as-you-go public pension scheme, such as the New Zealand superannuation (in which current expenditure on pensions is financed by taxes on current income). However, it is clear that the main alternative to the pay-as-you-go system, namely introducing a system based on defined-contribution private pension schemes, also faces serious problems and challenges. This Appendix summarizes the typical problems with both systems.

Typical problems with a public pension scheme

- **Disincentives to work and save**. The negative effects on work and saving occur because the need to finance the current generation of retirees increases the tax rates levied on the current working generation and because a guaranteed level of income during retirement is provided by the public pension scheme.

- **Diminished development of private capital markets and financial instruments**. The negative effect on capital markets occurs because the public scheme reduces the scope for pension funds and annuity markets.

- **Intergenerational redistribution**. The problem of intergenerational redistribution exists in any pay-as-you-go system, and is amplified by a demographic transition to a higher old-age dependency ratio.

- **Risk of political interference**. Because of its potential for policy-induced income redistribution, a pay-as-you-go pension system might generate strong political lobbies and political battles. Not only does this create an abundance of lobbies and interest groups that crowd out more productive activities, but it also introduces an element of uncertainty regarding the future of the scheme, upon which the intergenerational equity of the system is supposed to be based.[47]

- **Risk limitations which severely restrict the rate of return which can be earned by individuals on their savings**. A pay-as-you-go system is always compulsory and, when mature, it generally offers a low rate of return (roughly equal to the sum of

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[47]Other pension systems, such as defined-benefit schemes, can also be subject to political interference (e.g., a string of poor returns may generate pressure for a government subsidy, and issues such as taxation of capital, retirement age, and transferability of funds may also become political hot potatoes). However, this problem is more severe in pay-as-you-go schemes, because the fiscal sustainability problem of pay-as-you-go schemes (caused by adverse demographic dynamics) virtually guarantees political interference at some point in the future.

working-age population growth and real wage growth), which usually is dominated by other existing investment alternatives.

Typical problems with a private pension scheme

- **High administrative costs**. The administrative costs of a private scheme with competing funds are in general significantly higher than those of a public scheme (especially if the public scheme is financed from general revenue and does not require a separate collection bureaucracy). These costs include the public costs of regulation and supervision, the costs of marketing and managing the funds, and the compliance costs of employers (who need to collect contributions).[48]

- **Increased private and fiscal uncertainty**. Although the expected rate of return in a private scheme is usually higher than in a public scheme, possible variations in the rate of return are also much higher, creating uncertainty for participants. In addition, the public costs of a private scheme are uncertain, given the (sometime implicit) government guarantee of a minimum return.

- **Controversial reliance on well functioning of annuity markets**. Many countries currently do not have well-functioning markets for annuities, which are required for private pension schemes, and introduction of such schemes need to rely on the assumption that the schemes themselves will induce the development of these markets.

- **Complex regulatory mechanisms**. The explicit (or implicit) government guarantee of a minimum return requires the government to set up a complex regulatory mechanism, to ensure competent and prudent management of the funds, and to prevent fraud.

- **A transition period which might impose significant costs on the current generation (and might also deteriorate the fiscal position and decrease saving)**. The current working generation, through the contributions (or taxes) it paid in the past, had acquired some implicit claims on future benefits. Privatizing an existing pay-as-you-go system requires the government to deal with this issue. Ignoring these claims would make the current generation "pay twice." Recognizing these claims would require the government to bear the costs, either by cutting other expenditure, raising taxes, or issuing debt. In any case, the current generation will still need to carry a significant part of the transition costs. In case the government shares in this burden (by reducing tax rates and issuing public debt), the fiscal position deteriorates and the national saving rate can decrease (especially in the short and medium term).[49]

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[48]The high marketing costs of the investment funds in the Chilean scheme are a notable example (see Appendix II.3).

[49]For a comprehensive discussion of the relationship between pension regimes and saving, see IMF Occasional Paper by Mackenzie, Gerson, and Cuevas (1997).

THE EXISTING NEW ZEALAND SUPERANNUATION SYSTEM

The current superannuation system consists of a public pension scheme—New Zealand superannuation (NZS)—and private voluntary schemes.

The public scheme

The NZS scheme is a compulsory, collective "pay-as-you-go" pension scheme, administered by the government and funded from general tax revenues. The benefits are universally available to all persons who have reached the age of entitlement—subject only to ten years residency. The age of entitlement was 60 until April 1992, and is now in the process of being gradually increased, to 65 in April 2001.

The superannuation is based on the Accord, an agreement binding four political parties—National, Labour, Alliance, and United. Broadly speaking, it guarantees the share of national income received by New Zealand retirees. The Accord sets the after-tax rate of superannuation for a couple to at least 65 percent of average after-tax, ordinary time earnings (in 1997, the after-tax benefit for a couple was equal to $NZ 321 per week).[50] Single persons receive an additional allowance (about 15 percent more if living alone, and about 10 percent more if sharing accommodations).

In 1995, the pensions were received by nearly 500,000 persons—some 14 percent of the total population. The gross fiscal cost was estimated at 5.7 percent of GDP in 1995, but is expected to decline to less than 5 percent of GDP by 2001, as the retirement age is gradually increased to 65 (the net fiscal cost is about 15 percent less, because benefits are subject to income tax).

Private superannuation schemes

In addition to the public scheme (NZS), there also exist many private pension schemes. The contributions to these schemes are usually made by both employees and employers. Membership of the schemes is quite significant (about 800,000 members in 1996), but average retirement savings per investor are modest. As a result, the total amount invested in such funds is not large (about $NZ 15 billion in 1996).

The tax regime effectively treats superannuation schemes in the same way as most other forms of saving in New Zealand. Contributions to superannuation schemes are made from tax-paid funds (i.e., there are no tax concessions for contributions), all income gains of

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[50]The pensions constitute assessable income for tax purposes and is, therefore, subject to income tax at normal personal marginal rates. On average, the pensions are taxed at a rate of 15 percent. The pensions are also liable to a significant surcharge on additional income. However, this surcharge will be eliminated in 1998.

the schemes are subject to tax, and all distributions from such schemes (whether in lump sum or pension form) are received by members tax free.

The government appointed in 1991 a task force (known as the "Todd Task Force") to consider the private provision of retirement income in New Zealand and the treatment of saving for retirement. In its final report of December 1992, the Task Force recommended that the private provision or retirement saving (which complements the compulsory public scheme) will be voluntary and without tax incentives. This is essentially a continuation of the existing regime (the other two main options that were considered were compulsory retirement saving and voluntary retirement saving with tax incentives). However, the Todd Task Force reserved the position that, if a significant increase in private saving for retirement has not occurred by 1997, the government should reconsider the prospect of introducing a compulsory saving regime.

INTERNATIONAL EXPERIENCE WITH PRIVATIZING PENSION SCHEMES

This Appendix summarizes the experience of three countries that opted for a defined-contribution private scheme. The first, Singapore, introduced such a scheme in 1955, and never had a pay-as-you-go system. The second, Chile, had a very negative experience with its pay-as-you-go public scheme, and switched to a defined-contribution private scheme in 1981. The third, Australia, recently moved from an unfunded public scheme to a partly government funded-partly private funded retirement scheme.

Singapore[51]

Singapore's Central Provident Fund (CPF) was initiated in 1955. The CPF is a compulsory saving scheme under which employees and employers are required to contribute a portion of labor income to CPF accounts, which are specific to individuals. Members may withdraw their CPF savings, after setting aside a fixed amount, upon reaching the age of 55. The fixed amount is used to pay monthly returns to members after they reach the age of 60. In addition to retirement benefits, withdrawals from the CPF are also permitted in the event of permanent disability or upon permanent emigration from Singapore.

Contribution rates were originally set at levels at which individuals could accumulate enough savings to finance a basic retirement income. Over the years, the CPF has been broadened as a saving vehicle to help finance individuals' housing, health, investment, and other outlays. Starting from mandatory contribution rates of 5 percent of wages by employees and 5 percent by employers in 1955, the rates of contribution remained unchanged until 1968 but were then gradually increased to a peak in 1984 of 25 percent each for employees and employers. In 1986, the employers' contribution rate to the CPF was reduced to 10 percent as a measure to counter the recession. Between 1988 and 1994, the employer contribution rate has been gradually increased and the employee contribution rate gradually reduced. Since July 1994, both contribution rates are 20 percent. Employees' contributions to the CPF are excluded from their taxable earnings both when contributed and withdrawn. In addition, earnings on members' balances are tax exempt.

Uses of CPF savings have been liberalized over time. Under the liberalization policy, CPF savings could initially be used to purchase publicly built housing and, later, private residential property. As a result, home ownership is now nearly universal. More recently, withdrawal facilities have been expanded to include investment, education, Medisave, and CPF-administered life, health, and home insurance schemes.

CPF saving has increased relative to GDP since the 1960s, but the CPF's share of total private saving has declined in recent years (to about 40 percent). Withdrawals of CPF savings

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[51]This section follows closely the description and analysis of the Singaporean pension system by Husain (1995) and by Carling and Oestreicher (1995).

have increased over time, reflecting the liberalization of approved withdrawal schemes as well as the increased stock of the total CPF balance. More than one-half of withdrawals in recent years have been for housing.

The sizable mandatory CPF contribution rates have attracted attention. While these rates appear high in comparison with social security schemes in other countries, the fully funded and individual-specific nature of CPF saving does not afford a direct comparison with pay-as-you-go social security programs of other countries. Also, expanding withdrawal facilities for home ownership and investment purposes has enlarged the role of CPF saving considerably beyond that of a social security scheme.

Assets of the CPF peaked at more than 70 percent of GDP in 1986, and gradually declined to around 55 percent of GDP in 1994, and most of these balances are invested in government bonds. Interest earned on CPF saving balances is deposited into members' CPF accounts. The real rate of return during 1980–95 has been around 2 percent. While the CPF is the main lender to the government, the funds are not needed for budget financing and are invested (mainly as overseas portfolio investment) by the Government Investment Corporation.

The high level of mandatory saving through the CPF may have been a factor responsible for Singapore's high overall private saving rate. This point has been addressed by Husain (1995). His work suggests that, on average, over the period 1970–92, variations in CPF saving did not have a statistically significant effect on private saving, and that Singapore's high saving rate could be explained by demographic factors, the rapid growth of private disposable income, and the high level of budgetary saving.

As Husain notes, however, the CPF was probably a factor in Singapore's rising saving rate, even until the early 1980s, when withdrawal criteria were less liberal and the degree of substitutability with other saving was lower. Today, the CPF may still raise the saving propensity of low-income households, which might otherwise choose to consume more, although having little effect on aggregate saving. The effect on the disposition of private savings is a separate matter, because the fact that members are not free to allocate their balances to the full range of saving instruments represents a potential distortion. In addition, the arrangements favor particular forms and uses of savings, especially investment in housing.

Chile[52]

Background

The 1981 reform of the pension system in Chile has been undertaken in the context of a comprehensive market-oriented structural reform program that was initiated in 1975. The decision to undertake the reform responded to four considerations: (i) the explosive fiscal consequences of the old regime; (ii) the high degree of inequality of the old system; (ii) its implied efficiency distortions; and (iv) an ideological desire to reduce drastically the role of the public sector in economic affairs. Interestingly enough, in explaining the reform, the Chilean authorities barely referred to the potential effects of the new system on domestic saving.

The pension system in Chile originated in the 1920s. By the 1970s, the system had become an insolvent pay-as-you-go regime. An important characteristic of the old system was a complete lack of uniformity regarding benefits and retirement ages, which varied considerably across occupations, in general benefiting more high-income workers.

In 1981, the government decided to introduce a sweeping reform to the pension system. As a way to increase the appeal of the new system, and reduce political opposition, the contribution rates were set at a level that resulted in an increase of net take-home pay for those that joined the new system (given the anticipated higher rates of return on the accumulated funds, it was expected that the lower contribution rates would be enough to finance higher rates of replacement for pensions).

The new pension system is based on individual retirement accounts managed by companies known as AFPs.[53] Each AFP can manage only one retirement fund. Workers have the freedom to choose the AFP they want to be affiliated to, and can transfer their funds freely among them (up to four times a year). The retirement age is 65 for men and 60 for women, but early retirement is possible under certain conditions.

The system is obligatory, requiring that every worker participates in the new system (or, in the case of older workers, continues with the old system).[54] The volume of privately

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[52]This section follows closely the excellent description of the Chilean pension reform by Edwards (1996), who relies on various sources, including a comprehensive analysis by Diamond and Valdes-Prieto (1994).

[53]When the new system was launched in 1981, there were 12 pension management firms. By 1995, the total number had increased to 21.

[54]The total coverage of the system in 1994 was 63.5 percent of total employed persons. Of these, 58 percent belonged to the new system, and 5.5 percent to the old system. The

(continued...)

managed pension funds increased from 10 percent of GDP in 1985 to 43 percent of GDP in 1995, and are expected to reach 110 percent of GDP by 2010. The obligatory contribution rates by employees are equal to 10 percent of the worker's disposable income. Employees can also make voluntary contributions (up to a certain limit).[55] Required contributions are tax deductible, as is the income accrued to the accumulated fund during the contributor's active life. Once the worker retires, however, the pension becomes subject to income tax, as any other source of income. When individuals retire, they can choose either to buy an annuity or to withdraw their funds according to a preprogrammed plan. The actual rate of replacement for standard old-age pensions has differed slightly between annuities (about 74 percent) and preprogrammed withdrawals (about 83 percent). Both of these rates, however, are significantly higher (for most workers) than under the old pay-as-you-go system.[56]

Fees and commissions are determined freely by the AFPs. The government plays a fundamental role in the system, regulating and monitoring the operation of the AFPs. This role is performed by an institution especially created for this purpose—the Superintendency of AFPs—that established from the first day very precise norms to secure the diversification and transparency of AFP investments. During the early years, investment by the funds was largely restricted to government securities. In 1985, AFPs were allowed to invest up to 5 percent of the funds in equities. In 1989, they were allowed to invest in real estate and, in 1992, they were permitted to invest up to 9 percent of the funds in foreign securities.[57]

The government guarantees a minimum return on accumulated funds, in case the AFP significantly underperforms (relative to the other AFPs). In addition, the government guarantees a minimum pension to poorer participants in the system. The value of the minimum pension is adjusted from time to time and, in general, it is approximately equal to 25 percent

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[54](...continued)
relatively low percentage of active contributors is explained by the fact that self-employed are not required to participate in the system and, for a variety of reasons (including some tax considerations and moral hazard caused by a government-guaranteed minimum pension) have no incentives to make voluntary contributions.

[55]In addition to retirement pensions, the system also contains survivor's benefits (term life insurance) and a disability program, funded with an additional insurance premium (about 3 percent of wages, up to a maximum wage base.

[56]The coexistence of old- and new-system retirees allows for a direct comparison of pensions under the old and new systems. To December 1994, average old-age pensions under the new system were 42 percent higher than under the old system. In the case of disability pensions, the difference is even larger: 62 percent higher under the new system.

[57]Surprisingly, there has been a very limited interest in investing in foreign instruments. By December 1995, less than 1 percent of the accumulated funds had been invested abroad.

of average wages. In addition to its involvement in these areas, the Chilean government also makes pension payments to those individuals that, either by choice or because of their age, did not transfer to the new system. In some recent years, the cost of paying these pensions has been more than 4 percent of GDP.

The Chilean system imposes lower and upper limits to the return AFPs have to pay to their members.[58] Those AFPs that do not obtain the minimum return have to make up the difference from funds withdrawn from an "investment reserve" (which is especially set up for this purpose and has to amount to at least 1 percent of the total value of the fund). If an AFP cannot meet a profitability shortfall out of its reserves, it is liquidated (and the government makes up the difference). AFPs that exceed the maximum return have to deposit the excess funds on a "profitability reserve," to be used if, in a subsequent year, the AFP underperforms.

Rates of return on the accumulated funds have been nothing short of spectacular. Between 1981 and 1995, the funds earned an average real rate of return of 12.6 percent.[59] Real returns were negative in 1995 and reached only 3.5 percent in 1996, but rebounded to 8 percent during the first two-thirds of 1997.[60] It is clear that these high rates of return have been largely the result of Chile's economic circumstances during this period. Chile has experienced a tremendous growth period where the value of assets, and in particular firms, increased at a very fast rate. Additionally, between 1985 and 1991, real interest rates were very high, allowing funds that invested in fixed income securities to experience very healthy returns.

The transition

When the pension system was introduced in 1981, the new Chilean pension law established that workers that joined the labor force before the end of 1982 had five years to decide whether to join the new system. Those joining the labor force after that date could not participate in the old system, and had to become affiliated with an AFP of their choice. Since those that joined an AFP experienced an immediate increase in net take-home pay of 11 percent, the number of people transferring to the new regime was very high. The government dealt with past contributions of transferees by issuing bonds (called "recognition bonds"), which were deposited in their AFP accounts.

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[58]The minimum is either 50 percent of the average return across AFPs, or 2 percentage points below the average—whichever is higher. The maximum allowable return is 50 percent or 2 percentage points over the average across AFPs.

[59]Based on calculations using data provided by Edwards (1996, Table 4).

[60]See The Economist (1997).

The transition generated two major sources of public expenditure: (i) payment of pensions to retirees in the old system; and (ii) servicing and payment of the recognition bonds. The costs totaled 4–5 percent of GDP during the 1980s but, after 1990, are slowly declining and are expected to reach 3.5 percent of GDP by 2000 and 2 percent of GDP by 2010.[61] Chile has opted to directly finance these costs out of general government revenues. This choice required a strong fiscal consolidation in areas other than pensions.

Macroeconomic effects

Because the comprehensive structural reforms program caused very substantial changes in the Chilean economy over the last 20 years, it is difficult to use time-series techniques to estimate the effects of the pension reform.[62] However, it is conceivable that it made a significant contribution to the phenomenal increase in the country's growth and saving rates, as well as the rapid development of the financial sector.

The effect on saving rates has taken place mostly through an increase in public sector saving (by close to 5 percent of GDP between 1983 and 1993).[63] The effect of the pension reform on private saving probably included a positive direct effect (meaning that the offset of voluntary saving to new compulsory saving was less than full) and, perhaps more importantly, a positive indirect effect through higher growth rates.[64]

The effect of the pension reform on financial market development is quite evident. Pension funds are the largest institutional investors in the Chilean capital market, with assets exceeding 40 percent of GDP, compared with 1 percent of GDP in 1981. The massive amount of funds that AFPs control has helped create a dynamic and modern capital market. What is

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[61]The high cost during the period that immediately followed the reform reflect the cost of pensions to existing retirees. As the number of existing retirees in the system declines, these costs gradually decrease. In the longer term, the costs will mainly reflect payments of interest on the recognition bonds.

[62]Some studies nevertheless attempted to estimate these effects. For example, Holzmann (1997) presents empirical results that are consistent with most of the claims about the positive effects of the pension reform.

[63]It is important to remember that the pension reform in Chile was done in the context of general stabilization measures. However, the need to reduce government expenditure in other areas in order to pay the short-term costs of the pension reform probably contributed to the long-term increase in public saving.

[64]Another indirect effect may operate through the development of the financial markets. The direction of this effect, however, is theoretically ambiguous. Holzmann (1997) presents empirical evidence suggesting that this effect is negative.

perhaps more important, however, is that it has allowed private firms (and, especially, newly privatized utilities) to rely on long-term financing for their investment projects. This kind of long-term private financing is particularly important for Chile's ambitious infrastructure program.

The pension reform has probably also had an important effect on the functioning of the labor market. Chile experienced a rapid job creation, that has resulted in the reduction of the rate of unemployment from 25 percent to less than 6 percent of the labor force. By reducing total rates of payroll taxes and effective taxes on labor, the pension reform has reduced the cost of labor and has encouraged employment creation.

Specific weaknesses and possible lessons

The combination of the "one fund per AFP" and the minimum/maximum profitability rules have resulted in AFPs having very similar portfolios. Although this homogeneity of results may have some political appeal, it introduces significant economic distortions. In particular, it does not allow people with different tolerances for risk to have different portfolios. A way to correct this problem would be to allow two or more funds per AFP, and to relax the rules on minimum and maximum rates of return.

A number of critics have argued that the Chilean system is exceedingly costly. However, this criticism is not impeccable. Initially, administrative costs were indeed extremely high. In 1984, for example, they amounted to 90 percent of contributions to the retirement system. By 1994, however, costs have declined significantly, amounting to 10 percent of contributions. In terms of accumulated assets, administrative costs have declined, from almost 15 percent in 1983 to 1.8 percent in 1993, including sales costs.[65] Marketing and sales costs represent an important percentage of total administrative costs (more than one-third in 1991). Critics also complain that annuities are very expensive, costing almost 4 percent of the value of the contract. Several critics have suggested to allow for group purchase of annuities and called for a greater regulation of the industry, as a way of reducing the cost of annuities.

The biggest problem in terms of administrative costs appears to be the excessive cost of marketing. The Economist (1997) describes this problem: "The mutual funds, called AFPs, compete for Chilean workers' pension assets. Between them, the AFPs employ 18,000 sales-people—one for every 300 active workers. Since all civilians with regular jobs are already in the system, the marketers spend their time inducing workers to switch funds. One worker in four did so in 1996." A possible solution to this problem could be restricting the mobility of workers between AFPs, for example, by allowing funds to impose a small fee on participants

[65]These costs still are significantly higher than the costs incurred by government-run provident funds in Singapore and Malaysia (0.1 to 0.2 percent of accumulated assets). However, the net real rates of return to participants in Chile are many times higher, therefore making such a comparison somewhat irrelevant.

that decide to switch to another fund. Such fee could then be redistributed to the other participants in the fund.

An important problem concerns the distortions associated with the government guarantees. The design of these guarantees introduces a significant moral hazard problem. In particular, there is an incentive for lower-income individuals to minimize their contributions and to obtain the minimum pension. An easy way to reduce this problem would be to establish some relationship between the guaranteed pension level and the amount of contributions in the past.

Australia[66]

Introduction of Australia's compulsory system essentially involved a move from an unfunded pension system to a partly government funded-partly private funded retirement scheme, which nevertheless maintained a public pension safety net. In the mid-1980s, Australia began to move to introduce a system of compulsory private saving for retirement income ("superannuation") to complement its existing public pension system and private voluntary schemes.

Under the current compulsory saving arrangements, all employers were required to make superannuation contributions on behalf of their employees. Subsequently, self-employed persons have been incorporated in the scheme. The initial employer contributions were set at a rate of 4 percent of employee earnings (3 percent if the employer's payroll was less than $A 1 million). The rate of contribution rose to 5 percent in 1992/93 and 6 percent in 1995/96. Further increases are to be phased in, with contributions to peak at 9 percent in 2002/03.

The previous government had proposed that the employer contributions would be supplemented from 1997/98 onwards by contributions from individual employees and government itself; these contributions amounting, in aggregate, to a further 6 percent of payrolls by 2002/03. Overall, therefore, the aggregate contribution would have amounted to 15 percent of payrolls which was judged to be sufficient, over 40 years, to finance a pension approaching 60 percent of preretirement earnings.

The present government has decided not to proceed with co-contributions from individual employees and government sources. Instead, the contributions (by employers only) will be capped at 9 percent, which is judged to provide a pension equivalent to 43 percent of preretirement earnings over 40 years of continuous contribution (or 28 percent over 30 years). In place of the previously proposed arrangements, the government has decided to implement a broad-based saving rebate. The tax arrangements are complex, involving concessional tax rates.

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[66]This section was prepared largely by Jon Craig.

The compulsory arrangements have four effects on national saving: (i) there will be a reduction in future tax revenues arising out of the concessions available for pension contributions and earnings under the compulsory scheme; (ii) there will be a future reduction in public expenditure on pensions (arising largely out of the likelihood that an increasing number of those of pensionable age will receive only a part public pension as means tests are applied to the earnings from their compulsory savings);[67] (iii) the net increase in deficit will give rise to future increases in debt interest payments; and (iv) there will be a sizable gross increase in private saving from the compulsory contributions and subsequent accumulated earnings (which will be partly offset by decline in voluntary forms of nonsuperannuation saving).

Analysis of these factors by the Retirement Income Modeling (RIM) task force suggested that the current and proposed superannuation arrangements, including the measures announced in the latest budget, and the prescribed future schedule of contribution rates, are estimated to have a positive impact on national saving of 1.5 percent of GDP in 2001/02 rising to 3.6 percent in 2019/20.[68] In this context, it must be noted that the compulsory pension arrangements—which have now been in place for six years—appear to have had little impact on private saving to date. Total private saving continue to languish at about 15 percent of GDP—with household saving near post-World War II lows—well below the peak levels achieved in the 1970s.

One particular problem with the scheme is that benefits in private superannuation have to be preserved only until age 55, while the public pension is not generally available until age 65. There is a very strong incentive, therefore, to retire early, run down lump-sum savings, and then qualify for the public pension, when eligible. Alternatively, since the primary residence is excluded from the means test, there may be an incentive to use savings to fund excessively expensive home purchase. These incentives also appear to influence labor force participation, introducing a further doubt on the impact of the arrangements on national saving.[69]

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[67]Notwithstanding these expected savings, pensions are expected to rise from 3.2 percent of GDP in 1994/95 to 4.7 percent in 2050, as a result of the aging of the population.

[68]See Costello and Newman (1997) and Gallagher (1997). These assessments are subject to considerable uncertainty and depend importantly on the validity of specific assumptions. They exclude possible increase in saving flowing from the new saving rebate.

[69]It appears that the present public pension arrangements may be having a serious impact on work incentives for low- to middle-income workers, especially those in the 55 year age group, since their ultimate public pension payout is reduced by additional retirement income flowing from the compulsory scheme. Recent decisions to discontinue plans for a compulsory employee co-contribution and to allow low-income employees to opt out of the compulsory scheme may act to partially counter these disincentives without seriously detracting from national saving.

There might also be a significant effect on employment. Although employers can deduct contributions made on behalf of employees, the Australian scheme has nevertheless added to nonwage labor costs. The final impact of the scheme depends on where the incidence of the levy falls; if it falls on employees in the form of lower wage, it will not impact on employment, but could lead to lower discretionary saving by individuals (this approach was used by the RIM); if it remains on employers, it may impact negatively on employment.