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CANADA

Selected Issues

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Approved by the Western Hemisphere Department

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I. Assessing the Long-Term Fiscal Position of Canada[1]

1. The Canadian government has set fiscal sustainability and intergenerational equity as important policy objectives, and these goals have helped shape the broader fiscal strategy, as well as specific tax and expenditures policies. However, in Canada, as in most other industrial countries, demographic trends and pressures on health care systems are expected to make fiscal sustainability an increasingly challenging goal to achieve. This chapter assesses the extent to which Canadian fiscal policy of recent years has left the fiscal position well-placed to meet these challenges.

2. The results below are generally encouraging. Simulations based on current tax and spending policies suggest that the fiscal position will remain favorable until well into the middle of the century, and that relatively modest adjustments would be required to make these policies sustainable in the long run. At the same time, however, the analysis also illustrates that these conclusions could be easily overturned if pressures to spend the planning surpluses that are expected to emerge in coming years are not resisted and if measures are not put in place to contain the cost of health care.

A. Background and Assumptions

3. The analysis is based on a generational accounting framework, which first requires estimating the distribution of taxes and transfers across age cohorts in the current year.[2] Long-term fiscal projections are then constructed by assuming that taxes and transfers paid by the average person in each age cohort, and the level of other government outlays received by the average person in each cohort, increase in line with productivity. In the case of some expenditure or transfer categories, however, different rates of growth may be assumed to take into account policy commitments or other aspects of these programs. Given projections for the size and composition of the population, as well as for future productivity growth, these assumptions determine the evolution of aggregate public sector revenues and expenditure.[3]

4. Previous studies on Canadian long-term fiscal stance have typically projected revenues and expenditure of Canada's federal and provincial governments separately. However, the analysis below focuses on the consolidated government accounts, allowing a more comprehensive representation of the broader government sector, which is particularly

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[1] Prepared by Roberto Cardarelli.

[2] For examples of this approach's use for the United States, see the Congressional Budget Office (CBO, 2000). For Canada, see by King and Jackson (2000); Matier, Hu, and Jackson (2001); Matier and Jackson (2002) and Kennedy and Matier (2002). The Appendix describes the methodology and the data in more detail.

[3] These projections do not incorporate any feedback between the fiscal position and macroeconomic variables, such as productivity growth or interest rates. They are best interpreted as an indication of the magnitude of long-term pressures for fiscal balances if current tax and spending policies remained unchanged, given long-term economic and demographic assumptions.

important given the federal nature of Canada's fiscal system (Table 1).[4] In this chapter, the government sector is defined to include federal and provincial/territorial governments, the Canada and Quebec Pension Plans (CPP/QPP), non autonomous pension plans, health and social service institutions, and universities and colleges.

5. The **demographic projections** adopt the "medium-growth" case prepared by Statistics Canada.[5] Accordingly, during the next ten years, Canada's demographic profile is expected to remain roughly unchanged. However, between 2010 and 2030, the old-age dependency ratio (the ratio of retirees to those in the labor force) begins to increase rapidly, from around 20 percent in 2010 to slightly above 42 percent in 2036, before stabilizing at around 44 percent after 2050.

6. **Labor productivity** in the simulations below is assumed to grow at a rate of 1½ percent per year. This is broadly in line with the assumption used in other long-term fiscal projections for Canada (Jackson and Matier, 2002), and is consistent with recent Statistics Canada data that show that business sector labor productivity grew at an average rate of 1.4 percent over the period 1981-2000.

7. **Revenues:** The simulations in this chapter take into account future tax reductions that have already been announced by both the federal and provincial governments. For the federal government, personal and corporate income taxes are projected to grow over the period 2003–2008 in line with the October 2002 *Economic and Fiscal Update*. For the provinces, projections provided in the Conference Board of Canada's report *Fiscal Prospect for the Federal and Provincial/Territorial Governments* (2002) were used. Contributions to the Employment Insurance (EI) scheme are also assumed to move in line with the forecasts contained in the *Economic and Fiscal Update* until 2008.[6] After 2008, all per-capita taxes and social security contributions are assumed to increase with labor productivity.

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[4] These data are produced by Statistics Canada under the Financial Management System (FMS). The FMS uses the public accounts of the Federal, Provincial, and Territorial governments and transforms them into a common format. It also defines government more broadly than the public accounts, as it includes agencies, boards, commissions, and funds which are used for government policy even if these entities are excluded from government budgets.

[5] In this scenario, by 2026 fertility rate is 1.48, life expectancy is 80 for male and 84 for females; and immigration is 225,000. Population projections for the years beyond 2026 were obtained by assuming that the above parameters remain constant at their 2026 levels.

[6] As these forecasts assume that the economy grows at potential by 2008, starting to project from this year helps "sterilize" the effect of the economic cycle on the results of the simulations.

Table 1. Canada: Revenues and Expenditures of the Consolidated Government, 2001-2002 1/

(in percent of GDP)

Total revenue	**41.8**	**Total expenditure**	**41.0**
Income taxes	16.7	General government services	1.3
Personal	12.8	Protection of persons and property	3.1
Corporation income taxes	3.5	Transportation and communication	1.6
Other	0.4	Health	7.0
Consumption taxes	8.0	Social services	12.7
Property and related taxes	3.7	Social Assistance	8.7
Other taxes	1.4	Income maintenance	0.6
Payroll taxes	0.7	Family allowances and child tax benefits	0.7
Health and drug insurance premiums	0.2	Employment Insurance benefits	1.2
Contributions to social security plans	5.4	Old age security and other public pensions	2.3
Employment Insurance contributions	1.7	Canadian Pension Plan benefits	1.9
Contributions to the Canadian Pension Plan	2.0	Quebec Pension Plan benefits	0.6
Contributions to the Quebec Pension Plan	0.7	GST tax credits	0.3
Contributions to the employees pension plans	0.4	Other social assistance	1.1
Contributions to workers' compensation boards	0.6	Workers' compensation benefits	0.5
Sales of goods and services	3.1	Employee pension plan benefits	1.2
Investment income	3.0	Change in pension equity	0.7
Royalties and remitted trading profits	1.3	Veterans' benefits	0.2
Interest income	1.7	Other social services	1.4
Other revenue from own sources	0.3	Education	5.8
		Resource conservation and industrial development	1.4
		Environment	0.8
		Recreation and culture	1.0
		Labour, employment and immigration	0.3
		Housing	0.4
		Foreign affairs and international assistance	0.4
		Regional planning and development	0.2
		Research establishments	0.2
		Debt charges	4.8
		Other expenditures	0.2
		Surplus (deficit)	**0.8**
		Net Debt 2/	**63.5**

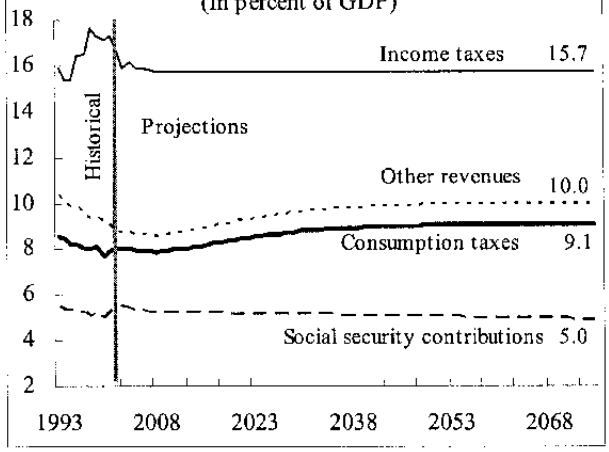
Source: Fund staff estimates based on FMS, Statistics Canada.

1/ Includes Federal, Provincial, Territorial, and Local governments plus Canada Pension Plan/Quebec Pension Plan.
2/ For year 2001/2002. Source: National Balance Sheet Accounts.

8. An exception to this assumption involves the CPP and QPP pension schemes. For the period 2002–2075, contributions to (and transfers from) the CPP are assumed to grow in line with the Office of the Chief Actuary's projections (OSFI, 2002). These projections show that, given the economic and demographic assumptions used, the CPP is actuarially balanced, i.e., transfers net of contributions from these pension plans are broadly equal to current assets on a net present value basis. After 2075, CPP contributions are assumed to grow in line with benefits. Projections for the QPP were also based on the Office of the Chief Actuary's report, and benefits and contributions from this scheme are assumed to grow in line with those for the CPP.[7]

9. In the projections, the ratio of overall tax revenues to GDP responds to changes in the composition of the population. For example, revenues from income taxes are projected to remain constant as a share of output, as both revenues and GDP are affected by the decline of the working-age population. Conversely, property tax revenues and consumption tax revenues increase as a share of GDP, owing to the increase in the elderly population relative to those in the working-age cohorts (Figure 1).

Figure 1. Canada: Tax Revenues
(In percent of GDP)



10. **Expenditure**: Employment Insurance benefits and elderly benefits are assumed to grow in line with the *Economic and Fiscal Update* over the period 2003-2008. Non-contributory social benefits—including income maintenance, family allowances and child tax benefits, old age security, and other elderly benefits after 2008—are assumed to be partially indexed to real wages. This represents a deviation from a "current-policy" assumption, since these programs presently are indexed only to CPI inflation. However, assuming CPI indexation over the long run implies that these payments would decline steadily as a share of GDP per capita, which would seem unrealistic and inconsistent with past experience in which ad-hoc increases in the benefit rates have been introduced.[8] Nonetheless, in the baseline

[7] The long-term real rate of return on the CPP assets used by the Chief Actuary's report is around 4 percent. However, the baseline scenario for the debt dynamics and debt sustainability analysis below is based on an effective net interest rate of 5 percent. For consistency with this assumption, both CPP and QPP projected contributions have been adjusted to make sure that the present value of the net transfers at a 5 percent discount rate is equal to the stock of CPP and QPP assets at 2002.

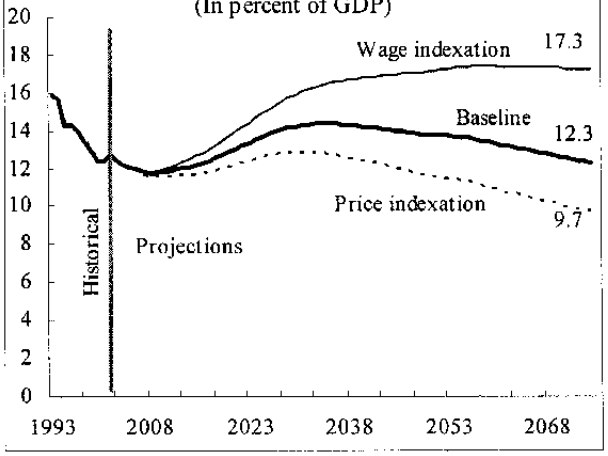
[8] A similar strategy has been followed by the CBO (2000). Its baseline long-term projections are based on official taxes and transfers forecasts for the next ten years, after which all taxes and transfers are assumed to be indexed to real wages, despite the fact that only few of these transfers are formally indexed to wages under current legislation. For this reason, CBO refers to the policy implied in its baseline projections as "prevailing," rather than "current," policy.

scenario, these per capita benefits are assumed to rise by only half the rate of labor productivity growth, which still implies only partial indexation to wage growth and a declining ratio of these payments to GDP.[9]

11. Pensions from government pensions plans are also assumed to be partially indexed to wages, in order to approximate the fact that benefits under these schemes are based on wages prior to retirement and are indexed to inflation thereafter.[10] Employment Insurance benefits and workers' compensation benefits paid on average to each member of current and future cohorts are assumed to rise in line with contributions, which in turn grow in line with productivity.[11]

12. Based on these assumptions, spending on social services is projected to rise from 12¾ percent of GDP in 2002 to a peak of around 14½ percent in 2035 and to slowly decline thereafter, as the effect of the partial wage indexation of social transfers offsets the effect of population aging. Figure 2 also shows the paths of social services expenditure under two alternative indexation rules. In the first, non-contributory transfers increase only with prices on a per-beneficiary basis, and

Figure 2. Canada: Social Transfers
(In percent of GDP)



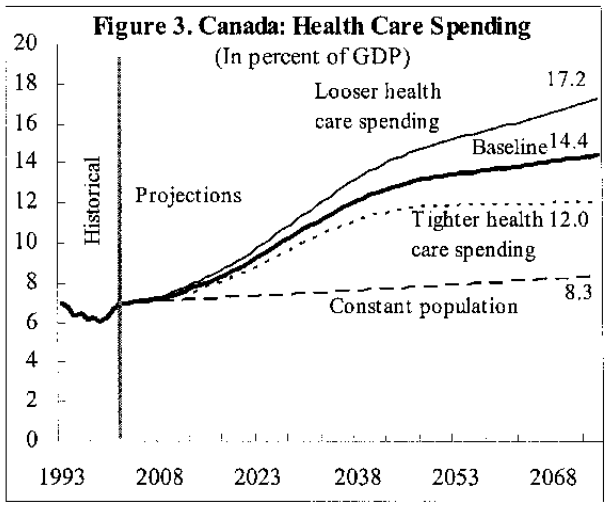
[9] Oreopoulos (1999) adopts a similar assumption for Canada. In contrast with King and Jackson (2000), who assume zero wage indexation of social transfers, Jackson and Matier (2002) assume that the average transfers received by members of each age cohorts will grow in line with wages, as the long-term nature of the projections make inflation-indexing appear "unreasonable."

[10] The government non-autonomous pension plans are fully-funded schemes, as the government contributions are deemed to cover the cost (net of employee contributions) of the *accrued* benefits of the schemes. However, it is worth noting that, despite indexing benefit rates more slowly than the rate of growth of wages (and thus contributions), these schemes do not appear to be actuarially balanced, as the difference in present value terms (using a 5 percent real discount rate) between future pension benefits and future contributions exceed the reserves of the funds. The simulations presented in this chapter do not incorporate recent decisions to increase contribution rates and to establish an investment board that will invest contributions in financial markets, both of which are likely to reduce the magnitude of the estimated actuarial imbalance.

[11] Pension benefits from government pension plans do not incorporate changes in pension equity. These are the surpluses of the government pension plans, that is, the difference between the receipts of the funds (contributions plus interest income on accumulated reserves) and pension benefits. These surpluses are considered as an expense in the FMS, as they represent a household claim on the government. Once future values of contributions and benefits are obtained as explained in the text, these surpluses (in real terms) are projected by applying an interest rate of 5 percent on the reserves of the funds. Given this rate, and based on the fact that pension benefits are much larger than contributions, the surpluses are projected to disappear in about 15 years.

spending falls to below 10 percent of GDP by 2075. In the second, these transfers are fully indexed to wages and increase more rapidly, converging to just above 17 percent of GDP by 2075.

13. Health outlays per each age cohort are assumed to grow in real terms at a rate that is ¼ percentage point faster than productivity growth. The growth of real per capita health expenditure implied by this assumption is broadly in line with historical experience.[12] As a result of this assumption and demographic projections, aggregate health expenditure doubles over the next 50 years as a share of GDP, from 7 percent to around 14½ percent (Figure 3). It is noteworthy, however, that this increase is principally the result of population aging rather than the higher price inflation assumed for health care. Simulations based on unchanged population structure would cause health care spending to rise only modestly to around 8 percent of GDP by the end of the projection period.[13]



14. Given the uncertainty surrounding projections for health care outlays and their importance for the estimated debt dynamics of the next section, two alternative scenarios are considered. In the first, defined as the *tighter health-care spending* scenario, average real per capita health expenditure is assumed to grow at the same rate as productivity, so that health care outlays as a share of GDP move solely in response to demographics. Health care spending in this case would grow at a slower rate than in the past, and would stabilize at 12 percent by 2050. In the second scenario, defined as the *looser health-care spending scenario*, larger price/technological pressures are assumed to cause spending on health care for each to cohort grow at an annual rate of 2 percent, ½ percentage point faster than

[12] Real per-capita spending on health is projected to grow at an average yearly rate of 2.4 percent over 2003-2075, slightly above the 2.2 percent increase over the 1994-2002 period (obtained by deflating nominal spending on health using the implicit price index for government consumption of goods and services, as in Canadian Institute for Health Information, 2002). However, considering a more extended period of time, this rate of growth does not seem unreasonable, and it is actually below the 2.9 increase over the period 1970–1998 (OECD, 2001). King and Jackson (2000) also show that real per capita growth in health expenditure (adjusted for population compositional changes) has been 1.8 on average over 1975-2000.

[13] Consistent with the "current" policy approach adopted in this chapter, future values of health spending are obtained by keeping the age profile for health spending constant in the future. However, the projected increase in life expectancy may cause this profile to shift, given that a large share of lifetime health costs takes place in the final years of life. All other things being equal, incorporating this shift into the simulations would lower the projected growth in overall health spending.

productivity growth. In this case, the impact of population aging would combine with the other pressures to take public health expenditure to around 17 percent of GDP by 2075.

15. On the basis of the projected revenue and expenditure, it is possible to simulate a path for the fiscal primary balances. This then allows projections for net debt of the government sector (total liabilities less financial assets), assuming that all primary balances are applied to the previous year debt and debt servicing costs. For the purposes of the present exercise, the effective interest rate on net government debt, in real terms, is assumed to be constant at 5 percent.[14]

B. Debt Dynamics and Fiscal Sustainability

16. In this section, Canada's long-term fiscal situation is assessed with regard to several criteria. First the debt dynamics are explored, to examine whether current tax and spending policies imply growth in the debt-to-GDP ratio to levels that would appear excessive in qualitative terms. Second, an assessment is made of the long-term fiscal imbalance, defined as the size of the immediate and permanent increase in income taxes needed to satisfy the intertemporal budget constraint—by ensuring that the present value of future primary surpluses matches the current level of net debt.[15] Third, the question of generational equity is considered, including by examining the inequities that arise by targeting alternative debt-to-GDP ratios.

17. **Debt dynamics**: A baseline scenario was first simulated, in which it is assumed that the government projected surpluses—including the "planning surpluses' projected in the federal government's *Fiscal Update*—are not spent and are devoted to debt reduction. In this case, the overall surplus of the consolidated government rises from 0.8 percent of GDP in 2002 to 1.9 percent in 2008, while the primary balance rises from 4 percent to 4.2 percent of GDP during the same period. The baseline scenario implies a relatively favorable path for the debt ratio—the persistence of primary surpluses over next two decades allows net debt as a

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[14] On a consolidated basis, the net effective interest rate for the year 2002 was slightly below 7 percent, in nominal terms. The rate of 5 percent is obtained based on the assumptions that the rate will remain constant in the future and that the long-term inflation rate is 2 percent. The initial stock of net debt is derived from the national accounts as the net financial debt of total government, which corresponds to the government sector considered in this chapter. The March 2001 figure was estimated by interpolating end-calendar year national accounts data. For 2000/2001, total government net financial debt was estimated at C$ 698 billion, or 63.5 percent of GDP, which includes the assets of the Canadian and Quebec pension plans (at around 5 percent of GDP), and the unfunded liabilities of government employee pension plans (around 16.5 percent of GDP).

[15] Satisfying this constraint typically only requires that the stock of debt grows no faster than the interest rate, or that the debt-to-GDP ratio will grow no faster than the difference between the interest rate and the GDP growth rate. A narrower concept of fiscal sustainability that is sometimes adopted would be the immediate and permanent increase in taxes needed to bring the net-debt to-GDP ratio to its initial level (or an alternative debt target) at some time T in the future, but as Auerbach (1994) points out, this will understate the fiscal gap when primary deficits are projected in the years following T.

share of GDP to decline steadily from around 60 percent in 2002 to a low of slightly below 4 percent in 2027 (Figures 4 and 5). However, since then population aging begins to place greater pressures on expenditure, the debt ratio begins rising again and by 2050 the ratio is projected to return to its initial value (see Figure 5).

Table 2. Indicators of the Fiscal Gap
(In percent of income tax revenue)

Income Tax Gap 1/	
Baseline scenario	1.4
Higher productivity growth (1.75 percent)	-4.8
Lower interest rate (4 percent)	2.3
Higher interest rate (6 percent)	1.2
Spending projected surpluses over 2003-2008	10.4
Looser health care spending	7.5
Tighter health care spending	-3.8
Non-contributory benefits indexed to prices	-5.3
All benefits fully indexed to wages	11.6
Income Tax Gap with an Explicit Debt/GDP Target 2/	
Net debt/GDP at 30 percent in 2010	
Tax change required during 2003-2010	5.6
Tax change required after 2010	-5.2
Net debt/GDP at 50 percent in 2010	
Tax change required during 2003-2010	-7.2
Tax change required after 2010	12.0

1/ Immediate and permanent change in income tax revenues (in percent) needed to satisfy the intertemporal budget constraint.
2/ The change in income tax revenues (in percent) required for every period from 2003 to 2010 to bring the net debt/GDP ratio to the target level at the terminal date and, thereafter, the immediate and permanent change in income tax revenues (in percent) needed to satisfy the intertemporal budget constraint.

18. These simulations, however, are sensitive to the underlying assumptions chosen. Even more benign scenarios can be constructed, including by assuming that transfers are indexed only to the price level (rather than partially indexed to wages), that growth of health care spending is constrained, or that productivity growth is stronger (maintaining the baseline path for health care spending). In each of these cases, net debt falls below zero and the government remains in a net creditor position in the long run.

19. However, considerably less benign scenarios also can be envisaged. For example, if the bulk of the surpluses projected over the next five years is devoted to increases in expenditure, government outlays are placed on a permanently higher level, with a permanently lower primary balance. As a result, much more modest debt reduction is achieved over the next 20 years, and the simulation illustrate that additional policy measures would be needed to avoid rapid debt growth thereafter.[16] Alternatively, if social transfers are required to keep pace with productivity gains and are indexed to wages, the debt ratio falls much slower in the nearer term and rises well above 100 percent of GDP by mid-century. Similarly, looser constraints on public health care outlays would significantly worsen the debt profile.

20. **Fiscal solvency**: As illustrated in Table 2, the re-emergence of fiscal deficits in the longer term means that even the baseline scenario does not fully meet the standard fiscal

[16] In this scenario, in every year between 2003 and 2008, only C$3 billion (0.2 percent of GDP in 2008) is devoted to debt reduction (this is the federal government's contingency reserve forecast by the *Economic and Fiscal Update* for the next five years). The remaining surpluses are assumed to be spent proportionally on all expenditure categories reported in Table 1.

Figure 4. Canada: Primary Balances

(In percent of GDP)

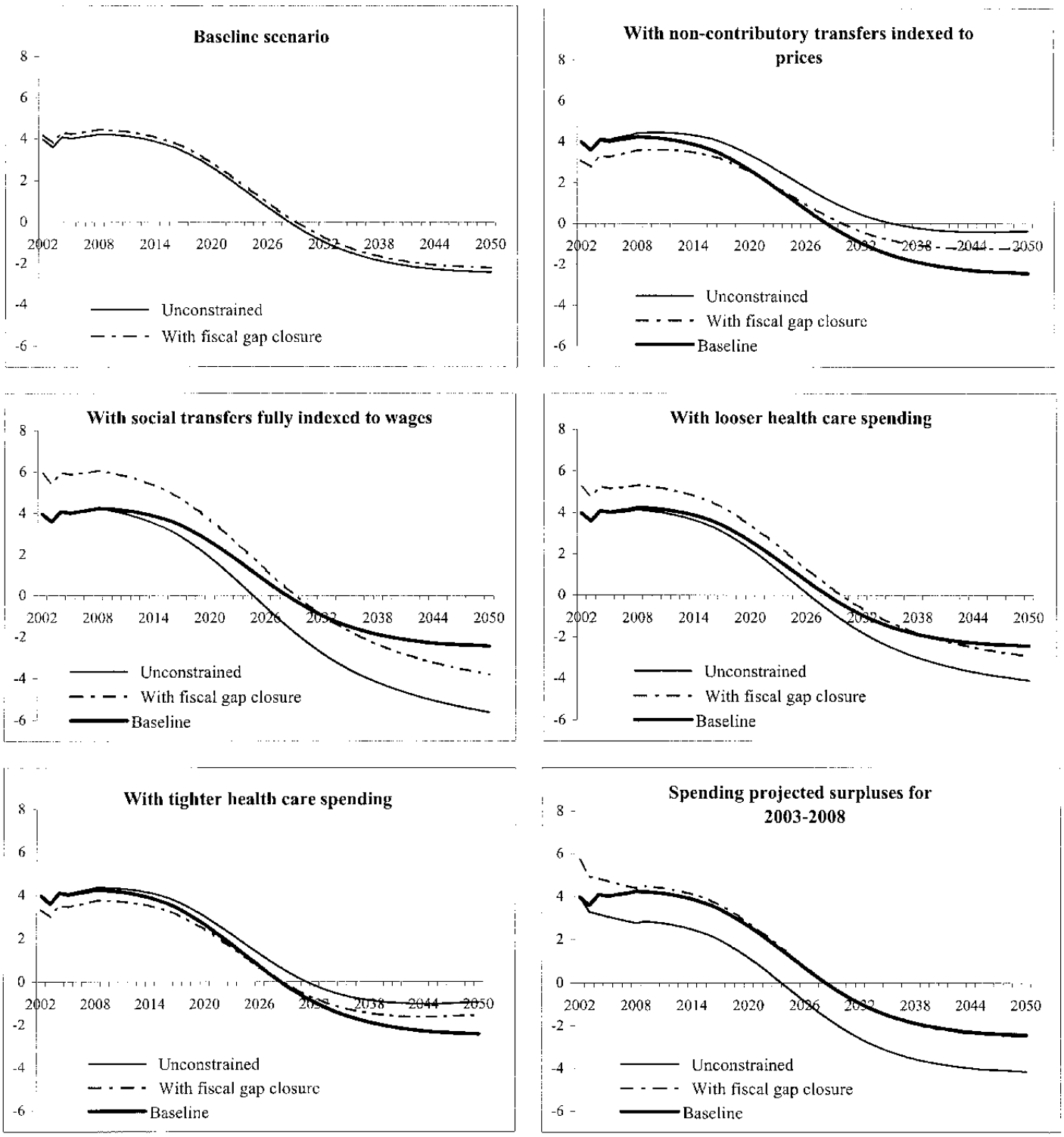
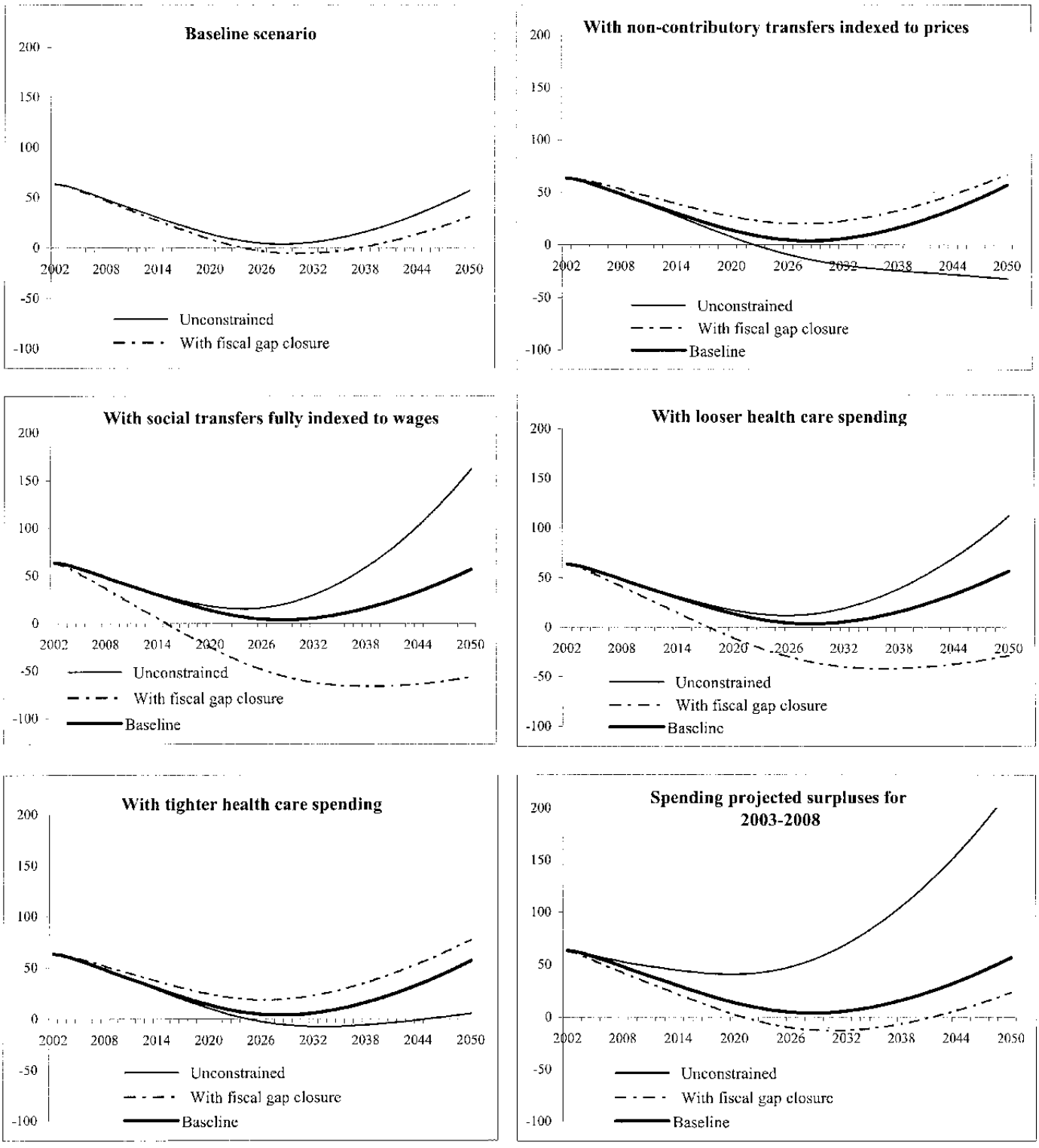


Figure 5. Canada: Net Debt
(In percent of GDP)



solvency criterion.[17] In other words, the net present value of future primary surpluses is not sufficient to cover the current outstanding net debt of the government sector, i.e., these surpluses do not satisfy the intertemporal budget constraint. The estimates suggest that closing this fiscal gap would require an immediate and permanent increase in taxes roughly equivalent to a 1.4 percent increase in the level of income taxes—this would be equivalent to C$2.5 billion or about 0.2 percent of GDP in 2002. Making this adjustment would allow a faster reduction of the net debt-to-GDP ratio than in the baseline and would facilitate the ability of the government sector to absorb the impact of demographic change on the budget through borrowing.[18]

20. Table 2 also shows the sensitivity of the fiscal gap calculations to macroeconomic and fiscal assumptions. Higher productivity growth—by ¼ percentage point—(without a commensurate growth in health spending) would eliminate the gap completely and would allow immediate and permanent tax cuts and/or an increase in expenditure consistent with fiscal solvency. Tighter limits on health care spending and indexation of non-contributory benefits solely to prices would have the same effect. Notably, assuming that the federal government spends the bulk of its planning surpluses over 2003-2008, inducing a permanent increase in spending, causes the fiscal gap to increase significantly, to the equivalent of 10 percent of revenues.

21. **Intergenerational equity**: Closing the fiscal gap through an immediate and permanent increase in taxes would be consistent with a policy of long-term tax smoothing, as it ensures that no further tax increases (including on future generations) are required to satisfy the government intertemporal budget constraint.[19] In addition to sharing the burden of closing the fiscal gap equally across generations—at least those born after the start date of the simulations—tax smoothing also minimizes distortions to labor-leisure decisions (Barro, 1979).

22. The intergenerational redistribution implied by alternative fiscal paths can be illustrated by considering the impact of alternative debt targets. For example, aiming at a

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[17] The stock of net debt used in the sustainability analysis does not include government pension liabilities. Further, changes in pension equity are not treated as an expenditure. The unfunded liability associated with the government pension plan is captured by the present value of the difference between future pension benefits and contributions.

[18] Adopting a similar methodology, Kennedy and Matier (2002) find that Canada's fiscal gap is negative, indicating that current fiscal policy is sustainable. However, their analysis focuses on the long-term fiscal stance of the federal government plus the CPP/QPP, while the simulations in this chapter include provinces and non-autonomous pension plans as well. Further, Kennedy and Matier adopt a narrower concept of the fiscal gap, defined as the immediate and permanent increase in taxes required to bring the net-debt to-GDP ratio to its initial level at some time T in the future (i.e., 2075).

[19] Clearly, the fiscal gap could be closed by an equivalent immediate and permanent change in expenditure, or some combinations of tax and expenditure changes.

30 percent net debt-to-GDP ratio by 2010 would require a 5½ percent increase in income taxes starting from 2002, since this would involve a more ambitious fiscal path than the baseline, which only brings the net debt ratio to around 35 percent of GDP by 2010. This adjustment would have a significant impact on the fiscal gap calculated in 2010—with a lower level of debt, fiscal solvency could be achieved with a permanent 5¼ percent cut in taxes after 2010.

23. Alternatively, a looser fiscal path, one that aimed at a 50 percent net debt-to-GDP ratio by 2010, would be consistent with a cut in income tax revenues of 7¼ percent for every year to 2010. However, the burden on future generations to close the fiscal gap thereafter would be the equivalent of a 12¼ percent permanent increase in income tax revenues. Similarly, policy that aimed at maintaining the debt/ratio constant at its present value would place a greater burden on future generations.

C. Conclusions

24. The analysis above illustrated the possible effects of population aging on the consolidated fiscal accounts of the federal and provincial governments under alternative economic and policy assumptions. Three main conclusions are suggested:

- The substantial improvement in the fiscal position achieved during the past decade—including the achievement of surpluses at both the federal and provincial levels, and the reform of the public pension systems—has left the Canadian government sector relatively well placed to withstand demographic pressures, especially compared to many other industrialized countries.[20] Baseline scenarios illustrate that, even on the assumption of more rapid increases in health care as the population ages, the government sector debt/GDP ratio would continue to decline and remain at a low level for the next 20-30 years.

- At the same time, however, the simulations illustrate that important fiscal risks and policy challenges remain. Despite present policies imply only a modest intertemporal fiscal imbalance, the relatively benign scenarios described above are vulnerable to the assumptions regarding productivity growth, the indexation of social programs, and the degree to which real per capita health care expenditure grows in excess of real income.

- In addition, the simulations also illustrate the risks associated with policies that allow planning surpluses that are projected for the next five years to be used to boost spending rather than contribute to debt reduction. Increased outlays on health care and other programs in coming years, especially if not easily reversed in subsequent

[20] For an international comparison of the degree of fiscal long-term intertemporal imbalances measured in a generational accounting framework see A. Auerbach, L. Kotlikoff and W. Leibfritz (1999).

years, could compromise the achievement of fiscal sustainability and intergenerational equity.

These points underscore the importance of ensuring that the recent debate over health care reform results in substantive improvements in the capacity of the system to contain costs, and of resisting pressures to erode the fiscal surpluses that have been achieved in recent years and slow the pace of debt reduction.

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Appendix

Methodology and Data

Assume that X_t denotes the amount of revenues from personal income taxes in the base year t. This aggregate amount is allocated to age and gender groups using age-gender profiles derived from the taxfiler information gathered by Canada Custom and Revenue Agency (in particular, from Table 4 of the income statistics, reporting taxable employment income by age and gender). Ignoring the gender subscripts for simplicity, $X_{i,t}$ denotes the personal income tax paid by members of the age group i at time t:

$$X_{i,t} = X_t R_{i,t}$$

where $R_{i,t}$ is the relative amount of the revenues that should be allocated to the age group i at time t. Denoting with $N_{i,t}$ the number of individuals belonging to group i at time t, the personal income tax paid by a member of the age group i is:

$$A_{i,t} = \frac{X_{i,t}}{N_{i,t}}$$

This amounts to defining the aggregate X_t as:

$$X_t = \sum_i^{100} A_{i,t} N_{i,t}$$

To project X_t forward demographic projections are needed that show how the number of persons in each age group evolves over time. Keeping the relative age and gender profiles R_i constant for the whole projection period, and assuming that real taxes and expenditures for the average person in age group i increase in line with productivity at rate g future values of X (at time t prices) are obtained as:

$$X_{t+1} = \sum_i^{100} (1+g) A_{i,t} N_{i,t+1}$$

which can be also put as:

$$X_{t+1} = \sum_i^{100} (1+g) R_i \frac{N_{i,t+1}}{N_{i,t}} X_t$$

The latter expression shows that aggregate taxes and expenditures will evolve in the future depending only on changes in the demographic structure of the population (reflecting both size and compositional effects) and on the productivity adjustment. While this is true in general, one also needs to take into account that several transfer payments in Canada have been de-indexed to wages and are currently only linked to inflation. In this case, there will be no adjustment for productivity growth ($g = 0$).

The age profiles for income tax revenue, payroll taxes, and health insurance premium were derived from the age and gender distribution of taxable employment income reported by the Income Statistics of the Canada Custom and Revenue Agency (2002). Contributions to social security plans were allocated using the age and gender distribution from the same source. The age and gender profiles for consumption taxes, property taxes, and other taxes were derived from Statistics Canada's Social Policy Simulation Database and Model (SPSDM), as

reported in "The Age Distribution of the Tax Transfer System in Canada," Hicks (1998). Revenues from the sales of goods and services and from natural resources and remitted trading profits were allocated equally across age groups.

Several social service benefits (including old age security pensions, CPP and QPP benefits, and the employment insurance benefits) were allocated based on the age and gender distributions reported by the Income Statistics of the Canada Customs and Revenue Agency (2002). The age and gender profiles for child tax benefits and family allowances, other social assistance, and education were obtained from Hicks (1998). The profile for health spending was obtained from Health Canada ("Health Expenditure in Canada by age and sex, 1980-81 to 2000-2001", 2001). All other expenditures were allocated equally across age groups (the age and gender profiles were flat).

II. The Canadian Health Care System: Cross-Country Comparisons and Options for Reform[1]

1. Although fiscal restraint during the 1990s in Canada substantially improved the overall fiscal position, it also severely strained the public health system as federal transfers and provincial health care budgets were cut. Cutbacks led to growing dissatisfaction with the quality of health care, while still leaving the Canadian system one of the most expensive among industrial countries. As a result, and given that cost and utilization pressures are likely to intensify with the aging of the baby boom generation, growing attention has been given—at both federal and provincial levels—to reforming the system of health care delivery and its financing.

2. This chapter first briefly describes the Canadian health care system and some of the weaknesses that have emerged in recent years. Section B then provides a comparison of the system to those abroad, and Section C reviews the longer-term cost pressures that are expected to emerge. The chapter concludes with a short overview of the principal reform options.

A. The Canadian Health Care System

3. The Canadian health care system provides universal, comprehensive coverage for medically-necessary hospital and physician services. The system is predominately publicly-funded, but services are largely delivered by nongovernment providers that are generally paid on a fee-for-service basis. The key elements of the system include:

- **Shared federal/provincial roles:** Provinces are responsible for health care policies under Canada's constitution and each province maintains separate insurance systems. However, the federal government funds a large proportion of provincial health care spending and has established national health care policies and standards. Federal legislation—the Canada Health Act of 1984—defines minimum standards of health care and provides a basis for withholding funding from provinces that deviate from national standards.[2]

- **Universality**: All insured persons have universal access to the public health care system. Provinces are required to provide comparable levels of service and coverage is portable across provinces.

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[1] Prepared by Paula De Masi and Christopher Towe.

[2] The Canada Health Act requires that the health services of provinces and territories meet the following criteria in order to receive federal funding: public administration; comprehensiveness; universality; portability; and accessibility. In cases where providers impose user fees (i.e., "extra bill") on patients in excess of the rates set by provincial authorities, the legislation requires dollar-for-dollar deductions from federal transfer payments to the provinces.

- **Comprehensiveness**: Under the Canada Health Act, all health care that is deemed "medically necessary" is covered under by the public system. This typically includes hospital treatment, as well as treatment by general practitioners and specialists, and related medical procedures and tests.

- **Tax financing**: Provincial health care programs are funded by tax revenues. Users do not pay premiums based on age or other factors that are related to the probability of usage.[3]

- **Absence of co-payments and deductibles**: Typically health-related services are 100 percent covered and no deductibles or co-payments are required.

- **Public administration**: Health insurance plans are administered and operated on a nonprofit basis by a public authority, and hospitals are generally also run on a not-for-profit basis. Physicians are generally self-employed or employed by hospitals.

- **Public-price setting/single-payer system**: The fees charged by medical practitioners and hospitals are set by the provincial authorities. Payment for services are made by provincial insurance plans, and practitioners and hospitals are prohibited from charging patients additional or separate fees.

4. The framework for federal funding of provincial health plans has evolved considerably. Prior to 1977, the federal government compensated provinces for 50 percent of their health care outlays, but this system was viewed as providing inadequate incentives to contain costs. In an effort to improve control over provincial spending on health care and post secondary education, the Established Programs Financing (EPF) transfer system was established in 1977, which provided a per capita block grant to provinces linked to per capita GNP. Beginning in 1996, the EPF and transfers under the Canada Assistance Plan (which funded social welfare programs) were combined into the Canada Health and Social Transfer (CHST), a block transfer to fund health care, post-secondary education, and social assistance.

5. Despite the large role played by the public sector in the health sector, only about 70 percent of health-related spending in Canada is publicly financed. Dental care and most prescription drugs are not included in provincial plans, and private insurance plans are available to cover these services.

6. Fiscal restraint caused health care spending, as a share of GDP, to fall from around 10 percent in the early 1990s to around 9 percent by the latter half of the decade. The decline mainly reflected a drop in spending by the public sector in real terms, with the compression mainly in the area of hospitals, which was partly offset by continued rapid growth of spending on pharmaceuticals (Figure 1).

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[3] Alberta and British Columbia do levy income-tested premiums, but these cover only a small proportion of provincial outlays.

7. Per capita health expenditures vary widely across the provinces and territories. Average per capita spending was estimated to be $2,226 in FY 2001/02, with the Northwest Territories spending the most at $4,268 and Quebec the least at $2,001.[4] The variation partly reflects differences across provinces with regard to the definition of whether some services—such as home care and long-term care—are deemed "medically necessary" and, therefore, fall under provincial health plans. Demographic and geographic factors are also relevant—areas with sparse and highly dispersed populations, such as the territories, are unable to benefit from economies of scale, and, thus, face higher costs.

8. The quality of service under the Canadian system has come under growing criticism in recent years. Concerns have centered on access to both services and medical technologies.

- Overcrowding in hospitals is increasingly reported, and patients also are often required to wait a considerable length of time before obtaining elective surgical and other procedures, or before seeing specialists.[5]

- A recent report by the Canadian Institute for Health Information highlights the decline in the ratio of physicians per population during the 1990s—from around 195 to around 185. This is ascribed to the increase in physicians attending post-graduate studies, fewer foreign doctors entering Canada, and increased retirements, all possibly in response to cuts in rates of remuneration. Data on the number of hospital days and waiting periods for organ transplants also deteriorated during the latter half of the 1990s.

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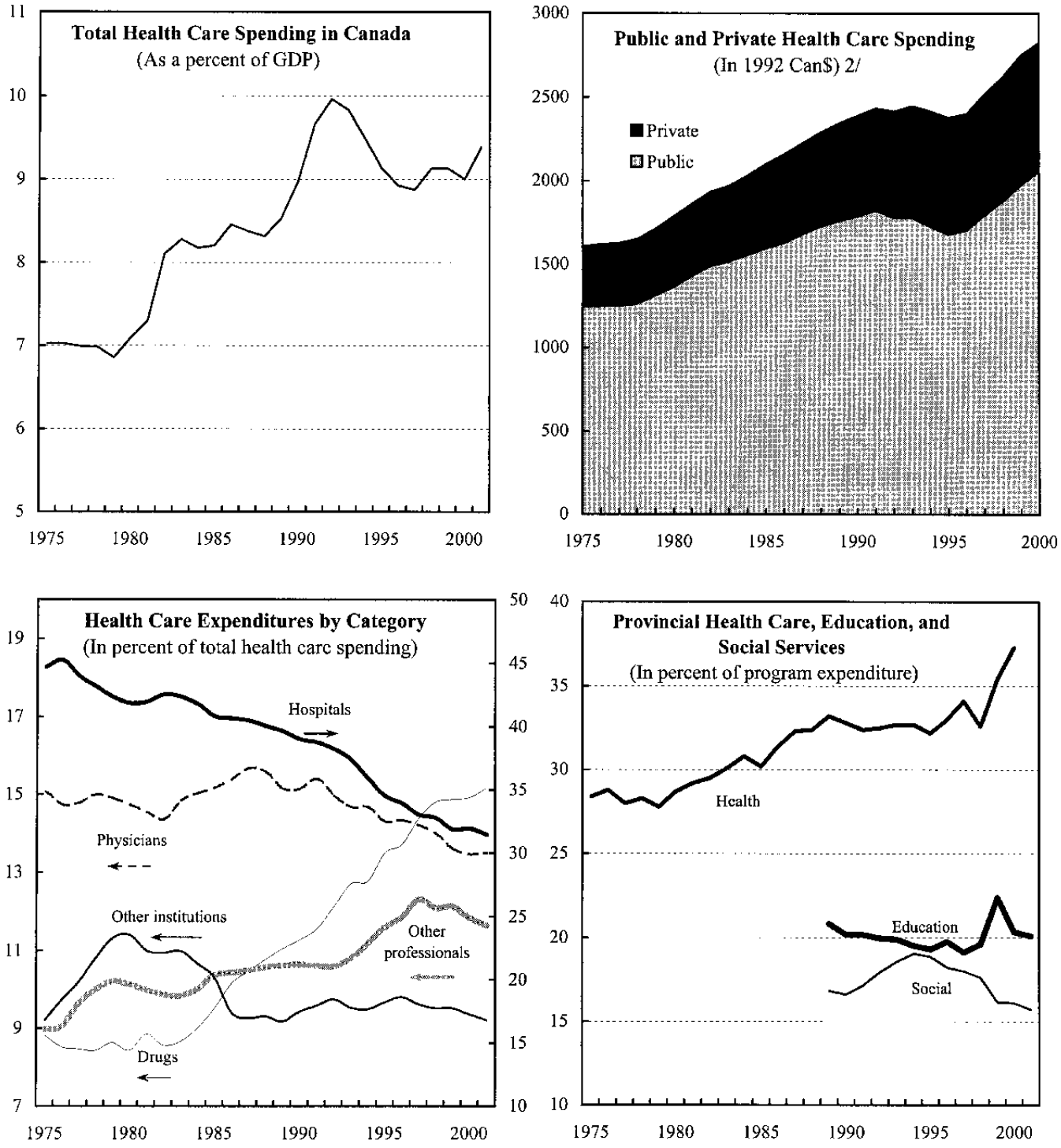
[4] Provincial health care spending as a share of provincial revenue (including federal transfers) in 2000 averaged about 30 percent in Canada, ranging from 34 percent in Ontario and Manitoba to 20 percent or less in the territories. See Robson (2001).

[5] Esmail and Walker (2002) review a number of international comparative studies which suggest that Canadian health consumers perceive considerably poorer access and quality compared to Australia, New Zealand, the U.K., and the United States. Moreover, access to care in Canada appears to differ across socioeconomic groups, with low income earners reporting less access. The Canadian Institute for Health Information (2002) cautions, however, that empirical studies find only mixed support for the perception of longer wait times, and that waiting periods seem long only in comparison to the United States.

Figure 1. Canada: Health Indicators 1/



Sources: Canada Insitute of Health and Statistics Canada.
1/ Data for 2000-01 are preliminary.
2/ Deflated by CPI inflation, base year 1992.

- In addition, underinvestment in key medical technologies—including in diagnostic devices such as MRI and CT scanners—has resulted in delays in accessing these devices, and existing equipment is often described as outdated or at the end of its useful life.[6]

B. How Does the Canadian System Compare with Other Countries?

9. The Canadian health care system has a number of unusual features compared with other OECD countries.[7] First, unlike Canada, most industrial countries maintain user fees for at least one of the major elements of the system—hospital services, general practitioners, and specialists. Only four other OECD countries do not—Denmark, the Netherlands, Spain, and the United Kingdom.[8] Although, ten other OECD countries also rely solely on public or heavily regulated hospitals, Canada is the only country that effectively prohibits the private provision of "core" medical services—such as hospital services.

10. A number of indicators suggest that Canada's health care system is relatively expensive compared to other countries. Among OECD countries, health care spending in Canada is the fifth highest at 9¼ percent of GDP, compared with an OECD average of just over 8 percent (Figure 2). Esmail and Walker (2002) argue, however, that this understates the cost of health spending in Canada, given the relatively small proportion of the population that is over 65 years in age—an age category with relatively expensive health care needs.[9] Taking this into account, they estimate that Canada ranks as the highest spending country, excluding the United States.

11. Comparing Canada's health care outcomes to those in other countries also suggests a mixed picture. According to World Health Organization (WHO) data, life expectancy, the distribution of life expectancy, and the fairness of financial contributions for health care in Canada are roughly comparable to other industrial countries, and the Canadian system also compares well in terms of responsiveness and goal attainment (Table 1). However, once per capita expenditure on health and other factors are taken into account in the WHO's index of

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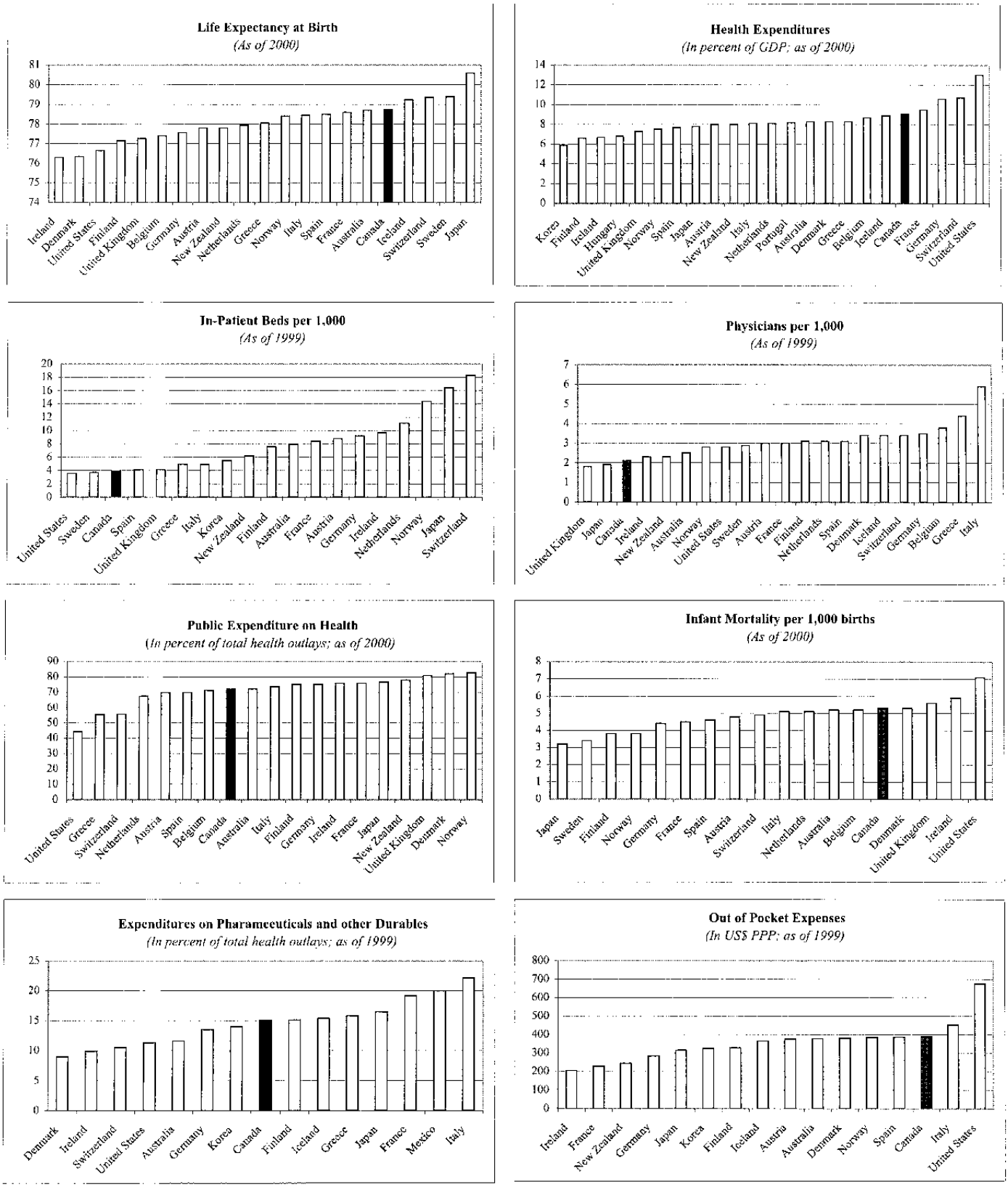
[6] For a discussion, see the Standing Senate Committee on Social Affairs (2001a).

[7] For a more detailed discussion of how Canada's system compares to other OECD countries, see Esmail and Walker (2002).

[8] Although France and Australia do not have explicit cost sharing, features of their systems allow for private payments.

[9] The proportion of the population over age 65 in Canada is around 12½ percent compared to 15¾ percent in the United Kingdom and France, and 17 ¾ percent in Italy.

Figure 2. Selected Cross-Country Comparisons of Health Outlays and Outcomes



Source: OECD.

Table 1. Relative Ranking of Health Care Systems, 1997[1]

Country	Attainment of Goals						Performance
	Disability Adjusted Life Expectancy		Responsiveness	Fairness in financial contribution	Overall goal attainment	Health expenditure per capita	Overall life expectancy
	Level	Inequality					
Australia	2	17	13	27	12	17	32
Austria	17	8	13	13	10	6	9
Belgium	16	26	16	4	13	15	21
Denmark	28	21	4	4	20	8	34
Finland	20	27	19	9	22	18	31
France	3	12	16	27	6	4	1
Germany	22	20	5	6	14	3	25
Ireland	27	13	25	6	25	25	19
Italy	6	14	22	46	11	11	2
Japan	1	3	6	9	1	13	10
Netherlands	13	15	9	21	8	9	17
New Zealand	31	16	22	24	26	20	41
Norway	15	4	7	9	3	16	11
Spain	5	11	34	27	19	24	7
Sweden	4	28	10	13	4	7	23
Switzerland	8	10	2	39	2	2	20
United Kingdom	14	2	26	9	9	26	18
United States	24	32	1	54	15	1	37
Average	14	16	14	19	12	13	20
Canada	12	18	7	18	7	10	30

Source: World Heath Organization, *World Health Report: Statistics, Table 1.*

[1] Relative rankings are against full WHO membership, and only a selected set of countries are shown above. The health ranking is based on a measure of the disability adjusted life expectancy, and inequality measures the distribution across countries' population of life expectancy at birth. The responsiveness ranking is based on surveys measuring respondents' assessment of the overall quality of the countries' health care system. Fairness in financial contribution is ranked according to the degree of inequality of outlays on health relative to income and includes tax and other payments to public programs. Overall goal attainment represents the countries' rank against a weighted average of life expectancy and the other measures of performance. Performance is the countries' rank of health outcomes and the weighted average of overall outcomes relative to outcomes that would be otherwise expected assuming a fully functioning health care system and taking into account per capita spending on health and countries' educational attainment.

overall performance, the Canadian system ranks only 30th in the world, below the industrial country average. More recent OECD data suggest that the Canadian system compares well in terms of life expectancy. However, in-patient beds, physicians per capita, and access to medical technology rank relatively low, and out of pocket expenses and infant mortality are relatively high (Figure 2 and Table 2).

Table 2. Medical Technology Availability in Canada and OECD Countries, 2000

(Number per million population)

Technology	Canada	OECD Average	Canadian Rank (Sample Size)
CT Scanners	7.3	15.9	17 (of 22)
Radiation Equipment	7	6	8 (of 22)
Lithotripters	0.5	2.1	13 (of 14)
MRIs	2.5	5.8	18 (of 23)

Source: Esmail and Walker (2002).

12. The high cost of the Canadian health care system can be illustrated with a simple cross-country regression that quantifies the relationship between health expenditure as a share of GDP and its key determinants. The factors assumed to determine spending include: the old-age dependency ratio; a country's income level (GDP per capita); life expectancy, which is defined as the WHO's health adjusted life expectancy (HALE) index; and private sector health care spending as a share of the total. The regressions were based on data for 163 countries in 1998. The principal results are (Table 3):

- Health expenditures tend to rise with income for middle income and higher-income countries, although the elasticity is the greatest at the middle-income range.
- The share of the elderly total population also tends to increase total outlays, but only at the upper income level.
- Health outcomes—defined in terms of life expectancy—seem to have significant effects only at low-income levels, and there appear to be economies at the middle income level, insofar as higher life expectancy is associated with lower health spending.
- Increases in the private share of health expenditure appear to increase total spending at the higher income levels.

The results also suggest that spending levels in Canada exceeded by roughly 20 percent that which would be expected on the basis of these basic determinants. Of course, given the

explanatory power of the regression equation, (as indicated by the R-squared statistic and high standard error) only limited confidence can be placed on this conclusion.

Table 3. Cross-Country Determinants of Health Expenditure[1]

Variable	Coefficient	t-statistic	Prob.
(1-LOW-MID)*Log(Old-Age Dependency)	0.41	4.02	0.00
MID*Log(GDP per Capita)	0.47	3.83	0.00
(1-LOW-MID)*Log(GDP per Capita)	0.07	2.25	0.02
LOW*Log (HALE)	0.37	36.41	0.00
MID*Log(HALE)	-0.45	2.03	0.04
(1-LOW-MID)*Private share	0.01	2.11	0.04
Standard error	0.30		
R-squared	0.44		
Adjusted R-squared	0.42		

Data sources: World Health Organization and the World Bank.

[1] Least squares regression. LOW is a dummy variable set at 1 for incomes below $800 per capita. MID is a dummy set at 1 for incomes between $800 and $3,000 per capita.

C. Long-term Outlook for Canadian Health Care Spending

13. Cost pressures on the Canadian health system are expected to intensify in the future owing to a variety of factors—including, the aging of the baby boom generation and innovations in technology. Most estimates suggest that the cost of health care will absorb a rising share of resources in Canada, as in other OECD countries.[10]

14. The key factor driving such estimates is the aging of the baby boom generation. The ratio of persons over age 65 to the working-age population—the old-age dependency ratio—in Canada is currently about 20 percent, but is projected to reach 32 percent by 2020 and over 40 percent by 2040. However, demographic trends are considerably different across Canada—dependency ratios in the Atlantic provinces and Alberta are projected to increase much more sharply than elsewhere.[11] The impact of demographics is compounded by the fact

[10] On a cross-country basis, Dang, Antolin, and Oxley (2001) find that over the period 2000-2050 the average increase is 3–3½ percentage points of GDP; however, for Canada, the United States, and several other countries increases of 4 percentage points or more are projected.

[11] See Robson (2001).

that health expenditures on people aged 65 and older are typically around 5½ times larger than on people under age 65. Again, this ratio varies considerably across provinces, ranging from 4½ in Saskatchewan to 6 in Newfoundland and Nova Scotia.

15. Robson (2001) estimates that demographic pressures will cause provincial health care spending, as a share of GDP, to rise from about 6 percent in 2000 to 7½ percent in 2020 and to 10 percent by 2040.[12] However, in several provinces—including Newfoundland, New Brunswick, and the Yukon Territories—provincial health care spending, as a share of GDP, would rise in percentage point terms by roughly twice the national average by 2040. The uneven distribution of these costs across provinces raises concerns that there will be continued pressures for increases in provincial transfers, and for changes in funding formulas that take into account the diversity of provincial needs.

D. Options and Issues for Reform

16. The discussion above suggests that the Canadian health care system has underperformed, with outcomes falling short of what would be expected given relatively high outlays, and cost pressures on the system likely to intensify in the future. As a result, the provincial and federal governments and private analysts have devoted considerable attention to alternative approaches to health care reform (Box 1). Much of the emphasis has been on identifying areas where expanded coverage is needed, ways to enhance incentives for efficiencies on the part of both suppliers and consumers of health care, and how best to finance health care spending.

Expanding coverage

17. With advances in technology and medical practices, many reform proposals have highlighted the need to modernize the Canada Health Act by expanding coverage beyond hospital and physician care. In particular, while new medical procedures have reduced the length of hospital stays, post-hospitalization care has grown increasingly important, both as a means of ensuring satisfactory health outcomes and for reducing pressures to extend costly hospital stays. As a result, recent reform proposals have called for home-based and palliative care to be covered on a consistent basis across the provinces. Moreover, with prescription drugs playing a greater role in health care system, there have also been strong calls for coverage of (at least) catastrophic prescription drug costs.

Demand-side incentives

18. Concerns that the current system provides inadequate incentives to users to economize on their access to the system have led to proposals for improving demand-side

[12] These same projections imply that the share of provincial revenues (excluding federal transfers) devoted to health care spending would rise from 35 percent presently to around 40 percent in 2020 and to over 55 percent in 2040. Using different methodologies, the Conference Board (2001) comes to similar conclusions.

incentives. For example, some analysts have argued for the introduction of **co-payments** as a means of encouraging consumers to economize on their demand for services and contribute to the funding of health care. Research has suggested that co-payments can have a significant effect on demand for health care services without adversely affecting health care outcomes. Suggestions for ameliorating the impact of catastrophic illness on family incomes include introducing an income-based maximum payment. For example, Aba, et al. (2002) illustrate that a system of a 40 percent co-payment up to an annual maximum of 3 percent of family income would reduce usage by 17 percent and yield roughly $6 billion in revenue.

19. An alternative approach to introducing demand-side incentives could involve a system of **medical savings accounts** (Migué, 2002). These would involve annual vouchers provided to insured persons that would vary in amount according to their potential need for health services (i.e., age and health). The vouchers would be used to pay for services, with costs in excess to be covered by patients' own resources up to an income-based maximum. Unused balances could be saved for future years.[13]

Supply-side incentives

20. Other analysts have argued instead for a focus on supply-side incentives for increased efficiencies, given that incentives that operate on the demand-side are costly to administer and may have a relatively weak impact on the demand for health care, given its unresponsiveness to price signals. A large part of this emphasis has been on **primary care reforms** that would improve the role of preventative care and ensure that specialists and high-costs procedures are directed to where they are most needed. In Canada, for example, this type of mechanism is already partly in place, since patients typically are required to obtain a referral from a primary care physician to see a specialist. However, increasing consideration is being given—especially by provincial health plans—to expanding the role of nurse practitioners as a less expensive provider of basic health care and as a gatekeeper to the rest of the system.

21. Some commentators have suggested, however, that more radical reforms may be needed, including moving away from a fee-for-service basis for remunerating physicians. Under a **capitation system**, for example, doctors would be provided a fixed dollar budget based on the number of patients on their "roster." Physicians' annual compensation would then depend, at least in part, on ensuring that their patients' health care was provided in a cost-effective manner.

22. Some analysts have suggested that the efficiency of the Canadian health care system could also be improved by greater **private provision of medical services**. As noted above, the Canadian system is unusual, insofar as hospitals are generally run on a not-for-profit basis and practitioners are unable to charge fees in excess of prescribed amounts. Although even partial privatization of the system has been resisted in order to preserve its universality,

[13] This type of system has been used in Singapore, China, South Africa, and (to some extent) the United States.

Box 1. Proposals to Reform Canada's Health Care System

Two federal commissions recently released reports summarizing the state of the Canadian health care system, and recommending reforms that would involve significant increases in public outlays on health care. Key proposals from each are summarized below.

The Commission on the Future of Health Care in Canada—the Romanow Commission—released its final report in late November. The Report includes 47 recommendations, whose costs would rise to $15 billion through 2006. A role for enhanced private sector participation was largely ruled out. Key recommendations included:

- Set a federal cash funding floor of 25 percent of the cost of insured health services under the Canada Health Act by 2005/2006 and increase federal health care funding by $6.5 billion from currently forecasted levels to provide more stable and predictable long-term funding for health care.

- Provide a new dedicated cash-only, five-year Canada Health Transfer that includes a built-in escalator provision.

- Introduce five new targeted funds to address immediate priorities for two years—at a cost of $3.5 billion in 2003/04 and $5 billion 04/05—until the minimum federal funding floor is achieved in 2005/2006:

  - Primary Health Care Transfer to remove obstacles to renewing primary health care delivery;
  - Home Care Transfer to create the foundation for an eventual national home care strategy;
  - Catastrophic Drug Transfer to expand and improve provincial drug programs;
  - Rural and Remote Access Fund to improve timely access to care in rural and remote areas;
  - Diagnostic Services Fund to improve wait times and purchase new equipment.

- In addition, introduce the following: a national immunization strategy; a National Drug Agency to evaluate new drugs, and re-evaluate existing drugs; an Aboriginal Health Partnerships to organize health services for aboriginal peoples; a Canadian Health Covenant that would act as a tangible statement of Canadians' values and confirm the vision of the future of health care; a Health Council of Canada to collect information on waiting times, measure and track performance of the health system, and report regularly to Canadians.

The Senate Social Affairs Committee released its recommendations in late October 2002. Its proposals were estimated to cost $5 billion annually, financed through either a 1.5 percent national health care sales tax or a national health care insurance premium tied to income. Key proposals include:

- Increase the federal contribution to spending on health care infrastructure, including medical technology, training doctors and nurses, and evaluating health care outcomes.

- Expand public insurance to include coverage for catastrophic prescription drug costs, as well as post-hospital and palliative home care.

- Establish maximum waiting times, which, if exceeded, would allow the patient to seek treatment in another jurisdiction, including the United States.

Restructure the current hospital and doctor system to enhance efficiency and effectiveness, including for hospitals, with a shift toward service-based funding and greater competition.

some observers have suggested that opening the hospital sector could improve efficiency and investment in key technologies. Deber (2002) cautions, however, that "for-profit" providers of hospital and similar care are typically most successful in achieving these objectives if they are regulated and subject to competition.

23. Proposals to **expand the coverage of the public system** could also have significant supply side implications. For example, broadening the scope of public system to include prescription drugs, post-hospital home care, and palliative care, would provide opportunities for a more effective integration of these services in the existing system. At the same time, however, the challenge will be to ensure that efforts to contain costs in these new areas—including through the use of price controls—enhance, rather than detract from efficient delivery of these services.

Fiscal issues

24. Significant fiscal issues are raised by many of these proposals, especially those that involve broadening the scope of the public insurance system. An important concern is that they would require large increases in federal and provincial health care spending, without concomitant improvements in efficiency or the definition of alternative sources of funding. While the recent Senate report has suggested that spending increases should be funded by an income-based health care premium or a dedicated sales tax, the Royal Commission report appeared to suggest that spending increases would be largely met out of prospective fiscal surpluses.

25. Moreover, health care reform has important implications for **fiscal federalism**. A significant proportion of provincial health care outlays are funded by transfers from the federal government, and a critical issue—especially given pressures to increase the amount flowing to the provinces—is the manner in which these resources are provided. Some authors have suggested that for the federal government to continue to enforce national standards and promote appropriate spending levels, a return to cost sharing may be required.[14] In addition, providing transfers in the form of cash payments, rather than as "tax points," would also improve the predictability of funding. However, Rode and Rushton (2002) caution that a return to open-ended cost sharing arrangements could undermine incentives at the provincial level to contain costs, and others have expressed concern that cash payments have provided too much scope for conditions to be attached to transfers.

E. Concluding Remarks

26. The Canadian health care system has come under considerable stress in recent years. This stress reflects a number of factors, including the effect of fiscal constraints and the high cost of new technology. Looking ahead, these budgetary pressures seem likely to intensify, given the impending aging of the baby-boom generation. Thus, Canada, like most other

[14] See for example Rocher and Smith (2002).

countries, faces the challenge of ensuring that the system delivers health care services in a manner that is as cost effective as possible.

27. The discussion above, and the results of numerous studies, suggest that the efficiency of the Canadian health care system could be improved by measures to enhance the incentives that operate on both the demand- and supply-sides. The difficult challenge will be to introduce these reforms in a manner that is consistent with both the commitment to universality and the need to preserve longer-term fiscal sustainability.

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III. Corporate Governance in Canada: Coping with Financial and Regulatory Spillovers from the United States[1]

A. Introduction

1. A striking feature of the recent corporate scandals in the United States was the extent to which losses in U.S. investor confidence spilled over to global financial markets, triggering substantial worldwide declines in equity prices.[2] Notably, despite the absence of similar scandals in Canada, stock price declines there largely matched those in the United States. At the same time, public confidence in Canada's financial reporting, auditing practices, and corporate governance appeared to have been shaken.

2. Canadian regulators responded quickly to bolster investor confidence and strengthen the framework governing accounting and corporate governance—including the establishment of an independent oversight board for auditors. However, with passage of the Sarbanes-Oxley Act in the United States—the most substantial overhaul in U.S. securities legislation since the Great Depression—Canada still faces the challenge of determining the extent to which Canadian practices should be harmonized with those in the United States.

3. This chapter reviews these issues by first presenting empirical evidence to illustrate the impact of U.S. corporate scandals on equity valuations in Canada. The chapter then discusses features of the Canadian corporate governance system and summarizes recent and past regulatory initiatives, concluding with a discussion of future challenges.

B. Spillovers from the United States: Empirical Evidence

4. Despite Canada's stronger economic performance and the absence of major corporate accounting scandals, Canadian stock price movements during 2001 and 2002 largely matched those in the United States, suggesting considerable spillovers from the failures of Enron and other major U.S. companies (Figure 1).[3] The co-movement of Canadian stock prices during this period raises questions regarding the extent to which stock price declines reflected heightened concerns regarding Canadian corporate governance practices or other factors.

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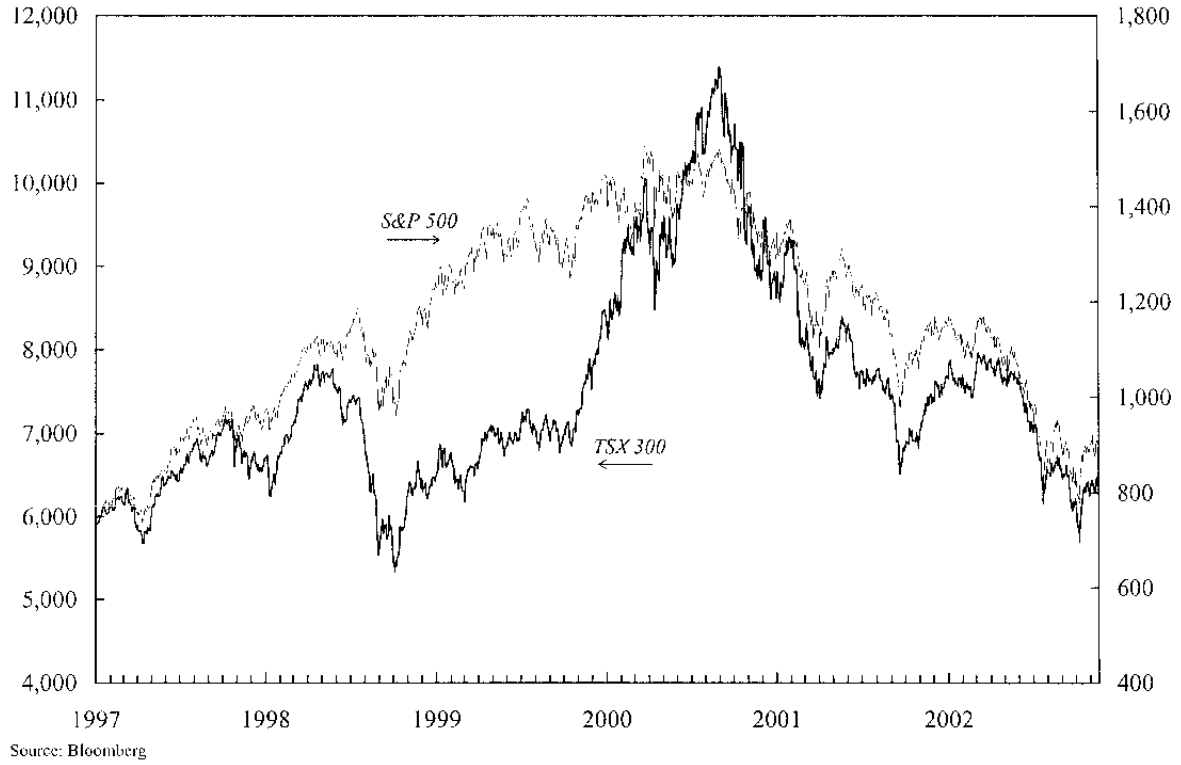
[1] Prepared by Paula De Masi and Iryna Ivaschenko

[2] See Schnure (2002).

[3] The correlation between U.S. and Canadian broad market stock returns remained above 80 percent over the past two years.

Figure 1. Stock Prices in the United States and Canada



Source: Bloomberg

5. Simple analysis of stock market returns suggests, however, that the effect of the U.S. corporate scandals on Canadian stock prices did not reflect a broader erosion of confidence in Canadian corporate practices. This can be illustrated by comparing the returns on Canadian companies that were solely listed on Canadian exchanges (domestically listed) with those that were listed on both Canadian and U.S. exchanges (cross-listed), calculated in excess of the broad market returns (Table 1).[4] It is notable that, prior to the Enron scandal, cross-listed companies achieved returns that were roughly comparable to domestically listed companies, despite the fact that cross-listed companies were required to meet both U.S. and Canadian listing standards. Subsequent to the Enron and WorldCom scandals, however, stock prices of cross-listed companies performed significantly worse than the prices for companies listed solely in Canada.

[4] All Canadian companies listed on U.S. stock exchanges are directly listed and, thus, are subject to U.S. corporate governance and disclosure requirements.

Table 1. Canada: Individual Equity Returns over the Broad Market, by Exchange Listing 1/

	Before Enron	After Enron	After WorldCom
Cross-listed	0.11	0.21	-0.36
	(0.01)	(0.01)	(0.05)
Domestically listed	0.10	0.45	0.22
	(0.01)	(0.01)	(0.03)

Sources: Bloomberg and Fund staff estimates.

1/ Individual equity returns over the broad market return are calculated as the difference between the monthly return on an individual stock and the monthly return on the broad TSX300 index, annualized, and averaged across firms. Numbers in parentheses are standard deviations. Returns were calculated for the sample of firms listed on the Toronto Stock Exchange (TSX). Cross-listed refers to companies listed both on the TSE and on a U.S. stock exchange. Period before Enron: August 2000 to December 2, 2001; after Enron: December 2, 2001 to June 27, 2002; period after WorldCom: June 27, 2002 to end November 2002.

6. In order to ensure that this result does not simply reflect characteristics specific to cross-listed companies, a similar exercise was performed using a version of the International Asset Pricing Model (IAPM). The model explicitly controls for other fundamental factors—such as changes in individual firm's exposures to domestic and global market risks—that might cause differences in returns on cross-listed and domestically listed companies.[5] The results summarized below indicate that, even after controlling for these factors, positive returns of the cross-listed companies (or the "cross-listing premium") disappeared in the post-Enron period, while increasing (the "domestic listing premium") for domestically-listed companies. Moreover, the perceived riskiness of cross-listed companies increased after the scandals, while the overall riskiness of domestically listed companies declined somewhat.

7. In particular, stock returns (in excess of a risk-free interest rate) on individual stocks of Canadian firms, R_{it}, were regressed on returns (also in excess of the risk-free interest rate) on the Canadian and global broad market indexes, R_t^{CN} and R_t^{WD}, respectively:[6]

[5] The original IAPM, as in Solnik (1974), defines equity returns in terms of risk exposures with respect to the global market portfolio; Foerster and Karolyi (1999) expand it to include exposures to the local market—a factor, also specified in the Sharpe-Lintner CAPM. A vast literature finds other variables—such as dividend yield, size, book-to-market ratio, P/E values, the average bond yield, to name a few—to be significant in explaining stock returns. For an overview, see Stulz (1995), and Dumas and Solnik (1995). However, there is still no consensus in the literature as to what specific variables should be included in explaining stock returns—for a detailed discussion, see Campbell, Lo, and McKinley (1997).

[6] Stock returns for large companies listed on the Toronto Stock Exchange (TSX)—comprising the TSX 300 Index—are used in the analysis. Cross-listed companies are those listed on the TSX and on the NYSE. The IAPM, specified in equation (1), is estimated for each individual stock return using panel data Feasible GLS estimation, and individual coefficients are then averaged. Dummy variables are included in equation (1) to analyze structural breaks in the coefficients across different time periods. See, for example,

(continued)

$$R_{it} = \alpha_i + \beta_i^{CN} R_t^{CN} + \beta_i^{WD} R_t^{WD} + \varepsilon_{it}. \quad (1)$$

In this case, β_i^{CN} can be interpreted as a firm's exposure to the Canadian market risk (its local beta), β_i^{WD} reflects the firm's exposure to the global market risk (its global beta), and α_i is the return on the firm's equity that is unexplained by the market risk exposures—the so-called abnormal return.[7] The averages of individual firm α's and β's were estimated for cross-listed and domestically listed firms before the U.S. accounting scandals and afterward. In this case, the difference between the average alpha coefficients of cross-listed and domestically listed companies provide a proxy for the cross-listing premium—i.e., the premium that firms enjoy as a result of being listed U.S. exchanges, after controlling for the market risk exposures of such firms.

8. Again, the IAPM results suggest that before the U.S. scandals, stock prices for cross-listed and domestically listed companies exhibited similar behavior (Table 2 and Figure 2). The abnormal returns were positive and similar for both sets of companies—suggesting little or no cross-listing premium—and the betas that measured exposures to Canadian market risks were virtually identical. Unsurprisingly, the betas that measured exposures to the global market were higher for cross-listed companies, given that these companies tend to have wider international investor recognition.[8]

9. The estimates also confirmed that the response of cross-listed and domestically listed companies differed markedly subsequent to the U.S. scandals. The exposure of cross-listed companies to local market risk increased sharply, with their local betas rising almost three-fold after Enron's bankruptcy on December 2, 2001. The local betas rose further during the winter and spring of 2002, as the Securities and Exchange Commission launched investigations of several other large corporations, and climbed even higher—to a level almost five times higher than before the scandals—after WorldCom announced its restated profits on June 27, 2002.[9] By contrast, the impact on exposures to domestic market risk was somewhat more muted for companies listed on the TSX only.

Jorion and Schwartz (1986) and Dumas and Solnik (1995) for studies of IAPM, and Foerster and Karolyi (1999) for its application across different time periods.

[7] The DataStream World Stock Index used in the analysis, although including equities worldwide, is dominated by U.S. stocks. In fact, using the S&P500 instead of DataStream's index did not change the results significantly.

[8] See, for example, Foerster and Karolyi (1999).

[9] Dates were chosen based on news media and stock market reactions. Although precise dates on which each corporate scandal in the United States became incorporated into investor's information set are unknown, experiments with alternative time periods indicate that the results are generally robust.

Table 2. Canada: Abnormal Returns and Risk Exposures of Canadian Firms Across Different Periods 1/

The IAPM market model for individual equity monthly annualized excess returns R_{it} is estimated as panel GLS regressions allowing for heteroskedastisity across and autocorrelation within panels:

$$
\begin{aligned}
R_{it} = {} & \alpha^{PRE} + \beta_{CN}{}^{PRE} R_{CNt} + \beta_{WD}{}^{PRE} R_{WDt} + \\
& + \alpha^{ENR} D_t{}^{ENR} + \beta_{CN}{}^{ENR} R_{CNt} D_t{}^{ENR} + \beta_{WD}{}^{ENR} R_{WDt} D_t{}^{ENR} + \\
& + \alpha^{WC1} D_t{}^{WC1} + \beta_{CN}{}^{WC1} R_{CNt} D_t{}^{WC1} + \beta_{WD}{}^{WC1} R_{WDt} D_t{}^{WC1} + \\
& + \alpha^{WC2} D_t{}^{WC2} + \beta_{CN}{}^{WC2} R_{CNt} D_t{}^{WC2} + \beta_{WD}{}^{WC2} R_{WDt} D_t{}^{WC2} + \varepsilon_{it}
\end{aligned}
$$

where R_{CN} and R_{WD} are monthly annualized excess returns on the broad Canadian and Global Stock Market Indexes, respectively, calculated by DataStream. The model is estimated with dummy variables to index periods after Enron's bankruptcy on December 2, 2001 $D_t{}^{ENR}$; between the time that news broke about WorldCom's troubles on February 08, 2002, and its announcement of profit restatements on June 27, 2002, $D_t{}^{WC1}$; *and* between June 27, 2002 and WorldCom's bankruptcy on July 21, 2002 $D_t{}^{WC2}$. For excess returns, one-month Euro-Canadian Dollar rates are used. A Chow test of the structural break in the coefficients across different periods, defined by the dummy variables, is reported as a chi-squared with associated p-values below the estimate.

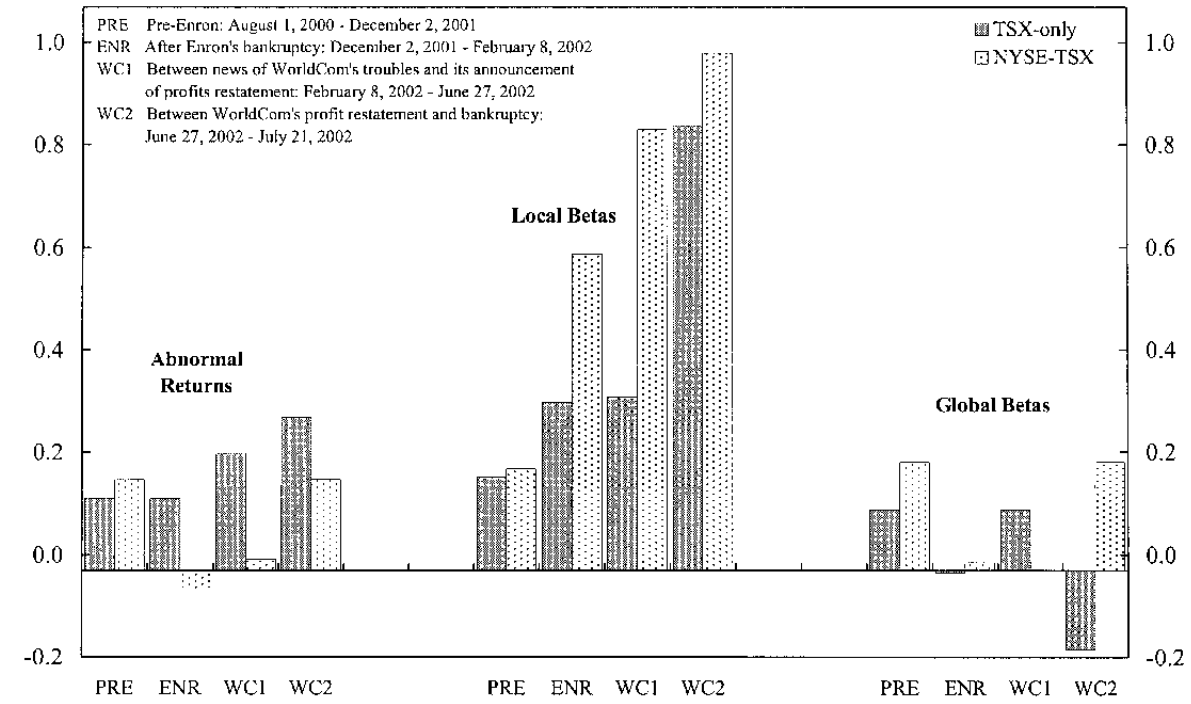
	TSX-only 2/			NYSE-TSX 2/		
	Coef.	**Std. Err.**	**P>|z|**	**Coef.**	**Std. Err.**	**P>|z|**
α^{PRE}	0.14	0.02	0.00	0.18	0.04	0.00
$\beta_{CN}{}^{PRE}$	0.18	0.01	0.00	0.20	0.01	0.00
$\beta_{WD}{}^{PRE}$	0.12	0.01	0.00	0.21	0.02	0.00
α^{ENR}	0.02	0.03	0.49	-0.21	0.05	0.00
$\beta_{CN}{}^{ENR}$	0.14	0.06	0.01	0.42	0.09	0.00
$\beta_{WD}{}^{ENR}$	-0.12	0.06	0.04	-0.20	0.09	0.03
α^{WC1}	0.09	0.04	0.03	-0.16	0.06	0.01
$\beta_{CN}{}^{WC1}$	0.16	0.05	0.00	0.66	0.07	0.00
$\beta_{WD}{}^{WC1}$	-0.05	0.04	0.26	-0.21	0.07	0.00
α^{WC2}	0.16	0.07	0.03	-0.03	0.11	0.83
$\beta_{CN}{}^{WC2}$	0.69	0.10	0.00	0.81	0.16	0.00
$\beta_{WD}{}^{WC2}$	-0.27	0.07	0.00	-0.16	0.11	0.16
chi-2(12)	99.10			29.00		
Prob > chi-square	0.00			0.00		

Source: IMF staff estimates.

1/ To interpret the results across specified periods, the estimated α's and β's in the pre-Enron period must be added to the respective coefficients in the subsequent periods, presented in the table. For example, the total local beta would be equal to $\beta_{CN}{}^{PRE} + \beta_{CN}{}^{ENR}$ following the Enron's bankruptcy; and equal to $\beta_{CN}{}^{PRE} + \beta_{CN}{}^{WC2}$ following the time between when WorldCom announced its profit restatements and its bankruptcy. Figure 2 contains these total coefficients.

2/ TSX-only indicates companies listed only on the TSX; NYSE-TSX indicates companies listed on both the TSX and the NYSE.

Figure 2. Canada: Total Abnormal Returns and Risk Exposures of Canadian Firms Across Different Periods



Source: Staff estimates

10. The initial impact on the global betas was initially favorable for cross-listed companies after Enron's bankruptcy, suggesting that they were perceived as less risky compared to stocks listed in the United States. Subsequently, however, the global betas of cross-listed companies rebounded, possibly reflecting a spillover of the broader loss of U.S. investor confidence. During this same period, the global betas for domestically listed companies turned negative, suggesting that these companies' stocks could have been perceived as insurance against stock market turbulences abroad.

11. Finally, the U.S. corporate scandals seemed to have adversely affected the "cross-listing premium" that Canadian companies listed in the United States previously enjoyed, while increasing the "domestic-listing premium" for non-cross-listed companies. In particular, the positive abnormal returns for cross-listed firms declined to zero after Enron's bankruptcy and subsequent corporate scandals, and only recovered in the period after mid-2002. By contrast, the abnormal returns for domestically listed stocks almost doubled during the period to mid-2002.

C. Canadian Corporate Governance

12. The more limited impact of corporate accounting scandals on Canadian domestically listed firms may suggest stronger confidence in Canada's institutional framework. Indeed, Canadian corporate governance is generally ranked high relative to other industrial countries. For example, survey evidence in McKinsey & Co. (2002) found that 60 percent of

institutional investors are willing to pay a higher price for companies with no corporate governance concerns. Canada had the lowest "good governance" premium required by investors to hold stocks of Canadian companies—that is, a relatively low concern about governance—among a broad range of countries surveyed. Similarly, cross-country indexes designed to measure outside investor rights and the quality of corporate disclosure also show that Canada ranks relatively high against a broad sample of countries.[10] Moreover, an Ontario Securities Commission (OSC) review of corporate practices and financial reporting in 517 publicly traded Canadian companies as of early 2002 found no serious evidence of "wrong doing."

13. Canada's strong rankings reflect in part its pro-active approach to corporate governance.[11] For example, in 1993, Canada convened a corporate governance task force—the Dey Task Force—which ultimately resulted in the establishment of guidelines for corporate accountability by spelling out best practices for board responsibility, composition, compensation, education, assessment, and committee structure as well as for disclosure practices. Follow up reports—which are required every five years—were published in 1999 and 2001, with the latter report containing recommendations on how to improve the way in which boards of directors function.[12]

14. Canadian corporate governance also differs from that in the United States in a number of important respects. First, Canada has a more principles-based system, which rests on both voluntary guidelines and mandatory requirements governing transparency and disclosure.[13] In contrast, the United States has a more rules-based system, which,some observers have argued, creates incentives to find loopholes in the rules to obfuscate corporate financial conditions. Second, Canada requires continuous disclosure—that is, material changes that affect a corporation must be disclosed as soon as they occur, and recent proposed rules would further strengthen this practice (see below). By contrast, U.S. rules require public disclosure only on a periodic basis, although measures recently adopted now mandate more frequent reporting. Third, Canadian corporate governance guidelines have encouraged a strong and independent board of directors as a check and balance to the powers of chief executives.[14] In contrast, chief executives in the United States often times also act as chairmen of their companies' boards, which can compromise the board's independence. Fourth, Canadian

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[10]See La Porta et al. (1998).

[11] For example, Stymiest (2002) observes that Canada and other countries including Australia and the United Kingdom that have followed a similar pro-active approach are largely free of systemic governance problems.

[12] See Joint Committee on Corporate Governance (2001).

[13] The Canadian accounting system is also more principles based, although in recent years it has moved closer to the U.S. rules-based system in an effort to harmonize.

[14] Similar approaches have been adopted in Australia and the United Kingdom.

corporate culture is considered to be less prone to excesses, particularly in the area of managerial compensation and the granting of stock options.[15]

D. Canadian Regulatory Response

15. In the wake of U.S. corporate accounting scandals, Canada has continued with its pro-active approach to corporate governance. Extensive collaboration among corporate executives, the stock exchanges, self regulatory agencies and regulators have resulted in a variety of initiatives to improve auditor oversight, accounting standards and disclosure, and corporate governance; to toughen enforcement; and to better control analysts' conflict of interest.

Auditor Oversight

16. Federal and provincial regulators and chartered accountants announced the creation in July 2002 of the new independent Canadian Public Accountability Board (CPAB), which will administer and enforce a new system of auditor oversight.[16] The main elements of the new system include:[17]

- More rigorous and annual review of major audit firms, with a report issued to the public. The cost of inspections will be borne by the industry.

- Tougher auditor independence rules, including limits on the types of consulting services provided by auditors, restrictions on financial interest on the part of auditors, and requirements for audit partner rotation.[18]

- Strengthened quality control requirements for firms auditing public companies—for example, a second partner review is required for every audit, and consultations are also mandated on sensitive and difficult issues.

Accounting Standards and Disclosure

17. The Accounting Standards Board (AcSB) issued new draft guidelines in the summer of 2002 aimed at improving the transparency of financial statements, including with regard to

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[15] See for example, Stymiest (2002).

[16] The CPAB—Canada's first ever national accounting board—will be made up of 11 members, seven from outside the accounting profession.

[17] Canada's major chartered accounting firms voluntarily agreed to implement the new requirements in October 2002. The requirements will apply to all other firms auditing public companies within three years..

[18] In early September, the Public Interest and Integrity Committee (PIIC) of the Canadian Institute of Chartered Accountants (CICA) released a new draft of auditor independence standards. The draft is offered for public comment and is expected to be finalized by the end of 2002.

the treatment of loan guarantees and special purpose vehicles.[19] In addition, the Canadian Securities Administrators (CSA) in July 2002 released draft rules on continuous corporate disclosure, designed to encourage more timely disclosure, and to enhance the consistency across Canada of disclosure in the primary and secondary securities markets.

Corporate Governance[20]

18. The Toronto Stock Exchange (TSX) in September 2002 announced proposed changes to its Guidelines for Effective Corporate Governance. The principal changes include: measures to strengthen boards of directors, especially the role of outside directors; requiring enhanced "financial literacy" of audit and compensation committees; and expanding the requirements for disclosure of corporate governance practices to non-corporate TSX issuers, such as trusts and limited partnerships. The TSX has also proposed new rules requiring that listed companies obtain shareholder approval before adopting certain types of compensation arrangements for staff.

Stricter Enforcement of Securities Laws

19. Canadian securities regulation is conducted at the provincial level, with each of the ten provinces and three territories having its own laws and regulators.[21] A number of provinces have recently issued new rules to toughen enforcement of securities laws. For example, the Ontario government has passed new legislation that toughens penalties for corporate wrongdoing; broadens investor rights; and grants greater powers to the securities regulator, including to hold management responsible for the accuracy of financial statements. The Quebec government has amended existing legislation to toughen penalties and expand powers of the securities regulator. Other provinces are considering similar rules.

Analysts' Conflict of Interest

20. In 2002, the Investment Dealers Association of Canada (IDA) announced new rules for managing conflict of interest for securities analysts. [22] These new rules require a full disclosure of information regarding the relationship between the securities analyst, his/her employer, and the firm about which recommendations are being made. In addition, analysts will be prohibited from issuing reports when they have an affiliation to the issuer; firms will

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[19] Guidelines regarding loan guarantees have been finalized and will be applicable starting January 2003, and guidelines regarding special-purpose vehicles are planned to be finalized early 2003. In addition, the AcSB has issued on December 23, 2002 a draft proposal requiring the expensing of all employee stock-based compensation transactions. The proposal is open for comments until March 31, 2002.

[20] Other initiatives include major Canadian institutional investors establishing the Canadian Coalition for Good Governance to share information and improve governance in public companies; and the Canadian Council of Chief Executives releasing a statement outlining how CEOs and boards can strengthen corporate governance.

[21] For a detailed discussion of the regulatory framework and related issues, see Mohindra (2002).

[22] The IDA is a national self-regulatory organization of the securities industry, overseeing more than 200 securities dealers, and 24,200 registrants.

be prohibited from compensating analysts from revenues received from specific investment banking transactions and must disclose whether the analyst received compensation from investment banking revenues within the last twelve months; and firms will be required to develop and enforce conflict of interest policies and procedures and file them with the IDA.

E. Remaining Challenges

21. The recent passage in the United States of the Sarbanes-Oxley (SOX) Act raises the question of whether Canada should follow the new U.S. rules in lock-step—so as to ensure a harmonized regulatory environment—or whether to adopt a "made-in-Canada" approach.[23]

22. As provincial regulators and the stock exchanges have already cautioned, the new U.S. rules may not be appropriate given the Canadian context.[24] Indeed, Canada has already tackled a number of the corporate governance issues—such as disclosure of material events and auditor independence—that the SOX Act aims to address. Moreover, the new rules in the SOX Act may be incompatible with Canada's greater emphasis on market as opposed to regulatory discipline. For example, the SOX Act sets out highly detailed criteria to define whether a company director is independent, whereas the Canadian approach is more principles based, resting on the requirement that companies disclose not only that a director is independent but also the basis for this judgment.

23. In addition, decisions on a Canadian response to the SOX Act and other new U.S. rules governing corporate governance are complicated by the uncertainties surrounding how these new requirements will be implemented in the United States. Moreover, wholesale application of the new U.S. rules could prove relatively more costly in the Canadian context, because of the higher proportion of smaller companies. More than 80 percent of Canadian listed companies have less than $500 million in market capitalization, 44 percent have capitalization of less than $50 million. In contrast, more than half of U.S. listed companies have capital in excess of $500 million. For smaller companies, the burden of meeting the SOX Act requirements—including with regard to audits and director independence—could be high, and in Canada's smaller market, it may also be difficult to find the large number of well-qualified independent directors required under the Act.

24. At the same time, however, in view of Canada's increasing links to global markets, it is recognized that Canadian accounting, disclosure, and governance standards will have to be broadly consistent with both U.S. and worldwide practices. For example, the Canadian

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[23]The Sarbanes-Oxley Act of 2002—signed into law in July 2002—substantially changes existing U.S. law and introduces new requirements including: new rules of public disclosure; regulation of trading and other activities by corporate officers and directors; new requirement that audit committees of companies are comprised solely of independent members of the board; auditor independence and the prohibition of providing non-audit services; and new criminal penalties and strengthening of existing penalties. The Act also creates the Public Company Accounting Oversight Board which will set professional standards and regulate the conduct of audits and accounting firms, under the Securities and Exchange Commission oversight.

[24] See Bank of Canada (2002).

Institute of Chartered Accountants (CICA)'s 2002 draft guidelines for auditor independence were based on both International Federal of Accountants (IFAC) issued in late 2001 and U.S. Securities and Exchange Commission (SEC) requirements for listed companies. Therefore, Canada has launched a process of consultations among regulators and industries to ensure a balanced regulatory response that capitalizes on the existing system while fostering continued harmonization with international best practices.

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IV. Regional Convergence and the Role of Federal Transfers[1]

1. Economic theory and evidence suggest that differences in income and output per capita between regions of a country tend to diminish over time, as factors of production relocate in response to relative cost/price advantages.[2] This convergence is typically viewed to carry important benefits, including a more efficient use of resources and higher levels of output for the country as a whole.

2. In Canada, however, although there has been some tendency toward convergence across provinces in recent decades, disparities in per capita output have narrowed much less markedly than in per capita income. This raises questions regarding the factors that may have hindered output convergence, and the extent to which government policies may have played a role. More specifically, federal transfer programs—such as the Employment Insurance (EI) and Equalization payments programs—may have discouraged factor movements and other adjustment to economic conditions, thereby contributing to slower output convergence.

3. The impact of federal transfer programs on output convergence across Canadian provinces is examined below using a panel regression framework. The evidence suggests that Equalization transfers may have helped spur convergence but that the Employment Insurance system seems to have had a significant negative effect, by discouraging migration and labor mobility within Canada. Despite the reforms to the EI system introduced in the 1990s, this program still appears to contain features that would deter labor mobility.

A. Stylized Facts of Regional Disparities

4. Differences in real per capita output across Canadian provinces are substantially larger, and have declined by less, than differences in per capita disposable income. This phenomenon can be illustrated by comparing the coefficient of variation of inter-provincial per capita real GDP and disposable income over time (Figure 1). By this measure, the dispersion of per capita disposable income across provinces has fallen markedly in the last four decades. In contrast, the provincial dispersion in per capita output has shown a much smaller decline during this period, and has remained nearly unchanged since the early 1980s.

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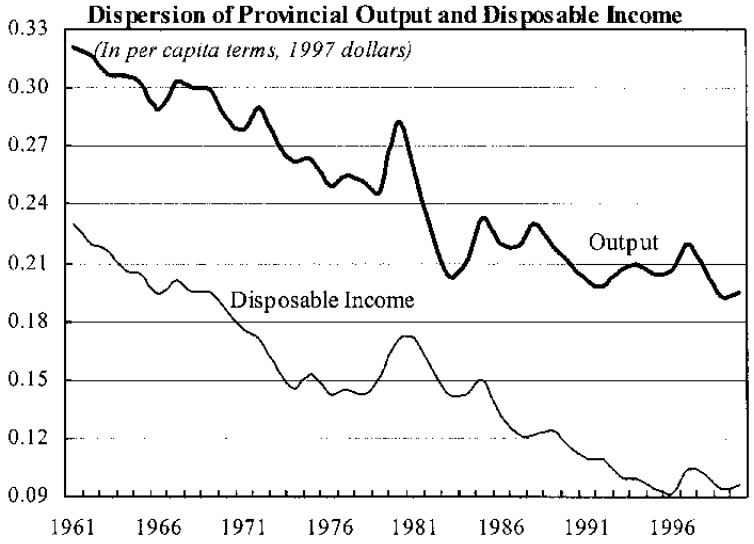
[1] Prepared by M. Kaufman, P. Swagel, and S. Dunaway. For a more detailed description of the statistical analysis, see forthcoming working paper.

[2] Examples of studies of regional convergence in the United States and Europe include respectively Kim (1997) and Quah (1995).

Figure 1. Canada.
Dispersion of Provincial Output and Disposable Income



5. These aggregate statistics reflect the marked differences in regional economic performance. Real per capita output in the four Maritime provinces—the lowest-income region in Canada—increased from around 65 percent of the national average in 1981 to 72 percent in 2000. In contrast, real per capita disposable income in the Maritimes rose from 60-80 percent of the national average in 1981 to 80-90 percent in 2000. Even in Newfoundland, the lowest-income province, real per capita disposable income rose from 67 percent of the national average in 1981 to 81 percent in 2000.

6. The relatively more rapid convergence in income compared with output has reflected the significant redistributive effects of federal government transfer programs. For example, in 2000, Newfoundland and Prince Edward Island—provinces with relatively lower levels of per capita output—received 3–3½ times the national average in per capita EI benefits, up from 2–2½ times the national average in 1980 (see Figure 2). All other provinces actually received smaller per capita EI transfers in real terms, and the amount directed toward Ontario and Quebec—which are relatively more productive—fell compared to the national average.

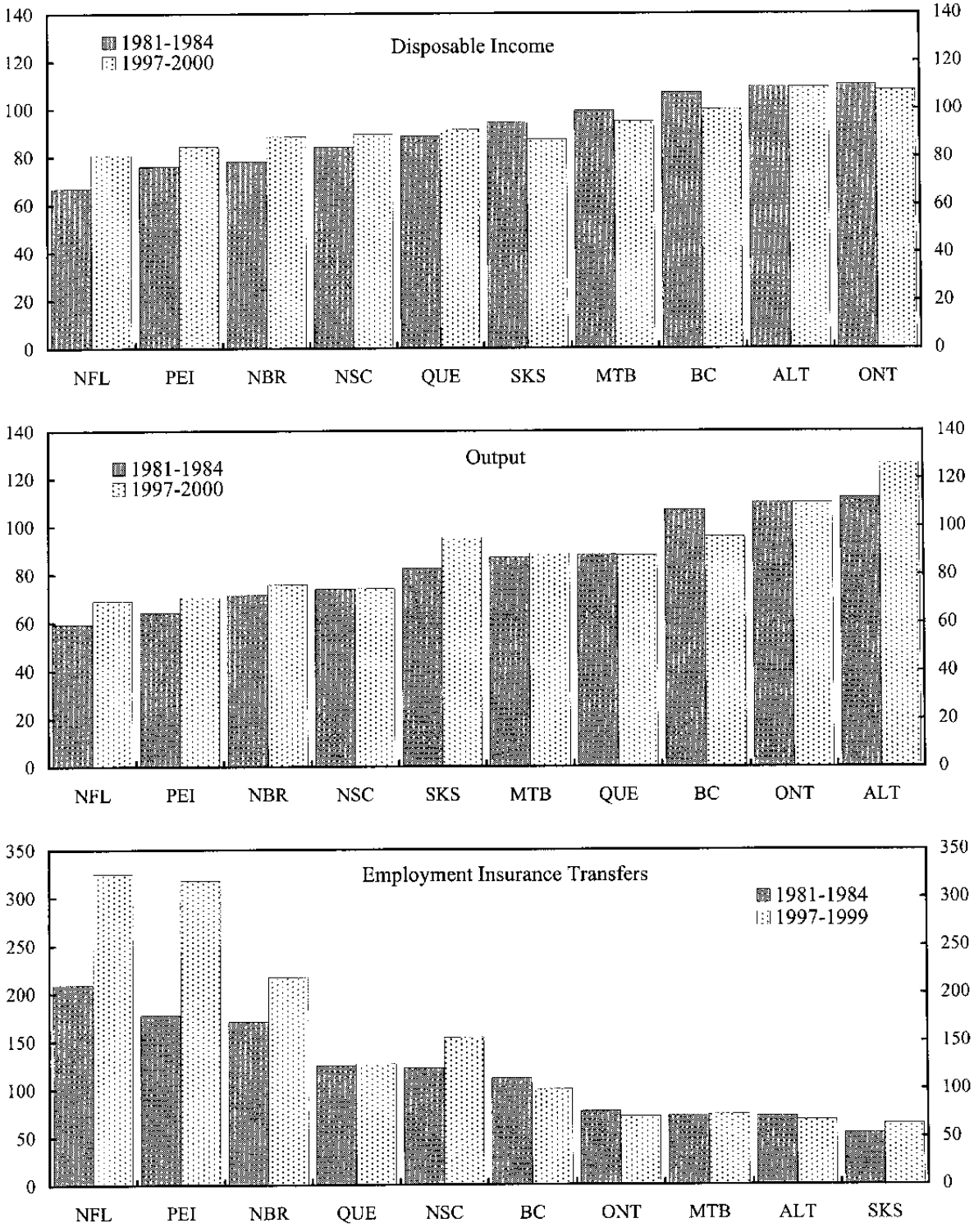
B. Equalization and Employment Insurance[3]

7. **Equalization payments** are provided directly to the provinces by the federal government and are designed to reduce fiscal disparities. The transfers are intended to ensure that lower-income provinces have access to sufficient resources to provide reasonably comparable levels of public services at reasonably comparable levels of taxation. No conditions are attached, and the provinces can use the transfers according to their own priorities.

8. The specific amount of Equalization payments provided to a given province is calculated according to formulas that are defined by federal legislation and regulations. The

[3] Helpful summaries are provided on the web sites of the Department of Finance (www.fin.gc.ca) and Human Resources Development Canada (www.hrdc-drhc.gc.ca).

Figure 2. Canada. Changes in Disposable Income, Output, and EI Transfers
(Per capita 1997 dollars relative to the national average)



Sources: CanSim and IMF staff Calculations.

calculations involve first the definition of a standard level of revenue-raising capacity—presently defined on the average capacity of the five "middle-income" provinces: Quebec, Ontario, Manitoba, Saskatchewan, and British Columbia, and equal to $5,863 per capita as of end-2002. Provinces whose revenue potential falls short of this amount are provided Equalization payments that bring them to the standard. Currently, eight provinces qualify: Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Manitoba, Saskatchewan, and British Columbia.

9. It is important to note that the calculations are based not on actual revenues, but on benchmark estimates of revenue capacity. Over 30 separate revenue sources are considered, and a national average tax rate is then applied to the tax base in each province.[4] A floor on Equalization payments protects individual provinces against large year-to-year declines in payments, while a ceiling that increases with GDP also applies.[5]

10. The **Employment Insurance** (EI) system is a federally administered program that provides temporary income support for individuals facing involuntary unemployment.[6] The EI program is presently financed through payroll taxes paid by employers and employees on insurable earnings. In principle, the EI tax rate is set at a level that is expected to meet the costs of providing unemployment benefits over the business cycle, but the system presently runs large surpluses. In this context, EI premia were reduced by 10 cents to $2.10 in early 2003, for a cumulative reduction of near a ⅓ from a premium level of $3.07 in 1994.

11. EI benefits are based on hours worked during the previous year, past earnings, and previous use. EI premia are uniform for all employers across Canada, and are not experience-weighted, i.e., the premiums paid by firms and employees do not depend on the likelihood of layoffs or past use.

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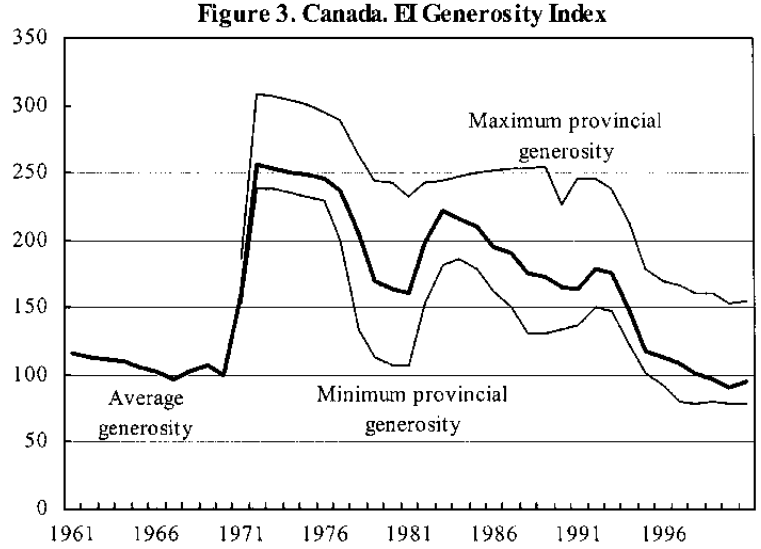
[4] In order to avoid adverse incentives in situations where a tax base is concentrated in one province and that province's decisions significantly affects the national average tax rate, a "Generic Solution" applies in cases where a province generates more than 70 percent of a particular type of revenue. For such a province, every $1.00 a province generates in revenues from that revenue source reduces its equalization payment by only $0.70.

[5] The floor provision limits the amount that a province's entitlement can decline from year to year to 1.6 percent of the per capita value of the equalization standard. Floor payment entitlements are calculated before the application of any ceiling restrictions to total equalization entitlements. Since the introduction of the floor provision in 1982, there have been nine floor payments to provinces.

[6] The EI system also provides other programs aimed at broader social objectives, including training and self-employment assistance, as well as sickness, maternity, and parental leave.

12. EI benefits vary considerably across provinces owing to the introduction of regionally extended benefits in the early 1970s(Figure 3). The number of hours of insurable employment required to qualify for EI benefits is lower in high unemployment regions, and the number of weeks of benefits that claimants are eligible for are also higher in such regions. Claimants in the Atlantic provinces are the largest net beneficiaries of the system, reflecting their dependence on seasonal, resource-based industries. Reforms during the 1990s substantially lowered the generosity of EI benefits, and the average level of generosity has returned to close to the level of the 1960s. However, the system continues to differentiate benefits depending on the level of unemployment within regions and the generosity index for high unemployment regions is still high.

Figure 3. Canada. EI Generosity Index



Source: Sargent (1995) and recent update.

C. Regional Convergence of Output Per-Capita

13. Several aspects of the Equalization and the Employment Insurance systems could work against promoting convergence of per capita output across the provinces. For example, the Equalization system has sometimes been argued to result in a form of "transfer dependency," in that provinces below the revenue standard have little incentive to boost their revenue bases. The absence of experience rating of EI premiums also implies a cross-subsidization of seasonal and other industries where employment demand varies predictably, and an implicit tax on sectors with more stable employment.[7] Moreover, the larger benefits paid in high unemployment regions may tend also to discourage individuals to respond to changes in economic conditions by migrating to areas with better employment prospects.[8]

14. To assess the effect of these federal transfers programs on regional convergence in Canada, a model of provincial output convergence is estimated using panel data of Canadian provinces for the period 1961-2000.[9] The model contains a standard convergence equation, in

[7] For a detailed analysis, see Canada—Selected Issues, SM/00/6.

[8] Previous studies on the structure of transfers in Canada include Bayoumi and Masson (1995).

[9] For a critical discussion of convergence issues, see Quah (1996).

which provincial GDP growth (in per capita terms) is assumed to depend on the previous year's level of provincial per capita GDP. In this case, however, provincial GDP growth is also assumed to depend on the amount of Equalization payments and, indirectly, EI transfers the province receives. The convergence equation also incorporates a number of province-specific factors, including net-inward migration. The latter would be expected to lower provincial growth in per capita terms, assuming decreasing returns to scale.

15. The equations are estimated to take into account the fact that the amount of Equalization and EI transfers received by a province are not strictly exogenous but dependent on other factors. In this case, the transfers are assumed to depend on a province's GDP and unemployment, and on changes in the generosity of the EI system. Finally, a migration equation is included; migration patterns into a province are expected to occur in response to relative unemployment conditions, GDP per capita, and EI transfers to provincial residents.

Summary of Model

Growth of real GDP/person = f(Log(real GDP/person)$_{-1}$, Log(real Equalization payments/person), Log (real EI payments/person), migration/person, other control variables and constant)

Log(real EI payments/person) = f(relative unemployment rate, EI generosity, constant)

Log(real Equalization payments/person) = f(relative GDP, constant)

Migration/person = f(relative unemployment rate, Log(real EI payments/person), Log(real GDP/person), constant)

16. The results of the panel estimation are presented in Tables 1 and 2.[10] In the first specification, province-specific controls are included in the convergence equation (growth of hours worked and the capital stock) to take into account differences in endowments that may not be accounted for by the level of GDP per capita (Table 1). The coefficients on lagged GDP and migration in the convergence equation are both negative and significant, as expected, whereas the Equalization parameter is not significant. The coefficient on the EI generosity index is positive and significant in the EI transfers, and the effect of EI transfers per capita is positive and significant in the migration equation.[11] In this case,

[10] Given the endogeneity introduced by using transfers and migration in the convergence equation, a three-stage procedure for estimating the panel was used. In addition, weighted least squares was applied using provincial GDP.

[11] There are, however, some studies that use micro-level data and find that EI has had a small or non-significant deterrent effect on migration (Day and Winer, 2001, and Audas and McDonald, 2002).

therefore, EI transfers seem to deter migration and hinder convergence, whereas Equalization appears to have no significant effect.

17. Table 2 presents an alternative specification that allows for province-specific effects through "fixed effects" terms—i.e., the constant term in the convergence equation was allowed to vary across provinces. In this case, the convergence parameter and the migration coefficient remain negative, but the Equalization parameter becomes now positive and significantly different from zero. EI generosity is positive and significant in the EI transfers equation, and EI transfers are positive and significant in the migration equation.[12] Thus, these latter results seem to confirm that EI transfers appear to deter migration and indirectly retard convergence, while suggesting that Equalization payments act to promote convergence.[13]

18. This analysis suggests that the reforms to the EI system in the 1990s are likely to have had important beneficial effects by promoting labor migration and regional convergence. At the same time, however, significant differences in regional generosity remain. Lowering these distortions, and introducing other reforms that would address the lack of experience rating, could have further significant benefits.

[12] The estimated coefficients for EI transfers in the migration equation are significant in both specifications, but the magnitude of the effect varies considerably. In the specification with fixed effects, the coefficient is significantly larger than in the one with a common constant term.

[13] Under an alternative specification without a migration channel, EI payments were found to have a significant and negative direct impact on convergence, but the result was not maintained with the inclusion of fixed effects.

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Table 1. Canada: Convergence Equation, with Migration Channel

(Three-stage least squares regression)

	Per Capita Real GDP Growth			ln(Real EI Transfers Per Capita)			ln(Real Equalization Transfers Per Capita)			Migration Per Capita		
	Coef.	z	P>|z|	Coef.	z	P>|z|	Coef.	z	P>|z|	Coef.	z	P>|z|
ln(Real GDP Per Capita) (-1)	-0.024	-2.5	0.01							-0.170	-1.5	0.14
ln(Real Equalization transfers Per Capita)	-0.001	-0.4	0.70									
Migration Per Capita	-0.039	-3.3	0.00									
Growth of Capital Stock	0.087	0.5	0.64									
Growth of Hours Worked	0.254	3.4	0.00									
Relative Unemployment Rate				0.902	11.8	0.00				-0.342	-3.0	0.00
Index of EI Generosity				0.005	9.2	0.00						
ln(Real EI Transfers Per Capita)										0.269	4.3	0.00
Relative GDP							-2.911	-5.3	0.00			
Constant	-0.099	-2.2	0.03	-9.641	-88.5	0.00	-5.244	-12.1	0.00	1.469	3.0	0.00
RMSE	0.040			0.534			1.195			0.457		
chi2	58.9			330.0			28.1			21.0		
P	0.00			0.00			0.00			0.00		

Table 2. Canada: Convergence Equation, With Migration Channel and Fixed Effects

(Three-stage least squares regression)

	Per Capita Real GDP Growth			ln(Real EI Transfers Per Capita)			ln(Real Equalization Transfers Per Capita)			Migration Per Capita		
	Coef.	z	P>|z|	Coef.	z	P>|z|	Coef.	z	P>|z|	Cocf.	z	P>|z|
ln(Real GDP Per Capita) (-1)	-0.548	-5.7	0.00							0.176	1.1	0.28
ln(Real Equalization transfers Per Capita)	0.360	6.8	0.00									
Migration Per Capita	-0.221	-6.9	0.00									
Relative Unemployment Rate				1.352	9.3	0.00				-0.755	-5.8	0.00
Index of EI Generosity				0.004	8.1	0.00						
ln(Real EI Transfers Per Capita)										0.395	5.7	0.00
Relative GDP							3.628	7.4	0.00			
Alberta												
British Columbia	2.059	6.3	0.00	-9.886	-31.5	0.00				4.241	8.8	0.00
Manitoba	0.350	4.9	0.00	-9.987	-67.8	0.00	4.281	11.8	0.00	4.051	9.3	0.00
New Brunswick	0.117	3.0	0.00	-9.979	-44.7	0.00	5.444	14.3	0.00	4.501	9.0	0.00
Newfoundland	-0.183	-4.2	0.00	-10.398	-35.5	0.00	6.145	15.2	0.00	4.262	7.6	0.00
Nova Scotia	0.172	3.9	0.00	-10.052	-48.8	0.00	5.302	14.0	0.00	4.579	9.4	0.00
Ontario												
Prince Edward Island				-9.804	-43.6	0.00	6.015	15.1	0.00	4.594	9.0	0.00
Quebec	0.449	5.5	0.00	-10.164	-50.5	0.00	4.142	11.4	0.00	4.441	9.5	0.00
Saskatchewan	0.934	6.1	0.00	-9.977	-72.1	0.00	2.656	7.2	0.00	3.809	8.8	0.00
Constant	0.141	1.4	0.15				-15.018	-26.0	0.00			
RMSE	0.251			0.508			0.692			0.372		
chi2	70.5			64780			637.0			513.5		
P	0.00			0.00			0.00			0.00		

Data Appendix

Per capita GDP growth

The series was constructed using data from Statistics Canada Tables 380-0002, Gross Domestic Product of Provinces, and 051-0005, Estimates of Population. As of 1980, GDP data were spliced backward using growth rates in provincial GDP, Table 384-0015, deflated by 1992 GDP deflator, code D15612.

Net-migration

Derived as in-migration minus out-migration. Series are from Statistics Canada Table 051-0017, inter-provincial migrants.

Transfers

Employment Insurance data are from Table 276-0005. The EI time series in the table is composed of data before and after 1996. The EI series for the paper is constructed by splicing the new series, i.e., 1996–01 backwards, using growth rates in the EI series before 1996. The series are concatenated in 1996 by using monthly observations.

Equalization data for the period 1980-2000 are from the Department of Finance. The series was extended backwards to 1960 by splicing Equalization series using growth rates in Transfers under Taxation Agreements from Table 384-0033.

Unemployment Rate

Variables are compiled from Tables 282-0087,1976-current, LFS estimates by sex and age group, 384-0035, Selected economic indicators, 1966-1975, and Unemployment Rates for different regions, 1961-66 from Statistics Canada, Labour Statistics Division.

Employment (hours worked)

Data are from Tables 281-0023, Employment (SEPH), 1991-current. Data were spliced backward using growth rates from Tables 281-0001, Number of employees, by type of employee and Standard Industrial Classification, 1983-00; 281-0005 Number of employees, by type of employee and Standard Industrial Classification, 1983-00; 281-0001 Number of employees, by type of employee and Standard Industrial Classification, 1983-00; and 281-0015 Estimates of employees, by industry, 1961-83.

Capital Stock

Data are from Statistics Canada, National Wealth, and Capital Stock Section. Data are provided in 1997 prices; capital stock are constructed by Statistics Canada using hyperbolic delayed methodology.

EI Generosity Index

The series is an updated version of the index described in Sargent (1995).