

### Canada: Selected Issues

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## CANADA

### Selected Issues

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## I. LABOR PRODUCTIVITY GROWTH IN CANADA<sup>1</sup>

1. The surge in U.S. labor productivity growth since the mid-1990s has attracted considerable attention, as most other major industrial countries, including Canada, have not experienced a similar surge. This surge generated strong interest in understanding the role of information technology (IT) investment in boosting U.S. productivity growth and the conditions under which other countries might benefit from such investment. Given the high level of economic integration with the United States and broad similarities in the stance of policies over the past few years, Canada would be expected to experience a “U.S.-style” pickup in labor productivity growth sooner than other industrial countries, particularly those in Europe, where policy differences are more pronounced.

2. The contrast between high economic integration with the United States and lackluster productivity growth in Canada appears puzzling.<sup>2</sup> To a large extent, however, the differences in labor productivity growth between Canada and the United States can be traced to the smaller size of the IT sector in Canadian manufacturing and to differences in the pattern of IT adoption and diffusion. They also reflect distortions caused by Canada’s employment insurance system and higher taxation on labor and capital relative to the United States, which may have limited capital deepening and total factor productivity growth in Canada. Nevertheless, investment in information technology has been buoyant in Canada since 1995, and recent policy actions aimed at eliminating distortions in the tax system should help to boost labor productivity growth in the period ahead, provided that the current macroeconomic policy framework and the structural reforms implemented over the past decade remain in place.

### A. Trends in Labor Productivity in Canada: An International Comparison

3. Between 1980 and 1995, labor productivity in the business sector grew at an average annual rate of about 1¼ percent in Canada, which was slightly faster than productivity growth in Germany, but significantly slower than labor productivity growth in the United States, France, Italy, and Japan (Table 1). Since 1995, labor productivity growth has differed

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<sup>1</sup> Prepared by Martin Cerisola, Paula DeMasi, and Victor Culiuc.

<sup>2</sup> In line with recent attention in the literature, this paper primarily focuses on labor productivity growth rather than on total factor productivity growth. Cross-country comparisons of productivity are somewhat limited by methodological differences in how the underlying data are constructed. This paper largely focuses on a comparison between Canada and the United States because the methodological differences between these two countries appear to be less pronounced than with respect to other industrial countries. The annex to this paper provides a description of some of the most important differences in estimating productivity between Canada, the United States, and other industrial countries.

markedly among major industrial countries, accelerating in the United States and Germany, remaining broadly unchanged in Canada, and declining sharply in France, Italy, and Japan.<sup>3</sup>

4. To better understand developments in labor productivity, it is useful to decompose its growth rate into changes in the capital-labor ratio and in total factor productivity (Table 2 and Figure 1).<sup>4</sup> In the United States, the acceleration in labor productivity growth during the 1990s, and especially since 1996, has been underpinned by both a rising capital-labor ratio and higher growth in total factor productivity. In contrast, labor productivity growth has remained largely unchanged in Canada through the 1990s, and has decelerated substantially since 1996, owing to a stagnant capital-labor ratio and slightly weaker growth in total factor productivity. Cyclical and structural factors may help to explain some of these differences. In particular, the 1990–91 recession was more severe in Canada than in the United States, and the Canadian economy also recovered more slowly. As a consequence, between 1990 and 1993, Canadian machinery and equipment investment lagged that in the United States (Figure 2). Since mid-1995, investment has been as buoyant in Canada as in the United States.<sup>5</sup> As for the role of structural factors, the Canadian economy faced several important structural changes in the late 1980s and early 1990s, including free trade agreements and deregulation in the transportation, communications, and financial sectors, which intensified corporate restructuring.<sup>6</sup> These changes may have contributed to the delayed recovery and weak growth in total factor productivity in Canada, owing to significant lags between restructuring and the realization of productivity gains. The introduction of new technologies and structural reforms may have a negative initial impact on productivity, as companies and

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<sup>3</sup> In contrast to the United States, the acceleration of labor productivity growth in Germany appears to reflect the substitution of capital for labor, as evidenced by a high rate of unemployment.

<sup>4</sup> This decomposition assumes that the production function depends exclusively on two inputs, labor and capital, as well as on the “current state of technology” or total factor productivity. The growth rate of labor productivity can be decomposed into the growth rate of the capital-labor ratio, weighted by the contribution of capital in production, and the growth rate of total factor productivity.

<sup>5</sup> However, methodological differences overstate the pickup in Canadian investment relative to the United States. In the Canadian national accounts, a Laspeyres index is used to deflate investment. If a Fisher-type index were used as in the United States, Canadian investment growth would be somewhat lower in the post-1995 period. For a more detailed description, see *Productivity Growth in Canada* (2001).

<sup>6</sup> A similar process of deregulation and corporate restructuring took place in the United States during the early 1980s. Kwan (2000) notes that the extent of corporate restructuring in Canada was greater in the 1990s than in the 1980s, and that the most common type of restructuring was the adoption of new technology and mergers and consolidations.

workers require some time to adapt to new business conditions and as new technologies and practices are adopted and diffused across sectors in the economy.<sup>7</sup>

5. Given the increased integration of the Canadian and U.S. economies over the past two decades, the gap in labor productivity performance, especially since 1995, is somewhat surprising. It can be traced largely to the relative performance of the manufacturing sector. Labor productivity growth in Canadian manufacturing grew at an average annual rate of 2½ percent between 1980 and 1995, but subsequently decelerated, to roughly 1 percent in 1996–99, amid a decline in the capital-labor ratio and a weakening of total factor productivity growth. In contrast, labor productivity growth in U.S. manufacturing accelerated, from an average annual rate of 2¾ percent in 1980–95 to 4½ percent in the second half of the 1990s (Figure 3 and Table 3), reflecting a sustained process of capital deepening and an acceleration in total factor productivity growth. Recent studies by Statistics Canada (1999) and Gu and Ho (2000) suggest that the gap between the manufacturing sectors in the two countries may be explained by the relative performance of total factor productivity in specific industries. In electrical products and commercial and industrial machinery—which include computers and computer parts—U.S. productivity has significantly outperformed that of similar Canadian firms. This difference in performance, together with the fact that these industries have a larger share in manufacturing output in the United States, largely account for the differential in manufacturing productivity growth.

### **B. Adoption of Information Technology and Productivity Growth**

6. As in the United States, the adoption of information technology accelerated significantly in Canada during the 1990s, and it is increasingly becoming an important source of economic, employment, and labor productivity growth. Since 1995, investment spending on machinery and equipment in Canada has increased at an average annual rate of 13½ percent, after remaining relatively flat in the first half of the 1990s (Figure 4). In particular, investment spending on computers and equipment and telecommunications grew at average annual rates of 30 percent and 17 percent, respectively.<sup>8</sup> Strong spending on IT in Canada resulted in an increase in the IT sector as a share of the total economy, rising in real terms from about 4 percent in 1993 to 5¾ percent in 1999. Although the IT sector represents a relatively small share of the economy, its contribution to GDP growth has increased considerably since the mid-1990s, rising from about 8 percent in 1994 to 25 percent in 1999 (Figure 5).<sup>9</sup> Although there has clearly been a step-up in IT-related investment spending in

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<sup>7</sup> See Cerisola and Chan-Lau (2001).

<sup>8</sup> In the first half of the 1990s, investment spending on computers and telecommunications grew at an average annual rate of 19 percent and 3 percent, respectively.

<sup>9</sup> The contribution of the IT sector to aggregate GDP growth is somewhat overstated because real GDP is valued at 1992 prices and prices for goods produced in the IT sector have declined considerably since then. See the annex for a more detailed explanation.

Canada, the acceleration has been more dramatic in the United States. Since 1995, growth in U.S. investment spending on machinery and equipment averaged about 12 percent, but spending on new computers and peripheral equipment averaged about 46 percent a year. Although IT accounts for less than 10 percent of output in the United States, the IT sector contributed about 30 percent of output growth on an annual basis over the period 1994–99.<sup>10</sup>

7. Employment in Canada's IT sector also exhibited strong growth, rising at an average annual rate of about 5¾ percent over the period 1994–98, compared to about 2 percent for total employment. As a result, the share of workers employed in the Canadian IT sector rose from about 3 percent of total employment in 1993 to about 3½ percent in 1998 (Figure 6). In the United States, employment growth in the IT sector employment was roughly the same as in Canada, although it started from a larger base and reached 5 percent of total employment by 1998. In both countries, these employment gains were largely concentrated in software and computer services, where the level of employment in these subsectors doubled over the period 1993–98.

8. The contribution of information technology to labor productivity growth has been more modest in Canada than in the United States. Recent evidence suggests that about 60 percent of the acceleration in U.S. labor productivity growth in the second half of the 1990s reflects an increase in total factor productivity growth, with the remaining 40 percent attributable primarily to a rising capital-labor ratio, reflecting to a significant degree investment in information technology.<sup>11</sup> In contrast, growth in the capital-labor ratio and total factor productivity growth since 1996 have been largely unchanged in Canada, while the contribution of investment in information technology to labor productivity growth has been only one-third of that in the United States (Table 4). To a large extent, information technology capital is still a rather small part of total capital in the Canadian business sector, especially when compared with the United States (Table 5).<sup>12</sup> In addition, the contribution

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<sup>10</sup> The IT sector as a share of GDP in real terms increased from about 5 percent in 1994 to 10 percent in 1999. However, because U.S. real GDP data are chain-weighted, calculating shares can be potentially misleading. Contributions to real output growth are based on inflation-adjusted data for gross domestic income because the data used in calculating GDP are not sufficiently disaggregated to capture the growth of the IT sector alone.

<sup>11</sup> Results based on Oliner and Sichel (2000). For a review of other studies which decompose the acceleration in labor productivity growth into capital deepening and total factor productivity, see "Does the Pickup in Productivity Growth Mean That There is a New Economy?" in *United States: Selected Issues*, (2000).

<sup>12</sup> The estimated contribution rate was based on chain-weighted indices published by Statistics Canada for labor productivity and capital and labor services for the business and manufacturing sectors. Data for information technology capital stock, which were also provided by Statistics Canada, were based on 1992 prices. These data are preliminary and unpublished. They were used as a proxy for information technology capital services, and they may bias upward the relative contribution of IT investment to labor productivity growth,

(continued...)



from capital deepening from investment in other types of capital has been negative in Canada, in contrast with the United States where it has been slightly positive.

9. In addition to the smaller size of the Canadian IT sector, the pattern of IT adoption and diffusion is distinctively different from that in the United States. According to Baldwin et al. (1999), the nationality of ownership and firm size have been important in explaining the pattern of technology adoption in Canada. Differences in technology adoption rates between domestically owned and foreign-owned firms in Canada have been quite significant over the past ten years. Based on information compiled in technology surveys for the manufacturing sector,<sup>13</sup> the authors note that Canadian-owned firms significantly lagged foreign-owned firms in adopting new technologies between 1989 and 1993, the period in which Canada faced significant adjustment costs associated with the free trade agreement with the United States and a more severe recession than did the United States. The 1998 survey showed that differences in adoption rates for domestic- and foreign-owned firms had narrowed markedly for different kinds of technologies since 1993. The faster adoption rate in foreign-owned firms might be explained by the relatively large number of these firms that are multi-nationals, which tend to be larger and more likely to adopt new technologies. The authors conclude that lagging technology adoption rates in Canada have been primarily caused by a weaker performance of small- and medium-sized firms, as adoption rates for large domestically owned firms do not appear to differ significantly from those of multinationals in Canada over the past few years. In a previous study, Baldwin and Sabourin (1998) reported that small- and medium-sized firms in Canada tended to lag those in the United States in adopting or using new technologies. However, their analysis was based on data from manufacturing surveys conducted in 1989 and 1993, and therefore, may be heavily influenced by the effects of the 1990–91 recession and may not reflect more recent developments.

### **C. Adoption of Information Technology and the Policy Framework**

10. In analyzing the acceleration in U.S. labor productivity growth, many observers and policymakers have emphasized the importance of having in place a flexible labor market and a sound tax regime. U.S. Federal Reserve Chairman Greenspan (2000) has noted that more costly labor markets tend to depress the rates of return on investing in new technologies, as businesses face higher costs of displacing workers, and therefore delay the rewards from incorporating new technologies. In the same vein, Bassanini et al. (2000) have emphasized that excessively high employment protection regulation and other policy-induced restrictions—such as a high level of taxation or a distortive tax system—tend to inhibit the

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because these data are not based on a chain-weighted index as the rest of the data are. However, in the recently published study, Conference Board of Canada (2000), based on 1992 data for labor productivity as well as for all factor inputs, very similar results to those presented here were reached.

<sup>13</sup> These surveys were conducted in 1989, 1993, and 1998.

adoption and diffusion of new technologies and the associated adjustments in the labor force that new technologies induce. As a result, labor productivity growth tends to be lower.

11. In terms of employment protection regulation, a recent study by Nicoletti et al. (2000) shows that the stringency of Canadian regulations is low relative to other OECD countries but high relative to the United States (Figure 7).<sup>14</sup> To some extent, the difference in the stringency of employment protection between Canada and the United States lies in regulations affecting regular employment contracts and reflects higher direct costs of dismissals in Canada. For example, the statutory entitlement in the case of no-fault dismissals after four years of employment is higher in Canada than in the United States. The study also shows that Canada and the United States have not changed the stringency of their regulations on regular and temporary contracts between 1990 and 1998, while other industrial countries have tended to make regulations on regular contracts more stringent and temporary contracts less stringent during the 1990s.

12. Disincentives in labor force participation associated with differences in the structure of unemployment insurance systems between both countries may pose some additional constraints in the functioning of labor markets in Canada. The Employment Insurance (EI) system in Canada has been considered to be a contributing factor to the higher level and persistence of unemployment in Canada during the 1990s. While significant reforms to the system have been introduced to lessen disincentives to work and reduce structural unemployment in the 1990s, the current EI system still provides important disincentives vis-à-vis the United States. The EI system in Canada is not experience-rated as in the United States, relying instead on uniform contributions from employers which are not linked to the costs they impose on the system. The result is significant cross subsidization of industries that are more prone to generating unemployment. For example, seasonal resource-based industries in the Atlantic provinces have been the largest net beneficiaries of the EI system, and industries in these provinces may have structured job duration based on the benefits available from the EI system.<sup>15</sup> In addition, reducing or eliminating the current practice of regional extended benefits, which is primarily based on regional unemployment rates, would encourage labor mobility across provinces and discourage the use of the EI system by employers in seasonal industries to maintain their workforces.

13. The tax burden on capital and labor in Canada has been high by international standards, especially relative to the United States. Carey and Tchilinguirian (2000) show that average taxation levels on capital and labor in Canada have trended upwards over the past 15 years, especially during the 1990s, outpacing the increase in average tax levels on capital

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<sup>14</sup> Employment protection regulation is measured by applying factor analysis to several indicators for regular and temporary contracts such as the direct costs and delay of dismissals associated with procedural obstacles.

<sup>15</sup> See "Experience Rating of Employment Insurance Premiums," in *Canada: Selected Issues* (2000); and Green and Sargent (1995).

and labor in the United States and the EU (Figure 8). In addition, marginal tax rates on personal income have been very high, especially at the middle-income bracket, while the burden of corporate income taxes has not only been high relative to the United States (Table 6), but also has tended to penalize “new technology” sectors (Table 7). The measures introduced in *The Budget Plan 2000* and the *October 2000 Economic and Budget Update*, particularly the reductions in personal and corporate income taxes, as well as in capital gains taxes, are expected to reduce the distortions embedded in the Canadian tax regime and increase the attractiveness of business operations and new investments in Canada (Table 8).

## **Annex: Cross-Country Comparisons of Labor Productivity Growth: Methodological Issues**

14. Labor productivity represents the amount of output produced per unit of labor, and is typically measured as the ratio of real GDP to hours worked. In disaggregated terms, labor productivity growth reflects the amount of capital per hours worked (capital deepening), the growth in the quality of labor, and in total factor productivity. While straightforward in concept, labor productivity is difficult to measure in practice, particularly in the context of cross-country comparisons because of significant variations in statistical methodologies.

### **Comparison Between Canada and the United States<sup>16</sup>**

#### **Differences in measuring output**

15. There are several important methodological differences in how real GDP estimates are constructed in Canada and the United States. First, Canadian and U.S. national accounts differ in how information technology (IT) goods, and in particular software, are treated. In the 1999 revisions to the U.S. national accounts, software was reclassified as an investment good—previously software was considered to be an intermediate good. This change resulted in higher output growth than previously estimated, and accordingly, higher productivity growth. Canada has yet to adopt this change in its national accounts. Second, Canada's measure of business sector output includes the crown corporations (government-owned companies), whereas, the U.S. measure excludes government enterprises.

16. Third, in constructing real GDP, Canada uses a fixed-base-volume index in which quantities are valued in terms of a fixed set of prices for a particular base year, which is updated roughly every fifth year. A drawback of this type of index is that it suffers from "substitution bias," in that it does not reflect changes in relative prices that occur from year to year. Sectors in which prices are falling sharply and output is rising rapidly—for example, the IT sector—tend to be overweighted by the fixed-weight index, and as a result, real GDP growth is overestimated. As part of its comprehensive revisions to the national accounts in 1996, the United States adopted a chain-type index in which the price weights are updated every year, and therefore the problem of substitution bias is eliminated.<sup>17</sup>

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<sup>16</sup> Eldridge and Sherwood (2000) analyze the methodological differences in constructing labor productivity in both Canada and the United States and conclude that these differences, at least at the aggregate level, do not explain much of the observed gap in labor productivity, particularly in the manufacturing sector.

<sup>17</sup> For example, in Canada, based on the fixed-base-volume index, labor productivity increased by 2½ percent over the period 1999Q2 to 2000Q2. However, if a chain-type index were used instead—as in the United States—for calculating real output, then Canadian labor productivity growth would be reduced to 2 percent. See Bank of Canada (2000).

17. Fourth, there are also differences in the construction of prices used to deflate nominal output, particularly in the IT sector. Improvements in IT-product quality and the introduction of new goods have presented challenges for how price indices should incorporate these changes. The United States has adopted a hedonic approach to price measurement, particularly for the IT sector. The price of a good is specified in the form of a regression equation as a function of its various quality characteristics. Changes in these characteristics can then be used to estimate quality-adjusted prices. Canada has adopted the hedonic price approach for many segments of the IT sector and supplements Canadian price data with some U.S. series for specific IT goods. For semiconductors, however, Canada continues to employ the traditional method that uses the change in the cost of production as an indicator of the change in quality.

### **Differences in measuring components of labor productivity growth**

18. Labor productivity growth is typically decomposed into contributions arising from capital deepening, growth in labor quality, and growth in total factor productivity, which is derived as a residual. As a result, in conducting cross-country comparisons of total factor productivity growth, it is also important to understand the methodological differences in measuring capital and labor.

19. Measuring capital deepening is particularly difficult. In the United States, a broad definition of the capital stock in the business sector is used and includes equipment, structures, rental residential capital, inventories, and land.<sup>18</sup> In contrast, Canada uses a narrower definition which excludes land and inventories. Because land and inventories tend to grow at a slower rate than the total capital stock, this narrower definition tends to overstate Canadian capital stock growth relative to that in the United States, tending to understate Canadian total factor productivity growth vis-à-vis the United States. At the same time, the Canadian depreciation rates for capital are significantly higher than those used in the United States which results in an underestimation of capital growth, and therefore an overestimation of relative total factor productivity growth. Coulombe (2000) suggests that this underestimation of capital stock growth more than outweighs the overestimation arising from the exclusion of inventories and land, implying that overall, total factor productivity growth in Canada may be biased upward relative to that in the United States.

20. There are significant methodological differences between Canada and the United States in how labor quality is measured. In Canada, relative wages by industry are used to weight growth in hours worked; therefore, compositional changes in the labor force depend on structural shifts across industries.<sup>19</sup> In contrast, in the United States, growth rates in hours

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<sup>18</sup> Rental residential is not included in the manufacturing sector.

<sup>19</sup> Therefore, the growth in relatively higher wage industries is assumed to reflect an increase in labor quality.

are weighted by relative wages for worker classes that are based on gender, experience, and education.

### Cross-Country Differences in National Accounts

21. On a broad cross-country basis, there are considerable methodological differences in the underlying data used to measure productivity growth, making multi-country international comparisons difficult to interpret. In particular, important differences lie in how various countries account for quality changes in price indexes and the extent to which countries have revised their system of national accounts (see table below).

Cross-Country Comparison of Methodological Differences

	Expenditure Accounts 1/	Price Base	Base Year or Benchmark	Output Deflator for Computers
Canada	SNA 1993	Fixed-weighted	1992	Hedonic price index for computers and peripherals
United States	NIPA	Chain-weighted	1996	Hedonic price index for computers, peripherals, and semiconductors
France	ESA95	Chain-weighted	1995	Hedonic price index for microcomputers, otherwise unit value indices or industrial selling price index
Germany	ESA95	Fixed-weighted	1995	Producer price index—no hedonic adjustment
United Kingdom	ESA95	Chain-weighted	1995	Producer price index—no hedonic adjustment

Source: OECD (2001) and Gust and Marquez (2000).

1/ SNA 1993 and ESA95 are the United Nations 1993 System of National Accounts, and the 1995 European System of National Accounts, respectively. NIPA is the National Income and Product Accounts.

22. Because measures of productivity growth are based on real output and real capital, price deflators to deflate nominal values of these variables are important. Rapid improvements in product quality, particularly in the computer industry, underscores the need to use hedonic pricing whereby prices are adjusted to reflect these improvements. Hedonic pricing is used most widely in the United States and Canada and to a lesser extent in France, but not at all in Germany and the United Kingdom. Countries that use hedonic price indices,

particularly for computers will tend to show higher output growth in their information technology (IT) sector, and accordingly, higher labor productivity growth.<sup>20</sup>

23. Cross-country comparisons of labor productivity growth are also affected by how various countries construct their national accounts. Many countries are in the process of updating their systems of national accounts to conform to either the United Nations' 1993 System of National Accounts, or the 1995 European System of National Accounts.<sup>21</sup> A complete updating will entail considerable changes over time, and include a broader definition of investment that incorporates software, as well as greater use of chain-weighted price indexes. Both of these recommended changes would have the effect of raising the growth rate of real GDP, and therefore labor productivity growth. Although the United States has already implemented these changes, many countries have made less progress, making U.S. data less comparable to that of other countries.

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<sup>20</sup> Without quality adjustments, a change in price will be overstated, and the corresponding change in real output will be understated.

<sup>21</sup> The 1995 European System—used by EU members—was designed to be consistent with the 1993 System of National Accounts—used by other countries.

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Table 1. International Comparison: Labor Productivity Growth in the Business Sector

(Annual, in percent)

	Canada	United States	France	Germany	Italy	Japan
1980-1999	1.2	1.7	2.1	1.0	1.8	2.0
1980-1995	1.2	1.5	2.2	0.8	2.0	2.2
1996-1999	1.0	2.7	1.5	1.8	0.8	1.1

Sources: Staff calculations based on Statistics Canada; U.S. Bureau of Economic Analysis; and OECD.

Table 2. Canada: Labor Productivity Growth in the Business Sector

(Annual, in percent)

	1980-90		1991-95		1996-99 1/	
	Canada	United States	Canada	United States	Canada	States
Output per hour	0.9	1.5	1.9	1.5	1.0	2.5
Contributions of:						
Capital-labor ratio	0.7	0.7	0.7	0.5	0.0	0.8
Labor quality 2/	...	0.3	...	0.4	...	0.3
Total factor productivity	0.2	0.5	1.2	0.6	1.0	1.4

Sources: Staff calculations based on Statistics Canada; and U.S. Bureau of Labor Statistics.

1/ Data for the United States refer to 1996-98.

2/ In Canada, improvements in labor quality are not presented separately, and are included in total factor productivity.

Table 3. Canada: Labor Productivity Growth in the Manufacturing Sector

(Annual, in percent)

	1980-90		1991-95		1996-99 1/	
	Canada	United States	Canada	United States	Canada	United States
Output per hour	2.3	2.6	3.1	3.3	1.1	4.5
Contributions of:						
Capital-labor ratio	1.1	1.5	0.4	2.2	-0.7	2.0
Total factor productivity	1.2	1.1	2.7	1.1	1.8	2.5

Sources: Staff calculations based on Statistics Canada; and U.S. Bureau of Labor Statistics.

1/ Data for the United States refer to 1996-98.

Table 4. Canada: IT Contributions to Labor Productivity Growth in the Business Sector 1/

(Annual, in percent) 1/

	1974-90		1991-95		1996-99	
	Canada	United States	Canada	United States	Canada	United States
Output per hour	1.1	1.4	1.9	1.5	1.0	2.5
Contributions of:						
Capital-labor ratio	0.8	0.8	0.7	0.6	0.0	0.9
Information technology	0.3	0.4	0.2	0.5	0.3	1.0
Other	0.5	0.4	0.4	0.1	-0.3	-0.1
Labor quality 2/	...	0.2	...	0.4	...	0.3
Total factor productivity	0.3	0.3	1.2	0.5	1.0	1.3

Sources: Staff calculations based on Statistics Canada; and U.S. Bureau of Labor Statistics.

1/ Data for the United States are based on Oliner and Sichel (2000).

2/ In Canada, improvements in labor quality are not presented separately, and are included in the capital-labor ratio.

Table 5. Canada: Share of the IT Capital Stock in the Business Sector Capital Stock

(In percent)

	1974-90		1991-95		1996-99	
	Canada	United States	Canada	United States	Canada	United States
Total capital stock in business sector	100.0	100.0	100.0	100.0	100.0	100.0
Total IT capital stock 1/	0.4	2.1	1.8	4.5	4.5	6.5

Sources: Staff calculations based on Statistics Canada; and U.S. Bureau of Labor Statistics.

1/ Data are preliminary and are in real terms. For the United States, shares are also based on real capital stock data. However, since the stock data are chain-weighted, its subcomponents do not sum to the aggregate total. Nominal shares for 1974-90, 1991-95, and 1996-99 are 4.1 percent, 5.3 percent, and 5.6 percent, respectively.

Table 6. Canada: Corporate Tax Rates in Canada and the United States

	2000	2005
Canada		
Federal income tax rate	29.1	22.1
Provincial average income tax rate	13.9	9.7
Federal-provincial income tax rate	43.0	31.8
Federal-provincial business tax rate (including capital taxes)	46.6	35.4
United States		
Federal income tax rate	35.0	35.0
Average state income tax rate	4.0	4.0
Federal-state income tax rate	39.0	39.0
Federal-state business tax rate (including capital taxes)	40.0	40.0

Source: The 2000 Economic Statement and Budget Update, Department of Finance, Canada.

Table 7. Canada and the United States: Corporate Tax Rates Across Sectors

	Canada		United States	
	Federal	Total	Federal	Total
Small business	13	21	26	30
Manufacturing and processing	22	35	35	39
Growth sectors	29	44	35	39

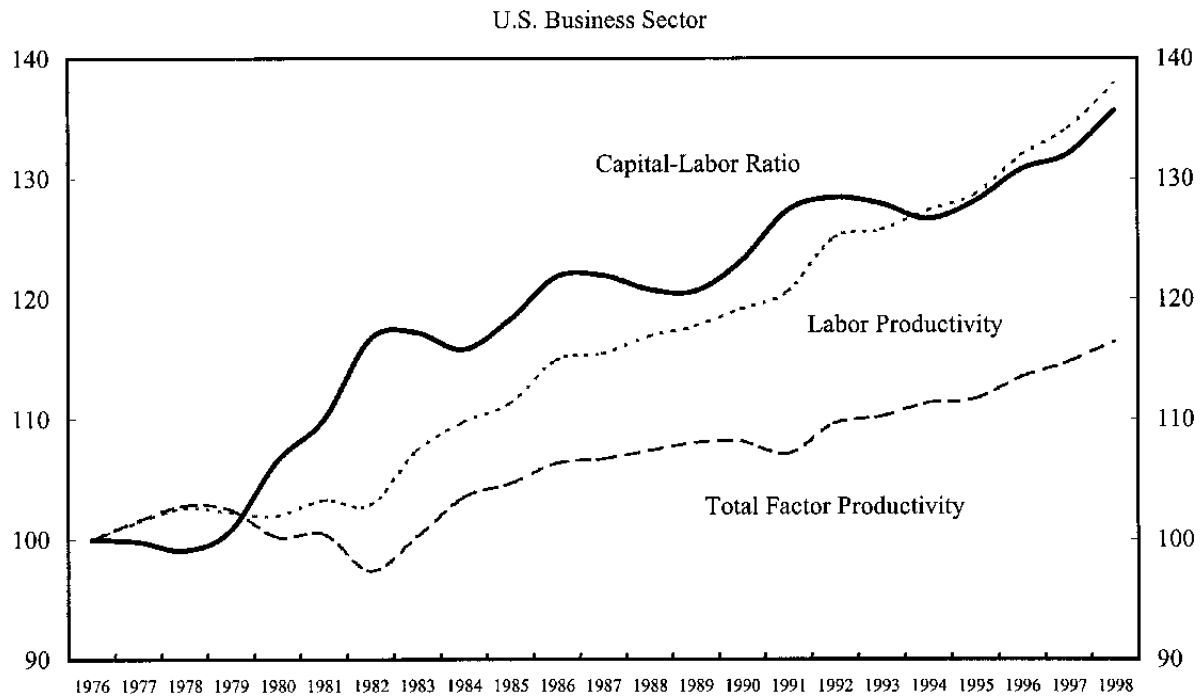
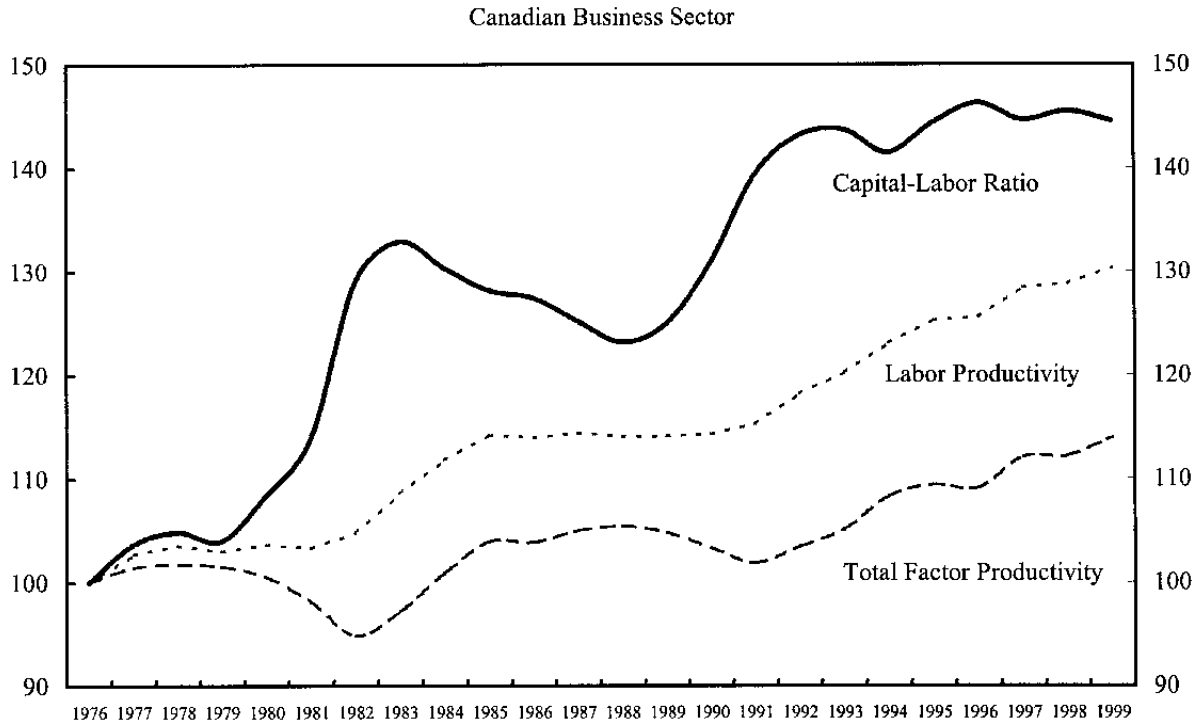
Source: Department of Finance, Canada.

Table 8. Canada: Measures to Promote Entrepreneurship in Canada

Large businesses:	5 percentage points lower average corporate tax rate in Canada than in the United States.
Small businesses:	Similar average corporate tax rate on income up to \$75,000 in Canada and the United States.
Capital gains:	2 percentage points lower average top tax rate in Canada than the typical top capital gains rate in the United States.
Employee stock options:	More generous treatment for employees in Canada than in the United States.
R&D companies:	A permanent 20 percent R&D tax credit for all R&D expenditures.

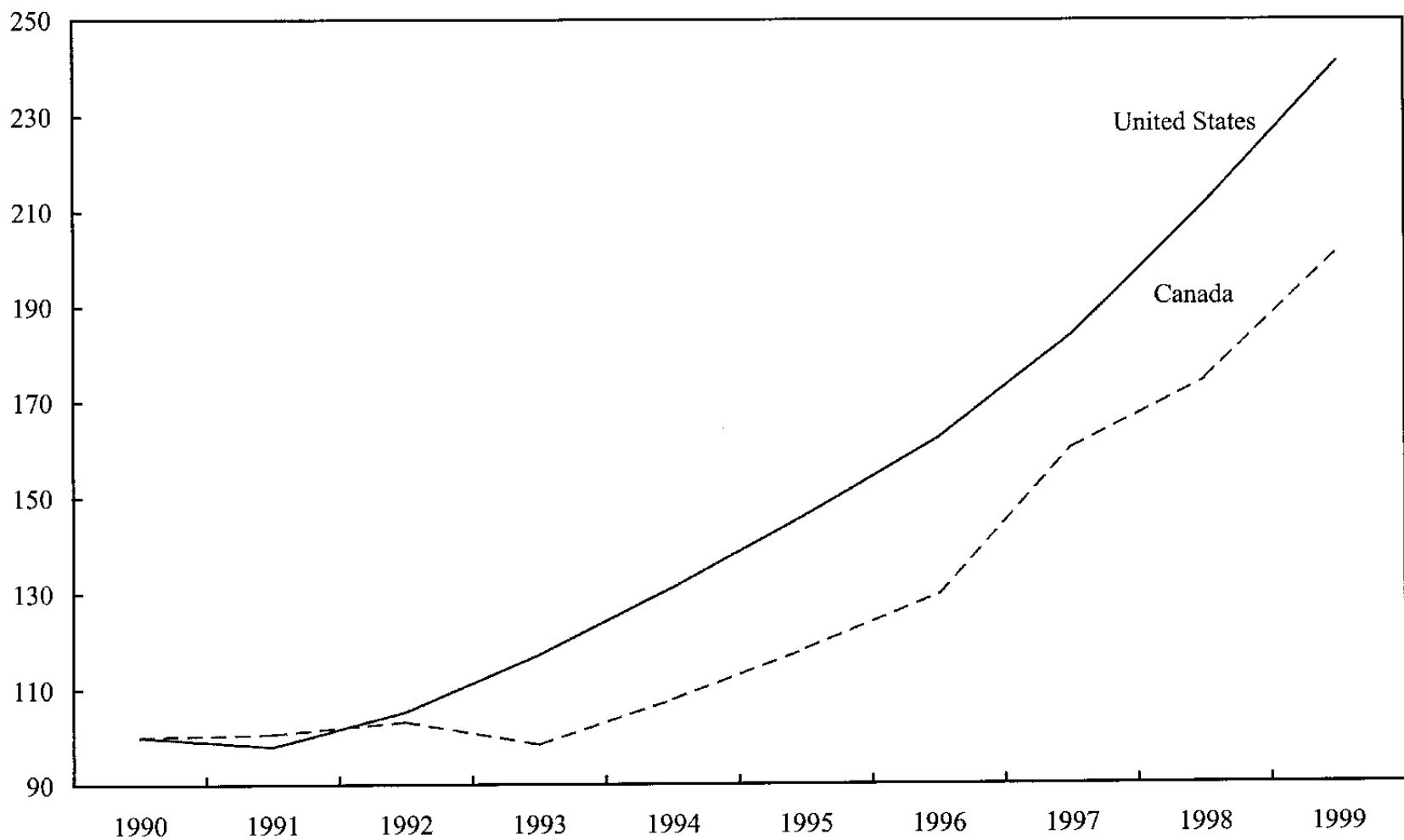
Source: The 2000 Economic Statement and Budget Update, Department of Finance, Canada.

Figure 1. Canada and the United States: Business Sector Productivity  
(1976=100)



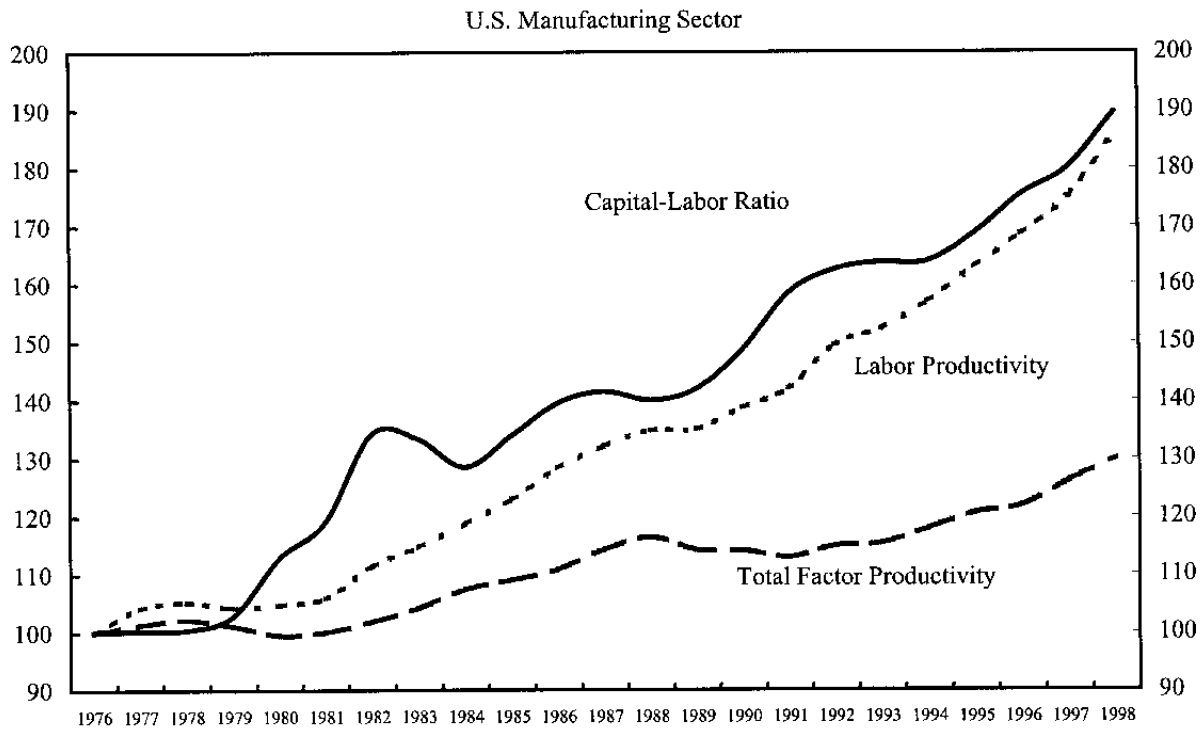
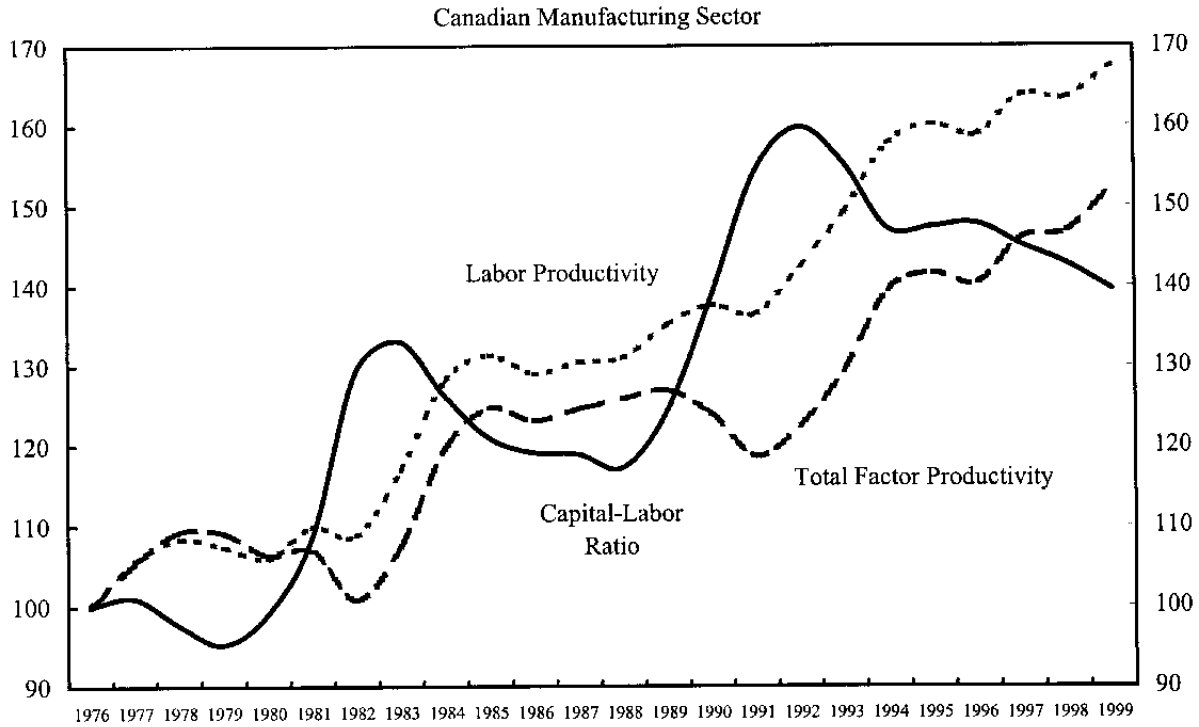
Sources: Statistics Canada; United States Bureau of Labor Statistics; and staff estimates.

Figure 2. Canada and the United States: Real Investment in Machinery and Equipment  
(Index 1990=100)



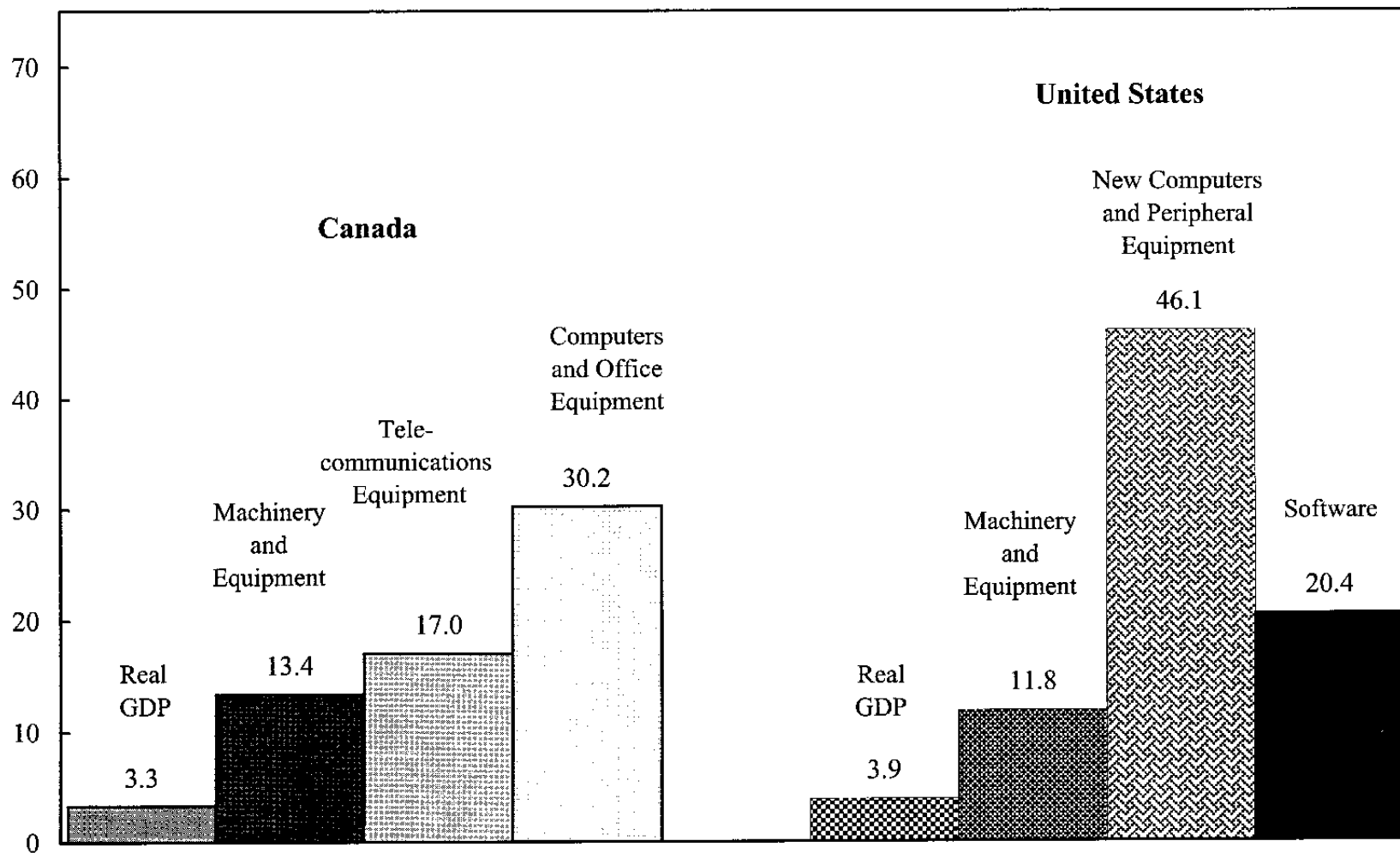
Sources: Statistics Canada; and U.S. Department of Commerce

Figure 3. Canada and the United States: Manufacturing Sector Productivity (1976=100)



Sources: Statistics Canada; United States Bureau of Labor Statistics; and staff estimates.

Figure 4. Canada and the United States: Real GDP and Real Investment Growth  
Average Annual Growth, 1995-99



Sources: Statistics Canada; and U.S. Department of Commerce.



Figure 5. Canada and the United States: IT Sector Contribution to Real Output Growth  
(In percent of average annual growth)

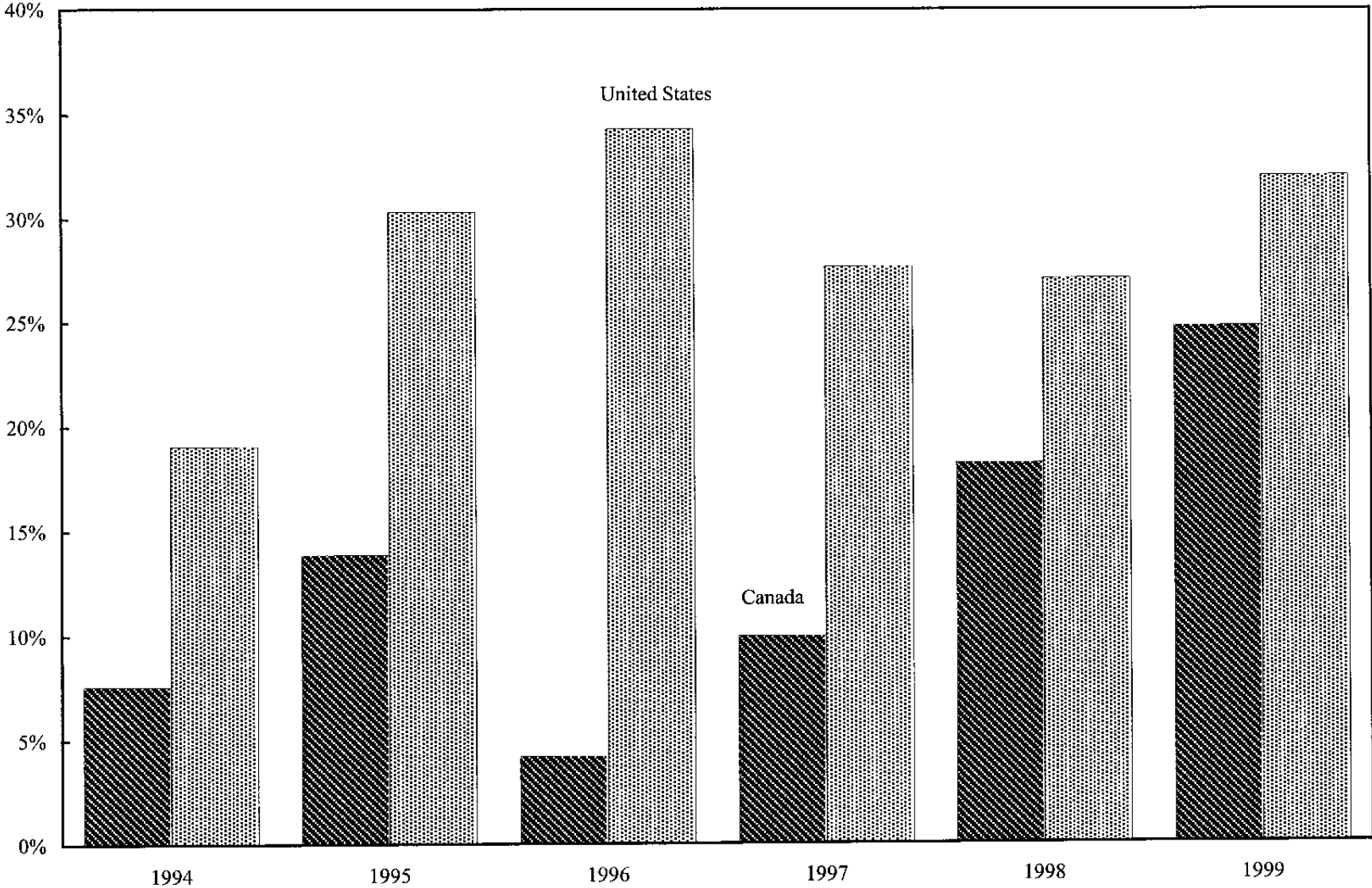
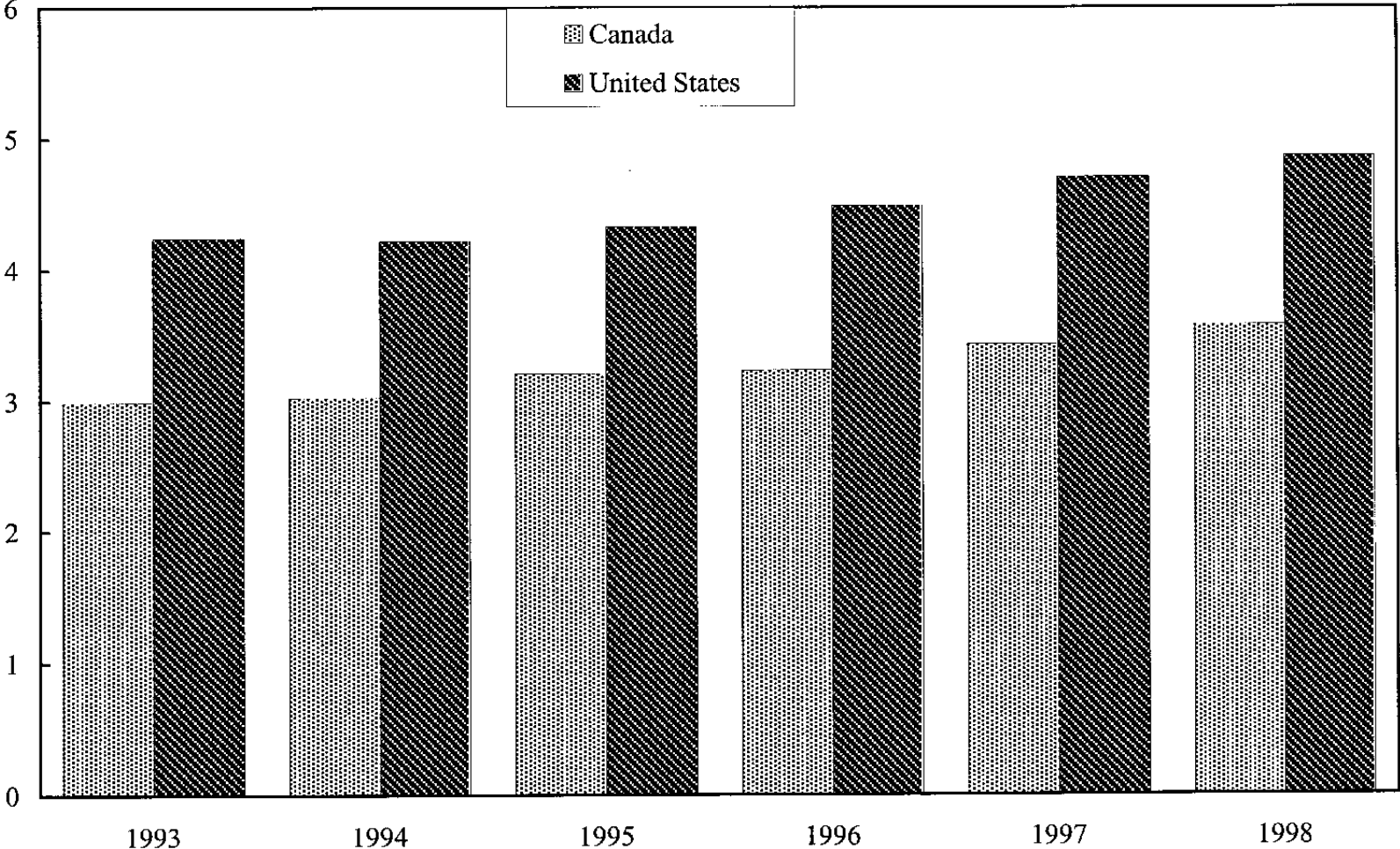
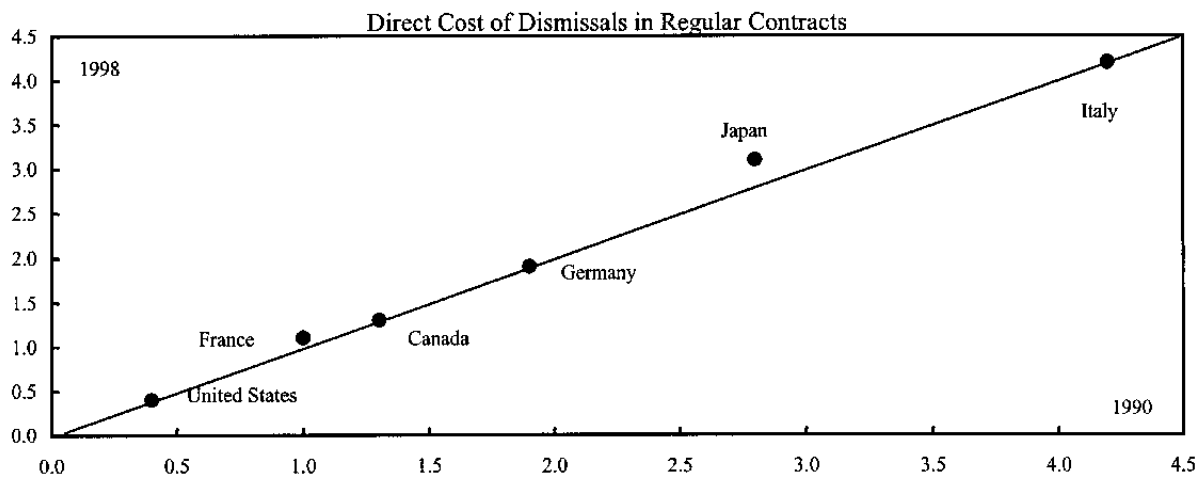
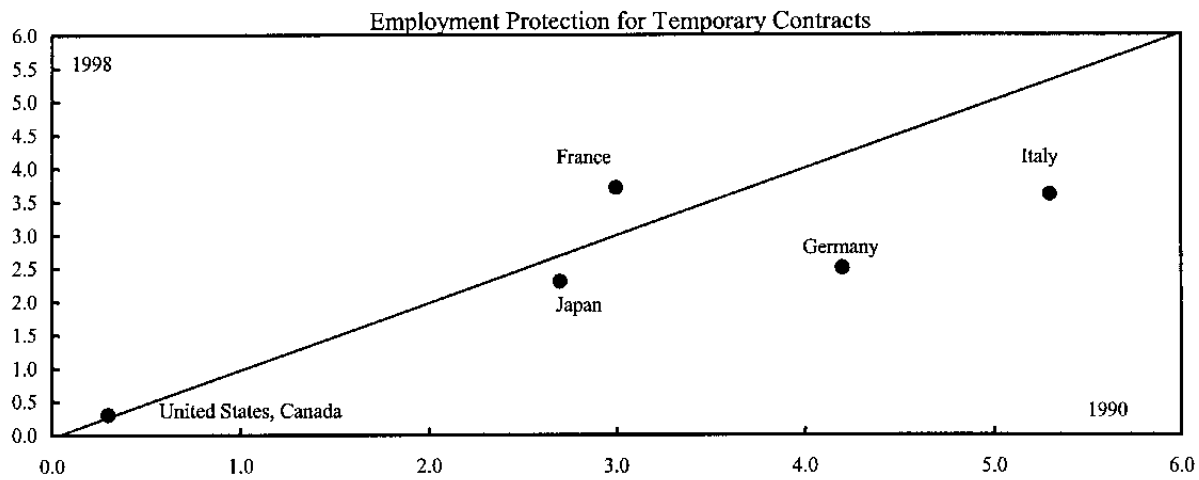
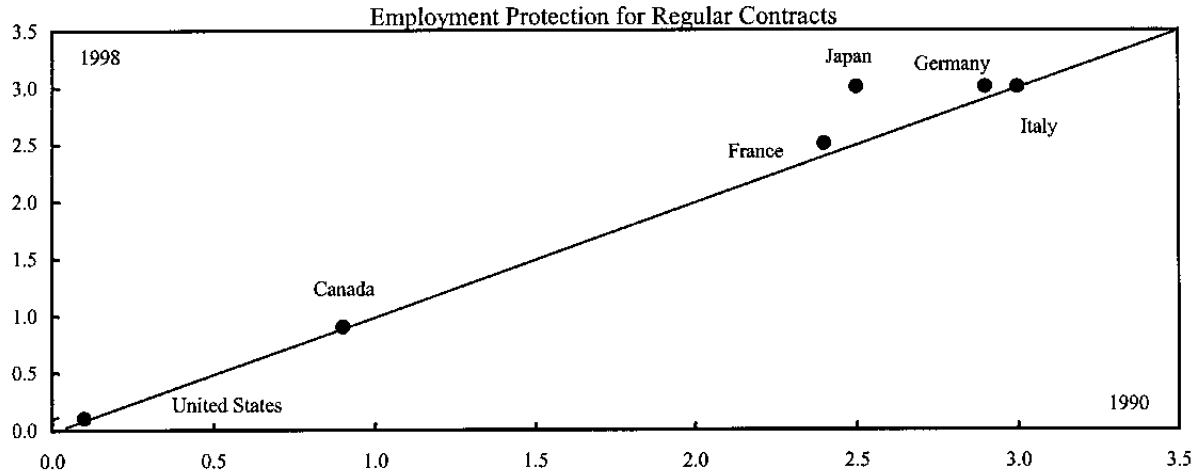


Figure 6. Canada and the United States: IT Employment as Share of Total Employment  
(In percent)



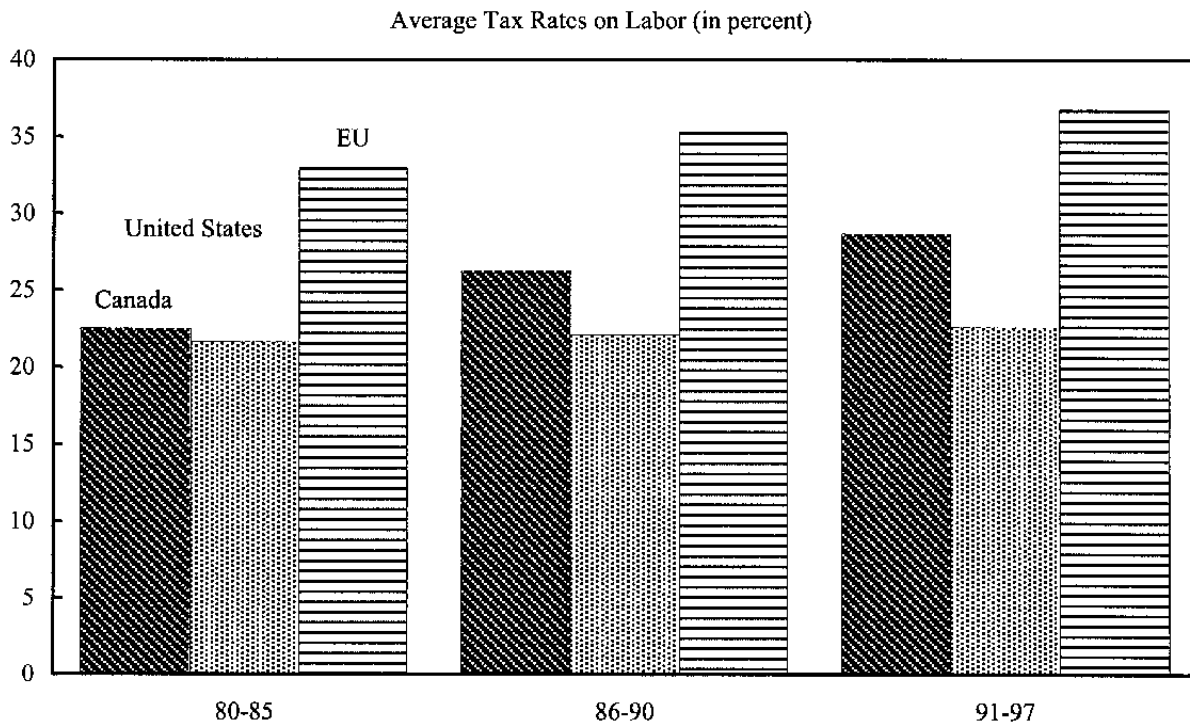
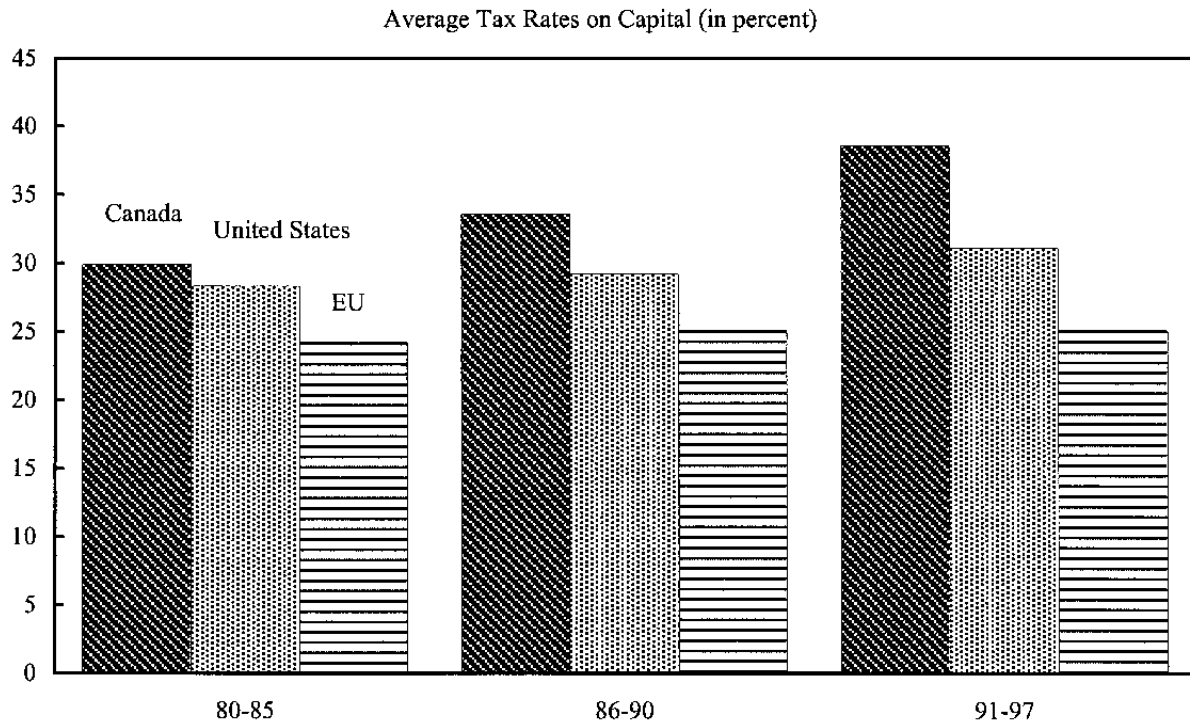
Sources: Industry Canada (2000); and U.S. Department of Commerce (2000).

Figure 7. Selected OECD Countries: Employment Protection and Dismissal Costs



Source: OECD.

Figure 8. Canada and the United States: Tax Rates on Capital and Labor



Source: OECD.

## II. ECONOMIC INTEGRATION AND THE EXCHANGE RATE REGIME<sup>1</sup>

1. A question of current interest in many parts of the world is whether with growing economic integration among groups of countries a fixed exchange rate, or even a common currency, becomes more desirable. Canadian experience since the inception of the 1989 U.S.-Canada Free Trade Agreement can shed some light on this question. In spite of exchange rate fluctuations, economic integration between Canada and the United States increased substantially during the 1990s. At the same time, the evidence indicates that exchange rate flexibility has played a useful role in buffering the Canadian economy against the asymmetric economic shocks the economy has experienced vis-à-vis the United States. In sum, the Canadian experience thus far does not suggest that a fixed exchange rate is a necessary feature of economic integration, although a deepening of economic integration could over time change the nature of the tradeoffs between fixed and floating exchange rates.

### A. Exchange Rate Volatility and Canada-U.S. Economic Integration

2. Exchange rate flexibility does not appear to have significantly impeded economic integration between Canada and the United States. Canada's trade regime is very open, with over 90 percent of imports entering duty free and an average trade-weighted tariff rate of 0.9 percent (see World Trade Organization (2000)). Trade with the United States is essentially duty free, with only imports of a few supply-managed agri-food products being restricted. The degree of Canada-U.S. integration is most evident in Canada's international transactions data. In 1999, Canada's external trade in goods and nonfactor services with the United States was equivalent to 65 percent of Canadian GDP (or 79 percent of total Canadian trade), up from 36 percent of GDP (or 70 percent of total trade) in 1989 (Figure 1).<sup>2</sup> By contrast, the share of intra-regional trade in GDP among European Union countries remained at roughly 30 percent during the decade (Table 1).<sup>3</sup> Nevertheless, "home bias" in consumption (a preference for domestically produced goods) remains substantial in Canada. Estimates indicate that trade between two Canadian provinces is anywhere from 2½ times

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<sup>1</sup> Prepared by Vivek Arora and Olivier Jeanne.

<sup>2</sup> Trade integration with Mexico, Canada's other partner under the North American Free Trade Agreement (1994), has also grown. Canadian barriers to Mexican trade have been reduced; the very few tariffs that remain (except those on a few supply-managed products) are scheduled to be eliminated by 2003. The share of Mexico in Canada's merchandise trade rose from 1¼ percent in 1993 to 1¾ percent in 1999, and exceeds the share of several industrial countries. (For example, the share of France in Canadian trade stayed unchanged at 1 percent during the period, and that of Germany declined from 1¾ percent to 1½ percent.)

<sup>3</sup> The data in Table 1 are based on merchandise trade, rather than total trade in goods and nonfactor services, because bilateral trade data on nonfactor services were not available for several countries.

(Wei (1998)) to 20 times (McCallum (1996)) as large as trade between a Canadian province and a U.S. state. Obstfeld and Rogoff (2000) attribute the home bias largely to trading costs, with exchange rate uncertainty being only one, and not necessarily the most important, factor in such costs.

3. Factor market integration between Canada and the United States is also close. With Canada-U.S. financial flows being generally free of controls during the past 50 years, capital mobility between the 2 countries is high. The United States accounts for over half of Canada's gross foreign direct investment assets and liabilities and for two-thirds of Canada's net international liability position.<sup>4</sup> Labor mobility between Canada and the United States, although it remains relatively limited as a share of the total labor force, has increased in recent years, especially among skilled workers.

4. According to the theory of optimum currency areas, the existence of separate currencies reduces the volume and welfare gains of international trade through several channels, including the cost of currency conversion, exchange rate risk (or the cost of hedging against it), and a reduction in the informational value of price signals. There is no direct evidence on the empirical magnitude of most of these costs.<sup>5</sup> The limited evidence that is available is on the currency conversion costs, which seem to be small in Canada like in other countries. The currency conversion costs incurred in the Canadian foreign exchange market are estimated at around 0.2–0.3 percent of Canadian GDP annually (Murray, 1999; Macklem et al., 2000), which is in line with historical estimates of transaction costs in Europe prior to the introduction of the euro.<sup>6</sup>

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<sup>4</sup> In terms of capital flows, in recent years the United States has accounted for just over half of Canada's direct investment inflows and outflows, roughly the same as the proportion of intra-EU direct investment. The United States accounted for over four-fifths of Canadian equity investment inflows and outflows in 1999, while intra-EU equity flows accounted for about half of the total among EU countries in recent years.

<sup>5</sup> Direct evidence on the costs of exchange rate uncertainty and distorted price signals is not available. One difficulty in measuring the cost of exchange rate risk is that it depends not only on the volatility of the exchange rate, but also on its correlation with other economic variables. Exchange rate flexibility can decrease true economic uncertainty if the exchange rate is used to buffer real shocks.

<sup>6</sup> Currency conversion costs (the bid-ask spreads and commission fees that households and nonbank enterprises pay to banks for foreign currency conversion) for the European Community as a whole were estimated at 0.2–0.3 percent of GDP by the European Commission (1990). The costs of cross-border payments and the in-house currency transaction costs incurred by firms added another 0.1 percent of GDP.

5. That exchange rate volatility has not prevented a high degree of trade integration between the United States and Canada in the 1990s and is consistent with the empirical evidence on other countries and other periods. Most time-series and cross-country studies have indicated that the impact of exchange rate volatility on the volume of trade is very small (Frankel and Wei (1993), De Grauwe (1988), Rose (2000)). The small impact of exchange rate volatility on trade is generally attributed to the availability of many instruments by which firms can hedge their currency exposure. Staff estimates based on Rose (2000) suggest that fixing the Canadian-U.S. dollar exchange rate would have increased bilateral trade by approximately 2 percent in the 1990s.

6. The adoption of a *common currency*, however, could have a much larger impact on trade flows than simply fixing the exchange rate. A common currency eliminates currency conversion costs and is a more definitive commitment to monetary integration than a fixed exchange rate regime. It may also induce integration in other policy areas, such as harmonization of standards and regulation. Rose (2000) finds that, other things equal, two countries that share the same currency trade three times as much as they would with different currencies. While Rose's results may not be directly applicable to industrial countries, including Canada,<sup>7</sup> they do point to a possibly important qualitative difference between fixed exchange rate regimes and common currencies.

#### **B. The Role of Exchange Rate Flexibility in Buffering the Canadian Economy Against External Shocks**

7. An international comparison suggests that during the past 20 years the Canadian dollar has fluctuated by less against the U.S. dollar than have several other floating currencies (Table 2). This is true at several horizons: for example both 1-month and 12-month exchange rate volatilities versus the U.S. dollar have been smaller in Canada than in other countries. The relatively low exchange rate volatility is consistent with the behavior of central bank interest rates, which have fluctuated more in Canada than in the United States, Japan, and Germany, as well as with the volatility in foreign exchange reserves (an indicator of exchange market intervention), which has been relatively large in Canada.<sup>8</sup>

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<sup>7</sup> Rose's study is based on a "gravity" model of bilateral trade flows and controls for a number of other determinants of trade, such as common borders, common language, as well as the endogeneity of exchange rate volatility to trade. His results, however, are largely driven by the behavior of trade flows in a group of developing and/or very small countries (CFA franc countries and a number of small territories and dependencies), and could attribute to a common currency the effects of integration in other policy areas.

<sup>8</sup> Fluctuations in Canadian foreign exchange reserves and central bank interest rates fell markedly after the September 1998 change in foreign exchange intervention policy, when the Bank of Canada decided to stop its previous practice of frequent interventions and instead

(continued...)

8. The relative stability of the Canada-U.S. exchange rate seems to reflect the close correlation between the Canadian and U.S. business cycles. The output gap and the inflation rate—the variables that determine the policy interest rate in a monetary policy Taylor rule—show a close synchronization between the Canadian and U.S. business cycles over the past 20 years (Figure 2). Canadian short-term interest rates, as a result, have moved broadly in line with U.S. rates. Canadian and U.S. monetary policies, however, were less closely aligned in the early 1990s, when the Canadian policy interest rates were set significantly above U.S. rates.<sup>9</sup> Perhaps as a result of this divergence, the output gap was wider and the inflation rate lower in Canada than in the United States during the 1990s.

9. A key question is whether the exchange rate has played a useful role in periods when the Canadian economy has been hit by significant asymmetric shocks. The evidence suggests that an important source of asymmetric shocks is fluctuations in commodity prices, which affect U.S. and Canadian terms of trade very differently because Canada is a net exporter of commodities while the United States is a net importer (Thiessen (1999), Murray (1999)). During the past two decades, changes in world commodity prices have tended to be accompanied by opposite movements in the Canadian and U.S. terms of trade (Figure 3). Simple correlations suggest that fluctuations in commodity prices have been positively correlated with the Canadian terms of trade and negatively correlated with the U.S. terms of trade (Table 3).<sup>10</sup> The terms of trade could be a significant source of shocks in the Canadian economy, given the relatively large share of commodities in Canada's exports (35 percent in 1999) and in Canadian GDP (11 percent in 1999).

10. The evidence also suggests that the exchange rate responded to shocks in commodity prices in a stabilizing way. An increase in the U.S. dollar price of commodities is correlated with an offsetting appreciation of the Canadian currency (Table 3). Impulse responses based

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limit interventions to exceptional cases when the exchange rate was considered to be significantly misaligned and intervention could influence market assessments about the currency's fundamental value.

<sup>9</sup> This period of policy divergence seems to reflect different assessments of inflation risk as well as the more uncertain fiscal outlook in Canada. In particular, during certain episodes—including in late 1994 and early 1995—one factor that constrained the Bank of Canada's ability to ease monetary conditions was investors' concerns about Canada's large fiscal deficit. The fiscal consolidation that has occurred since then in Canada has contributed to a better policy mix and given monetary policy somewhat greater latitude to operate.

<sup>10</sup> This is consistent with the conclusions of several analyses using vector autoregressions that the supply shocks experienced by Canada and the United States are very asymmetric. Bayoumi and Eichengreen (1994) and Arora (1999) report that macroeconomic shocks in Canada and the United States are asymmetric in several dimensions: their correlation is low and their sizes, as well as the speed of adjustment to them, are significantly different in the two countries.



on vector autoregressions show that the Canadian dollar appreciates in the long run, in both real and nominal terms, in response to a permanent increase in the U.S. dollar price of non-energy commodities (Figure 4).<sup>11</sup> Almost 90 percent of the real adjustment is achieved by a change in the nominal exchange rate. Under a fixed exchange regime, the same real exchange rate adjustment would have to be achieved through a change in the Canadian price level, which presumably would be more disruptive for economic activity.

11. The statistical evidence is supported by the experience during episodes in which Canada was hit by large asymmetric shocks. In 1998, for example, Canada suffered a substantial drop in commodity prices, as a result of the crisis in Asia and other emerging economies. The Canadian economy weathered the shock in part through a significant depreciation of the currency that mitigated the impact of the shock for Canadian exporters of primary commodities and commodity-based goods, and encouraged net exports of manufactured goods. Under a fixed exchange rate, Canadian exporters would have faced a much larger decline in the nominal demand for their products, while the Canadian monetary authorities might have had to increase interest rates to defend the fixed peg, possibly generating a recession (Laidler, 1999).

12. Although the benefits of exchange rate flexibility for macroeconomic stabilization in Canada may be large, they are difficult to quantify precisely. A recent study by the Bank of Canada takes a first step in this direction (Macklem et al. (2000)). The study compares the implications of different monetary and exchange rate regimes in terms of macroeconomic volatility, using simulations based on a stylized dynamic general equilibrium model with sticky nominal wages and calibrated using Canadian data. The simulations assume that the pattern of variation in the Canadian terms of trade mirrors the historical volatility of the relative price of non-energy commodities and manufacturing imports. The impact on output of the high volatility observed in the relative price of non-energy commodities and manufacturing imports is mitigated by the flexibility of the nominal exchange rate. If the floating regime is abandoned in favor of a fixed exchange rate, the study concludes that the volatility of macroeconomic variables would increase significantly. Switching from a floating regime with inflation targeting to a fixed exchange rate regime increases the volatility of aggregate income from 2.2 percent to 3.2 percent, because the nominal exchange rate can no longer be used to buffer the shocks in commodity prices.

13. In addition to its role in buffering external shocks, exchange rate flexibility has been useful in the adjustment to long-term trends in Canadian competitiveness. Under a fixed exchange rate, such an adjustment might have led to deflationary pressures in the Canadian

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<sup>11</sup> By contrast, the Canadian dollar tends to depreciate in response to an increase in the price of energy, as Amano and van Norden (1993) have shown in their estimation of the “Bank of Canada equation” for the exchange rate. This asymmetry, according to the Bank of Canada, could reflect the more energy-intensive production of some Canadian exports.

economy. Since the end of the Bretton Woods system, the Canadian dollar has depreciated by around 1½ percent annually in real terms relative to the U.S. dollar (Figure 5). The depreciation was due in part to the secular decrease in the price of commodities and the slower pace of productivity growth in the traded-goods sector in Canada relative to the United States. The economic adjustment to these long-run trends has been achieved primarily by a nominal depreciation of the Canadian dollar. If the nominal exchange rate had been fixed, the same real depreciation would have required a lower inflation rate in Canada. As a result, some periods in which the Canadian inflation rate was very close to zero could, under a fixed exchange rate, have been marked by deflation, complicating the task of monetary policy because of downward rigidity in nominal wages and the zero bound on nominal interest rates.

14. It has been argued, however, that exchange rate flexibility has contributed to lagging Canadian productivity performance, as Canadian firms have been able to count on exchange rate depreciation to compensate for lower competitiveness (Harris, 2000). According to this view, a fixed exchange rate regime would slow or even stop the erosion in Canadian productivity and living standards relative to the United States. There is no evidence, however, that the coincidence of Canadian dollar depreciation and the slower pace of Canadian productivity growth reflect a causality from the former to the latter (as opposed to, say, Balassa-Samuelson effects). Indeed, cross-country growth studies do not find any impact of the exchange rate regime on growth in industrial economies (Ghosh et al., 1997).

### **C. Lessons From the Canadian Experience**

15. The fact that exchange rate flexibility has not hindered Canada-U.S. economic integration does not mean that exchange rate flexibility is necessarily the best policy for all free trade areas. Indeed, various exchange rate regimes appear to have worked well in other free trade areas. In the EU/European Economic Area, fixed rates under the Bretton Woods system were followed by fixed rates and monetary union among several members, while others adopted a floating rate regime during most of the post Bretton Woods period. Among Mercosur countries as well, the absence of a common exchange rate regime has been accompanied by growing integration. Since 1991, Argentina has had a currency board, Brazil a variety of exchange regimes, Uruguay a crawling band regime, and Paraguay a floating regime with varying degrees of intervention. Merchandise trade among the Mercosur countries as a share of their total merchandise trade increased from 12 percent in 1991 (when Mercosur was initiated) to 20 percent in 1999.<sup>12</sup>

16. With the credibility of monetary policy well established in Canada, some arguments used in other parts of the world in favor of fixing exchange rates are less relevant in Canada. For example, several countries that moved toward hard pegs benefited from a “convergence gain” as their long-term interest rates fell toward those of the anchor country. In Europe,

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<sup>12</sup> At the same time, exchange rates among Mercosur members have fluctuated much more than Canada-U.S. exchange rates and at times have generated considerable trade tensions.

long-term interest rates in Italy and Spain, for example, fell markedly toward German levels during the period leading up to adoption of the euro (Figure 6).<sup>13</sup> In Canada, however, long-term spreads versus the United States have been much smaller than spreads in Europe and have even been negative at times in recent years.<sup>14</sup>

17. Flexible exchange rates have sometimes raised a concern about balance-sheet risk. If a large proportion of domestic liabilities is denominated in foreign currency, large exchange rate fluctuations can disrupt domestic financial markets. In Canada, however, the Canadian dollar, while it has tended to absorb shocks, has not fluctuated excessively over short horizons. In addition, while the proportion of foreign-currency liabilities in the banking system has increased over the past decade (from 33 percent to 42 percent during the period 1989-99), reflecting growing integration with world markets, the proportion of foreign-currency assets has increased in tandem (from 31 percent to 40 percent).<sup>15</sup> The proportion of foreign-currency liabilities seems to be lower than in several other industrial countries, and does not pose the same problems as in emerging economies (Calvo and Reinhart, 2000). Foreign currency loans to residents have remained relatively small as a share of chartered banks' assets, rising from 5 percent in 1989 to 6 percent in 1999.

18. The size of a country relative to others in a monetary union or fixed exchange rate arrangement has implications for the net benefits to the country, and, in this regard, the situation of Canada vis-à-vis the United States is somewhat different from that of several European countries vis-à-vis each other (see Thiessen (2000)). The Canadian economy is much smaller than the United States, while the euro area includes several economies of roughly equal size. Given its size and trade specialization, the United States is relatively insensitive to the exchange rate policies of its smaller trade partners—although trade frictions with Canada have occasionally arisen in some sectors.

19. The argument that a fixed exchange rate system benefits its participants by preventing competitive devaluations that ultimately undermine the political support for free trade thus applies with less force to North America than to Europe. The risk of self-defeating “beggar-thy-neighbor” policies is likely to be larger in free trade areas where countries are more

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<sup>13</sup> The reduction in long-term rates in these countries also reflected other policy measures, especially fiscal consolidation in line with the Maastricht requirements.

<sup>14</sup> Although Canada-U.S. long-term spreads fell during the mid-1990s, the reduction was related mainly to Canada's fiscal efforts, rather than any expectations of currency convergence.

<sup>15</sup> A close matching of foreign currency liabilities and assets is not always a guarantee against financial disruption in the event of a major exchange rate shift, especially if the bulk of lending is to unhedged borrowers. This does not, however, appear to be the case in Canada.

similar in size and compete in the same markets. Finally, if Canada were to peg to the U.S. dollar or to adopt a common currency, it would effectively be adopting U.S. monetary policy, in contrast to Europe where the relative size of partners is less unequal and each country thus has more influence on aggregate monetary policy.

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Table 1. Selected Countries: External Trade Within Regions, 1989-99 1/  
(in percent)

	Regional Trade/Total Trade		Regional Trade/GDP	
	1989	1999	1989	1999
	With United States			
<b>Canada</b>	72	81	31	58
Mexico	69	81	15	49
Mercosur 2/	21	20	2	4
	With Other EU Countries			
<b>Europe (selected countries)</b>				
Austria	69	69	38	46
Belgium-Luxembourg	76	71	90	93
Denmark	67	69	33	37
Finland	59	59	25	34
France	62	63	23	28
Germany	62	55	32	26
Greece	67	61	24	17
Ireland	73	62	74	76
Italy	61	59	21	22
Netherlands	73	68	65	72
Portugal	74	79	44	42
Spain	63	69	18	28
Sweden	67	59	31	36
United Kingdom	56	50	24	20
<b>EU weighted average</b>	64	61	30	31
	With Other Mercosur Countries			
<b>Latin America (selected countries)</b>				
Argentina	17	27	3	5
Brazil	7	14	1	3
Paraguay	35	53	16	18
Uruguay	37	42	13	12
<b>Mercosur weighted average</b>	11	20	1	4

Sources: Staff calculations based on IMF Direction of Trade Statistics; Statistics Canada; and WEO database.

1/ Based on aggregate merchandise trade (exports plus imports).

2/ Argentina, Brazil, Paraguay, and Uruguay.

Table 2. Selected Countries: Volatility in Exchange Rates, Interest Rates, and Foreign Exchange Reserves, 1980-2000 1/

	Canada		United States	Japan	Germany	United Kingdom	Australia	New Zealand
	1980-1998 2/	1998-2000 3/						
Exchange rate versus U.S. dollar								
1-month horizon	1.0	1.1	-	3.0	2.8	2.7	2.4	2.6
6-month horizon	2.8	3.3	-	9.1	8.8	8.5	7.0	8.4
12-month horizon	4.4	4.6	-	12.6	13.0	11.9	10.3	13.2
Central bank interest rate								
1-month horizon	0.7	0.2	0.7	0.2	0.3	1.0	0.8	1.3
6-month horizon	2.2	0.5	1.9	0.8	0.8	1.8	2.1	3.1
12-month horizon	2.9	0.8	2.5	1.3	1.4	2.7	3.0	3.9
Foreign exchange reserves								
1-month horizon	21.5	5.4	6.7	3.9	7.6	5.4	11.4	17.7
6-month horizon	44.9	9.9	26.5	15.8	14.3	17.0	40.6	32.8
12-month horizon	61.1	12.3	46.9	30.2	18.1	34.3	68.0	46.8

Source: Staff calculations based on IMF International Financial Statistics.

1/ Volatility is measured by the standard deviation of the change in a variable over various horizons (1-month, 6-month, 12-month).

2/ Covers the period until the September 1998 change in foreign exchange intervention policy.

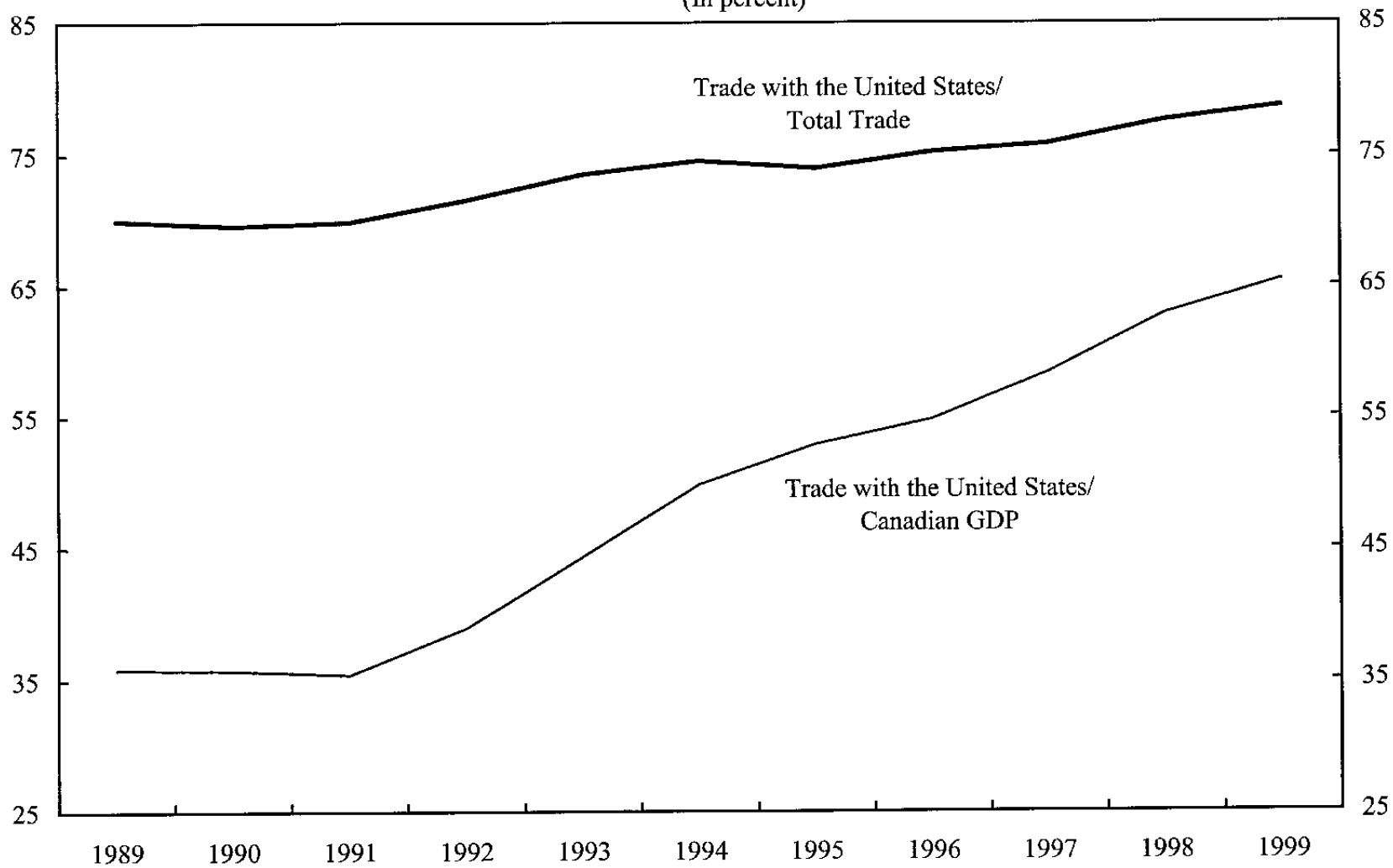
3/ Covers the period after the September 1998 change in foreign exchange intervention policy.

Table 3. Canada and the United States: Commodity Prices, Terms of Trade, and the Exchange Rate, 1980-2000  
Correlation coefficients (between growth rates of variables)

	World Commodity Prices	World Oil Prices	Exchange Rate US\$/Can\$	Canadian Terms of Trade	U.S. Terms of Trade
World commodity prices	1.00	...	...	...	...
World oil prices	0.92	1.00	...	...	...
Exchange rate (US\$/Can\$)	0.19	0.15	1.00	...	...
Canadian terms of trade	0.38	0.33	0.20	1.00	...
U.S. terms of trade	-0.24	-0.28	-0.14	-0.63	1.00

Source: IMF staff calculations, based on World Economic Outlook database. Data for 2000 are through Quarter II.

Figure 1. Canada: Trade with the United States, 1989-99<sup>1/</sup>  
(In percent)

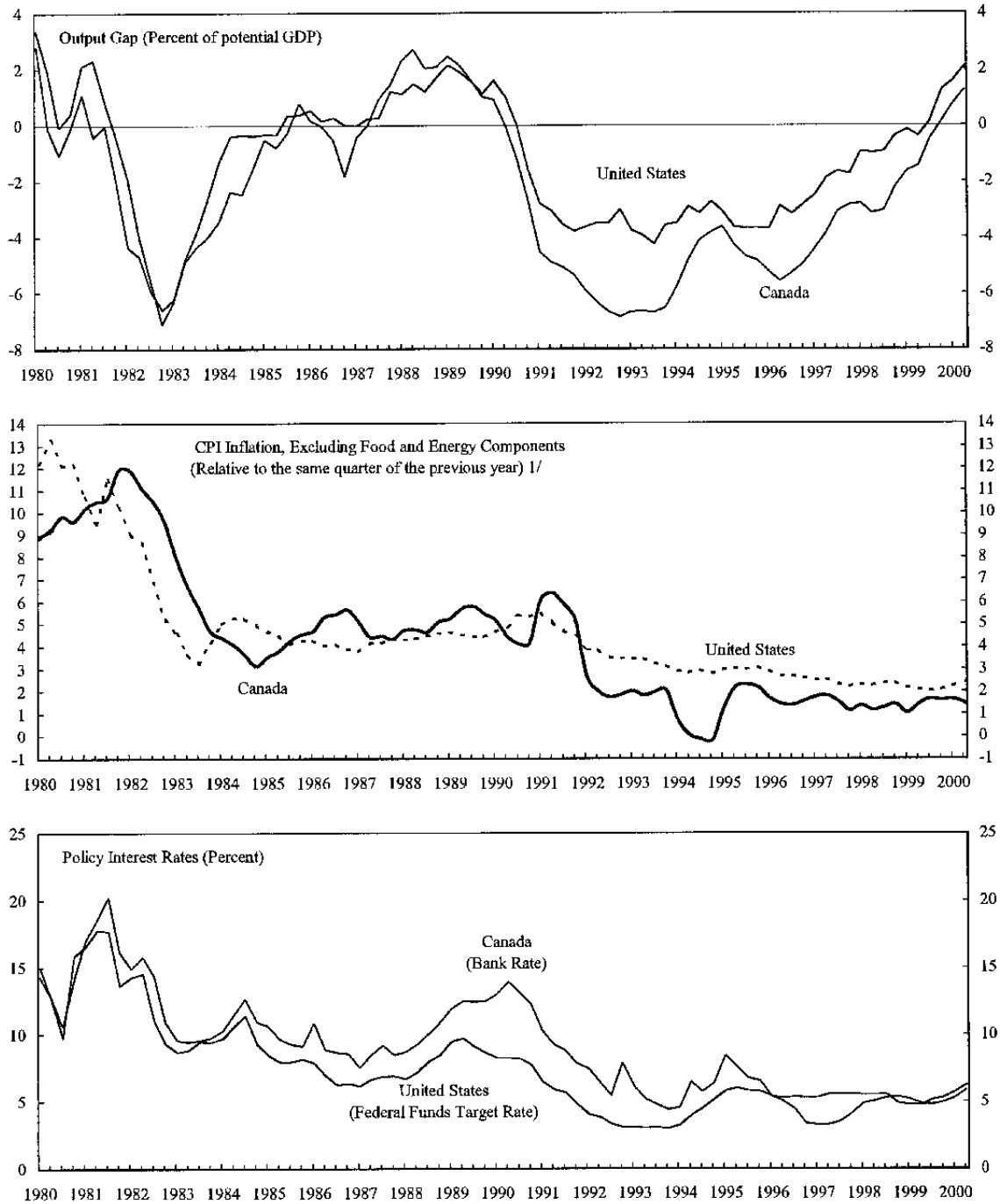


Source: CANSIM, Statistics Canada.

1/ Trade is defined as the sum of Canadian exports and imports of goods and nonfactor services.



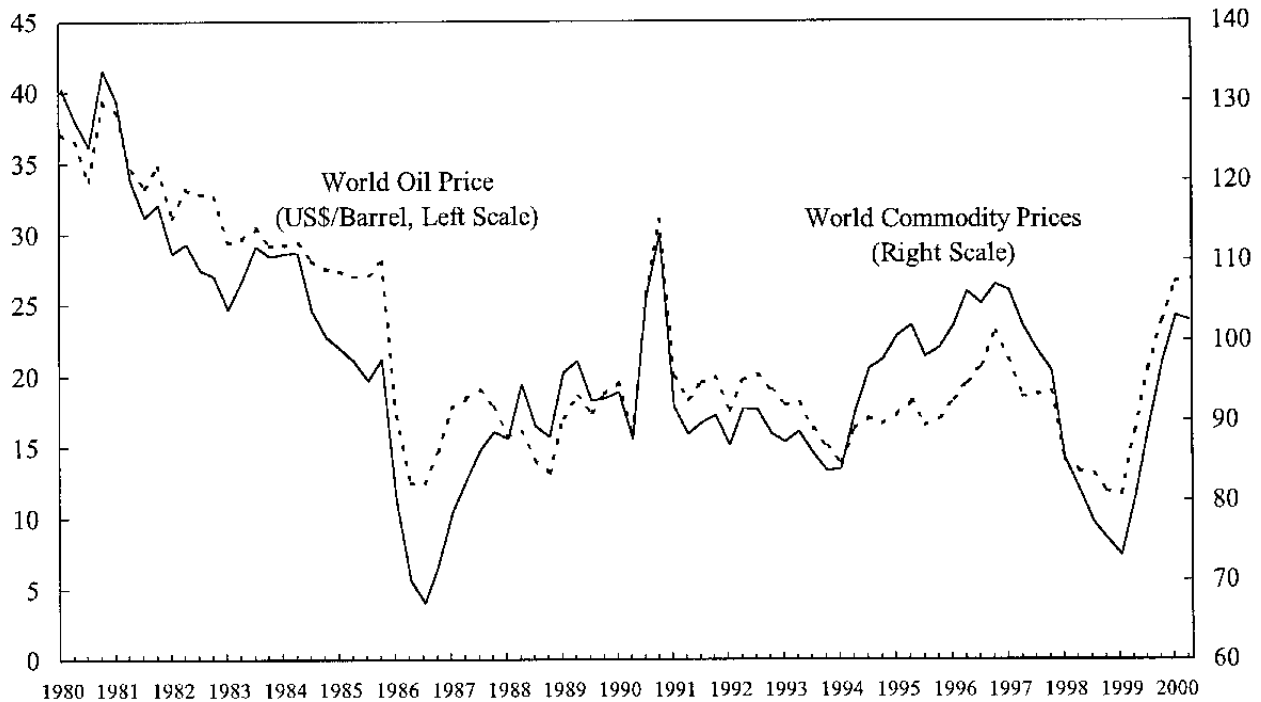
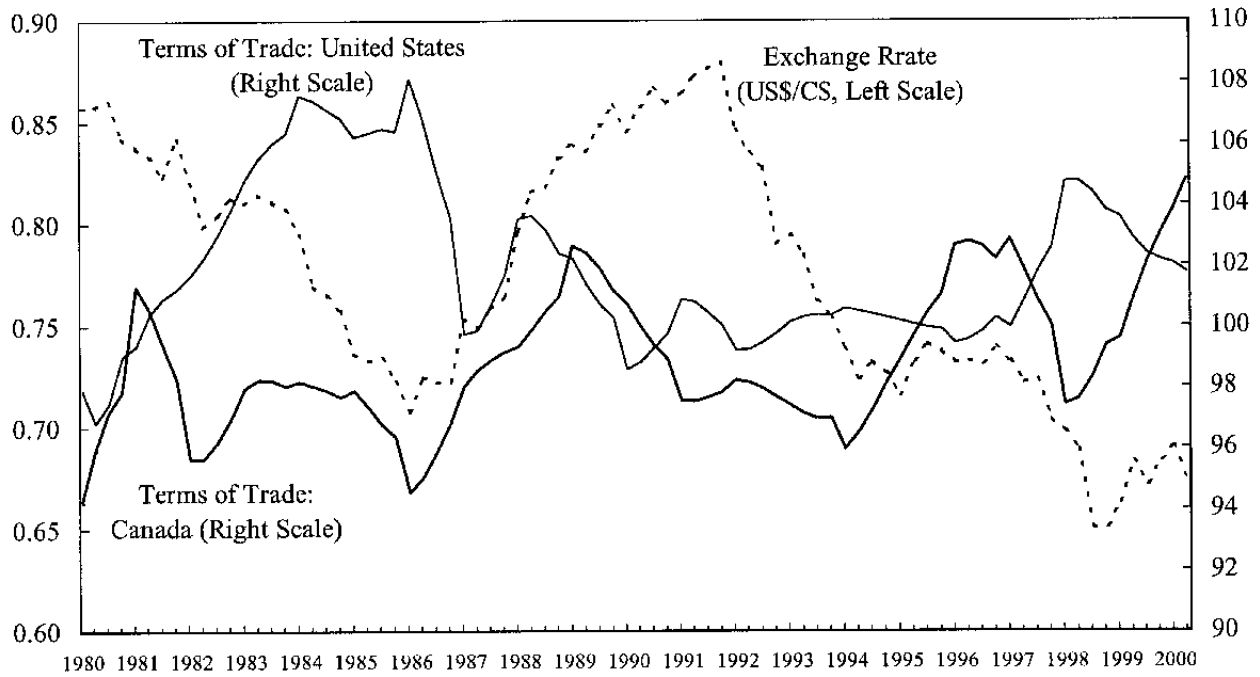
Figure 2. Canada and the United States: Output Gap, Inflation, and Interest Rates (1980-2000)



Sources: Bank of Canada; Cansim; and the United States Federal Reserve.

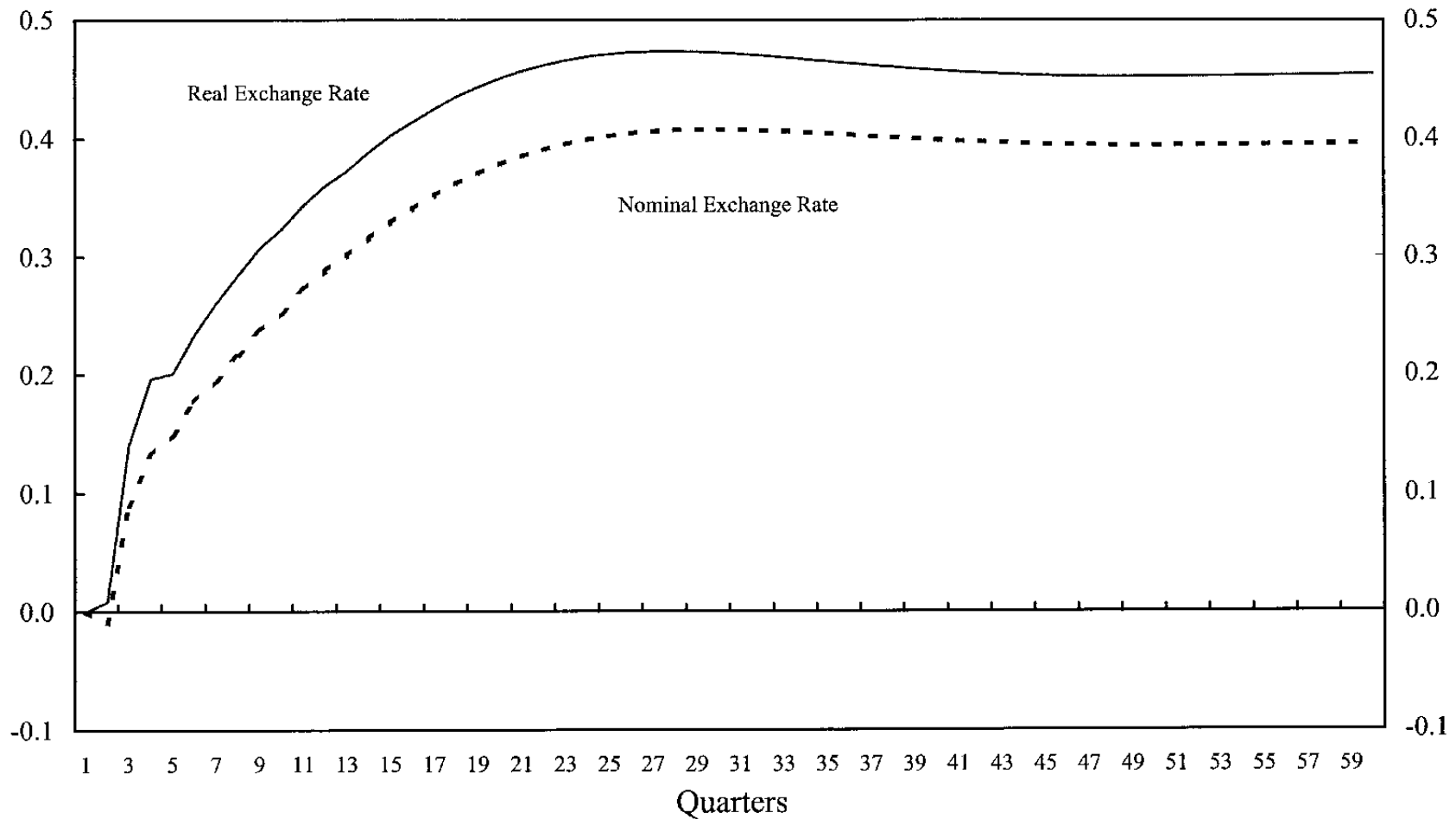
1/ For Canada, this variable was used instead of the core CPI (which, in Canada, also excludes the effects of indirect taxes) because the core CPI series was not available for the period before 1984.

Figure 3. Canada and the United States: Terms of Trade, Exchange Rate, and Commodity Prices, 1980-2000  
(Index 1995=100)



Sources: CANSIM (Statistics Canada); and World Economic Outlook.

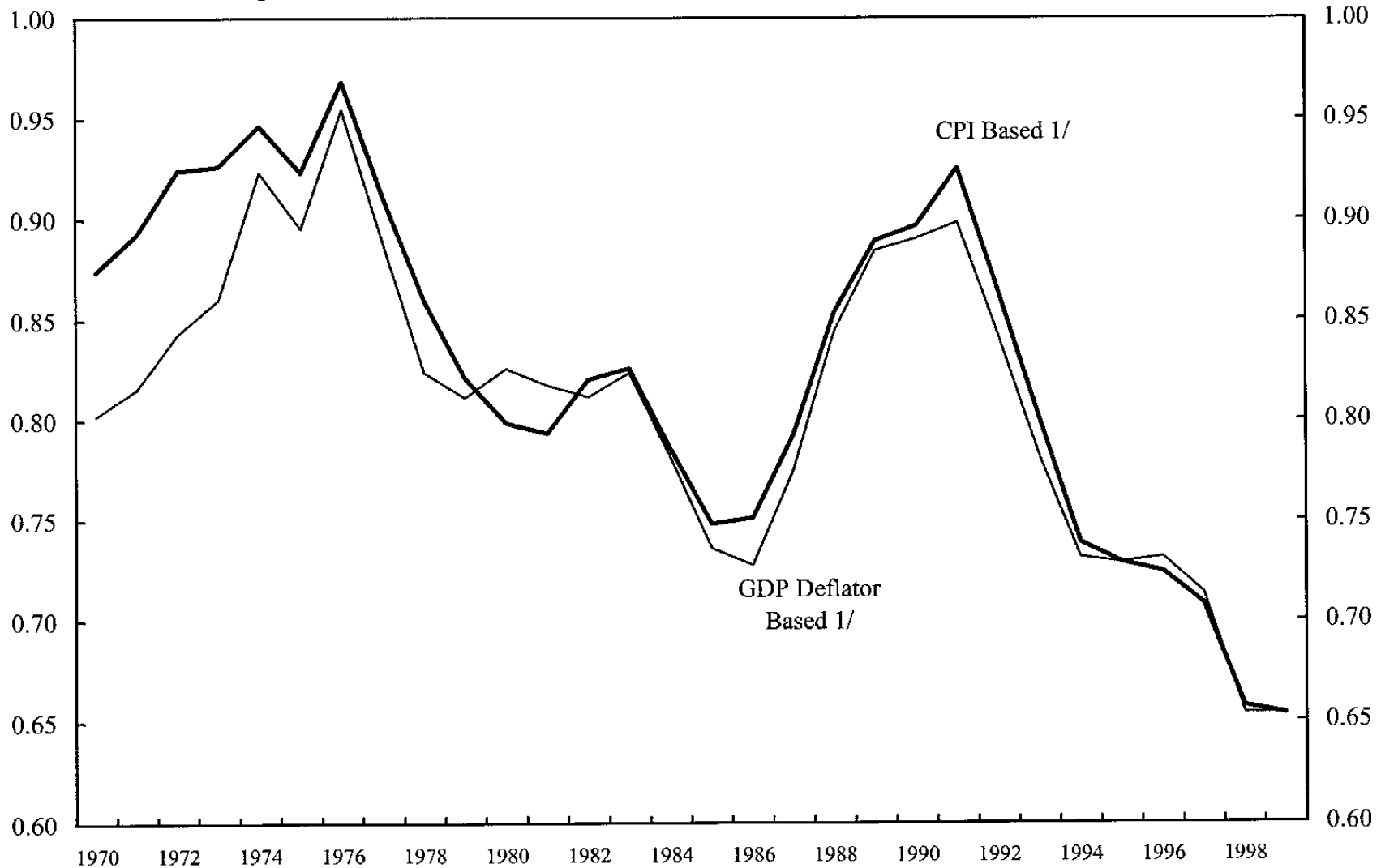
Figure 4. Canada: Impulse Response of the U.S. Dollar-Canadian Dollar Exchange Rate to a Shock in the Price of Non-Energy Commodities 1/



Source: Djoudad et al. (2000)

1/ The figure shows the percentage point change in the real and nominal U.S. dollar-Canadian dollar exchange rate in response to a 1 percent permanent increase in the U.S. dollar price of non-energy commodities. An increase represents an appreciation of the Canadian dollar.

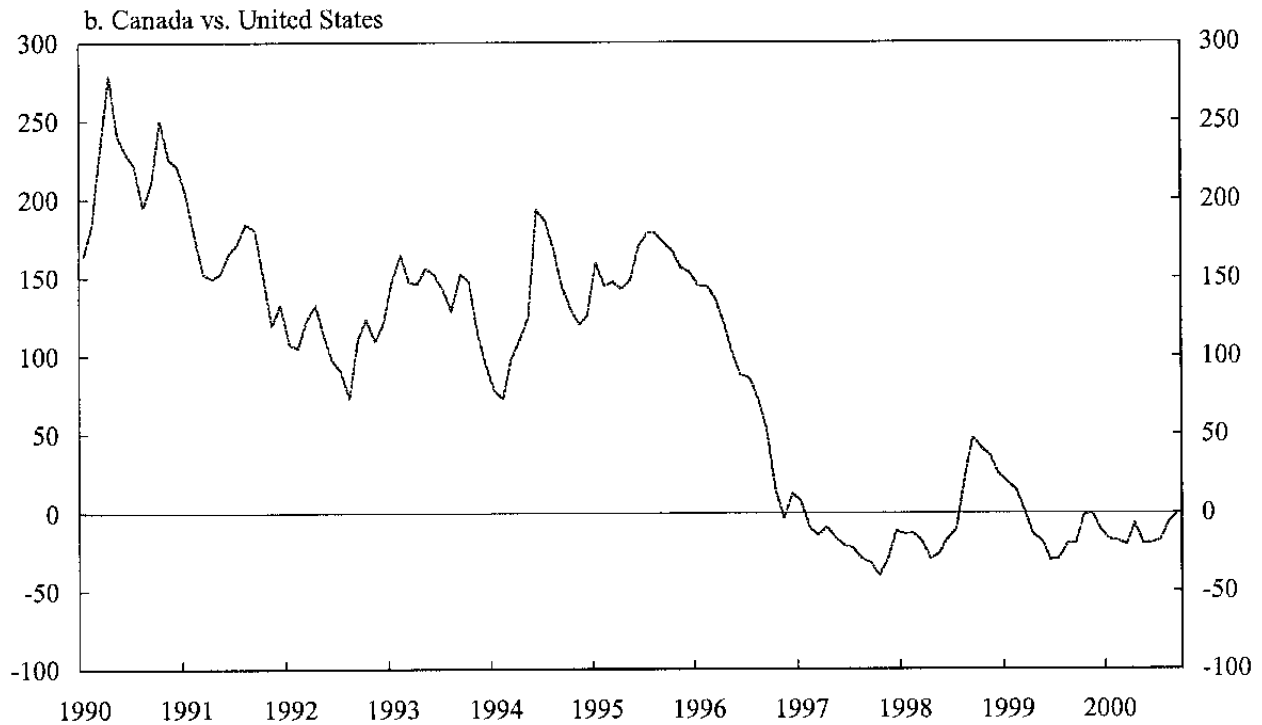
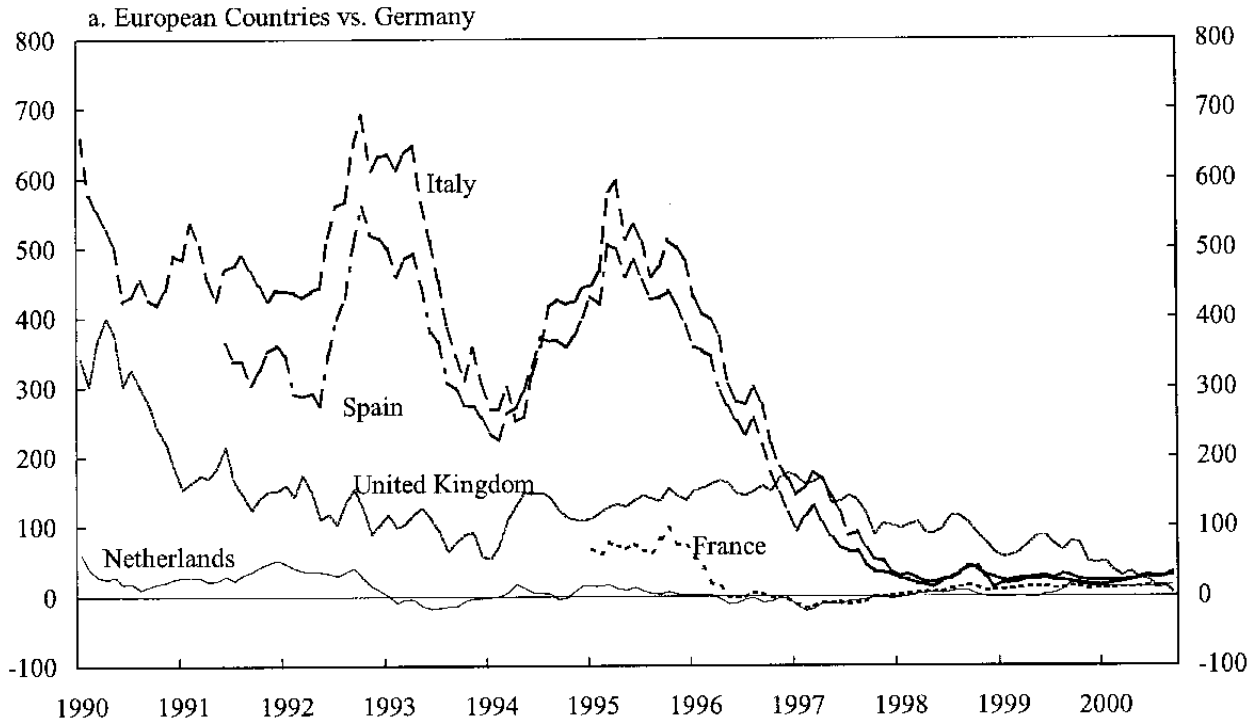
Figure 5. Canada: Real Exchange Rate vis-à-vis the United States, 1970-99



Source: IMF, International Financial Statistics.

1/ The index sets the 1995 levels of the CPI and GDP deflator equal to 100.

Figure 6. International Comparison: Ten-Year Government Bond Spreads 1990 - 2000 (Basis Points)



Sources: Datastream; and Bloomberg.

### III. MANAGEMENT OF THE GOVERNMENT DEBT: IMPLICATIONS FOR MONETARY POLICY IMPLEMENTATION AND FINANCIAL MARKETS<sup>1</sup>

1. In common with several other industrial countries, fiscal surpluses in recent years have contributed to a reduction in government debt in Canada (Table 1). At the same time, the Government has altered the composition of the debt, moving toward longer-term fixed-rate securities, with a view to reducing interest rate risk. The maturity structure has been lengthened through a substantial decline in short-term securities, especially treasury bills. Monetary policy makers and financial market participants have adapted to the changes in government debt without major disruptions. The prospect of substantial debt reduction in the future does, however, pose a number of questions arising from the role of government securities in monetary policy operations and in financial markets.

2. As the stock of government debt declines in Canada and other countries, alternative assets are emerging to fulfill some of the roles traditionally played by government securities, although it is not yet clear which asset will ultimately take the place of government securities in monetary operations and financial markets. In Canada, where the elimination of the government debt is a more distant prospect than in countries such as the United States, the question of alternatives to government securities is less immediate. Across countries, the assets through which central banks choose to inject liquidity are likely to become the de facto alternative to government securities, and the demand for those assets as safe havens will grow. It is possible that no alternative will emerge as a close substitute for government securities, in which case markets are likely to become more risky and less liquid, an externality that could be sufficiently significant to warrant the Government continuing to maintain an active market in government paper, even when the funds are not needed to finance current operations.<sup>2</sup>

#### A. Debt Developments

3. Gross federal government debt as a share of GDP declined from 73 percent in 1997/98 to 67 percent in 1999/2000 (Table 2).<sup>3</sup> The decline was led by a fall in the ratio to GDP of marketable debt, while the share of nonmarketable debt fell only slightly.<sup>4</sup> The share

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<sup>1</sup> Prepared by Vivek Arora, Rodolfo Luzio, and Anders Matzen.

<sup>2</sup> This would require decisions on whether and how the Government would manage investments in private assets.

<sup>3</sup> In Canada, the fiscal year begins April 1.

<sup>4</sup> In Canadian terminology, marketable debt is debt which the Government raises in financial markets and which is sold via public tender or syndication and can be traded among investors. It comprises marketable bonds, treasury bills, bonds and bills in foreign currencies, and bonds issued to the Canada Pension Plan. Nonmarketable debt is not tradable, and is issued to retail investors; it mainly comprises Canada Savings Bonds. Both marketable and

(continued...)

of marketable debt held by nonresidents declined from 28 percent to 24 percent. In terms of currency composition, the share of foreign currency debt in marketable debt rose moderately to 8 percent, largely reflecting a planned increase in gross international reserves, which in Canada are funded primarily by borrowing.

4. A key change in the profile of government debt has been a substantial decline in shorter-term debt. One objective of debt management policy since 1990 has been to lengthen the maturity structure.<sup>5</sup> The average term to maturity of government debt rose from around 4 years in 1990 to 6½ years in early 2000. In 1997, the latest year for which cross-country data were available, the average maturity of Canadian government debt was in the middle of the range for a group of industrial countries, but longer than in the United States (Figure 1). Consistent with the Government's objective, the share of longer-term, fixed-rate debt increased steadily during the 1990s, reaching two-thirds of the total by 1998 and staying at that level subsequently.<sup>6</sup> Reflecting the shift toward longer-term debt, the outstanding stock of treasury bills declined in absolute terms to \$100 billion in 1999/2000, from \$140 billion ten years earlier.

5. Debt management strategy has tried to mitigate the reduction in liquidity in the government securities market. Treasury bill auctions have been moved from a weekly to a bi-weekly schedule in order to contain the decline in issuance size. At longer maturities (two years and over), debt management operations have included efforts to maintain liquidity in key "benchmark" maturities (2, 5, and 10 years).<sup>7</sup> Debt issuance has been focused on these benchmark maturities; benchmark issues have periodically been reopened; and issuance in some other maturities has been stopped. In addition, under the Government's buyback

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nonmarketable debt are categorized officially as "market debt," since they are raised in financial markets, and are distinct from "nonmarket debt," which consists of past federal public sector pension liabilities (not funded in the public markets) and the Government's current liabilities (such as accounts payable). See Department of Finance Canada (2000a) and Auditor General of Canada (2000).

<sup>5</sup> In this respect, the approach to debt reduction in Canada is different from that in the United States, where efforts have been directed instead toward avoiding a lengthening in the maturity structure of the debt.

<sup>6</sup> The main advantages of longer-term fixed-rate debt, which is generally more costly than short-term floating rate debt (since long-term interest rates are usually higher), were seen to be greater predictability in interest costs and lower rollover risk (see Auditor General of Canada (2000)).

<sup>7</sup> See Harvey (1999) for a further discussion of recent initiatives to maintain liquidity, efficiency, and integrity in the market for Government of Canada securities.

program, off-the-run issues have been bought back at the same time that new benchmark issues were being sold, helping to maintain benchmark issuance size (O'Regan (2000)).<sup>8</sup>

6. A notable respect in which Canada's debt situation is different from other countries, including the United States, is that the prospect of the elimination of marketable government debt is less of an immediate issue in Canada.<sup>9</sup> An illustrative exercise shows that, due to the relatively high initial level of debt in Canada as well as the possible pace of debt reduction, the time horizon over which the debt might decline to very low levels is longer in Canada (Figure 2). For the purposes of this exercise, it was assumed that debt is reduced by \$10 billion in 2000/01 (as announced by the Government) and by \$3 billion annually (equivalent to the contingency reserve in the budget) over the next decade. On this basis, by the end of the decade the ratio to GDP of Canadian federal government market debt would fall only to the level currently prevailing in the United States. For the United States, it was assumed that the surpluses of the Social Security and Medicare trust funds are devoted to reducing marketable debt, while the rest of the budget is balanced.

### **B. Implications for Monetary Policy Implementation**

7. A reduction in public debt has the potential to affect monetary policy implementation directly because of the key role of government debt in open market operations. Permanent injections of liquidity into the financial system usually entail outright purchases of government securities (as well as, in some cases, other securities), while temporary liquidity management generally involves repurchase agreements (repos), in which the collateral is often government debt. Debt reduction can also affect monetary policy implementation indirectly by limiting the informational value of market signals. As liquidity declines, prices of government securities can become more volatile, imparting less information about market conditions and expectations.<sup>10</sup>

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<sup>8</sup> Several other industrial countries have also implemented buyback programs during the past ten years, including the United States, France, Italy, the United Kingdom, Australia, and New Zealand.

<sup>9</sup> The differential treatment of public pension plans in Canada and the United States also has some bearing on the pace of debt reduction in the two countries. The Canada Pension Plan (CPP), which is not part of the federal government budget, has no impact on the borrowing requirement of the federal government and its debt management operations. In contrast, in the United States, Social Security is included in the unified federal government budget, and its surpluses contribute to reducing the Government's borrowing requirement. This differences in the treatment of the public pension plans in the two countries would contribute to a slower pace of reduction of marketable debt in Canada compared to the United States.

<sup>10</sup> See Gravelle (1999).



8. In Canada, the Bank of Canada implements monetary policy through its influence on short-term interest rates and thereby on monetary conditions, using its standing facilities to set a target band for money market rates. The interest rate charged on overnight lending (the bank rate) establishes the ceiling for overnight money market rates; the rate on the Bank of Canada's overnight deposit facilities (remunerated at half a percentage point below the bank rate) establishes the floor. The Bank of Canada relies on open market operations to steer money market rates toward the middle of the band.<sup>11</sup>

9. The Bank uses both outright purchases/sales of Canadian government securities and repurchase agreements in its open market operations. Outright purchases of government securities are intended to provide liquidity for the issue of currency. Since the expansion in the demand for currency tends to be stable, the Bank of Canada rarely transacts in these securities after purchasing them at the auctions held by the Department of Finance. Repurchase agreements are used to guide overnight interest rates in the money market.<sup>12</sup> Since this facility is only meant to influence overnight rates in case of deviations from the Bank of Canada's target, the outstanding amount of repurchase agreements is rather small (\$0.8 billion, as of mid-October 2000).

10. Traditionally, outright securities transactions mainly involved purchases of treasury bills. With the decline in the stock of treasury bills outstanding, however, their use has become less practical. Liquidity in the treasury bill market has declined, with the turnover ratio (annual turnover relative to the outstanding stock) falling from a peak of 60 percent in 1995 to below 25 percent in 1999 (Figure 3). With declining liquidity in treasury bills, the Bank's outright purchases have shifted toward longer-term government bonds. Its holdings of treasury bills fell from a peak of \$19 billion (over three quarters of total government securities held by the Bank of Canada) in 1994 to \$9 billion (28 percent of the total) in the third quarter of 2000.<sup>13</sup>

11. With this switch in its portfolio by the Bank of Canada, prospective problems for monetary policy arising from a drying up of liquidity are not significant in the near term, although if government debt were indeed to fall substantially over the longer term, the Bank of Canada may need to consider alternative instruments for its operations. Liquidity at the longer end of the government yield curve has not fallen substantially.<sup>14</sup> Trading volumes, for

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<sup>11</sup> The Bank of Canada does not impose reserve requirements on the credit institutions (see Bank of Canada, 1996).

<sup>12</sup> Repurchase agreements comprise liquidity-providing "special purchase and resale agreements" (SPRA) and liquidity-absorbing "sale and repurchase agreements" (SRA).

<sup>13</sup> Bank of Canada, Weekly Financial Statistics (various issues).

<sup>14</sup> Gravelle (1999) argues that liquidity in longer-term bonds has benefited from the Government's debt management strategy, including the efforts to lengthen the maturity

example, have declined by much less for longer-term government bonds than they have for treasury bills (Figure 4). In addition, as the Bank of Canada holds to maturity the bulk of the government securities that it purchases outright, there appears to be a sufficient stock of securities for monetary operations. An expansion of the eligible asset class for permanent operations to include nongovernment assets with a high credit rating may also be a practicable future measure. For temporary operations, although repos are currently based on treasury bills, they can in principle be based on any security with a high credit rating and liquid market.

12. Cross-country experience does indeed suggest that monetary policy operations need not be based only on short-term government securities. In the euro area, open market operations are based on a range of assets, so-called “tier one” and “tier two” assets, which must fulfill certain criteria (such as meeting high credit standards) but are not restricted to government securities.<sup>15</sup> In the United Kingdom, the class of eligible securities for monetary operations by the Bank of England includes, in addition to various government securities, securities accepted by the ESCB and eligible bank bills.

13. In the United States, the U.S. Federal Reserve has started to adapt its operations to the declining stock of government debt, and some aspects of its approach may be relevant for Canada.<sup>16</sup> Open market operations are similar to those in Canada, with permanent operations, comprising outright open market purchases, being used to meet the expanding demand for currency and reserves; and temporary operations, through repos and matched-sale-purchase transactions (MSPs), being used to move the federal funds rate toward the target rate. Permanent operations principally involve treasury securities.<sup>17</sup> Temporary operations traditionally were conducted using only Treasuries and government-sponsored enterprise (GSE, or “agency”) debt as collateral. In 1999, partly in response to the declining stock of Treasuries, the Federal Reserve temporarily expanded the asset class for eligible collateral to include mortgage-backed securities; it also expanded the eligible maturity of repos to include

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structure of outstanding debt and to maintain adequate size in benchmark issues, as well as from greater competition among dealers.

<sup>15</sup> The most important instruments are refinancing operations in the form of reverse transactions, which are conducted on the basis of either repurchase agreements or collateralized loans (ECB, 1998). In addition to refinancing operations, the European System of Central Banks (ESCB) may use outright transactions, issuance of debt certificates, foreign exchange swaps, and collection of fixed-term deposits (see European Central Bank (1998)). These instruments have not, however, been used thus far.

<sup>16</sup> See Fleming et al. (2000) for a further discussion of the U.S. experience.

<sup>17</sup> Under the Federal Reserve Act, the Federal Reserve is also allowed to buy agency securities, some municipal securities, foreign exchange, and sovereign debt. In practice, however, its holdings of these assets are very small.

term repos. These changes have facilitated an increased reliance on the use of temporary operations and minimized disruptions in monetary policy operations.<sup>18</sup>

14. Several issues remain open, however, in considering whether nongovernment assets can replace government debt in monetary policy operations. Although they could represent an effective substitute for government securities in monetary operations, the use of nongovernment assets could have implications that are problematic from a broader policy perspective. Principally, the use of nongovernment assets in open market operations, as well as the central bank's willingness to buy them during periods of financial turmoil, would in effect provide the issuers of such assets with an implicit subsidy, which may have implications beyond the scope of monetary operations and may not always be regarded as appropriate. Additionally, the central bank's balance sheet would take on the credit risk that is associated with nongovernment assets.

### **C. Implications for Financial Markets**

15. A reduction in government debt has the potential to affect financial markets because of the important roles that government paper plays in most countries with mature financial systems. Government securities represent a key benchmark asset against which other fixed-income assets are priced, and they are also used as a reference rate against which yields on other fixed-income securities are quoted. In addition, government bonds are important vehicles for hedging private sector credit risk, and are used in day-to-day liquidity management and as collateral. Moreover, government securities represent a "safe haven" during periods of market turmoil, and their value in such situations is enhanced by the fact that central banks typically ease liquidity by buying up such securities.

16. In Canada, as noted, the reduction in government debt thus far has been confined to treasury bills. Treasury bills have, however, accounted for a larger share of the money market in Canada at times during the 1990s than they have in several other industrial countries.<sup>19</sup> At the longer end, although there has been no decline in the stock of government bonds, government debt has fallen in relation to GDP. Overall, the reduction in government debt, and the change in its profile, have not caused significant disruptions in Canadian financial markets, which are adapting smoothly to the changes.

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<sup>18</sup> A so-called "broad gauge" study, launched by the Federal Reserve to examine in detail the implications of debt reduction for monetary policy operations, will help to provide further guidelines on how monetary policy operations should respond to further debt reduction.

<sup>19</sup> In 1997, treasury bills represented 50 percent of the money market in Canada, compared with 31 percent in the United States, 21 percent in Japan, and 2 percent in the United Kingdom (Boisvert and Harvey (1998)). By 1999, the proportion had declined to 20 percent in Canada.

17. The reduction in the stock of treasury bills in recent years has been accompanied by a decline in liquidity in the treasury bill market. Turnover in the treasury bill market has declined, and bid-ask spreads have increased. Treasury bill yields have risen and spreads with other money market instruments, such as bankers' acceptances and corporate commercial paper, have increased (Figures 5 and 6). These changes have complicated transactions for investors in treasury bills, as the reduction in liquidity has made it more risky for investors to take short positions. The reduction in inventories held by the main market dealers has made it more difficult for investors to acquire specific maturities or to make large purchases, and treasury bill prices have been increasingly susceptible to "technical factors."<sup>20</sup>

18. Nevertheless, the reduction in treasury bills has not caused wide disruptions in the Canadian money market, as private security issues have grown to fill the void. There has not been a major impact on the pricing of short-term assets and the hedging of short-term private risk. Activity in other money market instruments, such as bankers' acceptances and commercial paper, has expanded (Figure 7). Bankers' acceptances and acceptance futures have become important pricing benchmarks and hedging vehicles. In addition, there has been a substantial increase in short-term interest rate derivatives.<sup>21</sup> As an investment vehicle, treasury bills are increasingly being replaced in investors' portfolios by short-term asset-backed securities, with the stock of such paper rising sharply from \$5 billion in 1995 to \$53 billion in 1999.<sup>22</sup> Finally, repo transactions have also increased, in part due to a gradual expansion in the range of assets included in the Debt Clearing Service of the Canadian Depository of Securities, which started to include bankers' acceptances and commercial paper in 1998.

19. At the longer end of the yield curve (maturities beyond two years), marketable government bonds have continued to serve as a pricing benchmark, as an important investment vehicle, and as a safe haven.<sup>23</sup> However, with the decline in the stock of government bonds relative to economic activity, and an associated decline in the correlation between government and private bond yields in recent years (Figure 8), their use in hedging private interest rate risk has declined. In Canada, however, there are few alternative hedging instruments to government bonds. Rates on interest rate swaps (the favored hedging

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<sup>20</sup> Boisvert and Harvey (1998).

<sup>21</sup> The monthly volume of trading in short-term interest derivatives increased from \$193 billion in 1995 to \$504 billion in 1999. Interest rate derivatives provide a useful hedging vehicle for security dealers and thus improve dealers' ability to conduct inventory risk management in the cash market, which in turn promotes market liquidity (Gravelle (1999)).

<sup>22</sup> Asset-backed securities represent commercial bank issues of short-term paper collateralized by high quality (investment grade) assets, such as mortgages and auto loans.

<sup>23</sup> See Branion (1995).

alternative in the United States) have not tended to move closely with private yields in Canada, in part owing to the relatively early stage of development of the Canadian swap market.

20. Several other industrial countries have also experienced a decline in government debt in recent years. In Australia and the United Kingdom, a liquid government bond market is considered desirable in terms of allowing government bonds to continue to fulfill their traditional roles, especially as benchmark assets and hedging vehicles. While no firm plans have been announced, consideration is being given in both countries to a range of options, including to devote fiscal surpluses partly to asset accumulation in order to maintain a minimum amount of government debt outstanding. The assets could include asset-backed securities and foreign fixed-income instruments (including sovereign paper and possibly high-rated private paper), with less consideration being given to domestic private assets in light of the difficult question of which assets to buy. In the interim, the debt management strategy has included efforts to maintain liquidity in government securities markets. In Australia the Government has sought to maintain liquidity across the government yield curve, while in the United Kingdom, like in Canada, efforts have been focused on maintaining liquidity in key issues, mainly by concentrating new debt in those issues.

21. In the United States, fiscal surpluses since 1998 have resulted in a reduction of government debt, which (unlike in Canada) has occurred across maturities.<sup>24</sup> The U.S. experience may be useful in terms of assessing the implications of a broader-based debt reduction in Canada in the future, although differences between Canadian and U.S. financial markets make a direct comparison difficult. In the United States, the complexity and depth of financial markets provide for a more important role for government securities. With large derivatives markets and the dominance of security finance (as opposed to bank finance), a substantial amount of hedging activity takes place, with U.S. Treasury securities traditionally representing the main hedging instrument.

22. The changes in U.S. federal government debt have affected financial markets in various dimensions, especially since 1997–98. The relationship among different Treasury securities has changed, reflected most visibly in an inversion of the Treasury yield curve since early 2000. With markets sometimes treating U.S. and Canadian government securities as substitutes, the inversion of the U.S. Treasury yield curve contributed to a change in the shape of the government yield curve in Canada, which also became inverted in 2000 before shifting back toward a more normal upward slope in recent months (Figure 9). The relationship between Treasuries and other fixed-income securities has also changed, with the spreads between interest rate swaps, agency securities, and corporate debt versus the ten-year Treasury note all widening since 1998, as well as becoming more volatile (Figure 10). Trading volumes in the government bond market have declined and, like in Canada, the

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<sup>24</sup> See Fleming et al. (2000), Jones (2000), Wojnilower (2000), and Zamsky (2000) for further analytical discussion, and market perspectives, on the implications of debt reduction for financial markets in the United States.

correlation between yields on Treasuries and other fixed-income securities has decreased. In sum, the greater disparity between the performance of Treasuries and other fixed-income securities has reduced the usefulness of Treasuries for referencing and hedging.

23. Financial markets in the United States have started to assess the usefulness of interest rate swaps, government agency debt, and corporate debt as the main alternatives to Treasuries, with interest rate swaps appearing to be the favored alternative at present.<sup>25</sup> Despite differences between U.S. and Canadian financial markets, the U.S. experience may be informative from a Canadian perspective given the prospects of continued Canadian government debt reduction and the rapid growth in financial markets, including the swap market, in Canada in recent years.

24. Swap rates in the United States have tended to move closely with other fixed-income yields, increasing their attractiveness for referencing and hedging. Increasingly, fixed-income positions are hedged with swaps. Corporate issues also are being priced off swap rates, and swap rates are being used to evaluate other fixed-income securities. The predominance of swaps is consistent with the experience in the euro area, where there is no uniform government asset to play a benchmark role and where pricing and hedging are typically done with swaps. Swaps are not, however, a perfect substitute for Treasuries. Being bilateral contracts for a fixed period of time, they are costly to unwind. Being over-the-counter instruments, they are not as widely accessible as Treasuries.<sup>26</sup> Moreover, unlike Treasuries, swaps entail a default risk ("counterparty risk"), which is not transparent and is likely to rise sharply in periods of constraints on market liquidity.

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<sup>25</sup> See Fleming (2000) and Zamsky (2000).

<sup>26</sup> Steps that would widen the tradability and accessibility of swaps could include the establishment of a clearing house as well as of a swap futures market.

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Table 1. Selected Countries: Debt Developments, 1995-99 1/

(In percent of GDP)

	1995	1996	1997	1998	1999
Canada	69.8	68.9	64.9	62.3	58.2
United States	52.0	51.8	49.4	46.5	42.3
United Kingdom	50.5	51.3	49.9	46.9	44.7
Australia 2/	18.9	18.0	14.7	11.9	9.0
New Zealand 2/	48.7	43.8	37.0	38.5	36.0

Sources: World Economic Outlook; WEFA; and national authorities.

1/ Net debt of the federal/central government.

2/ Fiscal year basis.

Table 2. Canada: Gross Federal Government Debt, 1990-2000

	1990/91	1997/98	1999/00
	As a percent of GDP		
Total debt	63.9	72.7	66.7
Market	47.8	53.2	47.6
Marketable 1/	42.2	47.9	43.3
Residents	31.4	34.7	32.7
Nonresidents	10.9	13.3	10.6
Nonmarketable 2/	5.5	5.3	4.4
Nonmarket (residents) 3/	16.1	19.5	19.0
	As a percent of total debt		
Total debt	100.0	100.0	100.0
Market	74.8	73.2	71.5
Marketable 1/	66.1	65.9	64.9
Residents	49.1	47.7	49.1
Nonresidents	17.0	18.2	15.8
Nonmarketable 2/	8.7	7.3	6.6
Nonmarket (residents) 3/	25.2	26.8	28.5

Sources: Department of Finance Canada (2000b); and IMF staff estimates.

1/ Marketable debt includes treasury bills and marketable bonds.

2/ Mainly Canada Savings Bonds.

3/ Nonresidents do not hold nonmarket debt.



Figure 1. International Comparison: Average Term to Maturity of Government Debt, 1997

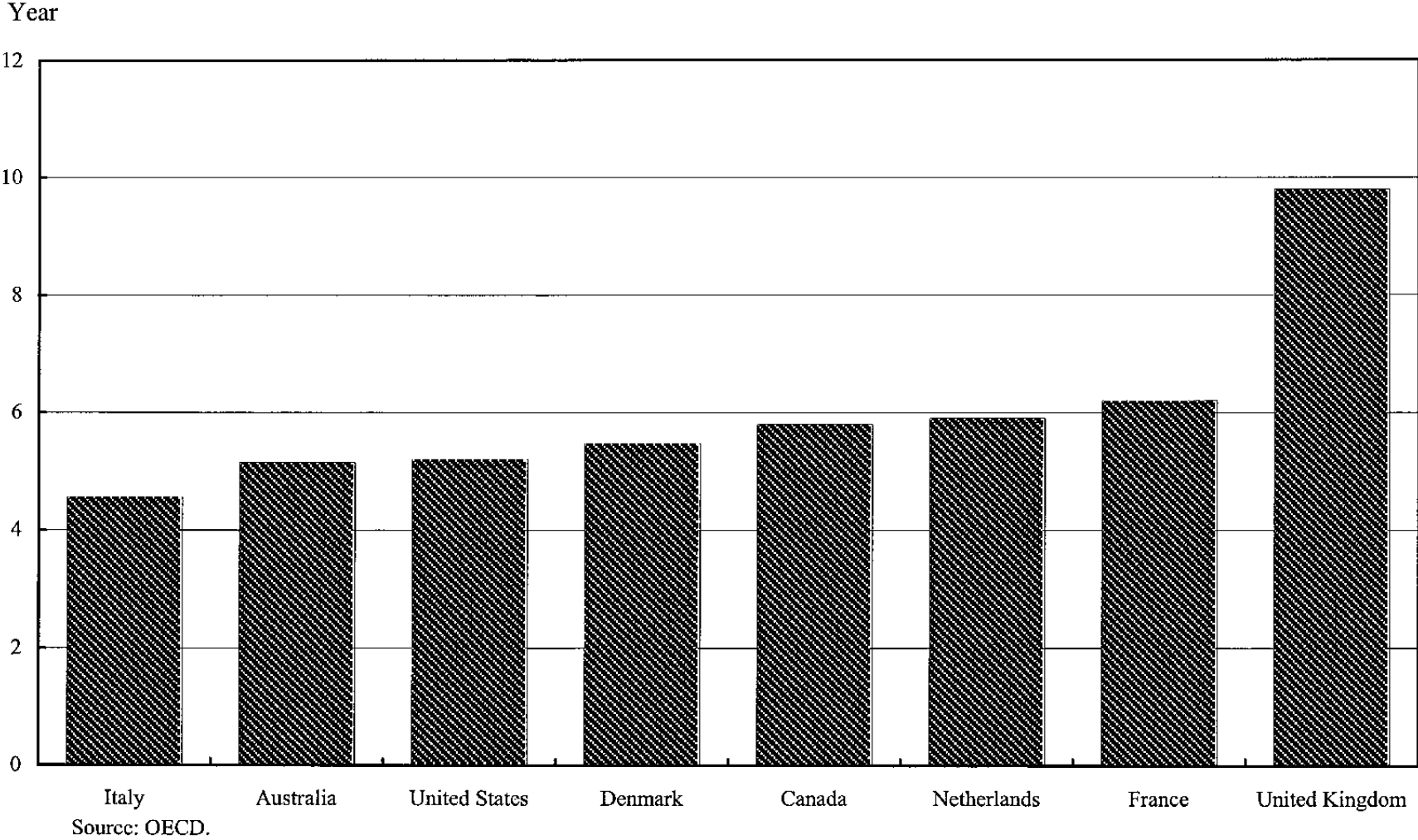
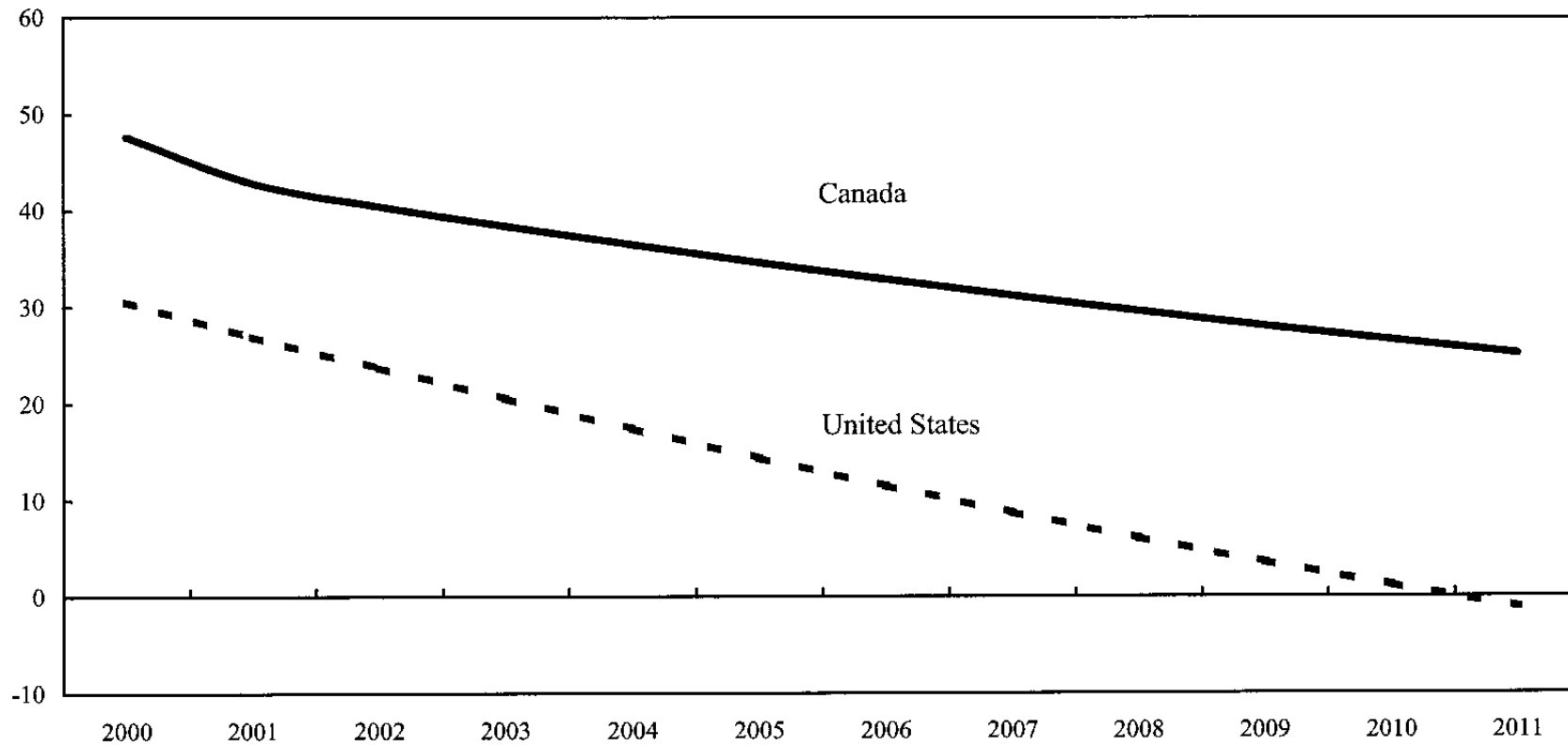


Figure 2. Canada and the United States: Marketable Federal Government Debt Projections, 2000-11  
(Fiscal Year, Percent of GDP) 1/

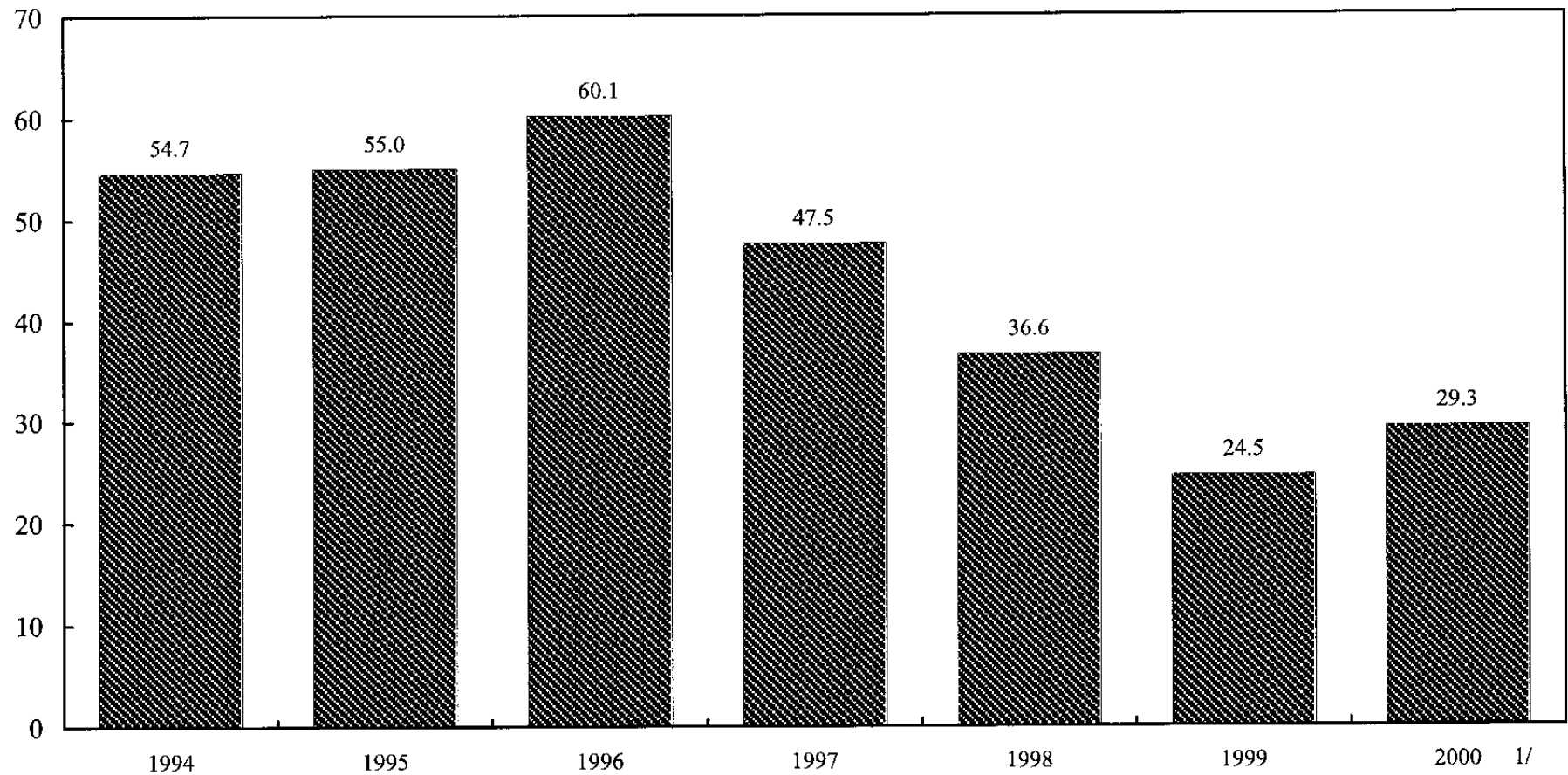


Source: IMF staff estimates, based on Department of Finance Canada Annual Financial Report of the Government of Canada, Fiscal Year 1999-2000, and U.S. Office of Management and Budget, FY 2002 Economic Outlook, Highlights from FY1994 to FY2001, FY Baseline Projections.

1/ For Canada, the projections assume that market debt is reduced by Can\$10 billion in FY 2000/01 and by Can\$3 billion annually in future years.

balanced) are assumed to be devoted to reducing marketable debt.

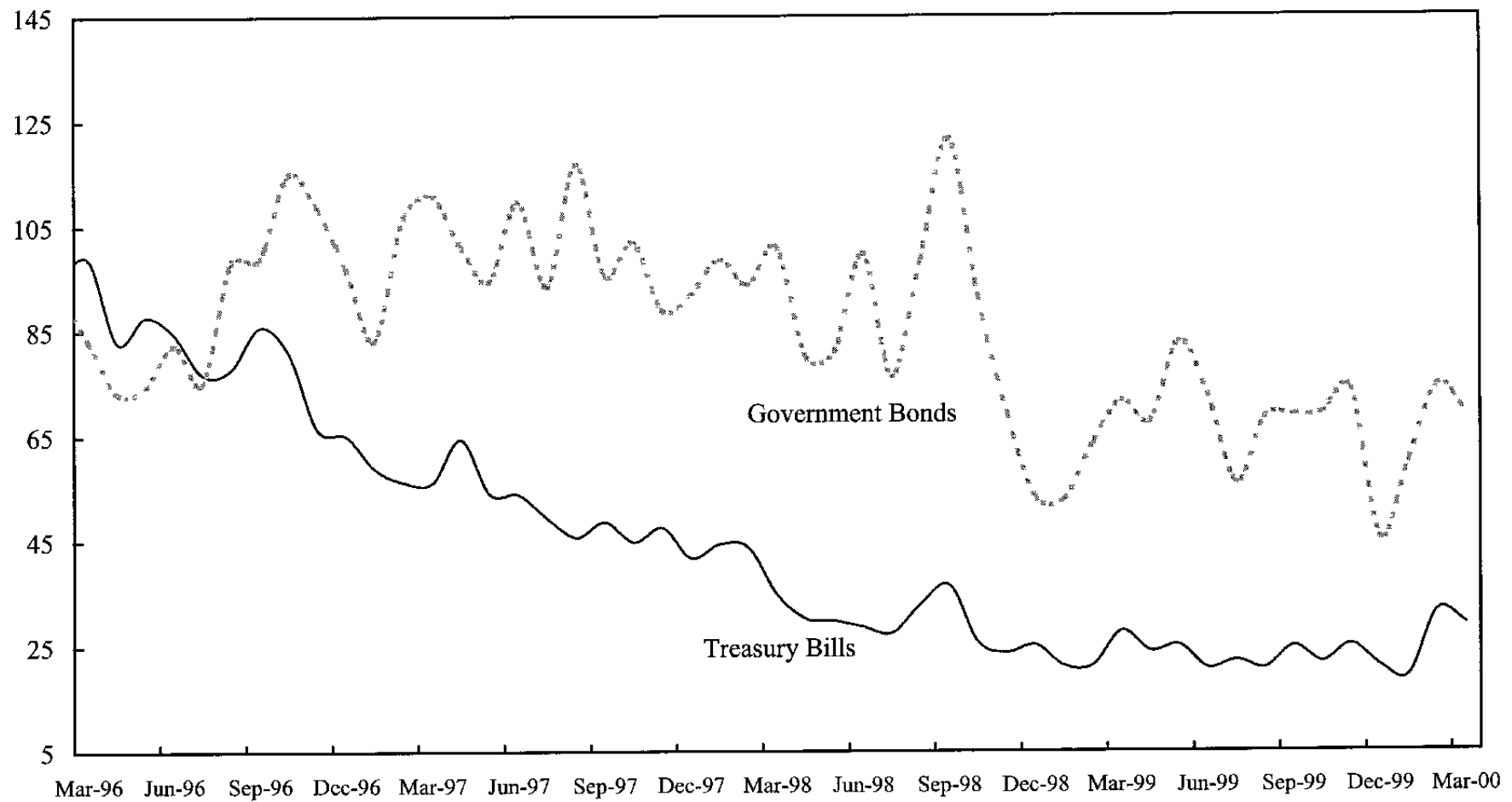
Figure 3. Canada: Average Yearly Turnover of Treasury Bills  
(As percent of outstanding stock of Treasury Bills)



Sources: Bank of Canada; and staff estimates.

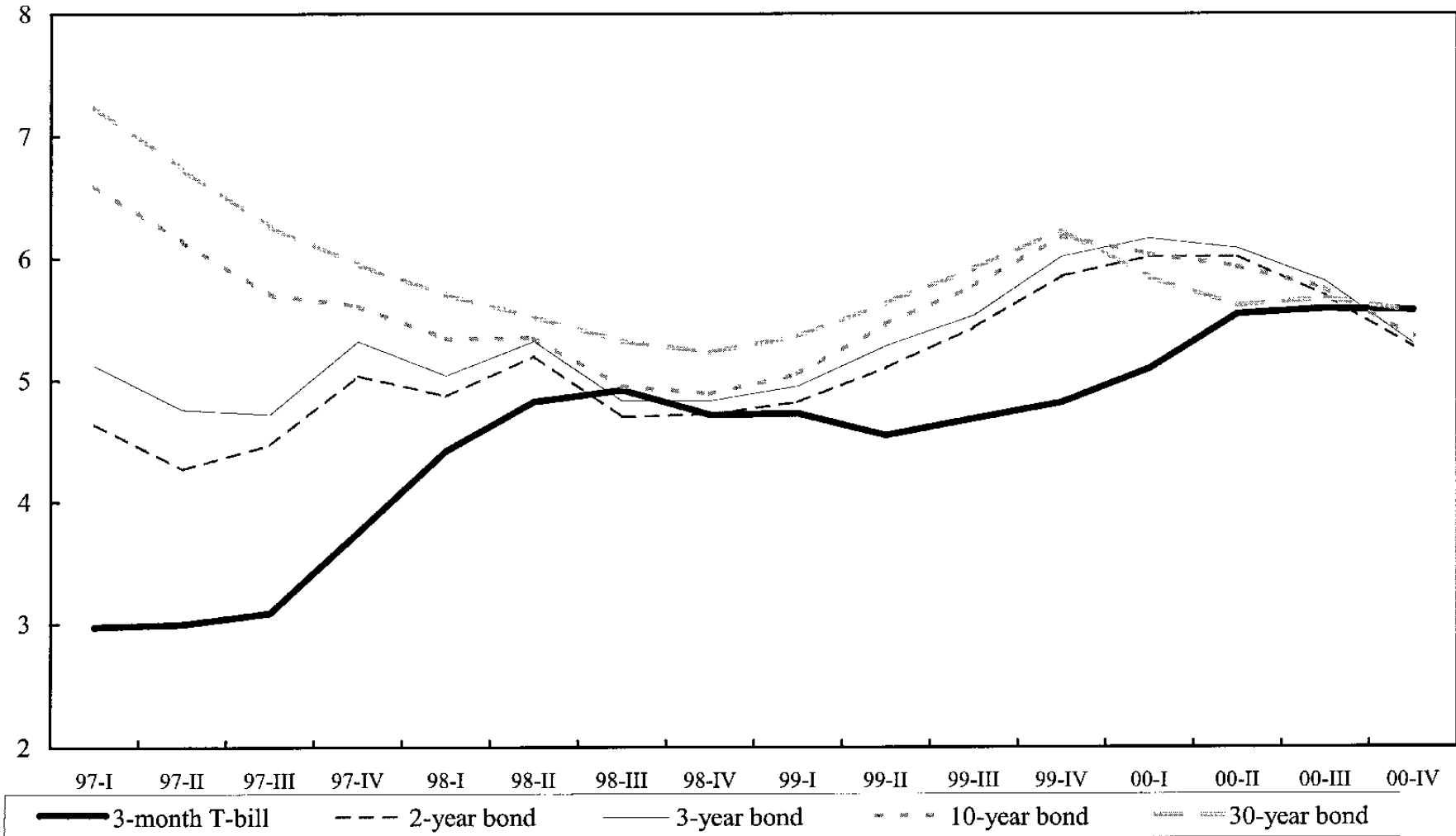
1/ Data available until March 2000.

Figure 4. Canada: Trading Volume of Treasury Bills and Bonds  
(In billions of Canadian dollars)



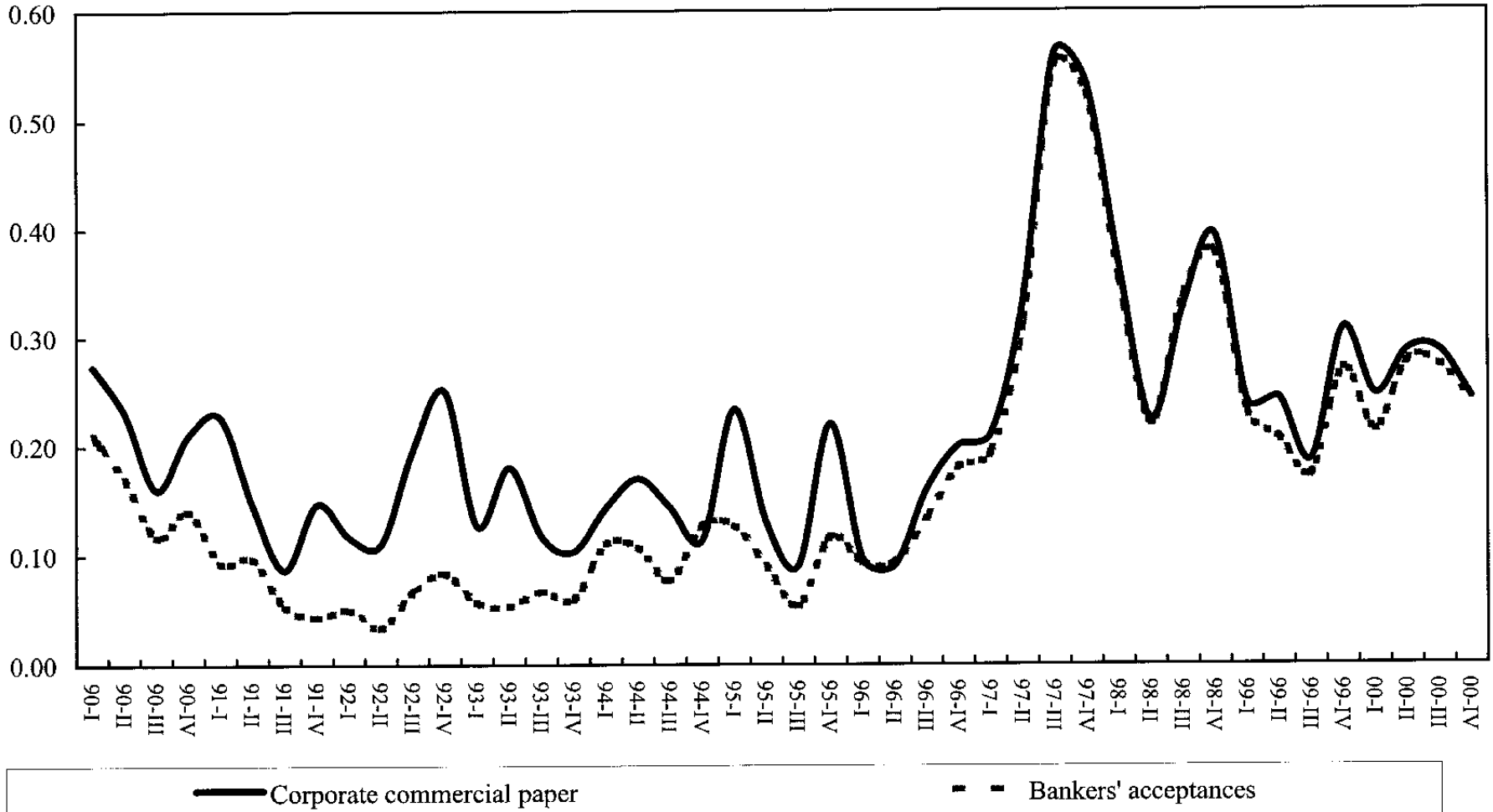
Source: Bank of Canada.

Figure 5. Canada: Yields on Various Marketable Government Securities  
(In percentage points)



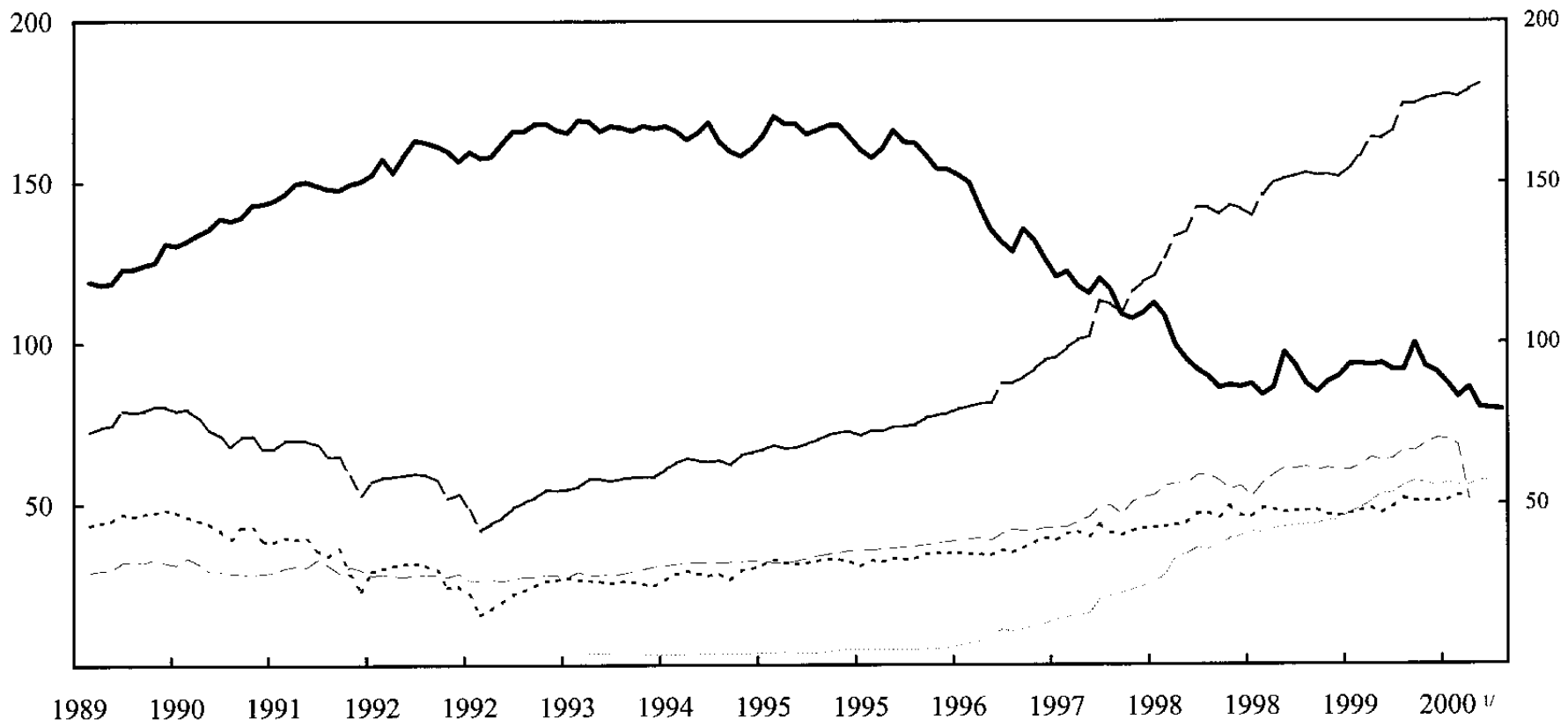
Source: Bank of Canada.

Figure 6. Canada: Yield Spreads on Corporate Commercial Paper and Bankers' Acceptances  
 Relative to Three-Month Treasury Bills  
 (In percentage points)



Sources: Bank of Canada; and staff estimates.

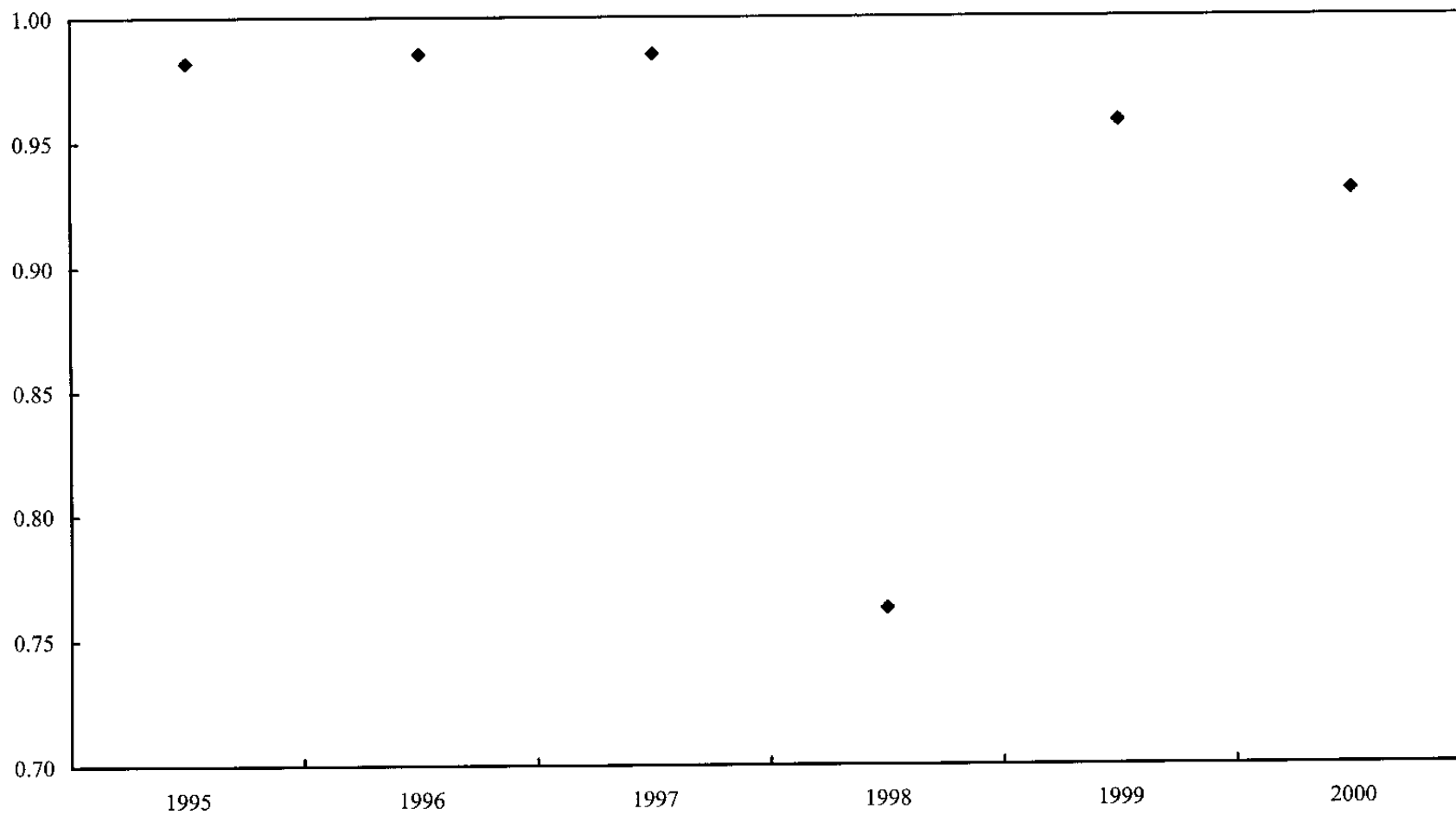
Figure 7. Canada: Major Money Market Instruments Outstanding  
(In billions of dollars)



— Treasury bills	- - - Corporate short-term paper	..... Bankers' acceptances
- - - Commercial paper	..... Short-term asset-backed paper	

Source: Bank of Canada.  
1/ Data available until October/November 2000.

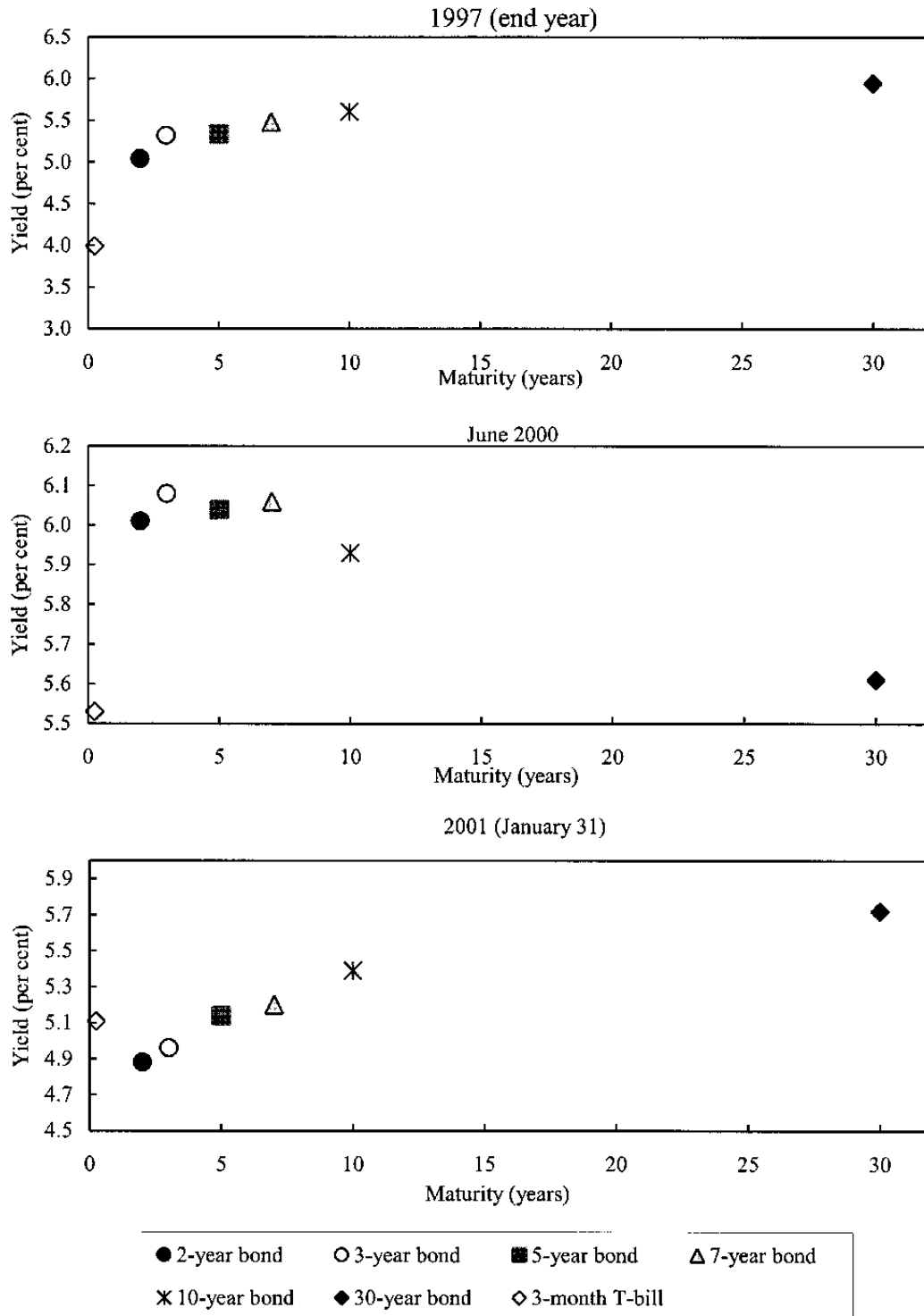
Figure 8. Canada: Correlation Between Corporate and Long-Term Government Bond Yields, 1995-2000



Sources: Bloomberg; and Statistics Canada.

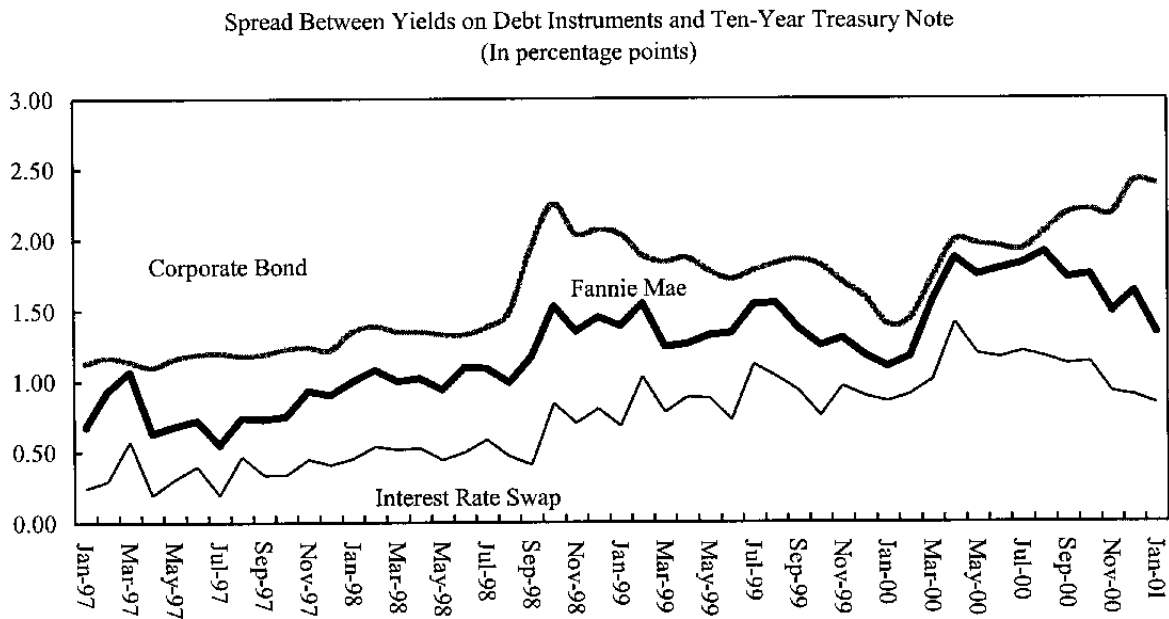
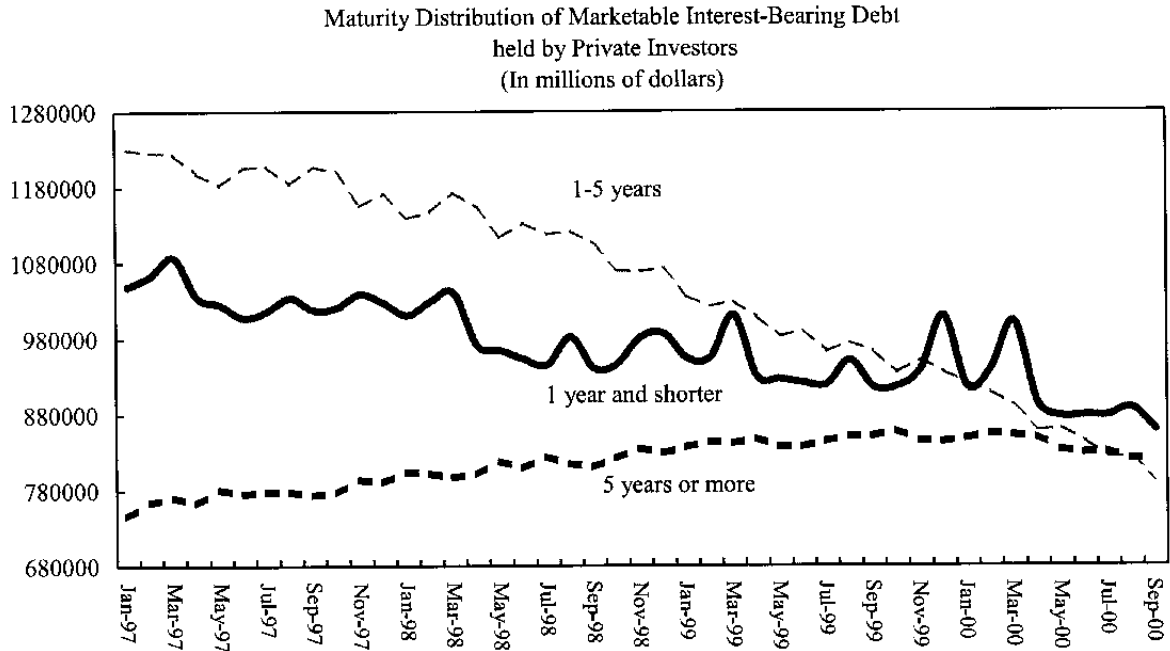


Figure 9. Canada: Yield Curve for Government Debt Instruments, 1997-2000



Source: Bank of Canada.

Figure 10. United States: Debt Developments, 1997-2000



Sources: U.S. Department of the Treasury (Monthly Statement); Bloomberg.

#### IV. PRICE STABILITY AND THE CHOICE OF INFLATION TARGET FOR MONETARY POLICY<sup>1</sup>

1. Since its introduction in 1991, Canada's inflation targeting framework has successfully curbed and then maintained inflation at low levels. At the last extension of the inflation target in 1998, the Government and the Bank of Canada announced that before the end of 2001 an appropriate long-run target consistent with price stability would be determined. In deciding whether to change the inflation target, the authorities will have to consider what are the possible benefits and costs of lowering inflation further. Moreover, the decision to examine the issue of a target consistent with price stability has raised a question among some observers as to whether a regime change from inflation targeting to price level targeting may be warranted. In coming years, other countries that have adopted inflation targeting will be faced with similar questions as they consider adjustments to their targets (Table 1).

2. The empirical literature does not offer much insight on the relative magnitude of the benefits to be gained in moving from low to lower inflation, perhaps in part because of the limited recent experience with very low inflation. Stable, lower inflation provides a firmer anchor for expectations and diminishes volatility in the aggregate price level. Thus, lower inflation can foster more effective longer-term planning which would entail efficiency gains for the economy. Costs associated with such a change in the inflation target to lower inflation center on nominal rigidities in the economy, with consideration generally focused on nominal wage rigidities. Empirical evidence suggests that wage rigidity may not be as severe as previously expected (at least when downward wage adjustments are relatively small) and that such rigidities could dissipate over time as individuals adjust to stable, low inflation. However, some nominal rigidities (such as those associated with the costs of contract renegotiations, information asymmetries, and the costs of monitoring inflation) are likely to continue to persist, imposing significant costs on the economy in moving to lower inflation. In considering a regime change, the economic literature has largely focused on the possible benefits of inflation versus price level targeting; it has not investigated all of the possible costs of such a regime change, especially the costs of the transition to a price level target. Moreover, with theoretical benefits of such a regime being highly dependent on the assumptions made in the economic models used, there is substantial uncertainty regarding what might be gained from switching from an inflation to a price level target.

##### A. Moving from Low to Lower Inflation and Price Stability

3. In contrast to the case of lowering inflation from high rates,<sup>2</sup> the benefits of moving from a low inflation rate closer to price stability are difficult to evaluate. Moving toward

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<sup>1</sup> Prepared by Martin Kaufman and Rodolfo Luzio.

<sup>2</sup> Sarel (1995) shows using panel data that there is a nonlinear effect of inflation on economic growth. When inflation is below a certain threshold, its effect on growth is null or slightly positive, while higher inflation has a negative, significant, and robust effect on growth. This  
(continued...)

price stability, which is specially important for economic decisions with long gestation periods, would entail efficiency gains to the economy. The costs associated with such a change are also highly uncertain. The potential costs of further inflation reduction are mainly associated with the extent and duration of downward nominal rigidities that impede adjustment in the economy and increase employment and output volatility. These nominal rigidities can result from a variety of sources, with the most commonly recognized one being nominal wage rigidity. Some of these costs (like those arising from wage rigidities) could be expected to be transitory, but the length of this transition period and the magnitude of the associated costs are difficult to estimate, especially when inflation is being reduced by only a small amount. A further reduction in inflation also would entail other adjustment costs since it would involve an effective transfer of real resources from debtors to creditors.

4. The empirical literature provides little guidance to draw firm conclusions on the desirability of moving from low to lower inflation. Statistically significant evidence is hard to find because of the lack of recent experience with very low inflation rates. Nevertheless, part of the literature has placed the burden of proof on the cost side, with the recurrent question of whether some level of inflation is needed to "grease the wheels" of the economy and eliminate the potential negative effects of nominal rigidities, particularly wage rigidity. The argument is that workers may strongly resist nominal wage rollbacks, but inflation might be able to produce a decline in real earnings. However, the behavior of workers should not be taken as exogenous to the regime they face. Thus, nominal wages could be expected to become more downwardly flexible in an environment of relative price stability. This process, nevertheless, could take time.

5. Several papers have explored the extent of downward wage inflexibility in Canada in recent years. The bulk of the evidence suggests that nominal wage rigidity may not be a pervasive phenomenon, at least over the range of small nominal wage reductions observed. Evidence of wage rigidity tends to be more prevalent in some specific sectors (e.g., large unionized firms). The impact of wage rigidity on aggregate employment and output appears small because it does not affect large segments of the economy (non-unionized and smaller firms) and because of the flexibility embedded in variable compensation schemes. Empirical studies suggest that nominal wage flexibility in Canada exhibits patterns closer to those in the United States and the United Kingdom than to those in other European economies; in the latter group of countries, the length, extent of indexation, and synchronization of wage contracts are much higher.

6. Wage freezes and lack of rollbacks have frequently been considered a first test of downward nominal wage rigidity.<sup>3</sup> Crawford and Harrison (1997) analyze the distribution of

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is sometimes referred to in the economic literature as the "grease" versus "sand" effects of inflation.

<sup>3</sup> Wage freezes alone are an incomplete test for downward rigidity because freezes can result from other sources, such as menu costs associated with changing wages and a lower variance of wage changes induced by a reduction in inflation uncertainty.

base salary settlements in large unionized contracts during the 1990s. They find that a large number of cases of unchanged wages could be partly explained by the presence of downward wage rigidity. However, broader wage measures, including bonuses, that provide additional flexibility in overall labor compensations, show a higher incidence of rollbacks. This indicates that total wage compensation exhibits a higher degree of nominal downward flexibility than suggested by base salaries. Moreover, wage settlement data cover only a relatively small share of total employment in Canada. Thus, from the analysis of various data sources, the paper concludes that wage settlement data overstates the extent of downward rigidity in the Canadian economy.

7. With respect to employment growth in Canada, Faruqui (2000) finds that downward nominal wage rigidities have had no discernible effect. Likewise, Crawford and Hogan (1999) show that wage inflexibility has had a relatively small effect on the outcome of wage negotiations and employment in the low-inflation period of the 1990s. The paper estimates that menu costs can explain at least half of the wage freezes in the private sector data over the period 1992–98, and concludes that the number of wage freezes significantly overstates the importance of wage rigidity. In addition, it finds that variable pay schemes provide an additional margin of flexibility to wage costs that lessens the impact on employment and real activity.

8. In a different exercise, Farès and Lemieux (2000) also find a lack of significant impact from downward wage rigidity during the 1990s. Controlling for composition effects,<sup>4</sup> they estimate a Phillips-curve relationship between real wages and unemployment. Nominal wage rigidity, by preventing real wages from adjusting to negative employment shocks in periods of low inflation, should flatten the Phillips curve compared to periods of high inflation. The paper finds that, during the low-inflation period of the 1990s, the Phillips-curve estimates do not suggest that the slope of the curve became flatter. The authors interpret this fact as evidence that downward rigidity did not have a significant effect on wages and employment. In part, this is because new entrants (young workers and workers on new jobs) seemed to bear a large share of the real wage adjustments over the business cycle, more than offsetting the effect of rigidities that may have been binding for other groups of workers.

9. It is possible, however, that nominal wages are flexible over a relatively narrow range (e.g., when downward adjustments in nominal wages of, say, less than 5 percent are required), but they may turn out to be much more rigid when larger wage cuts are needed. Larger wage cuts might prompt more worker resistance because of their impact on incomes and uncertainties about the need for such cuts given information asymmetries between management and workers regarding the financial viability of firms.

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<sup>4</sup> The composition effect refers to the changes in the composition of the workforce. This effect can bias up aggregate wage changes since rigidity only affects workers that stay with the same employer.

10. Other sources of nominal rigidities (such as menu costs) may impose significant costs on an economy as it moves from low to lower inflation. Also, in contrast to the case of nominal wages, the incidence of some of these rigidities could be expected to continue after the transition period to a regime of price stability, because such rigidities can be independent of the monetary regime. They may be rooted in the costs of contract renegotiation, information asymmetries, and costs of monitoring inflation, among other reasons.

11. Moreover, in moving from low to lower inflation (particularly moving to an inflation target consistent with “price stability”), the basic question of bias in the measurement of inflation has to be considered. In the case of Canada, the bias in the measurement of the CPI is estimated to add  $\frac{1}{2}$  of a percentage point a year to the measured inflation rate. This is generally less than the measurement bias in other major industrial countries (Table 2).

### **B. Changing the Regime from Inflation to Price-Level Targeting**

12. With inflation in recent years at low and stable rates, the question has arisen whether there might be significant benefits to be gained with little costs by shifting from targeting inflation to some form of targeting the price level. Pure price-level targeting consists of minimizing the deviation of the price level from a target level, thus precluding long-run price-level drift, while inflation targeting aims at minimizing inflation rate deviations from a target inflation rate, which allows for the possibility of price-level drift. Some hybrid alternatives could, in principle, limit the scope of price level drift by incorporating some form of error-correction mechanism which, for example, might provide for some correction of deviations in inflation from the mid-point of the inflation target band.<sup>5</sup>

#### **Conventional views**

13. Price-level targeting provides two potential advantages with respect to inflation targeting. First, it favors long-term planning and nominal contracting by precluding price-level drift.<sup>6</sup> Second, it provides a firmer anchor for expectations. A more effective information environment allows people to more efficiently differentiate changes in relative prices.<sup>7</sup> However, there are drawbacks to price-level targeting. In particular, it induces a higher probability of deflationary episodes, and thereby, it increases the possibility of financial instability. Under price-level targeting, unexpected shocks to the price level are not treated as bygones, so they must be offset. This requires a more contractionary monetary policy to reverse the overshooting of the price level, producing a higher probability of

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<sup>5</sup> In practice, however, these hybrid alternatives may be very difficult to implement due, in part, to problems in trying to clearly explain the regime and to potentially less predictability in how the correction of deviations in inflation would be done.

<sup>6</sup> See Feldstein (1997) for a detailed discussion on the role of expectations and price signals.

<sup>7</sup> See Woodford (1999) and Lucas (1973).

deflationary episodes.<sup>8</sup> In economies where long-duration debt contracts entail fixed nominal interest payments, price deflation increases the liability burden of debtors in real terms<sup>9</sup>. Not only does this balance-sheet effect reduce firms' financial capacity, but it also affects borrowers' repayment incentives, as net worth and collateral values fall. This, in turn, exacerbates adverse selection and moral hazard problems common to financial contracts and increases the probability of default and financial instability. Moreover, the gains from lower long-term inflation variability resulting from price-level targeting may be limited in developed countries where financial markets have developed an array of hedging instruments that can efficiently reduce the risk of price fluctuations.<sup>10</sup>

14. A price-level target that entails a very low or zero inflation rate would increase the possibility of episodes where short-term interest rates fall to zero. By having a zero-bound constraint on short-term nominal interest rates, monetary authorities are limited in their ability to lower interest rates to affect consumption and investment behavior.<sup>11</sup>

15. The recent Japanese experience presents an example of monetary policy being constrained by zero nominal interest rates and having a reduced ability to influence monetary conditions. From February 1999 to August 2000, the Bank of Japan held its prime interest rate (Uncollateralized Call Rate) at zero (except for 1–2 basis points in transaction fees). However, the zero interest rate constraint initially led to an increase in real interest rates, owing to a worsening of deflationary expectations, which was only reversed after the Bank announced its commitment to maintain the zero interest rate policy until deflationary concerns were dispelled. Once the Bank of Japan deemed that deflationary pressures had abated it reversed course and raised its prime interest rate above the zero floor.<sup>12</sup> There are, however, other means by which a central bank can conduct open market operations and inject liquidity into the system. For example, it can extend the scope of its money market operations along the yield curve, widen the range of private securities eligible for open market operations, and intervene in the foreign exchange market. In the case of Japan,

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<sup>8</sup> Mishkin (1997) discusses the relation between deflation and financial instability.

<sup>9</sup> Under price level targeting, the commitment to revert deviations of the the price level away from the target would determine that any unexpected increase in real debt burdens would be temporary. However, debtors do suffer a loss, and the target-reversion process can be protracted exacerbatng liquidity problems.

<sup>10</sup> Financial contracts such as indexed bonds, price-level contingent debt contracts, and option contracts efficiently reduce the cost associated with price uncertainty in the long run. See Fischer (1994).

<sup>11</sup> See Summers (1991). This argument assumes that changes in short-term nominal interest rates affect real interest rates at least in the short run.

<sup>12</sup> See Shiratsuka (2000) and Fujiki, Okina, and Shiratsuka (2000).

however, these options were not pursued, mainly out of concern over their effect on the Bank of Japan's balance sheet and the potential impact of a weakening in the yen on Japan's trading partners.

16. Finally, price-level targeting could generate higher output volatility in the short run if there exists nominal price rigidities in the economy. Because the monetary authorities need to reverse price-level deviations from their target, monetary policy could generate more output fluctuations in the short run if nominal price adjustments are not rapid.<sup>13</sup>

### **Recent literature**

17. New arguments in favor of price-level targeting claim that it can generate lower short-run inflation variability without affecting output volatility, while eliminating any potential inflation bias that might exist under inflation-targeting regimes.<sup>14</sup> This result is obtained in a neoclassical framework where deviations of actual and expected prices are associated with a gap between actual and potential output (the output gap).<sup>15</sup> The result holds if the output gap is persistent over time. As output-gap persistence dampens the effect of price changes in the short term, the monetary authorities would gain from lowering long-term price variability through price-level targeting. Output-gap persistence would reduce the tradeoff between low long-term price-level variability and high short-term inflation variability.

18. The reduced inflation-variability/output-variability result also holds in the context of a New-Keynesian framework where deviations of current and expected inflation are linked to the output gap due to partial price adjustments.<sup>16</sup> In this case, the result depends on two crucial assumptions. First, monetary policy takes private sector expectations as given, thus restricting policymakers from manipulating expectations as to avoid time-consistency problems.<sup>17</sup> Second, forward-looking inflation expectations rely on the existence of partial price adjustment processes stemming from market imperfections. Because people

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<sup>13</sup> See Fischer (1994).

<sup>14</sup> See Svensson (1999) in the context of a neoclassical framework, and Dittmar and Gavin (2000) in the context of a New-Keynesian model.

<sup>15</sup> See Lucas's island model (1972) or Fischer's wage-contracting model (1977).

<sup>16</sup> See Dittmar and Gavin (2000). The basic intuition is that given adjustment costs, forward-looking agents incorporate the effect of expected future price changes into current decisions. For instance, when prices are costly to change, firms raise current prices in response to an anticipated future aggregate demand expansion, thus affecting the current output level.

<sup>17</sup> Intuitively, the time-consistency problem arises when the monetary authority can use current policy announcements to influence public expectations, but then deviate from their announced policy path in order to reap the benefits from such deviation.



incorporate the price adjustments into the future, the monetary authorities can avoid short-term inflation variability by pinning down the price level in the long term.

19. These models, however, do not consider the costs associated with adjusting inflation expectations in a low and stable inflationary environment. Some recent literature has argued that people may prefer not to adjust their inflation expectations when the costs of inflation changes are minimal. In low inflationary environments, gains from incorporating inflation information may be so low that agents will choose to ignore it.<sup>18</sup> In this context, the benefits of price stability under price-level targeting would also apply to inflation targeting when the inflation target is set at a sufficiently low rate.

20. The benefits of moving from inflation targeting to price-level targeting remain an empirical question on which there is little available evidence. While many developed countries have explicit or implicit inflation-targeting policy regimes, no country has used price-level targeting since the 1930s.<sup>19</sup> Although economists have sought to use theoretical models to illustrate the potential magnitude of possible benefits from price-level targeting, these models are constrained by their specific assumptions that may bias the results. Moreover, these models do not address the cost implications of the transition from one policy regime to another.

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<sup>18</sup> See Akerlof et al. (2000). Federal Reserve Chairman Alan Greenspan has defined price stability as the level of inflation at which price changes no longer play a significant role in economic decision making, suggesting that price stability essentially may be associated with some low, positive inflation rate.

<sup>19</sup> Sweden implemented price-level targeting from 1931 to 1937 (see Berg and Jonung (1999)). The Swedish price stabilization program resulted from the suspension of the international gold standard in 1931 and was viewed as a temporary solution before a return to the gold standard. Its initial goal was to arrest the ongoing deflation and "maintain the domestic purchasing power of the Swedish krona" (Jonung and Berg (1999), p. 535). In 1937, employment stabilization became the primary objective of Swedish policy authorities; the implementation of active countercyclical fiscal policies marked the end of the price level stabilization program.

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Table 1. Selected Countries: Advanced Economies with Explicit Inflation Targeting Frameworks and Key Features

Country	Date of Adoption	Target Rate	Price Index	Other Details	Inflation/Monetary Report	Inflation Forecasts Published
New Zealand	March 1990	1-3 percent	Consumer price index (CPI) excluding interest cost components, indirect taxes and subsidies, government charges, and significant price effects from changes in the terms of trade.	Target set in Policy Target Agreements (PTA) between the Minister of Finance and the Governor of the Reserve Bank of New Zealand.	Quarterly	Yes
Canada	February 1991	1-3 percent through 2001	CPI, excluding food, energy, and the effect of indirect tax changes.	Target set by the Minister of Finance and the Governor of the Bank of Canada.	Half-yearly with two in-between updates	No
United Kingdom	October 1992	2½ percent, plus or minus 1 percent	Retail price index excluding mortgage interest payments (RPIX).	Target set by the Chancellor of the Exchequer. 1/	Quarterly	Yes
Sweden	January 1993	2 percent (with a tolerance band of plus or minus 1 percent)	CPI	Target set by the Bank of Sweden.	Quarterly	No
Finland	February 1993	2 percent	CPI, excluding indirect taxes, government subsidies, house prices, and mortgage interest payments.	Target set by the Bank of Finland. The target has no explicit band.	No	No
Australia	1993	Underlying inflation of 2-3 percent, on average, over the cycle	CPI, excluding the impact of interest rates on mortgage and other interest payments, indirect tax changes, and certain other volatile price items.	Target set by the Reserve Bank of Australia and endorsed by the Government in the Statement on the Conduct of Monetary Policy by the Treasurer and the Governor of the Reserve Bank.	Quarterly	No
Spain	November 1994	2 percent	CPI	Target set by the Bank of Spain.	Semi-annual	No

Sources: Masson, Savastano and Sharma (1997); and Debelle (1997).

1/ In May 1997, the Bank of England was given operational independence to set interest rates in order to achieve the inflation target (set by the U.K. Treasury). Inflation outside the target range would require the Governor to write an open letter to the Chancellor to explain the reasons for the deviation.

Table 2. Canada: Bias in the Consumer Price Index in Major Countries

Source of Measurement Error	United States	Japan	Germany	United Kingdom	Canada
Upper-level substitution	0.0	0.0	0.10	0.05–0.10	0.10
Lower-level substitution	0.0	0.1			
New products/quality change	0.6	0.7	<0.60	0.20–0.45	0.30
New outlets	0.1	0.1	<0.10	0.10–0.25	0.07
Total	0.7	0.9	0.75	(0.35–0.80)	0.50

Sources: Shiratsuka (2000); and Congressional Budget Office (1999).

“<” indicates estimated bias is lower than the figure in the table.

## V. FINANCIAL SECTOR REFORM<sup>1</sup>

1. Legislation to reform the financial sector was re-introduced by the Government in Parliament in February 2001.<sup>2</sup> It encompasses the findings of the Task Force on the Future of the Canadian Financial Services Sector completed in September 1998 and the Department of Finance's June 1999 policy paper, "Reforming Canada's Financial Services Sector: A Framework for the Future." The primary objectives of the legislation are to promote the efficiency and growth of the financial system, foster greater competition, and improve the regulatory environment.<sup>3</sup>

### A. Promoting Efficiency and Growth

2. To promote efficiency and growth in financial services, a number of the proposed reforms are aimed at increasing the flexibility of financial institutions. The legislation proposes to loosen the "widely held" rule which currently restricts individuals from owning more than 10 percent of any class of shares in Schedule I banks.<sup>4</sup> The widely held rule was intended to: (i) preclude the existence of a controlling shareholder; (ii) ensure the separation between financial and commercial activity to avoid instances in which dominant shareholders with commercial interests could pressure banks to make inappropriate lending decisions; and (iii) provide a high degree of market transparency and oversight for effective corporate governance. Although the widely held rule has been an element in achieving prudential objectives in the banking industry, more recently it has been seen as too restrictive in that it hinders Canadian banks from entering into certain types of joint ventures or other types of business alliances. In addition, the current rules require that all banks are widely held after ten years, regardless of size, creating disincentives for entrepreneurs to take on the risk of starting a bank.

3. The proposed legislation would replace the Schedule I and II distinction with a three-tier system of banks—small, medium, and large—based on equity. For large banks with over

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<sup>1</sup> Prepared by Paula De Masi and Martin Cerisola.

<sup>2</sup> This legislation was originally introduced in June 2000, but was not enacted prior to the disbanding of Parliament for the November 2000 elections.

<sup>3</sup> In addition, the legislation proposes new measures to empower and protect consumers of financial services, including: improved access to financial services, regardless of income or place of residence, and the creation of a Financial Consumer Agency and an independent Financial Services Ombudsman.

<sup>4</sup> Under current regulations, there is a distinction between Schedule I and Schedule II banks. Schedule I banks, which comprise the six largest banks in Canada, all must be "widely held." Schedule II banks are not subject to this restriction.

\$5 billion in equity, the proposed legislation expands the definition of widely held so that an individual is allowed to hold up to 20 percent of any class of voting shares and 30 percent of any class of nonvoting shares, subject to a “fit and proper” test.<sup>5</sup> Medium banks with equity between \$1 and \$5 billion would be allowed to be closely held but required to have a public float of 35 percent of voting shares; and small banks with equity less than \$1 billion would have no ownership restrictions except the “fit and proper” test. Under the proposed ownership rules, the large banks—where concerns about the impact of bank failure are likely to be the greatest—would still be subject to the widely held requirement. Overall, these reforms are expected to give banks greater flexibility in pursuing strategic alliances and joint ventures, but at the same time, they maintain the original prudential objectives of the widely held rule.

4. The legislation also introduces a new financial institution holding company structure, which is designed to provide greater latitude for how business activities are organized. A holding company structure is currently allowed for financial services institutions in the United States, the United Kingdom, and a number of other industrialized countries.<sup>6</sup> In the past, Canadian “closely held” institutions (for example, stock life insurance companies) had the option of organizing business activities under a holding company structure, whereas “widely held” institutions did not have this option. The current “bank-as-parent” structure has meant that all banking functions are subject to the same regulatory requirements that are designed to protect the parent bank. The legislation proposes to offer widely held financial institutions—and in particular banks—the option to organize under a regulated holding company structure. Although the holding company itself would be regulated and subject to consolidated capital requirements, activities such as credit cards or those that do not involve deposit taking could be organized into separate entities which may be subject to lighter regulation depending on the activities involved. The holding company structure would then allow various financial institutions to join forces and compete with larger institutions, or allow branches of a holding company to compete with highly specialized firms that are subject to less regulatory oversight.

5. During the 1990s, the worldwide acceleration in merger activity has resulted in cost reductions and increased efficiency in the financial services sector, making the global marketplace increasingly competitive. Mergers, therefore, have been a key business strategy through which financial institutions have grown. Guidelines released at the time that the legislation was originally introduced in Parliament set out a transparent Merger Review Process to provide greater clarity for financial institutions considering a merger, while

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<sup>5</sup> The “fit and proper” test examines the character and suitability of the prospective owner.

<sup>6</sup> For example, in the United States, holding company rules were modernized in 1999 through passage of the Gramm-Leach-Bliley Act which, in addition to existing bank holding companies, allows for a new and more flexible holding company type structure called a financial holding company.

ensuring that the merger, in the Government's view, is in the best interests of the Canadian financial sector and the Canadian economy as a whole. This Merger Review Process would apply to mergers among banks with equity in excess of \$5 billion, and the final decision would be based on an evaluation of potential prudential, competitive, and public interest concerns. Reviews would be conducted by the Competition Bureau and the Office of the Superintendent of Financial Institutions (OSFI), and the merger parties would have to prepare a Public Interest Impact Assessment, which the House of Commons Standing Committee on Finance would be asked to review. The Minister of Finance would make the final decision regarding the proposed merger.

## **B. Fostering Greater Domestic Competition**

6. Competition in the financial services sector is important for ensuring high quality service, competitive prices, and innovation. Since the late 1980s, new entry into the Canadian banking sector has been extremely low. For example, since 1987, only 2 Schedule I banks have been chartered, compared to over 200 new banks chartered in the United States in 1997 alone. To encourage greater entry into the marketplace, in addition to new ownership rules for banks discussed above, the legislation proposes reduced minimum capital requirements and removal of regulatory barriers hindering the presence of foreign banks. Under the proposed ownership rules, small- and medium-sized banks would be offered the greater flexibility of being closely held for an indefinite period of time. An important implication of the new ownership rules is that nonfinancial businesses would be able to buy or establish small- or medium-sized Canadian banks as a means of providing financial services to their customer base.

7. Minimum capital requirements for new financial institutions ensure that principal shareholders are committed to the institutions and that there is sufficient capital to support operations and reduce the probability of failure. These minimum capital requirements, however, are balanced against the objective of encouraging more entry into the market. Currently, minimum capital requirements are set at \$10 million—a level considered by many observers to be overly restrictive, especially in regions of Canada where there are few investors with sufficient levels of capital to meet this requirement. To support the formation of smaller community-based financial institutions, and to promote new entry into the market place, the proposed legislation would reduce the capital requirement to start a new bank, trust, or insurance company to \$5 million.

8. Throughout the 1990s, the presence of foreign bank subsidiaries in Canada declined, reflecting in part various regulatory barriers which discouraged foreign banks from doing business in Canada. However, legislation passed in June 1999 reduced such barriers by allowing foreign banks to offer specific services through branches rather than having to set up a separate Canadian subsidiary, as was previously the case. With reduced operating costs, the presence of foreign banks in Canada is expected to increase and introduce more



competition in the banking sector.<sup>7</sup> Under the proposed reforms in the new legislation, financial institutions in Canada would be allowed to hold more than one banking entity; for example, such an institution could hold a lending branch, a full-service branch, and other bank subsidiaries.

### **C. Improving the Regulatory Environment**

9. To keep pace with the ever changing nature of the financial services sector, the legislation also proposes a number of improvements to the regulatory environment. A review in 1996 of the payments system suggested that the Canadian Payments Association (CPA) did not take adequate account of concerns such as efficiency, safety, and consumer protection and that the governance of the CPA needed to be improved. The legislation would amend the mandate of the CPA to clarify its role in the payments system and establish its obligation to advance the public interest. Access to the payments system would be expanded to include life insurance companies, money market mutual funds, and securities dealers, which are currently excluded. With access to the payments system, these institutions would be able to provide additional competition for deposit-like services, such as checking accounts or debit accounts.

10. Regulatory changes are also important to support many of the reforms proposed in the legislation. The legislation would grant OSFI additional powers to more severely penalize financial institutions for not meeting supervisory or regulatory requirements. In addition, the regulatory approvals process would be streamlined. Currently, financial institutions must obtain approval from the Minister of Finance or OSFI before certain types of business transactions can be completed. Although this requirement aims to ensure the safety and soundness of the financial system, the approval process can be onerous. A number of applications formerly requiring ministerial approval would be moved to Superintendent approval, thereby expediting the process. The legislation also proposes to improve the process by introducing a new “notice-based approval process” for many of the business transactions that currently require OSFI approval. Rather than apply for approval, financial institutions will simply file a notice with OSFI, which has 30 days to raise objections or concerns, or seek further information.

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<sup>7</sup> Currently, foreign banks can either establish a full-service branch or a lending branch. Lending branches are not allowed to take in any deposits, but full-service branches are permitted to accept deposits in excess of \$150,000. Lending branches face fewer regulatory restrictions—because they do not hold Canadian funds—than do full-service branches.

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Table 1. Canada: Main Measures Proposed for Reforming  
Canada's Financial Services Sector

<p>Promoting efficiency and growth</p>	<ul style="list-style-type: none"> <li>▪ New definition of widely held rule for ownership.</li>   <li>▪ New holding company regime to increase structural flexibility.</li>   <li>▪ Transparent bank merger review process.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The widely held rule will apply to all banks and demutualized insurers whose equity exceeds \$5 billion. Banks and insurers below this level can be closely held. The widely held rule will be redefined so that investors can hold up to 20 percent of total voting shares, and 30 percent of nonvoting, subject to a "fit and proper test".</li>   <li>▪ Widely held and closely held firms are allowed to organize under a regulated non-operating holding company structure. The widely held rule will apply at the holding company level for institutions with over \$5 billion in equity.</li>   <li>▪ The holding company will be subject to consolidated supervision by the Office of the Superintendent for Financial Institutions (OSFI).</li>   <li>▪ Merger review process applies to mergers among banks with equity exceeding \$5 billion. Banks will be required to present a Public Interest Impact Assessment, the House of Commons Finance Committee will consider it in public hearings, the Competition Bureau and OSFI will also review the proposed merger from their own perspective and will report their results to the Minister of Finance. The Minister of Finance will subsequently render a decision.</li> </ul>
<p>Fostering domestic competition</p>	<ul style="list-style-type: none"> <li>▪ Liberalized ownership rules and lower minimum capital requirements.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Establish three classes of banks based on size of equity. Large banks (equity exceeds \$5 billion) will continue to be widely held according to the new definition; medium banks (equity between \$1 and \$5 billion) will be allowed to be closely held, but must have a 35 percent public float of voting shares; and small banks (less than \$1 billion) will have unrestricted choice of ownership structure.</li>   <li>▪ Existing Schedule I banks with equity less than \$5 billion may change its status to closely held with approval of the Minister of Finance, two-thirds of its Board of Directors, and a majority of shareholders.</li>   <li>▪ If a bank grows from one threshold to the next, it will have three years to comply with the ownership rule that applies to its new status, although the Minister of Finance may extend it, if requested.</li> </ul>

Table 1. Canada: Main Measures Proposed for Reforming  
Canada's Financial Services Sector

	<ul style="list-style-type: none"> <li>▪ Expanding access to the payments system to deposit-like services</li> <li>▪ Support foreign bank entry</li> </ul>	<ul style="list-style-type: none"> <li>▪ After December 31, 2001, small and medium demutualized holding companies would automatically be eligible to be closely held, and large entities will continue to be widely held.</li> <li>▪ The threshold above which trust, stock life, and property and casualty insurance companies must have a 35 percent public float would be raised from \$750 million to \$1 billion.</li> <li>▪ The current minimum capital requirement is reduced from \$10 million to \$5 million (it also applies to trust and insurance companies).</li> <li>▪ Access will be broadened to accommodate the entry of life insurance companies, securities dealers, and money market mutual funds.</li> <li>▪ Criteria for deciding access based on: (i) formal regulatory and supervisory oversight. While life insurers and securities dealers are subject to it, money market mutual funds are not perceived to pose major credit risk to the system; (ii) potential entrants should have access to an immediate and reliable source of liquidity. For money market mutual funds, access is conditioned on ability to pledge assets and borrow up to 5 percent of its net assets; (iii) appropriate legal foundation, a complex issue in the case of insolvency of life insurance companies; (iv) technical and operational capacity to perform the necessary functions as payment system providers. Money market mutual funds that demonstrate it may become members of the Canadian Payment System.</li> <li>▪ Since 1999, foreign banks have been allowed to establish themselves as branch, in addition to subsidiaries. The current legislation contains provisions to ensure that this new regime is consistent with the new domestic policy framework, particularly on providing adequate flexibility for foreign banks and a streamlined regulatory approval process.</li> </ul>
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Table 1. Canada: Main Measures Proposed for Reforming  
Canada's Financial Services Sector

<p>Improving the regulatory framework</p>	<ul style="list-style-type: none"> <li>▪ Reduce the reporting burden related to the Canadian Deposit Insurance Corporation (CDIC) standards.</li> </ul>	<ul style="list-style-type: none"> <li>▪ CDIC and OSFI are consulting with the industry on the possibilities for streamlining the standards. There seems to be little, if any, overlap between CDIC and OSFI guidelines, even if they deal with similar issues.</li> <li>▪ Standards will be reviewed to make them close to current risk management practices. Frequency and detail of compliance reporting will be reduced in many cases. CDIC and OSFI will improve their coordination and information sharing to reduce reporting burden.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Provide OSFI with new powers to deal with potential risks stemming from increased competition and streamline the regulatory approval process.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Superintendent will be allowed to remove directors and senior officers from office in certain circumstances, "such as instances of misconduct." Establish a new system of administrative money penalties for institutions and individuals that fail to comply, desist, cease, or violate undertakings, legislation, or regulations. Enhance Superintendent's power to deal with related party transactions.</li> <li>▪ OSFI will introduce a new notice-based approval process for many of those transactions currently requiring the approval of the Superintendent. There will be a maximum of 30 days for OSFI to raise concerns, seek further information, or indicate a delay; otherwise the transaction will be approved.</li> </ul>
<p>Payments system</p>	<ul style="list-style-type: none"> <li>▪ Improve its governance, efficiency, safety, and consumer interests.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Canadian Payments Association's Act will be modified to better define the Association's role in the payments system and establishing its responsibility to advance the public interest. The Canadian Payments Association board will be expanded from 11 to 15 members.</li> <li>▪ The Minister of Finance will be given the authority to designate other payments systems for oversight.</li> </ul>

Source: Canada House of Commons (2000).