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SPECIAL ISSUE
CANADA'S LINKS TO THE GLOBAL ECONOMY

Introduction

Articles

Speeches

Announcements

Cover

Moroccan Coin Moulds

David Bergeron, Curator, Currency Museum

The casting of coins originated in China in the seventh century BC. Moulds made of clay and other materials were used to cast bronze coins in the shape of small spades and knives. By the eighth century BC, most Western countries had begun to mint coins using engraved dies, but China and neighbouring countries in the Far East did not adopt the practice until the late nineteenth century. Some countries that had been minting coins for hundreds of years resorted to casting in order to mass produce low-denomination coins for small change. One such country was Morocco.

Alawid Sultan Sulayman (1792–1822) introduced cast bronze coins called fals (singular *falus*) to make up for the shortage of silver coins in Morocco. Coins were cast in various weights and dimensions that followed a fixed conversion scale; for example, 24 fals equalled one silver dirham, the basic unit of currency. Over time, as Moroccan currency was devalued by inflation, the size of the coins decreased.

Moulds had two parts: one side bore the star of Sulayman, and the other carried the issue date in Arabic numbers, based on the *Hejira* (Muslim) calendar. The two sides were attached, and the molten metal was poured into the spout at the top. After the liquid metal flowed into the recessed areas, it was left to cool. The cast was then separated from the mould, and the individual coins were broken off. The mould pictured on the cover is made of bronze and is about the size of an adult's hand.

Dating this mould presents a challenge, since the half containing the date is missing. Fortunately, other clues help to narrow the approximate date of manufacture. A typical falus issued under Sulayman measured 22.5 mm. The diameter of the coins made from this mould measures approximately 16.5 mm, consistent with the size of a falus issued during the reign of Sultan Abd ar-Rahman (1822–59).

Some believe that Sulayman adopted the great seal of King Solomon for the star design on the Moroccan falus to counter the Muslim belief that, compared with gold coins, base metal coins were vile and repugnant. This seal, which in ancient and medieval mythology was believed to possess great magical power, consisted of two animal pelts fastened with a rivet in the middle. The four points represented the four natural elements of fire, water, air, and earth, and the raised centre, the omniscient eye of God. What better symbol to place on base metal coins to encourage their circulation?

This bronze mould from Morocco is part of the National Currency Collection, Bank of Canada.

Photography by Gord Carter, Ottawa.

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Canada's Links to the Global Economy

Jack Selody, Chair, Editorial Board

It is well known that, by most standard measures of openness to trade and financial flows, Canada is among the most open of the industrialized countries. Although Canada has benefited enormously from its openness, many of the most significant shocks to the Canadian economy in recent years have come from abroad. Examining and understanding how these shocks affect the Canadian economy, and the potential policy actions that might flow from them, are the focus of this special issue.

As the world's most populous and fastest-growing large economy, China's emergence and integration into the world economy in the past 25 years is a force to be reckoned with for Canada and the rest of the global economy. In "Understanding China's Long-Run Growth Process and Its Implications for Canada," Michael Francis, François Painchaud, and Sylvie Morin review the factors that are driving, and will continue to drive, this growth.

Given the importance of international trade, the nature of international boundaries takes on special importance for policy-makers. In "Borders, Common Currencies, Trade, and Welfare: What Can We Learn from the Evidence?" John Helliwell, the Bank's Special Adviser in 2003–2004, and Lawrence Schembri examine recent research on the effects of borders and common currencies on trade, output, and welfare, looking specifically at trade linkages within and between Canada and the United States.

Owing to the openness of its economy, Canada has developed close ties with the rest of the world. Conducting research into the nature of these external linkages, their implications for the Canadian economy, and how it adjusts to external shocks is extradorinarily important to the Bank of Canada, both for monetary policy and for monitoring the financial system. In "Canada in the Global Economy," Lawrence Schembri reports on what was learned from the Bank's annual research conference, where these issues were discussed in depth by economists from the Bank of Canada, universities, and other policy institutions.

Understanding China's Long-Run Growth Process and Its Implications for Canada

Michael Francis, François Painchaud, and Sylvie Morin, International Department

- *China's remarkable increase in gross domestic product (GDP) and its integration into the world economy over the past 25 years have had an enormous impact and have stimulated intense discussion within the international community.*
- *An analysis of the determinants of growth in China suggests that this rapid growth should continue and that its importance to the world economy should therefore increase. The four major sources of productivity that will generate growth in China for the foreseeable future are the continued reallocation of labour from the agricultural sector to manufacturing, a more efficient allocation of capital, institutional reforms, and trade reforms.*
- *Although China's integration into the world economy poses challenges for policy-makers, both in China and abroad, and will entail structural changes, the prospect is for substantial net benefits for Canada and the global economy. While China's growth should result in increased competition for some labour-intensive Canadian products, Canada should benefit from China's burgeoning demand for commodities and skill-intensive goods and services.*

The growing economic importance of China has, in recent years, attracted the attention of the international community and stimulated intense debate. In the past year alone, discussions have focused on China's exchange rate regime; its accumulation of significant foreign exchange reserves; and the likelihood of a hard landing for the Chinese economy. More recently, attention has focused on the implications of a sharp slowdown in the country's economic growth. The debates underscore the extent to which China's integration into the global economy has already begun to affect the economies of other countries, including Canada. These discussions can be expected to intensify as the process of incorporating more than 1.3 billion people (about 20 per cent of the world's population) into the world economy gathers momentum and further affects international trade, capital flows, and employment in both China and the rest of the world.

Canada has a particular interest in the economic, social, and political developments in China. In the context of an increasingly globalized economy, China represents an opportunity for Canadian industries in some sectors and a formidable competitor to others. As trade flows become more globalized, Canadians can expect relative prices to be affected. For example, continued growth in China is likely to maintain upward pressure on the price of Canada's commodity exports relative to the price of imported manufactured goods. Similarly, it may affect the relative prices of labour and capital in Canada, with the price of capital rising relative to that of labour. Thus, the Canadian

economy will be affected both directly and indirectly.[1] Naturally, Canadian policy-makers are closely monitoring developments in China.

Between 1979 and 2003, the Chinese economy expanded, on average, by approximately 9.0 per cent per year, 3.0 percentage points higher than the annual rate of economic growth achieved before the economic reforms.

The emergence of China is not a recent phenomenon, however. Indeed, over the past 25 years, as a result of numerous reforms introduced since the end of the 1970s, China has gradually moved from a centrally planned economy towards a "socialist market economy" capable of generating robust and sustainable economic growth. Acknowledging the limits of central planning, Chinese authorities have increasingly relied on market incentives to reallocate resources across sectors and regions.

The results have been remarkable. Between 1979 and 2003, the Chinese economy expanded, on average, by approximately 9.0 per cent per year, 3.0 percentage points higher than the annual rate of economic growth achieved before the economic reforms. This compares with an average of approximately 2.9 per cent for Canada over the same period.[2] Empirical studies have shown that, to a large extent, the acceleration of economic growth in China reflects a better allocation of resources across the economy, which, in turn, reflects the impact of the reforms. In 1980, China was the ninth-largest country in the world in terms of gross domestic product (GDP) at purchasing-power-parity (PPP) exchange rates.[3] Today, China is in second place, behind the United States. Greater economic activity has translated into significant social and economic benefits, lifting about 400 million Chinese out of poverty.

Despite these significant improvements in the level of real economic activity, China remains, in per capita terms, a low-income country. In 2002, for example, its real income per capita was US$4,534, or 15 per cent of that for Canada.[4] Under certain assumptions, economic theory suggests that per capita income levels of poor countries should eventually catch up to the levels of rich countries, implying that China's economy should continue to grow faster than the Canadian economy. However, to sustain the process of convergence at current rates, continued reforms will be required.

The purpose of this article is to understand the factors that are driving China's economic growth and to examine its implications for Canada. Research suggests that the factors that have contributed to China's growth will probably continue to do so for some time, and that new reforms are likely to reinforce the process. In particular, the evidence reviewed here finds that the introduction of market-based incentives has produced a better allocation of resources (including the reallocation of labour from agriculture to manufacturing), resulting in substantial improvements in productivity and growth. As the process of reform and resource reallocation continues, driven by further trade liberalization, the impact will increasingly be felt abroad. For Canada, this may mean greater competition in labour-intensive industries, and hence some downward pressure on the wages of unskilled workers. On the other hand, China's growth is likely to increase the demand for the skill-intensive goods and commodities in which Canada has a comparative advantage. Canadian consumers will also benefit from lower prices for imported goods and services.

1. This influence will be felt, not only through bilateral trade between the two countries, but also through changes in the prices of goods that Canada trades via other countries, such as the United States. This is true of all trading economies. As a result, central bankers can increasingly be expected to pay close attention to shocks (such as the impact on commodity prices) emanating from China that may affect the domestic economy, especially prices. On the whole, however, inflation targeting in the context of a flexible exchange rate regime has proven capable of ensuring that inflation rates stay close to their desired levels, despite significant fluctuations in relative prices.

2. It is important to note that there is considerable and widespread skepticism concerning the accuracy of China's official GDP statistics. For example, Young (2000) argues that the use of more appropriate GDP deflators reduces China's annual manufacturing growth over the period 1978 to 1998 to 6.1 per cent, from official estimates of 7.8 per cent.

3. PPP exchange rates are constructed to permit international comparisons across countries. Using PPP rates, a unit of a given currency (typically the U.S. dollar) could purchase a similar bundle of goods in all countries.

4. Data are measured at PPP exchange rates, using 2000 as the base year (IMF 2004).

The Growth Process

A growth-accounting framework

Neo-classical growth theory offers an intuitive framework[5] with which to identify the main factors driving China's past growth and to assess its future potential. Using this framework, growth is decomposed into three components: contributions from labour, capital, and technological change (i.e., changes in the efficiency with which capital and labour are combined to generate output). Starting with the neo-classical production function and adopting the standard notation and assumptions, it is a straightforward matter to express growth in output as follows:

$$y = \alpha_K k + \alpha_L l + r$$

where y, k, and l are rates of growth of GDP, capital, and labour. Thus, y is the growth rate of the economy, and the parameters, α_K and α_L, are, respectively, the shares of capital and labour income in GDP. The first two terms on the right-hand side therefore capture the components of GDP growth that result from growth in the stocks of capital and labour. The catch-all term r describes the proportional increase in growth that would have occurred in the absence of any input changes, such as the adoption of a new technology or a better allocation of the existing stocks of capital and labour across industries. This source of growth is referred to as total-factor-productivity (TFP) growth. While the contribution from capital and labour can be directly estimated in empirical studies, TFP growth must be inferred by subtracting from estimates of GDP growth the components that result from the accumulation of factors.

Several studies have attempted to measure the individual contributions of capital, labour, and TFP to China's growth during the past three decades (Table 1). The results suggest that capital accumulation accounted for the lion's share during both the pre-reform and reform periods, while the contribution of the labour force has been modest, owing to its low marginal product. This is a common finding in economies with a surplus of labour. Accounting exercises aimed at assessing the contribution of TFP to output growth in China have produced a relatively wide range of estimates, owing to differences in the assumed size of the share of labour in GDP. The use of a lower labour share implies a higher capital share, which magnifies the contribution to growth of capital deepening. As a result, lower estimates of labour's share of GDP lead to lower estimates of TFP growth. Most approaches, however, yield similar conclusions about the relative importance of each component to output growth during the pre-reform and the reform periods. There is general agreement in the literature that capital accumulation and labour force expansion explain almost all of China's growth during the pre-reform period, and that the contribution of TFP growth was either small or negative (Chow 1993; Hu and Khan 1996). In contrast, increases in total TFP growth have been found to play a positive and significant role during the reform period. Empirical estimates of its contribution to output growth vary widely, from 2 to 5 percentage points a year, compared with estimates of 3 to 6 percentage points for capital accumulation and 0.5 to 1.5 percentage points for labour force growth. Thus, given that GDP growth averaged 6 per cent a year before the economic reforms and rose to 9 per cent a year during the reform period, these results suggest that TFP growth can explain most of the acceleration in output growth between the pre-reform and reform periods. Most studies find that the reform-induced migration of labour out of agriculture played a major role in generating this improvement in TFP growth (see, for example, the findings of Heytens and Zebregs [2003], reported in Table 2). To understand how the reforms have contributed to this process, they must be examined in more detail.

Table 1

Estimates of the Sources of China's Growth

	Hu and Khan (1996)		World Bank (1997)
	1953–78	1979–94	1978–95
Growth rates (% p.a)			
Output	5.8	9.3	9.4
Contribution to growth (%)[a]			
Physical-capital input	3.8	4.2	3.5
Labour input	1.0	1.2	0.7
Human-capital input			0.8
Total-factor productivity	1.0	3.9	4.3

a. Given that percentages are rounded, it is possible that the numbers do not exactly add up.

5. Solow (1956) and Swan (1956) made the seminal contribution to growth theory upon which the growth-accounting framework and the analysis employed here are based.

Table 2

Estimates of Sources of TFP Growth in China

	Heytens and Zebregs (2003)				
	1971–78	1979–94	1985–89	1990–94	1995–98
Total-factor productivity, of which:[a]	-0.53	2.78	2.11	2.81	2.30
Structural reform	0.38	0.94	0.76	0.83	0.39
Labour migration out of primary sector	2.34	2.01	1.52	2.15	2.08
Exogenous trend	-3.25	-0.17	-0.17	-0.17	-0.17

a. Given that percentages are rounded, it is possible that the numbers do not exactly add up.

The Reforms

China's economic and institutional reforms were implemented in two successive phases. The main objective of the first phase (1979–93) was to unleash the beneficial impact of market forces by providing greater incentives to economic agents, while protecting existing vested interests. This was achieved through a progressive decentralization of the economic decision-making process. In an effort to further reduce the social impact of the reforms, the Chinese authorities tried some of them out on a regional basis before attempting a wider implementation of those that were successful. The reform process can thus be characterized as gradual and experimental.

The second phase (since 1994) has been characterized by the introduction of measures aimed at strengthening the effectiveness of market forces, which include reducing preferential treatments to certain companies in order to level the playing field; introducing a more transparent accounting framework for governments; creating a central monetary authority; continuing the reform of state-owned enterprises (SOEs); establishing the first stages of a social safety net; addressing the issue of property rights and ownership; and, recently, establishing an independent bank regulator (Qian 1999).

The agricultural sector and labour market reforms

Before the reform process began, the Chinese agricultural sector was communal, with production quotas and prices administered by the central authorities. Not surprisingly, significant inefficiencies were associated with this system. For example, labourers were remunerated according to the average production of the commune, not according to their marginal product. Moreover, there was little incentive for workers to relocate into other industries where their marginal productivity may have been higher. Recognizing these limitations, the authorities introduced the Household Responsibility System in 1979, which allowed individual farmers to lease land from the commune in exchange for a fixed production quota (effectively, a lump-sum tax). Production above the administered quota could be sold in the market, resulting in a remuneration system based on marginal productivity. This dual-track system introduced market-based incentives.

In a sense, the introduction of the Household Responsibility System can also be interpreted as a major labour market reform because it forced a reassessment of the value of labour. The more highly productive workers increased farm production and income, while their less-productive counterparts pursued employment opportunities outside the agricultural sector.

The reallocation of farmers with a relatively low productivity level to other employment opportunities was pivotal to high TFP *growth.*

The new measures thus increased labour productivity in the agricultural sector. Furthermore, the reallocation of labourers with a relatively low level of productivity to other sectors where their productivity might be higher should have increased the economy-wide productivity level, or TFP. In theory, this process should eventually result in an equalization of the marginal productivity of labour (MPL) across industries. Chow (1993) estimates that the MPL in the agricultural sector at the beginning of the reform process was 63 yuan, compared with 1,027 yuan in the industrial sector. This figure suggests that the opportunity existed for a sizable reallocation of labour within the Chinese economy. Indeed, Brooks and Ran (2003) (among others) observe that employment in the agricultural sector declined substantially after the reforms were implemented, from around 70 per cent of total employment to about 50 per cent more recently. Heytens and Zebregs (2003) find that the reallocation of farmers with a relatively low productivity level to other employment opportunities was pivotal to high TFP growth (Table 2). Woo (1998) and Young (2000) also note the importance of labour

migration. Moreover, Brooks and Ran (2003) estimate that, with approximately 150 million excess workers in the agricultural sector (about 20 per cent of total employment), there is still considerable scope for further reallocation.

The non-agricultural, non-financial sector

The industrial sector of the Chinese economy was the natural recipient of the excess labour flowing out of the agricultural sector. In an effort to promote a better allocation of labour and capital, the authorities implemented three key market-oriented reforms to influence the non-agricultural sector. First, reforms of the capital-intensive SOEs were introduced to expand their autonomy with regard to production, supply, marketing, retained profits, experimentation with new products, and capital investment (Chow 2002). Under a new Economic Responsibility System, firms were also allowed to remunerate workers based on their productivity. Furthermore, the dual-track system was expanded to include industrial goods. Finally, while maintaining ownership and control of major industries, the central government reduced its intervention in the economy by moving loss-making SOEs to shareholding companies. By weakening the link between the SOEs and the government departments responsible for them, this policy reduced SOE access to government revenues. This hardening of the SOEs' budget constraint, combined with a decentralization of the economic decision-making process, is thought to have resulted in a better internal allocation of resources, thereby improving the marginal productivity of capital and labour and contributing to TFP growth.[6]

Second, the authorities successfully promoted the growth of the non-state sector. As a result, despite fundamental reforms of the SOEs, the non-state sector, which is dominated by township and village enterprises (TVEs), has been the most important contributor to China's outstanding economic performance. While technically government enterprises, TVEs are generally considered to be part of the non-state sector, reflecting the limited ability of local and regional governments to finance losses. TVEs thus function more as private, profit-seeking enterprises. In particular, given their binding budget constraint, TVEs' demand for labour and capital is based on their marginal productivity. Therefore, shifting existing resources to the non-state sector (where productivity is presumably higher) has led to a better allocation of resources across the economy, and an improvement in TFP growth.

Third, reducing barriers to foreign direct investment (FDI) and developing open economic zones (OEZs) that enjoy a more liberal investment and trade regime than other areas, as well as special tax incentives, created a market for labour-intensive manufactured goods. In addition to contributing to the forces responsible for drawing labour out of agriculture, these policies were also critical for attracting new technologies and managerial know-how through FDI. The surge in FDI has also resulted in a substantial increase in joint ventures with foreigners and wholly foreign-owned enterprises. As well as directly contributing to growth through increased capital formation, the increase in FDI is expected to have led to positive technological spillover effects, resulting in an improvement in TFP growth.[7] Zebregs (2003) estimates that while FDI directly contributed 0.4 percentage points to annual GDP growth during the 1990s (through capital deepening), its indirect contribution through long-term TFP growth, at 2.5 percentage points, was much higher.

Together, the agricultural and other economic reforms have had a profound impact on the Chinese economy, significantly affecting the structure of both the rural and urban labour markets (Table 3). The share of total

Table 3

Employment in China (millions)

	1980	1990	1995	2002
Urban employment	105.3	170.4	190.4	247.8
State (%)	76.2	60.7	59.1	30.3
Other (%)	23.8	39.3	40.9	69.7
Rural employment	318.4	477.1	490.3	489.6
TVEs[a](%)	9.4	19.4	26.2	27.2
Other (%)	90.6	80.6	73.8	72.8

a. Township and village enterprises
Source: Brooks and Ran (2003)

6. As long as the marginal products of labour and capital are increased proportionately, the labour and capital shares will remain unchanged, and improvements in productivity from this reform will be reflected in increases in TFP growth. Chow and Li (1999) find evidence that the reforms have not changed factor shares in China and hence provide some support for the argument that the Economic Responsibility System has improved TFP growth.

7. Although this source of technology transfer is a potentially important source of TFP growth, some analysts argue that China's inward FDI is vastly overstated, reflecting a problem of round-tripping. Krugman (1994) argues that domestic investors send financial capital offshore and then reinvest it in China through a business partner in order to take advantage of favourable tax concessions and other benefits that accrue to foreign investors.

urban employment accounted for by the state decreased from 76.2 per cent in 1980 to 30.3 per cent in 2002. During the same period, the share of rural employment accounted for by TVEs increased from 9.4 per cent to 27.2 per cent. As a result of the migration of labour between industries, the importance of the agricultural sector in China has declined, from around 33.3 per cent of GDP in 1981–82 to about 15.2 per cent. In turn, the importance of the non-agricultural sector has increased significantly (Gordon and Gupta 2004).

Future Sources of Growth

Given China's low per capita income, it is quite reasonable to expect that its economic growth will continue at a significant pace (Table 4). The question is, at what rate, and for how long. The evidence presented above suggests that China's growth rate can be attributed to a number of important factors, beginning with a high capital share in income. This, combined with its high savings rate, has produced growth that is largely the result of a process of capital deepening. But, clearly, there are limits to this process. It is unlikely that such a high savings rate can be sustained in the long term. Moreover, as capital is accumulated, the marginal product of capital will fall, resulting in a smaller capital share and reducing the extent to which capital accumulation can contribute to growth. Similarly, labour's contribution to growth will likely be constrained by the impact of China's population-control policies.

[China's] high savings rate has produced growth that is largely the result of a process of capital deepening. But, clearly, there are limits to this process.

The second important source of growth has been TFP growth, which, evidence suggests, has primarily resulted from the reform process that produced a better allocation of resources. Fortunately, as is discussed below, there is considerable room for further reforms to continue this process. Four major sources of TFP growth are likely to generate ongoing growth over the foreseeable future. The first is the continued reallocation of labour from the agricultural sector to manufacturing. Given the substantial supply of excess labour in agriculture, there is still ample opportunity for further growth through this channel alone.

Table 4

Projected Growth Rates of GDP in China

Estimates of average annual growth rates of GDP	2002–2020	2005–2020	2002–2020
IMF (2004)	7.6		
Goldman Sachs (2003)		6.1	
Heytens and Zebregs (2003)			7.5

Further reforms within the financial sector are expected to help promote the second two sources of productivity growth: a better reallocation of capital and increased encouragement to invest. Recent intitutional legal reforms that granted protection to private property rights have provided the foundation for the financial reforms. Such laws can be expected to enable private firms to use collateral assets as a means to obtain bank financing, thereby providing the opportunity for banks to increase the share of these relatively profitable private firms in their loan portfolios, at the expense SOEs, and producing a more efficient allocation of capital across firms and industries and an additional stimulus to investment.[8] Through the creation of a modern, commercially oriented banking system, financial reforms can help to reduce the possibility of a debilitating financial crisis that could stall both the growth process and the reform process. An indication of the urgency that the authorities are placing on financial reform is the government's commitment to the World Trade Organization (WTO), which is beyond that undertaken by other WTO members, to open the banking sector to foreign competition by 2006. In addition, the Chinese government recently recapitalized the Chinese banking system (in particular, two of the major banks) with an injection of funds equivalent to US$45 billion.

Trade reforms, such as further reductions in tariff and non-tariff barriers in the agricultural, textiles and clothing, and service sectors and greater protection of intellectual property rights, are expected to be the fourth source of future TFP growth, through their impact on

8. Private ownership and the rule of law were incorporated into the Chinese Constitution in March 1999. In addition, China recently introduced a constitutional amendment affirming that "private property obtained legally shall not be violated." These reforms represent a tremendous development in a society formerly constituted around the concept of property-less classes. The concepts of property rights and ownership are fundamental to a market-based economy.

resource allocation. The development of the legal and regulatory framework necessary for a market economy is likely to be spurred as China seeks to comply with WTO rules.

Naturally, certain risks, both internal and external, could slow China's growth. There are two main sources of domestic risk. First, the reform process could falter if the adoption of new reforms becomes politically challenging, or if the benefits of reform diminish considerably; and second, given the fragility of the banking system, the potential exists for a financial crisis to significantly interrupt the growth process.[9] In addition to internal risks, as the world's third-largest trading nation, China now faces a number of external risks to growth. From a purely economic perspective, the benefits of the export-led growth strategy could be partly offset by a worsening of China's terms of trade. From a political perspective, protectionist pressure could mount among China's trading partners if China is not seen to be doing its part to alleviate global imbalances. Despite these risks, however, most analysts agree that China will continue to grow at a reasonable rate over the foreseeable future, with potentially significant implications for the rest of the world.

China's Economic Integration

How China's growth affects the rest of the world depends on the extent of its economic integration and the nature of its economic linkages. The integration process is complex, involving a web of economic, financial, and political linkages. This section focuses on the trade and financial aspects of China's integration; other potentially important channels, such as migration flows and non-economic linkages, are not considered.

According to the WTO, China is now the world's third-largest trading nation (after the United States and Germany). In 2003, at US$438.4 billion and US$412.8 billion, its trade accounted for 5.9 per cent and 5.3 per cent of world exports and imports, respectively. In comparison, Canada's trade is considerably smaller, with exports and imports of US$272.1 billion and US$245.6 billion, respectively. Moreover, while Canada's trade with the rest of the world grew by approximately 8 per cent in 2003, China's trade grew at a rate in excess of 35 per cent (Box 1).[10]

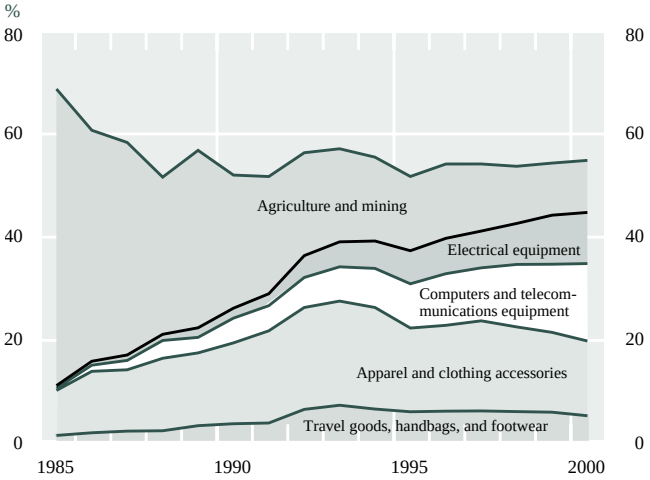
China's rise as a major trading nation is a relatively recent phenomenon. Before the reforms, China's trade with the rest of the world was highly restricted, and whatever trade occurred was the outcome of the State Planning Commission's export and import plans. Under these trade plans, China's imports were largely financed from the proceeds of its petroleum exports (Lardy 2002). Thus, in 1985, China accounted for less than 2 per cent of world trade, with petroleum exports accounting for more than 28 per cent of China's exports, and manufacturing exports accounting for less than half.

With the abandonment of the trade plans, China's trade pattern changed to reflect market signals and comparative advantages. As a result, its reliance on primary sector exports fell considerably, and exports of manufactured goods grew (Chart 1). Moreover,

Chart 1

Sectoral Composition of China's Exports

1985–2000



Source: Statistics Canada, World Trade Analyzer (2003)

9. According to official estimates, non-performing loans (NPLs) account for over 18 per cent of total assets. However, private sector estimates put the share of NPLs to bank assets at more than double the official figure (Standard & Poor's 2004). Given the precarious financial system, it is possible that depositors could lose confidence in the government's guarantee, leading to a major banking crisis that could seriously damage the economy. The Chinese authorities have recognized the weak capital position of the banking sector and have introduced a number of measures to improve the situation, in particular, the reforms aimed at reducing political interventions in the determination of successful loan applicants. They have also injected considerable sums of money to recapitalize the banking sector.

10. Because of its rapid trade expansion, China has become a relatively open economy; measured as a percentage of merchandise trade (exports plus imports) relative to GDP, China's openness to trade was 60.25 per cent in 2003 (IMF 2004), which is close to the figure for Canada (approximately 59 per cent, by IMF figures).

BOX 1

Understanding Canada's Commercial and Financial Links with China

Trade between Canada and China has grown at a brisk pace over the past decade.[1] Since 1995, Canadian exports to China have grown by roughly 40 per cent, and totalled about Can$4.8 billion at the end of 2003. Canadian imports from China have expanded at an even faster pace, quadrupling since 1995, and totalling Can$18.6 billion in 2003. As a result, China is now the second-largest source of imports for Canada, having surpassed Japan and Mexico. Like many countries, Canada is running a sizable trade deficit (Can$13.8 billion in 2003) with China.

The composition of Canada's exports to China also evolved significantly during the past decade, as they became more diversified. While wheat accounted for 60 per cent of Canada's exports in 1992, this proportion fell to only 10 per cent in 2003, supplanted by industrial materials and forestry products which, in 2003, accounted for 45 per cent and 24 per cent, respectively.[2] As a large net exporter of resources, Canada has benefited directly from China's growing appetite for Canadian raw materials and indirectly through recent upward pressure on commodity prices owing, in part, to strong Chinese demand. The range of Chinese goods being imported has also expanded rapidly. While Canadian imports from China during the mid-1990s consisted primarily of toys and trinkets, our demand for capital goods has soared in recent years, and they surpassed consumer goods in Canadian imports in early 2004. Electronic equipment and mechanical machinery now dominate our imports of capital goods from China.

Canadian direct investment in China covers a broad range of key sectors, including aerospace, biotechnology, education, finance, information technology, manufacturing, and natural resources. However, the overall level of direct investment is relatively small, totalling about Can$542 million in 2003 (or less than 1 per cent of total Canadian FDI). In the financial sector, the exposure of Canadian banks to China is very small (it stood at Can$865 million in the second quarter of 2004, which represents less than 0.5 per cent of the foreign assets of Canadian banks). Nevertheless, the Bank of Montreal and the Bank of Nova Scotia have established branches in China,[3] and the insurance firms Manulife and Sunlife are also operating there. Canadian banks and insurance companies are likely to expand their Chinese operations as China's WTO commitment leads to a further opening of these sectors to foreign firms and to increased demand for sophisticated financial products.

1. This sections draws substantially on Roy (2004).

2. The share of our exports to China accounted for by capital goods has remained at a stable 11 per cent over the past decade.

3. In 2002, the Bank of Nova Scotia and the World Bank Financial Corporation acquired a 1 per cent participation in a Chinese bank.

aside from trade liberalization, it is likely that the reform process also changed China's comparative advantage. Reforms that improve property rights tend to encourage capital accumulation and lower the costs of capital-intensive production. Thus, it is not surprising that, while China remains very much a labour-abundant country exporting predominantly labour-intensive goods, the range of goods that it exports has become considerably more sophisticated over time (Desroches, Francis, and Painchaud 2004; henceforth DFP).

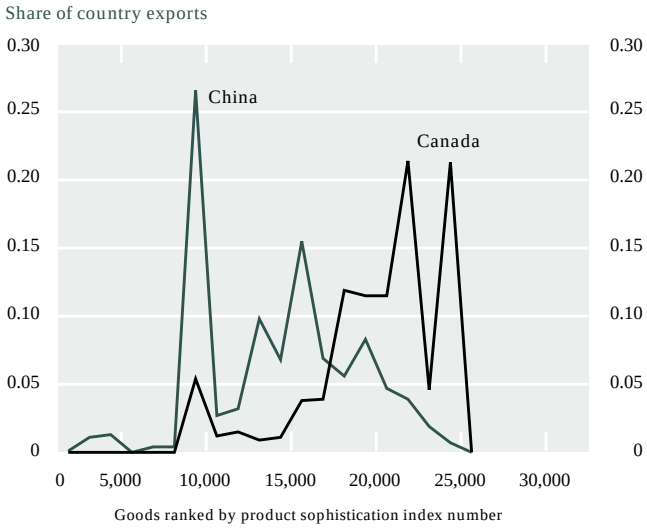
It is likely that the reform process also changed China's comparative advantage. Reforms that improve property rights tend to encourage capital accumulation and lower the costs of capital-intensive production.

DFP (2004) also found that the changing pattern of comparative advantage is gradually having a significant impact on Canada, as is illustrated in Chart 2. Products are ranked from least sophisticated to most sophisticated along the horizontal axis, and the share of each product in a given country's total exports is plotted against the vertical axis.[11] This gives a distribution of each country's total exports ranked by their sophistication. For comparison, we provide two sets of charts. In Chart 2a, we plot the export distributions for China and Canada as of 1985; in Chart 2b, we plot them using 2001 export data. The charts illustrate that while, in 1985, China exported goods that were generally less sophisticated than Canadian goods, by 2001 there had been a significant rightward shift in its distribution, such that its exports now overlapped with Canadian exports, especially in goods of middle levels of sophistication.[12] Thus, while China's exports were once complementary to Canada's, by 2001 there were clearly some areas in which they had become competitors. DFP (2004) provide evidence that increased trade with China is contributing positively to Canada's growth. Moreover, Canada's response to this increased competition in products of middle-level sophistication has been a consolidation of exports in relatively more sophisticated goods. Intra-industry trade, where a country imports and exports goods from within the same industry, is another important aspect of China's trade.[13] It is generally thought that this trade reflects vertical intra-industry trade effects, with China importing unfinished goods, primarily from other Asian economies such as Hong Kong and Taiwan; engaging in the labour-intensive activity of processing and packaging these goods; and then exporting

Chart 2a

Canada and China: Share of Exports Ranked by Sophistication

1985

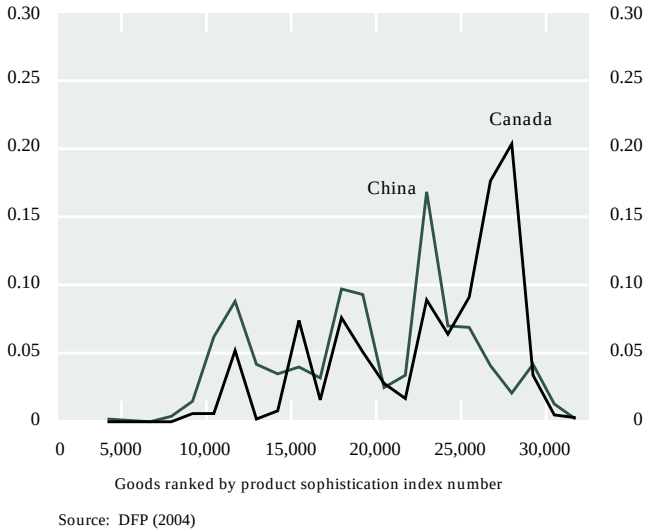


Source: DFP (2004)

Chart 2b

Canada and China: Share of Exports Ranked by Sophistication

2001



Source: DFP (2004)

11. Following Kwan (2002), the product sophistication index (PSI) for a given good is measured as the average real per capita income of the countries that export this type of good, weighted by their share in the global market for that good. That is, for good j and countries i,

$$PSI_j = \sum_i x_{ij} Y_i ,$$

where x_{ij} is country i's share of global exports of good j, and Y_i is the real per capita GDP of country i.

12. Using the PSI and export data, DFP (2004) calculate a global ladder of comparative advantage that ranks 115 countries in terms of the average level of sophistication of their exports. They find that, between 1985 and 2001, China's ranking rose from 55 to 41. Canada was ranked 16th in 2001, down from 10th in 1985.

13. This trade is particularly apparent in sectors such as electronics and electrical equipment. For example, in terms of value, electrical machinery, apparatus, and appliances constitute China's most important import sector (accounting for 26 per cent of merchandise imports). However, in 2000, it was also China's second-largest export sector (10 per cent of merchandise exports), with two-way trade equal to approximately 79 per cent of total trade in the sector.

the final product, often to the United States (Prasad and Rumbaugh 2003).[14]

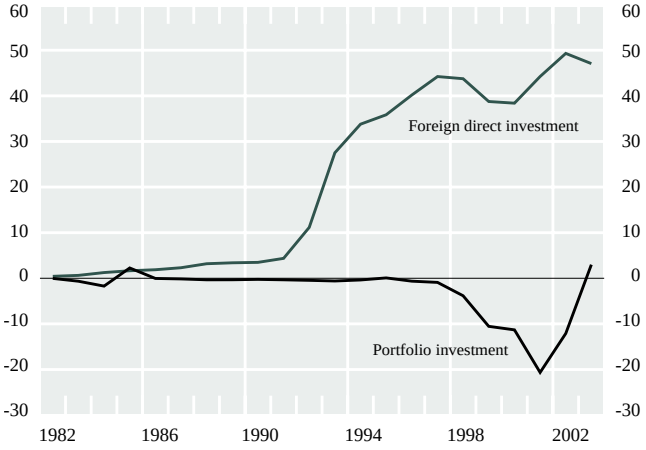
While China is becoming increasingly integrated into the world economy through trade flows, restrictions on capital flows limit both the opportunities for foreigners to invest in Chinese assets and for Chinese residents to invest abroad. Only a limited number of Chinese firms, for example, are permitted to raise equity capital from foreigners by issuing so-called "B-listed" shares on the Shanghai and Shenzhen stock exchanges; and while some issuance of international debt instruments is permitted, it is restricted and small. The main source of international capital is foreign direct investment (FDI) (Chart 3). Restrictions on this form of inward investment are much weaker, so while portfolio investment is relatively small, at US$62 billion in 2004, China is the second-largest recipient of FDI, after the United States, which attracted US$121 billion in 2004. This large number reflects, in part, market size. China's FDI, relative to GDP, has averaged around 4 per cent over the past five years, a figure comparable to other emerging markets, such as Brazil (Chart 4).

Although there has been some financial integration through FDI, China's integration into world capital markets has principally occurred through the acquisition of foreign assets (mostly U.S. Treasury instruments) by its central bank. The accumulation of international reserves reflects China's fixed exchange rate policy, which has resulted in persistent current account surpluses since the exchange rate was pegged at its current rate in 1995. Typically, a fixed exchange rate that results in ongoing sizable current account surpluses in developing countries is considered undervalued. Indeed, economists generally argue that countries in their early stages of development need to import capital from the rest of the world to finance their rapid pace of investment growth. As a consequence, most developing countries should run current account deficits if their exchange rates are appropriately aligned with market fundamentals. Thus, China's exchange rate policy can be thought of as contributing to its export-led growth strategy. It may also reflect a desire to accumulate substantial reserves, which the Chinese authorities may deem necessary to ensure against a financial crisis along the lines of the one experienced by other Asian economies in 1997–98.[15]

Chart 3

China: Capital Inflows

Billions of $US

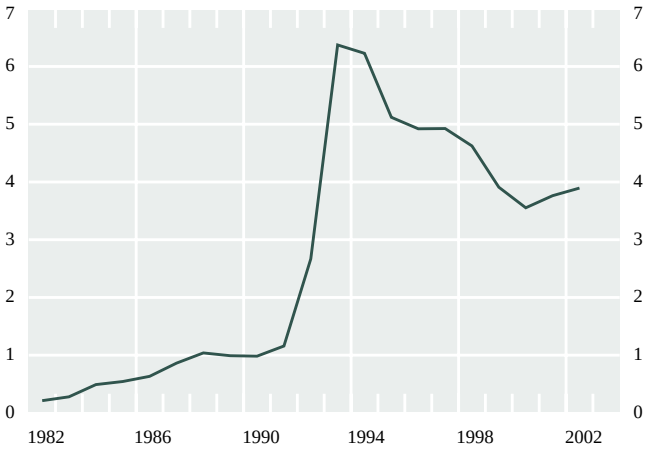


Source: International Monetary Fund, *International Financial Statistics Yearbook*

Chart 4

Net Inward FDI as a Percentage of GDP

China 1981-2003



Source: World Bank, *World Development Indicators*

While some benefits flow from the current exchange rate regime, there are also significant costs. An undervalued exchange rate, for example, increases the cost to Chinese households and firms of consumption and

14. This development has contributed to the decline in the share of exports from other Asian countries to the United States. In contrast, consistent with China's increasing role in the production chain, a rising share of China's imports comes from within the region, and Chinese exports to the United States have risen at a brisk pace. As a consequence, China's share of U.S. imports has increased dramatically.

15. Most economists are agreed, however, that at current levels in excess of US$600 billion, China's reserves are well beyond that necessary to prevent a balance-of-payments crisis.

investment goods, reducing domestic absorption. Furthermore, the foreign reserves could presumably have been more productively invested within the Chinese economy itself. In addition, the export-led growth strategy could be diverting too much investment towards the export sector, which may turn out to be unprofitable if the real exchange rate is revalued.

While some benefits flow from the current exchange rate regime, there are also significant costs. An undervalued exchange rate, for example, increases the cost to Chinese households and firms of consumption and investment goods, reducing domestic absorption.

China's high savings rate may also be important in explaining China's current account surplus. Since Chinese residents save about 40 per cent of their income, the country's savings could outstrip investment, producing a current account surplus. In order for the balance of payments to balance, an accumulation of foreign assets is therefore required. However, since private agents are generally not permitted to purchase foreign assets, an official agency, such as the central bank, must acquire them. While this process also acts to maintain the pegged exchange rate (whenever the current account is in surplus), it also permits China to use some of its national savings to accumulate claims on foreign assets. As China relaxes the restrictions on capital account transactions and eventually moves its economy towards a more flexible exchange rate system, China is expected to become much more highly integrated with world capital markets. The relaxation of capital controls will provide Chinese firms (especially those engaged in international trade) with better access to foreign capital markets. It will also allow Chinese residents (rather than the central bank) to diversify their considerable savings and invest in foreign markets, including, for example, the equities markets in industrialized countries. Such increased integration will lead to a better diversification of global risks, as well as a better allocation of global capital.

Implications for the World Economy

According to estimates by the International Labour Organization, China has roughly 25 per cent (close to 800 million people) of the world's economically active population. In contrast, in 1980, when the newly industrialized Asian economies were in the early stages of their growth process, their population represented about 1.5 per cent of the global population. The global economy is thus facing a potential adjustment challenge of an entirely different magnitude. Furthermore, the size of the labour force and the low starting point of the capital-to-labour ratio suggest that the shock will be both significant and persistent. Given China's size and already extensive trade links, its significant commitments to further open its trade and investment flows as a member of the WTO will ensure that its growth has important effects on the global economy, the scale of which the world may not have previously experienced.

As the opportunities for trade spread westward from the coastal regions and provinces, millions more Chinese will be integrated into the world economy and will enjoy the benefits of a higher standard of living.

The major beneficiary of further integration and reform will be China itself. As the opportunities for trade spread westward from the coastal regions and provinces, millions more Chinese will be integrated into the world economy and will enjoy the benefits of a higher standard of living. Moreover, the benefits of future reforms are likely to be magnified in a more open economy (DFP 2004).

For the rest of the world, including Canada, China's emergence and integration into the world economy offer the prospect of substantial net benefits. One important benefit, of course, is that it will result in a more efficient allocation of resources on a global scale. China's greater openness to trade and investment imply that production activities will continue to be shifted to sectors in which China has a comparative advantage. Moreover, increased competition from China is likely to enhance global competition, foster-

ing innovation and contributing to greater productivity gains and, hence, higher long-run growth rates, not only in China, but globally. While these effects are difficult to quantify, they could be substantial.

At the same time, China's integration into the world economy will have terms-of-trade effects for other trading nations. For example, the expansion of output in China has been widely cited as contributing to the recent increase in the demand for commodities and putting upward pressure on commodity prices. This process may continue over the near term, producing significant gains for resource-rich economies. The relative price of capital-intensive goods and services is also likely to increase as China's domestic demand increases. By implication, the relative price of manufactured goods will likely fall on world markets as a result of a large increase in their supply from China. Indeed, there is some evidence that China's rapid productivity growth has already led to sharp declines in the prices of some globally traded goods in which China specializes (IMF 2003). While the benefits associated with an increase in global demand from China's growth and integration are generally positive for industrialized and resource-rich countries like Canada, the terms-of-trade and welfare effects for some labour-abundant developing countries like Indonesia and the Philippines may be negative (Table 5).

As a net exporter of commodities and a net importer of labour-intensive manufactured goods, Canada would be expected to experience an improvement in its terms of trade, all else being equal. The total effect on Canada is expected to be positive since, in addition to greater demand for skill- and capital-intensive goods and services, Canada will benefit directly from increased opportunities for exporting primary commodities directly to China, and indirectly through higher prices for these products, owing to China's impact on global demand. Indeed, higher demand could be expected to strengthen demand for the Canadian dollar. In the long run, the integration of China's economy into the world economy implies a better allocation of global resources and, hence, a higher and more sustainable global growth path. However, over the short term, the adjustment phase will present policy-makers both inside and outside of China with some challenges. Some reallocation of labour and capital in response to changing comparative advantage and terms of trade among trading nations may be necessary. For some economies, especially those specialized in low-skilled, labour-intensive exports, such changes may involve considerable adjustment costs as uncompetitive enterprises are closed and unemployment rises temporarily in the home country (Prasad and Rumbaugh 2003). In addition, during the transition phase, low-skilled workers in the industrialized countries may experience a slower increase in wages, or even a decline, as the increase in the world's effective labour force associated with China's emergence leads to a decline in the world's capital-to-labour ratio and an increase in the returns to capital.

Table 5

Trade-Related Impact of Faster Chinese Integration, 2020[1]

	Welfare [2]	Exports	Imports	Terms of Trade
World [3]	5.3	7.4	7.2	0.0
China	126.1	86.6	85.7	-7.0
Advanced economies	0.1	2.3	2.7	0.7
NIE (newly industrialized economies)	0.2	2.2	2.9	0.5
ASEAN[4]	0.0	0.9	0.5	-0.1
South Asia	-0.2	0.1	-2.3	-1.0
Sub-Saharan Africa	0.4	0.2	0.8	1.4
Mexico, Colombia, and Venezuela	0.1	-0.7	-1.2	0.3
Other western hemisphere countries	0.2	2.5	2.8	0.9
Middle East and North Africa	0.7	-0.8	0.4	1.9
Rest of the world	0.1	1.3	0.6	0.4

1. As percentage deviation from the values prevailing in the slow-Chinese-integration scenario
2. Welfare is defined as the equivalent variation, relative to GDP.
3. F.o.b. prices for exports, and c.i.f. prices for imports. The discrepancy between changes in exports and in imports reflects transport costs.
4. Association of South East Asian Nations, including Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

Source: IMF (2004)

Conclusion

China is the world's most populous economy. It is also the world's fastest growing large economy. If current trends continue, by 2020, China could conceivably account for one-quarter of global GDP. In the interim, China's emergence and integration will require the rest of the global economy to adjust to its rise. For Canada, this is likely to involve, not only increased competition in some of its labour-intensive products, but increased demand for those products in which Canada has a comparative advantage: commodities and human-capital-intensive goods and services, in particular. On balance, Canada can expect to benefit from China's growth and integration. Indeed, if there is any significant risk to the Canadian economy, it is most likely to occur in the form of a sudden halt in the process of Chinese growth.

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Borders, Common Currencies, Trade, and Welfare: What Can We Learn from the Evidence?

John F. Helliwell, Special Adviser, 2003-2004,[1] and Lawrence L. Schembri, International Department

- *Recent research on the effects of borders and common currencies on international trade initially found estimates that were much larger than were commonly believed. Subsequent revisions to the empirical methodology and to the interpretation of the results have substantially reduced these estimates and their significance for policy.*
- *This research finds, however, that economic linkages are much tighter within, than among, nation-states. It is incorrect, however, to interpret these findings as necessarily implying that borders and separate national currencies represent significant barriers to trade that should be removed.*
- *The empirical models employed in this research lack sufficient economic structure to discriminate between the hypothesis that national borders and separate national currencies represent trade barriers, and the alternative, that these findings are consistent with the efficient organization of production, consumption, and exchange within and across nation-states.*

Borders geographically define nation-states. Economists have discovered that the intensities of economic exchange within and across national borders are remarkably dissimilar. In particular, the differences in intensities of domestic and international (or cross-border) trade in goods, services, and assets are much larger than what was previously believed or assumed. These observed "border effects" have raised questions about the extent of globalization and the continued coherence of national economic spaces in the face of a wide range of global opportunities.

The intensities of economic exchange within and across national borders are remarkably dissimilar.

The purpose of this article is to review the evidence on the extent to which national borders lessen the intensity of international economic linkages, primarily trade in goods and services. The particular focus is on trade linkages within and between Canada and the United States. A range of explanations for the observed border effects is considered, including the use of separate national currencies. Understanding the reasons for border effects is important for determining whether they represent barriers to be removed, or rational

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differences across countries that are driven by local residents' efforts to minimize costs or to maximize welfare. Although considerable uncertainty, even controversy, surrounds the estimated values of border effects, their unexpected magnitude and prevalence have led analysts to search for reasons for their existence, and policy-makers to ask what they might mean for policy. The answer for policy-makers depends, to a great extent, on the explanations found by the analysts. If, for example, policy-driven trade barriers are responsible for the border effects, and if significant gains from further trade expansion are likely, then large border effects signal that much is left to be completed in the global and North American free trade agendas. On the other hand, if the surprisingly local and national structure of economies and societies is a response to the lower costs of dealing with those close at hand who share a variety of common institutions, tastes, values, and networks, or is a reflection of local products matching local tastes (sometimes called a "home bias" in preferences), then the observed impact of the border could represent an optimal outcome.

A policy issue worthy of special attention is the effect on trade and welfare of a separate national currency. Since currency boundaries and political boundaries are generally the same for countries that are members of the Organisation for Economic Co-operation and Development (OECD), with the important new exception of the euro zone, some part of observed border effects in trade is likely the result of currency differences. A separate national currency is not a traditional trade barrier, such as a tariff, since countries maintain a national currency to ensure government control over the supply of money and domestic monetary policy, rather than to encourage domestic production. If, however, currency differences are a large part of the reason for the observed border effects, and if border effects are costly, then Canadian adoption of the U.S. dollar might increase trade, at least between Canada and the United States.[2]

How Globalized Is Canada?

Canada is normally viewed as an open economy that is integrated into global markets for goods, services, and capital. Relative to most countries, this is indeed true, because the share of exports and imports to gross domestic product (GDP) in Canada is high. Charts 1a and 1b show Canada's ratios of exports and imports to GDP, those for Germany (the second most open G–7 country) and the United States, and the average for the G–7 countries. Canada stands out as the most trade-oriented economy. Although the ratio of exports to GDP is often used to measure trade openness, it can be misleading, because exports represent sales, not value added, whereas GDP is a measure of value added. Thus, if there is an upward trend in international

Chart 1a

Exports of Goods and Services

1980–2003

Percentage of GDP

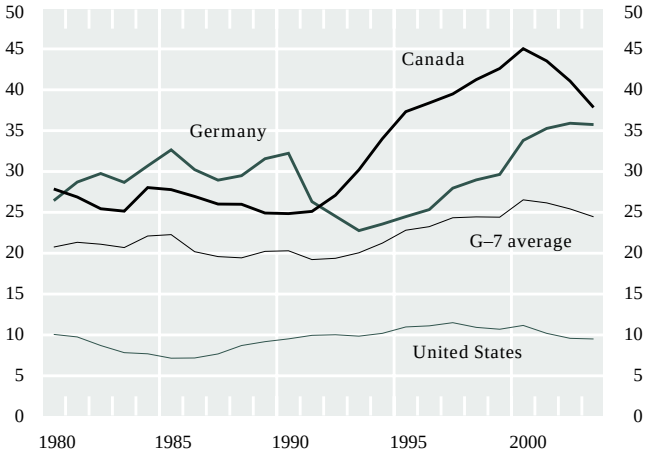
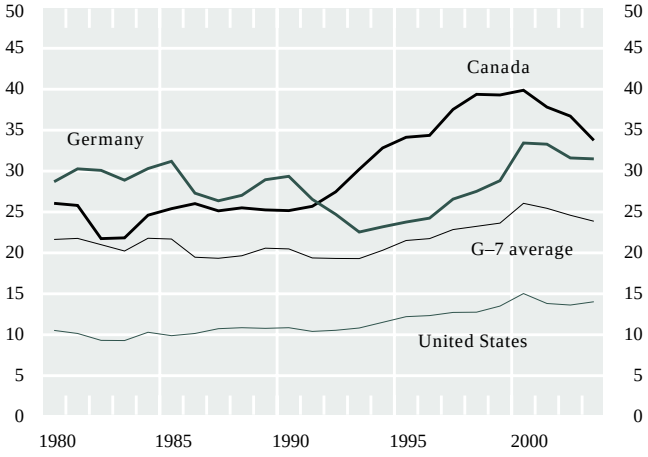


Chart 1b

Imports of Goods and Services

1980–2003

Percentage of GDP



2. Grubel (1999) and Courchene and Harris (1999), for example, make this argument. Laidler and Robson (1991) and Murray (2000) estimate the annual transactions costs associated with a flexible Canadian-dollar exchange rate as less than 0.2 per cent of gross domestic product (GDP).

trade in intermediate goods (as there has been in the North American motor vehicle industry, owing to increased specialization), then the ratio of exports to GDP will rise even if the share of exports to domestic sales is unchanged. Canada's ratios to GDP of total exports and total exports less imported intermediate goods, as well as the gap representing imported intermediate goods embedded in exports, are shown in Charts 2a and 2b. In Chart 2a, both ratios are increasing at approximately the same rate over the 1981–2000 period.[3] This finding implies, as is shown in Chart 2b, that the share of imported intermediate goods in total exports has not risen over time, and thus, two-way trade in intermediate goods is not the main explanation for the rapid growth in Canadian exports, especially to the United States, in the 1990s. Interestingly, the share of imported intermediate goods has increased for motor vehicles and motor vehicle parts over this period (Charts 3a and 3b), and these products are Canada's largest manufactured export good.[4] The results in Charts 2 and 3 are reconciled by the fact that the share of manufactured goods in total exports has declined, while the share of energy and non-energy commodities, whose production does not

3. Input-output data are used to identify the share of imported intermediate goods in exports, and these data are only available until 2000.

4. The sharp decline in imported intermediate goods in the motor vehicle industry in 1997 and 1998 shown in Chart 3b is the result of the 54-day strike at General Motors in 1998.

Chart 2a

Canadian Exports

1981–2000

Percentage of GDP

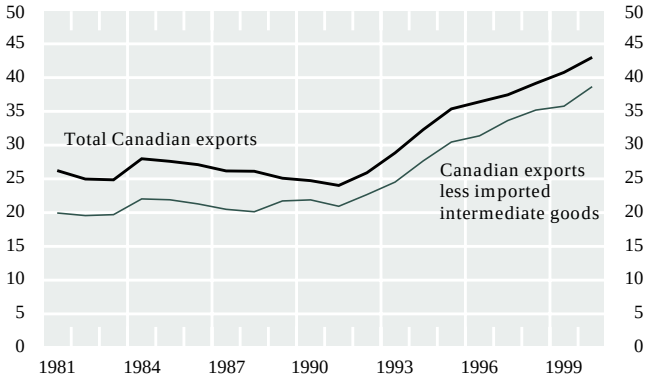


Chart 2b

Canadian Exports of Imported Intermediate Goods

1981–2000

Percentage of GDP

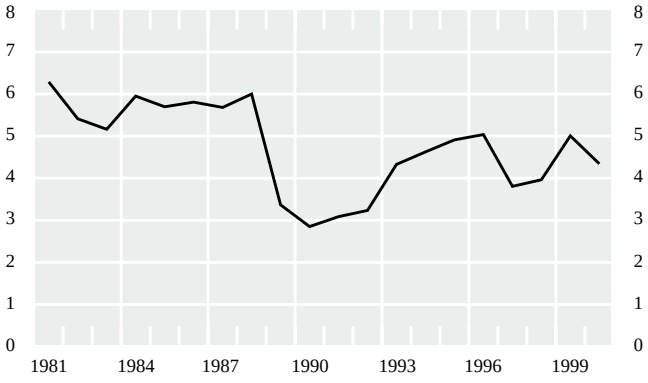


Chart 3a

Canadian Exports of Motor Vehicles and Motor Vehicle Parts

1981–2000

Percentage of GDP

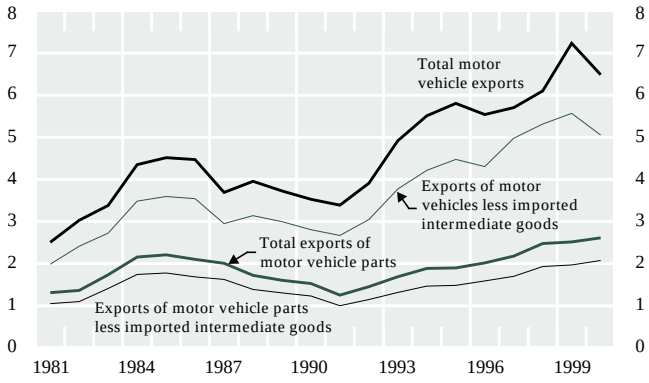
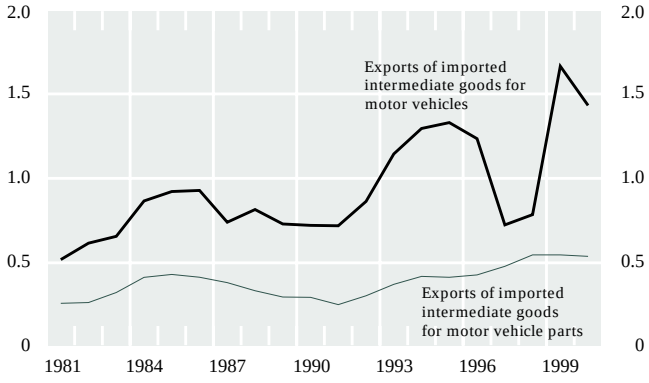


Chart 3b

Canadian Exports of Imported Intermediate Goods for Motor Vehicles and Motor Vehicle Parts

1981–2000

Percentage of GDP



require significant amounts of imported intermediate goods, has increased.

Canada stands out as the most trade-oriented economy within the G–7.

Canada's relatively high level of openness to trade compared with the rest of the G–7 is primarily because Canada is the smallest economy in the G–7 and also because it is next door to the United States, the world's largest economy.[5] Small countries almost always trade more than larger countries because of the lack of alternative domestic trading opportunities.[6] Thus, smaller countries also tend to have larger estimated border effects on trade, as we shall see below.

Canada has also been very open to international flows of capital. From Confederation in 1867 until late in the twentieth century, Canada was traditionally a net borrower, or a recipient of investment from the rest of the world, which was often linked to the development of natural resources and manufacturing. More recently, Canada has run current account surpluses, with an associated net outflow of investment. Canadian firms have invested abroad to gain access to new sources of technology and natural resources, and to develop foreign markets for Canadian goods and services. Canadian investors have also increased their investments abroad in an attempt to diversify their portfolios. Chart 4 compares Canada's foreign direct investment (FDI) inflows as a percentage of GDP with the average for the G–7 countries. In both cases, FDI inflows increased dramatically over the 1991–2000 period, with strong equity markets providing the financing for many large corporate mergers and acquisitions. Historically, Canada has generally remained above the G–7 average.[7] Chart 5 shows inflows and outflows of FDI and portfolio investment for Canada. Portfolio-investment outflows follow a pattern similar to the one for FDI outflows, increasing over the 1990s, and then declining after 2000. Port-

Chart 4

Foreign Direct Investment Inflows

1980–2003

Percentage of GDP

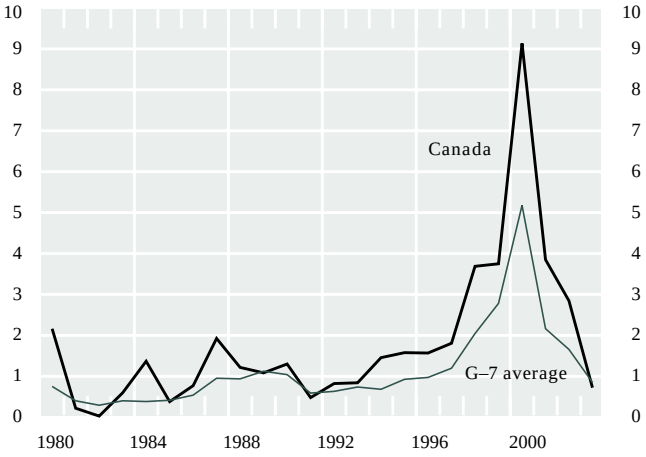
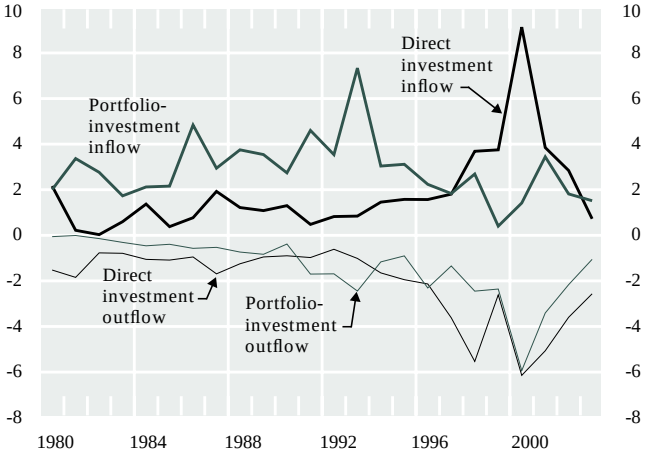


Chart 5

Canadian Capital Inflows and Outflows

1980–2003

Percentage of GDP



5. Much of Canada's trade openness comes from its relationship with the United States. In 2003, trade to and from countries other than the United States was 15 per cent of Canada's GDP. If we exclude Canada and Mexico from U.S. trade, trade with other countries was 13 per cent of U.S. GDP. In comparison, Japan's total external trade was 20 per cent of GDP in 2003.

6. In addition, when trade openness is measured as a percentage of GDP, it is tautological that smaller countries will appear more open because a given amount of trade among a group of countries of different sizes would represent a larger fraction of their GDP. Nonetheless, Head and Mayer (2004) develop a standardized measure of trade openness and find that the bilateral openness of Canada and the United Sates is much greater than that of France and Germany.

7. Relative to Mexico and the United States, however, Canada's share in inward North American FDI has declined. See Globerman and Shapiro (2003) for more details.

folio inflows are slightly lower after 1994, in part because of the reduction in federal government borrowing.

Over the past 25 years, however, many empirical studies have shown that Canada and other countries are much less integrated into the global economy than was previously believed. Often, the methodology of these studies was to compare measures of economic integration between countries with measures of economic integration within countries, and they found that the level of international economic integration for Canada and other countries is far below that within national economies. Three studies that challenged conventional wisdom have been especially influential and have generated much research that has probed the robustness and meaning of their results. These studies examine merchandise trade, price linkages, and capital market integration, respectively.[8]

Many empirical studies have shown that Canada and other countries are much less integrated into the global economy than was previously believed.

In the early 1990s, McCallum (1995) took advantage of the development of new data for province-state trade flows that closely matched data already available for interprovincial trade. Using these data for 1988, the only year for which both sources of data were then available, McCallum found interprovincial trade intensities to be much higher (22 times) than those between Canadian provinces and U.S. states. McCallum's study, and the research which it initiated, will be the main focus of our review.

At about the same time, Engel and Rogers (1996) compared the covariability of intercity price changes for U.S. and Canadian city pairs, as well as for cross-border pairs. They also controlled for the impact of distance because they argued that the covariability of prices would be lower for cities that were farther apart. They used monthly consumer prices for 14 categories of goods and services in the consumer price index (CPI) over the period 1978 to 1994 and found a higher covariability of prices among Canadian cities than among U.S. cities, and a very low covariability among the cross-border pairs of cities. Using their estimate of the impact of distance, they calculated a border effect equivalent to a border 75,000 miles wide. This estimated border effect is much greater than that found for merchandise trade volumes, because Engel and Rogers were comparing monthly changes in consumer prices converted at current exchange rates, and exchange rates are much more variable than consumer prices. Furthermore, some of the CPI components (e.g., housing) are essentially nontradable internationally.

These findings of much tighter national than international linkages among goods markets are comparable to Feldstein and Horioka's (1980) result that national savings rates and domestic investment rates are highly correlated across countries (approximately 0.8), which leads them to conclude that capital markets are not globally integrated. Skeptics of this interpretation argue that national shocks could produce a co-movement of national savings and domestic investment even if international capital markets were tightly linked. The availability of Canadian provincial accounts on a "national accounts" basis provided the opportunity, however, to test the Feldstein-Horioka proposition, using a data sample that pooled provincial data for Canada with national data for the rest of the OECD countries. If Feldstein and Horioka were right to treat their findings as evidence that international capital mobility is far less than that within national economies, then the correlation between savings and investment rates should be much lower across provinces than across countries. The actual results were even more striking. In the pooled sample, the correlation remained strong among the national economies but was completely absent among the provinces (Helliwell and McKitrick 1999).[9] Thus, investment that takes place in one prov-

8. Other studies also showed that migration is much more frequent within than between countries, with border effects that are much larger than for trade in either goods or services (Helliwell 1998, Chapter 5). This was not surprising to economists, whose models frequently assume that labour is an immobile factor of production. One interesting feature of the North American evidence is that long-term migration in both directions between Canada and the United States has fallen by a factor of 10 over the past century, based on census records showing the birthplaces of each country's residents. Trade linkages, in contrast, became less intense over the first half of the twentieth century and more intense over the second half, recovering by the end of the century to about the same levels as at the beginning.

9. Similar conclusions follow from more fragmentary regional data for other countries. See Sinn (1992), Bayoumi and Rose (1993), and Dekle (1996).

ince is equally likely to be financed by savings in any other province, as would be implied by the existence of a tightly linked national capital market. For national economies, however, domestic investment continues to be largely financed by national savings. This result has also been indirectly confirmed by many studies showing that investment portfolios in all countries display a strong preference for domestic securities.[10]

Borders, Trade in Goods, and the Gravity Model

Many researchers were surprised by McCallum's (1995) discovery that, in 1988, average interprovincial merchandise trade flows were about 20 times more intense than those between provinces and states. Consider an example: Ontario is approximately the same distance from California as it is from British Columbia, and California's population and GDP are about 10 times larger than those of British Columbia. If there were no systematic differences between interprovincial and province-state trade, we would expect to find two-way movements of goods between Ontario and California to be 10 times larger than those between Ontario and British Columbia. But actual merchandise flows between British Columbia and Ontario were more than twice as large as those between California and Ontario, or 20 times greater than expected. McCallum's result strongly suggests that national economies have a much tighter internal structure than previously thought; and hence, that the extent of globalization is much less than commonly supposed.

McCallum recognized the necessity of structuring the comparisons to permit trade intensity to be measured separately from the effects of size and distance. Choosing pairs of equal distance for comparison (e.g., trade between Ontario and California and between Ontario and British Columbia) thus takes distance into account. For this purpose, he used a popular empirical model of trade known as the gravity model, which was first used in empirical trade studies by Tinbergen (1962), and is a straightforward application of a bilateral version of the Newtonian model of gravity, wherein the attraction (trade) between two bodies is directly proportional to their masses (measured by GDP for trade purposes) and inversely proportional to the distances between the bodies. The basic bilateral log-linear form of the gravity model for trade used by McCallum to study the impact of the border is

$$lnT_{ij} = \alpha + \beta_1 lnY_i + \beta_2 lnY_j + \rho lnd_{ij} + \gamma D_{ij} + \varepsilon_{ij},$$

where T_{ij} is the value of trade from location *i* to location *j*;

and Y_i and Y_j are the GDPs of *i* and *j*;

d_{ij} is the distance between *i* and *j*;

D_{ij} is an indicator (dummy) variable that takes a value of 1 for internal trade and 0 for international trade; and the Greek letters, α, β_1, β_2, ρ, and γ are parameters to be estimated.[11]

McCallum (1995) estimated the border effect, which is measured by the ratio (or relative intensity) of interprovincial to province-state trade flows, from the estimated coefficient on the internal trade indicator variable.[12] Hence, a border-effect value of 1.0 means that, after adjusting for the effects of size and distance, transborder and interprovincial trade intensities are equal. Using data for 1988, McCallum (1995) finds that interprovincial trade was 22 times greater than transborder trade, holding all other variables constant. This result is consistent with total transborder flows being as large as interprovincial shipments because of the much larger size of the U.S. economy, and the fact that most major Canadian centres of population and production are as close to U.S. markets as they are to each other.

Subsequent research has lowered this estimate of the border effect for three main reasons. Most importantly, McCallum's estimate was produced in 1988, before the Canada-U.S. Free Trade Agreement (FTA) in 1989; since then, there has been a large increase in transborder trade (see Chart 1). Second, several data revisions have also slightly reduced the estimates. Finally, moving from a bilateral to a multilateral version of the gravity model has lowered the estimated border effect as well (as will be discussed in further detail below). Estimates for trade in services, based on more fragmentary data, are several times larger than for merchandise trade (Helliwell 1998, Chapter 2). This is not unexpected, because the international barriers to trade in services are normally thought to be larger than for merchandise,

10. French and Poterba (1991) and Baxter and Jermann (1997), for example, find evidence of substantial home bias in financial investment across countries.

11. Box 1 and Feenstra (2004, Chapter 5) discuss the derivation of the gravity equation from a theoretical trade model.

12. The border effect is the anti-log of the estimated coefficient. Thus, a border effect of 1.0 arises when the estimated coefficient on the dummy variable D_{ij} is zero.

owing to the heavier regulation of the provision of services. In addition, the intensity of domestic trade in services is likely to be higher because services are generally more idiosyncratic and thus require more contact between the provider and consumer; this necessity would generate home bias in both demand and supply, since transactions would likely occur via local networks, where information is better. Estimates of border effects for merchandise trade for other industrialized countries of similar size are comparable with those for Canada. Estimated border effects are much larger, however, when developing countries are included in the sample (Helliwell 1998, Chapter 3), presumably because differences in institutions are greater and the information and transportation networks are less effective between developing and industrialized countries.

It is worth noting as well that coefficient estimates of the distance variable in the gravity equation are generally much larger than would be predicted from transport costs alone (e.g., Grossman 1998). Hence, there must be other costs that increase with distance, such as communication and information. Interestingly, Helliwell (1998) finds that these distance-related costs are similar for both interprovincial and transborder trade. This finding implies that the estimated border effect cannot be associated with differences in such distance-related costs for trade within and between countries, but it must capture either the costs of cross-border trade associated with international transactions or the cost (or welfare-improving) advantage of domestic transactions. This critical issue is discussed in more detail below.

Multilateral versions of the bilateral gravity model

Both Newtonian physics and empirical trade equations become more complicated when we recognize that the universe contains more than two bodies. Two people are not inevitably drawn to one another. That is because both are more firmly rooted to the (much larger) earth. Following Feder (1980) and others, many researchers estimating border effects have attempted to account for the extent to which trade between two countries or regions is affected by each country's opportunities to trade with third parties. The simplest method uses the theory of the gravity model to construct, for each bilateral trading partner, separate variables that reflect the combined attraction of their trading possibilities with all other trading partners. This was done in Helliwell (1998) and Helliwell and Verdier (2001), and was shown to reduce estimates of the border effect in the Canadian case.[13]

Anderson and van Wincoop (A&vW) (2003) use a formal trade model that assumes fixed endowments of differentiated goods to derive a multilateral version of the bilateral gravity model. The multilateral model includes an explanatory variable that represents the magnitude of alternative trading opportunities faced by the members of the bilateral trading pair. This derivation represents an improvement over previous definitions of such variables in empirical gravity models because, by including the border effect itself in the definition of alternative trading opportunities, it is possible to derive a more consistent prediction of what would happen to trading patterns in the absence of border effects. It also permits the same model to explain why, in the presence of border effects, smaller countries are likely to have relatively more intense domestic versus external trade than larger countries. The reason for this, as emphasized by A&vW (2003) and Feenstra (2004), is that larger countries have within their borders a greater range of alternative products, and are hence less likely than smaller countries to significantly alter their internal trading patterns if and when new international opportunities become available.

To illustrate A&vW's key finding that the effect of the border is much greater for smaller countries, consider the following hypothetical example, taken from Feenstra (2004), as loosely representative of the relationship between the Canadian and U.S. economies, with Canadian GDP assumed to be 10 per cent of U.S. GDP. Assuming a frictionless world in which all goods are equally tradable, products differ by location, and consumers love variety (i.e., they wish to spread their expenditures over all available goods), Canada would export 90 per cent of its GDP to the United States and sell only 10 per cent internally. Suppose that border effects, whether arising from cross-border trade costs or simply from taste differences, reduce international trade by one-half. This implies that 45 per cent of Canada's GDP would be sold to the United States, and

13. Helliwell (1998) and Helliwell and Verdier (2001) also use data for the years following the U.S.-Canada FTA. The combined effect of post-FTA data and the inclusion of a variable representing the strength of alternative trading opportunities reduces the estimated border effect for merchandise trade to a value of about 12 for 1993 and approximately 10 for 1996. Unpublished research indicates that more recent estimates may be even lower. The evidence indicates that most of the decline in the estimated border effect is owing to the increase in Canada-U.S. trade in the aftermath of the free trade agreements, rather than to the introduction of the explanatory variable representing alternative trading opportunities.

55 per cent internally. Comparing the scenario with border effects to one with no frictions, we find that internal trade in Canada increases by 5.5 times, and cross-border trade declines by half, which implies that internal trade is 11 times more intense than cross-border trade in the world with border effects. The impact for the United States is obviously much less, as internal trade rises from 90 per cent to 95 per cent, and cross-border trade declines from 10 per cent to 5 per cent if trade is cut in half. In this scenario, the estimated border effect would be 11 for Canada and approximately 2.1 for the United States. Hence, any factor that increases intranational trade at the expense of international trade will create a much larger estimated border effect for the smaller country.

A&vW (2003) derive their version of the gravity equation from a theoretical model of trade similar to the one given in the example above, in which consumer utility in both countries depends on the variety as well as the amount of goods consumed. Hence, goods are traded between countries because each good is different, and consumers value variety. Although they recognize that their theoretical model is but one of many that could be used to derive a gravity equation (see Box 1 for more details), A&vW (2003) use this specification to estimate the impact on trade and welfare of removing border effects caused by trade costs. As shown in the example, border effects are bigger for smaller countries than for larger ones. Thus, removing trade costs that limit consumer access to product varieties would shift consumer expenditure and trade patterns much more for Canada than for the United States, with a correspondingly larger rise in Canadian welfare. A&vW find that eliminating trade costs and the border effects in their model would increase Canada-U.S. trade by 79 per cent (A&vW 2002, Table 1), and welfare by an incredible 52 per cent (A&vW 2002, Table 2).[14] It is noteworthy that this huge estimated increase in Canadian trade and welfare does not depend on greater levels of efficiency in production, because the levels of production are held constant in their model. [15] The result is almost entirely determined by the assumptions that variety is valuable, all tastes are the same, and products differ by location. It is, however, more plausible to assume that, if products differ across North America, then some of these differences reflect local (and national) preferences, incomes, and climates. Thus, if most product differences are generated by attempts to match local tastes, then the removal of border barriers will not shift consumption patterns towards international goods, and interprovincial trade will remain much tighter than province-state trade.

There are two alternative explanations of the observed border effects: trade barriers or costs that limit cross-border transactions; or some combination of differences in tastes and more efficient local transactions networks that generate more intranational trade.

Thus, for policy analysis, it is important to know why the estimated border effects exist. Unfortunately, the A&vW model cannot discriminate empirically between the two alternative explanations of the observed border effects: trade barriers or costs that limit cross-border transactions; or some combination of differences in tastes and more efficient local transactions networks that generate more intranational trade. Fortunately, the advent of the Canada-US FTA in 1989 provides a strong test of the otherwise untested A&vW hypothesis that the border effect reflects cross-border trade costs. The FTA reduced border barriers by eliminating tariffs and many non-tariff barriers. If the A&vW model of tastes and cross-border trade costs were correct, then the FTA would have led to a proportionate reduction in interprovincial trade that was greater than the increase in north-south trade. For example,

14. Based on the Rose and van Wincoop (2001) estimate of the border barrier that is associated with a separate national currency, A&vW calculate that almost 30 percentage points of the 52 per cent welfare improvement comes from dollarization alone (A&vW 2002, Table 3).

15. This result stands in contrast to the work of Harris (1984), who predicted that the gains from the FTA would come from trade creation, increased competition and specialization, and productivity improvements. Head and Ries (1997) and Trefler (2004) have confirmed that some of these gains have been realized, although not all, as the gap between Canadian and U.S. manufacturing productivity levels has remained almost unchanged.

Box 1

The Gravity Equation: Theoretical Basis

Although the gravity equation is often successful in explaining bilateral trade flows among a wide range of countries, its theoretical basis has been the subject of debate. In a two-country setting, the bilateral gravity equation is consistent with several international trade models (e.g., Ricardian, Heckscher-Ohlin, or Imperfect Competition-Increasing Returns) because these models generally predict that the larger the economic size of the bilateral trading partners and the lower the bilateral impediments to trade, the greater will be the volume of bilateral trade. In a *multi-country* setting, however, the theory becomes less definitive, because theoretical models that can generate the gravity equation are often at odds with the evidence the gravity model produces.

The standard derivation of the gravity model (e.g., Feenstra 2004, Chapter 5) is based on the monopolistic competition model of trade that assumes increasing returns to scale and product differentiation at the firm level, and consumer preferences that dictate that consumers will spread their expenditures equally over all available goods.[1] This model implies that each country will completely specialize in a set of goods and that consumers will demand some of all the goods that each country produces. Clearly, the larger the two countries, the more goods they will produce and the larger their bilateral trade volume will be. Although the predictions of this model are loosely consistent with the empirical results of the gravity equation for trade among industrialized countries, which primarily consists of intraindustry trade in differentiated products, the model has three main weaknesses: it cannot explain the success of the gravity model in explaining North-South trade, which is primarily interindustry trade; it overpredicts the volume of trade; and it underpredicts the impact of distance- and other frictions, relative to the empirical results of the gravity model.[2]

More recently, Evenett and Keller (2002) and Haveman and Hummels (2004) have argued that these anomalies can be partly explained using the Heckscher-Ohlin factor-endowment model. In particular, countries in the North and South may specialize in different goods because of differences in factor endowments. Also, this model typically generates incomplete specialization (i.e., countries produce an overlapping set of traded goods), which may explain the observation that the actual volumes of bilateral trade are not as large as most theoretical models based on complete specialization would predict. Incomplete specialization would imply that some domestic demand could be satisfied locally. Haveman and Hummels also maintain that a home bias in consumers' preferences may also be part of the explanation for this observation. In reality, this so-called home bias may not be an accident; it is likely the natural consequence of local producers being better placed to see and respond to local tastes and opportunities.

Although no single theoretical trade model can completely explain all of the results obtained by the gravity equation, it is nonetheless clear that in order to derive a gravity equation in a multi-country setting, a theoretical model must generate some degree of product specialization across countries on the supply side (if products and the output mix were homogeneous across countries, then the goods would be purchased locally to avoid incurring the transportation costs). It must also assume that consumer utility is sufficiently similar across countries, but also positively related to the consumption of these specialized outputs as final goods or as intermediate products (i.e., variety in terms of final goods must increase utility or variety in terms of intermediate inputs must lower production costs); otherwise there would be insufficient demand for the specialized products that each country produces.

1. Anderson (1979), Bergstrand (1985), and Helpman (1987) are early references for this approach.

2. See Evenett and Keller (2002) and Haveman and Hummels (2004) for more details.

A&vW (2003, Table 5) estimate that eliminating the border effect caused by the trade costs would reduce interprovincial trade by 83 per cent, and cause north-south trade to increase by slightly less, 79 per cent.[16] In fact, north-south trade increased by more, not less, than the decline in interprovincial trade. Charts 6 and 7 show that north-south trade increased by larger amounts in the years after the introduction of the FTA than the models had predicted (based on the reductions in tariffs), and that interprovincial trade did not dramatically decline. Helliwell, Lee, and Messinger (1999) conduct a more formal analysis and find, after using an estimated gravity model to adjust for changes in GDP, that interprovincial trade fell by, at most, 13 per cent between 1988 and 1996, while Canada-U.S. trade increased by 22 per cent.[17] Thus, the two observations, that the major effect of the FTA was to create new international trade (generating, as its proponents had hoped, corresponding increases in GDP per capita, especially in Canada), and that interprovincial trade flows were only moderately affected by the FTA, cast doubt on the validity of the A&vW model, its maintained assumptions about tastes and product differentiation, and its hypothesis that border effects reflect transborder trade costs. It is thus more likely that national producers are better able to satisfy domestic tastes and that transactions can be more efficiently executed among individuals who share similar national values; institutions; and information, communications, and transportation networks.[18] If this is correct, then a substantial piece of the border effect, (i.e., the portion that cannot be explained by traditional cross-border trade costs) does not represent a reduction in welfare, as asserted by A&vW (2003), but may instead reflect the greater ability of domestic producers to satisfy the needs of local consumers.

Recent research, most notably by Combes, Lafourcade, and Mayer (2004), finds strong evidence of the trade-creating effects of business and social networks. Business networks consist of firms with shared control or enduring buyer-seller relationships (e.g., the Japanese *keiretsu*). Social networks consist of individuals with similar traits, most notably ethnicity, language, and religion (e.g., Chinese immigrants in North America), who also have ongoing economic relations. Such networks create trade because they reduce information costs, improve contract enforcement, and lead to a diffusion of similar preferences. Although networks have

Chart 6

Canadian Exports to and Imports from the United States

Goods and Services

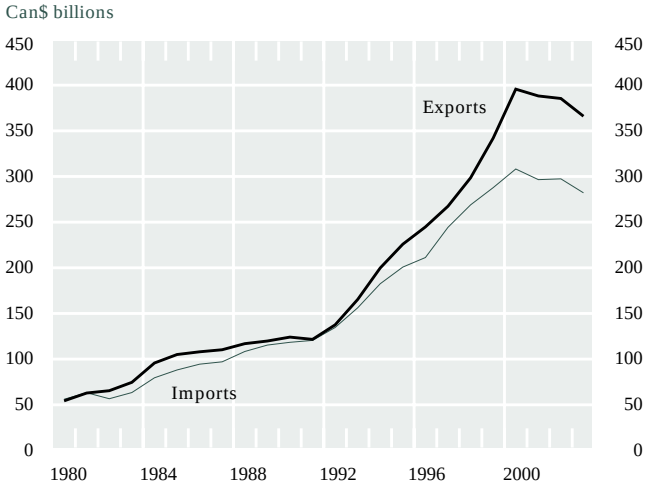


Chart 7

Canadian International and Interprovincial Trade

Goods and Services

16. A&vW (2003, Table 5) estimate that if the border were removed, interprovincial trade would fall from a relative intensity of 5.6 to 1.0, whereas Canada-U.S. trade would increase from 0.56 to 1.0.

17. Note that the Helliwell, Lee, and Messinger (1999) study ends in 1996, before all of the adjustment to the FTA had taken place. Brox (2001), using provincial expenditure data from 1981 to 1998, maintains that the FTA reduced interprovincial trade by almost one-third. Grady and Macmillan (1998) and Coulombe (2003) find results similar to those of Helliwell, Lee, and Messinger (1999), but they also demonstrate that interprovincial trade began falling relative to international trade in the early 1980s, well before the FTA in 1989.

18. Although national institutions reflect the preferences of a country's citizens, they may also represent a barrier to international trade; for example, different legal and regulatory frameworks can increase the cost of performing international transactions.

been found to facilitate international trade (Rauch 2001), such networks are likely to be stronger within nations than across international boundaries, because local firms and individuals are more likely to share similar traits and values and common economic institutions. Hence, a country's business and social networks serve to reduce transactions costs and to diffuse similar preferences, and thus provide a plausible alternative to trade costs as an explanation for the higher density of intranational to international trade that is captured by estimated border effects.

Common-Currency Effects

If the estimated border effects are, in part, the result of trade barriers, then one possible barrier is the use of separate national currencies. Different currencies create an additional friction to trade because cross-border transactions require currency conversion and, in some cases, hedging of the exchange rate risk. In addition, price discrepancies are less transparent, and arbitrage is hindered. These costs would be proportional to the volatility of the exchange rate.

Rose (2000) also employs the gravity model to estimate the impact of a common currency on bilateral trade flows and thereby test the hypothesis that a common currency would reduce the cost of cross-border transactions and, hence, increase trade. He uses essentially the same specification of the empirical gravity model as McCallum (1995), but with two key differences: the model is estimated with a data set consisting of bilateral trade flows for 186 countries over time, and the indicator variable included in the model takes a value of one if the two countries have a common currency, and zero if they do not.[19] He finds that having a common currency between two countries increases their trade by more than 300 per cent. As with McCallum's result, the magnitude of Rose's finding was most unexpected. Within the framework of the gravity model, Rose tries to control for a number of other variables, such as a shared border, a common language, a colonial relationship, and a free trade agreement, that could also explain the intensity of bilateral trade, but the estimated impact of a common currency on trade flows is not greatly affected. Moreover, he includes the variability of the exchange rate in the model and finds that, although a volatile exchange rate reduces trade flows, the impact of reducing exchange rate volatility on trade is much smaller than that of adopting a common currency.

Rose's research, like McCallum's, generated many further studies that probed, extended, and questioned his findings. Rose (2004) reviews many of these studies and concludes that the estimated effects of a common currency on trade flows are statistically and economically significant, and that estimates of the long-run impact of between 30 and 90 per cent are reasonable. Nevertheless, this additional research produced three compelling criticisms that seriously limit the applicability of his findings. The first is that the sample of countries with a common currency is not representative of most industrialized countries of interest (e.g., the United Kingdom, Sweden, or Canada) because it consists almost exclusively of countries that are small and poor, or both, and they represent roughly one per cent of Rose's sample and even less of world trade.[20] Nitsch (2002) classifies Rose's common-currency countries into three different groups: (1) small, poor, and distant dependencies (typically islands) that use the currency of their former colonial power or existing parent country (e.g., Guadeloupe and France, Guam and the United States); (2) small countries that unilaterally adopted the currency of a larger neighbouring country (e.g., Brunei and Singapore, San Marino and Italy); and (3) multilateral currency unions among regional neighbouring countries (e.g., the Eastern Caribbean Currency Union and the CFA [communauté financière africaine] franc zone in Central and West Africa). Indeed, Rose (2000, 15) is sympathetic to this critique when he writes, "(A)ny extrapolation of my results to the EMU may be inappropriate since most currency union observations are taken from countries unlike those inside Euroland."[21]

Borrowing from the medical literature on testing the treatment effects of pharmaceuticals, Persson (2001) and Kenen (2002) address this criticism (that the sample of countries with a common currency is not representative of the entire population) by constructing a comparison group that emulates the main characteristics of the countries with a common currency. By econometrically comparing the countries with a common currency with the comparison group, they find

19. Rose also includes per capita income as an explanatory variable to measure approximately the standard of living in the two countries. The time dimension of Rose's data consists of observations at 1970, 1975, 1980, 1985, and 1990.

20. Of the 22,948 bilateral observations used in Rose (2000), only 252 have a common currency.

21. This concern, however, did not stop Rose and his co-authors [Frankel and Rose (2002) and Rose and van Wincoop (2001)] from conjecturing large effects of a Canada-U.S. common currency on bilateral trade flows, output, and welfare in Canada.

that the treatment effect of a common currency does not have a statistically significant impact on trade.

The second criticism is that Rose interpreted his results to imply that the use of a common currency by two countries caused increased bilateral trade, when, in most cases, a high bilateral trade intensity was likely already present (as a result of economic or political dependence), and the currency of the "parent" country was adopted by the smaller country in recognition of this dependence in order to facilitate the relatively high volume of trade (e.g., the Bahamas and Bermuda and the U.S. dollar; Liechtenstein and the Swiss franc).[22] Hence, the causality probably runs from trade dependence to a common currency, not the other way around. Recognizing this possibility, Rose (2000) tries to address the potential simultaneity bias by using instrumental variable estimation. Although this modification to the estimation technique does not significantly alter the estimated effect of a common currency, it is not clear that it adequately resolves the problem. Glick and Rose (2002, 11) also consider the reverse causality criticism, but they admit that "we have been unable to devise a convincing set of instrumental variables for bilateral currency union incidence that would allow us to quantify this effect."

The third criticism concerns the statistical significance of the common-currency indicator variable, which comes from variation across countries in the sample at points in time and not from variation across a given country over time.[23] In other words, of the 23,000 observations in the original Rose (2000) sample, only 7 (0.03%) represent countries that joined or withdrew from a common-currency arrangement.[24] Hence, based on this small number of observations, it is invalid to assume that if countries A and B at time *t* decided to adopt a common currency, then trade between these two countries at time *t* + 20 years would increase by 300 per cent, other things unchanged. Glick and Rose (2002) attempt to address this concern by extending the sample from 1948 to 1997 to include 16 switches into and 130 switches out of a common currency. They find that the impact of a common currency over time increases trade by approximately 200 per cent. It should be noted, however, that the majority of the switches out of a common currency took place before 1975 and represent the (sometimes violent) end of a colonial relationship (e.g., Algeria and France, India and Pakistan). Thus, it is not surprising that trade between two such countries fell dramatically. An interesting and more relevant case study is Ireland, which abandoned the use of the pound sterling in 1979. Thom and Walsh (2002) find that the change in currency regime had no significant impact on trade between Ireland and the United Kingdom. Thus, the empirical research using time-series data has not definitively answered the question of what impact a common currency has on trade.

Despite these criticisms, which raise serious doubts about the validity of these estimates for policy, Frankel and Rose (2002), Rose and van Wincoop (2001), and A&vW (2002) claim that, if Canada, for example, were to adopt a common currency with the United States, trade between the two countries would greatly expand and welfare would rise. Frankel and Rose (2002) assert that if Canada were to dollarize, Canada's volume of trade as a percentage of GDP would rise from an already high 76 per cent to an astounding 186 per cent, and output would eventually rise by 36 per cent.[25] Rose and van Wincoop (2001) use an empirical version of the A&vW (2003) multilateral gravity model and find that, if Canada were to adopt the U.S. dollar, its total trade flows would increase by 38 per cent, and welfare would rise by 15 per cent. As noted earlier, A&vW (2002) estimate that dollarization would increase welfare by 30 per cent. Clearly, given the concerns already discussed, these numbers cannot be taken at face value. They are best interpreted as motivating the importance of finding more directly applicable models and evidence.

22. For example, Nitsch (2002) notes that Guadeloupe receives 50 per cent of its gross national product (GNP) and 70 per cent of its imports from France, and that, for almost 175 years (1776–1950), Denmark imposed a monopoly on trade with Greenland.

23. Glick and Rose (2002, 1) concede that Rose's original data set and results better address the cross-sectional question, "How much more do countries within a currency union trade than non-members?" than they do the more interesting time-series question, "What is the trade effect of a country joining or leaving a currency union?"

24. Pakko and Wall (2001) use a fixed-effects specification to deal with the issue of possible endogeneity and omitted variables, rather than Rose's set of dummy variables tied to specific country attributes, because they argue that there are time-invariant effects (such as the unique historical relationship between Panama and the United States) that are not properly captured by the dummy variables. They find that changes in currency status had no significant impact on trade.

25. To obtain their predicted effects, Frankel and Rose (2002) combine estimates of the trade-increasing effects of a currency union and the GDP-increasing effects of expanded trade. They maintain that countries in a currency union would significantly increase their per capita GDP. The Frankel and Rose estimates, however, are too great because the large size of the common currency (and border) effects implies that GDP per capita should be much higher in larger industrialized countries (under the Frankel and Rose reasoning), but in fact this is not true. The difference in per capita incomes between small and large OECD countries is much less than their estimates would predict.

The advent of the euro in 1999 offers an almost ideal controlled experiment to test Rose's hypothesis. Fifteen countries were members of the European Union in 1999, but only 12 adopted the euro. Thus, three countries, the United Kingdom, Sweden, and Denmark, have conveniently designated themselves the control group, which should permit the identification of the impact of the euro. Several studies, most notably Micco, Stein, and Ordoñez (2003) and Flam and Nordström (2003), have already been completed using data for the four-year period 1999 to 2002, and none find an effect consistently larger than 10 per cent. These estimates are much lower than those previously obtained by Rose and others in the general currency-union case. Moreover, the robustness of these estimates also needs to be verified. Preliminary testing by Gomes et al. (2005) reveals that, if the sample is extended back to 1980 from 1993, as in Micco Stein, and Ordoñez, the increase in intra-euro zone trade commences in 1986 (the year of the Single European Act), not in 1998 (the year before the euro was adopted) as Micco et al. and Flam and Nordström find. Hence, this evidence suggests that the increase in intra-euro zone trade has more to do with the economic integration associated with the EU than with the adoption of the euro, per se. This evidence is loosely consistent with that of Engel and Rogers (2004), who use price data on a variety of items and find that most price convergence in Europe was completed by the mid-1990s, well before the adoption of the euro. Thus, the early evidence on the effects of adopting the euro is mixed at best.

Conclusions

Although the recent research on the effects of borders and common currencies on trade, output, and welfare initially produced eye-opening estimates that were at least an order of magnitude larger than commonly believed, a careful review of the methodologies employed and of the interpretation of the results has significantly reduced the size of the estimates and raised questions that preclude drawing firm conclusions for policy. In the main, this research finds that economic linkages are far tighter within, than among, nation-states. These findings were interpreted as implying that borders and separate national currencies represent significant barriers to trade, but, in fact, this research was unable to provide completely convincing explanations for either set of facts. In particular, the empirical model most often used (the gravity model) lacks sufficient economic structure to permit discrimination between the hypothesis that these estimates represent trade barriers to be removed and its alternative, that these results are consistent with the efficient organization of production, consumption, and exchange within and among nation-states. For example, relatively high domestic trade intensities may reflect the appropriate matching of local products to local tastes and the cost advantages associated with using local information and transportation networks.

Initial estimates of the effects of borders and common currencies on trade were larger than commonly believed; subsequent research has reduced the size of these estimates and raised questions that preclude drawing firm conclusions for policy.

The observation that, among the OECD economies, the smaller countries do not have significantly lower per capita incomes than the larger ones implies that shared national values, institutions, and networks are important for achieving relatively high standards of living, and that there are unlikely to be significant increases in GDP per capita from further increases in trade intensities among the industrialized countries. This in turn suggests that border effects do not represent costly barriers to be removed.[26] The same logic would also apply to currency unions among these countries; they are not likely to produce significant increases in GDP per capita for similar reasons.

In summary, recent research on the effects of borders and common currencies on trade has been useful because it has spawned many additional studies of these important policy questions; nonetheless, this research has not yet matured to the point where it can provide a solid foundation for the decisions of policymakers.

26. Helliwell (2003) makes a similar argument based on cross-country comparisons of well-being.

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Conference Summary: Canada in the Global Economy

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This article is a report on the Bank of Canada's annual research conference, hosted by the Bank in November 2004. It describes the purpose of the conference and provides highlights of the papers presented in each of the five sessions, as well as summaries of the keynote lecture and the discussion of the policy panel.

The Bank of Canada's annual research conference, held in November 2004, examined the real and financial linkages between the Canadian economy and the economies in the rest of the world. It is well known that by most standard measures of openness to trade and financial flows, Canada is among the most open of the industrialized countries.[1] This openness is largely a function of Canada's relatively small size, compared with other developed countries; its proximity to the United States; its strong comparative advantage in natural resource products; and its economic policy, which, in the postwar period, has been committed to liberalizing trade and financial flows. Canada has profited enormously from its openness to international trade in goods, services, and financial assets through the gains from the specialization of production, the expansion of markets, and increased access to new financial instruments to facilitate the diversification of risk. Although the net benefits to the Canadian economy of being so open are clearly positive, the downside is increased exposure to external shocks. Indeed, many of the most significant shocks to the Canadian economy in recent years have come from abroad—they have become the rule, rather than the exception.

Therefore, because of Canada's close ties with the rest of the world, comprehending the extent and nature of the external linkages, their implications for the Canadian economy, and the process by which the Canadian economy adjusts to external shocks is of critical importance in the formulation of monetary policy and in the Bank of Canada's monitoring of the Canadian financial system. Thus, the main purpose of this conference was to deepen our understanding of these critical issues.

Canada has profited enormously from its openness to international trade in goods, services, and financial assets, but the downside is that many of the most significant shocks to the Canadian economy in recent years have come from abroad—they have become the rule, rather than the exception.

The International Department at the Bank of Canada, which is responsible for monitoring and analyzing economic events in the rest of the world, was the host department for the conference. The International

1. In 2003, the sum of Canada's imports and exports exceeded 60 per cent of gross domestic product (GDP), which is several times larger than the G–7 average. For more details on Canada's relative openness, please consult Helliwell and Schembri (this issue). It is worth noting that Canada was one of the original signatories to the General Agreement on Tariffs and Trade (GATT) in 1947; and that, in 1989, the Canada-U.S. Free Trade Agreement (FTA) came into being, followed by the North American Free Trade Agreement (NAFTA) in 1994. On the financial side, Canada abolished exchange controls in 1951, one of the first industrialized countries to do so after World War II.

Department, along with the other analytic departments at the Bank, analyzes this information to determine the impact of external shocks on the Canadian economy and on the Canadian financial system, and to help develop the appropriate policy response. The goal of the conference was thus to help improve our own research and the quality of our analysis and advice.

The conference consisted of five sessions, the John Kuszczak Memorial Lecture, and a closing policy panel. Two or three papers were presented in each session, for a total of eleven. Six were written by economists from the Bank of Canada, and five by economists from universities or other policy institutions. The paper presentations in each session were followed by comments from designated discussants and questions from the floor. Professor Charles Engel of the University of Wisconsin gave the keynote Kuszczak Lecture, and the members of the policy panel were Mark Carney, Senior Associate Deputy Minister of Finance; John Helliwell,[2] Emeritus Professor of the University of British Columbia; and William White, Economic Adviser and Head of the Monetary and Economic Department at the Bank for International Settlements. The policy panel examined Canada's role in the formulation of international macroeconomic policy. Engel and the panel members also took questions from the floor. The conference volume includes all of the papers, the discussants' comments, the addresses of Engel and the panel members, and summaries of the question-and-answer periods. Highlights of the papers are outlined here, together with summaries of the keynote lecture and the discussion of the policy panel.[3]

Session 1: Financial Market Linkages

Recently, there has been considerable interest in the issues of financial globalization and the economic implications of increased capital market integration. Although the trend has been towards greater international integration of financial markets, the evidence provided in the two papers in this session indicate that these markets are not as well integrated as some would believe.

Andrew Rose develops a new methodology for testing asset-market integration by examining whether the expected intertemporal marginal rate of substitution (EMRS) across different portfolios of equities within and across markets is the same. This test exploits the basic asset-pricing equation, which states that the price of an equity today is the discounted value of the expected future return. In particular, he argues that two portfolios are integrated if they are priced with the same stochastic discount factor, given by the inverse of the EMRS. From the asset-pricing equation, Rose derives an estimable empirical model using the percentage return as the dependent variable and the ratio of the equity price to the systemic component of the price as the independent variable (this ratio is a measure of idiosyncratic risk). The coefficient on this variable is the inverse of the EMRS.

Although the trend has been towards greater international integration of financial markets, the evidence indicates that these markets are not as well integrated as domestic financial markets.

Rose obtains estimates of the EMRS by using two data sets: monthly data spanning the period January 1994 to December 2003; and daily data from 2003. These data are from several hundred firms on the Standard & Poor's (S&P) 500, the New York Stock Exchange (NYSE), and the Toronto Stock Exchange (TSX). For the purpose of estimation, he groups the firms into portfolios of 20 stocks. His main finding is that his estimates of the EMRS are the same across portfolios in the same market, as theory would predict, but that they are different across markets, in particular, between the NYSE and the TSX. It is interesting to note that the difference is of similar magnitude between the NYSE and the S&P 500. Hence, these limits to financial integration seem more related to structural differences across financial markets than to national differences.

Jean Imbs examines the impact of financial integration on business cycle correlations, using data for Canadian provinces and U.S. states. This research is motivated, in part, by the well-known "Quantity Puzzle"—the observation that the correlation of output across coun-

2. John Helliwell was Special Adviser at the Bank of Canada from August 2003 to July 2004.

3. Titles and full texts of the papers presented at the conference will be published in a volume of conference proceedings later this year. Publication of the conference volume will be noted in an upcoming issue of the *Review*.

tries is positive, and larger than the correlation of consumption.[4] One aspect of this puzzle is that financial integration at the international level seems to increase the correlation of output, but standard theory would predict the opposite. He finds that the puzzle disappears when intranational province and state data on output and disposable income (in lieu of consumption data) are used; consumption is more highly correlated across provinces and states than output. He also finds that these intranational regions are more financially integrated, which permits increased consumption smoothing, and that the increased financial integration reduces output correlations, rather than increasing them, as with international data. It thus appears that national financial markets are an order of magnitude more integrated than international financial markets, because the empirical results for national markets conform to standard economic theory, whereas those for international markets do not.

Session 2: Exchange Rate Determination in a Global Setting

The primary motivation for these two papers is the unusually large (25%) and rapid appreciation of the Canada-U.S.-dollar exchange rate between the first quarter of 2003 and the third quarter of 2004. This appreciation cannot be readily explained by the traditional exchange rate equation developed at the Bank of Canada by Amano and van Norden.[5] This equation is a regression model of the bilateral real Canadian exchange rate that incorporates a long-run cointegrating relation between the real exchange rate and the real prices of Canada's energy and non-energy commodity exports. To capture the short-term dynamics, the model also includes the short-term Canada-U.S. interest rate differential as well as the first difference of the Canada-U.S. relative public debt. Both papers in this session begin with the traditional Bank equation and then modify it to improve its explanatory power, in particular, over the recent period of appreciation.

Bailliu, Dib, and **Schembri** focus on the role of multilateral adjustment to U.S. macroeconomic imbalances in determining shifts in the value of the Canadian dollar. They argue that, under normal circumstances, movements in the exchange rate are reasonably well explained by the bilateral Canada-U.S. variables in the traditional exchange rate model. There are, however, situations when U.S. external imbalances are relatively large, such as in the early-to-mid 1980s and over the most recent period. To redress this imbalance, the Canadian dollar may have to adjust in tandem with the currencies of other countries, because the U.S. economy represents such a large part (about a third) of the world economy. Such exchange rate movements cannot be understood by focusing solely on bilateral Canada-U.S. variables, because the adjustment process is global. The authors consider U.S. fiscal deficits and current account deficits as measures of macroeconomic imbalance and adopt a two-step threshold-regression model that allows the coefficient estimates of the traditional Bank equation to change when these imbalances are large. The first step is to estimate the threshold value of the measured imbalance and then to estimate the coefficient estimates with non-linear least squares. The authors find that the U.S. fiscal deficit, rather than the current account deficit, is the appropriate threshold variable; this result is appealing because current account deficits can occur during investment booms, as happened in the late 1990s, when the U.S. dollar was strong. It is also consistent with the "twin-deficits" phenomena (when there are both current account and fiscal deficits) of the mid-1980s and of the period since 2002. The authors modify the equations to include the two measures of U.S. macroeconomic imbalance and find that the specification of the exchange rate equation changes when the deficit is greater than 2.65 per cent of GDP. Overall, the threshold model represents a significant increase in explanatory power over the traditional model.

Under normal circumstances, movements in the exchange rate are reasonably well explained by the bilateral Canada-U.S. variables, but there are situations when U.S. external imbalances are relatively large, so that the Canadian dollar may have to adjust in tandem with the currencies of other countries, because the U.S. economy represents such a large part of the world economy.

4. See Backus, Kehoe, and Kydland (1994) for more details. A standard theoretical model with complete financial markets would predict that consumption should be more correlated across countries than output, since consumers use the international financial markets to smooth their consumption profiles.
5. See Amano and van Norden (1995) for further details

Helliwell, Issa, Lafrance, and Zhang make several modifications to the traditional Bank exchange rate equation. In particular, the traditional equation models the real exchange rate as the dependent variable; Helliwell et al. model the nominal exchange rate. They also replace the real price of energy in the long-run cointegrating relation, which they find is no longer statistically significant, with the ratio of labour productivity in manufacturing to total labour productivity in Canada relative to that in the United States. This latter variable represents the ratio of labour productivity in the traded-goods sector to total labour productivity in the two countries. The estimated coefficient on this variable implies that an increase in Canadian manufacturing productivity, all else unchanged, causes the real and nominal exchange rates to depreciate. The authors argue that this effect is consistent with the impact of a positive supply shock in the traded-goods sector, which necessitates a real depreciation. The empirical model also includes two other short-run explanatory variables in addition to the Canada-U.S. interest rate differential: namely, the emerging-market bond spread to capture shifts in international risk preferences on the Canadian dollar; and the effective U.S.-dollar exchange rate to represent the portion of the movement in the Canadian exchange rate that is driven by the multilateral adjustment of all other currencies relative to the U.S. dollar. The modified model fits the nominal exchange rate well, in and out of sample, and represents a considerable improvement over the traditional equation in terms of explaining movements in the nominal exchange rate.

Session 3: Current Account Dynamics

The Canadian current account measures the net balance on transactions in goods and services between Canadian and foreign residents. For most of its history, Canada has had a current account deficit, largely reflecting the excess of domestic investment over domestic savings. Since 1999, the situation has reversed: the current account has been in surplus and Canadians are, on net, investing abroad. In general, the current account is determined by a variety of Canadian and foreign variables that reflect current and expected future consumption, production, investment, and saving decisions and the extent to which Canada is linked to the rest of the world by trade in goods and services. The papers in this session extend existing models to better understand the determinants of the Canadian current account.

Bouakez and Kano apply the intertemporal model of the current account for Canada to investigate the existence of a Harberger-Laursen-Metzler effect: the proposition that an increase (decrease) in the terms of trade causes an increase (decrease) in the current account balance. The rationale for such an occurrence in an intertemporal setting is that a temporary rise in the terms of trade, for example, causes a temporary increase in real income, and consumers will respond by smoothing this income increase over their lifetime consumption. Hence, over the period when the terms of trade rises, income goes up by more than consumption, and the current account increases. From their optimizing model of a small open economy, the authors derive a closed-form estimable equation for the current account that is based on current and expected values of the real interest rate, the real exchange rate (defined as the relative price of tradables to non-tradables), real output, and the terms of trade. The empirical model is estimated using quarterly Canadian data from 1962Q2 to 2001Q2. It is reasonably successful: the predicted current account is 60 per cent as volatile as the actual series, which is an improvement over past estimates, and the first three variables are statistically significant and economically meaningful. The terms of trade variable, however, is not found to be significant in explaining Canadian current account fluctuations, given the presence of the other three variables in the equation. This somewhat puzzling result is consistent with other similar findings in the literature.[6]

Boileau and **Normandin** examine the joint behaviour of Canadian output, the current account, and the interest rate differential at the business cycle frequency. Their main innovation is to allow for a difference between the domestic and the world interest rates, which is determined by the net foreign asset position of the domestic economy. They derive a real business cycle model for a small open economy with three shocks (productivity, government expenditure, and the world interest rate), determine parameter values for the model based on post-1975 Canadian data, and generate dynamic responses of the three variables of interest to the three shocks. The productivity shock is found to have the largest impact, while the impacts of the shocks to government expenditure and the world interest rate are small to non-existent. The productivity shock raises output and lowers the current account, because investment rises faster than savings, and this reduces the net

6. For example, Otto (2003).

foreign asset position, which in turn causes the interest rate to rise. The authors then compare the variances and cross-correlations generated by the model to those they compute using the detrended post-1975 quarterly data for Canada. In the data, consumption, the current account, and the interest rate differential are less volatile than output, while investment is more. Only the current account is found to be countercyclical; the other variables are procyclical. The results from the model compare favourably with those from the data; the main discrepancies are that the simulated current account is much less volatile than the actual current account, at around 25 per cent, and the simulated interest rate differential is 2.7 times more volatile than the actual.

Session 4: Real Linkages: Canada and the United States

It goes almost without saying that the United States is Canada's closest economic partner. By almost any measure, whether it is exports (82 %), imports (69 %), or stocks of inward (64 %) or outward (41 %) direct investment, the United States is in most cases on the other end of any international transaction Canada undertakes.[7] Although this close economic relationship is largely driven by geographic and cultural proximity, and complementary resource endowments, it has been greatly strengthened by the economic policies adopted by the two countries. Capital flows between Canada and the United States have largely been unimpeded. Although the liberalization of trade in goods and services has been more sporadic, the Auto Pact of 1965 was an historical agreement and had a huge impact on the production and trade of automobiles and their parts in North America. The Free Trade Agreement of 1989, followed by NAFTA in 1994, also had a significant impact, as trade of goods and services between the two countries increased dramatically.

The three papers in this session are very complementary; they adopt different approaches to analyze the relationship between the Canadian and U.S. business cycles. Generally speaking, they find a close economic relationship between the two economies, which has grown closer as bilateral trade has increased.

Gosselin, Lalonde, Perrault, and **Stuber** examine the determinants of business cycle variations in Canadian output at the industry level. They employ output data for Canada and the United States for the years 1963 to 2001; the Canadian and U.S. data are disaggregated by 10 industries and 13 regions (five Canadian and eight U.S.). They estimate a state-space model for each industry to decompose business cycle output movements in that industry into a common North American factor, a Canadian factor, and regional and idiosyncratic factors.[8] They find that the Canadian factor is predominant for the Canadian business cycle, but the influence of the common North American factor has increased over the sample, at the expense of regional-specific shocks. On a regional basis, they find, not surprisingly, that the North American factor is most important for Ontario and Quebec. Over the sample, the Canadian factor increases in importance for the manufacturing sector, implying that this sector has likely become more specialized over time in the products in which Canada has a comparative advantage. The last key result is that industry composition matters, in the sense that the factors that explain output variation across industries are different. Manufacturing and wholesale and retail trade are more related to the North American component, whereas the Canadian factor is relatively more important for most non-traded industries; for the primary sector, idiosyncratic shocks dominate (which may be the result of movements in world commodity prices). Given this variation across sectors, it is critical that monetary policy and other public policy aim at creating a flexible and well-functioning Canadian economy.

Cardarelli and **Kose** investigate the impact on the Canadian business cycle and labour productivity of the free trade agreements (FTA and NAFTA) between Canada and the United States. They provide a useful review of the literature and evidence of the impact of these agreements on the level and compositions of trade flows. They remark that bilateral trade has increased dramatically—exports to the United States have more than doubled as a share of Canada's GDP, from 15 per cent in 1989 to over 30 per cent in 2002—and also note that Canada's exports have become more specialized in manufactured goods and contain more imported intermediate goods. They estimate a dynamic-factor model using aggregate output, consumption, and investment in Canada and the United States over

7. The trade data are for 2004, the stock data on foreign direct investment for 2003.

8. In general, state-space models are similar to dynamic-factor models, such as the one presented by Cardarelli and Kose at the conference; the main difference is the imposition of the identifying restriction to identify the orthogonal dynamic factors.

the period 1960 to 2002 and find that the common North American factor becomes more significant over time, as the bilateral trade flows increased, but the country-specific and idiosyncratic factors still remain important. They also use a regression model to examine movements in the total-factor-productivity (TFP) gap between Canadian and U.S. industries and remark that the increased trade has raised Canadian TFP, but that the gap has not been eliminated because of differences in industrial structure between Canada and the United States: the rapidly growing information and communications technology (ICT) sector represents a smaller share of Canadian industry. Because the TFP gap remains, the authors argue for further efforts to eliminate less obvious barriers to trade, such as regulatory differences, between the two countries.

Increased trade has raised Canadian total-factor productivity, but has not eliminated the Canadian-U.S. productivity gap because of differences in industrial structure between Canada and the United States.

Voss examines the synchronization of Canadian and U.S. business cycles at the aggregate level and at the industry level. He computes partial correlations for the Canadian and U.S. output for the period 1963 to 2003 using aggregate data, and at the industry level (9 sectors) for the period 1978 to 2001. At the aggregate level, he tests for a structural break in the output correlations at 1980. Voss finds some evidence of an increase in business cycle synchronization at the aggregate level: the Canada-U.S. output correlation is higher after 1980, and the highest correlation takes place in the same quarter, rather than with U.S. output lagged by one quarter, as in the pre-1980 sample. With the industry-level correlations, he finds evidence that there is a high degree of economic integration between the two economies.

Session 5: Real Linkages: Canada and the Rest of the World

Although Canada's primary external economic linkages are with the United States, historically Canada has had very important links with Europe, and in particular, with the United Kingdom. The first paper in this session reviews Canada's trade and investment linkages with Europe and examines how they have changed over the past 40 years, especially in view of the evolution of the European Union from a free trade area with six countries to a virtual economic union with 25 countries.

China and India have an important effect on Canada through their impact on global markets, especially for commodities and labour-intensive goods.

The second paper in the session shifts the geographic perspective 180 degrees, to Asia. Although Canada's economic ties with Europe have declined in relative importance, the economic significance of east and south Asia to the global and Canadian economies is growing larger. The paper focuses on China and India, since they are the largest and among the fastest-growing countries in this region. Since 1990, China and India have grown by 9.3 per cent and 5.6 per cent per year, to become the seventh and twelfth largest economies, respectively.[9] Despite this period of rapid growth, the per capita GDP of both countries continues to be well below those of industrialized countries, indicating that there is still much potential for further growth as their economic resources become more fully and efficiently employed and as capital accumulates as a result of very high savings rates. Although Canada's direct economic ties with these countries, in terms of trade and investment, are still relatively small, China and India have an important effect on Canada through their impact on global markets, especially for commodities and labour-intensive goods. Although careful analysis has not yet been conducted, in part because of the lack of data, it is widely believed that both countries, especially China, have significantly raised the world prices of commodities through their increased demand, and have lowered the relative prices of many labour-intensive goods, especially con-

9. This ranking is based on the use of market exchange rates. If purchasing-power-parity rates are employed, China and India would be the second and fourth largest economies.

sumer items, by increasing supply. Generally speaking, these relative price movements have increased Canada's terms of trade and appreciated the real exchange rate, but at the same time have forced a reallocation of resources within the Canadian economy. The paper examines the reasons underpinning the rapid growth of the Chinese and Indian economies and the effects on Canada.

Cameron, Coté, and **Graham** provide a comprehensive and detailed review of Canada's trade and investment links with Europe since 1960. In particular, they examine the evolution of economic integration within the European Union and its ramifications for Canada, and provide an historical overview of Canada-Europe trade relations. They analyze the aggregate bilateral trade and investment data and estimate an export-share model for Canada's trade with European countries. Their main conclusion is that, although Canada's trade with the United Kingdom, especially in non-energy commodities, declined significantly after the United Kingdom joined the European Community in 1973 and Commonwealth preferences were abolished, the rest of Europe has maintained its share of bilateral trade and investment with Canada. They confirm, as well, that Canada's experience was similar to that of New Zealand and Australia. The finding that Canada has been able to maintain its export share with Europe (excluding the United Kingdom) is generally consistent with the facts that trade among industrialized countries has grown faster than GDP over the postwar period, and that Europe has experienced reasonable rates of economic growth over most of this period, owing partly to the formation of the European Union.

Desroches, Francis, and **Painchaud** examine growth in India and China and its implications for Canada from several different perspectives. They consider the role of trade liberalization and institutional reform in explaining economic growth in these countries by first documenting the measures that they have already taken. They conclude that the two countries have taken significant steps in both areas, but that efforts to promote trade have outpaced institutional reform, especially in China. They also perform an econometric analysis with a broad panel data of over 80 countries to find that these two variables have a synergistic effect on economic growth; in particular, they conclude that trade liberalization in the absence of institutional reform may not have a large impact on growth. Using detailed data on exports, they construct measures of export sophistication that show that both countries have moved up the ladder of comparative advantage in terms of exporting more sophisticated goods. They also find that Canada has concentrated its exports farther up the ladder as well, which, the authors argue, could be owing to lower relative prices for less sophisticated goods, driven by China and India's increased contribution to the world supply of these goods. Finally, the authors find that bilateral trade between China and Canada has increased rapidly in recent years (over 157% between 1997 and 2003), which has had a significant impact on economic growth in Canada.

John Kuszczak Memorial Lecture: Canada's Exchange Rate [10]

In his lecture, **Engel** makes four sequential arguments that lead to his conclusion that cooperative monetary policy aimed at smoothing fluctuations in the Canada-U.S. exchange rate may be welfare improving. First, using new transactions price data on individual commodities collected by the Economist Intelligence Unit, he confirms the Engel and Rogers (1996) finding that the law of one price does not hold between Canadian and U.S. cities. He maintains that this evidence is consistent with the hypothesis of local-currency pricing. Second, he argues that the Chen and Rogoff (2003) model of the empirically well-established link between commodity prices and the Canadian real exchange rate stems from changes in the relative price of non-traded to traded goods; and third, he demonstrates that this channel is not consistent with the data. Lastly, he develops a simple two-country (Canada-U.S.) model in which commodity-price movements imply a real transfer of resources between Canada and the United States. He argues, for example, that a commodity-price increase implies that a transfer from the United States to Canada must cause an appreciation in order to restore balance-of-payments equilibrium. Such an appreciation causes welfare losses, because the resulting relative price movements do not reflect changes in underlying costs, and thus, resources would be misallocated. Hence, there may be scope for the use of cooperative monetary policy to limit exchange rate movements to reduce this welfare loss.

Closing Panel: Canada's Role in International Macroeconomic Policy

In past conferences, the closing panel typically provided a critical review of the papers presented. At this con-

10. This lecture is funded by the Bank of Canada in memory of our esteemed colleague, John Kuszczak, who died in 2002.

ference, the panel was asked to reflect on Canada's role in the formulation of macroeconomic policy at the international level, because policy decisions made by bodies such as the G–7, the G–20, and the different international fora on financial stability have important implications for Canada as an open economy. Indeed, Canada is unique in the sense that it is "large" enough, in either a political or an economic sense, to be included in such decision making at the highest level, yet sufficiently small that it still resembles the prototypical small open economy with strong economic links to the rest of the world. The three panelists were asked to provide different perspectives on Canada's role.

Carney addressed the G–7 process after spending almost a year as Canada's G–7 Deputy at the Department of Finance.[11] He made several interesting remarks about the G–7 process and Canada's role. Carney opened by discussing the G–7 priorities in recent years: he felt that at least half of the G–7's attention was being paid to development and debt issues in the poorest countries, and that oversight of the International Monetary Fund and the World Bank was also an important priority. Other international macroeconomic policy challenges often did not receive the attention one might expect. He felt that there are three international macroeconomic policy issues that are important for Canada, and that Canada has and should continue to push these issues forward by its thoughtful and disinterested analysis and through the Bank of Canada's collaborative efforts with central banks in other countries. In particular, he noted international architecture reform, structural resolution of global imbalances, and current concerns involving oil prices or exchange rates. Canada has an enviable record of recent macroeconomic performance and can draw from that experience to make meaningful interventions on these issues.

Helliwell provided an insightful overview of several of the conference papers. He stressed that, despite the rapid growth in international trade and capital flows over the postwar period, many of the papers found that national markets appear distinct. Helliwell noted that these findings of "border effects" have less to do with traditional barriers to trade than with the fact that it may be more efficient to organize economic activity along national lines, given common institutions, similar tastes and shared values.

He also noted the importance of institutions, defined broadly to include social capital, for economic growth. He concluded by arguing that middle-level countries like Canada, which lack the pretence of being military or economic powers, but have made important contributions to the good governance of their own countries as well as that of the international community, can play an important leadership role. In particular, they can build coalitions for reform within the traditional international institutions, or lead new policy experiments, such as the G–20, to bridge the policy gap between the G–3 and emerging-market countries.

Middle-level countries like Canada, which lack the pretence of being military or economic powers, can play an important leadership role as "honest and thoughtful brokers" in international macroeconomic policy deliberations.

White carried on with Helliwell's theme of Canada as an "honest and thoughtful broker" in international macroeconomic policy deliberations. Drawing on his experience as a deputy governor at the Bank of Canada and then the economic adviser at the Bank for International Settlements, White provided an insightful and engaging overview of the contribution that Canada (via the Bank of Canada) and individual Canadian economists have made to the intellectual framework for international macroeconomic policy making, to international cooperation, and to the international institutions themselves. He paid particular attention to Canada's involvement in issues of financial stability.

11. He was on leave from his position as Deputy Governor at the Bank of Canada.

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Speeches

Introduction

The three speeches reproduced in this issue of the *Review* all concern the Bank's conduct of monetary policy. In a speech to the Vancouver Board of Trade in February, Governor David Dodge discussed the implications of currency movements, noting that the relationship between the exchange rate, the economy, and monetary policy is complex. Speaking to the National Association for Business Economics in Washington, D.C., on 21 March, Governor Dodge described Canada's experience with inflation targeting as "unambiguously positive." He pointed out that inflation targeting is "the best way to achieve high, sustainable growth of output and employment."

Senior Deputy Governor Paul Jenkins described the vital role communications plays in implementing monetary policy in a speech given at the joint conference of financial market professionals from Canada and the United States. Timely and effective communication continues to engage the markets and public in issues faced by the Bank, and also allows for public input that helps to make monetary policy more effective.

The full text of other speeches given by the Governor can be found on the Bank's website at http://www.bankofcanada.ca, including:

20 April 2005	Opening statement to the Senate Committee on Banking, Trade and Commerce
19 April 2005	Opening statement to the House of Commons Finance Committee
15 April 2005	Remarks to the Canadian Association of New York, New York, NY
14 April 2005	Opening statement following the release of the *Monetary Policy Report*
30 March 2005	Remarks to Humber College Institute of Technology & Advanced Learning, Toronto, Ontario
27 January 2005	Opening statement following the release of the *Monetary Policy Report Update*
9 December 2004	Remarks to the Empire Club of Canada and the Canadian Club of Toronto, Toronto, Ontario
24 November 2004	Opening statement to the Senate Committee on Banking, Trade and Commerce
22 November 2004	Speech delivered on behalf of Canada's Finance Minister, Ralph Goodale, to the German-Canadian Business Club of Berlin
26 October 2004	Opening statement to the House of Commons Finance Committee
21 October 2004	Opening statement following the release of the *Monetary Policy Report*
13 October 2004	Remarks to the Nation Builders Dinner, Famous 5 Foundation, Calgary, Alberta

Inflation Targeting: A Canadian Perspective

Remarks by David Dodge
Governor of the Bank of Canada
to the National Association for Business Economics
Washington, D.C., U.S.A.
21 March 2005

Good afternoon. Three years ago, when I last addressed this group, I spoke about the conduct of monetary policy in the presence of economic shocks. In those remarks, I made passing reference to the Bank of Canada's inflation-targeting framework. Today, I am happy to accept your invitation to return and talk in more depth about how we use inflation targeting as our monetary policy anchor.

The invitation is timely, given that the Bank of Canada's inflation-targeting agreement with the Canadian government is up for renewal next year. At the Bank, we are always reflecting on our framework, deciding what works well and what we can improve. Against that backdrop, we have watched with interest the debate taking place here in the United States—both inside and outside the Federal Reserve—about whether that institution should join the ranks of inflation-targeting central banks.

As part of that debate, the minutes of the February FOMC meeting show that my colleagues at the Fed had a discussion about the merits of inflation targeting last month. According to the minutes, arguments were made both for and against the adoption of an explicit inflation target. Those in favour spoke of how such a target can anchor inflation expectations, add clarity to monetary policy decision making, and help with communications. Those opposed said that the benefits of adopting a target were unlikely to be large, that adopting a target might bias or constrain policy, and that it might *appear*—and I stress the word "appear"—to be inconsistent with the Fed's dual mandate to promote price stability and maximum employment.

Before I proceed with my remarks today, I want to make it absolutely clear that my purpose here is not to weigh in on the debate within the Federal Reserve. I would not presume to tell the Fed what it should or should not do. Rather, I want to talk about the Canadian experience with inflation targets. However, in doing so, I will address some of the arguments raised at the FOMC meeting that I just mentioned.

I will begin by discussing the Bank of Canada's legislated mandate, and how inflation targeting helps us to meet the objectives of that mandate. I will then talk about some of the choices that we have made to establish and refine our particular framework. I'll discuss some of the benefits that we can attribute—at least in part—to inflation targeting. And I will conclude by touching on some of the issues still facing us as we look to the future.

Our Mandate and Objectives

Let me start with the Bank of Canada's legislated mandate. It is interesting to compare our mandate with the one spelled out in the Federal Reserve Act, given that the nature of the Fed's mandate is often cited as one reason why it should not adopt an explicit inflation target.

The pieces of legislation that govern the Bank and the Fed do contain some clear differences. But in terms of the conduct of monetary policy, it is the similarities that are more striking. Our mandate is broadly set out in the preamble to the Bank of Canada Act. The preamble was drafted in 1934 and, of note, has not been substantively amended over the past 70 years. The

preamble calls on us to "regulate credit and currency in the best interest of the nation." It goes on to say that the Bank should mitigate "fluctuations in the general level of production, trade, prices and employment, so far as may be possible within the scope of monetary action, and generally to promote the economic and financial welfare of Canada." By comparison, the most recent revision of the Federal Reserve Act calls on the Fed to maintain growth of credit and the money supply "commensurate with the economy's long-run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."

The Fed's mandate is a bit more specific than ours in that it states directly that monetary policy should aim at having the U.S. economy operate at full capacity. But the main point is that both central banks have references in their mandates to production, prices, and employment. Indeed, a key goal for all central banks is to conduct monetary policy so as to provide favourable conditions for maximum, sustainable long-run growth, while recognizing that monetary policy alone is not sufficient to bring about that growth.

The best way for monetary policy to promote sustainable economic growth is to anchor expectations about the future purchasing power of money.

So the question is, What is the best way to operate monetary policy in order to provide the conditions for sustainable growth, bearing in mind the words in our mandate: "so far as may be possible within the scope of monetary action"? Over the years, central banks have tried various frameworks in attempting to answer this question. First, central banks tried fixing exchange rates to gold; most later tried fixing their exchange rates to those of other countries. Some central banks tried to target credit or the growth of monetary aggregates, while many relied solely on their own judgment. All of these frameworks have had their problems, which I won't go into today.

But over time, what has become clear is that the best way for monetary policy to promote sustainable economic growth is to anchor expectations about the future purchasing power of money. What we have learned from the bitter experience of many countries—including Canada and the United States—is that when monetary policy chases short-term goals, mistakes are made, uncertainty is increased, and fluctuations in economic activity are aggravated. Focusing on domestic price stability—however that term is defined—is the best contribution monetary policy can make to economic stabilization and sustainable long-term growth. Indeed, as my predecessor Gordon Thiessen put it, "Focusing on price stability helps us to guard against the sort of systematic [policy] errors that often occurred when we tried to aim directly at output and employment."[1]

At the end of the 1980s, the Bank of Canada faced the question of how to pursue price stability in a way that would allow it to accomplish three things: first, help to anchor expectations about the future purchasing power of money; second, give the Bank a guide for the conduct of policy; and third, help us to explain to markets, politicians, and the Canadian public what we are doing and what actions they could expect from their central bank.

By 1991, the Bank and the Government of Canada had agreed that inflation targeting was the right framework for pursuing this objective. We considered targeting inflation as the best way to achieve high, sustainable growth of output and employment. To be clear, inflation targeting is not an end in itself. Rather, it is the best means of fulfilling our commitment to promote the economic and financial welfare of Canada.

The Canadian Version of Inflation Targeting

Let me now say a few words about some of the particular choices we have made over the years to shape our inflation-targeting framework. A central bank that wants to target inflation and run an independent monetary policy must allow its currency to float. As you know, a monetary authority cannot control both the domestic and external values of its currency. We have one instrument, so we can have only one target. Thus, with inflation as our target, we naturally operate with a floating currency.

1. G. Thiessen, "Can a Bank Change? The Evolution of Monetary Policy at the Bank of Canada 1935-2000," *The Thiessen Lectures* (Ottawa: Bank of Canada, 2001), p. 79.

Once the Bank and the government agreed on the concept of inflation targeting, we needed to make some choices to put the concept into practice. Our goal of price stability came to be defined as low and stable inflation. Like many other central banks, we chose a target for the annual increase in the consumer price index (CPI). Initially, our focus was on inflation reduction. So it was announced that the target would decline gradually—from the 3 per cent midpoint of a 2 to 4 per cent target range at the end of 1992 to the 2 per cent midpoint of a 1 to 3 per cent range by the end of 1995. The target has remained there since. Let me take you through some of the key decisions that we made in 1991, and the rationale behind our choices, as we set out the details of our framework.

First of all, why did we choose the CPI as our target? The key reasons were that it is widely understood and is the measure of inflation most familiar to Canadians. Choosing a well-known indicator as a target makes it easier to explain our actions and to be accountable to Canadians. However, movements in the prices of particularly volatile components of the CPI can cause the index to fluctuate sharply. So we use a measure of core inflation as an operational guide. This measure strips out the most volatile components and the effect of changes in indirect taxes on the rest of the index, giving us a better understanding of the trend of inflation.

Second, why have a range? While we emphasize the 2 per cent target, we have a range—as many central banks do—because monetary policy operates with long and variable lags. If we tried to target inflation too precisely we could have "instrument instability"; in other words, we would be adjusting our policy interest rate sharply and frequently, which would lead to greater instability in the economy. Further, measured inflation itself can be volatile as specific prices adjust. But to be clear, the range does *not* represent a zone of indifference—we *do* aim to achieve the 2 per cent target.

Third, given that we must always be forward looking as we conduct policy, what time frame would we choose to achieve our target? From the beginning, we said that if a demand shock pushed inflation away from the target, we would conduct policy so as to return inflation to target over a period of 18 to 24 months. This is because our research suggests that it takes 12 to 18 months for changes in interest rates to have most of their impact on output, and 18 to 24 months to have most of their impact on prices. Of course, there is always uncertainty about the lags involved, and I'll have more to say about this later on.

To be sure, there will always be times when there are large swings in relative prices in the economy—energy prices being a good example. Under inflation targeting, the objective is not to try to offset or stifle these relative price movements. Our experience has been that with a clear inflation target and with well-anchored expectations, these types of relative price shocks have only a one-off effect on the price level, and do not feed into ongoing inflation.

Before I leave this section, I want to emphasize two points about our inflation-targeting framework. The first is that we operate in a symmetric way, and we make it clear to everyone that we do so. By this, I mean that we worry just as much about inflation falling below target as we do about it rising above target. This is a tremendously important point. When the demand for goods and services pushes the Canadian economy against the limits of its capacity, and inflation is poised to rise above target, the Bank will raise interest rates to cool off the economy. Just as importantly, when the economy is operating below its production capacity, and inflation is poised to fall below target, the Bank will lower interest rates to stimulate growth. Whatever the direction of the demand shock, the Bank of Canada will respond appropriately.

This symmetry is our answer to the charge that central banks target inflation at the expense of growth.

This symmetry is our answer to the charge that central banks target inflation at the expense of growth. On the contrary, paying close attention to signs of deviation from our target promotes timely action in response to both positive and negative demand shocks. This is how we can keep the economy operating near its full capacity and thus keep inflation low, stable, and predictable.

The second point I want to stress is that having an inflation target as an anchor is very helpful in terms of the Bank's accountability. If inflation persistently deviates from the target, we are committed to explaining

the reasons why this is so, what we will do to return it to target, and how long we expect the process to take.

Our Experience with Inflation Targeting

Now let me turn to our experience with inflation targeting. Just as Canada was a pioneer at having a floating exchange rate, we were also among the very first to adopt inflation targeting. And as in other countries that have done so, the result has been unambiguously positive. Indeed, as Claudio Borio put it, "no country embracing inflation targeting has regretted doing so."[2]

Back in 1991, Canada had several compelling reasons for moving to inflation targeting. Compared with today, inflation was still relatively high. Further, the Bank of Canada and the federal government wanted to minimize the possibility of a wage-price spiral developing in the wake of the introduction of the Goods and Services Tax. We recognized the importance of having both the general public and financial markets understand our actions. And as inflationary pressures built towards the end of the 1980s, we saw that the lack of a monetary anchor was leading to rising inflation expectations.

All of the benefits we had hoped would come from inflation targeting have, in fact, materialized.

As we look at Canada's record since 1991, in terms of inflation and economic growth, I can tell you that all of the benefits we had hoped would come from inflation targeting have, in fact, materialized. We expected that inflation would become more stable under a targeting framework—and it did so, sooner than we had anticipated. We expected that our credibility would increase and that inflation expectations would become well anchored under targeting—and this also happened. Indeed, short-term expectations quickly became anchored to our target, although longer-term expectations took a bit more time to fall in line. Together with marked improvements in Canada's fiscal position in the mid-1990s, our excellent track record on inflation added to our credibility. Private sector forecasts for inflation in Canada now average close to the 2 per cent target far into the future.

We expected that setting out a clear paradigm for operating under inflation targeting would bring benefits—and it did. Internally, focusing on inflation brought increased discipline and clarity to our monetary policy deliberations. But more importantly, being transparent about our operational paradigm has allowed markets and analysts to better predict how we will react to different economic outcomes. Financial markets and analysts now pay more attention to their own evaluations of the prospects for the economy and inflation in assessing the future path of our policy interest rate. Appropriately, they do not have to rely on the wording of our communications for guidance.

Empirical evidence shows that inflation targeting has been an unqualified success for Canada. Inflation has averaged very close to 2 per cent and has remained within the target range since we adopted our targets, with rare exceptions that were due mainly to large swings in the prices of oil or other commodities. Further, there is evidence that inflation targeting has been successful as a macroeconomic stabilizer, helping to smooth the peaks and valleys of the business cycle.

Our symmetric approach to inflation targeting is crucial in this regard. Because we guard against both inflationary and deflationary pressures, businesses and individuals can make long-range economic plans with increased confidence. Scarce economic resources are no longer wasted trying to hedge against the threat of runaway inflation. And because our paradigm makes it clear that we guard against deflationary pressures, Canada has avoided any serious threat of deflation. Throughout all the shocks we have experienced, Canadian inflation expectations have remained remarkably well anchored on the 2 per cent target.

At the time that we were considering the adoption of inflation targeting, we heard many of the same arguments against such a framework that we hear today in the United States. Some argued that inflation targeting could constrain our ability to act, or would take away our ability to apply our own judgment in the conduct of policy. Our experience has shown these concerns to be groundless.

Let me illustrate with a couple of recent examples. In the immediate aftermath of the 9/11 terrorist attacks,

2. C. Borio, "Wrap-up Discussion," in *The Future of Inflation Targeting*, Proceedings of a conference held at the H. C. Coombs Centre for Financial Studies, Kirribilli, 9–10 August 2004 (Sydney: Reserve Bank of Australia, 2004), p. 278.

we lowered interest rates quickly and decisively to underpin confidence, which could have been profoundly shaken by the attacks. When a major loss of confidence did not materialize over the next few months, we were able to reverse course and withdraw some of that monetary stimulus. Our inflation-targeting framework did not restrict our ability to act. Indeed, because our paradigm is clear, financial markets were able to understand why we made these rapid rate adjustments.

Our paradigm has given us the flexibility to apply judgment in the face of considerable uncertainty over this period.

Another example is our reaction to the continuing realignment of world currencies over the past two years. The Canadian economy has had to adjust to sharp movements, not just in the external value of our dollar, but also in the foreign demand for many of our goods and services. Inflation targeting gives the Bank an important guideline for dealing with the currency appreciation, allowing us to maintain our focus on macroeconomic stabilization at a time when various sectors of the economy are dealing with the exchange rate shock. Our paradigm has given us the flexibility to apply judgment in the face of considerable uncertainty over this period.

The Future of Inflation Targeting

Before I close, let me say a few words about the future of inflation targeting in Canada. As I noted at the beginning, our current agreement with the federal government is up for renewal in 2006. So it is useful to think about those elements of our framework that we would not want to change, and other areas where changes might be considered.

From the central bank's point of view, the basic arrangement of aiming inflation at the 2 per cent midpoint of a 1 to 3 per cent target range has served us well, along with the use of the CPI as our target. The CPI may not be a perfect indicator of inflation, but it is the most readily recognized and understood measure, and so likely represents our best option for targeting. However, given the volatility inherent in the index, the Bank has emphasized a core inflation measure for operational purposes. I would expect that these elements of our framework will remain in place. But good public policy demands that we continue to do the necessary research to confirm that these remain the best options.

Also, the Bank of Canada will continue to recognize the importance of communications and transparency to the conduct of monetary policy. Inflation targeting is a helpful tool for anchoring expectations, but its effectiveness is greatly enhanced when a central bank communicates well. And a symmetric approach to inflation targeting allows the bank to make a convincing case for its policy actions, even during difficult economic conditions.

But I don't want to suggest that there aren't questions to be answered as we go forward. One question facing us now is whether 18 to 24 months is the appropriate time horizon for monetary policy to bring inflation back to target after various types of shocks. One type of shock that we have to consider is a major movement in asset prices. Do these types of movements in asset prices contain any information about future inflation beyond our typical policy horizon? And if so, what should we do about it? This is not to suggest in any way that we should try to target asset prices. Rather, the question is whether it would ever be appropriate to lengthen the time horizon for returning inflation to target.

A similar question applies to exchange rate shocks. Globalization appears to have altered the way in which economies adjust to movements in exchange rates. This applies both to the adjustment of real economic activity to the shock, as well as the direct pass-through of exchange rate movements to prices. This raises the question of whether 18 to 24 months is too short a time horizon for monetary policy to deal with exchange rate shocks. On the other hand, the reduction in the persistence of inflation that we have seen under inflation targeting would suggest that it may instead be more appropriate to shorten the policy horizon.

Given the success to date of handling shocks within an 18 to 24-month horizon, we should not change our framework lightly. But we need to think hard about the appropriate time horizon in dealing with various shocks as inflation targeting evolves in the future.

Conclusion

Let me close by emphasizing a few key points. There is no doubt in my mind that inflation targeting is the right monetary policy framework for Canada. Through our symmetric approach of keeping inflation low, stable, and predictable, we have laid the groundwork for solid, sustainable growth in output and employment. In doing so, we fulfill our commitment to "promote the economic and financial welfare of Canada," as spelled out in the Bank of Canada Act. With inflation targeting, our policy is more focused, our communications are clearer, and Canada's inflation expectations are more solidly anchored.

During a period when consumer price inflation is low and appears to be stable, it may be tempting to some to conclude that an inflation anchor is unnecessary. In my opinion, to reach this conclusion would be a huge mistake. On the contrary, it is particularly important at this time, in the face of large terms-of-trade movements and other shocks, that central banks have an anchor to keep monetary policy focused. From my perspective, inflation targeting is the best anchor we've seen.

With inflation targeting, our policy is more focused, our communications are clearer, and Canada's inflation expectations are more solidly anchored.

Of course, I'm not saying that inflation targeting is the end of monetary policy history. And, I love a good debate. So I hope that my remarks today may have helped to add some context to the ongoing discussions here in the United States. And I can tell you that we in Canada will continue to watch, with great interest, as the debate unfolds.

Monetary Policy and Exchange Rate Movements

Remarks by David Dodge
Governor of the Bank of Canada
to the Vancouver Board of Trade
Vancouver, British Columbia
17 February 2005

Good afternoon. It is always a pleasure for me to return to Vancouver, a city I called home for a year. And now that I live in Ottawa, I can tell you that it is particularly nice to get the chance to come here in the middle of February.

Every year, the Canadian Press surveys news directors and editors to select the top business story of the year. In 2004, they picked the rise of the Canadian dollar. That was not a surprising choice. The dollar's appreciation drew a lot of attention from the media, from business people, from individual Canadians, and indeed, from the Bank of Canada. Changes in the external value of the dollar are one of the key factors that we scrutinize and work hard to understand. We watched the dollar closely as it depreciated during the 1990s, as it fell to an all-time low against the U.S. dollar in early 2002, and as it rose by roughly 25 per cent between January 2003 and January of this year.

The relationship between the exchange rate, the economy, and monetary policy is complex.

With the rapid appreciation of our dollar has come an increase in public commentary about the currency—its effects on the Canadian economy in general, and the Bank of Canada's monetary policy in particular. There has been no shortage of stories broadcast or articles written. At the Bank, we welcome this increased interest. Canadians should discuss important economic issues that affect their daily lives. However, some of this commentary has oversimplified how movements in the exchange rate affect the Canadian economy and monetary policy. I don't mean this as a criticism. The relationship between the exchange rate, the economy, and monetary policy is complex. So today, I want to talk about the various factors that influence the exchange rate, examine how these factors affect the Canadian economy, and lay out how the Bank takes them into account as we conduct monetary policy. In doing so, I will elaborate on the contents of a technical box in our latest *Monetary Policy Report Update*, published on 27 January.

The Exchange Rate in an Inflation-Targeting Framework

Let me begin with a brief review of Canada's monetary policy framework. At the heart of our monetary policy is the idea that the best contribution the Bank can make to the Canadian economy is to keep inflation low, stable, and predictable. By aiming to keep the annual rate of inflation at the 2 per cent midpoint of a 1 to 3 per cent target range over the medium term, we lay the groundwork for the economy to grow in a strong and sustainable way.

To keep inflation low and stable, we aim to maintain a rough balance between demand and supply in the economy. When aggregate, or total, demand exceeds aggregate supply, the economy will push against its capacity limits—and inflationary pressures will tend to build over time. If we see that inflation is threaten-

ing to rise above target over the next 18 to 24 months, the Bank will tighten monetary policy to dampen demand. Similarly, if there is too little aggregate demand relative to supply, the economy will operate below its capacity. If this gap between aggregate demand and supply were to persist, the projected trend of inflation would fall below target. The Bank would then ease monetary policy to stimulate demand and close the gap. That's why it is important for us to understand how developments in the Canadian and world economies affect the balance between demand and supply in Canada.

Now let's bring the exchange rate into the picture. To understand the effect of exchange rate movements, we need to understand why exchange rates are moving, and how these movements affect the balance between demand and supply. Exchange rate movements tell us something about economic developments that may be having a direct impact on Canadian aggregate demand. And the movements themselves have their own impact on aggregate demand, by changing relative prices for Canadian goods and services and by shifting demand between domestic- and foreign-produced products. The challenge for the Bank is to evaluate these movements, together with other data, and set a course for monetary policy that works to keep demand and supply in balance and inflation low and stable.

Two Types of Exchange Rate Movement

With this general framework in mind, let me now talk in more detail about the forces that can influence the exchange rate. Here, I want to emphasize a key point: From the Bank's point of view, the *causes* of a movement in the exchange rate are just as important as the movement itself. I will spend the balance of my time today explaining why this is so.

For monetary policy purposes, there are two basic types of exchange rate movement—and no, I don't mean "up" and "down." I mean movements in the Canadian dollar that directly reflect changes in the demand for Canadian goods and services, and those that do not.

Consider the first type of movement, which I'll call Type One. Growing world demand for Canadian goods or higher world prices for Canadian products both prompt a direct increase in aggregate demand in Canada. And both tend to cause an appreciation of the Canadian dollar. Put simply, when demand for our goods and services increases, our currency tends to appreciate. Conversely, when demand for our goods and services decreases, our currency tends to depreciate.

From the Bank's point of view, the causes of a movement in the exchange rate are just as important as the movement itself.

But not all exchange rate movements are Type One. Some movements, let's call them Type Two, reflect the rebalancing of portfolios in financial markets, which may have nothing to do with current demand for Canadian goods and services.[1] One example of a Type Two movement would be a flight to so-called "safe havens" during an international financial crisis. Another example is a movement that relates to expectations of what might be necessary to resolve global imbalances. I'll say a bit more about this later on. But for now, let me just stress the key point about Type Two exchange rate movements. While they are more difficult to describe, their defining feature is that they do *not* reflect current changes in demand for our goods and services.

It's important for us at the Bank to try to distinguish between exchange rate movements that reflect changes in demand for our goods and services and those that do not. That's because these movements have different implications for aggregate demand and, hence, for monetary policy. This is a complicated issue, all the more so because both types of currency movement sometimes occur at the same time. So I want to spend some time talking about these two different types of exchange rate movement. I'll give you some real

1. This is not to suggest that all Type Two movements in the exchange rate originate in the capital account of the balance of payments and are driven by investment flows. Although most of the examples described later in the text are based on shifting investor expectations and on the rebalancing of portfolios, other Type Two movements are possible and can be driven by non-financial factors. Similarly, while most of the discussion in this text focuses on aggregate demand and the effects of exchange rate movements on net export sales, aggregate supply considerations can also be important and can exert a significant influence on exchange rates. My focus here on demand considerations reflects their greater relevance in the current economic context.

examples and explain their different implications for monetary policy.

When global demand for Canada's goods and services rises, the demand for our dollar also increases, so it tends to appreciate.

Let me start with Type One. I've already noted that when global demand for Canada's goods and services rises, the demand for our dollar also increases, so it tends to appreciate. Similarly, when global demand for Canada's goods and services falls, so will the demand for our currency, which then tends to depreciate. But the exchange rate, by reacting to these changes in demand, also acts as a shock absorber. For example, when global demand for our goods and services weakens, and our dollar depreciates in response, the lower dollar pulls down the relative prices of Canadian goods and services, making them more attractive. And, of course, the opposite happens when global demand rises for Canadian goods and services; the increase in demand is dampened by the associated appreciation of our dollar.

Let me give you an example from here in British Columbia. In 1997 and 1998, the world economy was dealing with the effects of economic crises in Asia, Russia, and other emerging markets. In this environment, global demand for the primary commodities that Canada produces was very weak. That weakness resulted in falling prices for many commodities, including some of the raw materials produced in British Columbia or shipped through its ports. At that time, there was a sharp depreciation of the currencies of countries that export raw materials—Canada, Australia, and New Zealand—while the U.S. dollar appreciated. While there were other forces driving the exchange rate at that time, the drop in global demand for raw materials was a direct, negative shock to Canadian aggregate demand, and this shock led to a depreciation of the Canadian dollar. The lower dollar, in turn, helped to offset the shock by making other Canadian exports more attractive to global markets, and by making foreign products and services less attractive to Canadians.

Over the past two years, we have seen this movement work in the opposite direction. In 2003 and most of 2004, both the demand for, and prices of, Canadian products rose. Once again, there were other factors at work on the exchange rate during this time. But this direct, positive shock to Canadian aggregate demand led to increased demand for our currency and an appreciation of the Canadian dollar. The stronger Canadian dollar, in turn, increased the relative price of Canadian goods compared with foreign products, and helped to restore the balance between demand and supply. In these two instances, the flexible exchange rate helped to absorb positive and negative shocks to our economy.

That's the first type of exchange rate movement. Let's now turn to Type Two. You may wonder: if this second type doesn't reflect changes in demand for Canadian goods and services, what does it reflect? What are the forces behind this type of movement?

If investors develop a greater appetite to hold Canadian equities or bonds, this drives up the demand for our currency, which then tends to appreciate.

Quite often, it reflects changes in foreign demand for Canadian financial assets or changes in Canadian demand for foreign financial assets.[2] For example, if investors develop a greater appetite to hold Canadian equities or bonds, this drives up the demand for our currency, which then tends to appreciate. The reverse also holds true. A shift in investor sentiment away from our bonds and equities reduces the demand for the Canadian dollar, and it tends to depreciate. But let's remember that these changes in demand for *equities and bonds* are not related to current changes in aggregate demand for *goods and services* produced in Canada. The fact that these movements are not related to changes in aggregate demand is the essential difference between a Type One and a Type Two currency movement.

A textbook example of a Type Two currency movement occurred during the Mexican Peso Crisis of 1994–95. As a result of the Mexican situation, inves-

2. I am referring here to a change in demand for Canadian assets that does not involve a change in investment in physical capital in Canada.

tors became less comfortable with holding the financial assets of countries with governments that were heavily in debt—and this included Canada at the time. As a result, investors sold the financial assets of those countries and sought the relative safety of investments in the United States. This was one of the factors behind the sharp depreciation of the Canadian dollar during this period.

Let me give you another example of an exchange rate change that is not driven by a change in Canadian aggregate demand. The period near the end of the 1990s saw investors become increasingly optimistic—some have said irrationally exuberant—about the prospects for the U.S. economy. The associated financial flows into the United States helped to drive up the U.S. dollar over this period—at the expense of other currencies, including the Canadian and Australian dollars, the euro, and the yen. This optimistic view about the U.S. economy, combined with the decline in commodity prices that I mentioned earlier, helped push down the value of the Canadian dollar from 71 cents (US) in March 1998, to about 62 cents (US) in January 2002.

Of course, the process also works in the other direction. During the past two years, investors have become more concerned about the large and growing U.S. current account deficit—which has arisen out of that country's large fiscal deficit and its very low level of private savings. While the United States saves too little, Asian countries are saving too much, and this situation cannot be sustained indefinitely. More domestic demand in Asia and some other countries, and more savings in the United States, are needed to help restore global economic balance. Against this backdrop, market participants have come to the view that further depreciation of the U.S. dollar will be needed to help resolve these imbalances. The earlier "irrational exuberance" about the prospects for the U.S. economy has been cooled by an increased focus on the risks facing that economy. And so we have seen the U.S. dollar fall against many major currencies, including the Canadian dollar.

Let me stress the relevant feature that is common across all Type Two movements. These movements *do not* reflect a change in the aggregate demand for our goods and services. However, the exchange rate movements, by having the usual effect on relative prices, still lead to changes in Canada's net exports and, thus, in Canadian aggregate demand.

The Implications for Monetary Policy

At this point, it might be tempting to say, "So what?" After all, Canadians looking to head south for a winter break probably don't care what is causing the exchange rate to move. They only want to know how many U.S. dollars or Mexican pesos they can buy with their hard-earned Canadian dollars. But it is important for us at the Bank, and for those who follow our actions, to understand what is causing the exchange rate to move. This is because the monetary policy implications of a currency movement depend on its cause, and on what other forces might be at work in the economy.

Let's look at examples of the two types of exchange rate movement that result in a stronger Canadian dollar. In Type One, we start with an increase in foreign demand for our goods and services and, hence, an increase in aggregate demand. The Canadian dollar strengthens in response, increasing the relative price of Canadian goods. This increase offsets some of the higher foreign demand by encouraging imports and dampening exports. In other words, the appreciation of the Canadian dollar works to dampen the initial increase in aggregate demand. To the extent that the dampening effect on aggregate demand exactly offsets the direct increase in demand, there would be no need for a monetary policy response.

A Type Two appreciation is a different story. Consider the example where the U.S. dollar weakens, driven by market concerns about global imbalances. In this case, there is no initial increase in Canadian aggregate demand. But the stronger Canadian dollar still raises the relative prices of domestic products and leads to a decline in net exports. The overall effect on Canadian aggregate demand is clearly negative. And this decrease in demand—if it persisted—would likely lead to undesirable downward pressure on inflation. All other things being equal, this would require monetary policy to be more stimulative than it otherwise would have been.

I hope that this helps to clarify why these two different types of exchange rate movement have different implications for monetary policy. However, I don't want anyone to think that we at the Bank have a mechanical or formulaic approach to dealing with exchange rate movements. The truth is exactly the opposite. Analyzing foreign exchange movements and determining the appropriate monetary policy response is a complicated business.

Consider the sharp appreciation of the Canadian dollar against the U.S. dollar over the past couple of years. Which type of movement drove this appreciation? How much of this movement was related to stronger demand for Canadian goods and services, and how much was related to widespread weakness in the U.S. dollar?

As we noted in our *Monetary Policy Report Update* last month, both types of exchange rate movement seem to have been at play over the past year. However, their relative importance appears to have shifted over this period. And that made it difficult to determine the appropriate monetary policy response.

Looking at the economic data at the beginning of 2004, we saw that net exports had made a significant negative contribution to Canadian economic growth in 2003. We were concerned that, on balance, much of the exchange rate appreciation in 2003 was of the Type Two variety. This assessment was one of the factors that led the Bank to lower interest rates in early 2004. However, by late last summer and early last autumn, we had seen strong commodity prices and strong world demand. And net exports had made a solid, positive contribution to Canadian growth in the first half of 2004—a typical Type One effect. With our economy approaching its capacity limits, we raised interest rates in order to reduce the amount of monetary stimulus in the economy.

Analyzing foreign exchange movements and determining the appropriate monetary policy response is a complicated business.

But towards the end of 2004, the balance of Type One and Type Two forces appeared to shift again, with Type Two dominating. The U.S. dollar weakened against all the major floating currencies, and the Canadian dollar rose to a 13-year high of about 85 1/2 cents (US). This occurred despite the fact that world commodity prices had declined somewhat and the outlook for the global economy had weakened. The Bank's target overnight rate was therefore left unchanged at the fixed announcement dates in December 2004 and January 2005.

It's one thing to observe a movement in the exchange rate. It's quite another to determine its implications for aggregate demand and, hence, for monetary policy.

Each monetary policy decision that we make is complicated by uncertainty about the persistence of exchange rate changes and about the length of time it takes for both exchange rate and monetary policy movements to influence the economy. This has been one of the Bank's major challenges in the recent conduct of monetary policy. It's one thing to observe a movement in the exchange rate. It's quite another to determine its implications for aggregate demand and, hence, for monetary policy.

We continue to struggle with the same complications today as we chart a path for monetary policy. Canadian interest rates remain low by historical standards. Eventually, this considerable monetary stimulus will have to be reduced; that is, at some point, interest rates will have to rise. But as I said, the second type of exchange rate movement appears to have gained relative importance in recent months, which means that aggregate demand in Canada will be weaker than we had expected last autumn. That is why in our recent *Update* we slightly lowered our growth projection for 2005, to 2.8 per cent from 2.9 per cent. And it is why we said in the *Update* that, "the pace of reduction in monetary stimulus is likely to be slower than envisioned in the October *Report*." By slowing the pace at which we will reduce monetary stimulus, we will continue to provide support for domestic demand to offset the additional drag we expect from net exports.

Conclusion

Let me conclude by reminding you of what I said at the beginning of my remarks today. The relationship between the exchange rate, the economy, and monetary policy is complex. And the effects of movements in the currency are spread out over time. You can't look at one day's or one week's performance of the Canadian dollar and pinpoint the reason behind the movement. There is no precise way to measure the relative importance of the two types of movement that I have described, or their likely persistence. So, in setting monetary policy, we at the Bank use an analytical framework based on historical evidence, assess a lot of current data and, even then, we must apply a lot of judgment to our analysis. And the analysis and the judgment can change over time as new information becomes available.

Ultimately, the Bank of Canada's commitment to Canadians about monetary policy boils down to this: We will continue to work at maintaining a rough balance between demand and supply in the economy, in order to keep inflation low, stable, and predictable. And as we pursue this objective, we will continue to explain the reasons behind our policy actions, and our view of the outlook for inflation and for economic growth in Canada.

Communication: A Vital Tool in the Implementation of Monetary Policy

Remarks by Paul Jenkins
Senior Deputy Governor
Bank of Canada
to the FMAC/FMA-USA Joint Conference 2004
Toronto, Ontario
30 September 2004

It is a pleasure to have the opportunity to address this joint conference of financial market professionals from Canada and the United States. At the outset, I want to thank the Financial Markets Association of Canada and the Financial Markets Association of the United States for inviting me to be your conference keynote speaker.

The members of these two organizations play an instrumental role in ensuring the efficient functioning of North America's financial markets and, from a central bank perspective, the efficient transmission of monetary policy. You are, therefore, among the Bank of Canada's key target audiences. We rely on the effective two-way flow of information between the Bank and financial markets in order to fulfill our mandate efficiently and serve the public interest responsibly. In aiming to do so, our overriding priority is to provide markets with the confidence that the value of money will be preserved through sound monetary policy. Put differently, financial markets embody the views of savers, investors, and borrowers, and the most basic consideration in the formulation of such views is confidence in the future value of money.

Many of you who have worked in financial markets for some years may well take for granted the evolution in the way monetary policy is conducted. But if Rip Van Winkle had been a monetary policy "wonk" and had awakened from his 20-year sleep today, he would surely be bewildered by the extraordinary changes that have occurred in central banking, especially in the way central banks communicate.

While central banks used to say little and let actions speak for themselves, today it would be accurate to say that words can, and often do, speak louder than actions.

The fact is, few aspects of the conduct of monetary policy have changed quite so dramatically as the role of public communications. We have gone from a communication approach that not so long ago had central banks doing little to let people know what they were up to and why, to one that is now progressively transparent and deliberately forthcoming. Indeed, while central banks used to say little and let actions speak for themselves, today it would be accurate to say that words can, and often do, speak louder than actions.

Central bank practitioners of monetary policy have become far more preoccupied with communication because communication is so tightly bound to achieving good economic outcomes. As financial market players, you are one of the publics that are most sensitive to this new reality.

Bearing all this in mind, I want to focus my remarks today on communication and monetary policy. I will

structure my remarks to address three key issues:

- first, why communication has become so important in conducting monetary policy;
- second, the need for central banks to be strategic in their communication approach;
- and third, some practical challenges central banks must manage in implementing their communication strategies.

Importance of Communication in Conducting Monetary Policy

Let me begin, then, with the importance of communication. For the Bank of Canada, communication is a strategic priority in supporting our goal of preserving low, stable, and predictable inflation. Indeed, I would submit that effective communication has become a vital tool in the implementation of monetary policy.

Communication is a strategic priority in supporting our goal of preserving low, stable, and predictable inflation. Indeed . . . effective communication has become a vital tool in the implementation of monetary policy.

Why this emphasis on communication as an important monetary policy tool? There are at least two key reasons: first, experience has shown that communication improves the effectiveness of monetary policy or, put another way, monetary policy is most effective when it is effectively communicated; and second, communication helps central banks to be more accountable.

I want to touch on each of these points in turn.

Like all public policies, monetary policy benefits from increased public understanding and support. This translates into what I call "legitimacy of policy." Through clear explanation of why our policy objectives and actions are the right ones, we aim to gain public support for what we are doing. With success on this front, we begin to shape expectations and influence behaviour in ways that support policy outcomes.

Central to our effort is clarity of purpose. We at the Bank of Canada have found that a clear statement of our objective—an explicit inflation target—is crucial. With the clear recognition and appreciation of this objective, agents in the economy—consumers, investors, businesses, financial market participants—begin to adjust their behaviour in ways consistent with an expectation that future inflation will be firmly in line with the inflation target. Price, wage, and financial decisions will tend to be consistent with the target. And the net effect will be a more stable macroeconomic environment and greater success in keeping inflation low and stable.

The second reason why communications is important is accountability. A clear basis for judging a central bank's performance is extremely important to its credibility and independence. For the Bank of Canada, the explicit inflation target is that basis for accountability. Put simply, the public can measure our performance by how successful we are in achieving the 2 per cent inflation target. The fact that we have had a pretty good record in this regard has reinforced our credibility and the public's confidence that we will keep inflation at, or near, the target.

But for the Bank to be fully accountable, we must not only communicate the information that the public needs to understand our policy objective and our progress in meeting that objective, but also the challenges that arise in the economic environment and the factors that we take into account in making decisions. Communicating all this information has become one of the Bank's chief activities.

The Need to be Strategic in Our Communications

To communicate successfully, we need to be strategic. That requires an effective, proactive approach to communications. So we have to identify who our audiences are and what communication vehicles are most effective in reaching them.

To communicate successfully, we need to be strategic.

We aim for effective dialogue with the public, the media, the markets, and other interested and influential constituencies. We want to further *their* understanding of monetary policy and foster public support for our goals and actions. At the same time, and equally important, we want to increase *our* understanding of the public's views.

This is clearly a continuous and iterative process. And the old communications principle, "Repeat, Repeat, Repeat," is entirely appropriate. By repeating our fundamental messages about the framework we use to conduct policy and about our policy goals and why they are important, we are increasing the odds that these messages will take hold in the public consciousness and resonate in shaping behaviour.

Through all our communications, we are providing the opportunity for public critique of our economic analysis, by economists, financial market players, journalists and reporters, politicians, and the public more broadly. This is constructive. Engaging the public in the issues is important in broadening awareness and understanding of monetary policy.

Let me be a little more specific about this. As I have already noted, expectations play a critical role in the conduct of monetary policy. First and foremost, we want to anchor expectations about future inflation to our 2 per cent target. Financial market expectations about future policy actions are also important to us. Market expectations get reflected in medium- and longer-term interest rates, as well as prices of other financial assets, and these financial prices make up part of the overall financial conditions in the economy. We therefore pay close attention to market expectations, and indeed look to financial markets to get an independent view of the expected future path of interest rates.

Bank staff, in our trading room and in our regional offices, are in regular contact with market dealers and investors in key financial centres, including Toronto, Montréal, New York, and elsewhere around the world. We also apply analytic techniques to extract from asset prices the views of market participants about the future path of interest rates. We look at interest rate futures, expectations implicit in the term structure of interest rates, and markets for instruments such as bankers' acceptances, term repos, and treasury bills. This involves assessment about relevant term, risk, and liquidity premiums. In this way, we keep our finger on the pulse of the market, on its interpretation of our decisions and statements, and on its views as to where policy interest rates are headed. We also stay on top of published economic analyses and commentaries from financial institutions. And we review the surveys of economists' and market participants' expectations for interest rates that are published by the major wire services.

All of this information, together with other economic and financial analysis, feeds into the Bank's deliberations leading to our interest rate decisions and then into the messages we communicate about the decision to the public. If the iterative process and the two-way communication that I have just described work as they should, the views of the Bank and the markets should be broadly consistent. And this should help create an environment in which positive economic outcomes are achieved in an efficient manner.

The Bank of Canada's communications strategy is based on reaching our target audiences through a schedule of key publications and communications events throughout the year. This gives us a regular, continuous, and integrated program of communication with the public. It permits us to communicate our evolving views on the economy and the trend of inflation on a regular basis through the course of the year.

These communications events include eight scheduled policy interest rate announcements, when we issue a press release, publication of our semi-annual *Monetary Policy Report* in April and October, *Updates* to the *Report* in January and July, frequent speeches by the Governor and other Governing Council members, public appearances before parliamentary committees, press conferences, and other media events and interviews. And a recent initiative has been to publish our regional office *Business Outlook Survey,* which summarizes business and industry views on their outlook for the economy and inflation.

From the Bank's perspective, we are encouraged by the progress we are making in engaging public interest in economic and monetary policy issues. The quantity and quality of media coverage of the Bank—both electronic and print—has increased markedly in recent years, especially since the adoption of a fixed schedule of regular dates for announcing policy interest rates. The C.D. Howe Institute's creation of a shadow Monetary Policy Council last year to provide an independent analysis and view on interest rate decisions is making a constructive contribution to public awareness and debate. And the public traffic to the Bank's Web site has grown enormously, indicating a growing public appetite for our published statements and information. These are encouraging indications that the public is reacting to our communications and, in many cases, providing us with tangible feedback.

Some Practical Challenges to a Successful Communications Strategy

Implementing an effective communications strategy for monetary policy in 2004 has some very real chal-

lenges. Today, I want to touch on a couple of these: first, how to communicate uncertainty; and second, how to capitalize on new technologies, specifically an effective Web site.

How to communicate about an uncertain future

After many years of being involved in developing and communicating monetary policy, I have found that dealing with the simple fact that the future is uncertain is one of the most difficult communications challenges a central bank faces. Clearly, financial markets are hypersensitive to anything a central bank says about the future because the markets are looking for indications about where interest rates may be going. This makes talking about the future all the more challenging.

Let's remember, central banks do not have a crystal ball. Economies are always subject to events and shocks that are unforeseen. And the fact that monetary policy operates over a medium-term time frame compounds the communications challenge.

How can a central bank best address this communications challenge?

I believe that we must be able to tell a coherent narrative—in other words, a story. The story has to explain the logic of central bank decisions, but allow the public and the markets to make their own assessment of future Bank decisions. The story must be set in the context of a clear statement of the objective of policy, a view of the key macroeconomic relationships, especially the inflation process, and an understanding of the tools and the actions used to achieve our policy objective.

But the story also has to recognize the forward-looking nature of monetary policy; that is, the considerable time lags between monetary policy actions and their effects. And it has to recognize that the outlook is uncertain and that the future path of interest rates will be linked to developments in the economy. In other words, the outlook is conditional—conditional on assumptions, such as an assumption about the world price of oil, and on views and analysis based on circumstances at a given point in time.

This may not be an easy story to tell. But for it to be as clear as possible, the elements have to add up in a way that reflects the monetary policy framework we have adopted to conduct policy. This includes how the exchange rate fits into the framework. Fundamentally, we have to assess the implications of movementsin the currency for aggregate demand since, in setting policy, we aim to keep aggregate demand and supply in balance in order to help keep inflation close to our target. Another important aspect of the story is to communicate a sense of the risks and uncertainties facing the economy. If our story does all this, then it will properly convey the key relationships, nuances, and conditional nature of policy.

More specifically, what we do, primarily through our *Monetary Policy Reports* and *Updates*, is to provide a projection of those key macroeconomic variables—real GDP growth, the output gap, and inflation—that drive monetary policy decisions and give indication to the general direction of policy. We do not provide an interest rate path as part of these projections. Under an inflation-targeting framework, the policy consequences of changing circumstances or unanticipated events fall primarily on interest rates, and thus any projected interest rate path would be an unreliable guide to future policy actions.

Our commitment is to the policy objective, not to a particular interest rate path.

In other words, our commitment is to the policy objective, not to a particular interest rate path. Our communication focus is therefore on presenting and updating our macroeconomic "base-case" projection consistent with eliminating any output gap— positive or negative—and achieving the 2 per cent inflation target over the policy horizon of roughly 1 1/2 to 2 years. But in order to underscore the conditional nature of the base-case projection, we also discuss the main risks and uncertainties that we see, and we identify those issues that we will be watching closely.

Let me offer a specific example from the Bank of Canada's fairly recent experience. In the spring of 2002, there was evidence that demand pressures in the economy were growing more rapidly than had been anticipated, even though they were not yet showing up in price increases. Based on the evidence at the time, we raised our policy interest rate three times. By the first quarter of 2003, there was further

evidence that inflation was above target, suggesting that strong domestic demand was putting pressure on the economy's production capacity. So we raised our target overnight rate further in March and again in April. At that time, we concluded that the risks to the global economic outlook were more evenly balanced than they were the previous autumn, and we said so.

Then the Canadian economy was sideswiped by a number of unanticipated developments, most notably SARS, BSE, and a rapid rise in the value of the Canadian dollar as part of a broad-based weakness in the U.S. dollar. The impact of these developments caused us to alter our outlook for economic activity and inflation in Canada. With inflation pressures easing, we lowered the policy interest rate in July and September to help support domestic demand.

Through this period, there was some criticism of the Bank, that we had acted prematurely in raising rates and that, as a result, we had to reverse our decision. The fact of the matter is that conditions did change significantly. So our analysis and outlook changed accordingly, and we communicated the evolving story consistent with our monetary policy framework and its forward-looking nature. Like the baseball umpire says, "There's strikes and there's balls, and I calls 'em as I sees 'em."

Communication technologies: capitalizing on a good Web site

A second communications challenge that I want to highlight is capitalizing on new technology. By shrinking time and space, new communication technologies have created enormous pressure to provide markets and the public with access to real-time information about monetary policy.

Fortunately, these technologies offer the means to help address these pressures. So the Bank of Canada has put a lot of emphasis on developing and maintaining a high-calibre Web site. The Web has become particularly important for monetary policy communication because it helps facilitate equal treatment of target audiences and it enables us to respond more quickly to information needs. Our site gives the general public and more specialized audiences direct and immediate access not only to our releases, publications, speeches, and technical information, but also to more easily understandable information about the Bank and monetary policy. Thus, the Web supports our objective of being proactive in reaching the public, the markets, and specialized audiences with news and information.

Last year, we were honoured to be presented with the "Central Bank Website of the Year" award by Central Banking Publications and Lombard Street Research. Nonetheless, we continue to work at improving and expanding the site. (If I might add a plug, our Web site address is bankofcanada.ca; banqueducanada.ca.)

Our audio "Webcasts" of speeches and press conferences by the Governor have been highly successful. They provide the instant access that markets and media want, to what the Bank is saying on monetary policy issues, as we say it. They also enable journalists and market participants from anywhere in the world to tune in "in real time."

Our Web site plays an important role in supporting our financial market activities. Dealers and distributors can find up-to-the-minute information on securities auctions and tenders, plus historical yield data and a variety of technical documents. And the site permits much wider distribution of the Bank's research than was possible in the past.

The Web is maturing as a medium, and the Bank will continue to exploit it to communicate more directly and effectively with its target audiences.

Conclusion

Let me conclude by summarizing my main points. First, communication has become another vital tool in the implementation of monetary policy. Thanks in part to effective communication, Canadians are now more confident that inflation will be kept near the 2 per cent target, and this expectation is feeding into their day-to-day decision-making.

By communicating in a timely and effective way, we can engage the markets and the public in the issues we face. At the same time, public input helps make monetary policy more effective.

Second, central banks need to be strategic in their approach to communications. By communicating in

a timely and effective way, we can engage the markets and the public in the issues we face. At the same time, public input helps make monetary policy more effective.

And finally, there will continue to be numerous day-to-day challenges in communicating monetary policy. But in addressing these challenges, be they complex ones like the conditionality and forward-looking nature of monetary policy or technical ones like capitalizingonnew technology, we are always striving to achieve better,more effective policy.

Communications is indeed a vital tool in helping the Bank achieve the goal of low, stable, and predictable inflation. But it is important to remember that low inflation is not an end in itself. Ultimately, it is the means by which monetary policy contributes to Canada's solid economic performance and to the rising living standards of Canadians.

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Summary Tables

A1 Summary of Key Monetary Policy Variables

Monthly		Inflation-control target (12-month rate)			Policy instrument			Monetary conditions			Monetary aggregates (12-month growth rate)			Inflation indicators					
		Target range	CPI	Core CPI*	Operating band for overnight rate (end of month)		Overnight money market rate	Monetary conditions index (January 1987=0)	90-day commercial paper rate	C-6 trade-weighted exchange rate (1992=100)	Gross M1	M1++	M2++	Yield spread between conventional and Real Return Bonds	Total CPI excluding food, energy, and the effect of changes in indirect taxes	CPIW	Unit labour costs	IPPI (finished products)	Average hourly earnings of permanent workers
					Low	High													
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
2001	A	1-3	3.6	2.3	4.50	5.00	4.7442	-7.71	4.49	80.28	11.3	7.1	7.3	2.36	1.9	2.4	0.4	4.3	3.5
	M	1-3	3.9	2.3	4.25	4.75	4.6700	-7.60	4.49	80.54	11.6	8.8	7.8	2.45	2.0	2.5	3.6	3.8	4.0
	J	1-3	3.3	2.3	4.25	4.75	4.4935	-7.03	4.38	82.21	9.8	7.8	7.2	2.36	1.9	2.4	3.3	2.8	3.8
	J	1-3	2.6	2.4	4.00	4.50	4.2414	-7.70	4.22	80.97	9.4	8.2	6.9	2.28	2.1	2.4	3.8	2.6	3.3
	A	1-3	2.8	2.3	3.75	4.25	4.1679	-8.28	3.96	80.18	9.1	8.6	7.0	1.99	2.1	2.3	2.8	2.5	2.5
	S	1-3	2.6	2.3	3.25	3.75	3.4858	-9.69	3.19	78.65	11.7	10.7	7.6	2.18	2.0	2.3	1.9	3.5	2.3
	O	1-3	1.9	2.2	2.50	3.00	2.7412	-10.59	2.45	78.28	12.1	10.9	7.8	1.71	1.8	2.1	2.6	1.4	2.5
	N	1-3	0.7	1.7	2.00	2.50	2.5955	-10.78	2.17	78.50	13.8	13.2	8.6	1.91	1.4	1.7	1.8	0.6	3.0
	D	1-3	0.7	1.6	2.00	2.50	2.2444	-10.94	2.08	78.33	14.4	14.0	7.7	1.93	1.3	1.6	2.3	1.0	3.3
2002	J	1-3	1.3	1.8	1.75	2.25	1.9923	-10.82	2.07	78.63	14.4	15.6	8.0	1.95	1.4	1.8	1.7	2.0	3.5
	F	1-3	1.5	2.2	1.75	2.25	1.9926	-11.07	2.16	77.84	12.6	15.7	7.6	1.96	1.4	2.1	0.7	1.5	3.4
	M	1-3	1.8	2.1	1.75	2.25	1.9933	-10.61	2.36	78.45	12.4	15.7	7.1	2.30	1.8	2.1	0.5	1.1	3.2
	A	1-3	1.7	2.2	2.00	2.50	2.2440	-10.07	2.46	79.48	11.6	15.3	7.0	2.29	1.9	2.1	-	0.6	2.8
	M	1-3	1.0	2.2	2.00	2.50	2.2471	-9.31	2.68	80.79	11.8	14.3	6.7	2.24	2.0	1.9	1.0	-0.3	2.4
	J	1-3	1.3	2.1	2.25	2.75	2.4964	-9.12	2.78	80.99	12.9	15.6	6.8	2.32	2.1	1.9	0.4	0.6	2.7
	J	1-3	2.1	2.1	2.50	3.00	2.7418	-10.40	2.88	77.71	13.3	14.7	6.7	2.28	2.1	2.0	-0.3	0.5	2.8
	A	1-3	2.6	2.5	2.50	3.00	2.7448	-9.68	3.09	78.90	13.8	15.1	6.7	2.18	2.2	2.4	0.5	1.3	3.0
	S	1-3	2.3	2.5	2.50	3.00	2.7447	-10.27	2.90	77.97	10.8	12.6	6.1	2.18	2.3	2.3	-	0.9	2.8
	O	1-3	3.2	2.5	2.50	3.00	2.7449	-10.06	2.83	78.63	11.5	12.6	5.6	2.18	2.5	2.4	0.5	2.1	2.7
	N	1-3	4.3	3.1	2.50	3.00	2.7431	-10.21	2.85	78.24	9.5	10.3	4.8	2.15	3.1	3.0	1.4	1.8	2.5
	D	1-3	3.9	2.7	2.50	3.00	2.7439	-9.80	2.83	79.24	7.0	8.2	3.9	2.09	3.3	2.4	0.7	2.1	1.9
2003	J	1-3	4.5	3.3	2.50	3.00	2.7439	-9.34	2.91	80.15	7.4	7.3	3.7	2.27	3.3	2.9	1.2	1.1	1.9
	F	1-3	4.6	3.1	2.50	3.00	2.7469	-8.61	2.97	81.78	6.9	6.5	3.3	2.40	3.3	2.9	1.3	1.1	2.1
	M	1-3	4.3	2.9	2.75	3.25	2.9920	-7.72	3.28	83.22	6.2	5.5	3.3	2.50	3.1	2.7	1.4	0.1	1.8
	A	1-3	3.0	2.1	3.00	3.50	3.2373	-6.92	3.35	85.07	6.6	5.2	3.1	2.28	2.8	2.1	2.1	-1.5	1.3
	M	1-3	2.9	2.3	3.00	3.50	3.2416	-6.02	3.27	87.60	7.2	5.3	3.5	2.12	2.5	2.2	1.3	-2.7	1.8
	J	1-3	2.6	2.1	3.00	3.50	3.2449	-5.11	3.11	90.45	7.7	5.3	3.3	2.04	2.1	2.0	1.4	-3.7	1.4
	J	1-3	2.2	1.8	2.75	3.25	2.9947	-6.60	2.89	87.07	10.0	6.6	3.5	2.25	1.7	1.9	1.8	-2.1	2.1
	A	1-3	2.0	1.5	2.75	3.25	2.9972	-6.68	2.80	87.11	9.5	6.6	3.4	2.29	1.7	1.7	1.8	-2.6	2.1
	S	1-3	2.2	1.7	2.50	3.00	2.7490	-5.93	2.64	89.52	8.5	6.5	3.4	2.15	1.8	1.9	1.2	-3.8	2.7
	O	1-3	1.6	1.8	2.50	3.00	2.7492	-4.85	2.71	92.25	7.3	6.1	3.0	2.38	1.8	1.8	1.2	-5.5	2.7
	N	1-3	1.6	1.8	2.50	3.00	2.7481	-4.73	2.73	92.54	8.8	6.8	3.1	2.38	1.8	1.7	0.3	-6.0	2.3
	D	1-3	2.0	2.2	2.50	3.00	2.7481	-4.68	2.66	92.87	9.9	7.6	3.9	2.41	1.5	2.1	0.6	-5.4	2.7
2004	J	1-3	1.2	1.5	2.25	2.75	2.4951	-5.77	2.37	90.68	10.7	8.3	3.8	2.66	1.5	1.5	0.7	-5.3	2.7
	F	1-3	0.7	1.1	2.25	2.75	2.4953	-6.21	2.25	89.82	13.2	9.8	4.4	2.53	1.0	1.2	1.4	-4.3	2.8
	M	1-3	0.7	1.3	2.00	2.50	2.2482	-5.72	2.10	91.55	14.2	10.4	4.7	2.65	1.1	1.2	0.6	-3.5	3.0
	A	1-3	1.6	1.8	1.75	2.25	1.9959	-6.98	2.05	88.28	15.6	12.0	5.1	2.85	1.2	1.7	0.9	-1.3	3.2
	M	1-3	2.5	1.5	1.75	2.25	1.9985	-7.08	2.07	87.98	16.2	13.1	5.2	3.00	1.2	1.8	0.9	2.8	3.0
	J	1-3	2.5	1.7	1.75	2.25	2.0005	-6.36	2.10	89.81	14.4	13.0	5.7	2.96	1.4	1.8	1.2	3.1	3.3
	J	1-3	2.3	1.9	1.75	2.25	1.9973	-6.03	2.12	90.65	11.1	11.6	5.4	2.98	1.4	1.9	1.0	0.6	2.5
	A	1-3	1.9	1.5	1.75	2.25	1.9979	-5.28	2.22	92.43	10.6	10.5	5.1	2.93	1.0	1.7	0.2	0.3	2.3
	S	1-3	1.8	1.5	2.00	2.50	2.2496	-4.22	2.50	94.63	10.3	10.3	5.1	2.72	1.0	1.6	1.2	-	2.1
	O	1-3	2.3	1.4	2.25	2.75	2.4960	-3.03	2.60	97.77	11.2	10.6	5.7	2.72	0.8	1.7	1.0	0.7	2.3
	N	1-3	2.4	1.6	2.25	2.75	2.4977	-1.82	2.74	100.95	10.3	10.0	5.3	2.73	1.1	1.8	1.4	-0.7	3.1
	D	1-3	2.1	1.7	2.25	2.75	2.4999	-3.02	2.57	97.89	11.5	11.0	5.7	2.81	1.3	1.7	1.8	-0.7	2.6
2005	J	1-3	2.0	1.6	2.25	2.75	2.4980	-3.35	2.56	96.96	11.1	10.6	5.9	2.71	1.2	1.6		-0.2	3.1
	F	1-3	2.1	1.8	2.25	2.75	2.4971	-3.54	2.57	96.37	10.2	10.2		2.69	1.4	1.7		-0.8	2.2
	M				2.25	2.75	2.4794	-2.74	2.68	98.39				2.69					

* New definition for core CPI as announced on 18 May 2001: CPI excluding the eight most volatile components: fruit, vegetables, gasoline, fuel oil, natural gas, intercity transportation, tobacco, and mortgage-interest costs, as well as the effect of changes in indirect taxes on the remaining CPI components

A2 Major Financial and Economic Indicators

Rates of change based on seasonally adjusted data, percentage rates unless otherwise indicated

	Year, quarter, and month	Money and credit									Output and employment				
		Monetary aggregates					Business credit		Household credit		GDP in current prices	GDP volume (millions of chained 1997 dollars, quarterly)	GDP by industry (millions of 1997 dollars, monthly)	Employment (*Labour Force Information*)	Un-employment rate
		Gross M1	M1+	M1++	M2+	M2++	Short-term business credit	Total business credit	Consumer credit	Residential mortgages					
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	1992	7.1	4.2	0.2	5.8	7.1	-3.4	1.8	1.3	8.4	2.2	0.9		-1.0	11.2
	1993	9.4	5.1	-0.7	4.2	6.6	-6.3	0.7	2.3	7.6	3.8	2.3		0.5	11.4
	1994	13.2	8.4	1.4	1.9	6.8	1.6	4.7	7.9	6.4	6.0	4.8		2.1	10.4
	1995	6.6	0.8	-2.6	3.8	4.1	5.5	5.1	7.5	3.7	5.1	2.8		1.7	9.6
	1996	12.2	8.2	3.3	4.4	6.8	1.5	5.5	6.5	4.2	3.3	1.6		0.9	9.7
	1997	16.9	11.2	7.2	0.9	7.2	7.7	10.0	10.0	5.6	5.5	4.2		2.1	9.2
	1998	10.3	7.0	3.1	-1.1	5.5	11.5	11.6	10.1	4.9	3.7	4.1	3.8	2.5	8.4
	1999	7.6	6.0	4.3	3.6	5.3	2.4	6.3	7.1	4.3	7.4	5.5	5.6	2.6	7.6
	2000	14.7	10.6	8.8	5.9	7.0	6.5	7.4	12.6	4.8	9.6	5.2	5.5	2.6	6.8
	2001	12.1	10.3	9.6	6.6	7.6	-1.6	5.6	6.8	4.1	2.9	1.8	1.9	1.3	7.2
	2002	11.7	10.9	13.7	7.4	6.4	-5.9	3.8	6.1	7.3	4.5	3.4	3.5	2.4	7.7
	2003	8.0	5.1	6.3	4.7	3.4	-2.9	1.6	8.9	8.1	5.3	2.0	2.1	2.3	7.6
	2004	12.4	9.1	10.9	4.7	5.1	-1.0	4.0	10.2	9.6	6.1	2.8	3.0	1.8	7.2
Annual rates	2001 I	13.2	8.0	6.9	7.7	8.7	-1.8	5.3	5.5	3.0	4.7	1.4	1.1	0.8	7.0
	II	9.0	11.6	10.5	7.7	7.2	-15.5	2.5	5.9	3.7	0.8	0.9	1.1	1.1	7.1
	III	8.5	7.9	11.2	5.1	5.7	-4.0	5.6	4.6	6.3	-5.6	-0.6	-0.3	0.5	7.2
	IV	23.7	17.6	22.8	13.9	10.5	-0.2	5.9	2.0	7.2	-1.3	4.0	2.6	0.4	7.7
	2002 I	11.9	14.5	18.6	8.5	6.9	-11.0	3.9	5.3	7.4	8.8	5.5	6.1	2.9	7.9
	II	5.1	5.5	8.2	3.5	4.4	-6.1	2.4	8.9	8.5	12.0	3.8	4.7	4.3	7.7
	III	10.5	7.7	7.8	5.7	4.3	-3.5	2.4	9.2	8.2	5.4	4.2	4.0	4.2	7.6
	IV	9.9	7.0	7.1	4.9	3.4	0.5	2.4	9.6	7.4	6.4	1.9	1.6	2.5	7.5
	2003 I	2.1	0.6	2.7	4.7	1.7	-0.9	1.1	7.4	7.9	9.6	2.8	2.3	2.5	7.4
	II	6.4	2.6	3.6	5.2	3.7	-1.9	0.6	9.0	7.7	-2.6	-0.7	-0.1	0.5	7.7
	III	19.5	12.3	13.2	4.7	5.0	-7.7	1.4	10.6	9.0	4.2	1.4	1.6	1.1	7.8
	IV	7.4	6.1	8.2	1.3	2.9	-8.7	3.1	8.9	9.7	4.8	3.3	4.5	3.5	7.5
	2004 I	18.3	11.1	13.2	5.4	5.7	-3.5	3.9	10.1	8.9	7.0	2.8	2.5	1.2	7.3
	II	16.8	14.2	16.3	8.1	7.8	9.0	5.8	11.2	10.6	10.6	4.5	4.2	2.4	7.2
	III	1.0	3.4	5.9	4.0	4.5	7.3	6.7	11.4	10.6	6.8	2.9	3.7	1.3	7.1
	IV	8.7	7.1	7.1	3.2	4.2	3.2	5.2	10.4	10.3	5.0	1.7	2.1	1.7	7.1
	2005 I														
Last three months		17.0	12.9	12.1	4.3	4.9	8.3	8.1	9.7	9.4			2.5	0.9	7.0
Monthly rates	2004 M	0.9	0.9	0.9	0.4	0.5	0.9	0.3	0.8	0.6			1.1	-	7.3
	A	1.5	1.3	1.4	0.7	0.7	0.5	0.4	1.0	1.0			0.1	0.4	7.2
	M	1.5	1.4	1.5	0.7	0.6	0.8	0.6	0.9	0.9			0.1	0.2	7.1
	J	-	0.7	1.0	1.0	0.9	2.2	0.8	1.0	1.0			0.5	0.1	7.2
	J	-0.2	-	0.2	-	0.2	0.5	0.5	0.9	0.8			0.3	0.1	7.1
	A	-0.1	-0.2	-	-	0.1	-0.6	0.4	0.9	0.9			0.3	-0.1	7.1
	S	-	0.2	0.4	0.2	0.3	-0.1	0.2	0.8	0.7			0.1	0.2	7.0
	O	1.0	0.9	0.7	0.5	0.5	0.2	0.1	1.0	0.9			0.1	0.3	7.1
	N	0.6	0.3	0.4	-0.2	-	0.7	0.8	0.7	0.6			0.3	-	7.2
	D	2.1	1.7	1.5	1.0	0.9	1.2	1.0	0.7	0.9			0.2	0.1	7.0
	2005 J	0.9	1.0	0.9	0.8	0.5	0.2	0.4	0.8	0.5			0.2	-	7.0
	F	1.3	0.5	0.9			0.3	0.5						0.2	7.0
	M														

A2 (Continued)

Capacity utilization rate		Prices and costs				Wage settlements		Bank of Canada commodity price index (unadjusted)		Securities mid-market yield			Year, quarter, and month
Total industrial	Manufacturing industries	CPI	Core CPI*	GDP chain price index	Unit labour costs	Public sector	Private sector	Total	Non-energy	Treasury bills 3-month	Canada 10-year benchmark bonds	Canada 30-year Real Return Bonds	
(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
78.2	76.4	1.5	1.8	1.3		2.0	2.6	-0.3	0.6	7.01	7.86	4.62	1992
80.0	79.9	1.8	2.1	1.4		0.6	0.8	0.5	3.0	3.87	6.57	3.78	1993
82.4	83.5	0.2	1.8	1.1		-	1.2	3.3	7.5	7.14	9.07	4.92	1994
81.6	83.9	2.2	2.3	2.3		0.7	1.4	8.3	11.1	5.54	7.11	4.42	1995
81.2	82.8	1.6	1.7	1.6		0.5	1.8	3.8	-1.2	2.85	6.37	4.09	1996
82.5	83.6	1.6	1.9	1.2		1.1	1.9	-3.7	-4.3	3.99	5.61	4.14	1997
83.4	84.3	0.9	1.3	-0.5	1.0	1.6	1.7	-15.3	-12.6	4.66	4.89	4.11	1998
84.5	85.8	1.7	1.4	1.7	0.1	1.9	2.7	6.7	1.5	4.85	6.18	4.01	1999
85.4	86.1	2.7	1.3	4.2	3.0	2.5	2.4	18.4	3.5	5.49	5.35	3.42	2000
82.7	81.8	2.6	2.1	1.1	2.8	3.3	3.0	-5.2	-6.9	1.95	5.44	3.76	2001
83.0	83.3	2.2	2.3	1.0	0.6	2.9	2.6	-5.9	-6.6	2.63	4.88	3.33	2002
83.0	83.0	2.8	2.2	3.2	1.3	2.9	1.3	20.1	8.8	2.57	4.66	2.79	2003
85.0	87.0	1.9	1.5	3.2	1.0	1.4	2.2	20.5	21.4	2.47	4.39	2.11	2004
84.1	83.6	1.0	1.5	3.0	4.4	3.9	2.5	11.6	-5.5	4.58	5.41	3.45	2001 I
83.7	82.8	5.2	3.2	-	1.7	3.1	3.0	-16.0	23.0	4.30	5.73	3.53	II
81.9	80.9	0.5	2.2	-5.1	2.4	3.7	3.2	-38.1	-22.2	3.05	5.32	3.68	III
81.0	79.9	-2.1	0.6	-4.8	0.3	3.0	2.6	-41.3	-30.8	1.95	5.44	3.76	IV
81.8	81.6	3.0	2.5	3.1	-0.7	3.1	2.1	15.9	12.3	2.30	5.79	3.68	2002 I
83.1	83.6	4.3	3.5	7.8	-0.1	2.7	2.3	40.0	-1.8	2.70	5.37	3.42	II
83.8	84.5	4.6	3.0	1.1	0.8	3.2	2.5	2.8	-1.5	2.83	4.92	3.25	III
83.1	83.6	3.5	2.0	4.5	3.5	3.3	3.5	20.4	-4.0	2.63	4.88	3.33	IV
83.6	84.0	5.2	3.9	6.8	1.1	2.9	2.4	82.0	14.1	3.14	5.13	3.08	2003 I
82.2	82.2	-1.8	-0.3	-1.8	0.9	3.1	0.3	-17.4	14.8	3.07	4.37	2.99	II
82.2	81.7	1.9	1.3	2.6	1.0	3.2	2.4	0.6	20.8	2.58	4.64	3.08	III
83.8	84.1	1.6	2.9	1.4	-0.2	2.2	1.6	17.6	19.5	2.57	4.66	2.79	IV
83.7	84.5	2.0	1.1	4.0	2.0	2.8	2.7	45.3	38.9	1.98	4.33	2.39	2004 I
84.6	86.4	3.3	1.6	5.8	1.3	-0.3	2.5	36.7	34.4	2.01	4.83	2.37	II
85.7	88.5	1.2	1.0	3.9	0.1	1.8	0.9	5.4	1.5	2.45	4.58	2.32	III
86.0	88.5	2.7	2.5	3.2	2.3	2.1	2.6	13.7	-15.7	2.47	4.39	2.11	IV
								16.3	25.6	2.56	4.39	2.08	2005 I
		1.5	2.5		2.3			16.3	25.6	2.56	4.39	2.08	
		0.1	0.1		-0.7			2.6	2.5	1.98	4.33	2.39	2004 M
		0.3	0.2		0.5			3.2	3.4	1.95	4.71	2.46	A
		0.6	0.2		0.1			4.9	1.2	1.98	4.77	2.32	M
		0.2	0.2		0.2			-0.9	0.9	2.01	4.83	2.37	J
		-	0.1		-0.1			0.3	-0.3	2.08	4.82	2.31	J
		-0.1	-0.2		-0.3			1.0	0.5	2.13	4.68	2.22	A
		0.2	0.2		0.5			-1.9	-2.2	2.45	4.58	2.32	S
		0.4	0.2		-0.1			6.8	-3.6	2.57	4.52	2.28	O
		0.2	0.4		0.2			-3.5	-	2.63	4.44	2.17	N
		0.1	0.2		0.8			-0.2	2.0	2.47	4.39	2.11	D
		-0.1	-					1.0	1.1	2.43	4.21	2.03	2005 J
		0.2	0.2					2.5	3.8	2.46	4.28	2.07	F
								7.2	2.3	2.56	4.39	2.08	M

* New definition for core CPI as announced on 18 May 2001: CPI excluding the eight most volatile components: fruit, vegetables, gasoline, fuel oil, natural gas, intercity transportation, tobacco, and mortgage-interest costs, as well as the effect of changes in indirect taxes on the remaining CPI components

A2 (Continued)

	Year, quarter, and month	Government surplus or deficit (-) on a national accounts basis (as a percentage of GDP)		Balance of payments (as a percentage of GDP)		U.S. dollar, in Canadian dollars, average noon spot rate
		Government of Canada	Total, all levels of government	Merchandise trade	Current account	
		(28)	(29)	(30)	(31)	(32)
	1992	-5.1	-9.1	1.3	-3.6	1.2083
	1993	-5.5	-8.7	1.8	-3.9	1.2898
	1994	-4.6	-6.7	2.6	-2.3	1.3659
	1995	-3.9	-5.3	4.4	-0.8	1.3726
	1996	-2.0	-2.8	5.1	0.5	1.3636
	1997	0.7	0.2	2.9	-1.3	1.3844
	1998	0.8	0.1	2.6	-1.2	1.4831
	1999	0.9	1.6	4.3	0.3	1.4858
	2000	1.9	2.9	6.2	2.7	1.4852
	2001	1.3	1.1	6.3	2.3	1.5484
	2002	0.8	0.3	4.9	2.0	1.5704
	2003	0.4	0.6	4.8	2.0	1.4015
	2004	1.1	1.3	5.2	2.6	1.3015
Annual rates	2001 I	1.7	2.1	8.0	3.9	1.5280
	II	1.8	2.0	7.0	2.9	1.5409
	III	1.2	0.7	5.1	1.1	1.5453
	IV	0.4	-0.3	5.2	1.1	1.5803
	2002 I	0.6	-0.1	5.4	2.8	1.5946
	II	0.6	0.1	5.1	2.4	1.5549
	III	0.7	0.3	4.7	1.5	1.5628
	IV	1.2	0.9	4.5	1.1	1.5698
	2003 I	0.8	0.9	5.2	1.7	1.5102
	II	-0.8	0.1	4.4	1.8	1.3984
	III	0.7	0.7	4.9	2.2	1.3799
	IV	0.8	0.8	4.6	2.2	1.3160
	2004 I	0.7	0.6	5.1	2.6	1.3179
	II	0.9	1.3	6.0	3.4	1.3592
	III	1.5	1.5	5.1	2.6	1.3072
	IV	1.6	1.8	4.7	1.9	1.2203
	2005 I					1.2267
Last three months						1.2267
Monthly rates	2004 M					1.3284
	A					1.3425
	M					1.3783
	J					1.3577
	J					1.3219
	A					1.3118
	S					1.2878
	O					1.2469
	N					1.1961
	D					1.2191
	2005 J					1.2253
	F					1.2397
	M					1.2161

Notes to the Tables

Symbols used in the tables

R Revised

– Value is zero or rounded to zero.

Note:

Blank spaces in columns indicate that data are either not available or not applicable.

A horizontal rule in the body of the table indicates either a break in the series or that the earlier figures are available only at a more aggregated level.

A1

(1) In February 1991, the federal government and the Bank of Canada jointly announced a series of targets for reducing inflation to the midpoint of a range of 1 to 3 per cent by the end of 1995. In December 1993, this target range was extended to the end of 1998. In February 1998, it was extended again to the end of 2001. In May 2001, it was extended to the end of 2006.

(2-3) Year-to-year percentage change in consumer price index (Table H8). The core CPI is the CPI excluding the eight most volatile components: fruit, vegetables, gasoline, fuel oil, natural gas, intercity transportation, tobacco, and mortgage-interest costs, as well as the effect of changes in indirect taxes on the other CPI components

(4–5) The *operating band* is the Bank of Canada's 50-basis-point target range for the average overnight rate paid by investment dealers to finance their money market inventory.

(6) The *overnight money market financing rate* is an estimate compiled by the Bank of Canada. This measure includes overnight funding of the major money market dealers through general collateral buyback arrangements (repo) including special purchase and resale agreements with the Bank of Canada. Prior to 1996, data exclude all repo activity with the exception of those arranged directly with the Bank of Canada. These latter have been included in the calculation since 1995.

(7) The *monetary conditions index* is a weighted sum of the changes in the 90-day commercial paper rate and the C–6 trade-weighted exchange rate (see technical note in the Winter 1998–1999 issue of the *Bank of Canada Review*, pages 125 and 126). The index is calculated as the change in the interest rate plus one-third of the percentage change in the exchange rate. The Bank does not try to maintain a precise MCI level in the short run. See *Monetary Policy Report*, May 1995, p.14.

(8) *90-day commercial paper rate*. The rate shown is the Bank of Canada's estimate of operative market trading levels on the date indicated for major borrowers' paper.

(9) The C–6 exchange rate is an index of the weighted-average foreign exchange value of the Canadian dollar against major foreign currencies. (See technical note in the Winter 1998–1999 issue of the *Bank of Canada Review*, pages 125 and 126.) Weights for each country are derived from Canadian merchandise trade flows with other countries over the three years from 1994 through 1996. The index has been based to 1992 (i.e., C–6 = 100 in 1992). The C–6 index broadens the coverage of the old G–10 index to include all the countries in the EMU.

(10) Gross M1: Currency outside banks plus personal chequing accounts plus current accounts plus adjustments to M1 described in the notes to Table E1 *(Bank of Canada Banking and Financial Statistics)*.

(11) M1++: M1+ plus non-chequable notice deposits held at chartered banks plus all non-chequable deposits at trust and mortgage loan companies, credit unions, and caisses populaires less interbank non-chequable notice deposits plus continuity adjustments.

(12) M2++: M2+ plus Canada Savings Bonds plus cumulative net contributions to mutual funds other than Canadian-dollar money market mutual funds (which are already included in M2+).

(13) Yield spreads between *conventional* and *Real Return Bonds* are based on actual mid-market closing yields of the selected long-term bond issue. At times, some of the change in the yield that occurs over a reporting period may reflect switching to a more current issue. Yields for *Real Return Bonds* are mid-market closing yields for the last Wednesday of the month and are for the 4.00% bond maturing 1 December 2031. Prior to 24 September 2001, the benchmark bond was 4.25% maturing 1 December 2026. Prior to 7 December 1995, the benchmark bond was 4.25% maturing 1 December 2021.

(14–15) CPI excluding food, energy, and the effect of changes in indirect taxes. CPIW adjusts each of the CPI basket weights by a factor that is inversely proportional to the component's variability. For more details, see "Statistical measures of the trend rate of inflation." *Bank of Canada Review,* Autumn 1997, 29–47

(16) *Unit labour costs* are defined as aggregate labour income per unit of output (real GDP at basic prices).

(17) IPPI: Industrial product price index for finished products comprises the prices of finished goods that are most commonly used for immediate consumption or for capital investment.

(18) Data for average hourly earnings of permanent workers are from Statistics Canada's *Labour Force Information* (Catalogue 71-001).

A2

The majority of data in this table are based on, or derived from, series published in statistical tables in the *Bank of Canada Banking and Financial Statistics.* For each column in Table A2, a more detailed description is given below, as well as the source table in the *Banking and Financial Statistics,* where relevant.

(1) Gross M1: Currency outside banks plus personal chequing accounts plus current accounts plus adjustments to M1 described in the notes to Table E1.

(2) M1+: Gross M1 plus chequable notice deposits held at chartered banks plus all chequable deposits at trust and mortgage loan companies, credit unions, and caisses populaires (excluding deposits of these institutions) plus continuity adjustments.

(3) M1++: M1+ plus non-chequable notice deposits held at chartered banks plus all non-chequable despoits at trust and mortgage loan companies, credit unions, and caisses populaires less interbank non-chequable notice deposits plus continuity adjustments.

(4) M2+: M2 plus deposits at trust and mortgage loan companies and government savings institutions, deposits and shares at credit unions and caisses populaires, and life insurance company individual annuities and money market mutual funds plus adjustments to M2+ described in notes to Table E1.

(5) M2++: M2+ plus Canada Savings Bonds plus cumulative net contributions to mutual funds other than Canadian-dollar money market mutual funds (which are already included in M2+).

(6) Short-term business credit (Table E2)

(7) Total business credit (Table E2)

(8) Consumer credit (Table E2)

(9) Residential mortgage credit (Table E2)

(10) Gross domestic product in current prices (Table H1)

(11) Gross domestic product in chained 1997 dollars (Table H2)

(12) Gross domestic product by industry (Table H4)

(13) Civilian employment as per labour force survey (Table H5)

(14) Unemployment as a percentage of the labour force (Table H5)

(15-16) Data for capacity utilization rates are obtained from the Statistics Canada quarterly publication *Industrial Capacity Utilization Rates in Canada* (Catalogue 31-003), which provides an overview of the methodology. *Non-farm goods-producing industries* include logging and forestry; mines, quarries and oil wells; manufacturing; electric power and gas utilities; and construction.

(17) Consumer price index (Table H8)

(18) Consumer price index excluding the eight most volatile components: fruit, vegetables, gasoline, fuel oil, natural gas, intercity transportation, tobacco, and mortgage-interest costs, as well as the effect of changes in indirect taxes on the other CPI components. (Table H8)

(19) Gross domestic product chain price index (Table H3)

(20) Unit labour costs are defined as aggregate labour income per unit of output (real GDP at basic prices).

(21–22) The data on wage settlements are published by Human Resources and Skills Development Canada and represent the effective annual increase in base wage rates for newly negotiated settlements. These data cover bargaining units with 500 or more employees. Contracts both with and without cost-of-living-allowance clauses are included.

(23–24) Bank of Canada commodity price indexes: Total and total excluding energy (Table H9)

(25) *Treasury bills* are mid-market rates for typical quotes on the Wednesday shown.

(26–27) *Selected Government of Canada benchmark bond yields* are based on actual mid-market closing yields of selected Canada bond issues that mature approximately in the indicated term areas. At times, some of the change in the yield occurring over a reporting period may reflect a switch to a more current issue. Yields for *Real Return Bonds* are mid-market closing yields for the last Wednesday of the month and are for the 4.00% bond maturing 1 December 2031. Prior to 24 September 2001, the benchmark bond was 4.25% maturing 1 December 2026. Prior to 7 December 1995, the benchmark bond was 4.25% maturing 1 December 2021.

(28-29) The data on the government surplus or deficit on a national accounts basis are taken from Statistics Canada's *National Income and Expenditure Accounts* (Catalogue 13-001), where the government surplus or deficit is referred to as "net lending."

(30) Merchandise trade balance, balance of payments basis (Table J1)

(31) Current account balance, balance of payments basis (Table J1)

(32) U.S. dollar in Canadian dollars, average noon spot rate (Table I1)