Bank of Canada Review

Spring 2004

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The Millennial Celebrations in Ancient Rome

The practice of issuing commemorative coins to cele-brate significant milestones in a nation's history has a long tradition that goes back to ancient Greece and Rome. In 1992, Canada celebrated its 125th anniversary by issuing one-dollar and twenty-five cent coins with designs featuring national historic sites and symbols, including the lighthouse at Peggy's Cove in Nova Scotia, the hoodoos in Alberta, and an aboriginal Inukshuk.

The celebrations to mark the 1,000th anniversary of the founding of Rome took place in AD 248 during the reign of the emperor Philip I (244–249). Philip's career was noted for various military victories, administrative improvements, and a certain degree of religious toler-ance. Its pinnacle, however, was the millennial celebra-tions. By the middle of the tumultuous third century, the small village founded on the Tiber River in 753 BC had risen to become the capital of an empire stretch-ing from Spain in the west to Mesopotamia in the east and from Britain in the north to Egypt in the south.

Philip's millennial celebrations began on 21 April and included sumptuous games in the Circus Maximus in Rome. Many of the animals showcased at the games, such as lions, hippopotamuses, gazelles, goats, and stags, were depicted on a series of commemorative coins. Struck in the names of members of the imperial family in gold, silver, or bronze, the coins also fea-tured portraits of Philip, his wife Otacilia Severa, and his son, Philip II.

Among the coins shown on our cover is one bearing a representation of the temple of Roma, the personifi-cation of the city. Other coins depicted a column inscribed "Cos III" in reference to the emperor's third consulship, a suggestion that his reign would continue. Legends adorning the coins proclaimed the dawning of a new era. Glory, however, is fleeting. One year later, Philip was dead, killed in battle at Verona.

The coins pictured on the cover range from approxi-mately 20 to 35 mm in diameter and form part of the National Currency Collection, Bank of Canada.

Photography by Gord Carter, Ottawa

The Bank of Canada's Business Outlook Survey

Monica Martin, Ontario Regional Office

- *Since the autumn of 1997, the regional offices of the Bank of Canada have conducted quarterly consultations with businesses across Canada. These business consultations are timed to feed into the decision-making process that precedes the Bank's fixed dates for announcing monetary policy decisions.*

- *These consultations are now referred to as the Business Outlook Survey (BOS). The BOS provides a flexible and timely method of gathering business perspectives on topics of particular interest to the Bank. The consultations are structured around a questionnaire. Every quarter, 100 firms that reflect the diverse composition of the Canadian economy in terms of region, type of business activity, and firm size are interviewed. Results of the BOS are available on the Bank's Web site and will be published quarterly.*

- *Since the BOS is a relatively new tool, the survey time series is quite short. The assessment presented in this article, which is based on charts and correlations, is intended as an initial guide.*

- *The findings suggest that the survey provides an informative barometer of the Canadian economic environment and leading signals of future activity. The interview responses also provide information about some important economic concepts; namely, production-capacity constraints, labour shortages, and inflation expectations.*

I n the autumn of 1997, the Bank of Canada's regional offices began a structured program of business consultations, now referred to as the Business Outlook Survey (BOS),[1] extending the informal discussions that the Bank had always conducted with businesses, associations, and provincial governments. These consultations, which are structured around a survey questionnaire, are a vehicle for collecting information from businesses across Canada on demand and capacity pressures as well as their forward-looking views on economic activity. The face-to-face format of the meetings facilitates a broader discussion of issues facing firms and allows for clarification of responses. The process also establishes a network of contacts that can be drawn upon to address specific questions as they arise.

Even in the best of times, monetary policy decisions are made in a context of uncertainty about economic conditions, particularly the economic outlook.[2] To mitigate this uncertainty, the Bank gathers information from various sources to develop as much insight as possible into current and prospective economic conditions. Particular attention is paid to the measurement of the output gap[3] and to alternative measures of pressures on the economy's production capacity, since these are considered to be key determinants of inflation pressures and, therefore, of monetary policy decision-making.

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1. See Martin and Papile (2004), which presents a more detailed analysis of the results of the BOS.

2. See Jenkins and Longworth (2002) for a more detailed discussion of types of economic uncertainty.

3. The output gap is defined as the difference between what the economy can produce and what it is actually producing at a certain time.

The BOS provides a flexible method for gathering timely information from a cross-section of regions and industries on topics of particular interest to the Bank. For example, businesses are asked for 12-month outlooks on their activities and two-year views on inflation. These horizons, which are longer-term than those used in many surveys produced outside the Bank, are helpful because of the long and variable lags in the effects of monetary policy.[4] When new issues arise, the BOS consultations present an opportunity to probe business reactions and to broaden the Bank's understanding of the likely impact of these developments. The Bank will begin publishing the BOS data on a quarterly basis in July of this year (see Box 1).

While there are advantages to the BOS, it is not intended to replace the large variety of externally produced surveys of Canadian economic participants (see Box 2 for examples), which are regularly reviewed by Bank of Canada economists. Many of the external surveys are based on a larger sample of responses than the BOS, often using a mail-out or e-mail-based questionnaire (the personal interview format of the BOS allows for two-way communication with respondents but is more time-consuming, which limits the size of the sample for practical reasons). Some surveys focus on a particular sector of Canadian business. While these surveys may not be as broad in scope as the BOS, they are able to gather more detailed information relating to the specific activities of that sector.

When new issues arise, the BOS consultations present an opportunity to probe business reactions and to broaden the Bank's understanding of the likely impact of these developments.

The BOS results are presented to the Bank's Governing Council on a quarterly schedule as part of the information that feeds into the monetary policy decision-making process.[5] The presentation adds an important real-world perspective on economic activity by providing insight into business decisions, as well as information on, and evidence of, what business people are seeing and planning.

In this introduction to the BOS, we describe both the consultation process and the questionnaire and make an initial assessment of the survey data gathered during the business interviews.[6] The analysis of such information is an ongoing process at the Bank.

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4. The effects of changes in monetary policy are spread over a period of 12 to 24 months. For an overview of how monetary policy is transmitted, see Bank of Canada (2001).

5. Other information includes model-based projections, analysis of financial conditions, and an assessment of financial markets' expectations. For a description of this decision-making process, see Macklem (2002).

6. Two previous articles in the *Review* have presented subsets of this survey data. See Brady and Novin (2001) and Amirault and Lafleur (2000).

Box 1
Publishing the Results of the Business Outlook Survey (BOS)

The results of the latest BOS are available on the Bank of Canada's Web site (http://www.bankofcanada.ca/en/bos/2004/index_0404.htm). Beginning in July, the results will be available in the week preceding the Bank's fixed dates for announcing monetary policy decisions in July, October, January, and April.

Results for eight core questions on future sales, investment in machinery and equipment, employment, labour shortages, firms' ability to meet

demand, input-price inflation, output-price inflation, and inflation expectations will be included in each of the published quarterly reports.

The BOS, which measures the sentiments of a sample of 100 businesses across Canada, is one of the sources of information considered when monetary policy decisions are made. The *Monetary Policy Report* and *Updates*, which are released each quarter, explain the Bank's views on economic conditions.

Box 2

A Sample of Other Surveys of Business Activity

Canadian Federation of Independent Business (CFIB), Quarterly Business Barometer: Quarterly survey of CFIB members (predominantly small businesses)

Canadian Manufacturers and Exporters, Management Issues Survey: Annual survey of 400–500 small and medium-sized manufacturing and exporting firms

Conference Board of Canada, Index of Business Confidence: Quarterly survey of a cross-section of Canadian firms that is mailed to approximately 2,000 businesses

Export Development Canada, Trade Confidence Index: Semi-annual survey based on a random sample of approximately 1,000 Canadian businesses, providing responses from a cross-section of industries, regions, and firm sizes

Retail Council of Canada, Report to Members: Occasional surveys of retail firms

Richard Ivey School of Business/Purchasing Management Association of Canada, Ivey Purchasing Managers' Index: Monthly survey of a panel of 175 purchasing managers selected to provide a geographic and industrial cross-section of Canadian firms

Statistics Canada, Business Conditions Survey: Quarterly survey of approximately 4,000 Canadian manufacturing firms, consisting of a questionnaire designed to obtain advance indicators of manufacturing trends such as production, unfilled orders, product inventories, and employment prospects

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The [BOS results] add an important real-world perspective on economic activity by providing insight into business decisions, as well as information on, and evidence of, what business people are seeing and planning.

The Consultations

The BOS consultation process provides an opportunity for Bank economists to engage in a dialogue with businesses about developments in the Canadian economy. The observance of utmost confidentiality fosters candid discussions on a wide variety of business issues. The publication of aggregate results respects the parameters of the Bank's confidentiality agreement with the firms.

The BOS is produced on a quarterly basis by the Bank's regional offices, which are: Atlantic Canada (Halifax); Quebec (Montréal); Ontario (Toronto); the Prairies, Northwest Territories, and Nunavut (Calgary); and British Columbia and the Yukon (Vancouver). For each round of consultations, about 100 private sector companies are carefully selected to provide a representative profile of the Canadian economy. The regional and industrial mix of companies approximates their representation in business sector[7] gross domestic product (GDP). The businesses selected by each region reflect the composition of that region's GDP. A cross-section of small, medium, and large companies are interviewed.[8]

Participation is voluntary. If a selected company is unavailable, another suitable company is substituted so that there are consistently 100 respondents and the profile is maintained. No company is interviewed

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7. Business sector GDP excludes the public sector.

8. Firm size is defined by the number of employees: small (1–100), medium (101–500), or large (more than 500). Each quarter, the aim is to balance the sample with approximately one-third each of small, medium, and large firms.

more than once a year, to avoid company fatigue with the process. This also allows the Bank to develop a broad base of industry contacts. A disadvantage of this approach is that changes over time in the survey results may, in part, reflect sample turnover rather than changes in business conditions.

Meetings take place over a three-week period during each quarter. Typically, two economists from the Bank's regional offices conduct an interview with the chief financial officer or another senior officer of the company. The meetings are structured around the BOS questionnaire. Since the survey deals exclusively with Canadian activity, companies that have operations in other countries are asked to respond based on the experience of their Canadian operations. Consulta-

tions almost always take place in person, although telephone interviews are occasionally arranged to accommodate companies' schedules. This helps to ensure a common understanding of the questions and a better grasp of the issues facing the firm.

The Questionnaire

The BOS questionnaire can be divided into four broad categories of core questions: (i) a question about past business conditions; (ii) questions that gauge the outlook for various aspects of business activity; (iii) questions that evaluate the pressures on firms' production capacity; and (iv) questions that measure firms' outlook on wages, prices, and inflation. A summary is presented in Box 3.

Box 3
Core Survey Questions

Questions included in the BOS can be grouped in the following four broad categories.

Past Business Conditions

Past sales: The growth of sales volume (adjusted for price changes) over the past 12 months (compared with growth over the previous 12 months) was: (*i) greater, (ii) less, (iii) the same.*

Outlook for Business Activity

*Future sales: The growth of sales volume over the next 12 months (compared with growth over the past 12 months) is expected to be: (*i) greater, (aii) less, (iii) the same.*

*Investment intentions for machinery and equipment: The level of investment spending on machinery and equipment over the next 12 months is expected to be: (*i) higher, (ii) lower, (iii) the same.*

Investment intentions for buildings: The level of investment spending on buildings over the next 12 months is expected to be: (*i) higher, (ii) lower, (iii) the same.*

*Outlook for employment: The number of employees (full-time equivalent) employed by your organization over the next 12 months is expected to be: (*i) higher, (ii) lower, (iii) the same.*

Pressures on Production Capacity

*Labour shortages: The organization is facing shortages of labour that restrict the ability to meet demand: (*i) yes, (ii) no.*

*Ability to meet demand: Currently, the potential level of difficulty in meeting an unexpected increase in demand or sales would be: (*i) no difficulty (operating below capacity), (ii) some difficulty (at or near full capacity), (iii) significant difficulty (operating above capacity).*

Outlook for Wages, Prices, and Inflation

Outlook for wages: The increase in labour costs (per hour) over the next 12 months is expected to be: (*i) greater, (ii) less, (iii) the same.*

*Outlook for input prices: The increase in the prices of products or services purchased over the next 12 months is expected to be: (*i) greater, (ii) less, (iii) the same.*

*Outlook for output prices: The increase in the prices of products or services that are sold over the next 12 months is expected to be: (*i) greater, (ii) less, (iii) the same.*

*Inflation-expectations index: The firm's expectation for the average annual rate of inflation over the next two years as measured by the consumer price index (CPI) is: (*i) above 3 per cent, (ii) 2 to 3 per cent, (iii) 1 to 2 per cent, (iv) below 1 per cent.*

* Responses to questions marked with an asterisk will be published in the BOS.

Businesses are asked to provide qualitative responses about their business activity. Questions about the volume of sales exclude the influence of price changes and seek information on real activity. The questions on the outlook for sales, wages, and prices are expressed in terms of momentum (changes in year-over-year rates of growth) to obtain a business perspective on how the environment is changing. Seasonal influences on responses are avoided by asking about expectations over the next 12 months (or two years, in the case of inflation expectations).

Supplementary questions that pertain to issues of topical importance to monetary policy decisions are introduced from time to time. Recent examples of such issues include the effects of global uncertainty on investment spending and the impact of the sharp appreciation of the Canadian dollar. While the supplementary questions have certainly added to the usefulness of the survey, they cannot be analyzed systematically and are therefore not included in the analytic work of this article.

Special topics, sometimes explored in a separate survey, have also been introduced to gain further insight into issues such as the effects on firms of restructuring, dollarization, and price-setting behaviour. These survey topics have been interpreted and evaluated independently.[9]

The Time Series

The assessment of the BOS presented in this article is based on 24 quarterly surveys, from 3Q97 through to, and including, 2Q03. The question on firms' ability to meet demand was introduced only in 3Q99, limiting the number of quarterly surveys available for this question to 16, rather than the full 24.

During the survey's first three years, the BOS consultations were conducted with companies three times a year and with industry associations once a year (during the second quarter). The same questions were employed for both companies and associations. Following the association visits of 2000, the decision was made to base the BOS exclusively on interviews with companies in order to improve the consistency of the time series.[10] Given the short sample available, the three data points based on the association visits are

included in the time series. These three observations are highlighted in the charts.[11]

The survey questions typically use a three-part scale for measuring qualitative responses: *positive/higher*, *no change/the same*, or *negative/lower*. A balance of opinion is a useful way of summarizing these types of responses. The balance-of-opinion data are constructed by subtracting the proportion of negative responses from the proportion of positive responses. Values can range from -100 to +100. For example, a positive balance of opinion for the question on future sales implies that there are more respondents expecting sales momentum (an increase in the growth rate of sales volume) to be positive than are expecting it to be negative.[12]

The responses to questions on firms' ability to meet demand and on labour shortages are summarized as the percentage of respondents experiencing constraints. For the question on inflation expectations, respondents are offered a range of quantitative options for their reply, and an index is constructed to summarize the results. The index is calculated as an average of the midpoints of the response options weighted by the proportion of responses for each option.[13]

The statistical reliability of the survey results is limited by the small sample size. Objectives are set for the number of firms selected by region, industry type, and firm size, for a total of 100 interviews each quarter. This method of sample selection is referred to as quota sampling. While an effort is made to choose a sample that is representative of the Canadian economy, this is *not* a random sample. Therefore, its statistical properties are difficult to ascertain.[14]

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9. For a summary of the results of these surveys, see Kwan (2002) and Murray and Powell (2002, 2003). Results of the survey on price-setting behaviour, which was conducted in 2003, are currently being analyzed.

10. Industry associations have a unique perspective and are still contacted regularly by regional office staff for their views.

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11. The charts indicate a clear difference of perception between companies and associations on the extent of labour shortages. For the question on labour shortages, we therefore present the correlation results for a sample that excludes the three observations from the association visits.

12. Specifically, in response to a question on a firm's expected rate of future sales, if 60 per cent of respondents indicate *greater rate*, 30 per cent indicate *the same rate*, and 10 per cent indicate *lesser rate*, then the balance of opinion is +50 per cent. The proportion of negative responses (10 per cent) is subtracted from the proportion of positive responses (60 per cent).

13. Before 2Q01, the index is the weighted average of three options: index = (percentage of respondents expecting < 1 per cent) x 0.005 + (per cent of respondents expecting 1–3 per cent) x 0.02 + (per cent of respondents expecting > 3 per cent) x 0.035. From 2Q01, the index is a weighted average of the four options: index = (per cent expecting < 1 per cent) x 0.005 + (per cent expecting 1–2 per cent) x 0.015 + (per cent expecting 2–3 per cent) x 0.025 + (per cent expecting > 3 per cent) x 0.035. Note that there is no midpoint for the < 1 per cent and > 3 per cent options. Given the inflation environment of this sample, 0.5 per cent and 3.5 per cent were chosen to represent these options.

14. By comparison, the 95 per cent confidence interval for responses from a random sample of 100 would generally be assessed at +/- 10 percentage points.

Evaluating the Information Content of the Data

A straightforward approach was used to evaluate the information provided by the BOS, given the short time series available for analysis (the 24 quarters from 3Q97 to 2Q03). As a first step, the BOS time series were plotted against comparable variables of economic activity. These charts provide visual evidence of the signalling properties of the data. Large changes in the balance-of-opinion data are of particular interest.

The data are quarterly time series. The BOS data point for time *t* is the quarter when the survey is conducted. These responses are compared with the economic data for the same quarter. For the forward-looking questions, one must therefore look to quarter $t + 4$ to see the outcome in the economic data. (See Box 4 for a more detailed explanation of the terminology used in the analysis.)

The BOS involves only private sector companies so that, wherever data sources were available, responses were compared with data for the private sector only. The economic time series were also transformed into measurement units that match the formulation of the survey question as closely as possible. For example, responses to questions about changes in activity over the next year were compared with year-over-year growth rates in economic activity. Responses to ques-

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Box 4
Terminology

Data are quarterly time series.

Data for time *t* (for survey results and comparable economic variables): The data point for time *t* in the BOS is the quarter when the survey data are collected. The comparable economic time series have been constructed so that *t* represents data for the same quarter.

Data for time $t + 4$ (for survey results and comparable economic variables): The time series for comparable economic variables have been constructed so that $t + 4$ matches the one-year (four-quarter) outlook of the forward-looking questions (future sales, investment intentions, outlook for employment, outlook for wages, input prices, and output prices). For the question on inflation expectations, which asks for a two-year average outlook, the variable constructed for CPI inflation (CPI $_{t + 8}$) matches this outlook.

Growth: Refers to the year-over-year growth rate.

For example,

$$GDPgrowth_t = \left(\frac{GDP_t}{GDP_{t-4}} - 1 \right) \times 100.$$

Momentum: Refers to the year-to-year change in the year-over-year growth rate.

For example,

$$GDPmomentum_t = (GDPgrowth)_t - (GDPgrowth)_{t-4} =$$

$$\left[\left(\frac{GDP_t}{GDP_{t-4}} - 1 \right) \times 100 \right] - \left[\left(\frac{GDP_{t-4}}{GDP_{t-8}} - 1 \right) \times 100 \right].$$

Leads/Lags ($t - x$, t, $t + x$): These terms refer to the quarterly timing of the relationship between the current-quarter BOS results (t) and corresponding economic variables in other periods. That is, lagged correlations ($t - x$) compare survey results in time t with economic data in time $t - x$; contemporaneous correlations (t) compare survey results in time t with economic data in time t; leading correlations ($t + x$) compare survey results in time t with economic data in time $t + x$.

Example

Future Sales: This question asks whether the growth of sales volume over the next year is expected to be greater, less, or to remain the same. The balance of opinion for the current quarter (proportion of responses indicating a greater rate minus proportion of responses indicating a lesser rate) is compared with the momentum of real business sector GDP (year-to-year change in the year-over-year growth rate). The outlook horizon for the question on future sales is one year, so a comparison with GDP momentum over the next year (quarter $t + 4$) matches that horizon. Correlations are presented for $t - 4 \ldots t \ldots t + 4$.

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tions about the expected change in the rate of increase of activity or prices were compared with measures of GDP or price momentum over the comparable period (i.e., changes in year-over-year growth rates).

The charts provide visual evidence of the signalling properties of the survey data. Large changes in the balance-of-opinion data are of particular interest.

To evaluate the indicator properties of some of the questions, comparisons were also made with measures of economic activity of particular interest to the Bank. For example, the responses to the questions relating to pressures on production capacity were compared with the Bank's estimate of the output gap.[15] The responses to the question on output prices were compared with CPI inflation.

Simple pair-wise correlations between the survey data and the economic variables were calculated to measure the strength of the relationship between the BOS data and official economic data. To test the timing of the relationship, correlations of both leading and lagging values of the economic variables were examined. The outlook questions have a four-quarter horizon, so one might expect the highest correlations with the four-quarter lead. However, certain influences may cause the timing of the relationship with the actual economic data to be different. For example, the world changes in unexpected ways; respondents may formulate outlooks based on past experience; or there may be measurement differences between business evaluations and economic data.

With only 24 observations, the 95 per cent confidence bands for the correlation coefficients are quite wide.

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15. The estimate of the output gap used for the analysis in this article is from the Bank's 2003 projection, which was published in the October 2003 *Monetary Policy Report* (Bank of Canada 2003).

The following rough scale of assessment is used to evaluate the correlation coefficients: strong, > 0.80; moderately strong, 0.80 to 0.60; moderate, 0.60 to 0.40; weak, 0.40 to 0.20; insignificant, < 0.20.

The Results: Charts and Correlation Tables

Each of the core survey questions from the BOS questionnaire is evaluated individually. The questions are grouped into the four categories presented in Box 3: Past Business Conditions; Outlook for Business Activity; Pressures on Production Capacity; and Outlook for Wages, Prices, and Inflation.

Summary of Assessment Results

- Overall, the charts indicate that large changes in the balance of opinion appear to signal changes in comparable economic variables.

- The question on past sales experience provides a timely barometer of recent economic activity and sets the stage for the questions on the outlook for business activity and production capacity.

- The questions on the outlook for business activity do not consistently predict future activity. However, large changes in the balance of opinion appear to provide leading signals. Firms' predictions regarding economic developments over the next four quarters are closer to what actually occurs over the next two quarters.

- The responses to questions on pressures on production capacity provide potentially useful proxy indicators for production-capacity constraints, labour shortages, and the output gap.

- The questions on input prices and output prices provide moderately strong signals of price momentum one to two quarters in advance.

- Firms' views about the average rate of CPI inflation over the next two years have been well anchored around the Bank's 2 per cent target for inflation.

**Box 5
Summary**

Assessing the Correlation Results

Survey variable	Economic variable	Correlation
Past sales	Momentum* of real business GDP	moderately strong: $t - 1$
Outlook for business activity		
Future sales	Momentum of real business GDP	moderate: $t + 1$, $t + 2$
Investment intentions for machinery and equipment	Growth of business investment in machinery and equipment	moderate: $t + 2$
Investment intentions for buildings	Growth of business investment in buildings	weak: $t + 4$
Outlook for employment	Growth of private sector employment	moderate: $t + 2$
Pressures on production capacity		
Labour shortages	Output gap	moderate: $t - 1$, t
Ability to meet demand	Industrial capacity utilization rate	strong: t, $t + 1$
Ability to meet demand	Output gap	moderately strong: t, $t + 1$
Outlook for wages, prices, and inflation		
Outlook for wages	Momentum of business sector compensation	moderate: t; weak: $t + 1$
Outlook for input prices	Momentum of the GDP deflator	moderately strong: $t + 1$
Outlook for output prices	Momentum of the GDP deflator	moderately strong: $t + 1$
Outlook for output prices	Momentum of total CPI	moderately strong: $t + 2$
Inflation-expectations index	2-year total CPI inflation	moderately strong: t, weak beyond $t + 3$

* See Box 4 for a definition of momentum.

Conclusion

The BOS was initiated as an extension of the public consultations that the Bank has always conducted. It formalizes this consultation process and systematically summarizes much of the information obtained on business experiences.

Business perceptions and expectations are interesting in and of themselves. They are of greater value, however, if they can provide policy-makers with a more accurate understanding of current and future economic activity. The assessment presented in this article is intended to provide an initial interpretation of the BOS data. On balance, the results suggest that the

BOS provides informative measures of current business conditions and expected future activity. It will be important to update this analysis as the number of observations available expands, allowing for an increased degree of confidence in the results.

It should be emphasized that the value of the BOS goes beyond the data captured by the questionnaire. The BOS interview format allows for a broader understanding of current business perceptions through confidential discussions with business representatives, which provide invaluable information that cannot be measured quantitatively.

PAST BUSINESS CONDITIONS

Chart 1

Past Sales and Real Business GDP
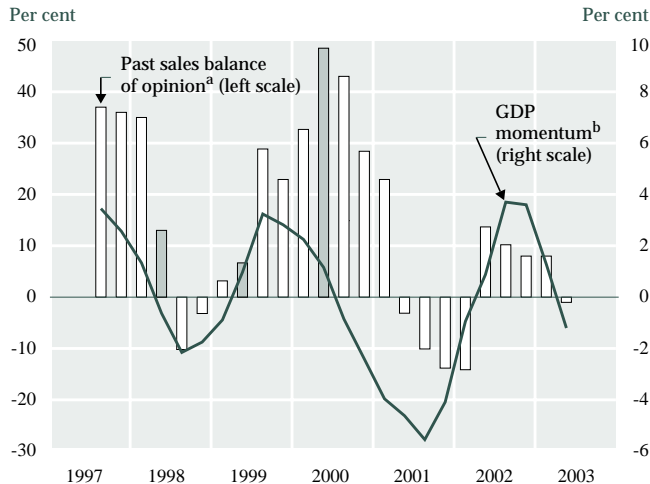
Per cent   Per cent

a. Growth of sales volume over the past 12 months compared with growth over the previous 12 months—percentage of firms that experienced faster growth minus the percentage that experienced slower growth

b. Momentum refers to the year-to-year change in the year-over-year growth rate.

▢ 2Q98, 2Q99, and 2Q00: industry association survey

Table 1

Correlation Between Past Sales at Time t and the Momentum of Real Business GDP (BGDP)

BGDP $_{t-4}$	0.26
BGDP $_{t-3}$	0.50
BGDP $_{t-2}$	0.64
BGDP $_{t-1}$	**0.68**
BGDP $_{t}$	0.53
BGDP $_{t+1}$	0.15
BGDP $_{t+2}$	-0.35
BGDP $_{t+3}$	-0.76
BGDP $_{t+4}$	-0.90

- Responses have a moderately strong correlation with momentum in real business sector GDP in the previous quarter.

OUTLOOK FOR BUSINESS ACTIVITY

Chart 2

Future Sales and Real Business GDP
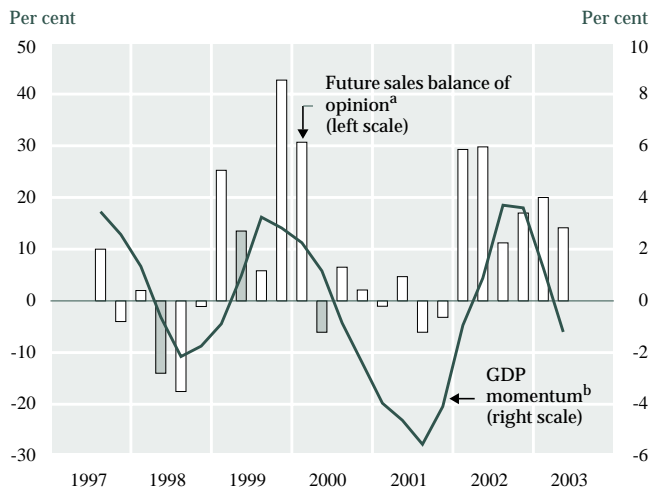
Per cent   Per cent

a. Growth of sales volume over the next 12 months compared with growth over the past 12 months—percentage of firms expecting faster growth minus the percentage expecting slower growth

b. Momentum refers to the year-to-year change in the year-over-year growth rate.

▢ 2Q98, 2Q99, and 2Q00: industry association survey

Table 2

Correlation Between Future Sales at Time t and the Momentum of Real Business GDP (BGDP)

BGDP $_{t-4}$	-0.58
BGDP $_{t-3}$	-0.44
BGDP $_{t-2}$	-0.15
BGDP $_{t-1}$	0.21
BGDP $_{t}$	0.43
BGDP $_{t+1}$	**0.54**
BGDP $_{t+2}$	0.50
BGDP $_{t+3}$	0.18
BGDP $_{t+4}$	-0.26

- This question does not track small changes in momentum in business sector GDP consistently over the sample periods. It does appear, however, to have signalled large changes in momentum (see 1Q99, 2Q00, and 1Q02).

- The correlation with momentum in real business sector GDP indicates that this is a moderate indicator of future activity one to two quarters ahead ($t+1$, $t+2$).

OUTLOOK FOR BUSINESS ACTIVITY

Chart 3a

Investment Intentions for Machinery and Equipment and Business Investment in Machinery and Equipment
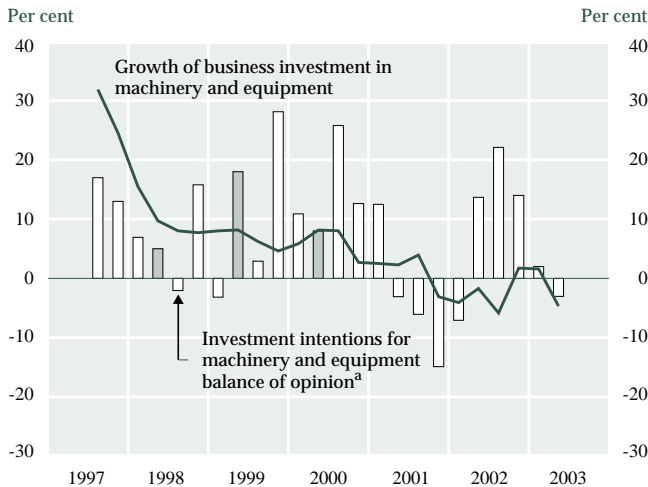
Per cent

a. Expected level of investment spending over the next 12 months compared with the past 12 months—percentage of firms expecting more investment minus the percentage expecting less investment

☐ 2Q98, 2Q99, and 2Q00: industry association survey. Associations were asked one general question about total investment spending, and those results are used in both Chart 3a and Chart 3b.

Chart 3b

Investment Intentions for Buildings and Business Investment in Buildings
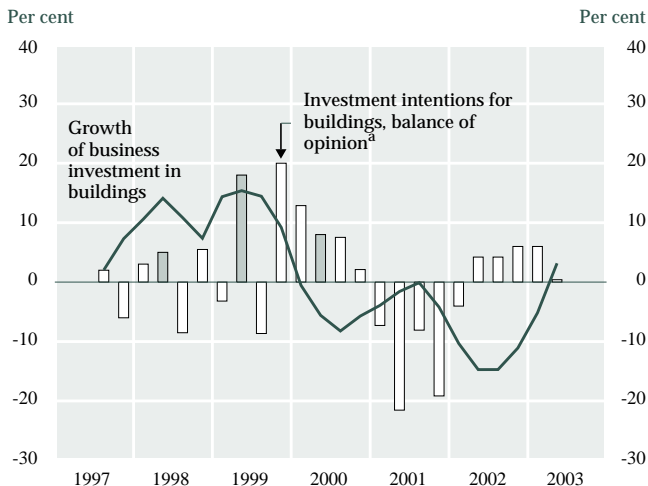
Per cent

a. Expected level of investment spending over the next 12 months compared with the past 12 months—percentage of firms expecting more investment minus the percentage expecting less investment

☐ 2Q98, 2Q99, and 2Q00: industry association survey. Associations were asked one general question about total investment spending, and those results are used in both Chart 3a and Chart 3b.

Table 3a

Correlation Between Investment Intentions for Machinery and Equipment at Time t and Growth of Business Investment in Machinery and Equipment (INV)

INV_{t-4}	-0.03
INV_{t-3}	0.02
INV_{t-2}	0.08
INV_{t-1}	0.18
INV_t	0.28
INV_{t+1}	0.31
INV_{t+2}	**0.41**
INV_{t+3}	0.30
INV_{t+4}	0.15

- The survey asks two questions about investment intentions: one for planned investment in machinery and equipment and the other for investment in buildings.[1] The question about machinery and equipment is of primary interest, since this type of activity is expected to provide the best signal about cyclical developments.

- Chart 3a suggests a poor relationship over the first half of the sample but stronger signals over the most recent sample.

- Correlations were moderate to weak, with the strongest result for investment intentions for machinery and equipment at quarter $t+2$ (0.41).

Table 3b

Correlation Between Investment Intentions for Buildings at Time t and Growth of Business Investment in Buildings (INVB)

$INVB_{t-4}$	0.40
$INVB_{t-3}$	0.38
$INVB_{t-2}$	0.24
$INVB_{t-1}$	0.15
$INVB_t$	0.06
$INVB_{t+1}$	0.07
$INVB_{t+2}$	0.12
$INVB_{t+3}$	0.20
$INVB_{t+4}$	**0.29**

1. The results for the question on investment intentions for buildings are based on a smaller sample of respondents. On average, 20 per cent of respondents answered "Not applicable."

Chart 4

Outlook for Employment and Private Sector Employment
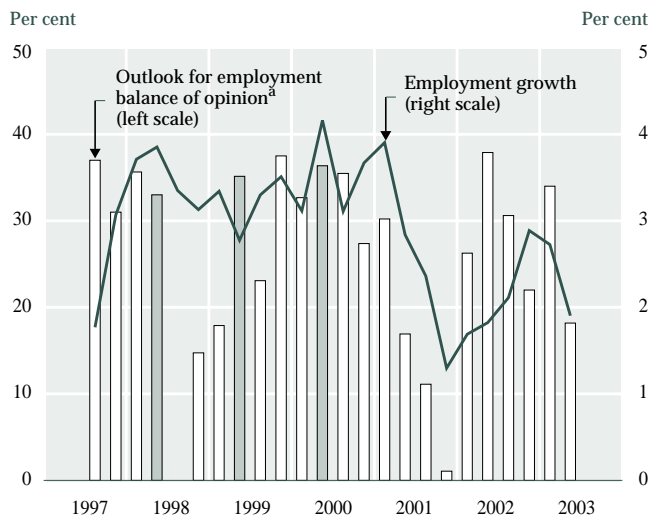
Per cent | Per cent

a. Expected level of employment (full-time equivalent) over the next 12 months compared with the past 12 months—percentage of firms expecting more employment minus the percentage expecting less employment

▨ 2Q98, 2Q99, and 2Q00: industry association survey

Table 4

**Correlation Between the Outlook for Employment at Time *t* and Growth of Private Sector Employment (EMP)**

EMP $_{t-4}$	-0.18
EMP $_{t-3}$	-0.40
EMP $_{t-2}$	-0.46
EMP $_{t-1}$	-0.12
EMP $_t$	0.25
EMP $_{t+1}$	0.38
EMP $_{t+2}$	**0.55**
EMP $_{t+3}$	0.33
EMP $_{t+4}$	0.08

- The optimistic outlook for employment in 1997, through 1999 and 2000, and in 2002 was consistent with the Canadian experience of strong employment growth during those periods. On the other hand, respondents' pessimism about employment growth from 3Q98 to 1Q99 did not materialize in weak employment growth.

- Overall, the correlations suggest moderate information content, with a correlation of 0.55 for two quarters ahead $(t+2)$.

PRESSURES ON PRODUCTION CAPACITY

Chart 5

Labour Shortages and the Output Gap
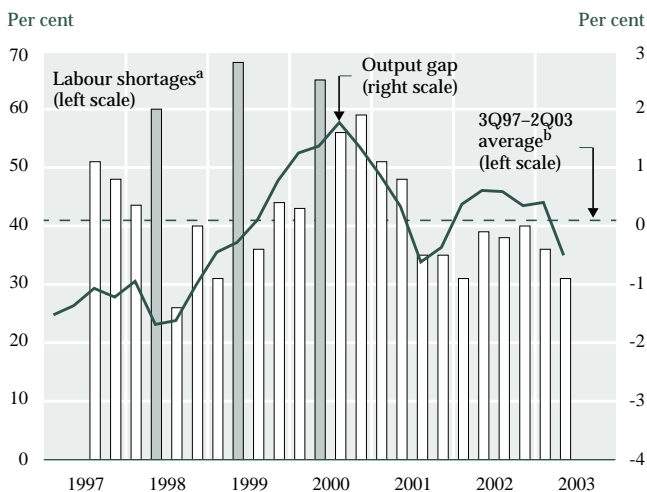
Per cent | Per cent

a. Percentage of respondents indicating that they face shortages of labour that restrict their ability to meet demand
b. Average calculated excluding association data.

▨ 2Q98, 2Q99, and 2Q00: industry association survey

Table 5

Correlation Between Labour Shortages at Time *t* and the Output Gap (OG) (excluding association data)

OG $_{t-4}$	0.01
OG $_{t-3}$	0.21
OG $_{t-2}$	0.33
OG $_{t-1}$	0.43
OG $_t$	**0.43**
OG $_{t+1}$	0.17
OG $_{t+2}$	-0.13
OG $_{t+3}$	-0.32
OG $_{t+4}$	-0.45

- This question was designed to measure scarcity of resources in the labour market and to signal pressures on the output gap arising from employment conditions.

- The period of labour-market tightness in 2000 did coincide with the peak in the Bank's measure of the output gap. The correlation with the output gap was only moderate (0.43) for quarters t and $t-1$.

PRESSURES ON PRODUCTION CAPACITY

Chart 6a

Ability to Meet Demand and the Industrial Capacity Utilization Rate
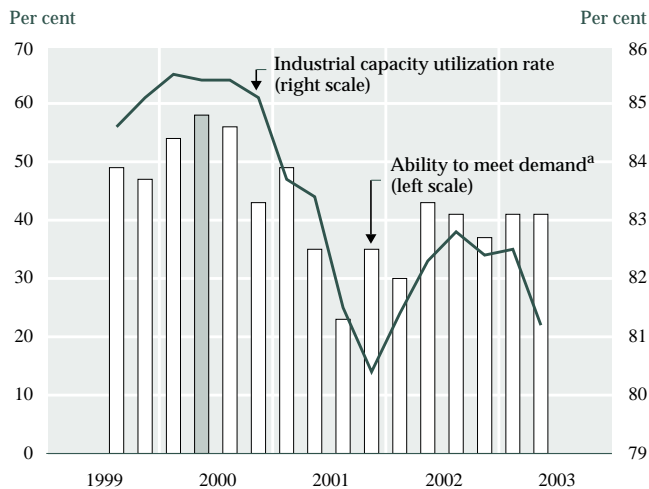
Per cent   Per cent

Industrial capacity utilization rate (right scale)

Ability to meet demand[a] (left scale)

a. Percentage of respondents indicating difficulty in meeting an unexpected increase in demand (significant difficulty/some difficulty)

2Q00: industry association survey

Table 6a

Correlation Between Ability to Meet Demand at Time *t* and Industrial Capacity Utilization Rate (CAPU)

$CAPU_{t-4}$	-0.09
$CAPU_{t-3}$	0.09
$CAPU_{t-2}$	0.43
$CAPU_{t-1}$	0.66
$CAPU_{t}$	0.80
$CAPU_{t+1}$	**0.88**
$CAPU_{t+2}$	0.68
$CAPU_{t+3}$	0.43
$CAPU_{t+4}$	0.17

Table 6b

Correlation Between Ability to Meet Demand at Time *t* and the Output Gap (OG)

OG_{t-4}	-0.61
OG_{t-3}	-0.43
OG_{t-2}	0.05
OG_{t-1}	0.44
OG_{t}	0.75
OG_{t+1}	**0.77**
OG_{t+2}	0.51
OG_{t+3}	0.26
OG_{t+4}	0.02

Chart 6b

Ability to Meet Demand and the Output Gap
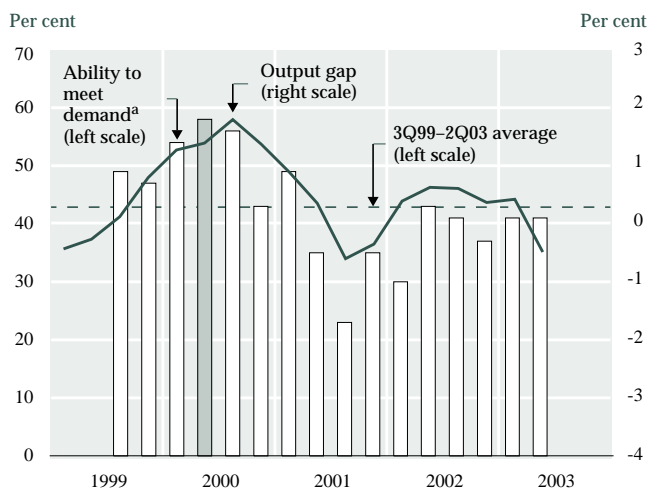
Per cent   Per cent

Ability to meet demand[a] (left scale)

Output gap (right scale)

3Q99–2Q03 average (left scale)

a. Percentage of respondents indicating difficulty in meeting an unexpected increase in demand (significant difficulty/some difficulty)

2Q00: industry association survey

- Note that the time-series data for this question begin in 3Q99.

- Comparisons were made with the Statistics Canada measure of industrial capacity utilization and the Bank's estimate of the output gap.

- The charts and correlations suggest strong information content. This question appears to provide a good proxy for capacity utilization and the output gap.

OUTLOOK FOR WAGES, PRICES, AND INFLATION

Chart 7

Outlook for Wages and Business Sector Compensation per Hour
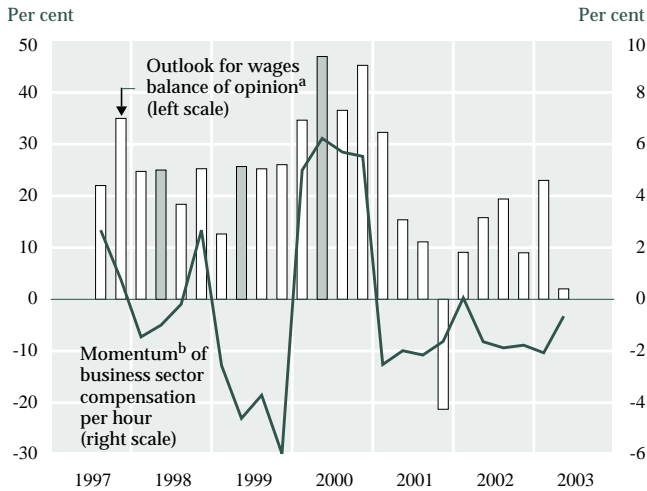
a. Expected increases in labour costs (wages per hour) over the next 12 months compared with the past 12 months—percentage of firms expecting greater increases in labour costs minus the percentage expecting lesser increases

b. Momentum refers to the year-to-year change in the year-over-year growth rate.

☐ 2Q98, 2Q99, and 2Q00: industry association survey

Table 7

Correlation Between the Outlook for Wages at Time t and Momentum of Business Sector Compensation per Hour (BSC)

BSC $_{t-4}$	-0.42
BSC $_{t-3}$	0.09
BSC $_{t-2}$	0.26
BSC $_{t-1}$	0.45
BSC $_t$	**0.49**
BSC $_{t+1}$	0.30
BSC $_{t+2}$	0.28
BSC $_{t+3}$	0.18
BSC $_{t+4}$	0.02

- The BOS responses are compared with compensation in the business sector and do not consistently track this measure of wages.

- Responses were moderately correlated with current wages and provided weak leading information at quarter $t+1$.

Chart 8

Outlook for Input Prices and the GDP Deflator

a. Expected increases in input prices over the next 12 months compared with the past 12 months—percentage of firms expecting greater price increases minus the percentage expecting lesser price increases

b. Momentum refers to the year-to-year change in the year-over-year growth rate.

☐ 2Q98, 2Q99, and 2Q00: industry association survey

Table 8

Correlation Between the Outlook for Input Prices at Time t and Momentum of the GDP Deflator (PGDP)

PGDP $_{t-4}$	-0.24
PGDP $_{t-3}$	-0.17
PGDP $_{t-2}$	0.05
PGDP $_{t-1}$	0.30
PGDP $_t$	0.55
PGDP $_{t+1}$	**0.72**
PGDP $_{t+2}$	0.50
PGDP $_{t+3}$	0.15
PGDP $_{t+4}$	-0.32

- The BOS results track the broad cyclical movements of the measure of momentum in the GDP deflator quite well, providing advance indications of the sharp increase in the deflator in 2002 and the subsequent decline in momentum in 2003.

- The correlation results indicate that the survey results provide moderately strong leading information for prices in the next quarter, with a coefficient of 0.72 ($t+1$).

OUTLOOK FOR WAGES, PRICES, AND INFLATION

Chart 9a

Outlook for Output Prices and the GDP Deflator

Per cent (left axis) — Per cent (right axis)

a. Expected increases in output prices over the next 12 months compared with the past 12 months—percentage of firms expecting greater price increases minus the percentage expecting lesser price increases
b. Momentum refers to the year-to-year change in the year-over-year growth rate.
☐ 2Q98, 2Q99, and 2Q00: industry association survey

Chart 9b

Outlook for Output Prices and the CPI
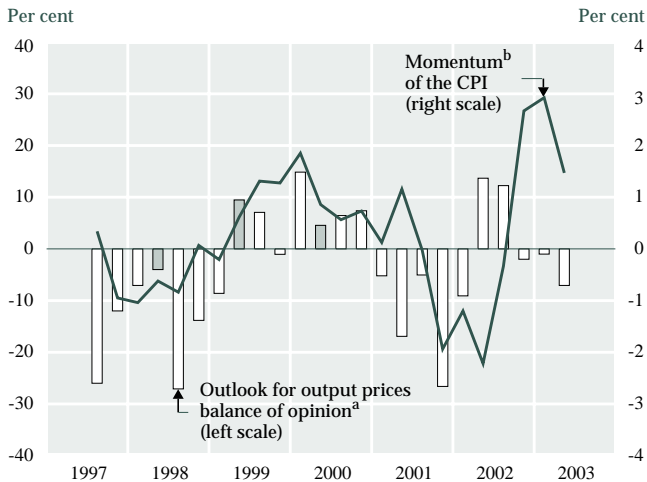
Per cent (left axis) — Per cent (right axis)

a. Expected increases in output prices over the next 12 months compared with the past 12 months—percentage of firms expecting greater price increases minus the percentage expecting lesser price increases
b. Momentum refers to the year-to-year change in the year-over-year growth rate.
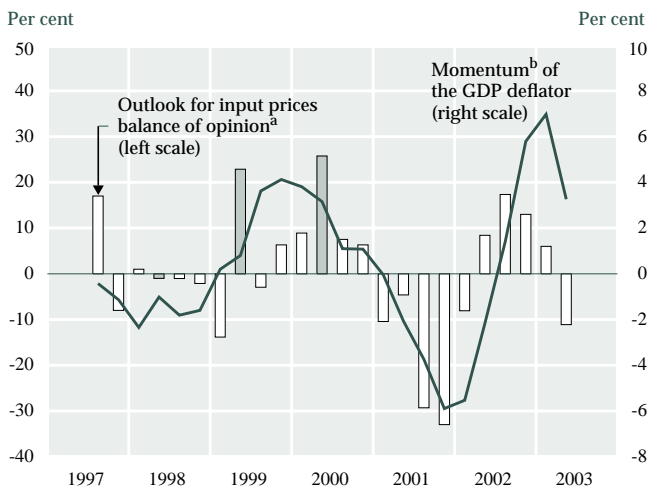☐ 2Q98, 2Q99, and 2Q00: industry association survey

Table 9a

Correlation Between the Outlook for Output Prices at Time t and Momentum of the GDP Deflator
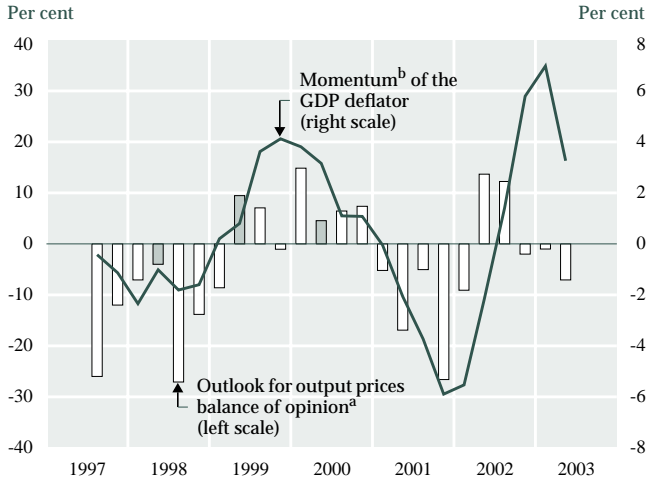
PGDP $_{t-4}$	-0.11
PGDP $_{t-3}$	-0.05
PGDP $_{t-2}$	0.08
PGDP $_{t-1}$	0.24
PGDP $_{t}$	0.50
PGDP $_{t+1}$	**0.64**
PGDP $_{t+2}$	0.54
PGDP $_{t+3}$	0.23
PGDP $_{t+4}$	-0.25

Table 9b

Correlation Between the Outlook for Output Prices at Time t and Momentum of the CPI

CPI $_{t-4}$	0.09
CPI $_{t-3}$	0.06
CPI $_{t-2}$	-0.07
CPI $_{t-1}$	0.08
CPI $_{t}$	0.29
CPI $_{t+1}$	0.49
CPI $_{t+2}$	**0.75**
CPI $_{t+3}$	0.40
CPI $_{t+4}$	-0.10

- Both the charts for the GDP deflator and CPI momentum demonstrate the strong information content of the question on output prices.
- Correlation results indicate that the BOS data provide moderately strong leading information for momentum in the GDP deflator one quarter ahead (0.64 at $[t+1]$) and for momentum in the CPI two quarters out (0.75 at $[t+2]$).

Chart 10

Inflation-Expectations Index and CPI Inflation

Per cent
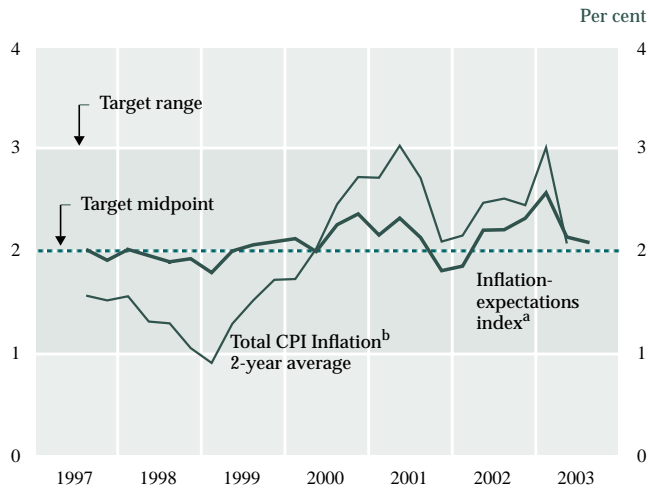
a. Index of responses for the expected annual rate of CPI inflation over the next
    two years. For index methodology, see footnote 13 on p. 7.
b. For more information on the target rate for inflation, see the Bank's Web site
    at: http://www.bankofcanada.ca/en/backgrounders/bg-i3.htm

Table 10

Correlation Between the Inflation-Expectations Index at Time *t* and Total CPI Inflation (2-year average) (CPIT)

CPIT $_t$	**0.78**
CPIT $_{t+1}$	0.58
CPIT $_{t+2}$	0.52
CPIT $_{t+3}$	0.48
CPIT $_{t+4}$	0.25
CPIT $_{t+5}$	0.22
CPIT $_{t+6}$	0.35
CPIT $_{t+7}$	0.31
CPIT $_{t+8}$	-0.02

• Inflation expectations appear to have been well anchored over the sample period. The inflation-expectations index fluctuated within a relatively narrow range, very close to the Bank's target of 2 per cent. From 3Q97 to early 2000, this index was virtually unchanged.

• Correlation results indicate a strong relationship between the inflation-expectations index and total CPI inflation in the current quarter (0.78[*t*]) and weaker correlations over the outlook period. The magnitude of the movements in this index have been quite small relative to the total CPI measure.

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Appendix

Data Sources

The data used to prepare the charts and tables were obtained from the following sources as of October 2003.

Economic Variables: Series Name	Source
Business sector GDP at basic prices, seasonally adjusted, constant 1997 dollars	Statistics Canada: V2044313
Private sector employment, unadjusted	Statistics Canada: V2067135
Business investment (machinery and equipment), unadjusted, current dollars	Statistics Canada: V499493
Business investment (buildings), unadjusted, current dollars	Statistics Canada: V499491
Total CPI, all items, unadjusted	Statistics Canada: V735319
Total industrial capacity utilization rate	Statistics Canada: V4331081
GDP deflator	Statistics Canada: V1997756
Output gap, Bank of Canada estimate	Bank of Canada: October 2003 *Monetary Policy Report*
Business sector compensation per hour (index)	Statistics Canada:V1409158
Business Outlook Survey	Bank of Canada

Exchange Rate Pass-Through in Industrialized Countries

Jeannine Bailliu and Hafedh Bouakez, International Department

- *Although estimates of exchange rate pass-through vary both by industry and by country, it appears that the full effect of a depreciation or appreciation of the domestic currency is not passed through to local-currency import prices across industrialized countries.*

- *Many industrialized countries seem to have experienced a decline in exchange rate pass-through to consumer prices in the 1990s, despite large exchange rate depreciations in many of them.*

- *The fact that this documented decline in exchange rate pass-through has coincided with the low-inflation period that most industrialized countries entered a decade or so ago has popularized the view that these two phenomena could be linked.*

- *Assessing the extent of exchange rate pass-through, and whether it has indeed declined, has important implications for the conduct and design of monetary policy.*

T he degree to which exchange rate movements are reflected in prices has long been a question of interest in international economics. Interest in this issue, however, was rekindled in the 1970s by a combination of rising inflation and the adoption of more flexible exchange rate regimes in many industrialized countries following the demise of the Bretton-Woods system of adjustable pegs.[1] In this high-inflation environment, concern increased among central bankers about the potential effects of movements in their currencies on inflation. In particular, there were concerns that a vicious cycle could emerge in which a large currency depreciation could fuel inflation and increase expectations of higher future inflation.

This fear that a currency depreciation could degenerate into an inflationary spiral subsided as industrialized countries began to reduce and stabilize their inflation rates in the 1980s and early 1990s (Chart 1). Although several factors may have contributed to this trend towards low and stable inflation, it is generally agreed that a shift towards more credible monetary policy regimes played an important role. In countries like Australia, Canada, and the United Kingdom, the increased credibility was supported by the adoption of an inflation-targeting framework for conducting monetary policy. In others, such as the United States, monetary policy credibility was boosted by a sustained commitment to maintaining low inflation.

This low-inflation period, which most industrialized countries entered approximately a decade ago, also happened to coincide with significant exchange rate depreciations. However, these depreciations had much smaller effects on consumer prices than anticipated, based on historical experience. The response of

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1. Inflation rose in the 1970s in part as a result of the oil-price shocks and the accommodative policy response to these shocks.

Chart 1

Inflation Rates in Selected Industrialized Countries

Year-over-year percentage change in total comsumer price index
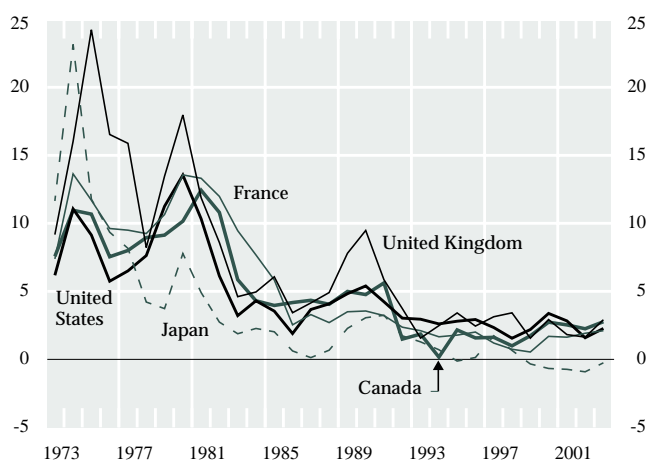
consumer prices to the large currency depreciations experienced by Canada, Sweden, and the United Kingdom in the 1990s, for example, was much smaller than expected. This common experience has led to the belief that the extent to which exchange rate movements are "passed-through" to consumer prices has declined.[2] Assessing this view has important implications for monetary policy. Indeed, a decline in pass-through would imply that movements in the exchange rate have smaller effects on consumer prices and, hence, on short-run inflation, than previously thought.[3] This could influence central bankers' forecasts of the future path of inflation, a key element in the conduct of monetary policy. Moreover, if nominal changes in the exchange rate have a smaller effect on the relative price of the domestic and foreign goods, this would translate into a dampening of "expenditure-switching" effects.[4] Finally, a decline in exchange rate pass-through could have implications for the international transmission of monetary shocks and the

choice of exchange rate regime and monetary policy regime in industrialized countries.

This article examines exchange rate pass-through in industrialized countries. We first examine why pass-through might be expected to be less than complete, even in the long run, a premise that is consistent with findings in the empirical literature. We then review empirical estimates of pass-through across industrialized countries and investigate whether pass-through has indeed declined. Explanations for this decline are then reviewed, followed by a discussion of policy implications.

Why Is Exchange Rate Pass-Through Incomplete?

A depreciation of a country's domestic currency is typically expected to result in an increase in the prices of imported goods.[5] If the effect of the depreciation is fully reflected in import prices, then pass-through is said to be full, or complete. If only a portion of the depreciation is reflected in import prices, then pass-through is described as partial, or incomplete. The extent and speed of the pass-through to import prices will depend on several factors, including expectations as to the duration of the depreciation, the cost of adjusting prices, and demand conditions.

The pass-through process consists of two stages. In the first stage, exchange rate movements are transmitted to import prices. In the second stage, changes in import prices are transmitted to consumer prices.

The pass-through process consists of two stages. In the first stage, exchange rate movements are transmitted to import prices. In the second stage, changes in import prices are transmitted to consumer prices. The extent to which those changes are reflected in the consumer price index (CPI) depends on the share of imports

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2. The change in domestic prices that results from a change in the exchange rate is referred to as *exchange rate pass-through*. This concept is traditionally defined in the literature as the percentage change in the domestic-currency price of an imported good resulting from a 1 per cent change in the nominal exchange rate between the exporting and importing countries. This definition has evolved over time to include other types of prices, notably consumer prices.

3. In an economy where inflation expectations are well anchored, movements in the exchange rate should not have an impact on the trend rate of inflation.

4. Expenditure-switching effects are defined and discussed in more detail in the section on policy implications.

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5. This applies to the prices of both intermediate and final imported goods. For intermediate goods, an increase in the price of imported inputs would translate into higher production costs.

in the consumption basket. Typically, however, a change in the exchange rate will affect consumer prices through an additional channel: a currency depreciation which leads to higher prices for imported goods will, in turn, increase the demand for domestically produced goods that compete with imports. As demand rises, there will be upward pressure on domestic prices and nominal wages. Rising wages will exert further upward pressure on domestic prices.[6]

Pass-through to import prices

The bulk of the literature on exchange rate pass-through is motivated by a common finding in empirical studies that import prices do not respond fully to changes in the exchange rate, even in the long run.[7] Incomplete pass-through to import prices reflects departures from the law of one price (LOP) in traded goods. According to the LOP, in competitive markets free of transportation costs and official barriers to trade, homogeneous goods must sell for the same price when their prices are converted to a common currency, regardless of where those goods are sold. Violations of the LOP can occur either because of trade costs or pricing to market (PTM).

Incomplete pass-through to import prices reflects departures from the law of one price (LOP) in traded goods.

Trade costs include all factors that drive a wedge between goods prices in the domestic and foreign markets, ranging from transport costs to tariffs and non-tariff barriers. It is important to emphasize, however, that pass-through will be complete if the marginal trade cost is constant. In that case, the LOP holds, up to a constant, and exchange rate movements are entirely transmitted to import prices. Non-constant marginal costs of transport, on the other hand, can lead to incomplete pass-through. Krugman (1987) illustrates this point using a simple example which assumes that the marginal cost of transport rises with the volume of imports. If the currency of the import-

ing country appreciates, import prices will fall, thereby causing an increase in the volume of imports. The rise in imports will trigger a rise in the marginal transport cost. As a result, import prices will not fall by as much as the currency appreciates.

PTM is the ability of monopolistically competitive firms to (intentionally) practise price discrimination, setting different prices for different destination markets.[8] As microeconomic theory suggests, under certain conditions, such behaviour can be optimal from the firm's perspective. It is clear, however, that PTM is possible only if there are economic and/or institutional constraints that prevent agents from exploiting international arbitrage opportunities in the goods market. The automobile sector is a good example of an industry where firms engage in PTM. For example, retail prices (when converted to the same currency) for the same vehicles across automobile producers have been substantially lower in Canada than in the United States in recent years.[9] Automobile producers discourage "cross-border shopping" using various means, such as limiting the validity of warranties to the country of purchase.

A crucial result in the literature is that the extent of PTM depends on the firm's markup over marginal cost.[10] In particular, if the firm has a constant markup, there is no PTM, and import prices move in proportion to exchange rates. On the other hand, if the firm's markup decreases as its price increases, PTM occurs, and pass-through to import prices is less than complete.[11] To illustrate this point, consider a depreciation of the domestic currency. In this case, the domestic-currency price of a foreign good will increase, inducing the foreign exporting firm to lower its markup. As a result, the import price rises by less than the exchange rate depreciation.

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6. See Caramazza (1986) for further discussion.

7. Goldberg and Knetter (1997) provide a comprehensive review of this literature.

8. Empirically, there seems to be strong evidence in favour of PTM. Using disaggregated Canadian and U.S. price data, Engel (1993) shows that the relative price variability of similar goods across countries is higher than that between differentiated goods within the same country. In addition, using CPI data for U.S. and Canadian cites, Engel and Rogers (1996) find that deviations from the LOP are much higher for two cities located in different countries than for two equidistant cities in the same country.

9. For example, in 2002, manufacturers' suggested retail prices ranged from 25 to 40 per cent lower in Canada for many small and mid-sized sedans and for minivans (see www.canadiandriver.com for Canadian prices and www.autotrader.com for U.S. prices).

10. This result has been shown by Dornbusch (1987), Krugman (1987), and Marston (1990), among others.

11. The rationale behind the idea that the firm's markup decreases when its price increases is the firm's desire to maintain its market share.

Initial work on PTM was carried out using a partial-equilibrium approach that treats exchange rate movements as an exogenous process. A drawback to this approach is that it obscures the mechanisms (and channels) through which the exchange rate is affected by other economic variables. More recently, PTM has been embedded in a general-equilibrium framework by Betts and Devereux (1996). They introduce PTM by assuming that prices are pre-set in the currency of the importing country, an assumption that has come to be known as local-currency pricing (LCP).[12] Hence, if a monetary shock hits the importing economy, and its currency appreciates, import prices will remain unchanged, resulting in a zero pass-through. To allow for limited but non-zero pass-through, subsequent studies that build on Betts and Devereux (1996) assume that import prices are sticky in local currency.[13] That is, import prices are not completely predetermined but take time to adjust. Typically, this sluggishness in price adjustment is explained by assuming that firms change their prices infrequently and in a staggered fashion or that they face explicit costs of adjusting prices.[14] Under these circumstances, the extent of pass-through will depend on the degree of stickiness in import prices: the more rigid those prices are in local currency, the lower will be the exchange rate pass-through.[15]

PTM is the ability of monopolistically competitive firms to (intentionally) practise price discrimination, setting different prices for different destination markets.

Price-adjustment costs also explain why the degree of pass-through tends to be low when exchange rate appreciations or depreciations are not expected to be persistent. Indeed, a transitory variation in the exchange rate implies that a firm that expects to pass exchange rate movements through to its price will have to change its price twice in a short period of time. If the gain from doing so is not large enough to justify the costs of adjusting the price, import prices will remain unchanged, and pass-through will be zero.

Pass-through to consumer prices

Typically, the consumption basket used to compute the CPI in a given country consists of domestically produced and imported goods. The extent of pass-through to the CPI will therefore depend on the rate of pass-through to import prices, the share of imports in the consumption basket, and the response of domestically produced goods to movements in the exchange rate. Assuming for a moment that the prices of domestically produced goods do not respond to exchange rate changes, there are at least two reasons why pass-through to consumer prices might not equal the share of imports in the consumption basket even if pass-through to import prices is complete. First, local distribution costs, such as transportation costs, marketing, and services, will cause import and consumer prices to diverge, and the wedge between the two prices will fluctuate if distributors adjust their profit margins in response to movements in the exchange rate. Second, as discussed in Bacchetta and van Wincoop (2002), differences in the optimal pricing strategies of foreign wholesalers and domestic retailers can explain why pass-through to consumer prices is lower than the share of imports in the CPI even when pass-through to import prices is complete. Indeed, this discrepancy can occur if foreign exporting firms price their goods in the exporter's currency, while domestic retailers resell these goods priced in domestic currency.[16] However, as discussed earlier, the prices of domestically produced goods typically do respond to movements in the exchange rate, and this provides an additional reason why the rate of pass-through to consumer prices need not be equal to the share of imports in the consumption basket even if pass-through to import prices is complete. It is worth emphasizing

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12. In contrast, producer-currency pricing (PCP) refers to the denomination of imported goods in the currency of the exporting country.

13. An alternative way to obtain incomplete but non-zero pass-through is to assume that there is a combination of LCP and PCP in the economy. That is, only a fraction of import prices are pre-set in domestic currency, while the remaining prices are pre-set in foreign currency. In this case, the degree of pass-through will depend on the prevalence of LCP: the higher the LCP, the lower the exchange rate pass-through, and vice-versa.

14. Price-adjustment costs include re-tagging goods, revising and reprinting catalogues, and advertising.

15. Note that, in models based on a general-equilibrium framework, prices are sticky in the short run but are fully flexible in the long run. Thus, exchange rate pass-through is complete in the long run.

16. Moreover, major retailers may have house brands which they source from overseas or domestically depending on relative prices. Another type of import substitution effect can occur when major retailers stop stocking foreign products when their price becomes too high. In both cases, movements in the nominal exchange rate would not be passed-through to consumer prices.

that the responsiveness of prices of domestically pro-
duced goods to exchange rate changes is a function of
several factors, including substitutability with
imports, adjustment costs of domestic prices, and
nominal wage stickiness.[17]

Empirical Estimates of Exchange Rate Pass-Through

As discussed earlier, much of the work discussed in
the previous section—which seeks a theoretical ration-
ale for why pass-through is incomplete—was moti-
vated by a common finding in the empirical literature
that import prices do not respond fully to exchange
rate changes. Although estimates of exchange rate
pass-through vary both by industry and by country, it
appears that the full effect of a depreciation/apprecia-
tion of the domestic currency is not passed-through to
local-currency import prices across industrialized
countries.[18] For example, in their study of import
prices in a sample of industrialized countries in the
post Bretton-Woods period, Campa and Goldberg
(2002) find average pass-through elasticities of about
60 per cent in the short run, and 75 per cent in the
long run.[19,20] Across countries, pass-through was
found to be higher in industries that produce more
homogeneous goods such as energy and raw materi-
als, but was estimated to be lower for sectors that pro-
duce more differentiated manufactured goods.
Estimates for Canada were roughly consistent with
the sample average, with pass-through elasticities of
65 per cent in the short run and 68 per cent in the long
run. These figures, however, should be interpreted
with caution because they are subject to an important
caveat. In fact, a number of Canadian import prices
are constructed by multiplying the foreign-currency
price by the nominal exchange rate.[21] Because the

degree of pass-through is, by construction, equal to
1 for those prices, the empirical estimates of pass-
through for Canada are likely to be biased upward.

The United States is a notable outlier with a much
lower degree of exchange rate pass-through (25 and
40 per cent in the short and long runs, respectively)
than other countries in the sample.[22] The lower pass-
through in the United States could be because firms
exporting to the United States will likely be concerned
with gaining or maintaining market share in this large
competitive market and may therefore be reluctant to
pass exchange rate changes through to prices. This is
consistent with anecdotal evidence suggesting that the
majority of firms exporting to the United States follow
LCP.[23]

Empirical evidence supports the view that the rate of
pass-through to consumer prices is less than the share
of imports in the consumption basket. Gagnon and
Ihrig (2002) estimate that the long-run average rate of
pass-through in a sample of industrialized countries
over the period 1972 to 2000 was roughly equal to 20
per cent, although this figure decreased to about 5 per
cent in the latter part of the sample. Moreover, this
decline occurred over a period in which international
trade (and hence imports) grew dramatically (imply-
ing that the average import share in the consumption
basket must have risen as well).[24] This is consistent
with the Canadian experience. It has traditionally
been estimated that about 20 per cent of a persistent
change in the Canadian dollar is reflected in the core
CPI.[25] This corresponds roughly to the import content
of the 1986 core CPI basket of goods and services
(Bank of Canada 2000). However, paralleling the expe-
rience of other industrialized countries, the share of

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17. See Ambler, Dib, and Rebei (2003) for a discussion of the role of nominal
wage rigidities in generating lower exchange rate pass-through to consumer
prices.

18. Empirical evidence suggests that a significant proportion of this muted
price response is the result of adjustments in markups. See Goldberg and
Knetter (1997) and Anderton (2003) for more details.

19. As is typical in this literature, Campa and Goldberg define the short run
as one quarter and the long run as one year.

20. These figures are consistent with estimates in Anderton (2003). Indeed,
he finds that, in the long run, 50 to 70 per cent of changes in the euro's effec-
tive exchange rate are passed-through to manufactured imports from outside
the euro area.

21. For further discussion of this issue, see Statistics Canada (2003).

22. The authors noted that the ranking of elasticities was not tightly corre-
lated with country size. This suggests that lower pass-through is a "U.S."
effect rather than a "big-country" effect.

23. This anecdotal evidence is in line with data that suggest the prevalence
of invoicing in U.S. dollars by foreign firms selling in the U.S. market. Indeed,
according to the ECU Institute (1995), over 80 per cent of U.S. imports are
invoiced in U.S. dollars.

24. Imports of goods and services grew by about 10 per cent on an average
annual basis from 1988 to 2000 in countries belonging to the Organisation for
Economic Co-operation and Development (OECD) (this figure is based on
data obtained from the International Monetary Fund's *International Financial
Statistics*).

25. The core measure of inflation excludes the eight most volatile compo-
nents of the CPI and adjusts the remaining components to remove the effect
of changes in indirect taxes. The eight most volatile components are fruit,
vegetables, gasoline, fuel oil, natural gas, intercity transportation, tobacco,
and mortgage-interest costs.

imports in the core CPI basket in Canada has risen, while the rate of pass-through appears to have declined.[26]

Paralleling the experience of other industrialized countries, the share of imports in the core CPI *basket in Canada has risen, while the rate of pass-through appears to have declined.*

Indeed, many industrialized countries, and even some emerging-market countries, appear to have experienced a decline in exchange rate pass-through to consumer prices in the 1990s, despite large exchange rate depreciations. For example, the United Kingdom (1992), Sweden (1992), and Brazil (1999) experienced significant depreciations which had much smaller effects on consumer prices than had been expected, based on historical experience.[27] Similarly, the response of consumer prices in Canada to the sharp depreciation in the Canadian dollar in the first half of the 1990s was much smaller than expected. Several econometric studies have also found support for the view that exchange rate pass-through in industrialized countries declined in the 1990s.[28] In interpreting this evidence, however, one must bear in mind an important caveat: during periods when the exchange rate undergoes significant changes, other factors may be offsetting the effects of these changes on the cost of imported goods and the domestic price level, but these factors are difficult to capture econometrically. Laflèche (1996–97), for example, finds that special factors, including the restructuring of the retail market and the abolition of customs duties on trade between Canada and the United States, helped to explain the response of consumer prices in Canada to the currency depreciation in the first half of the 1990s.[29] Another special factor that affected inflation in industrialized countries in the 1990s was the rapid growth in the exports of manufactured goods among emerging markets, particularly in Asia. This caused the global supply of manufactured goods to increase and put downward pressure on prices in industrialized countries.[30]

Explaining the Recent Decline in Exchange Rate Pass-Through

A plausible explanation for the decline in exchange rate pass-through is that the degree of market segmentation has increased because (i) more firms are engaging in PTM behaviour, and/or (ii) a larger proportion of goods are subjected to price discrimination across international markets. This implies that the degree of PTM is an endogenous process that depends on the state of the economy. Which factors, then, might have caused an increase in PTM and therefore a decline in the degree of pass-through?[31]

Monetary policy and the inflation environment

During the past decade, many industrialized countries reduced their inflation rates and entered a period of relative price stability. Although several factors may have contributed to this trend, it is generally agreed that a shift towards more credible monetary policy regimes played an important role. That this transition to a low-inflation environment coincided with the documented decline in exchange rate pass-through has popularized the view that these two phenomena could be linked. Taylor (2000) was one of the first to formally articulate the hypothesis that the low-inflation environment in many industrialized countries has successfully reduced the degree of exchange rate pass-through to domestic prices. He argued that exchange rate pass-through is primarily a function of the persistence of exchange rate and price shocks, which tend to be reduced in an environment where inflation is low and monetary policy is more credible.

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26. The import share of the core CPI for Canada rose from about 15 per cent in 1976 to about 27 per cent in 1997 (Bank of Canada 2000).

27. As discussed by Cunningham and Haldane (1999) in their event study, pass-through to consumer prices in all three cases was less than an amount proportional to the share of imported goods in the consumer basket.

28. For example, see Gagnon and Ihrig (2002) for consumer prices and Campa and Goldberg (2002) for import prices. In addition to these cross-country studies, individual-country studies have also found support for a decline in pass-through. For instance, Fillion and Léonard (1997) and Kichian (2001) both found evidence that the coefficient of the exchange rate pass-through in a Phillips curve model for Canada fell in the 1990s compared with previous decades.

29. Cyclical factors most likely played a role as well. Indeed, Canada was in a position of excess supply throughout most of this period, and in such an environment, it may have been difficult for firms to increase their prices.

30. See Gagnon, Sabourin, and Lavoie (2003–2004) for more details.

31. By extension, the reasons why pass-through to import prices has declined would also account for the decline in pass-through to consumer prices. However, the latter could also be explained by a stronger degree of nominal wage stickiness in the final-goods sector.

In addition to being intuitively appealing and consistent with anecdotal evidence, Taylor's hypothesis is also consistent with recent macroeconomic theory and is supported by empirical evidence. Indeed, theoretical models explicitly linking exchange rate pass-through and the inflation environment have recently emerged as part of the new open-economy macroeconomics (NOEM) literature.[32]

Choudhri and Hakura (2001), for example, emphasize a channel similar to the one in Taylor (2000) in the context of a more elaborate DGE model with imperfect competition and staggered contracts. In their model, a low-inflation regime reduces pass-through because the latter reflects the expected effect of monetary shocks on current and future costs, which, in turn, are reduced by a low-inflation regime. Devereux and Yetman (2002) also explore the link between pass-through and monetary policy in the context of a DGE framework. In their model, pass-through is determined by the frequency of price changes among importing firms, and this frequency is a function of the monetary policy regime. Firms in countries where monetary policy is more credible (and, hence, where the mean inflation rate is lower) will tend to change their prices relatively less frequently, leading to a lower degree of pass-through in the short run but not in the long run. Finally, Devereux, Engel, and Storgaard (2003) also develop a DGE model linking pass-through to monetary policy. In their framework, the aggregate degree of pass-through is determined by the currency in which the price of imported goods is pre-set. Unlike earlier studies, however, where the choice of currency of denomination is exogenous, the authors show that countries with relatively stable monetary policies will tend to have a prevalence of LCP in the economy. This implies that a more stable monetary policy is associated with a lower degree of pass-through.

The relationship between exchange rate pass-through and the inflation environment has also been examined empirically in a handful of studies. The majority of these studies are cross-sectional and focus on cross-country variations in pass-through elasticities. Choudrhi and Hakura (2001) and Devereux and Yetman (2002), for example, investigate the role of inflation variables in accounting for cross-country differences in exchange rate pass-through in a large sample of countries and find that these variables do have explanatory power. Gagnon and Ihrig (2002) and Bailliu and Fujii (2004) take a different approach and examine whether exchange rate pass-through has declined in industrialized countries in response to a shift to a more credible monetary policy regime. Both studies find evidence of such a decline.

Changes in the composition of the imported goods index

Thus far, we have focused on the reasons that might explain a decline in the degree of pass-through to the import prices of individual goods. However, many empirical studies use import price indexes rather than highly disaggregated data. An alternative explanation of the recent decline in pass-through among industrialized countries could therefore be that the composition of imports has shifted towards sectors that have lower degrees of exchange rate pass-through. Campa and Goldberg (2002) find support for this hypothesis in their study. Indeed, their results suggest that exchange rate pass-through to import prices in industrialized countries has declined because the composition of their imports has shifted towards sectors with lower degrees of exchange rate pass-through, such as the manufacturing sector (where more differentiated goods are produced and hence where PTM is likely to be more prevalent).

Policy Implications of a Decline in Exchange Rate Pass-Through

Important policy implications could follow from a decline in exchange rate pass-through. First, a decline in the pass-through to consumer prices could influence central bankers' forecasts of the future path of inflation, a key element in the conduct of monetary policy. Indeed, the successful implementation of monetary policy presupposes that central bankers have not only a good understanding of inflation dynamics, but that they are also relatively successful at predicting the future path of inflation.[33] If inflation forecasts are based on estimates of exchange rate pass-through that do not take into account such a decline, these forecasts could be overestimating the effects of changes in the exchange rate on inflation.[34]

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32. In the NOEM literature, based on work by Obstfeld and Rogoff (1995), nominal rigidities and market imperfections are introduced into a dynamic general-equilibrium (DGE) open-economy model with well-specified microfoundations.

33. This is particularly important for central banks that have adopted an inflation-targeting framework within which to conduct monetary policy.

34. This bias would obviously be more substantial for open economies that have larger import shares in their consumption baskets.

Second, if import prices are less responsive to movements in the exchange rate, this could lead to a dampening of "expenditure-switching" effects. These refer to the change in the composition of demand resulting from a change in relative international prices induced by movements in the nominal exchange rate. For instance, a depreciation of the domestic currency (in the presence of exchange rate pass-through to import prices) would increase the price of foreign goods relative to domestic goods, which should—all else being equal—increase the worldwide demand for domestic goods relative to foreign goods. If there is a decline in exchange rate pass-through to import prices, the change in relative international prices will be smaller and so will the resulting effect on relative demand. In other words, if the adjustment in relative prices is dampened, then the incentive for consumers to switch expenditures from foreign to domestic goods will be reduced. It is important to note that expenditure-switching effects will not be dampened in the case where pass-through to consumer prices has declined but pass-through to import prices has not.

Third, a decline in exchange rate pass-through also has important implications for the international transmission of shocks. As shown by Betts and Devereux (2001), when pass-through is complete, monetary policy shocks produce a negative co-movement of output across countries. Intuitively, an exchange rate depreciation that is induced by a positive monetary shock generates an expenditure-switching effect which shifts world demand away from foreign goods towards domestic goods. Consequently, output rises in the country where the depreciation has occurred and falls abroad. As the degree of pass-through decreases, this result starts to be reversed. For a sufficiently low degree of pass-through, the cross-country correlation of output becomes positive.[35] This suggests that, to the extent that monetary policy shocks are important in explaining business cycles, the recent decline in pass-through would imply that those business cycles are becoming more synchronized.

Finally, an important theoretical result that has recently emerged in the NOEM literature is that optimal monetary policy depends on the degree of pass-through to import prices.[36] In particular, when pass-through to import prices is complete, a flexible exchange rate regime is desirable because it allows rel-
ative price adjustments to occur, thus enabling appropriate monetary policy to replicate the flexible-price allocations. In contrast, under zero pass-through (that results from full LCP), the optimal policy involves fixing the nominal exchange rate because in this case flexible exchange rates cannot achieve the optimal relative price adjustment. It is important to note, however, that neither one of these two extreme cases is likely to hold in practice, given that exchange rate pass-through to import prices in industrialized countries is neither zero nor complete. Although it has declined in recent years, empirical evidence suggests that pass-through is partial (and thus that industrialized countries are best characterized as economies where firms follow a combination of LCP and PCP). Thus, further research is needed to determine the optimal design of monetary policy in the case of partial exchange rate pass-through.

Empirical evidence also suggests that pass-through to imported goods is higher than pass-through to consumer prices. Indeed, as discussed in the section on empirical estimates, it appears as though pass-through to import prices, although not complete, is very high. On the other hand, pass-through to consumer prices since the early 1990s seems very low. A higher rate of pass-through to import prices might thus imply that there is scope for the exchange rate to act as a shock absorber, even if the pass-through to consumer prices is very low. As discussed by Engel (2002), once this assumption about different rates of pass-through to import and consumer prices is incorporated into macroeconomic models, the optimal monetary policy no longer involves fixing the exchange rate.

Conclusions

Evidence suggests that exchange rate pass-through to both import and consumer prices has declined in industrialized countries over the past decade. Several plausible explanations for this potential decline have been advanced in the literature, including the shift to a low-inflation environment in industrialized countries (brought about by a move towards more credible monetary policy regimes) and changes in the structure of imports towards sectors that have lower rates of exchange rate pass-through. Assessing both the extent and origin of such a decline is important, given potential policy implications such as its effects on central bankers' inflation forecasts, expenditure-switching effects, the international transmission of monetary shocks, and the optimal choice of exchange rate regime and monetary policy regime.

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35. With complete pass-through, monetary policy shocks produce a positive cross-country correlation of consumption, but the sign of this correlation is also reversed when pass-through becomes sufficiently low.

36. See Devereux and Engel (2003) for further discussion.

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Are Wealth Effects Important for Canada?

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- *Some analysts believe that a sharp rise in equity values was an important factor in the strong consumer spending between 1995 and 2000.*

- *Empirical evidence for Canada suggests that consumer spending responds very little to changes in equity wealth but is sensitive to changes in housing wealth.*

- *This difference can be explained by two factors: changes in equity prices tend to be more temporary than changes in housing prices, and only a small share of households hold equities in their portfolios.*

- *Since changes in wealth directly affect aggregate demand, central banks must pay attention to this factor when formulating monetary policy.*

This article examines the empirical relationship between wealth and consumer spending in Canada, focusing in particular on the role of stock market wealth and housing wealth in explaining movements in aggregate consumption.[1]

Many economists have argued that the sizable appreciation in stock prices from 1995 through 2000 and the subsequent increase in household wealth were important factors in the strong consumer spending during that period. A cursory glance at the data for Canada suggests that increased household wealth may have played a role in maintaining consumer spending over the past decade. As shown in Chart 1, the ratio of disposable income to gross domestic product (GDP)

Chart 1

Ratios of Disposable Income, Wealth, and Consumption to Real GDP
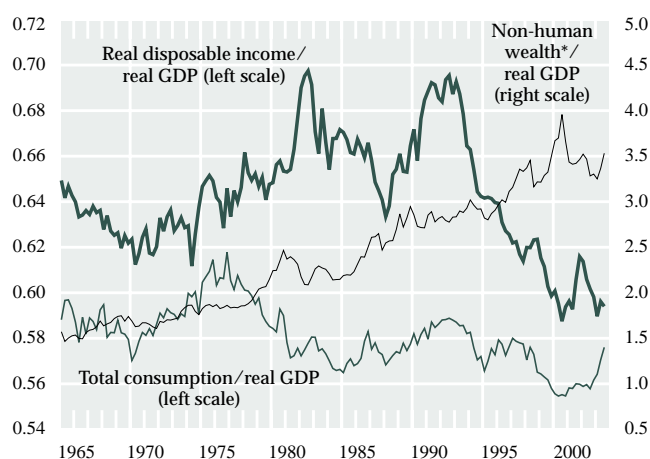
* Non-human wealth is the sum of all real and financial assets net of liabilities, expressed at market value.

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1. See Pichette and Tremblay (2003) for the complete analysis (including technical details), which is summarized in this article.

decreased during this period, while the ratio of consumption to GDP remained relatively stable. One possible explanation lies in the increasing ratio of wealth to real GDP, which is also shown in Chart 1.

Nevertheless, if equity prices really were driving consumer expenditures, then a slowdown in consumption would have been expected, all else being equal, once stock market valuations fell back to lower levels. In fact, consumer spending has remained strong. This phenomenon could be explained by the strength of housing prices.

Stock Market Wealth vs. Housing Wealth

Although theories that highlight the role of wealth in determining patterns of consumption do not usually imply different effects for different types of wealth, there are many reasons to believe that the marginal propensity to consume (MPC)[2] from housing wealth and stock market wealth could be different.

First, housing wealth is less concentrated among the most affluent households than stock market wealth. According to the *1999 Survey of Financial Security* published by Statistics Canada (Canada 2003) approximately two-thirds of Canadian households own their residence, while less than one-third of households own equities, either directly or in mutual funds. Since a relatively small proportion of households own stocks compared with those that own their homes, the effects of these two types of wealth on consumption are expected to be different when the data are aggregated.

Second, changes in equity prices have a higher probability of being reversed than changes in housing prices. For that reason, households might be more likely to modify their consumption habits following a change in housing prices than they would for a change in equity values.

Third, housing wealth is less liquid than stock market wealth, and transactions costs in the housing market are usually higher because the financial system can, in some cases, restrain households from using their houses as collateral. This results in a relatively smaller wealth effect from housing. But such constraints have been reduced in Canada since the 1960s, when previous restrictions on the involvement of banks in residential mortgage financing were eliminated (Freedman 1998).

This, in turn, has allowed banks to compete more effectively in the market for mortgage lending and should, in principle, facilitate the use of property as collateral. Nevertheless, mortgage refinancing is still more costly, and thus less widespread, in Canada than it is in the United States.

According to the 1999 Survey of Financial Security . . . *approximately two-thirds of Canadian households own their residence, while less than one-third of households own equities, either directly or in mutual funds.*

Fourth, capital gains on wealth resulting from owner-occupied housing may lead to a higher MPC, since these gains have a tax advantage over stock market gains. When homeowners dispose of their principal residence, any profit might be exempted from the capital gains tax.

Literature Review

Since the publication of Friedman's (1957) permanent-income hypothesis and Ando and Modigliani's (1963) life-cycle model, considerable research has been devoted to examining the relationship between consumption, wealth, and income. With the surge in equity wealth in the second half of the 1990s and the more recent increase in housing prices, the impact of stock market wealth and housing wealth on consumption has received particular attention. The bulk of the studies in this field apply to the United States, but some economists have analyzed the Canadian situation.

Macklem (1994) develops a measure of wealth for Canada that can be divided into two components: human wealth and non-human wealth. Human wealth is a measure of permanent income, which is the present value of future labour income. Non-human wealth is the sum of all real and financial assets net of liabilities, expressed at market value. Macklem notes that most of the variations in non-human wealth are driven by fluctuations in stock prices. Using an error-correction model (ECM) estimated over the period

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2. The MPC is the ratio of a change in consumer expenditure to a change in either disposable income or in any measure of wealth.

1964–93, Macklem finds a long-run relationship between consumption of non-durable goods and services, human wealth, and non-human wealth (excluding equities). He suggests two possible reasons for the exclusion of equity wealth: (i) consumers may consider changes in equity prices to be largely transitory, and (ii) only a small share of households own equities. Based on Macklem's estimates, consumption of non-durable goods and services increases by 3.5 cents for every one-dollar increase in non-human wealth (excluding equities).

Using the same methodology as Macklem (1994), but extending the sample to the end of 1998, Pichette (2000) focuses on the effect of stock market wealth on total consumer spending (including durable goods) in Canada. The author finds that, on average, a one-dollar increase in the value of equities leads to an increase of 2.2 cents in total consumer expenditures.

In the United States, the MPC from non-human wealth, estimated with traditional macroeconomic models, is generally found to be between 3 and 7 cents per dollar. Maki and Palumbo (2001) find estimates that fall into the same range (3 to 5 cents per dollar). They combine macroeconomic and microeconomic data for their analysis, which allows them to investigate the effect of stock market wealth on households with different levels of income. Their results demonstrate that only the richest households benefited from the exceptional performance of the stock market in the late 1990s. These households also lowered their savings rates (as conventionally measured)[3] the most significantly. Maki and Palumbo also report that most U.S. households held a relatively modest share of equity in their portfolios and that the surge in stock prices did not significantly increase their net worth.

Using more sophisticated econometric methods, Lettau and Ludvigson (2001) distinguish between permanent and transitory changes in wealth.[4] Interestingly, they find that most of the variations in wealth are transitory and are largely attributable to fluctuations in equity prices. The authors also find that consumption responds only to permanent changes in wealth. As a result, they estimate that U.S. consumption rises by only 1.4 cents, on average, following a one-dollar increase in wealth, a significantly smaller effect than that obtained in previous studies.

[Pichette] finds that, on average, a one-dollar increase in the value of equities leads to an increase of 2.2 cents in total consumer expenditures.

Most authors who examine disaggregated wealth find that housing wealth has a larger effect on consumption than stock market wealth does. Using a panel of 14 countries and a panel of U.S. states, Case, Quigley, and Shiller (2001) find, at best, weak evidence of a significant effect from stock market wealth on consumption. In contrast, their results show that an increase in housing prices has a large and robust impact on consumption. For the U.S. economy, Desnoyers (2001) defines wealth as consisting of only two elements: stock market wealth and housing wealth. He finds that the MPC from stock market wealth is about 5.8 cents per dollar, whereas the tendency to consume from housing wealth could be as large as 20 cents per dollar. These wealth effects are transitory, however; that is, shocks to wealth do not have any significant permanent effect on consumption.

Data

In this study, we follow Macklem (1994) and divide total wealth into two broad components: human wealth and non-human wealth. Human wealth depends on the present value of current and future disposable income, as well as on the expected real interest rate. Stock market wealth and housing wealth, the variables of particular interest in this article, are part of non-human wealth and are defined, respectively, as stocks held by persons and unincorporated businesses, and residential structures net of mortgages. Most of the data used in the calculation of non-human wealth are from Statistics Canada's *National Balance Sheets* (Canada 2004), except for those on real assets. The value of durable goods and residential structures is adjusted to take into account their depreciation rate and market value. Equities are adjusted from book values to market values, using the Toronto Stock Exchange (TSX) index.

Chart 2 illustrates the evolution of non-human wealth, including both stock market wealth and housing wealth, over the period 1965–2003. Developments in non-human wealth over the past decade seem to have

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3. Conventional measures of income and savings exclude capital gains.

4. Their measure of wealth does not include human wealth.

been driven mainly by stock market wealth. The share of equities in non-human wealth, which was less than 30 per cent in the early 1960s, increased significantly, to more than 50 per cent in 2000. It has fallen back to about 40 per cent since the stock market bubble burst in 2001. Conversely, the importance of housing has increased over the past three years and now represents more than 30 per cent of the non-human wealth of households.

Real Per Capita Non-Human Wealth and Its Stock Market and Housing Components

$ thousands
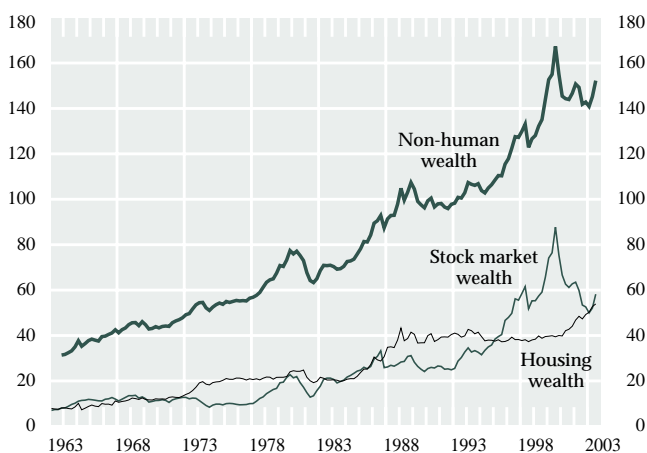
Another crucial variable in this model is consumer spending. Standard consumer theory suggests that the appropriate measure of aggregate consumption focuses on the service flow from durable goods, rather than from the purchase of such goods. To illustrate, the utility from owning a car derives not from the car itself, but from the services it provides (e.g., transportation and convenience). But there is no straightforward method of computing the service flows obtained from durable goods. In this study, real expenditures on non-durable goods and services are used as a proxy for total consumption. This supposes that consumption of non-durable goods and services is a constant share of total consumption. The exclusion of durable goods from the analysis does bias the MPC slightly downward, since stock market gains are often redirected towards the purchase of this type of good.[5]

Regarding the measurement of consumption, it should be noted that consumption of services includes actual and imputed rent, which is directly related to housing wealth.

Empirical Results

Until recently, the methodology commonly used to estimate the MPC was a simple ECM. This is a single dynamic equation which includes a term that takes into account the long-run level relationship between consumption, labour income, and various types of wealth. Lettau, Ludvigson, and Barczi (2001) criticize this approach because it assumes that consumption is the only variable that will adjust when the levels of consumption, wealth, and labour income are inconsistent with what is implied by their long-run relationship. To address this problem, they suggest proceeding with a vector-error-correction model (VECM). This more advanced econometric method allows us to take into account the dynamic responses of all the variables included in the analysis. Their results for the United States indicate that wealth (through a change in the prices of financial assets), rather than consumption, does most of the adjusting that is required to restore the long-run level relationship between consumption, wealth, and labour income following shocks.[6]

Another aspect to consider in the choice of the methodology is whether it allows permanent shocks to be distinguished from transitory shocks. Assuming consumers prefer a smooth consumption profile throughout their lifetime, we would expect consumer spending to be considerably less sensitive to transitory shocks than to permanent shocks. The procedure that allows us to identify the reaction of consumption to both types of shocks is a VECM in which permanent and transitory shocks are identified, using restrictions implied by long-run relationships as proposed by King et al. (1991) and Gonzalo and Granger (1995).[7] Following Lettau and Ludvigson (2001), we find a unique long-run relationship (also called a cointegrating relationship) between consumption, disposable income, human wealth, stock market wealth, housing wealth, and non-human wealth (excluding stock market wealth and housing wealth).[8] To calculate the MPC from an aver-

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5. Poterba and Samwick (1995) find a more important wealth effect for consumption of durable goods than for non-durable goods and services in the United States.

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6. Our analysis confirms this result in the Canadian context.

7. See the Technical Box in the Appendix for detailed results.

8. All of these variables are expressed in log level.

age change in each type of wealth, we use the following formula:

$$MPC_i = \pi_i \, \Phi_i^T + (1 - \pi_i) \, \Phi_i^P,$$

where i is a wealth component (e.g., stock or housing), π is the percentage of the wealth variation that is transitory, $1 - \pi$ is the percentage of the wealth variation that is permanent, Φ^T is the MPC from a transitory movement in wealth, and Φ^P is the MPC from a permanent movement in wealth.

Our findings suggest that consumption does not respond significantly to a permanent increase in stock market wealth, while a permanent increase in housing wealth leads to a significant rise in consumption.

The first item of information necessary to calculate the MPC from an average change in each of the measures of wealth is the percentage of the change in wealth that is transitory. Our analysis suggests that, for all horizons, most of the variability in consumption, disposable income, housing wealth, and non-human wealth (excluding equities and housing), is explained by permanent shocks. As in previous studies, our work also finds that movements in human and stock market wealth have a much larger transitory component.[9]

The second piece of information needed is the MPC from permanent and transitory shocks to each of the measures of wealth. Our findings suggest that consumption does not respond significantly to a permanent increase in stock market wealth, while a permanent increase in housing wealth leads to a significant rise in consumption. In addition, we find that the response of consumption to temporary changes in both equity and housing wealth is not statistically significant.

On average, the MPC from stock market wealth is small and statistically insignificant (less than 0.5 cents per dollar). This result is not surprising, since, as argued earlier, direct holdings of equities are concentrated in the hands of a relatively small proportion of households.

With a significant MPC of 5.7 cents per dollar, housing wealth is, without doubt, the variable to examine when studying the future evolution of consumption. Again, the stronger link between housing wealth and consumption relative to stock market wealth can be explained by its more equal distribution among households and the greater likelihood that the average change in housing wealth will be permanent.[10]

Conclusion

When the empirical relationship between various components of wealth and consumer spending (particularly housing and stocks) is examined, the effect of stock market wealth on consumption is found to be significantly different from the effect of housing wealth. This finding is consistent with the results of previous studies for the United States, such as those by Case, Quigley, and Shiller (2001) and Desnoyers (2001). Using Canadian data, we found an average MPC from housing wealth of 5.7 cents per dollar, which is much greater than the very small and statistically insignificant MPC from stock market wealth.

If movements in wealth, especially housing wealth, directly affect consumption, they will also influence aggregate demand and inflation.

These results can be explained by the higher concentration of stocks among a relatively small group of wealthier households and by the tendency of changes in equity values to reverse themselves more often than changes in housing wealth. Other factors, such as an increased incidence of mortgage refinancing and the

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9. In both variables, 22 per cent of the variations are transitory.

10. As noted above, this result might be slightly overstated, since consumption of services includes imputed rent from housing, which is directly related to housing wealth.

more frequent use of housing wealth as collateral, are likely to increase the wealth effect from housing.[11]

These results are important from the viewpoint of monetary policy. If movements in wealth, especially housing wealth, directly affect consumption, they will

11. A recent study by the Canadian Imperial Bank of Commerce (2003) indicates that, since 2001, Canadians have obtained an additional $22 billion from the refinancing of their houses and the use of this asset as collateral.

also influence aggregate demand and inflation. Of course, wealth effects are not the only channel through which changes in asset prices affect aggregate demand. Other connections exist as well, such as a possible direct causal link from stock prices to business investment or a cost-of-capital effect. These, too, need to be taken into account when studying the full impact of asset prices on aggregate demand.

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Appendix

Technical Box

Our analysis is based on the following reduced-form VECM:

$$\Delta X_t = \mu_t + \sum_{j=1}^{l} A_j \Delta X_{t-1} + \alpha\beta'X_{t-1} + \varepsilon_t, \qquad (1)$$

where X_t is an $n \times 1$ vector of cointegrated $I(1)$ variables, that is, $X = (c, y, hw, s, h, nhwxsh)$. All of these variables are expressed in log level. The $n \times r$ matrices (α) and (β) are both full rank, and $0 \le r \le n$ is the number of cointegrating vectors. The reduced-form shocks are assumed to have the following properties: $E_t[\varepsilon_t\varepsilon_{t-j}] = 0 \ \forall j \ne 0$, $E_t[\varepsilon_t] = 0$ and $Var[\varepsilon_t] = \Sigma_\varepsilon$.

The long-run relationship is defined as:

$$c_t = 2.21 + 0.36\,y_t + 0.15\,hw_t + 0.02\,s_t + 0.09\,h_t + 0.08\,nhwxsh_t.^{[1]\,(2)}$$

In equation (1), $\beta'X_{t-1}$ is the error-correction term. When this term is not equal to zero, variables deviate from the long-run equilibrium. The matrix α includes the adjustment coefficients, which tell us which variables will adjust to restore the equilibrium. The estimated parameters are $\hat{\alpha} = (-0.047, 0.176, \mathbf{1.346}, \mathbf{2.236}, -0.606, 0.094).^{[2]}$

Following King et al. (1991) and Gonzalo and Granger (1995), the permanent and transitory components are identified. The forecast-error variance decomposition is calculated (Table 1); this gives the fraction of the total forecast-error variance that is attributable to permanent (σ_P^2) and transitory (σ_T^2) shocks for each variable.

1. All coefficients are significant at the 5 per cent level.

2. Bold numbers indicate significance at the 5 per cent level.

Table 1

Forecast-Error Variance Decomposition

	σ_T^2	σ_P^2
Δc_t	0.09 (0.03,0.19)*	0.91 (0.81,0.97)
Δy_t	0.10 (0.03,0.24)	0.90 (0.76,0.97)
Δhw_t	0.22 (0.07,0.43)	0.77 (0.56,0.93)
$\Delta nhwxsh_t$	0.09 (0.03,0.18)	0.91 (0.82,0.97)
Δs_t	0.22 (0.09,0.38)	0.78 (0.62,0.91)
Δh_t	0.10 (0.03,0.23)	0.90 (0.77,0.97)

* The 90 per cent confidence intervals are in parentheses.

Because the forecast-error variance decomposition gives the share of each shock in the variability of a variable in squared changes, the percentage in wealth fluctuations that is transitory is given by

$$\pi_i = \frac{\sqrt{\sigma_{Ti}^2}}{\sqrt{\sigma_{Ti}^2} + \sqrt{\sigma_{Pi}^2}}.$$

Speeches

Introduction

Speaking to the Board of Trade of Metropolitan Montréal on 11 February, Governor David Dodge talked about the longer-term trends and challenges facing the Canadian economy in the years ahead. The Governor assured Canadian business people that they can count on the Bank of Canada to pursue the appropriate monetary policy that will help sustain aggregate demand and facilitate the adjustments to a changing world. The Governor's remarks are reproduced in this issue.

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

22 April 2004	Remarks to the Conference on Financial Services and Public Policy, Schulich School of Business at York University, Toronto, Ontario
21 April 2004	Opening statement to the House of Commons Finance Committee
20 April 2004	Opening statement to the Senate Banking, Trade and Commerce Committee
19 April 2004	Remarks by David Dodge to the Council of the Americas, New York City, N.Y.
15 April 2004	Opening statement following the release of the *Monetary Policy Report*
16 March 2004	Remarks to an event hosted by the Center for Financial Stability and the Canadian Embassy, Buenos Aires, Argentina
10 March 2004	Remarks to the Brazil-Canada Chamber of Commerce, São Paulo, Brazil
17 February 2004	Remarks to the Mexican Business Coordinating Council, Mexico City, Mexico
22 January 2004	Opening statement following the release of the *Monetary Policy Report Update*
17 November 2003	Remarks to the Office for Partnerships for Advanced Skills Annual Visionary Seminar, Ottawa, Ontario
3 November 2003	Remarks to the David Dodge Tribute Dinner hosted by the Canadian Foundation of Economic Education, Toronto, Ontario
23 October 2003	Opening statement to the Senate Banking, Trade and Commerce Committee
22 October 2003	Opening statement at the House of Commons Finance Committee following the release of the *Monetary Policy Report*
	Opening statement following the release of the *Monetary Policy Report*
10 September 2003	Remarks to the Vancouver Board of Trade, Vancouver, British Columbia
5 September 2003	Remarks to the Spruce Meadows Roundtable, Spruce Meadows, Alberta

Adjusting to a Changing Economic World

Remarks by David Dodge
Governor of the Bank of Canada
to the Board of Trade of Metropolitan Montréal
Montréal, Quebec
11 February 2004

Good afternoon, ladies and gentlemen. It's a pleasure to be with you here in Montréal today.

These are turbulent times, not just for business people, but for all Canadians. We have come through a very difficult year, a year filled with surprises that have challenged us all. At times like these, it is easy to focus on the near-term issues and problems. But by doing that, we risk losing sight of the big picture. The Bank of Canada had plenty to say about the near-term outlook in its *Monetary Policy Report Update* a few weeks ago. So today, I want to talk about the longer-term trends at work in the economy.

In doing so, I want to take a quick look back at some of the major economic events of recent decades, and examine how we approached the issues of adjustment at the time. Then, I will discuss the adjustments that are needed now and in the future. In this way, I hope to draw on the lessons learned from the past. I will frame this discussion in terms of structural economic policies, macroeconomic policies, and the role of the exchange rate in facilitating adjustments.

Previous Adjustment Policies

I will start by going back to the 1970s. There were at least two forces at play that highlighted the need for economic adjustments. The first was a significant drop in the rate of productivity growth. Canada, like the United States, had become accustomed to productivity rising at a rapid pace during the 1950s and 1960s. With this growth in productivity came steady advances in real incomes. But the trend towards higher productivity slowed abruptly in the early 1970s.

At the time, policy-makers, business, and labour assumed that the slowdown was cyclical. It wasn't. Economists still don't have a complete explanation for it. But what we now understand more clearly is that the productivity increases of the 1950s and 1960s had a lot to do with the application throughout the economy of earlier advances in general-purpose technology. Businesses took advantage of various technological advances in many diverse fields, enabling them to realize significant productivity gains.

When productivity growth slowed in the 1970s, many people assumed that the slowdown was temporary and that rapid growth would resume on its own. This was a mistake. Without solid productivity gains, the economy was unable to deliver the increases in real incomes that everyone had come to expect. This situation was compounded by the second major event of the 1970s: the energy crisis. Unfortunately, we in Canada didn't recognize the full implications of the energy crisis. We were slow to realize that higher oil prices also meant a reduction in the economy's production capacity.

Canadian policy-makers tried to cushion the impact of the higher energy prices and slower productivity through increased transfers, subsidies, and easier monetary and fiscal policies. For example, the Bank of Canada added to liquidity by expanding the money supply too fast in relation to the slower growth in the economy's production capacity. In the wake of these structural and macroeconomic policies, inflation rose, and fiscal deficits grew. This slowed the structural-adjustment process in the late 1970s and early 1980s. All of this was made worse by the shared misperceptions about the productivity slowdown. Businesses, households, and governments all thought that economic growth would recover and that real incomes could

continue to rise at their previous rate. But without strong productivity growth the economy could no longer satisfy these demands.

But that difficult period from 1975 to 1985 taught us a lesson. We learned that structural adjustments are important and inevitable, and that macroeconomic policies have a role to play in making those adjustments work quickly and with less disruption. Canada had the opportunity to apply those lessons in the 1990s. Let me explain how.

To begin, recall the state of Canada's economy as the 1990s began. Although inflation had come down from the very high levels seen in the early 1980s, it was still relatively high by today's standards. On the fiscal side, the picture was pretty grim and getting worse. Public sector deficits eventually peaked at around 8 per cent of Canada's GDP, and public debt levels were continuing to mount. Clearly, the situation was not sustainable. Changes were urgently needed.

Structural adjustments are important and inevitable, and . . . macroeconomic policies have a role to play in making those adjustments work quickly and with less disruption.

The first major change came in 1991, when the Bank and the Government of Canada agreed on a series of explicit inflation-reduction targets. The agreement called for an inflation target—defined in terms of the annual rate of increase of the consumer price index—that descended gradually to 2 per cent, the midpoint of a 1 to 3 per cent range. The agreement has been extended three times, with the latest one covering the period to the end of 2006. Each time, the midpoint of the target range has been kept at 2 per cent.

This framework has worked very well. From the end of 1994 to today, inflation has averaged almost exactly 2 per cent. Moreover, not only has inflation fallen, it has become more stable. Indeed, the trend of inflation—as measured by what we call "core inflation"—has stayed within the target range almost continuously for the past 10 years. More importantly, we found that, after a few years of inflation targeting, the inflation

expectations of Canadians fell into line with the 2 per cent target. And expectations have remained close to the target in recent years.

Another major adjustment began in the middle of the 1990s. At that time, Canada was facing an unsustainable fiscal situation. Spending had to be put on a viable long-term course, and the ratio of public debt to GDP put on a steady downward track.

By the middle of the decade, governments—federal and provincial—had begun to take the painful but necessary steps to balance their books and reduce their debt burdens. This fiscal adjustment helped improve the credibility of Canada's economic policies and reduced the risk premium that investors demanded on Canadian government bonds. Lower interest rates reduced debt-servicing costs and stimulated economic growth, which brought in more revenues for governments. The federal debt-to-GDP ratio has fallen to about 44 per cent, from a peak of close to 70 per cent. The ratio of total government liabilities to GDP has declined from a peak of about 100 per cent to about 80 per cent, according to the OECD.

The other major change in the 1990s was the structural adjustments that took place in the public and private sectors. In both cases, these adjustments were enormously helpful, because they made the Canadian economy more flexible.

In the public sector, governments moved to reduce distortions in the economy, by eliminating many industrial subsidies, lowering income taxes, and putting the Canada and Quebec Pension Plans on a sustainable basis. Further, the government made changes to its system of unemployment insurance, basing the program more on insurance principles and improving the employability of labour. In the private sector, businesses and employees faced restructuring in the wake of free-trade agreements, as Canada opened up further to international competition. None of this was easy, but it did leave Canada's economy more flexible, and in a better position to handle economic shocks and, therefore, to grow sustainably.

Canada's floating exchange rate helped facilitate the adjustments that were taking place on these various fronts. It helped by sending signals to businesses about the kinds of adjustments that were needed. Firms that produced traded goods and services, and that were able to take advantage of free-trade agreements and strong foreign demand, saw their profits increase.

And because the depreciating Canadian dollar raised the cost of machinery and equipment relative to labour,

businesses in expanding sectors of the economy were encouraged to absorb some of the excess labour that had been released by shrinking sectors. The floating exchange rate also helped on the macroeconomic side. The depreciating Canadian dollar in the late 1990s helped to encourage foreign demand, as demand from the government sector was being restrained.

None of this was easy, but it did leave Canada's economy more flexible, and in a better position to handle economic shocks and, therefore, to grow sustainably.

So you can see how these three factors converged in the 1990s to lay the groundwork for a stronger economy in the future. A sound macroeconomic policy framework, appropriate structural adjustments, and a floating exchange rate all did their part to help the economy adjust to the changing circumstances of the 1990s.

Economic Adjustments in the Future

That's a quick look back. Now, I'd like to talk about some of the longer-term forces we can expect to see at work in the economy in the years ahead and the economic adjustments that will likely be necessary.

The first point I would make is that we have an opportunity in the next few years to again register solid productivity gains. This time, the information and communications technology sector is providing the general-purpose technologies that can drive sustained gains in productivity and incomes. Of course, the mere presence of technology is not enough to guarantee higher productivity. We also need investment, as well as training and organizational changes and flexibility. In the latter part of the 1990s, Canadians had begun to invest in these productivity-enhancing technologies. After a pause at the beginning of this decade, such investments seem to have resumed.

These efforts are particularly important, especially in light of the serious demographic challenges we will face over the next few years. That is my second point: our workforce is aging. Current projections are that

the share of the population that is of working age—those aged 15 to 64—will begin to decline in about 15 years. We will need to take these population shifts into account, and to remove impediments for older workers who wish to remain in the labour force.

The third point I would make is that there are powerful forces in the global economy that bear watching. The significant imbalances that we now see in the world's current- and capital-account flows need to be corrected. Emerging markets, particularly in Asia, are becoming increasingly powerful players in the global economy. All these forces will have an impact on the Canadian economy in the years ahead.

Against this backdrop, what kinds of economic adjustments will be needed in the future? Let me suggest a few.

First, Canada's economic structures must continue to adjust to changing circumstances. There will need to be more high-productivity activities in the economy and fewer low-productivity ones. But for significant gains in productivity to resume, governments must ensure that their microeconomic policies encourage flexibility and do not hinder innovation in the public and private sectors. Workers will need to have the training and skills to take advantage of new technologies. And businesses will need to ensure that their organizations and practices allow the potential of new technologies to be fully realized.

Second, Canada must keep its fiscal house in order. Canada's ratio of public debt to GDP will need to decline further. This will free up more resources to help us support our aging population. At the same time, this implies that governments at all levels will be keeping their budgets more or less balanced, if not in surplus.

What about monetary policy in the future? In the Bank's *Monetary Policy Report Update* last month, we said that the role of monetary policy is to facilitate adjustments by helping to sustain aggregate demand.

What does this mean? As always, it means that we will aim to return inflation to its 2 per cent target, by trying to keep the economy operating as close as possible to its full production capacity. That is our constant goal. But it also means that we will be aware of the forces that are driving adjustments in the economy in the years ahead. We know that with a stronger currency, the economy will have to rely more on domestic demand and less on foreign demand for ongoing, solid growth. We will take this into account as we set monetary policy.

This leads me to my last point, which concerns the exchange rate. A floating exchange rate will continue to be an important part of our monetary policy framework, facilitating the necessary adjustments and sending important price signals. Canadian businesses should continue to be guided by price signals, including those being sent by exchange rates. Just as businesses reacted to the signals of a weaker Canadian dollar in the 1990s, they should now respond to the signals of a stronger currency against the U.S. dollar, as well as to the changing exchange rates against other currencies.

A stronger Canadian currency is consistent with the adjustments that are going to be needed in our economy, even if the speed of the recent appreciation has made these adjustments more difficult. Because it makes machinery and equipment less expensive relative to labour, a stronger currency is in line with our need to increase productivity, as well as with the future demographic pressures on our labour force. A stronger currency is also consistent with the increase in commodity prices relative to those of manufactured goods and services. And it increases the price of non-tradable goods relative to that of tradable goods. This should encourage the shifting of labour and capital into those sectors that are oriented to meeting domestic demand.

We are already seeing signs that Canadian businesses are indeed adjusting to the stronger dollar. Each quarter, the Bank of Canada surveys Canadian firms about the state of their business. Recent surveys show that Canadian firms are reasonably optimistic about the future. Obviously, the appreciation of the Canadian dollar has affected different companies in different ways. In particular, some manufacturers who have not benefited from rising commodity prices have struggled to adjust. But most firms are acting to raise productivity, as well as cutting costs, adjusting supply chains, and hedging their currency exposure, among other efforts. Those businesses that have been helped by the stronger currency are also adjusting, by lowering prices, strengthening their balance sheets, and in some cases, increasing productivity. Our surveys, as well as those conducted by the Export Development Canada and the Conference Board of Canada, suggest that business investment will increase.

I can appreciate that making some of these adjustments is not easy. For many firms and employees, it can be a painful and difficult process. But in today's world, not adjusting is not an option.

I can appreciate that making some of these adjustments is not easy. For many firms and employees, it can be a painful and difficult process. But in today's world, not adjusting is not an option. Fortunately, thanks to a sound economic policy framework, we have a relatively favourable climate in which to take these necessary steps. Many elements currently support investment: inflation remains low, stable, and predictable, and credit conditions are favourable. Business confidence and balance sheets are strong, and equity markets are performing well.

Conclusion

Let me close by talking about the lessons we can learn from the past. To me, the key points are clear. Economies must have the flexibility to adjust as circumstances change. This means having the right structural policies in place, as well as appropriate macroeconomic policies. Along with the right economic policies, a floating exchange rate will help the economy make adjustments more smoothly.

All of us, whether as economic policy-makers or business people, must be quick to recognize the need to adjust. We ignore economic realities at our own peril. When adjustments are too slow, the economy suffers. When inappropriate policies are followed, the damage can take years to undo. But when the right adjustments are made quickly, the whole economy can benefit.

As business people making your own adjustments to future economic challenges, you can count on the Bank of Canada to pursue the appropriate monetary policy to help you get on with the job.

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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)
2000 A	1-3	2.1	1.1	5.00	5.50	5.26	-5.37	5.62	83.23	14.7	9.6	7.3	2.28	1.2	1.3	5.2	2.2	3.7
M	1-3	2.4	1.1	5.50	6.00	5.75	-5.48	5.98	82.08	13.6	8.3	6.6	1.82	1.3	1.4	1.4	3.2	3.2
J	1-3	2.9	1.3	5.50	6.00	5.75	-5.32	5.89	82.70	15.5	9.3	7.2	1.84	1.4	1.6	2.7	3.2	2.9
J	1-3	3.0	1.2	5.50	6.00	5.73	-4.88	5.88	83.83	16.6	9.2	7.6	1.90	1.5	1.7	2.5	2.5	3.0
A	1-3	2.5	1.2	5.50	6.00	5.75	-5.05	5.90	83.34	15.9	8.5	7.0	1.84	1.5	1.6	3.3	2.3	3.4
S	1-3	2.7	1.0	5.50	6.00	5.74	-5.45	5.83	82.53	17.4	9.2	6.9	2.07	1.3	1.5	4.6	2.4	4.0
O	1-3	2.8	1.3	5.50	6.00	5.75	-5.70	5.85	81.87	17.5	9.6	7.5	2.09	1.5	1.6	3.4	3.5	3.7
N	1-3	3.2	1.5	5.50	6.00	5.75	-6.22	5.89	80.49	15.8	9.5	7.5	2.00	1.8	1.8	4.3	4.8	3.3
D	1-3	3.2	1.8	5.50	6.00	5.80	-5.92	5.71	81.66	15.6	10.1	7.9	2.14	1.9	2.0	3.9	3.0	3.2
2001 J	1-3	3.0	1.8	5.25	5.75	5.49	-6.06	5.29	82.36	14.4	9.1	7.7	2.36	2.0	2.0	4.1	3.7	3.0
F	1-3	2.9	1.7	5.25	5.75	5.49	-6.94	5.05	80.78	14.3	8.6	7.7	2.27	2.0	1.9	3.8	3.8	3.5
M	1-3	2.5	1.8	4.75	5.25	4.99	-7.93	4.66	79.35	13.5	7.7	7.5	2.34	1.7	1.9	4.1	3.8	3.7
A	1-3	3.6	2.3	4.50	5.00	4.74	-7.71	4.49	80.28	11.3	7.2	7.3	2.36	1.9	2.4	-	4.3	3.5
M	1-3	3.9	2.3	4.25	4.75	4.67	-7.60	4.49	80.54	11.7	8.9	7.8	2.45	2.0	2.5	3.1	3.8	4.0
J	1-3	3.3	2.3	4.25	4.75	4.49	-7.03	4.38	82.21	10.0	8.0	7.2	2.36	1.9	2.4	2.9	2.8	3.8
J	1-3	2.6	2.4	4.00	4.50	4.24	-7.70	4.22	80.97	9.5	8.3	7.0	2.28	2.1	2.4	3.3	2.6	3.3
A	1-3	2.8	2.3	3.75	4.25	4.17	-8.28	3.96	80.18	9.1	8.7	7.0	1.99	2.1	2.3	2.5	2.5	2.5
S	1-3	2.6	2.3	3.25	3.75	3.49	-9.69	3.19	78.65	11.7	10.7	7.6	2.18	2.0	2.3	1.8	3.5	2.3
O	1-3	1.9	2.2	2.50	3.00	2.74	-10.59	2.45	78.28	12.0	10.8	7.8	1.71	1.8	2.1	2.5	1.4	2.5
N	1-3	0.7	1.7	2.00	2.50	2.60	-10.78	2.17	78.50	13.7	13.1	8.7	1.91	1.4	1.7	1.9	0.6	3.0
D	1-3	0.7	1.6	2.00	2.50	2.24	-10.94	2.08	78.33	14.3	14.0	7.6	1.93	1.3	1.6	2.4	1.0	3.3
2002 J	1-3	1.3	1.8	1.75	2.25	1.99	-10.82	2.07	78.63	14.4	15.5	8.0	1.95	1.4	1.8	2.1	2.0	3.5
F	1-3	1.5	2.2	1.75	2.25	1.99	-11.07	2.16	77.84	12.7	15.4	7.5	1.96	1.4	2.1	1.1	1.5	3.4
M	1-3	1.8	2.1	1.75	2.25	1.99	-10.61	2.36	78.45	12.4	15.7	7.0	2.30	1.8	2.1	1.2	1.1	3.2
A	1-3	1.7	2.2	2.00	2.50	2.24	-10.07	2.46	79.48	11.8	15.3	7.0	2.29	1.9	2.1	0.5	0.6	2.8
M	1-3	1.0	2.2	2.00	2.50	2.25	-9.31	2.68	80.79	12.0	14.4	6.7	2.24	2.0	1.9	1.8	-0.3	2.4
J	1-3	1.3	2.1	2.25	2.75	2.50	-9.12	2.78	80.99	13.5	15.7	6.9	2.32	2.1	1.9	1.2	0.6	2.7
J	1-3	2.1	2.1	2.50	3.00	2.74	-10.40	2.88	77.71	13.8	14.8	6.8	2.28	2.1	2.0	0.7	0.5	2.8
A	1-3	2.6	2.5	2.50	3.00	2.74	-9.68	3.09	78.90	14.2	15.2	6.7	2.18	2.2	2.4	1.4	1.3	3.0
S	1-3	2.3	2.5	2.50	3.00	2.74	-10.27	2.90	77.97	11.1	12.7	6.9	2.18	2.3	2.3	0.9	0.9	2.8
O	1-3	3.2	2.5	2.50	3.00	2.74	-10.06	2.83	78.63	11.8	12.5	5.6	2.18	2.5	2.4	1.4	2.1	2.7
N	1-3	4.3	3.1	2.50	3.00	2.74	-10.21	2.85	78.24	9.8	10.3	4.7	2.15	3.1	3.0	2.2	1.8	2.5
D	1-3	3.9	2.7	2.50	3.00	2.74	-9.80	2.83	79.24	7.2	8.1	3.8	2.09	3.3	2.4	1.6	2.1	1.9
2003 J	1-3	4.5	3.3	2.50	3.00	2.74	-9.34	2.91	80.15	7.8	7.3	3.6	2.27	3.3	2.9	1.5	1.1	1.9
F	1-3	4.6	3.1	2.50	3.00	2.75	-8.61	2.97	81.78	7.3	6.4	3.2	2.40	3.3	2.9	1.6	1.1	2.1
M	1-3	4.3	2.9	2.75	3.25	2.99	-7.72	3.28	83.22	6.6	5.5	3.2	2.50	3.1	2.7	1.7	0.1	1.8
A	1-3	3.0	2.1	3.00	3.50	3.24	-6.92	3.35	85.07	7.1	5.3	3.0	2.28	2.8	2.1	2.7	-1.5	1.3
M	1-3	2.9	2.3	3.00	3.50	3.24	-6.02	3.27	87.60	7.7	5.4	3.5	2.12	2.5	2.2	1.7	-2.7	1.8
J	1-3	2.6	2.1	3.00	3.50	3.24	-5.11	3.11	90.45	7.9	5.4	3.3	2.04	2.1	2.0	1.9	-3.7	1.4
J	1-3	2.2	1.8	2.75	3.25	2.99	-6.60	2.89	87.07	10.0	6.7	3.5	2.25	1.7	1.9	2.0	-2.1	2.1
A	1-3	2.0	1.5	2.75	3.25	3.00	-6.68	2.80	87.11	9.4	6.6	3.5	2.29	1.7	1.7	1.8	-2.6	2.1
S	1-3	2.2	1.7	2.50	3.00	2.75	-5.93	2.64	89.52	8.4	6.5	3.4	2.15	1.8	1.9	1.1	-3.8	2.7
O	1-3	1.6	1.8	2.50	3.00	2.75	-4.85	2.71	92.25	7.1	6.1	3.0	2.38	1.8	1.8	0.8	-5.6	2.7
N	1-3	1.6	1.8	2.50	3.00	2.75	-4.73	2.73	92.54	8.6	6.8	3.1	2.38	1.8	1.7	0.1	-6.0	2.3
D	1-3	2.0	2.2	2.50	3.00	2.75	-4.68	2.66	92.87	9.7	7.6	3.9	2.41	1.5	2.1	0.1	-5.3	2.7
2004 J	1-3	1.2	1.5	2.25	2.75	2.50	-5.77	2.37	90.68	10.7	8.5	3.9	2.66	1.5	1.5		-5.5	2.7
F	1-3	0.7	1.1	2.25	2.75	2.50	-6.21	2.25	89.82	13.2	9.8		2.53	1.0	1.2		-4.5	2.8
M				2.00	2.50	2.25	-5.72	2.10	91.55				2.65					3.0

* 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)
1991	2.7	4.9	2.9	8.6	7.6	1.0	3.5	2.0	8.2	0.8	-2.1		-1.8	10.3
1992	7.1	4.2	0.2	5.8	7.1	-3.4	1.8	1.3	8.4	2.2	0.9		-0.7	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		0.8	11.4
1994	13.2	8.4	1.4	1.9	6.8	1.6	4.8	7.9	6.4	6.0	4.8		2.0	10.4
1995	6.6	0.8	-2.6	3.8	4.1	5.6	5.2	7.5	3.7	5.1	2.8		1.9	9.4
1996	12.2	8.2	3.3	4.4	6.8	1.6	5.5	6.5	4.2	3.3	1.6		0.8	9.6
1997	16.9	11.2	7.2	0.9	7.2	7.7	10.1	10.0	5.6	5.5	4.2		2.3	9.1
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	2.7	8.3
1999	7.6	6.0	4.3	3.6	5.3	1.9	6.1	7.9	4.5	7.4	5.5	5.6	2.8	7.6
2000	14.7	10.6	8.8	5.9	7.0	6.6	7.4	12.5	4.7	9.5	5.3	5.5	2.6	6.8
2001	12.1	10.3	9.6	6.6	7.6	-1.5	5.4	7.1	4.2	3.0	1.9	2.0	1.1	7.2
2002	12.0	10.9	13.7	7.4	6.4	-5.6	3.7	7.1	7.3	4.3	3.3	3.5	2.2	7.7
2003	8.2	5.1	6.3	4.7	3.4	-3.3	1.7	8.8	7.9	5.2	1.7	1.8	2.2	7.6
Annual rates 2000 I	22.7	12.8	11.4	8.0	8.4	10.7	7.4	16.3	5.6	11.2	5.7	6.2	3.4	6.8
II	22.4	16.9	13.9	6.5	8.2	15.9	10.8	12.6	6.2	10.7	4.2	3.5	1.5	6.7
III	11.6	8.4	6.4	5.0	6.8	3.1	5.5	11.2	2.1	8.5	5.3	4.5	1.4	6.9
IV	9.1	9.8	7.6	3.4	7.0	7.1	7.2	8.1	3.6	3.8	1.7	2.3	3.0	6.9
2001 I	13.5	7.8	6.2	7.7	8.4	-1.9	4.7	4.9	3.4	4.9	1.3	1.5	0.3	7.0
II	10.0	12.7	12.2	8.1	7.5	-15.7	2.1	6.1	4.1	0.7	1.1	1.5	0.9	7.1
III	7.8	7.8	11.1	5.1	5.8	-2.8	6.0	6.4	6.3	-5.0	-0.7	-0.6	0.2	7.2
IV	22.6	16.4	21.5	13.4	10.4	-	6.0	4.6	7.0	-1.4	3.8	2.9	0.3	7.6
2002 I	12.7	14.2	17.6	8.4	6.3	-10.4	3.4	5.6	7.0	9.2	5.8	6.3	2.7	7.9
II	7.3	7.4	10.7	4.2	4.9	-5.7	2.5	9.5	8.8	10.6	3.8	4.8	4.1	7.6
III	10.2	7.3	7.6	5.8	4.6	-3.0	2.7	10.1	8.3	4.9	2.7	3.1	3.9	7.5
IV	8.2	5.4	5.5	3.9	3.0	-1.8	1.6	10.0	7.5	6.1	1.6	1.9	2.8	7.6
2003 I	3.4	0.5	1.9	4.5	0.9	-1.4	1.8	7.6	7.4	10.0	2.5	1.8	1.8	7.5
II	8.7	5.1	6.6	6.4	4.6	-1.6	0.9	7.7	7.5	-2.6	-1.0	-0.9	0.7	7.7
III	17.2	11.4	12.8	5.1	5.5	-7.2	1.4	10.4	8.7	4.7	1.3	1.6	0.8	7.9
IV	5.2	4.5	6.3	0.4	2.5	-11.1	2.4	7.6	9.4	4.1	3.8	4.2	3.6	7.5
2004 I													1.1	7.4
Last three months	15.9	8.9	9.7	2.1	3.2	-7.3	3.9	8.3	8.9			4.2	1.1	7.5
Monthly rates 2003 M	0.2	1.0	1.1	0.5	0.1	0.2	0.4	0.4	0.4			-0.2	0.1	7.4
A	0.7	-0.1	0.2	0.4	0.5	-0.3	-0.1	0.7	0.7			-0.3	-	7.6
M	1.1	0.7	0.7	0.8	0.7	-0.4	-0.1	0.7	0.7			0.1	-	7.9
J	1.7	1.1	1.2	0.4	0.4	-	0.3	0.7	0.5			-	0.3	7.7
J	2.5	1.2	1.3	0.5	0.6	-0.7	0.1	1.4	0.8			0.5	-	7.7
A	0.2	0.8	0.9	0.2	0.4	-0.8	0.1	0.3	0.7			-0.8	-0.1	8.0
S	-0.1	-0.2	0.3	-	0.2	-1.4	-	0.7	0.8			1.1	0.3	7.9
O	0.1	0.3	0.3	-0.3	-	-0.6	0.3	0.6	0.8			0.2	0.4	7.6
N	1.2	0.8	0.8	0.2	0.5	-1.3	0.2	0.7	0.8			0.2	0.4	7.5
D	1.0	0.4	0.5	0.6	0.1	-0.8	0.3	0.6	0.4			0.5	0.3	7.4
2004 J	1.7	1.3	1.3	0.5	0.4	-0.1	0.5	0.8	0.8			-0.1	0.1	7.4
F	2.4	0.7	0.8			-	0.3						-0.1	7.4
M													-0.1	7.5

		Prices and costs				Wage settlements		Bank of Canada commodity price index (unadjusted)		Securities mid-market yield			Year, quarter, and month
Capacity utilization rate		CPI	Core CPI*	GDP chain price index	Unit labour costs	Public sector	Private sector			Treasury bills 3-month	Canada 10-year benchmark bonds	Canada 30-year Real Return Bonds	
Total industrial	Manufacturing industries							Total	Non-energy				
(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
78.3	74.2	5.6	2.8	2.9		3.4	4.3	-11.2	-11.8	7.43	8.32	4.45	1991
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
83.3	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
84.4	85.9	1.7	1.4	1.7	0.1	1.9	2.7	6.7	1.5	4.85	6.18	4.01	1999
84.9	86.1	2.7	1.3	4.0	3.0	2.5	2.4	18.4	3.5	5.49	5.35	3.42	2000
82.2	81.7	2.6	2.1	1.1	2.7	3.3	3.0	-5.2	-6.9	1.95	5.44	3.76	2001
82.3	83.3	2.2	2.3	0.9	1.4	2.9	2.6	-5.9	-6.6	2.63	4.88	3.33	2002
82.0	82.9	2.8	2.2	3.4	1.4	2.9	1.5	20.1	8.8	2.57	4.66	2.79	2003
85.2	86.1	2.8	0.6	5.2	3.6	2.4	3.0	30.1	20.0	5.27	6.03	3.80	2000 I
84.7	85.6	1.7	1.3	6.3	8.5	2.5	2.7	4.7	-4.9	5.53	5.93	3.77	II
84.8	86.2	4.0	1.8	3.1	0.8	2.6	1.9	5.8	-17.6	5.56	5.75	3.60	III
84.9	86.3	4.2	2.5	2.3	2.6	3.0	2.3	17.0	-7.6	5.49	5.35	3.42	IV
83.5	83.5	1.0	1.5	3.4	4.1	3.9	2.5	11.6	-5.5	4.58	5.41	3.45	2001 I
83.3	82.9	5.2	3.2	-0.4	0.4	3.0	3.0	-16.0	23.0	4.30	5.73	3.53	II
81.5	80.8	0.5	2.2	-4.4	2.8	3.7	3.2	-38.1	-22.2	3.05	5.32	3.68	III
80.4	79.6	-2.1	0.6	-5.2	1.7	3.0	2.4	-41.3	-30.8	1.95	5.44	3.76	IV
81.3	81.6	2.9	2.6	3.1	1.1	3.1	2.1	15.9	12.3	2.30	5.79	3.68	2002 I
82.3	83.3	4.5	3.2	6.6	-0.9	2.7	2.3	40.0	-1.8	2.70	5.37	3.42	II
82.9	84.2	4.3	3.2	2.3	2.2	3.2	2.5	2.8	-1.5	2.83	4.92	3.25	III
82.6	83.9	3.7	2.1	4.5	4.7	3.3	3.5	20.4	-4.0	2.63	4.88	3.33	IV
82.6	83.5	4.8	3.8	7.2	0.4	2.9	2.4	82.0	14.1	3.14	5.13	3.08	2003 I
81.2	82.1	-1.6	-0.4	-1.8	1.2	3.1	0.7	-17.4	14.8	3.07	4.37	2.99	II
81.3	81.9	1.8	1.1	3.7	0.3	3.2	2.3	0.6	20.8	2.58	4.64	3.08	III
82.9	84.0	2.0	3.4	0.4	-0.5	2.3	1.6	17.6	19.5	2.57	4.66	2.79	IV
								45.0	38.4	1.98	4.33	2.39	2004 I
		2.0	1.9		-0.5			45.0	38.4	1.98	4.33	2.39	
		0.1	-	0.1				-8.4	-0.4	3.14	5.13	3.08	2003 M
		-0.6	-0.4	0.2				-6.1	0.5	3.19	4.90	3.13	A
		-0.1	0.4	0.1				3.3	1.8	3.16	4.50	3.00	M
		0.1	-0.1	-				3.2	2.6	3.07	4.37	2.99	J
		0.2	-	-				-3.4	-0.2	2.81	4.78	3.15	J
		0.2	0.1	0.4				1.6	2.2	2.71	4.96	3.15	A
		0.2	0.4	-0.6				-1.8	3.6	2.58	4.64	3.08	S
		-0.1	0.2	0.1				1.1	-0.8	2.64	4.85	3.00	O
		0.3	0.3	-0.1				1.3	2.5	2.67	4.79	2.91	N
		0.3	0.2	0.3				8.5	1.7	2.57	4.66	2.79	D
		-	-					2.7	2.6	2.25	4.61	2.57	2004 J
		-0.1	-0.2					-0.1	4.2	2.13	4.41	2.56	F
								2.6	2.5	1.98	4.33	2.39	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

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)
1991	-5.4	-8.4	1.0	-3.7	1.1458
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	1.8	3.0	6.3	2.9	1.4852
2001	1.2	1.4	6.4	2.4	1.5484
2002	1.0	0.8	5.0	2.0	1.5704
2003	0.7	1.2	5.0	2.1	1.4015
Annual rates					
2000 I	1.8	2.2	5.6	2.6	1.4538
II	1.3	3.2	6.0	2.6	1.4808
III	2.3	3.5	6.4	2.9	1.4822
IV	1.9	3.1	7.2	3.3	1.5258
2001 I	1.6	2.4	8.2	4.3	1.5280
II	1.8	2.3	6.9	3.2	1.5409
III	1.1	0.9	5.3	1.1	1.5453
IV	0.2	-	5.3	1.0	1.5803
2002 I	0.5	0.4	5.5	2.4	1.5946
II	0.9	0.5	5.0	2.2	1.5549
III	1.1	0.8	5.0	1.8	1.5628
IV	1.5	1.4	4.6	1.7	1.5698
2003 I	1.1	1.4	5.3	2.0	1.5102
II	-0.4	0.6	4.5	1.7	1.3984
III	1.0	1.1	5.2	2.6	1.3799
IV	1.2	1.6	4.9	2.2	1.3160
2004 I					1.3179
Last three months					1.3179
Monthly rates					
2003 M					1.4759
A					1.4585
M					1.3845
J					1.3523
J					1.3815
A					1.3957
S					1.3632
O					1.3218
N					1.3126
D					1.3128
2004 J					1.2960
F					1.3290
M					1.3284

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 funding of the major money market dealers through general collateral buyback arrangements (repo) including special purchase and resale agreements with the Bank of Canada and funding through call loans and swapped foreign exchange funds. 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 4.25% bond 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 deposits 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 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 4.25% bond 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)