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Contents

Session 1: Financial Market Linkages

Session 2: Exchange Rate Determination in a Global Setting

v

Session 3: Current Account Dynamics

Session 4: Real Linkages: Canada and the Rest of the World

John Kuszczak Memorial Lecture

Session 5: Real Linkages: Canada and the United States

Policy Panel:
Canada's Role in International Macroeconomic Policy

Introduction

Lawrence Schembri

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

Because of Canada's close ties with the rest of the world, comprehending the extent and nature of external linkages, their implications for the

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1. In 2003, the sum of Canada's imports and exports exceeded 60 per cent of GDP, which is several times larger than the G-7 average. For more details on Canada's relative openness, see Helliwell and Schembri (2005). It is worth noting that Canada was one of the original signatories to the General Agreement on Tariffs and Trade (GATT) in 1947 and, in 1989, the Canada-US Free Trade Agreement (FTA) came into being, followed by the North American Free Trade Agreement (NAFTA) in 1994. On the financial side, Canada abolished exchange controls in 1951; it was one of the first industrialized countries to do so after World War II.

Canadian economy, and the process by which the Canadian economy adjusts to external shocks is of critical importance in the formulation of monetary policy and in the Bank of Canada's monitoring of the Canadian financial system. The main purpose of this conference, therefore, was to deepen our understanding of these critical issues.

The International Department at the Bank of Canada, host of the conference, is responsible for monitoring and analyzing economic events in the rest of the world. With the other economics departments at the Bank, the International Department analyzes this information to determine the impact of external shocks on the Canadian economy and on the Canadian financial system, and to help develop the appropriate policy response. The goal of the conference was to help improve our own research and the quality of our analysis and advice.

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

Session 1:
Financial Market Linkages

Recently, there has been a great deal of interest in financial globalization and the economic implications of increased capital market integration. Although the trend has been towards greater international integration of financial

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

markets, the evidence provided in this session's papers indicates that these markets are not as well integrated as some would believe.

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

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

Jean Imbs examines the impact of financial integration on business cycle correlations, using data for Canadian provinces and US states. This research is motivated, in part, by the well-known "quantity puzzle"—the observation that the correlation of output across countries is positive and larger than the correlation of consumption.[3] One aspect of this puzzle is that financial integration at the international level seems to increase the correlation of output, but standard theory would predict the opposite. Imbs finds that the puzzle disappears when intranational province and state data on output and disposable income (in lieu of consumption data) are used; consumption is more highly correlated across provinces and states than output. He also finds

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

that these intranational regions are more financially integrated, which permits increased consumption smoothing, and that the increased financial integration reduces output correlations rather than increasing them, as in the case with international data. Hence, it appears that national financial markets are an order of magnitude more integrated than international financial markets, because the empirical results for national markets conform to standard economic theory, whereas those for international markets do not.

Session 2:
Exchange Rate Determination in a Global Setting

The primary motivation for these two papers is the unusually large (25 per cent) and rapid appreciation of the Canada-US dollar exchange rate between the first quarter of 2003 and the third quarter of 2004. This appreciation cannot be readily explained by the traditional Bank of Canada exchange rate equation developed by Amano and van Norden (1995). This equation is a regression model of the bilateral real Canadian exchange rate that incorporates a long-run cointegrating relationship between the real exchange rate and the real prices of Canada's energy and non-energy commodity exports. To capture the short-term dynamics, the model includes the short-term Canada-US interest rate differential, as well as the first difference of the Canada-US relative public debt. Both papers in this session begin with the traditional Bank equation and then modify it to improve its explanatory power, in particular, over the recent period of appreciation.

Jeannine Bailliu, **Ali Dib**, and **Lawrence Schembri** focus on the role of multilateral adjustment to US macroeconomic imbalances in determining shifts in the value of the Canadian dollar. They argue that, under normal circumstances, movements in the exchange rate are reasonably well explained by the bilateral Canada-US variables in the traditional exchange rate model. There are, however, situations when US external imbalances are relatively large, such as in the early to mid-1980s and over the most recent period. To redress these imbalances, the Canadian dollar may have to adjust in tandem with the currencies of other countries, because the US economy represents such a large part (about one third) of the world economy. Such exchange rate movements cannot be understood by focusing solely on bilateral Canada-US variables, because the adjustment process is global. The authors consider US fiscal deficits and current account deficits as measures of macroeconomic imbalance and adopt a two-step threshold-regression model that allows the coefficient estimates of the traditional Bank equation to change when these imbalances are large. The first step is to estimate the threshold value of the measured imbalance and then estimate the coefficient with non-linear least squares. The authors find that the US

fiscal deficit, rather than current account deficit, is the appropriate threshold variable. This result is appealing, because current account deficits can occur during investment booms, as in the late 1990s when the US dollar was strong. The result is also consistent with the "twin-deficits" phenomena of the mid-1980s and of the period since 2002. The authors modify the equations to include the two measures of US macroeconomic imbalance and find that the specification of the exchange rate equation changes when the deficit is greater than 2.65 per cent of GDP. Overall, the threshold model represents a significant increase in explanatory power over the traditional model.

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

Session 3:
Current Account Dynamics

The Canadian current account measures the net balance on transactions in goods and services between Canadian and foreign residents. For most of its history, Canada has had a current account deficit, largely reflecting the excess of domestic investment over domestic savings. Since 1999, the situation has reversed: the current account has been in surplus and Canadians are, on net, investing abroad. In general, the current account is

determined by a variety of Canadian and foreign variables that reflect current and expected future consumption, production, investment, and savings decisions and the extent to which Canada is linked to the rest of the world by trade in goods and services. The papers in this session extend existing models to better understand the determinants of the Canadian current account.

Hafedh Bouakez and **Takashi Kano** apply the intertemporal model of the current account for Canada to investigate the existence of a Harberger-Laursen-Metzler effect: the proposition that an improvement (deterioration) in the terms of trade causes an increase (decrease) in the current account balance. The rationale for such an occurrence in an intertemporal setting is that a temporary rise in the terms of trade, for example, causes a temporary increase in real income, and consumers will respond by smoothing this income increase over their lifetime consumption. Hence, over the period of the terms-of-trade increase, income goes up by more than consumption, and the current account increases. From their optimizing model of a small open economy, the authors derive a closed-form estimable equation for the current account that is based on current and expected values of the real interest rate, the real exchange rate (defined as the relative price of tradables to non-tradables), real output, and the terms of trade. The empirical model is estimated using quarterly Canadian data from 1962Q2 to 2001Q2. It is reasonably successful: the predicted current account is 60 per cent as volatile as the actual series, which is an improvement over past estimates, and the first three variables are statistically significant and economically meaningful. The terms of trade variable, however, is not found to be significant in explaining Canadian current account fluctuations, given the presence of the other three variables in the equation. This somewhat puzzling result is consistent with similar findings in the literature.[4]

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

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4. For example, see Otto (2003).

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

Session 4:
Real Linkages: Canada and the Rest of the World

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

The second paper in the session shifts geographic perspective 180 degrees to Asia. Although Canada's economic ties with Europe have declined in relative importance, the economic significance of East and South Asia to the global and Canadian economies is growing. The paper focuses on China and India, since they are the largest and among the fastest-growing countries in this region. Since 1990, China and India have grown by 9.3 per cent and 5.6 per cent per year, to become the seventh- and twelfth-largest economies, respectively.[5] Despite this period of rapid growth, the per capita GDP of both countries continues to be well below that of industrialized countries, indicating that there is still considerable potential for growth as their economic resources become more fully and efficiently employed and as capital accumulates as a result of very high savings rates. Although Canada's direct economic ties with these countries, in terms of trade and investment, are relatively small, China and India still have an important effect on Canada through their impact on global markets, especially for commodities and labour-intensive goods. Although careful analysis has not

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

yet been conducted, in part because of lack of data, it is widely believed that both countries, especially China, have significantly raised the world prices of commodities through their increased demand, and have lowered the relative prices of many labour-intensive goods, especially consumer items, by increasing supply. Generally speaking, these relative price movements have increased Canada's terms of trade and appreciated the real exchange rate, but at the same time have forced a reallocation of resources within the Canadian economy. The paper examines the reasons underpinning the rapid growth of the Chinese and Indian economies and the effects on Canada.

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

Richard Cameron, **Denise Côté**, and **Christopher Graham** provide a comprehensive and detailed review of Canada's trade and investment links with Europe since 1960. In particular, they examine the evolution of economic integration within the European Union and its ramifications for Canada, and provide a historical overview of Canada-Europe trade relations. They analyze the aggregate bilateral trade and investment data and estimate an export-share model for Canada's trade with European countries. Their main conclusion is that, although Canada's trade with the United Kingdom, especially in non-energy commodities, declined significantly after the United Kingdom joined the European Community in 1973 and Commonwealth preferences were abolished, the rest of Europe has maintained its share of bilateral trade and investment with Canada. The

authors confirm, as well, that Canada's experience was similar to that of New Zealand and Australia. The finding that Canada has been able to maintain its export share with Europe (excluding the United Kingdom) is generally consistent with the facts that trade among industrialized countries has grown faster than GDP over the postwar period, and that Europe has experienced reasonable rates of economic growth over most of this period, owing partly, perhaps, to the formation of the European Union.

Session 5:
Real Linkages: Canada and the United States

It goes almost without saying that the United States is Canada's closest economic partner. By almost any measure, whether it is exports (82 per cent), imports (69 per cent), or stocks of inward (64 per cent) or outward (41 per cent) direct investment, the United States is in most cases on the other end of any international transaction Canada undertakes.[6] Although this close economic relationship is driven largely by geographic and cultural proximity and complementary resource endowments, it has been greatly strengthened by the economic policies adopted by the two countries. Capital flows between Canada and the United States have been largely unimpeded. Although the liberalization of trade in goods and services has been more sporadic, the Auto Pact of 1965 was a historic agreement and had a huge impact on the production and trade of automobiles and their parts in North America. The Free Trade Agreement of 1989, followed by NAFTA in 1994, also had a significant impact, as trade of goods and services between the two countries increased dramatically.

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

Marc-André Gosselin, **René Lalonde**, **Jean-François Perrault**, and **Gerald Stuber** examine the determinants of business cycle variations in Canadian output at the industry level. They use output data for Canada and the United States for the years 1963 to 2001; the Canadian and US data are disaggregated by 10 industries and 13 regions (five Canadian and eight US). The authors estimate a state-space model for each industry to decompose business cycle output movements in that industry into a common North

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6. The trade data are for 2004, and the stock data for foreign direct investment are for 2003.

American factor, a Canadian factor, and regional and idiosyncratic factors.[7] They find that the Canadian factor is predominant for the Canadian business cycle, but the influence of the common North American factor has increased over the sample, at the expense of regional-specific shocks. On a regional basis, they find, not surprisingly, that the North American factor is most important for Ontario and Quebec. Over the sample, the Canadian factor increases in importance for the manufacturing sector, implying that this sector has become more specialized over time in the products in which Canada has a comparative advantage. The last key result is that industry composition matters, in the sense that the factors that explain output variation across industries are different. Manufacturing and wholesale and retail trade are more related to the North American component, whereas the Canadian factor is relatively more important for most non-traded industries; for the primary sector, idiosyncratic shocks dominate (which may be the result of movements in world commodity prices). Given this variation across sectors, it is critical that monetary policy and other public policy aim at creating a flexible and well-functioning Canadian economy.

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

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

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7. In general, state-space models are similar to dynamic-factor models, such as the one presented by Cardarelli and Kose in the final paper of this session; the main difference is the imposition of the restriction to identify the orthogonal dynamic factors.

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

John Kuszczak Memorial Lecture

In his lecture,[8] **Charles Engel** makes four sequential arguments that lead to his conclusion that co-operative monetary policy aimed at smoothing fluctuations in the Canada-US exchange rate may be welfare-improving. First, using new transactions price data on individual commodities, collected by the Economic Intelligence Unit, he confirms the Engel and Rogers (1996) finding that the law of one price does not hold between Canadian and US cities. He maintains that this evidence is consistent with the hypothesis of local currency pricing. Second, he argues that the Chen and Rogoff (2003) model of the empirically well-established link between commodity prices and the Canadian real exchange rate stems from changes in the relative price of non-traded to traded goods, and he demonstrates that this channel is not consistent with the data. Finally, he develops a simple two-country (Canada-US) model in which commodity price movements imply a real transfer of resources between Canada and the United States. He argues, for example, that a commodity price increase implies that a transfer from the United States to Canada must cause an appreciation in order to restore balance-of-payments equilibrium. Such an appreciation leads to welfare losses, because the resulting relative price movements do not reflect changes in underlying costs, and thus, resources would be misallocated. Hence, there may be scope for co-operative monetary policy to limit exchange rate movements to reduce this welfare loss.

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

Closing Policy Panel:
Canada's Role in International Macroeconomic Policy

In past conferences, the closing panel typically provided a critical review of the papers presented. At this conference, however, the panel was asked to reflect on Canada's role in the formulation of macroeconomic policy at the international level, because policy decisions made by bodies such as the G-7, G-20, and the various international forums on financial stability have important implications for Canada as an open economy. Indeed, Canada is unique in the sense that it is "large" enough, in either a political or an economic sense, to be included in such decision making at the highest level, yet sufficiently small that it still resembles the prototypical small open economy with strong economic links to the rest of the world. The three panellists were asked to provide different perspectives on Canada's role.

Mark Carney addressed the G-7 process after spending almost a year as the Canada's G-7 Deputy at the Department of Finance.[9] He made a number of interesting observations about the G-7 process and Canada's role. He began by discussing the G-7 priorities in recent years: he felt that at least half of the G-7's attention was being paid to development and debt issues in the poorest countries, and that oversight of the International Monetary Fund and the World Bank was also an important priority. Other international macroeconomic policy challenges often did not receive the attention one might expect. He felt that there were three international macroeconomic policy issues that are important for Canada, and that Canada has and should continue to push these issues forward by its thoughtful and disinterested analysis and through the Bank of Canada's collaborative efforts with other central banks. In particular, he noted international architecture reform, structural resolution of global imbalances, and current concerns involving oil prices and exchange rates. Canada has an enviable record of recent macroeconomic performance and can draw from that experience to make meaningful interventions on these issues.

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

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9. Mark Carney was on leave from his position as Deputy Governor at the Bank of Canada.

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

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

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