Panel Discussion

Discussion 1

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Alternating Exchange Rate Regimes: The Canadian Experience, 1820–2000

Introduction

Canadian exchange rate history over the past two centuries displays an alternating pattern of fixed and floating rates. From the early 19th century until the mid-20th, fixed exchange rates generally prevailed. Since 1950, the opposite has been the case. My remarks will focus on the determinants of Canada's choice of exchange rate under different international monetary regimes.

I define a monetary regime as a set of monetary arrangements and institutions accompanied by a set of expectations—expectations by the public with respect to policy-makers' actions and expectations by policy-makers about public response to their actions. Two types of monetary regimes have been followed: one based on convertibility into a commodity, generally specie, and the other based on fiat.

The international aspect of a regime relates to the monetary arrangements between nations. Two basic types of international regimes have been pursued—fixed and flexible rates, along with a number of intermediate variants, including adjustable pegs and managed floating (Bordo and Schwartz 1999).

I argue that a key factor in Canada's choice of exchange rate regime was the international monetary arrangement prevailing at the time—convertible or fiat. This choice can also be understood in terms of rules versus discretion.

I define a rule as a commitment mechanism to prevent monetary authorities from setting policies sequentially in a time-inconsistent manner (i.e., by discretion).

Over most of the first century of our survey, Canada followed the gold (specie) standard convertibility rule, as did most other countries. The rule for the monetary authorities was to ensure that domestic currency was convertible into gold (specie) at a fixed price. Following such a rule left little room for activist monetary or fiscal policy. In countries that had central banks, the operating procedure or rule of thumb was to follow the "rules of the game"—to expand or contract the domestic monetary base depending on the level of gold reserves. A key implication of adhering to the gold (specie) convertibility rule for a small open economy is that the domestic price level was determined by prices in the rest of the world. It also meant that shocks and business cycle disturbances could easily be transmitted from abroad to the domestic economy.

The gold (specie) convertibility rule followed by many countries was a contingent rule (Bordo and Kydland 1995). It was contingent in the sense that the monetary authorities would keep the price of currency fixed in terms of gold—except in the event of a well-understood emergency such as a war, a financial crisis, or an external shock such as a decline in the terms of trade. Under these circumstances, the monetary authorities could temporarily abandon the convertibility rule, allow the exchange rate to float, and exercise monetary independence. In the case of a wartime emergency, for example, the monetary authority could issue fiat money to capture seigniorage revenue. The rule was contingent in the sense that the public understood that the suspension would last only for the duration of the emergency, and that the government would later adopt the deflationary policies necessary to resume payments at the original parity. Moreover, adherence to the rule would be viewed as credible to the extent that the original parity was restored.

I argue that Canada followed the gold convertibility contingent rule in various guises until the 1970s. Gold parity was maintained except in the face of financial crises in the 19th century, the two world wars, and the shock of the Great Depression. Moreover, under the post-war Bretton Woods system, with its indirect link to gold, the rule (although different in the sense that changes in parity were allowed under conditions of fundamental disequilibrium) was followed, and the contingency or "escape clause" was exercised from 1950 to 1962 and again in 1970. A major sea change occurred in the international monetary regime with the breakdown of the convertibility regime in 1971 and the adoption by major nations of managed floating. This development meant that there was no longer a convertibility

rule to turn to, or put another way, there was no longer a nominal anchor defined in terms of gold (Redish 1996). The subsequent experience of Canada, the United States, and other major countries, was characterized by expansionary monetary policy in the 1970s that could possibly play the Phillips-curve trade-off and accommodate oil price shocks. The arrangement changed to a fiat regime based on discretion. In the 1980s, in response to the costs of high inflation, monetary authorities in Canada and elsewhere vigorously pursued a disinflationary policy, and by 1990, began explicit inflation targeting. This change in policy can be viewed as a new type of domestic policy rule—the domestic convertibility principle.

1 The History

1.1 The gold standard, 1820–1914

Before Confederation in 1867, Canada had no central bank, and the monetary role of the government was to define the gold content of coins acceptable as legal tender. Bank notes issued by chartered banks were required to be convertible into gold. The contingent rule in the form of a suspension of convertibility was exercised in the face of a financial crisis in 1837. In the crises of 1847 and 1857, authorities may have issued short-term debentures but did not suspend convertibility (Bordo, Redish, and Shearer 1999).

With Confederation in 1867, the Canadian government issued Dominion notes convertible into gold. The rule followed was based on the British Bank Charter Act of 1844 of a fixed fiduciary issue and an additional issue determined by gold reserves. The rule followed after Confederation was also contingent. In the face of the 1907 crisis, an emergency discount window was set up by the Department of Finance to provide Dominion notes to banks under liquidity pressure.

1.2 Wars and depression

In World War I, the escape clause was quickly invoked, and the currency became inconvertible. Through the institution of the Finance Act of 1914, which provided a liberal discount facility, Canada, like other belligerents, pursued an expansionary monetary policy, and this led to rapid inflation. After the war, Canada followed the British example and deflated in an attempt to restore the pre-war gold parity. This was achieved in July 1926. But the gold standard to which Canada had returned was a feeble variant of its predecessors. Weakened by problems, the gold standard had become vulnerable: key members had returned to gold at inappropriate parities, and members were no longer prepared to strictly follow the dictates of the

convertibility rule and eschew activist financial policies for domestic goals. It lasted only six years. In the Canadian case, adherence to the convertibility rule was weakened by continued access by the chartered banks—after the war ended—to the discount window of the Finance Act.

In the face of external shocks, Canada de facto suspended convertibility in December 1928. However, expansionary monetary policy was not pursued, Canadian prices and output moved in line with those in the United States (see Table 1 and Figures 1 and 2), and Canada, in effect, shadowed the gold standard. In 1931, following Britain's departure from gold, the suspension of convertibility became de jure. The Canadian dollar floated halfway between sterling and the U.S. dollar until the United States left the gold standard in April 1933, and the Canadian dollar moved close to parity with the U.S. dollar (see Figure 3) (Bordo and Redish 1990).

Although the gold standard had been formally suspended in the 1930s, and a central bank, the Bank of Canada—was established in 1935, the floating exchange rate and effective abandonment of the gold standard were not used to run an expansionary monetary policy. Indeed, there is considerable anecdotal evidence to suggest that many in Canada expected the resumption of a form of the gold standard (Bordo and Redish 1987). Thus, the gold standard contingent rule was still in play.

World War II, like World War I, was largely financed by taxes and bond issues, with only a small fraction financed by monetary expansion. Although monetary expansion was significant, inflation was largely suppressed by vigorous controls.

1.2.1 Bretton Woods

After World War II, Canada became a charter member of the International Monetary Fund (IMF) and declared its parity in 1946 at US$1.

This rate proved to be too high and led to large balance of payments deficits in the next three years. Canada, along with the United Kingdom and many other countries, devalued its currency to 90.9 cents US in November 1949. With the onset of the Korean War, massive capital flows into Canada led to large payments surpluses and, hence, inflationary pressures.

Canada once again invoked the escape clause from the prevailing successor to the gold standard rule, Article VIII convertibility, and allowed the dollar to float in June 1950. As in earlier episodes, the float was viewed as a temporary measure until market forces determined a sustainable new parity.

Canada experienced few difficulties with the floating rate, and despite repeated criticism by the IMF and other authorities, persisted with it. The

Table 1
Inflation (CPI) and real GDP growth
Canada and the United States, 1880–1997 (percentages)

	Canada				United States			
	Inflation		Real GDP growth		Inflation		Real GDP growth	
Period	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
1880–1913	0.71	3.93	4.75	5.14	0.09	2.10	4.32	6.39
1925–1931	–1.22	3.94	2.17	7.72	–1.5	3.63	0.39	6.95
1932–1939	–0.79	4.11	3.44	7.73	–1.03	4.79	3.84	9.58
1950–1962	2.11	2.76	5.36	3.66	1.88	2.07	4.38	3.40
1963–1970	3.14	1.02	5.78	1.68	3.18	1.82	4.09	2.39
1971–1987	7.45	3.02	3.68	3.31	6.57	3.39	2.55	3.30
1988–1997	2.83	1.85	1.88	3.03	3.51	1.03	2.04	1.55

Canadian exchange rate remained remarkably stable, staying within about 6 per cent of par: it was almost as if Canada had continued the Bretton Woods par rate of exchange with a wider band of permissible fluctuation (Figure 3). Furthermore, it was a relatively "clean" float, since the Bank of Canada only intervened in the foreign exchange market to offset disorderly market conditions (Yeager 1976). Indeed, Canadian prices and output closely matched those of the United States (see Figures 1 and 2).

Canada declared a new Bretton Woods parity of 92.5 cents US in May 1962 under pressure from the IMF, but also after the government unsuccessfully attempted to talk the dollar down. The 1962 peg ran into immediate difficulties. A full-scale speculative attack on the Canadian dollar was only repulsed by a rescue package of over US$1 billion, the institution of (temporary) current account controls, and tight monetary and fiscal policies.

Canada maintained its peg at 92.5 cents US for the next eight years. The experience with pegged rates was initially successful because Canadian monetary and fiscal policies were compatible with those in the United States. Canada seemed to have avoided the policy dilemma posited by Robert Mundell (1968) between a pegged exchange rate, monetary policy independence, and free capital mobility. The early to mid-1960s was a period of rapid growth and low inflation (see Table 1 and Figures 1 and 2). As in the past, an external shock led to the evocation of the contingent rule and a move to floating exchange rates. In June 1970, as in 1950, Canada abandoned its pegged exchange rate in the face of massive capital inflows from the United States. The pressure, it is believed, resulted from expansionary U.S. monetary and fiscal policy to finance new social programs and the war in Vietnam. This policy led to growing balance of payments surpluses in Canada.

Figure 1
Inflation in Canada and the United States, 1880–1997

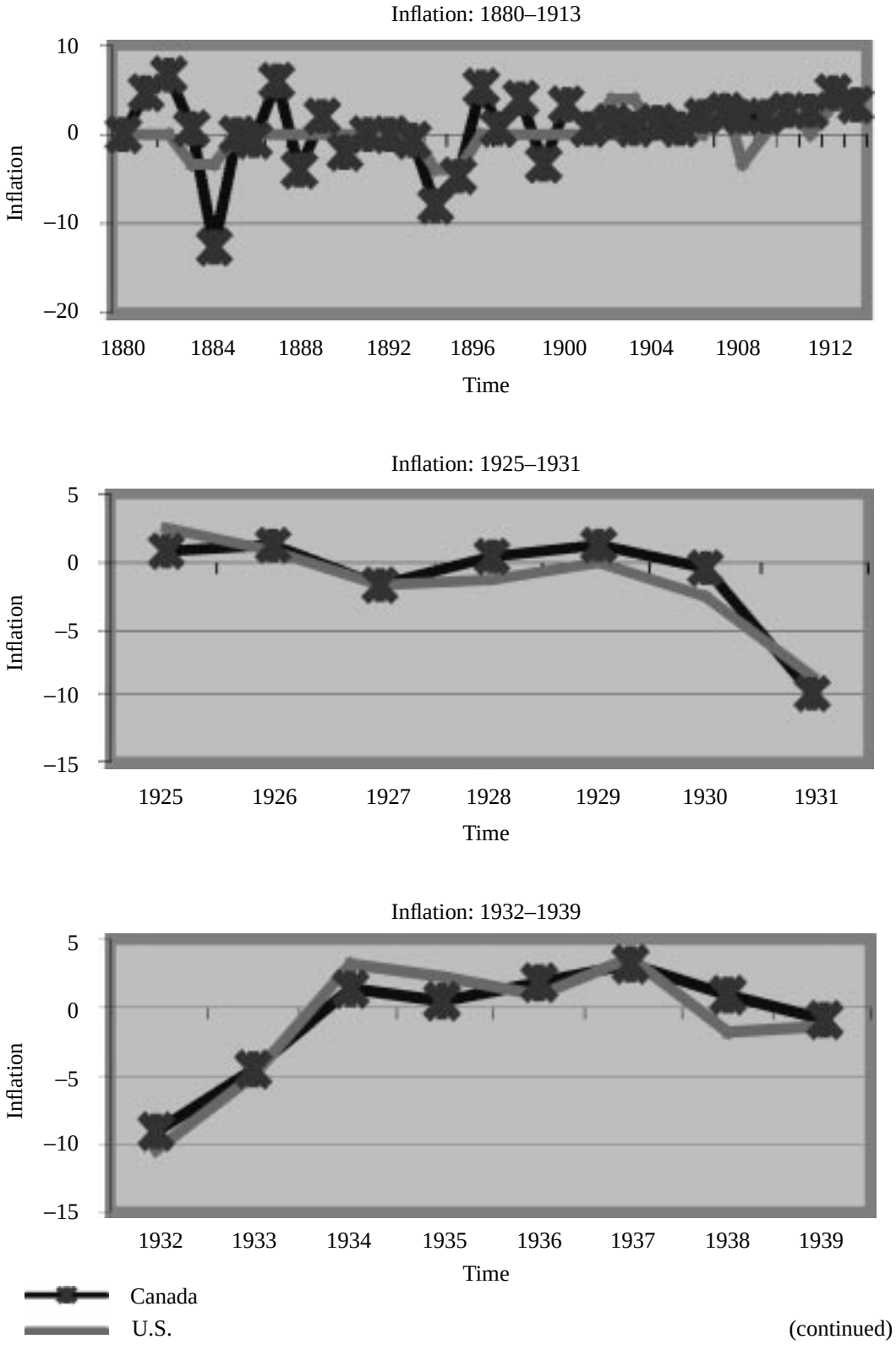

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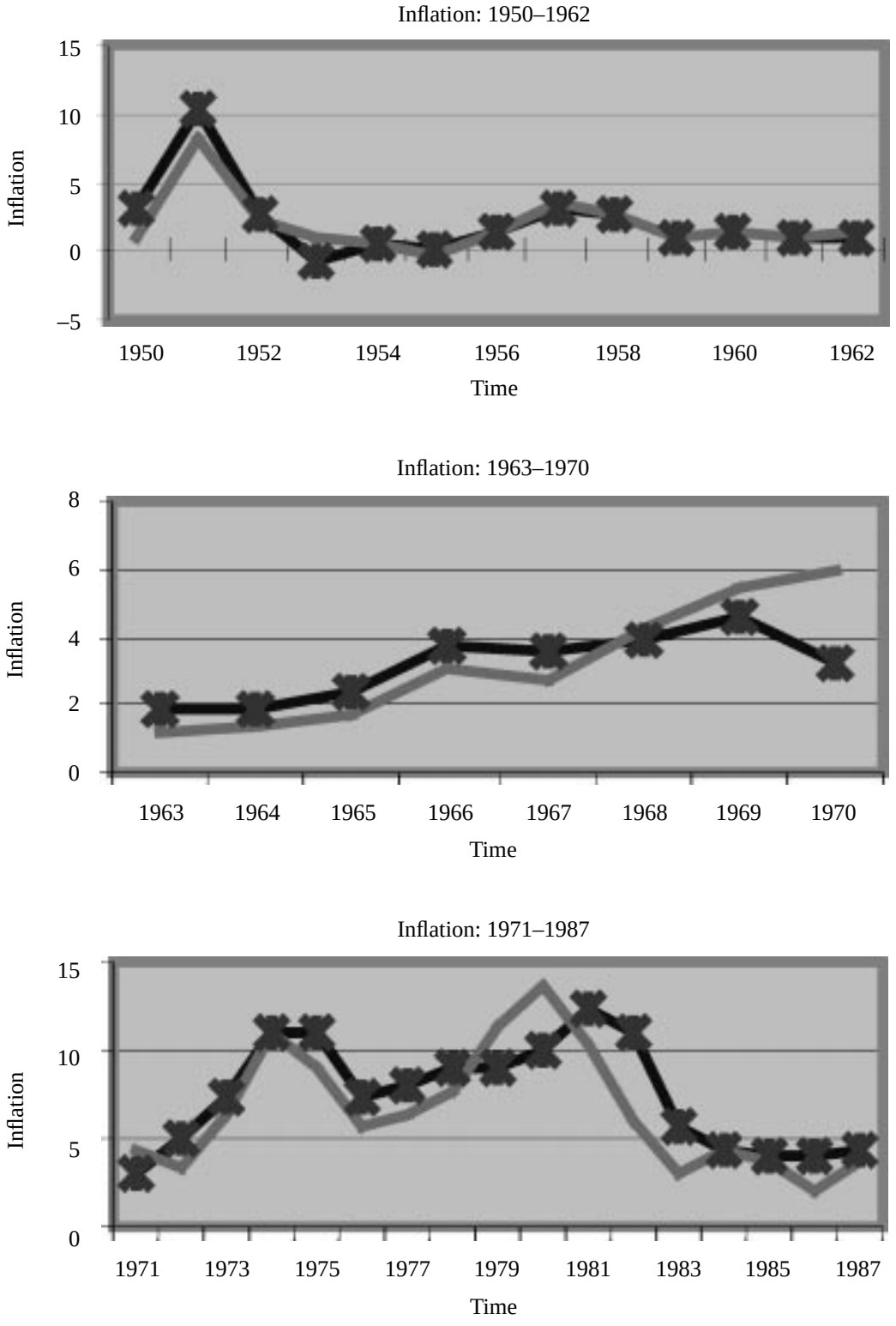
Figure 1 (continued)
Inflation in Canada and the United States, 1880–1997



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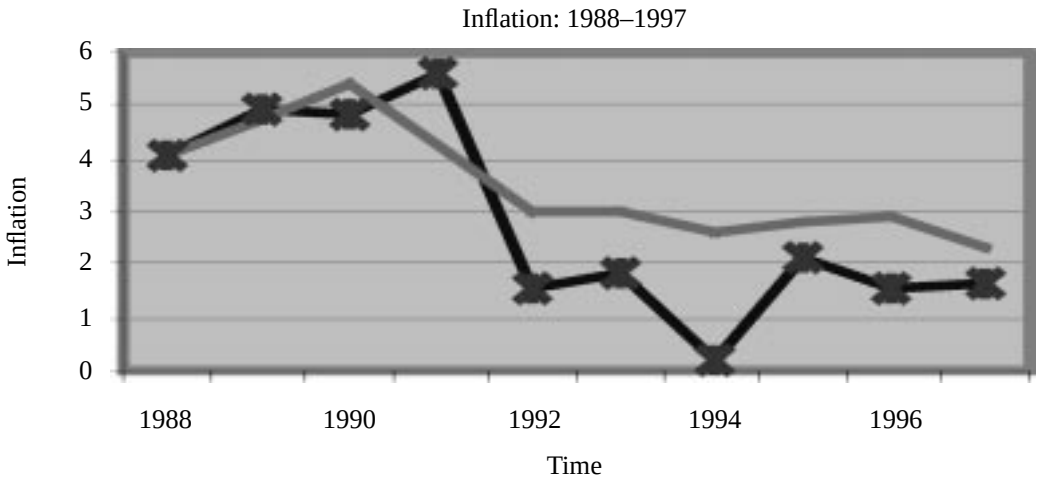

Figure 2
Real GDP growth in Canada and in the United States, 1880–1997

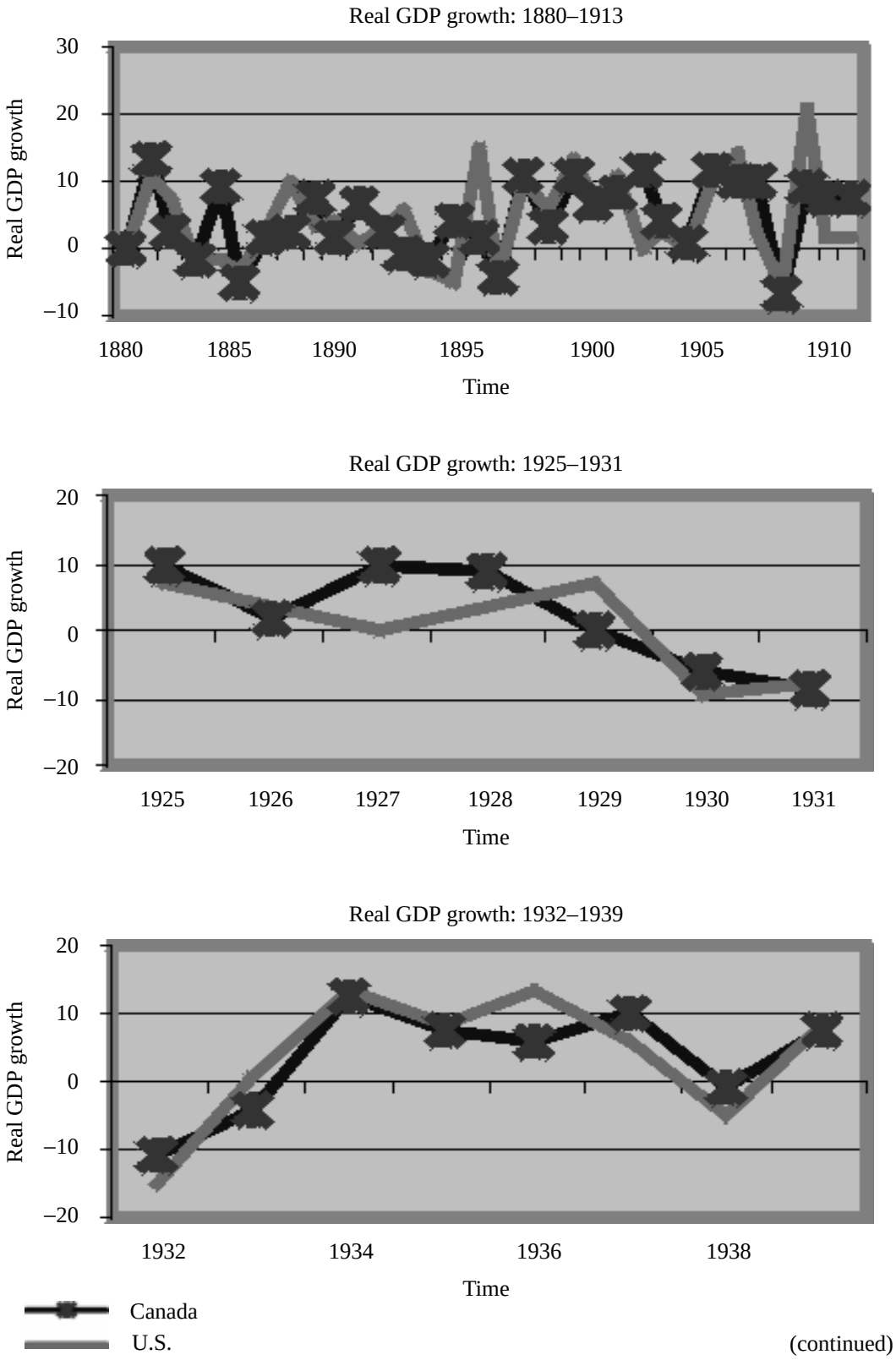

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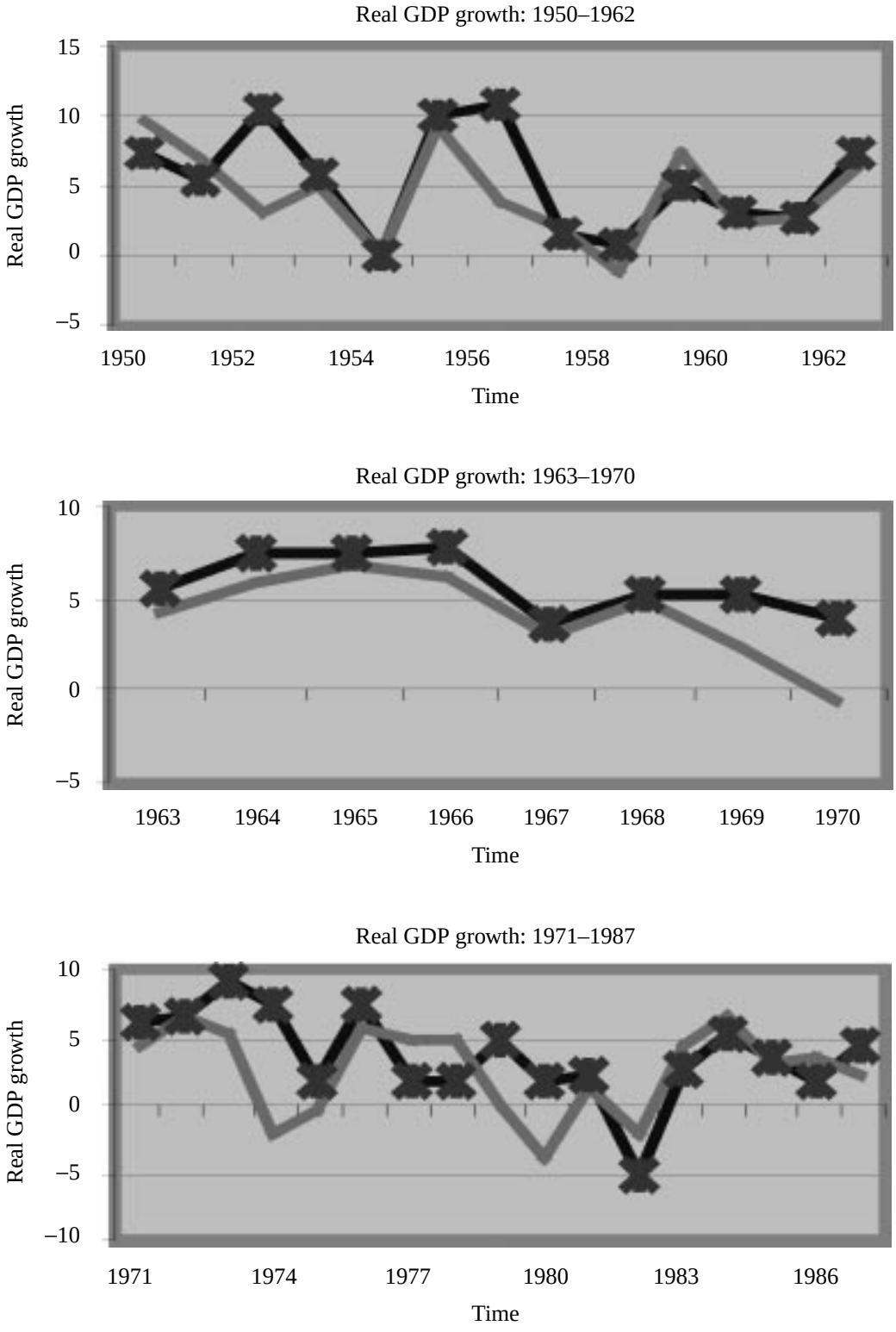
Figure 2 (continued)
Real GDP growth in Canada and in the United States, 1880–1997



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Real GDP growth in Canada and in the United States, 1880–1997

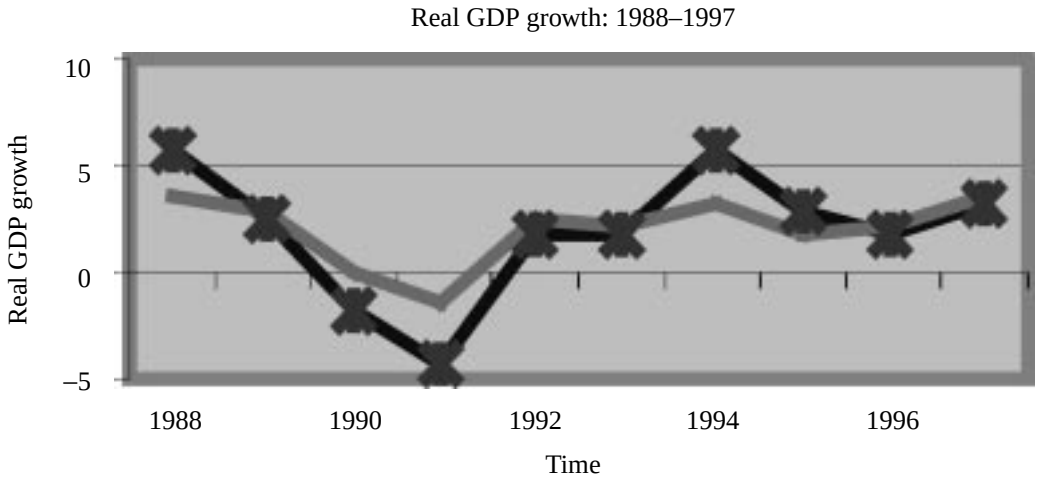
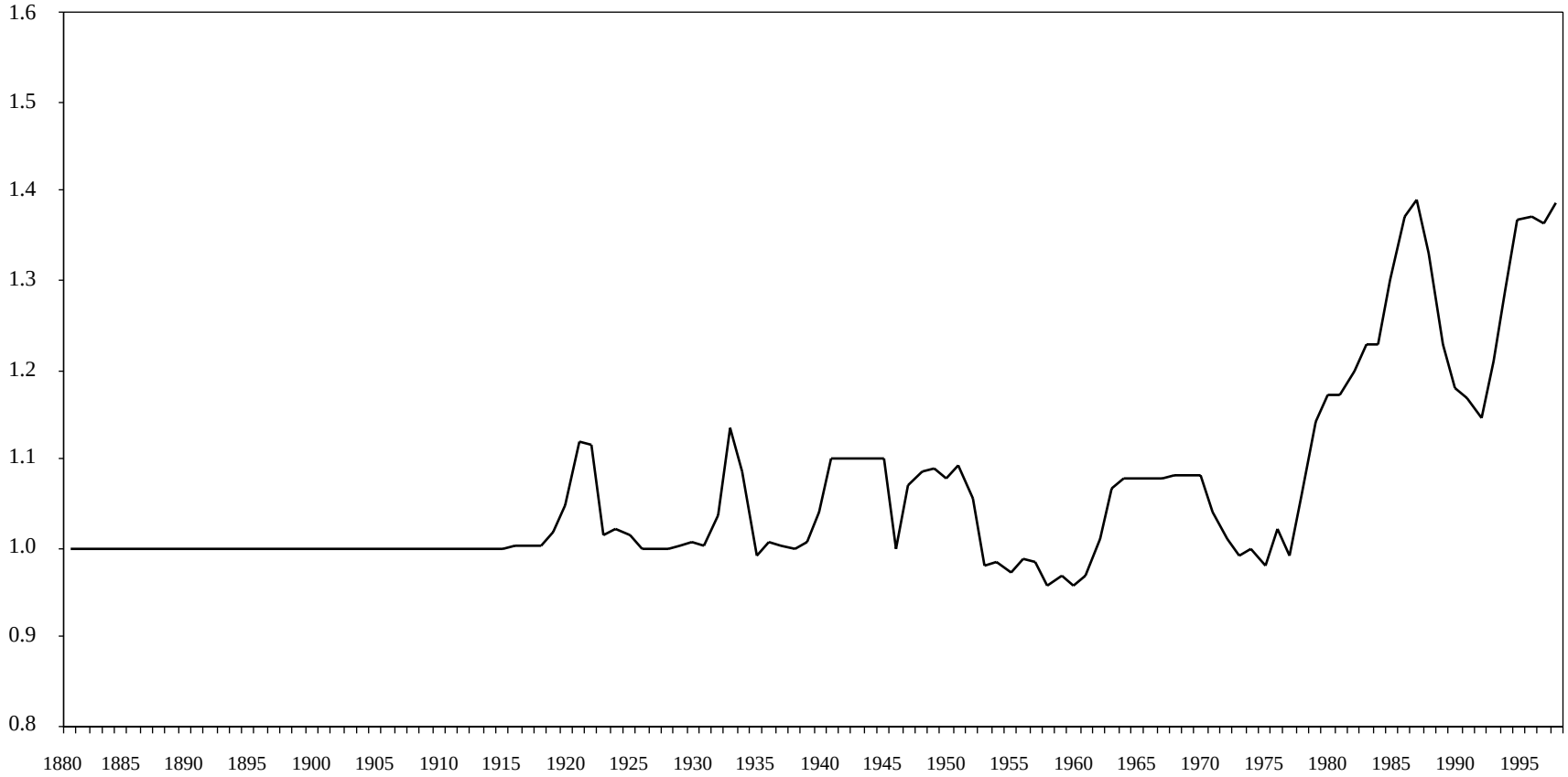


Figure 3
Price of U.S. $1 in Canadian dollars, 1880–1997



1.2.2 Managed floating

Canada's abandonment of its Bretton Woods parity in 1970 presaged the abandonment of pegged rates by all the other advanced countries in the following year. And the Smithsonian Agreement of 1973 permanently ended the adjustable peg of the Bretton Woods system. The abandonment of pegged exchange rates gave countries monetary independence. It also meant that there was no longer a nominal anchor to return to and, consequently, the regime changed from one based on a contingent convertibility rule to one based on domestic discretion. In this environment, Canada behaved no worse than the United States and other countries, but it did follow expansionary monetary and fiscal policies that led to unprecedented peacetime inflation (see Table 1 and Figure 1). The reasons for the Great Inflation of the 1970s are still debated, but the main candidates are the belief in the Phillips curve, accommodation of the oil-price shocks of 1973 and 1979, the financing of expensive social programs, the pursuit of incorrect monetary policy indicators, and incorrect measurement of output gaps.

From 1979 to 1981, the United States, the United Kingdom, and Canada reacted to perceived economic and social costs of high inflation by strongly pursuing disinflationary policies. These policies produced a serious recession and led to a return of lower inflation by the mid-1980s. In 1991, Canada began explicitly targeting low inflation and has been very successful at virtually eliminating inflation. In many respects, the adoption of low inflation as the prime target of monetary policy is a domestic fiat money rule that evokes the convertibility principle that prevailed under the gold standard.

Conclusion

Canada's choice of exchange rate has been determined largely by the prevailing international monetary regime and by the special external pressure it has faced because of its openness.

Consequently, the contingency aspect of the convertibility rule was often invoked by Canada, yet it largely followed policies that didn't dramatically differ from those of the United States and other countries, which adhered more closely to the rule. Until the 1970s, Canada used the monetary policy independence afforded by the contingent rule wisely. In the past decade, it has returned to its earlier record now based on a domestic convertibility-like rule. But should this state of affairs continue?

The recent experience with financial crises in an environment of growing financial market integration has led many writers to stress the advantages of bipolar exchange rate arrangements—currency boards and currency unions

on the one hand or floating on the other. This raises the question whether Canada should stick with its managed float or, following the example of Europe, enter a currency union (with the United States).

The argument in favour of a currency union is that the elimination of exchange rate volatility and transactions costs increases international trade and, hence, real growth. The case for floating is still monetary independence in the face of external shocks. Recent empirical work surveyed by Frankel (1999) suggests that the balance may have shifted in favour of currency unions. This conclusion reflects his (and Andrew Rose's) evidence linking currency unions with dramatic increases in international trade and real growth, and increased cross-border correlation of output shocks, which reduces the case for monetary independence.

The lesson learned from my survey of Canada's exchange rate experience, however, suggests that moving to a currency union is in many respects like returning to the gold standard. Would it be like a contingent rule? Would the likelihood of external shocks, such as bad U.S. monetary policy, be sufficiently unusual to justify such an innovation?

This discussion has not considered the political aspects of currency unions, which have been closely intertwined with political integration. Indeed, the historical evidence suggests that successful currency unions generally occurred along with considerable political integration (Bordo and Jonung 1999).

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Discussion 2

Richard G. Lipsey

I want to make five general points suggested by our discussions over the last day and a half. They are not all meant as criticisms of the papers, since some of my points were covered quite well in several of the studies; others, however, were not. I accept what David Laidler said from the floor about the proper contrast being between various monetary rather than various exchange rate regimes, but I will still cast my comments in terms of exchange rate regimes, since they were the focus of the conference.

Feasible Alternatives Need to Be Specified

One question that is relevant for the policy debate and that has not been touched on here, is what kinds of fixed-rate regimes are practical alternatives to the present one? I see the current regime of flexible rates with inflation (or price-level) targeting at one extreme and a monetary union with the United States at the other. Both of these are technically feasible, although there are strong doubts that the latter would be politically acceptable to either country in the near future. Is there an alternative intermediate regime that would be acceptable and feasible? To be acceptable, it would have to be a pretty hard-pegged rate with little expectation of periodical adjustment.

I would argue that this regime is not feasible given the Canadian-U.S. circumstances. First, Canada has large, periodic terms-of-trade shocks coming from the resources sector and large and variable capital flows, resulting in an exchange rate that has varied from about $0.95 to $1.55 over that last 35 years. Consider, for example, what would have happened if the Bank had decided to peg the rate early in the 1990s when it passed through the purchasing-power-parity point of about $1.25. Does anyone believe that that rate could have been held until now when the market equilibrium rate

has been fluctuating between about $1.45 and $1.55? As the author of one of the papers presented yesterday observed, very few countries have managed to hold a pegged rate unchanged for as long as 50 years.

Second, there are limitations on tools for stabilizing the rate that did not exist in the Bretton Woods period. To mention just one example, foreign exchange controls on both current- and capital-account transactions of the sort routinely imposed by many countries under the Bretton Woods system, and by many smaller countries today, would be unacceptable in Canada today—and probably impossible to enforce in any case.

Third, there is a political problem. To illustrate, let there be a large shock that required a marked increase in the interest rate to stabilize a pegged Canadian dollar. And let this take place close to the time of an election. The high interest rate would surely become an election issue. The market would then wonder: if the election is won by the opposition, will they stand by promises to drive down interest rates and accept the devaluation that will inevitably follow?

Fourth, destabilizing speculations would be a continuing problem for the Bank. If, for any of the above reasons, it is believed that the rate may occasionally need to be altered, the market will be testing the Bank whenever the currency comes under pressure to determine whether this is the run that cannot be resisted. As James Meade argued long ago (I think before Milton Friedman began making the same point), speculation is destabilizing under an adjustable peg, because the bets are all one way—either the rate is held, or it is changed in a direction that is known to everyone. All of these considerations lead me to the conclusion that the only realistic choice facing the Bank today is between the existing regime of flexible rates and a monetary union with the United States.

John Helliwell pointed out that the papers in the session on emerging markets showed that many countries do adopt some middle ground between fluctuating rates and currency unions. Whereas many had pegged rates in the past, today they more often announce that they are on a flexible rate and then engage in substantial stabilizing actions. These actions sometimes produce what looks like a fully pegged rate, except for the absence of a commitment to defend a specified rate under all circumstances. While this kind of “very dirty float” is clearly a feasible alternative, at least over the short and intermediate terms, it is probably not what the critics of the Bank’s present regime have in mind. They appear to advocate either a currency union with the United States or a traditional pegged rate, with the Bank committed to defending a publicly announced par value for the Canadian dollar.

Whether I am right or wrong in my view that there are only two possible regimes that the Bank of Canada can realistically choose from, this is a topic that needs full consideration whenever the debate touches on the shortcomings of the present regime. The critics need to specify, and defend the feasibility of, the alternative that they are advocating. If they believe that the Bank could sustain a pegged rate, they should argue their case in some detail and not just point out the shortcomings of the present regime. This has even more force if, by any chance, they are considering a quasi-fixed rate under a regime of "very dirty float," which is currently found in many emerging countries, particularly in Southeast Asia.

Useful Criticisms Are Comparative

Assessing the significance of calculations of the costs of the present regime requires comparing them with the costs of a proposed alternative regime. That exchange rate fluctuations impose some costs under the current regime is undeniable; only their magnitude is uncertain. The true net cost of the present regime, however, is its costs *minus* the costs that would be incurred under the proposed alternative.

If the alternative is the politically feasible pegged rate, there are at least two major sets of costs that need to be put into the balance. The first is the short-term interest rate fluctuations required under such a regime. After all, interest rate fluctuations have always been a major tool for stabilizing the exchange rate in the face of short-term fluctuations in the demand for, and supply of, foreign exchange. (It is almost always true in economics that the cost of policy-induced reductions in the fluctuations of one economic variable is larger fluctuations in some other variable(s)—a simple illustration of the no-free-lunch proposition.) A second set of significant costs are those associated with the change in the pegged rate when such adjustment is forced on the Bank—as I have argued that sooner or later it would be. We heard in the paper by Bailliu, Lafrance, and Perrault that the crises associated with the devaluations under fixed rates also seem to be associated with slowdowns in growth rates. (Although it is difficult to say how much of this is due to the fixed rate itself and how much to the other causes of the crisis that would have existed even if the rate had been fluctuating.) When we are dealing with moderate fluctuations, the alternative is clear: the fluctuations would not exist under a pegged rate whenever the rate was sustained. But what about the larger fluctuations that have taken our rate from about $1.12 to the vicinity of $1.50 in less than a decade? As I have already asked, could the rate have been held through to today if it had been pegged at $1.25? If not, it is misleading to imply that the calculated costs of the observed rate fluctuations *are* the costs of the present regime.

If one has a pegged rate in mind, as many of the current critics seem to do, then the costs under that regime must be estimated and set against the costs under the present one. Most of the costs of the pegged rate would not, however, exist under a currency union. It is misleading, therefore, to treat the gross costs of a fluctuating rate as net costs unless one is advocating the currency-union alternative. If one has such a union in mind, it must be admitted that this is a very long-term goal not politically feasible in the near future.

Understanding the Bank's Exchange Rate Equation

The Bank's equation for explaining the exchange rate is remarkable indeed. (See the fascinating paper by Djoudad et al.) But one thing worries me about it. This concern was sparked by John Helliwell's explanation—which I think is correct—of the perverse sign on the energy-price coefficient in the Bank's equation. You will recall that John argued that our being a high user of energy could not explain the perverse sign on the energy coefficient as long as we are a net exporter of energy, and that the real explanation has nothing to do with Canada. When there is a major energy-price shock, his argument continues, there is a "rush to quality" in the market as investors worldwide scramble to buy U.S. assets—for reasons that are not fully understood. This causes the U.S. dollar to appreciate and the Canadian dollar to depreciate for reasons unrelated to events in the Canadian economy.

More generally, Canadians are so self-centred that we almost invariably take a depreciation of our dollar as requiring a Canadian explanation, whether it is a Canadian depreciation or an appreciation of the U.S. dollar, for reasons that have nothing to do with Canada.

What has this to do with the Bank's equation? Well, what bothers me is that it seems to use Canadian variables to explain movements in the bilateral exchange rate, both when they emanate from causes that affect Canada and when they do not—such as a major run on the U.S. dollar or a major rush of capital into the United States.

If the Fed pushes U.S. rates down, or the Bank of Canada pushes them up, that should, according to the equation, cause the Canadian dollar to appreciate. That is all well and good. But let there be a rush to move capital into the United States for reasons unrelated to Canada. That should lead to an appreciation of the U.S. dollar and force U.S. asset prices up and U.S. yields down. The result should be a depreciating Canadian dollar combined with a rise in Canadian interest rates relative to the United States. In the case of energy prices, we have the Helliwell hypothesis: the energy coefficient is taking the blame for what should be a "perverse" relationship between the

interest differential and the bilateral exchange rate. But what about other cases in which external value of the U.S. dollar changes for reasons that do not affect on the Canadian economy. Why does the Bank's equation do so well in these circumstances? (Or perhaps this is an explanation of the times when the equation does not perform so well?)

Flexible Rates Are Best for Canada

The consensus at this conference seems to be that flexible rates do a pretty good job for Canada without incurring dramatic costs. Andrew Rose's evidence, however, appears somewhat at odds with this. I find it compelling and would not quarrel with the conclusion that currency unions do have some significant effects in expanding trade. One part of the explanation of the gravity model's mystery of "too much" domestic trade may concern different currencies. (People can be irrational about currencies. For example, even some of my most rational U.S. economist friends insist on using U.S. dollars when they come to Canada, even though retail outlets give them a very poor exchange rate. I am never quite sure why, but there seems to be some kind of gut feeling that their money ought to be acceptable here. Try as I may, I can seldom get them to a bank to change their currency at the correct rate.)

Nonetheless, I would suggest some caveats to Rose's figures before extending his results to other countries.

- All of the countries on his list are, as he himself points out, either small or poor, and many are or were, dependent on some larger country. The fact that, as he repeatedly emphasized, decisions to form a currency union are made on political grounds does *not* demonstrate that economic conditions are unimportant. Let the set A be those whose economic conditions make a currency union desirable. Let a proper subset of A be chosen on political grounds. Now, all unions come about because of political decisions, but economic considerations have still mattered in determining the set from which the politicians can choose elements. I do not know if this is true. I only make the logical point that because the choices were made on political grounds does not preclude the possibility that certain economic conditions also had to be satisfied.
- Many of the countries on Rose's list were colonies or were otherwise dependent on one large country, the relationship being one central and several peripheral countries. A revealing calculation would be to eliminate the trade between the peripheral countries and the central country and see how much trade there was between the peripheral

members of one union—for example, the former French colonies with one another, but not with metropolitan France.

- It is a big step from more trade to more growth. I have no doubt that fully or mainly closed economies have trouble growing in today's globalized world. A certain amount of openness is necessary to take part in global specialization. But it is less obvious that making an already highly open economy a little more open will add to its growth potential. In other words, is the relationship between more openness and growth continuous or merely a threshold requirement? If there is a continuous relationship, Canada should have undergone a spurt of growth when, as a result of the Canada-U.S. free trade area, Canada's trade/GDP percentage rose during the 1990s from the mid-20s to around 40 per cent.

Reinhart and Calvo raised the spectre of fear of fluctuating exchange rates. While I don't think that any advanced country needs to share this fear, I have no doubt that many small countries with large debts denominated in foreign currencies do fear a fluctuating rate, which probably means they also fear a depreciating one. (Or, as Mick Devereux said: "When my daughter says she fears swimming, she means she fears drowning.") Part of the problem for these countries lies in the false security given by a rate that was believed to be fixed but that could not, in fact, be defended in the long run. This encouraged the acquisition of foreign-denominated liabilities. Many small countries have no alternative but to acquire such obligations. Nonetheless, an exchange rate thought to be fixed but that is, in fact, adjustable, encourages an incorrect assessment of the exchange risks of such liabilities. If agents correctly assess the risks that the rate will be changed under pressure, they are acting *as if* the rate were fluctuating and, as a result, some of the alleged advantages of the fixed rate were no longer present.

Reinhart and Calvo also tried to estimate the kind of exchange rate regime in place by observing the variation in rates. This is similar to the old error of arguing that the observation of few differences in the prices quoted by various agents in some market is evidence of lack of competition and even of collusion. But as theory tells us, the closer a market is to perfect competition, the less dispersion of prices there should be in that market. Similarly, a fully flexible rate combined with good macro policies and a well-informed set of stabilizing speculators will produce an exchange rate that is relatively stable in the face of short-run shocks (but it will not prevent the rate from undergoing trend changes in the face of alterations in the fundamentals that determine the real rate). So, although it is not desirable to take at face value the kind of exchange rate regime that governments say they are following, it is not valid to use the variance of actual exchange rates to assess the degree of policy flexibility. Put another way, flexible rates refer to potential, not to actual changes in the rate.

Productivity and Technological Change

The paper by Bailliu, Lafrance, and Perrault makes an important contribution to the investigation of a possible relationship between exchange rate regimes and economic growth—although as Paul Masson cautioned in his comments, the jury must remain out on this issue for a while yet. In the meantime, the authors' conclusions seem eminently plausible. First, major upsets, which include forced devaluations, are likely to have slowing effects on investment and technological change that show up as temporary reductions in growth rates—which still leaves the question of whether the effects of these shocks will be enduring or only transitory. Second, the long-term growth rate is influenced by so many fundamental forces that determine the rate of technological change that I would be amazed if two reasonably well-managed regimes, one floating and the other fixed, would have any noticeable differential effects on long-term growth rates. I hold this expectation not because I believe in a complete separation of real from monetary forces in influencing long-term behaviour, but because I believe that the forces that determine technological change are too strong to be significantly influenced by the choice between two well-managed exchange rate regimes. The "well-managed" proviso is important. It is obvious to even casual observers that a government can mismanage an economy to the extent that growth rates are effectively driven to zero, or even to negative values, for long periods of time.

Rick Harris's paper is also an interesting contribution to this debate. Some of his data appear unsettling at first glance. In particular, the data for small firms seem almost too dramatic to be true. Many of these firms are in the new economy; others are in traditional areas, many of which are non-traded. It would be helpful to see a breakdown into sectors. If the poor figures hold up across the board, there would appear to be something wrong with them. My message here is that there does seem to be something disturbing going on, but there are too many possible explanations, such as poor data, to justify jumping to radical conclusions.

Finally, I'd like to say a few words about one of Harris's possible smoking guns, which raises an issue that emerged in many different papers. This relates to my own research on technological change. Neo-classical economics is an extremely valuable tool. Little more is needed to understand the behaviour of exchange rates, volumes of trade, and the response of capital investment to changes in relative prices of labour and machinery—to mention three things that arose many times at our conference. But where standard theory lets us down is in the behaviour that concerns Harris and the other authors who deal with long-term growth—technological change. Invention and innovation are different from most of the things we study in

standard economics, because genuine uncertainty, not just risk, pervades the invention-innovation process. (I am using the Knightian distinction that the possible outcomes of risky situations can be expressed by some probability-density function, while the outcomes of uncertain situations cannot.) Economic analysis handles risk easily, since agents merely maximize expected values. When major technological advances are attempted, however, it is typically impossible even to enumerate in advance the possible outcomes of a particular line of research, let alone to attach a probability to each. For example, the search for one breakthrough often produces a breakthrough in an unexpected direction. Of course, most people who make decisions regarding R&D must form subjective expectations and revise these in a kind of Bayesian process as experience accumulates. This does not, however, alter the key characteristic of uncertain situations that *two equally well-informed agents, with the same objective function and presented with the same set of alternative actions, may make different choices—in contrast to risky situations where the two agents will make the same choice: the one that maximizes the expected value of the outcome.* If the choice concerns R&D, one agent may back one line of attack while the other backs a second line, even though both know the same things and both are searching for the same technological breakthrough. After the results are known, one agent may prove to have made a better decision than the other, but no one can say which agent is making the better choice at the time that the decisions are being made. This sort of thing happens all the time when firms are in competition for innovation. When striving for the next generation of breakthroughs, Japanese firms may make one R&D choice while U.S. firms make another, and only later do we know who made the better decision.

Because firms are making R&D choices under uncertainty, there is no unique line of behaviour that maximizes their expected profits—if there were, all equally well-informed competing firms would be seeking the same breakthrough made in the same way at the same time. Because of the absence of a unique best line of behaviour, firms are better seen as groping their way into an uncertain future in a purposeful and profit-seeking manner, rather than maximizing the expected value of future profits. This type of behaviour is best modelled in evolutionary rather than neo-classical models. In these models, agents struggle in a profit-seeking manner through a foggy environment in which they can at least partially anticipate the outcome of the next couple of steps, but they have little or no idea where the next sharp turn or hole in the road may be. The result is a path-dependent process that is highly sensitive to initial conditions and that, if repeated, would not necessarily result in the same outcome. In this kind of world, transitory shocks can have permanent effects, one result of which is that there is no

guarantee that real and monetary variables will be sharply separated in their influences over any time horizon.

Note that Helpman and Lucas—to mention two authors referred to in this context during our proceedings— and all the others who argue that there is no long-term link between the real and monetary sectors, assume perfect foresight and/or that everything that is not perfectly known can be reduced to risk. My co-authors and I have written two chapters in Helpman's excellent book on general-purpose technologies (GPTs),[1] in which we point out that the pioneering attempts to theorize about this difficult issue assume a number of things that are contradicted by the facts. All of the models assume that when a new GPT arrives on the scene, it is recognized as such, which was clearly not the case with most GPTs that we have seen thus far. The models assume that the full course of the GPT's evolution is foreseen at the time of its original introduction. This is manifestly untrue, as will be shown, for example, by a moment's reflection on what the inventors of the first practical dynamo in 1887 could have foreseen about all of the new technologies that were made possible by electricity, right up to, and beyond, the beginning of the 21st century. My point is not to disparage these pioneering attempts to replace the modelling of technological change as some faceless homogenized shift in an assumed aggregate production function with more realistic structured views of technological change. Instead, my point is that what we know about technological change upsets our confidence in neo-classical propositions concerning the isolation of all real outcomes from monetary shocks over the time horizon in which technological change dominates the growth process, as it does over very long periods of time. Although the separation may be true for many real variables, it is suspect with respect to technological change.[2]

How Harris's suggestions, and those of Bailliu, Lafrance, and Perrault, will stand up, is an empirical matter. All I want to point out here is that neo-classical models with perfect foresight and risk-only, paint a picture that does not conform with much of the micro theory and evidence about the behaviour of firms in innovating situations. Theory and evidence exist for a path-dependent evolution of technological change that will be influenced by many forces both real and nominal, including the behaviour of the exchange rate. So we cannot rule out such possibilities a priori. Having said that, I will close with a reminder of what I said above—that I would be surprised if

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1. See Helpman (1998). This book includes many of the models to which I refer in the text and also two chapters by Lipsey, Bekar, and Carlaw: Chapter 2, "What Requires Explanation?" and Chapter 8, "The Consequences of Changes in GPTs."
2. I have discussed these issues in a series of publications on theory and policy. See, for example, Lipsey (2000), Chapter 2, and Lipsey (2001).

anything so fundamental as the path of technological change were significantly influenced by something so relatively trivial as the choice between two well-managed exchange rate regimes.

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Discussion 3

John F. Helliwell

The Evidence on Key Issues

The relative ability of fixed and flexible rates to stabilize prices and output when the economy is subject to fluctuations

Several Bank papers (Macklem et al. in the GE stable, Djoudad, Gauthier, and St-Amant and Lafrance and Tessier with VARs) could be seen as a symphony of very professional studies aimed at improving modelling of the comparative ability of fixed and flexible exchange rates to aid in the digestion of shocks, especially those relating to the terms of trade. All of them tend to find systematic advantages for flexible over fixed exchange systems. Devereux's GE model produced the same result, although in discussion he described himself as being impressed by the high welfare gains seen to flow from the Macklem et al. model, much higher than his or most other previous results. The Macklem et al. estimates of the macro-economic benefits were substantial enough to handily exceed estimates of savings in transactions costs likely to flow from the use of a common currency.

The costs and benefits of intervention under flexible exchange rates (Djoudad et al.)

The specification of the Bank's fundamentals model

There was widespread admiration for the longevity of the continued goodness of fit of the Bank equation and for its ability to track the Australian and

New Zealand dollars reasonably well. There was much skeptical discussion of the negative sign on the energy-price term in the Canadian and Australian equations. The arguments offered in support were not given much credence, as noted by Dick Lipsey in his comments. Canada's role as a major user of energy in other industries was not regarded as sufficient, since several of these industries, e.g., aluminum, are best seen as alternative ways of exporting Canadian energy. Thus, they would tend to increase, rather than decrease, the expectation that the Canadian dollar, like the U.K. pound and the Norwegian krone, would be seen as a petro currency. Moreover, the idea advanced in discussion—that the U.S. dollar might strengthen because the United States was more self-sufficient in oil and energy than Germany and Japan—provides no reason why the U.S. dollar should strengthen relative to even more energy-rich Canada. I suggest that the strength of the U.S. dollar, relative to all other industrial country currencies, was due to the position of U.S. financial markets as OPEC's first choice for investment, and to other surpluses generated by higher oil prices, combined with the frequent, although not always explicable, flight to the U.S. dollar in times of financial uncertainty. Since there are likely to have been changes in the link between energy-price increases and parallel investment movements favouring the U.S. dollar, it is perhaps not surprising that the coefficient on this variable has not been stable as the sample period changed.

Examination of the consequences of direct and monetary intervention

The Djoudad et al. paper estimated that chartist behaviour seemed prevalent in tranquil markets, with fundamentalists (presumed to be those betting according to the predictions of the Bank's equation) becoming dominant in turbulent times. They used this result to infer that exchange-rate-induced intervention was likely to be unnecessary and counterproductive.

In his discussion, Gregor Smith argued that the Bank equation could be used to provide some measure of the extent to which the exchange rate was influenced by monetary policy, and he recommended additional study of the timing and effects of official intervention and a closer analysis of the extent to which monetary policy was, in fact, determined by exchange rate considerations. I think he is right and that, in general, the sources and consequences of official support, both direct intervention and exchange-rate-focused interest rate changes, merit more research.

I suspect this would require—shades of exchange rate modelling at the Bank in the 1960s (e.g., Helliwell 1969)—separate estimation of official intervention, net private demand for foreign exchange, and a monetary policy reaction function. It would be excessively brave to expect to find much

stability of structure, but the challenge posed by Smith is worthy of a serious research effort of the sort the Bank has long been noted for.

How dangerous is the middle ground?

Occupation of the middle ground, while unfashionable, is prevalent, as shown by Calvo and Reinhart[1] and by Bailliu et al. What is perhaps most risky is the weak peg; what is much more common, and much less risky, is a rusty flexible rate. No commitment need be, or should be, made to a specific rate, and the extent and nature of support can be altered without loss of credibility. The risks come, as much of the conference discussion showed, where there is no credible commitment to a nominal anchor. Such an anchor is more likely now than 15 years ago to be the inflation rate or the price level, rather than a monetary growth rate or a target of the money stock—and so much the better for that.

Is a monetary conditions index (MCI) a useful management tool for monetary policy under flexible exchange rates?

This issue, raised by Mark Kruger, is tightly linked to the question of whether, and in what way, it is appropriate for interest rates to be changed in response to exogenous changes in the exchange rate. An MCI approach would normally involve a rise in domestic interest rates to offset, at least partially, the impact on the MCI of an exogenous fall in the exchange rate—otherwise, there would be an unintended change in monetary conditions. This is equivalent to using interest rates to lean against the wind in response to exogenous exchange rate changes. Although this is a defensible strategy, it presumes some ability to sort out fundamental from non-fundamental changes in the exchange rate, and the strategy must always be conditional upon maintaining the credibility of the chosen nominal anchor.

The economic consequences of currency unions

This is a key issue raised by the stylized fact, discovered by Andy Rose, that members of a currency union trade three times as intensively with each other as do similarly placed non-members. When seen in conjunction with the research by Frankel and Rose (2000), who argued that greater trade leads to higher output, a case can be advanced that currency unions are good for GDP. The two parts of the case need to be considered separately: (i) the

1. This volume includes the paper by Carmen Reinhart entitled “The Mirage of Floating Exchange Rates,” and not the Calvo and Reinhart paper, “The Fear of Floating,” which was presented at the conference.

effects of a currency union on trade, and (ii) the effects of such increased trade on GDP and welfare.

The effects on trade; or, who joins a currency union?

One way of interpreting the Rose paper is answering the question of whether the right countries have joined currency unions. He finds that they have. He is also inclined to infer that some of the characteristics that define these countries may have been brought about through the adoption of a common currency. This is especially true in the case of international trade, where Rose finds that currency-union members trade much more with each other than do countries that are not members of currency unions. In discussion, Rose argued that although the reverse causation was worthy of study, it was not likely to be empirically relevant. I am less sure of that and, hence, am even more keen to await the results of the euro experiment, and to applaud Denmark, on scientific grounds, for narrowly voting to stay out, thus joining the United Kingdom and Sweden in providing controls that will make the euro experiment as close as we get to a set of macroeconomic conditions that mimic the conditions required for a natural experiment to show the effects of a currency union.

I suspect that despite Rose's efforts to include variables that might result in both currency-union membership and expanded trade—e.g., common colonial histories and common languages—there are undoubtedly other factors and historical ties that link certain groups of countries, with expanded trade and currency-union membership as joint consequences of these common causes. To this extent, the finding of greater trade among currency-union members cannot be considered a measure of the trade effects of establishing a currency union. For this reason, as well as to provide evidence directly applicable to developed industrial countries, the euro experiment has a unique value. As emphasized by Rose, the border effects for trade require explanation, and their size is large enough to permit even a large common-currency effect to still be only a relatively small part of the total explanation.

The link from trade to output

In discussion, Rose mentioned the striking calculation in Frankel and Rose (2000), that joining a currency union with the United States would lead to an increase of 36 per cent in Canadian GDP. This calls for some investigation. The result is based on a two-step procedure, with a first stage estimating the link between currency-union membership and trade, and a second stage, based on cross-sectional GDP level equations, estimating the link between

trade and output. The authors find a significant effect of trade on output, and are encouraged by the result that this effect is even stronger if actual trade is replaced by the basic gravity-model determinants of partner-country size and proximity. I think that the latter result, in fact, gives grounds for questioning the basis for the analysis. Earlier studies of the effect of trade on growth (including Leamer 1988 and Helliwell 1994) have argued that to find a measure of openness that reflects the effects of policy, one should use the extent to which actual trade flows differ from those that depend directly on the size and proximity of trading partners. Thus, what Frankel and Rose should be looking for is an effect of trade based on some measure of the extent to which trade differs from that predicted by the simple gravity model.

It would also be possible to separately consider the effects of the trade increase that would be predicted (from the trade equations estimated earlier) to follow from membership in a currency union. The fact that Frankel and Rose find that countries have higher GDP per capita if they are close to large and well-off neighbours is an interesting result in its own right, but it says nothing about the income effects of expanding trade, whether by currency unions or through other means. It is probably related to other results showing that knowledge spillovers, within countries or across borders, decline with greater distance (Keller 2000). Thus, it is to be expected that there are GDP-level and perhaps growth advantages to being located near major centres of knowledge creation. This is probably part of the reason why the smaller European countries can be at the same income levels as the larger countries. What still needs to be established is the extent to which knowledge spillovers are greater with tighter trade linkages as opposed to only size and proximity effects.

The Frankel and Rose indication—that the output effect of the gravity-model determinants is bigger than that of the trade flows themselves (as suggested by comparing their ordinary least squares and instrumental variables results)—leads one to suspect that there is a positive output effect for countries that are close to large neighbouring countries, with additional trade having a smaller effect, or perhaps none at all. A location close to large and knowledgeable neighbours could well have positive spillovers for growth and output. This could also be responsible for additional trade, without the trade itself being the cause of or the conduit for, the spillover. Only additional research can assess these effects, but in the meantime, it would be a mistake to use their current estimates of the output effects of currency unions.

The link from trade to welfare

To supplement fresh research results, there are several other types of evidence that can give us some idea of what GDP and welfare benefits are likely to flow from expanded trade. There are well-known results (e.g., Sachs and Warner 1995) suggesting that successful convergence for emerging economies is more likely if they are sufficiently open to goods, capital, and especially ideas, from the rest of the world. But is this relationship linear? How much openness is enough?

I first started to think seriously about this question after discovering the prevalence of border effects for trade, capital, and migration. The trade effects are so large, even among industrialized countries, as to imply that national economies are an order of magnitude more tightly woven internally than across national boundaries. If gains from additional trade are still substantial for these industrial countries, then border effects are likely to be damaging to welfare. What evidence might help to indicate if there is a basis for concern?

A first, easy test is to compare the levels of GDP per capita among the industrial countries. Given the size of border effects, large countries have much greater internal, and therefore dense, trade networks. If additional trade has significant advantages, then GDP per capita will be larger in the larger countries. Yet if one looks across the OECD economies, there is little systematic relationship between population and GDP per capita. The smaller countries do very well, which suggests that their existing international trading opportunities are sufficient to allow them to exploit major sources of comparative-advantage trade, to achieve adequate economies of scale and to gain access to international sources of knowledge.

Additional evidence is provided by the Canadian experience in the 1990s, during which there was a very large policy-induced increase in the density of two-way manufacturing trade with the United States, and yet no evidence of a narrowing of the aggregate productivity gap in manufacturing. The actual trade flows increased three times as much as was forecast in pre-FTA studies, while the effects on aggregate manufacturing productivity were far less than forecast.

Both of the above pieces of evidence suggest that increases in openness beyond those already existing among the industrial countries might not be expected to produce major gains in income and productivity. There is a third strand of evidence that speaks more directly, if somewhat imprecisely, to the welfare effects. There is now an increasing body of literature that uses subjective measures of well-being, whether to revisit estimates of the appropriate weights to attach to macroeconomic goals, or to assess the

consequences of alternative forms of government (Frey and Stutzer 1999). Some results suggest diminishing welfare returns to increasing average per capita incomes, relative to other determinants of well-being, such as education. In addition, there is evidence that individuals value increased relative income much more than income increases that are received by all, while the reverse is the case for education, social capital, and probably health (Putnam 2001; Helliwell 2001a, 2001b).

Exchange rate regimes, productivity, and growth

Rick Harris outlined some of the theories advanced to explain why under- or overvalued exchange rates might be linked to temporary or permanent differences in the level or rate of growth of productivity. He argued that experiences of single countries were unlikely to provide convincing evidence, and presented some preliminary results from a panel-data set for OECD countries. His dynamic results, as worked out by David Longworth, suggested that a once-and-for-all depreciation in the real exchange rate, relative to general purchasing-power parity (PPP), would lead to an eventual reduction in the level of output per capita. He was inclined to treat this as evidence that the undervaluation of the Canadian dollar in the 1990s might, therefore, have contributed to the lower productivity levels during the decade. In discussion, the Harris results were criticized for using general PPP as a definition of the equilibrium rate, a criticism that Harris accepted in theory, while continuing to use general PPPs as the only widely available measure.

The distinction between resource and other prices is very important to interpreting the Harris results. Changes in resource prices are generally seen as a key fundamental for determining the relative value of the Canadian dollar. When resource prices weaken, some fraction of this weakening shows up in the external value of the Canadian dollar, in relation to the values that would be suggested by PPP for GDP. This weakening of resource markets is the driving cause of the lower productivity in Canada—trees remain uncut, and nature's bounty is saved to be later claimed as a "productivity dividend." Mines are shut down, and aggregate productivity appears lower. But these are primarily utilization effects, exaggerated by the fact that the industries in question are ones in which productivity is falsely claimed for output value that should be credited to the stocks of renewable and non-renewable resources.

To the extent that the value of the Canadian dollar is responsive to the prices of raw materials, which the Bank equation suggests is the case, it should be expected that GDP per capita is low in Canada when the Canadian dollar is low relative to PPP. These drops are clearly due to lower prices for

resources, and not to the low value of the Canadian dollar. Indeed, the models presented at the conference suggest that the macroeconomic consequences of falling resource prices are mitigated if the Canadian dollar is able to fall by some fraction of the drop in resource prices. Thus, the results of equations based on departures from PPP cannot be used to indicate anything about the productivity effects of flexible exchanges rates for countries subject to systematic changes in their terms of trade. At the very least, it would be necessary to make use of departures of exchange rates from some fundamentals-driven value that takes the changes in resource prices directly into account.

In the meantime, to use David Longworth's attractive metaphor, it is too early to design arguments for the defense of Mr. D, since a reasonable prosecutor would find no adequate evidence at hand to justify laying charges.

Implications of the continued economic separation of nation states

In general, as I have argued elsewhere (Helliwell 2000), the fact that economic separation of nation states is much greater than is generally thought, whether measured in terms of trade, capital mobility, price linkages, or business cycle co-movements, means that the economic case for common currencies is correspondingly weaker.

Consequently, GE models, like those of Macklem et al. and Devereux, that approach reality in their separation of national goods markets, are more inclined to favour flexible over fixed exchange rates.

The models presented at this conference need to be extended to reflect another aspect of global reality: that national capital markets are also highly segmented by information, distance, and preferences, so that uncovered interest parity (UIP) cannot be assumed. In my view, the failure of UIP should be taken as given. Covered interest parity is maintained by the forward rate whipping about in response to changes in interest rates on one side or the other of the border. Consequently, we get the familiar result that the forward exchange rate is inferior to the current spot rate as a predictor of the future spot rate.

National monies and nation states: Is the correlation causal or coincidental?

The fact that there is at least a high correlation has traditionally made it difficult to assess the economic effects of common currencies, as is evident from the discussion of Rose's valuable attempts to come to grips with the issue. When the dust has settled, it will probably be found that currency effects are responsible for some fraction of the separating effects of national borders. But I suspect it will continue to be found that the net GDP effects of adopting a common currency are likely to be small and of uncertain sign. The political significance of national currencies, however, is likely to remain large. Where a supranational currency is adopted, it is likely to be done as an explicit move to cement political and economic allegiances, accompanied by the establishment of a matching supranational monetary authority. It is not easy to think of cases, beyond that of the euro, where this is likely to happen. In most other instances, common currencies are likely to arise when smaller countries adopt the more stable currency of a large neighbour or trading partner, either to gain a nominal anchor or as part of a general policy of political and economic harmonization with the larger partner.

When countries reject a common currency, as in the recent Danish vote, the matter is likely to turn on fears that the adoption of a common currency will reduce policy independence, not just in the setting of interest rates, but in other areas of social and economic policy where preferences are likely to differ from country to country. There is suggestive evidence from studies of subjective well-being, that the welfare effects of these other policies are likely to be of increasing importance relative to the direct economic consequences of exchange rate harmonization, even if the latter should turn out to be larger and more favourable to common currencies than is suggested by most of the papers in this volume. This, in turn, suggests that industrial countries capable of creating their own credible nominal anchors are unlikely to be attracted by common currencies, given the current state of the economic evidence and the fact that broader considerations favour separate national monies in the absence of an underlying desire to move towards political union.

Flexible exchange rates can only be assessed as part of a framework for monetary policy

Many participants emphasized the crucial link between monetary policy credibility and the choice of exchange rate regime. This is perhaps obvious, but it is important and often ignored. It is dangerous to have a flexible rate if there is no domestic capacity to provide monetary credibility, and there may be no reason to peg if there is such capacity. Hence, flexible exchange rates need to be considered as parts of a monetary regime, with their prospects of success so judged.

Finally, several participants noted the need for modellers and policy-makers alike to recognize that exchange rates need to be modelled, managed, and interpreted in a multilateral, not a bilateral, context. It has long been a failing of Canadian analysts and especially Canadian media, to treat the Canadian-dollar price of the U.S. dollar as though it were a sufficient description of the external value of the Canadian dollar. This leads to two sorts of error.

First, by ignoring the fact that it is just one bilateral rate, commentators are thereby encouraged to think solely of Canadian causes for movements of the rate, instead of also examining events in the partner country. This is a risk for modellers, too, as emphasized by Lipsey in his comments.

Second, judgments about whether the Canadian dollar is high or low frequently ignore all other bilateral rates, even when they are moving in the opposite direction, often by enough to make their movements the largest part of a story based on some more global or even trade-weighted view. Even as this conference was proceeding, Canadian headlines were speaking of the Canadian dollar as headed for an all-time low. Looking at the actual bilateral exchange rates told a much different and more complicated story, with changes of the Canadian dollar over the previous 12 months being +15 per cent against the euro, –2 per cent against the yen, +8 per cent against the U.K. pound, and –5 per cent against the U.S. dollar. Seen in a global context, the story is one of the strength of the U.S. dollar against the euro, with the Canadian dollar in its traditional middle ground. To avoid misleading analysis and mistaken policies, it is important that modelling and policy reactions alike be set in their appropriate multilateral context.

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General Discussion

David Laidler began by praising Michael Bordo's survey. He agreed with Bordo that monetary policy under inflation targeting is beginning to resemble the gold standard. He stressed that the credibility of inflation targets in Canada in the 1990s was underpinned by fiscal policy and, in particular, the 1995 budget was a significant event. It must be recognized that this fiscal support did not lower inflation directly, but contributed to the sustainability of low inflation with higher real growth and a vanishing output gap.

Dale Orr expressed several reservations regarding the proposition that flexible exchange rates can be advantageous in protecting against commodity price shocks. In particular, the prices of many of the commodities that Canada exports, apart from forestry products, are not strongly correlated.

Instead, the argument in favour of a flexible exchange rate should be based on protecting Canada from an external demand shock such as for automobiles, because they are our biggest export to the United States. Nonetheless, the flexible exchange rate would still have large distributional effects across regions. A decline in the U.S. demand for autos, for example, would cause a depreciation of the exchange rate and potentially a profit windfall for commodity exporters. Thus, the benefits of a flexible exchange rate must be weighed against these distributional effects.

Orr concluded by noting that the models that find greater advantages of a flexible over a fixed rate regime for Canada would also imply that British Columbia, Alberta, or Texas should have their own currencies and flexible exchange rate regimes.

Simon van Norden had two comments for Richard Lipsey. The first touched on the link between oil prices and the value of the U.S. dollar. Higher oil prices represent an adverse terms-of-trade shock to the main trading partners of the United States. Higher oil prices are very bad news for Europe, van Norden said—and even worse for Japan. The fact that we see higher oil prices leading to a real appreciation of the U.S. dollar can be interpreted as simply another link between the terms of trade and the exchange rate.

Van Norden's second comment addressed Lipsey's request for an interpretation of the Bank of Canada's exchange rate equation. He considered it useful to reinterpret the negative sign of the estimated coefficient on the energy-price variable as potentially one that is largely a U.S. story and not a Canadian one.

Robert Lafrance offered some clarification on the Bank of Canada's Amano-van Norden equation. Lafrance emphasized that the equation was not driving the Bank's view on the Canadian dollar over the medium term.

He then talked about the research of James Hamilton that implied that the U.S. economy always went into recession when there was a big oil price shock, which subsequently reduces Canada's exports. His final comment concerned the use of only Canadian variables in explaining the Canadian-U.S. dollar. He said that Ramdane Djoudad and David Tessier had carefully examined other variables, as had van Norden and Amano before them, but none of them was statistically significant.

In response to Dale Orr, John Helliwell said that he accepted the channel in the Bank's equation from the non-oil commodity prices to the exchange rate. He added that the equation provides precisely the kind of theoretical and empirical argument for the flexible exchange rate. The fact that the exchange rate responds to movements in these prices implies that terms-of-trade changes necessitate real economic adjustment.

Helliwell responded to van Norden by arguing that if Canada is a net exporter of energy products, the sign of the coefficient on the energy price variable in the exchange rate equation should be positive, i.e., higher energy prices should cause a real appreciation.

Helliwell agreed with Lafrance's statement that higher energy prices often lead to a recession in the United States, but stipulated that higher energy prices have the same effect on all countries that use energy. Similar stagflationary effects in Canada have been identified, so it isn't entirely clear that the higher prices should change the bilateral exchange rate.