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Articles

Speeches

Announcements

Cover

Depression Scrip

by David Bergeron, Curator

The Great Depression was a dark period in Canadian economic history. While theories on what caused it vary, historians largely agree that the stock market crash of October 1929 (known as Black Tuesday) was the trigger that sent most world economies into a tailspin. Canada, in particular, was hit hard, with deflation, depreciated markets, and rising unemployment. Not until the outbreak of World War II did the Canadian economy begin to make a full recovery.

Falling commodity prices during the Depression led to deflation, so that consumer prices tumbled and unemployment rose. By 1933, more than one-third of Canada's labour force were out of work, and one-fifth of the population were dependent on government assistance. Incomes fell by almost half, and prices fell so sharply that the production of currency was affected. The mintage of high-denomination coins at the Royal Canadian Mint was significantly reduced, as was the printing of government and chartered bank notes.

While many private and charitable agencies came to the assistance of the unemployed, much of the financial help was supplied by local municipal governments. Municipalities across Canada issued scrip—redeemable notes that the unemployed could use to cover the cost of such necessities as food, fuel, clothing, housing, and taxes. Many notes were redeemable in specific goods, or as a credit towards the purchase of goods. The various examples of Depression scrip pictured on the cover of this issue reflect the range of goods and services that could be purchased with them, as well as the relatively low value that these pieces of paper represented, from a few cents to a couple of dollars.

Municipalities set up programs where the unemployed received scrip in return for work on municipal projects, with the aim of providing the recipients with a degree of pride and self-respect. Although the system was beneficial for the unemployed, it nevertheless posed a problem for the municipalities, which still had to cover their own expenses. Some responded by issuing scrip specifically intended to pay municipal taxes and other government services, such as water.

Scrip was used for only a short time during the Great Depression. Because of the stigma associated with it, which served as a stark reminder of the suffering that many Canadians faced in the 1930s, much of the Depression scrip was destroyed after its use. Today, many pieces are quite rare and are found only in institutional collections.

The examples of Depression scrip illustrated here are part of the National Currency Collection of the Bank of Canada.

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Global Imbalances—Just How Dangerous?

Bruce Little, Visiting Special Adviser, 2005–2006, and Robert Lafrance, International Department*

- *Growing current account surpluses in Asia and among oil-exporting countries, alongside a growing current account deficit in the United States, have raised concerns that such imbalances pose a threat to the world economy, especially if they are reversed in a disorderly manner.*
- *A related worry is that surplus savings in emerging-market economies are financing the U.S. deficit instead of supporting investment and growth in these emerging-market economies.*
- *Experts are divided on the gravity of this situation. Some believe that normal market forces will resolve these imbalances over time; others argue that policy-makers should facilitate the adjustment with policies that curb domestic demand in deficit countries and stimulate it in surplus countries.*
- *The most likely outcome is an orderly transition back to a more "normal" situation, especially if market forces are allowed to work, but the longer these imbalances persist, the greater the risk of a sharper reversal that could destabilize the world economy and undermine growth. There is also a danger that some countries might resort to policies of trade protectionism to reduce the imbalances.*

In a world economy that increasingly interweaves the fortunes of all countries, concerns have arisen over the phenomenon known as global imbalances. That major imbalances exist is almost unquestioned, although there are a few skeptics; however, the nature, extent, and urgency of the risk that imbalances pose to global economic growth and financial stability is less clear. These features automatically make global imbalances an ideal subject for the hundreds of studies, reports, articles, speeches, and conferences, both public and private, that have been devoted to the myriad issues surrounding them. For the most part, debate has been limited to the international organizations, central banks, academics, and other analysts who follow these questions most closely. But the issues are important enough, and the potential consequences serious enough, that a broader public understanding is important.

When we talk about global imbalances, we are referring to the current account deficit of the United States and the offsetting current account surpluses of many emerging-market countries in Asia and of oil-exporting countries. Both are large and growing. In 2005, the United States ran an external deficit of US$805 billion, double its 2001 level and equal to about 6 per cent of its gross domestic product (GDP), while China had a surplus of US$159 billion, or 7.1 per cent of its GDP. Substantial surpluses can also be found in several East Asian and oil-producing countries (Chart 1). Successive annual surpluses have allowed Asian countries to accumulate over US$2 trillion in foreign exchange reserves, with China alone holding US$875 billion at the end of February, when it overtook Japan to become the world's largest holder of reserves.

This is not normal. Until this decade, the world tended to stay in rough balance. Current account balances in absolute terms—ignoring the plus and minus signs and focusing solely on the numbers—ranged from 2 per cent of world GDP to just over 3 per cent.

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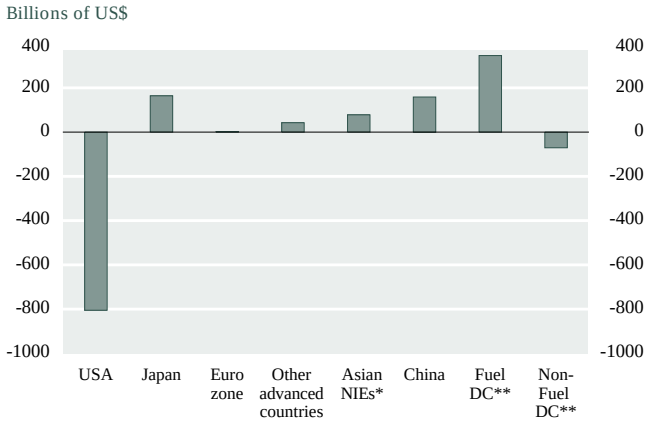
Chart 1

Current Account Balances by Region, 2005



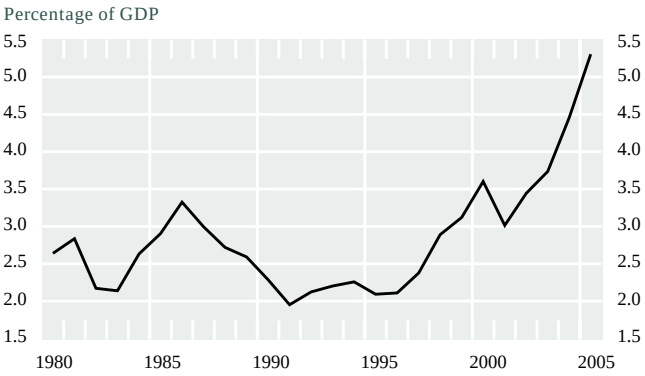
* Asian NIEs = Asian newly industrialized economies

** Fuel DC = Fuel-exporting developing countries; Non-Fuel DC = Non-Fuel-exporting developing countries

Source: IMF, World Economic Outlook, April 2006

Chart 2

Aggregate of Current Account Balance in Absolute Terms



Source: IMF, World Economic Outlook, April 2006, BoC calculations

Since 2002, however, absolute balances have climbed from 3.6 per cent to over 5 per cent of global output (Chart 2). The size of today's imbalances and their recent growth have set off a vigorous debate. The conclusion of almost every analysis—there are exceptions, as we shall see—is that such imbalances are unsustainable, a word whose meaning is best captured in the memorable aphorism of the late U.S. economist Herb Stein: "If something cannot go on forever, it will stop" (Greenspan 2000).

What fuels the debate over global imbalances is disagreement on almost all the important questions. What caused the sudden emergence of wide imbalances? When will they stop growing—sooner or later? What will stop them—underlying economic forces, government policy action, nervous financial markets, or a combination of all three? How will they stop—gradually or abruptly? What harm can be attributed to imbalances and what damage might a reversal cause? Who will benefit and who will lose?

The official international community has entered the debate repeatedly through a wide range of organizations, such as the G–7 major industrialized nations, the broader G–20, and the International Monetary and Financial Committee of the International Monetary Fund (IMF). All have raised concerns that the inevitable shrinking of large current account surpluses and deficits, when it comes, might seriously undermine global economic growth. A disruptive adjustment would involve the sudden realignments of major currencies (marked by a steep depreciation of the U.S. dollar against many other currencies) and perhaps even a revival of trade protectionism that would choke off ordinary trade flows. It goes almost without saying that policy-makers in general would like to avoid such an outcome. In the main, however, they have been reluctant to adopt policies to address the issue, preferring in many cases to point the finger of blame elsewhere.

How this ends matters to all countries. The latest wave of globalization has integrated emerging-market economies (EMEs)—notably China and India—into the global economy, spreading the gains from trade more widely than ever before. Economic globalization has been beneficial, notably in reducing poverty rates in Asia. It has fostered increased competition and has allowed more countries to benefit from their comparative advantages in world markets. At the same time, financial globalization has stimulated foreign investment and a broader and more efficient allocation of savings. More countries now have more to lose from a major disruption. Canada has a special stake in the outcome, since international trade has always been a key source of this country's development and prosperity. As a trading nation with a more open economy than most, Canada feels the impact of anything that affects the health of the global economy.

Anyone who has tried to follow the global imbalances discussion knows that there are wide, and often deep, divides among researchers and opinion leaders on the key questions, so it is often difficult to keep these disparate views in perspective. Our goal in this article is

to bridge that gap and offer an accessible guide to the major issues and controversies.

Three Views of Global Imbalances

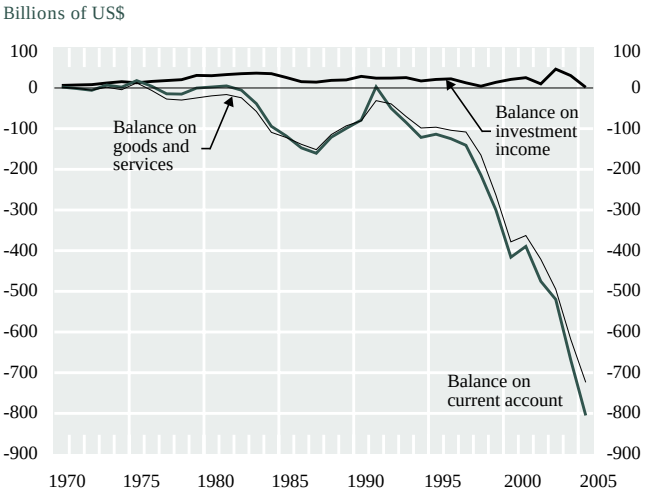
There are three main camps in this debate. The optimistic view is that the global imbalances reflect decisions—based on economic factors alone—by firms and households that are increasingly integrated in a global economy. From this perspective, the situation is not very alarming because market forces will resolve the imbalances over time in an orderly manner. What is really needed is better research to understand how technological, political, and market forces have interacted to bring this situation about. The pessimistic view is that policy-makers will fail to stimulate domestic demand in countries with large current account surpluses and to curb it in countries with large deficits, thus increasing the probability, as Nouriel Roubini has put it, "that the global rebalancing will be disorderly and occur through a hard landing of the U.S. and the global economy" (2005). A third group is cautiously optimistic that the imbalances will be resolved in an orderly fashion but worried that governments will not encourage this outcome by removing distortions that are thwarting market forces.

In this debate, there are optimists, pessimists, and cautious optimists who hope for an orderly resolution of imbalances but worry that governments will get in the way of the outcome.

All three positions have champions among the academic economists who take an interest in these issues. Most international organizations, such as the IMF, the Bank for International Settlements (BIS), and the Organisation for Economic Co-operation and Development (OECD), fall into the third group, as do many policy-makers in countries like Canada. The key players, notably the United States and China, appear to be less concerned, or alternatively, more likely to seek policy initiatives from other countries as being most useful to resolve these imbalances. In the place of concrete policy development, "one finds in the United States something between complacency and denial, and in the rest of the world finger pointing and hand wringing" (Truman 2005, 32). This is true to a point, but finger pointing, complacency, and denial know no borders.

Chart 3

Components of the U.S. Current Account



Source: U.S. Bureau of Economic Analysis

What Do We Mean by Global Imbalances?

To understand better what is going on, we need both a global and a local perspective, as well as an interpretive framework.

Many people see the current account strictly through the lens of the cross-border flows of money tracked by statistical agencies and reported quarterly in the media: a deficit country consumes more than it produces and thus imports more than it exports, using the broadest possible definitions of those terms; conversely, a surplus country exports more than it imports. This approach is valid, but incomplete. Saving and investment, which does not show up directly in the popularly reported data, plays a crucial role.

It works this way. The current account balance summarizes a country's transactions with the rest of the world over a period of time. It has two main components. First, the trade balance represents the difference between a country's receipts for the goods and services it exports and its payments for the goods and services it imports. Second, the balance of net income receipts tracks two smaller categories of cross-border receipts and payments: one is the interest and dividends paid on bonds and stocks held by people in other countries;

the other involves financial transactions like transfers by individuals, most commonly when immigrants send money to family members back in their home countries. The current account, then, is a measure of flows—it follows regular movements of money across borders. In the case of the United States (Chart 3), the current account deficit is driven almost entirely by a large deficit in the trade of goods and services.

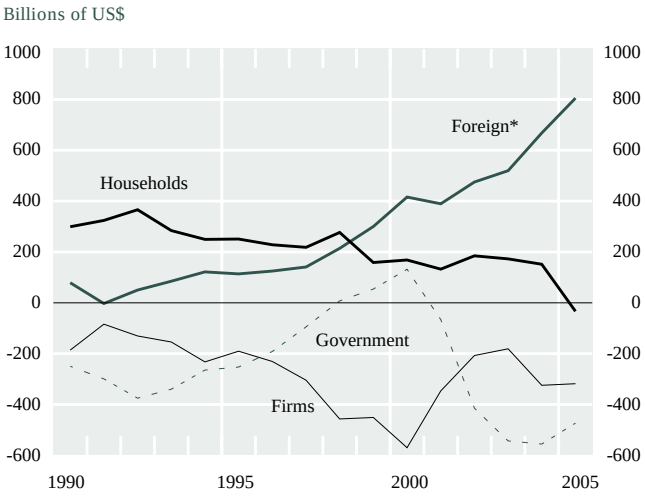
When a country runs a current account deficit, its receipts from international transactions of all kinds are too small to cover its payments. In effect, the country is spending more than it is earning and borrowing from abroad to pay the difference. This is usually seen from a consumption perspective; the country is consuming more than it is producing, and satisfies its excess consumption with imported products, which it pays for with money borrowed from foreigners. True enough, but there is another way of saying the same thing: the country is not saving enough of its current production to meet its investment needs.[1] This cannot happen for the world economy as a whole. Savings are the source of investment capital, and because the planet is a closed economy, total savings must always equal total investment.[2]

Since individual countries trade with each other, however, they can borrow and lend their savings. Countries that save more than they invest at home (China, for example) wind up with surplus savings, so they become capital exporters and have current account surpluses. Countries that invest more than they save domestically (the United States, for example) have insufficient savings, so they become capital importers and have current account deficits. The former are net national savers; the latter, in the jargon of economics, are net national dissavers, a word that does not trip lightly off the tongue.

The concept of net national savings, the difference between saving and investment, is sometimes difficult to grasp because it is the sum of net savings by three groups—households, firms, and governments. Typically in industrialized countries, households are net savers in that they save more than they invest, while companies are net dissavers, since they borrow to invest in new buildings and machinery to increase their productive capacity or to increase efficiency. Governments that run fiscal deficits are, of course, net borrowers (or dissavers). If those three groups collectively save less than they invest, their country must turn to non-residents to make up the difference.

Chart 4

Net Savings



* Inverse of the current account balance

Source: U.S. Bureau of Economic Analysis

The Emergence of Major Imbalances

In the early 1990s, U.S. borrowing from the rest of the world was relatively small because U.S. households saved enough to finance most of the needs of firms and governments (Chart 4). As the borrowing needs of U.S. companies increased sharply towards the end of the decade, and household savings fell, the need for foreign savings rose, though the increase was modest because governments were running surpluses—saving instead of dissaving. By 2005, however, U.S. households, firms, and governments alike had all become net borrowers (Chart 4). Together, they were saving an amount equal to 14 per cent of GDP, but investing 20 per cent of GDP. They made up that 6 percentage point gap by importing capital from the rest of the world.

Those imported savings, recorded in the United States' capital account, are the flip side of the current account deficit, which could, according to some predictions, grow from its present level of 6 per cent of GDP to as much as 10 per cent in a few years. The deficit is not only large in terms of historical norms for the United

1. A little math can show this. Let Y be national income (or gross domestic product); C, total consumption; S, national savings (= income minus savings); and FS, foreign savings. Then, for a closed economy: $Y - C = S$ and $Y - C = I$, or $I = S$; for an open economy: $I = S + FS$.

2. While true in theory, it is a bit more difficult to show this in official data. Statistical agencies cannot track every transaction, so there are omissions and errors.

States and large industrialized countries, but also in terms of the capital flows it generates. In 2004, the United States alone absorbed about 70 per cent of the world's net international capital flows; in other words, of every dollar that savers worldwide were willing to lend to people in other countries, 70 cents ended up in the United States. Just to finance its savings shortfall, the United States must now import more than US$65 billion a month—the savings of people outside the United States—to pay its bills to the rest of the world. The monthly data on those money flows are now watched closely by financial markets.

Traditionally, developing countries have run current account deficits and used capital imported from wealthier countries to finance their growth. These days, that pattern is reversed: developing countries are running surpluses and exporting capital.

The size of the U.S. draw on the world's pool of savings is worrisome. Savings are the source of the investment capital needed to finance economic growth and development. In recent years, the bulk of internationally mobile global net savings has been channelled to the United States rather than to developing countries, presumably because investors expected better returns in the United States. Traditionally, developing countries have run current account deficits and relied on capital imported from wealthier countries to finance their growth. This was Canada's experience for many decades, and it is consistent with economic theory—investment capital should flow to faster-growing low-income countries from wealthier countries where growth has slowed. These days, however, developing countries—notably China and the oil-exporting countries—are running surpluses and exporting capital, reversing the usual pattern.

Interest rates have assumed an important role in the debate over global imbalances because they represent the crossing point for supply and demand in the global market for capital. More accurately, real interest rates (that is, nominal rates adjusted for expected inflation) reflect the interaction of saving and investment intentions. If desired saving (the supply of capital) increases more than desired investment (the demand for capital), then the real interest rate—the rental fee for funds and the return on savings, if you like—falls. If inflation rates are roughly the same in most countries, then low interest rates can be interpreted as reflecting an excess of global saving intentions over investment opportunities. Recently, long-bond yields have been remarkably low around the world (Chart 5). This has been particularly perplexing in the United States—former Federal Reserve Board Chairman Alan Greenspan called it a "conundrum"—where a combination of strong economic growth, large fiscal deficits, and sustained tightening of monetary policy through rising short-term official interest rates would normally have resulted in higher yields. From a global perspective, however, low long-bond interest rates, in real terms, can be explained by an "excess" of desired global saving over desired global investment.

Chart 5

10-Year Real Yields

Monthly average of weekly closing benchmark yields less year-over-year consumer price index (not seasonally adjusted)

Source: Bloomberg, BoC calculations

The Excess-Savings Story

What, then, is behind these excess savings? Advanced countries, EMEs, and oil-producing nations alike have their own reasons to save more. In advanced economies, one important driver appears to be a widespread restructuring of corporate balance sheets following the collapse of stock market bubbles in 2001. Corporate profits are high, yet firms have preferred on the whole to distribute profits, buy back their shares, and reduce

their debt load, rather than invest heavily in new ventures. This relative reluctance to invest reflects several factors. Firms have turned prudent after coming under greater public scrutiny in the wake of corporate scandals. Strategies for spending on information technology equipment have become more cautious following the splurge of overinvestment—extreme in some cases—associated with Y2K and the telecom and dot.com bubbles.

In many industrialized countries (less so in the United States), the story might also involve aging populations. Some countries have been saving more to meet the retirement needs of the baby-boom generation, the oldest of whom have just turned 60. Yet there may be fewer investment opportunities at home in economies that are less dynamic than those with younger populations. Saving has exceeded investment in Japan for the past quarter-century and—to a lesser extent—in the euro area for most of the past 20 years.

EMEs have their own reasons to make a bigger contribution to global savings. Many Asian nations that boomed in the mid-1990s experienced recessions following the currency crises of the late 1990s. Their recovery strategy—chosen freely or out of necessity and often at the urging of the international community—has been to reduce domestic expenditures and generate current account surpluses, making them net suppliers of funds. Even non-crisis countries like China began to accumulate foreign exchange reserves as a precautionary measure. Having been burned themselves, or seen their close neighbours burned, they have built "war chests" of foreign exchange reserves to protect themselves from a sudden outflow of capital. The recent rapid rise in oil prices has also contributed to higher global savings. Oil producers, many of which learned some hard lessons in the 1980s when they squandered their sudden oil wealth, have been unwilling—and to some extent unable—to spend their rising revenues as fast as they accumulate them.

It is possible, then, to argue that low long-term real interest rates can be largely explained by a combination of forces that created a significant increase in the global supply of savings—a "global saving[s] glut," to use the term popularized by Federal Reserve Board Chairman Ben Bernanke. Broadly speaking, this is the view of the optimists in the global imbalances debate.

This story has some appeal in the United States, because it means the current account deficits can be seen, not in the negative light of U.S. overspending and undersaving, but as a positive reflection of its greater growth potential and of the lack of investment opportunities outside the United States. The United States is simply buying now (and absorbing more imports) with the prospect of paying later (because the U.S. economy, widely regarded as more productive than most, is likely to grow faster than other industrialized countries in the future). When stock markets crashed in 2001–02, an expansionary monetary policy kept interest rates low and encouraged a surge in the building and buying of homes, which created opportunities for capital gains in the housing market. Rebounding equity markets delivered a further rise in household wealth. These gains, combined with low interest rates, encouraged low private saving at a time when the fiscal balance was deteriorating. In effect, households saw their wealth increasing as their homes appreciated in value, so they saw less need to save.

Financial globalization played a role by facilitating the growth of the U.S. current account deficit in three ways. First, it increased the pool of international savings that could be used to finance the deficit. Second, it reduced the degree of home bias in portfolio investments. Traditionally, most savers invested the bulk of their money in their own countries, so there was a home bias in their financial portfolios. Financial globalization has made it easier and cheaper to invest in foreign assets—always an attraction for investors seeking to diversify their portfolios—while the U.S. productivity "miracle" of the late 1990s (and more recently) generated further interest in investing in the United States. Third, because the U.S. dollar is the dominant international currency, central banks in countries that have been accumulating large current account surpluses have invested much of their increasing international reserves in liquid U.S. Treasury securities.

This is the kernel of the optimists' view. To the extent that the global imbalances reflect financial globalization, an increased desire to save in countries outside the United States, and the better economic prospects of the United States relative to other industrialized countries, the optimists believe market forces will automatically correct these imbalances over time. In this context, the word imbalance carries no negative connotation.

There is a twist to the story that is peculiar to the United States, which enjoys what some call an "exorbitant privilege" as a result of its central position in the global economic system. The U.S. dollar is the dominant medium for international transactions, the key official reserve currency, the unit of account for

global markets, and the nominal anchor for many economies. This confers the advantage of international seignorage, which some regard as important enough either to render the U.S. current account deficits sustainable or, at least, to postpone the eventual adjustment into the distant future.

Moreover, almost all of the United States' liabilities to foreigners—bonds, stocks, even property—are denominated in U.S. dollars, while the foreign assets held by residents of the United States are denominated in foreign currencies. So when the U.S. dollar falls against other currencies, its net position improves in two ways. First, the lower dollar helps to increase U.S. exports while reducing U.S. imports in the medium term. Second, foreign assets held by U.S. residents rise in value (they are now worth more in U.S. dollars), while the value of U.S. liabilities to foreigners is unaffected (since they are priced in U.S. dollars, they are still worth the same).

For most countries, a current account deficit causes a deterioration in their net foreign asset position. A net creditor country is one whose total current holdings of foreign assets exceed its total current liabilities to foreigners. If it runs a current account deficit in a given year, that shortfall will reduce its net holdings of foreign assets; it may still be in the black, but less so than a year earlier. A net debtor country, on the other hand, is one whose total liabilities exceed its total assets. If it runs a current account deficit, it will go deeper into the red as its net foreign liabilities increase. But in the case of the United States, Gourinchas and Rey (2005a) show that revaluation effects from the changing value of the U.S. dollar have, on average, accounted for about 30 per cent of changes in the net foreign asset position of the United States. That explains how, even though the United States ran deficits averaging almost 5 per cent of GDP over the 2001 to 2004 period, the ratio of U.S. net foreign assets to GDP actually improved.

In addition, the United States has tended to borrow short and lend long during the post-war era, and U.S. investors have mainly invested in higher-yielding equities rather than bonds. The upshot is that the return on U.S. investments abroad is higher than that of foreign investments in the United States. The differential has averaged 3.3 percentage points since 1973 (Gourinchas and Rey 2005b).

The Policy-Failure Story

The pessimists rest their case on five points, which—at the risk of caricature—might be summarized as follows.

First, the imbalances—more specifically the U.S. deficit and the surpluses in China and Japan—reflect either poor policy decisions (the United States) or a lack of initiative in reforming their economic systems (China and Japan). Thus, U.S. government deficits are making the situation worse by reducing national saving. U.S. monetary policy, by keeping interest rates low for a substantial period, encouraged the housing boom that drove home prices higher. Householders who save less because their homes have become more valuable are misleading themselves because housing prices tend to move with income over the long run, and booms can unwind rapidly. Moreover, the United States is attracting the bulk of internationally mobile savings, but these funds are supporting private and public consumption rather than being channelled into productive investment.

Tensions created by the large U.S. trade deficit and the surpluses elsewhere, notably in Asia, are leading to calls for increased trade protectionism to shelter U.S. and European producers from Asian competition.

A second view from the pessimists is that financial markets are confused. Investors and financial analysts, because their perspective is too short, cannot see that the imbalances are unsustainable. In effect, their inexplicable optimism flows from a poor perception of the risks involved, so investors are not pricing risk appropriately. In light of the boom and bust of stock markets in the industrialized countries in the late 1990s and early 2000s, this less charitable view of the wisdom of financial markets cannot be dismissed offhand.

Third, the tensions created by the large U.S. trade deficit and the surpluses elsewhere, notably in China and other Asian countries, are leading to calls for increased trade protectionism to shelter U.S. and European producers from competition from Asia. Many are concerned that the steady gains from the liberalization of international trade since the end of World War II may grind to a halt. This would add to the lack of progress in the latest multilateral trade talks, called the Doha round.

Fourth, if the markets have got it wrong and trade tensions increase, then the risk of a rapid and disorderly correction of the imbalances is that much greater. The fear most often heard is that global investors will grow increasingly unwilling to finance the U.S. deficit at current terms. As a consequence, they will purchase fewer U.S. assets or liquidate part of their U.S.-dollar portfolios. This would lead to higher U.S. interest rates and a lower U.S. dollar. Higher U.S. rates would dampen domestic demand in the United States, while the depreciation of the U.S. dollar would hurt foreign exports to the United States, notably from Japan and Europe. Higher U.S. interest rates, in turn, might dampen the attractiveness of investing in EMEs, causing difficulties around the world. Overall, world economic growth would be considerably weaker.

Finally, adding to the pessimists' anxiety is the fact that policy-makers in the key countries have not acted to reduce these tensions. Their assessment that such inaction will persist leads them to the gloomy conclusion that only a crisis—most likely in the form of a sudden market correction—will resolve the growing imbalances and that the result will be an inevitable period of economic weakness, if not recession.

The Middle Ground

The cautiously optimistic—our third group—remain-hopeful that market forces will be allowed to do most of the heavy lifting and that the imbalances will begin to unwind in an orderly fashion, with a gradual decline in the U.S. dollar and a smooth shift of expenditure from the United States to Asia and the oil-exporting countries. But they worry deeply that governments will discourage this development by continuing to maintain policies that get in the way of market forces. On the whole, this has been the view of international organizations that have argued for stronger policy actions by governments, rather than counting on market forces alone to solve the problem.

Although they recognize that major imbalances have persisted longer than expected, despite repeated warnings that they cannot last, these organizations continue to make their case that the imbalances are indeed unsustainable. Rodrigo de Rato, managing director of the IMF, warned recently (2006) that "many features of the economic landscape that seem permanent eventually cease." He cited the mid-1990s boom in emerging markets and the technology bubble in the United States as cases in point. The OECD takes the view that the U.S. need to borrow from abroad is driven mainly by the lack of domestic savings in the United States, rather than the robust investment demands of its growing economy. The most fundamental source of low and falling U.S. domestic savings is the household sector, whose saving rate has been dropping since the early 1980s.

For many years, discussions in international forums by heads of state, finance ministers, and governors of central banks have generally pointed to a number of policy measures that could be taken to ease the situation. The United States has been asked to rein in its fiscal deficits. Japan and China have been encouraged to make faster progress on structural reforms, while countries in the euro area have been urged to loosen their labour markets, in both cases to stimulate internal demand. China has been encouraged to accelerate reforms to its financial system and to let its currency float (that is, appreciate), which would reduce its growing trade surpluses; more expensive exports would reduce China's reliance on export-led growth, while cheaper imports would stimulate domestic demand. China has also been advised that a stronger social security system would allow its citizens to save less as a precaution against poor health and a penurious retirement.

Looking Ahead

So far, however, progress has been limited. One reason why policy-makers have shied away from taking strong action is the lack of general agreement on the sustainability of external deficits, particularly in the case of the United States. In practical terms, a current account deficit is sustainable if it can persist over the long run without triggering significant changes in macroeconomic variables (such as a large currency depreciation) or in public policies (such as smaller government deficits or greater protectionist measures) to ensure solvency. A solvent country should maintain a perceived capacity to eventually repay its net foreign debt (with interest) out of future trade surpluses. In effect, a country cannot borrow indefinitely to finance its external debt. Debtor countries must eventually generate trade surpluses, and creditor countries, deficits. The problem is knowing when a country has accumulated too much debt.

This question is especially germane for the United States. Its prominence in the global economics system may delay corrective market forces, so its current account deficits could conceivably continue for some time yet, favouring the accumulation of an excessive level of

net external debt by the United States. Still, it is important to keep in mind that these advantages merely postpone adjustment. An eventual decline in its current account deficit—almost all of which can be attributed to its deficit in the trade of goods and services—is unavoidable, and the longer the United States delays correction, the larger the correction must ultimately be.

How Are Large Current Account Deficits Typically Resolved?

For industrialized countries, current account deficits typically reverse themselves when they reach about 5 per cent of GDP (Freund 2000). It usually takes about three years for the accounts to return to equilibrium, during which time the country's growth slows and the value of its currency drops. Investment falls sharply, while saving in proportion to GDP changes little. At first, the growth of real (inflation-adjusted) imports slows, but over time, it is rising real exports that sustain the improvement. However, it is difficult to draw too many generalizations from the major studies. Depending on the approach, the turnaround in a current account deficit may begin at different thresholds and may require either a large or only moderate depreciation of the currency. Higher interest rates, either as a result of monetary policy interventions or investor concern, may trigger the reversal. The analysis of the contribution of fiscal policy to the current account deficit is inconclusive. It does seem, however, that economic growth must slow, and investment is often the prime mover.

There are enough uncertainties to make predictions difficult, but it is reasonably safe to say that the U.S. current account deficit has already crossed historical thresholds by a significant margin, and that the correction will need to come more from higher household and public savings, which means government deficits will have to fall. Because the current account deficit is associated with strong private consumption and government spending, any further depreciation of the U.S. dollar (it has already fallen by almost 15 per cent since 2002) could be significant. A lower-valued dollar would help to sustain U.S. export growth, while the tightening in U.S. monetary policy that we have seen through higher short-term interest rates should encourage more domestic saving. However, long rates have not moved in tandem. This suggests that a possible trigger for any correction will be a growing reluctance by foreign investors to increase their holdings of U.S. assets. The U.S. current account deficit, then, will not be corrected by U.S. action alone, but will require some reduction in saving by the surplus countries, which, in turn, will require them to raise their domestic consumption.

This does not dismiss the possibility that a rapid and disruptive correction could begin in the United States with what the IMF's de Rato (2006) recently called "an abrupt fall in the rate of consumption growth in the United States, which has been holding up the world economy." In this case, the trigger could be a combination of slowing growth in house prices and a desire by U.S. consumers to save more, a possibility that has worried forecasters for some time now. The danger, as de Rato put it, is that a sudden slowing of U.S. consumption could "take away a major support from world demand before other supports are in place."

What Must the Surplus Countries Do?

Countries running surpluses must invigorate their own domestic economies so they can make a bigger contribution to global growth rather than relying on the United States to keep the global economy moving.

Many of the countries with current account surpluses have been criticized no less than the United States for policy failures that have encouraged the buildup of surpluses and dampened the domestic demand that will be needed to prop up the world economy if U.S. demand falters. A common theme is that countries running surpluses must invigorate their own domestic economies so they can make a bigger contribution to global growth rather than relying on the United States to keep the global economy moving. Japan and Europe have been urged to carry out structural reforms to reduce rigidities in their product and labour markets. China has been criticized for tightly managing its exchange rate when its surpluses would drive a floating currency much higher. Although China last year allowed its currency to appreciate by 2.1 per cent and has taken other moves to promote flexibility in its capital markets, international organizations continue to recommend broader policy reforms—not only in China, but in other emerging Asian countries as well—to

encourage faster growth in domestic demand and greater exchange rate flexibility. Oil-producing countries have been urged to mop up some of their surpluses by investing more at home; in many cases, there is a pressing need to expand and modernize production infrastructure, so there is no lack of opportunities for such investment.

Implications for Growth

How these imbalances are resolved is important for global economic growth—and for Canada. A decline in the U.S. current account deficit requires more saving in the United States, and this would come at the expense of consumption, the largest source of demand in the U.S. economy. And since the U.S. economy accounts for more than one-fifth of the world economy, a slowdown there would affect all countries. For the global economy to keep growing at a healthy clip, other countries would have to pick up the slack. Faster growth in the major industrialized countries—especially Europe and Japan—would help, but would not be enough. The surplus-holding countries of Asia and the oil-producing countries will have to make a major contribution to world economic activity by spending more and saving less, which would reduce their current account surpluses.

Market forces will encourage this shift, and while a smooth and orderly transition remains the most likely outcome, the risk remains that it will be sudden and disorderly. Financial markets especially have a history of rapidly changing direction in response to changing assessments of risk. When that happens—a recent example is the 1997–98 currency crisis in Asia that spread to Russia and Argentina—the outcome can be damaging and extend well beyond the original source. Financial markets often overshoot, pushing a trend beyond its reasonable, or sustainable, limits; just as often, the reversal to correct that error overshoots in the opposite direction. The longer the current global imbalances last and the greater they become, the greater the risk of an extreme reversal.

This risk could be lessened if governments adopted policies designed to encourage balanced domestic economic growth. A range of policies would be useful: a focus on sustainable ratios of public debt to GDP; the promotion of flexible markets for goods, services, labour, and capital; the development of strong social safety nets that would reduce the need for individual citizens to save large sums as a precaution against job loss, illness, and penury in old age; and the development of financial systems that can offer companies and households appropriate access to credit. They could also move to more flexible exchange rate regimes that would lessen the threat of protectionist trade measures and encourage economic adjustment at home.

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Issues in Inflation Targeting: A Summary of the Bank of Canada Conference Held 28–29 April 2005

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The Bank of Canada has held economic conferences since 1990. These conferences serve as a forum to present staff research and to exchange ideas with leading researchers. This year's conference was particularly important, since it focused on some relevant issues that need to be considered as the Bank and the government prepare to renew the inflation-control targets in 2006.[1] Such issues had also been the theme at each of the conferences preceding the renewal of the inflation-targeting agreement (1993, 1997, and 2000). The topic of price stability, for example—its nature, the costs and benefits associated with it, and the design of explicit targets for achieving it—recurred at every conference. Previous conferences also included sessions on such other topics as the real effects of inflation, the effect of inflation on economic growth, downward nominal-wage rigidity, and the Phillips curve at low inflation.[2]

The 2005 conference revisited two critical issues relating to the design of inflation targeting: price-level targets versus inflation targets, and the appropriate rate of inflation. Returning to these issues was worthwhile for two reasons: improvements in economics and changes to the Canadian economy. In particular, advances in structural interpretations of inflation dynamics, such as the New Keynesian Phillips curve, and recent micro data and survey studies have indicated that the length of average price contracts is much shorter than previously thought. Robust control methods now allow policy-makers to consider the possibility that their economic model may be incorrect. Finally, advances in computing power make it feasible to conduct welfare-comparison experiments in fully specified dynamic general-equilibrium (DGE) settings.

The 2005 conference revisited two critical issues relating to the design of inflation targeting: price-level targets versus inflation targets, and the appropriate rate of inflation.

There have also been changes in the Canadian economy that argue for continued research into the Bank's inflation-targeting regime. Inflation persistence has diminished substantially, and the forecasting ability of models of inflation has thus deteriorated. The volatilities of the Canada-U.S. exchange rate and some Canadian asset prices have increased, raising questions about the role of monetary policy under these circumstances. Finally, over the course of the 2000s, Canadian interest rates fell to their lowest levels in more than a generation.

The Bank was pleased to host a notable group of authors and discussants at the 2005 conference to examine these and other questions, including inflation dynamics, asset-price inflation, and the communication of mone-

1. In a joint agreement with the Government of Canada in 1991, the Bank of Canada adopted a series of explicit inflation targets. Currently, the target is the annual percentage change in the consumer price index (CPI), using the 2 per cent midpoint in a range of 1 to 3 per cent and a target horizon of six to eight quarters. For more information on the Bank's inflation-targeting regime, see www.bankofcanada.ca/en/monetary/inflation_target.html.

2. Conference papers and discussions are available on the Bank of Canada's website (www.bankofcanada.ca). Proceedings of this conference will be published later in 2006.

tary policy. In a departure from the custom at previous conferences, the Bank invited general discussants, who spoke, not about specific papers, but more about the issues of the session as a whole. As well, two distinguished speakers gave their perspectives on inflation targeting. Christopher Ragan expressed his thoughts on the future challenges for inflation targeting, while Frederic Mishkin posed a series of salient questions in this year's John Kuszczak Memorial Lecture.

Session I: Inflation Targeting in Canada

In his paper, "The Road Ahead for Canadian Inflation Targeting," **Christopher Ragan** (Bank of Canada and McGill University) argued in favour of extending the current inflation-targeting framework.

He began by evaluating the performance of inflation targeting in Canada. Inflation has been stable, averaging close to 2 per cent, and, with few exceptions, has remained within the target range since the Bank adopted the targets. There is evidence that inflation targeting has acted as a macroeconomic stabilizer, helping to attenuate the business cycle and to increase economic growth. As well, monetary policy is credible: private sector inflation expectations have largely centred on 2 per cent over the post-1993 inflation-targeting period. Anchored expectations result directly from clear communication. The transparency of the inflation-targeting framework has allowed markets to understand better how the Bank reacts to projected economic outcomes.

Ragan proposed two extensions for consideration: (i) reducing the inflation-control targets, and (ii) moving from inflation targeting to price-level targeting. He conceded that more analysis is required to determine whether these modifications to the current framework would be welfare-enhancing. He also drew attention to the importance of improved central bank communication with the public, suggesting in particular that the Bank reduce its emphasis on short-term signalling (i.e., giving hints about or providing actual projections of future policy actions) and increase the amount of longer-term education (i.e., explaining the reasoning that goes into monetary policy actions) so that the public can understand even better than it does now how the Bank formulates monetary policy decisions. He listed three areas where public education was needed: the bluntness of monetary policy, the monetary transmission mechanism and the importance of lags, and the effect of oil-price shocks on monetary policy.

Session II: Inflation Dynamics

Although the New Keynesian Phillips curve (NKPC) is often used in the academic economic literature as a structural model of short-run inflation behaviour, empirical support for that model has been mixed. The two papers presented in this session entered the debate by applying novel methodological approaches to examine the NKPC's validity for Canada.

Bergljot Bjørnson Barkbu and **Nicoletta Batini** (International Monetary Fund) used a new method that controls for the effects of non-stationary variables to estimate the NKPC. They found that the dynamics of inflation as measured by the Canadian gross domestic product (GDP) deflator can be explained by movements in labour's share, but that the link between these two variables is not especially robust. Barkbu and Batini found that their results are sensitive to measurement of labour's share (e.g., the treatment of indirect taxes, the openness of the economy, the degree of self-employment, and the inclusion of the public sector). **Günter Coenen** (European Central Bank) questioned the ground for expecting a long-run relationship between inflation, which is a nominal variable, and real marginal cost, a real variable. He argued that it may be more appropriate to treat the variables under consideration as stationary. He also presented empirical results based on a model of generalized price-setting using Canadian data, and confirmed the main finding reported in Barkbu and Batini.

In the second paper, **Robert Amano** and **Stephen Murchison** (Bank of Canada) found clear support for the NKPC using the Bank of Canada's measure of core inflation when they employ a general measure of the real marginal cost (one that allows for a production function, labour adjustment costs, and an explicit role for imported intermediate goods) and relax the assumption of a constant inflation target. Their estimation results are consistent with price-contract durations found in survey data (about two to three quarters) and with other statistical properties of inflation. The authors also found an important role for expected inflation relative to past inflation, a result shared by Barkbu and Batini. Despite these positive results, Amano and Murchison were unable to explain why inflation persistence has fallen significantly since the early 1990s, while real marginal cost has remained persistent. **Jean Boivin** (Columbia University) highlighted the importance of both the more general measure of real marginal costs and the non-constant inflation target for generating the results in favour of the NKPC model

of inflation. Boivin suggested that the authors extend their model by estimating the inflation target and the inflation equation jointly.

Although both papers found evidence in favour of the NKPC, **Sharon Kozicki** (then Federal Reserve Bank of Kansas City, now Bank of Canada) stressed the need for more analysis of the measurement of inflation, inflation expectations, and marginal cost before concluding that the NKPC is a good structural model of inflation in Canada. As well, she noted that, while inflation persistence can be suppressed by monetary policy with a credible constant inflation target, other sources of inflation inertia remain.

Session III: Asset Prices and Monetary Policy

Recent debates on asset prices have focused on two questions. Can large fluctuations in asset prices affect the real economy? Should inflation-targeting central banks react directly to asset prices? The papers in this session studied the monetary policy implications of (i) border effects[3] caused by nominal exchange rate volatility, and (ii) Bernanke-Gertler-Gilchrist's (BGG) model of the "financial accelerator"—the mechanism through which a large change in equity prices affects the balance sheets of firms and households, and hence credit flows, investment, and consumer spending.

Steven Globerman and **Paul Storer** (Western Washington University) showed that the volatility of the Canada-U.S. exchange rate has increased since 1997. They also presented evidence of an increase in the size of border effects contemporaneous with the increased volatility. They argued that inflation targeting may have contributed to lower exchange rate pass-through, which in turn led to a decline in the implicit weight that the central bank places on exchange rate fluctuations, even if the costs of exchange rate volatility have not changed. If the costs of volatility have not changed, the authors argue, then the central bank needs to reassess the weight put on exchange rate volatility. **Lucie Samson** (Université Laval) questioned how much of the increase in border effects can be attributed to increased exchange rate volatility and reduced pass-through, and how much to some exogenous event, such as an increase in transactions costs. She also warned against focusing too much on the adoption of inflation targeting to explain reduced pass-through and increased exchange rate volatility. Low pass-through, low and stable inflation, and high exchange rate volatility are compatible with models with nominal-wage rigidity, menu costs, pricing to market, and noise traders, she noted.

Robert Tetlow (Board of Governors of the Federal Reserve System) added more structure to the BGG model to enhance dynamic propagation, making the model more consistent with the data. He used the model to compute the optimal weight the central bank should place on stock-price fluctuations in its policy rule. He also introduced model uncertainty by assuming that the central bank only knows the range in which the growth rate of the stock prices lies. He found that a direct reaction to stock prices in a policy rule that includes expected inflation reduces inflation and output volatility only marginally. The results broadly suggest that policy need not respond directly to asset-price bubbles. **Klaus Schmidt-Hebbel** (Central Bank of Chile) noted that the optimal-response coefficients in the central bank's policy rule are huge, which suggests model misspecification. He also remarked that Tetlow defines a stock market bubble as a change in stock prices. He suggested that Tetlow should redefine a stock market bubble as a deviation of stock prices from their fundamental values and use the method of robust control to allow for uncertainty around those values.

Policy need not respond directly to asset-price bubbles.

Philip Lowe (Reserve Bank of Australia) questioned Globerman and Storer's hypothesis that inflation targeting causes increased exchange rate volatility, since this did not occur in Australia. He suggested that the more interesting question is how central banks should respond to an exchange rate depreciation in conjunction with a decline in the terms of trade. Inflation would rise in the usual short-term policy horizon, but would then fall in the medium term as the negative effects of the decline in the terms of trade took hold. In reference to Tetlow's paper, Lowe stated that he agreed with the conclusion that the central bank should not react directly to equity prices, but is less certain

3. Border effects are defined as the differences in common currency prices in cities on opposite sides of a border that cannot be explained by distance.

when it comes to property prices because real estate is a more important source of collateral for loans than equities, so a boom in property prices might well coincide with a boom in lending and consumer spending. He also questioned whether the class of model employed by Tetlow is an oversimplification because asset-price bubbles, which may be debt-financed, are assumed to be exogenous and are not affected by policy interest rates. He reminded the audience that asset-price bubbles may be initiated by favourable supply-side developments that boost growth and lower inflation. In this situation, an increase in the current interest rate that reins in a boom might be considered, since the collapse of that boom may lead to a stronger undershoot of the inflation target in the medium term. Lowe concluded that central banks would be better off if they were able to convince the public that the inflation forecast is at the target and that the policy horizon is only one dimension of inflation targeting.

Session IV: John Kuszczak Memorial Lecture

Frederic Mishkin (Columbia University) delivered the 2005 John Kuszczak Memorial Lecture, "The Inflation-Targeting Debate."[4] It focused on five important inflation-targeting questions. Does inflation targeting improve economic performance? Is inflation targeting able to stabilize both inflation and output? Can central bank transparency go too far? Would a price-level target be better than an inflation target? Would a point target be better than a target range?

Mishkin cited statistics and studies that show a positive relationship between inflation targeting and economic performance. He noted, however, that the positive relationship is less conclusive than it first appears and showed that the economic performance of non-inflation-targeting countries such as the United States and Germany has equalled that of countries that target inflation. He also pointed out that the countries experiencing high inflation might adopt inflation targeting, which facilitates a reduction in inflation. There is thus a possible endogeneity bias associated with the positive correlation between inflation targeting and economic performance. He concluded that the provision of a strong nominal anchor is an important argument favouring the adoption of inflation targets.

Mishkin addressed his second question by remarking that flexible inflation targeting, the framework where inflation is brought back to target over a given horizon, is consistent with stabilizing both inflation and output. This is the practice of virtually all inflation-targeting central banks. On the question of whether central bank transparency can go too far, Mishkin argued that transparency has to contend with the principle of simplicity in communications. Contrary to other positions in the literature, Mishkin suggested that announcing a policy path or disclosing the central bank's objective function can complicate communication and challenge the focus on the long-term goals that should prevail in the conduct of monetary policy.

On the fourth question, Mishkin admitted to becoming less skeptical of price-level targeting than he was five years ago, suggesting that events in Japan might point to price-level targeting as an important weapon to combat deflation. In particular, a key advantage of price-level targeting is its ability to manage expectations in a deflation by making agents expect high inflation, thus reducing short-term real interest rates. This, in turn, helps the central bank to avoid the zero lower bound on nominal interest rates. In the end, Mishkin advocated inflation targeting during non-deflationary periods, since communicating an inflation target is easier then.

A key advantage of price-level targeting is its ability to manage expectations in a deflation by making agents expect high inflation, thus reducing short-term real interest rates.

Mishkin admitted to a complete change of opinion in regard to the final question. Five years earlier, he had argued for a point target rather than a range, but now he advocated the opposite and outlined the reasons for a range. A range is flexible, which makes it palatable to politicians, and simple, which makes it easy to implement and explain. Finally, welfare comparisons show that a target range is able to achieve welfare that is very close to the social optimum with only slightly higher inflation and output volatility.

4. This annual lecture was inaugurated in 2003 in memory of John Kuszczak, a Bank of Canada researcher who died in 2002.

Session V: Zero Lower Bound on Nominal Interest Rates

Francisco Ruge-Murcia (Université de Montréal) expanded the expectations-hypothesis model of the term structure of interest rates exposited by Cox, Ingersoll, and Ross (CIR 1981) to take into account the zero lower bound on nominal interest rates. The modified CIR model introduced a non-linearity into the term structure. The key insight of Ruge-Murcia's paper is that the non-linear term structure and the linear term structure offer virtually identical predictions for the long-term interest rate when long-term rates are distant from the zero lower bound, but starkly different ones when interest rates are close to zero. In this way, Ruge-Murcia derived a definition of "close to zero": the interest rate is only close to zero when the non-linear term structure offers a statistically different prediction for the interest rate from the linear term structure. Applying this definition to Canadian interest rates in the past decade, which reached a floor of about 2 per cent, he found that Canadian interest rates were never close to zero.

In his discussion of the paper, **Peter Ireland** (Boston College) recalled that when Ruge-Murcia applied this model to data from Japan in an earlier paper, he found that Japanese interest rates were close to zero under his definition, since the key distinction between Japanese and Canadian monetary policy is that the Bank of Canada targeted 2 per cent inflation, while the Bank of Japan appears to have targeted zero inflation. Ireland concluded that higher targets reduce the likelihood of being close to zero. He suggested that Ruge-Murcia extend his analysis to more than two countries.

Session VI: Welfare Implications

Two papers addressed questions of inflation and welfare in general-equilibrium macroeconomic models.

The paper by **Eva Ortega** (then Bank of Canada; now Bank of Spain) and **Nooman Rebei** extended the new open economy macroeconomic framework to a two-sector economy, and estimated the resulting model using Bayesian techniques. In the context of this model, the authors considered classes of simple monetary policy rules and asked which ones maximize economic welfare. Ortega and Rebei first considered the optimal inflation-targeting rule, which responds strongly to inflation and does not respond to the output gap at all. They then considered a variety of possible inflation measures to target. There is a key trade-off: while targeting inflation in the non-tradable sector increases expected welfare more than targeting overall inflation does, it also increases macroeconomic uncertainty. Finally, Ortega and Rebei looked at hybrid rules, in which both the price level and the inflation rate are targeted. These results are inconclusive, since welfare is essentially invariant to parameter changes in these hybrid rules.

Craig Burnside (Duke University) raised two points in his discussion. First, he expressed some disappointment that the discussion of optimal rules did not take place in an environment where commitment can be problematic, since the ability to commit to a policy rule can affect the choice of rule itself. Second, he reminded the audience that the Lucas critique can apply even to general equilibrium models; if the model is incorrectly specified, it is not appropriate to perform policy analysis. To remedy this concern, Burnside suggested that the authors conduct a comprehensive exploration of the business cycle properties of their model, at both the macroeconomic and the sectoral levels. If the model is indeed a good representation of the Canadian economy, the policy conclusions drawn from it are valid.

Kevin Moran (Université Laval) made two substantial modifications to the standard, calibrated, macroeconomic policy model. First, he introduced money through the use of a (partial) cash-in-advance constraint, a specification that allows more flexibility than introducing money in the utility function. Second, he assumed that agents imperfectly observe changes in the central bank's inflation target and thus must use Bayesian updating. In the context of such a model, Moran investigated the welfare gains of moving from a target of 2 per cent to zero. Comparing the two steady states, the gains are substantial, but the learning costs are also large. Agents perceive that, within one year, the target has dropped to 1 per cent. Further learning is much slower; it takes agents almost four years to believe the target is half of 1 per cent. Eventually, agents come to believe that the target is zero, but this learning process lasts a considerable time. The net welfare gains are positive, even when considering the possibility of learning, and robust to a variety of changes in model specification, such as habit formation, wage rigidities, and different specifications of the cash-in-advance constraint.

Andrew Levin (Board of Governors of the Federal Reserve System) noted that the optimal steady-state inflation rate might not be the same as the optimal average inflation rate if the distribution of macroeconomic shocks was skewed, owing to the presence of

the zero lower bound on interest rates. In considering such optimal inflation, however, he considered it important to reflect on credit-channel effects and aspects of incomplete indexation, whether in wages, prices, or tax brackets. Levin also asked how well the models can match historical disinflation episodes. Finally, he highlighted the role of credibility and communication for potentially reducing the welfare costs of the transition to disinflation.

In his combined discussion of both papers, **Vitor Gaspar** (Bank of Portugal) referred to Hume's (1739) principle of "no ought from is," suggesting that while this principle may not preclude policy analysis in macroeconomic models, it at least urges caution. He was also concerned about the ad hoc assumption of simple policy rules in both papers, as opposed to more general rules that may yield higher welfare.

Session VII: Panel Discussion

In light of the research presented at the conference, **Paul Beaudr**y (University of British Columbia) discussed four issues. First, why should a central bank adopt inflation targeting if its objective is to foster a stable monetary and financial environment that promotes economic well-being? Is inflation targeting the best policy? Over the past 15 years, inflation-targeting countries have not had markedly different economic outcomes (economic growth or inflation) than comparable industrialized countries that do not explicitly target inflation. Therefore, the data suggest that alternative policies may perform equally well at promoting economic well-being.

Price-level targeting aids long-term planning, allowing people to save for retirement without worrying about the erosion of their savings owing to inflation.

Second, what are the advantages and disadvantages of inflation targeting as opposed to price-level targeting? Inflation targeting aids medium-term planning, allowing people to sign multi-year contracts. But price-level targeting aids long-term planning, allowing people to save for retirement without worrying about the erosion of their savings owing to inflation. Beaudry suggested that a proper examination of this question needs to model incentives to plan for the long term.

Third, what level of inflation should be chosen as the target? Is 2 per cent better than any other level? What are the costs associated with moving to a lower target? He highlighted a paradox for monetary policy makers. On the one hand, if the zero lower bound on nominal interest rates is not problematic for a range of inflation targets around 2 per cent, the target could be decreased, and economic outcomes may improve. On the other hand, there may be an important role for stasis: if there is a costly transition to a new policy, it might be best to retain the present policy.

Finally, Beaudry asked how an inflation target should be implemented. The most common way to achieve the target is via a feedback rule that specifies how to adjust interest rates in response to different economic outcomes. Inflation and output are the usual elements included in a feedback rule (a Taylor rule). A new question of interest is whether the monetary authority should react to asset prices. Beaudry acknowledged Tetlow's conclusion that monetary policy should not do so, but he noted that business cycle fluctuations are mostly driven by non-monetary disturbances, implying that the Bank should have a clear position on how it will respond to non-monetary shocks.

The discussion by **Pierre Duguay** (Bank of Canada) centred on two themes: the target and challenges in meeting the target. On the first point, he noted that the success of inflation targeting in anchoring expectations and dampening fluctuations should encourage consideration of further progress towards price stability. At the most recent renewal of the inflation target (May 2001), theoretical arguments supported a reduction in the target rate, but the benefits were difficult to quantify. Since then, search-theoretic models (by Shi, Wright, and others) have increasingly been used to quantify welfare gains under different frameworks. Moran used a more conventional DGE model. All point to positive benefits from a lower target. Ragan noted that the only way to quantify the gains is with a DGE model with multiple sectors and relative prices. Ortega and Rebei took a good first step in that direction. The challenge for central bankers is to determine which model is closest to the real world and to communicate results clearly to the public and the government.

Duguay agreed with Ragan that long-run price certainty is too important an issue to dismiss price-level targeting without a careful consideration of its costs and

benefits. The conventional view used to be that price-level targeting would induce more variability in inflation, output, and nominal interest rates. New studies show that, when agents are forward looking and monetary policy is credible, price-level targeting can lower the variability of inflation, output, and the nominal interest rate. When demand increases, the price level rises above the target, and agents' anticipation of prices returning to target raises the real interest rate, thus helping to curb demand, and ultimately requiring a smaller reaction from nominal interest rates. The reverse occurs under a contractionary shock. Price-level targeting thus allows monetary policy greater room to manoeuvre without hitting the zero lower bound. In the case of a supply shock, however, the trade-off between output and price stabilization (which disappeared under credible inflation targeting) may re-emerge.

The challenge for central bankers is to determine which model is closest to the real world and to communicate results clearly to the public and the government.

Duguay listed three key challenges for the conduct of monetary policy: asset-price movements, vanishing exchange rate pass-through, and reduced inflation persistence. On asset-price movements, Duguay noted Tetlow's conclusion that, in normal times, monetary policy had little to gain by reacting to asset prices over and above their effect on the inflation forecast. However, he felt that Tetlow did not fully address the question being debated in central banking circles, namely, whether to allow for a longer horizon to meet the target when faced with a "non-fundamental" asset-price shock. Given our limited ability to forecast beyond 18 months and to foretell the bursting of a bubble, he concluded that it would be imprudent to trade off the achievement of the inflation target over a six-to-eight-quarter horizon for a possible better outcome later.

Duguay then remarked on vanishing exchange rate pass-through: Globerman and Storer pointed to growing intrafirm and intraindustry trade as sources of reduced pass-through, given that exchange rate fluctuations have offsetting effects on revenues and costs of firms. This could also explain the increased variability of exchange rates: larger variations are needed to achieve required reallocations of resources if some sectors are insulated from exchange rate movements. Duguay asked whether there is a link between lower pass-through of other cost increases (energy, raw materials) and increased variability of relative prices now that inflation is under control.

On reduced inflation persistence, Duguay argued that the main breakthrough in the NKPC literature is an acknowledgement of the roles played by central bank behaviour and agents' learning in affecting inflation persistence. Duguay opined that the puzzle noted by Amano and Murchison, that there is much lower persistence of inflation than marginal cost, raises questions about assumptions underlying the construction of the marginal-cost variable. Amano and Murchison's NKPC can outperform other popular models for forecasting inflation; however, extracting "deep parameters" requires arbitrary manipulations. It may be premature to conclude that the Bank has good models of inflation. Finally, Duguay noted that the NKPC framework misses the central relationship between demand pressures and wage growth, a point acknowledged by Barkbu and Batini.

Peter Howitt (Brown University) divided his discussion into two parts: What have we learned? and What have we yet to learn? On the first question, Howitt began by noting that inflation stabilization has not been destabilizing for economic activity. He pointed out that Ragan's paper showed that real output variability has declined during the period of inflation targeting in Canada. Output variability has also declined in the United States and other countries that have stabilized inflation, despite the absence of explicit inflation targets. Howitt would have expected this to be the case only if most of the shocks were demand shocks. If supply shocks are dominant, then they are less important than real-business-cycle theorists claimed. Another possibility is that an inflation-targeting regime is inherently stabilizing and mitigates the trade-off between output and inflation variability in the face of supply shocks. Anchoring inflation expectations allows an economy to absorb negative supply shocks without a round of wage and price increases. The fact that so many countries share similar experiences shows that stabilizing inflation at a low rate has a smaller adverse real effect than originally predicted. Inflation targeting may even be the best way to promote stable growth.

Amano and Murchison showed that the fall in persistence began at the start of inflation targeting, even

though the persistence of real marginal cost did not decline. This suggests a change in the process of forming expectations. It appears that, since targeting has anchored expectations and hence dampened the effect of shocks, the central bank can afford to take a more accommodating approach to supply shocks without unwanted movement in inflation.

As well, the exchange rate can be left alone, since exchange rate movements need not undermine inflation-targeting policy. There have been large fluctuations in the Canada-U.S. exchange rate since 1991, without derailing policy. Globerman and Storer point out that exchange rate pass-through, which has been historically slow and gradual in Canada, has become even more so under inflation targeting. This again suggests well-anchored expectations.

The exchange rate can be left alone, since exchange rate movements need not undermine inflation-targeting policy.

Finally, the success of policy has as much to do with communication and politics as with economics. Communication is facilitated by the clarity of the inflation-targeting framework, as emphasized by Ragan. Communication sharpens expectations. It also helps to make policy changes transparent, boosting credibility. When news arrives, private agents understand that the policy changed because of new information, not because of a surreptitious change of course. Politics plays a role, since the government had to agree to inflation targeting. However, inflation targeting gives the Bank a degree of independence, which adds to its credibility. Howitt remarked that this is why central banks that adopted inflation targeting were those that had been the least independent.

Howitt then reflected on what we have yet to learn. It is not clear why inflation targeting works. Why have expectations become anchored? Why has persistence fallen? Although dynamic stochastic general-equilibrium (DSGE) models are being developed to answer this question, unresolved issues linger. Kozicki noted that the least well-developed or most ad hoc elements of most DSGE models are persistence issues (e.g., indexation, rule-of-thumb, and habit persistence). "Learning" may be a fruitful avenue to generate persistence, but the literature on learning in DSGE models is still in its infancy.

The next question is, how do we fly blind? How does a central bank formulate policy without good indicators of inflation pressure? Policy that efficiently stabilizes inflation six to eight quarters from now makes inflation per se orthogonal to information six to eight quarters earlier. The Bank must act without the benefit of feedback, so it may be the case that the Bank will not see an inflationary spiral immediately. It may also be the case that if expectations are really stuck at 2 per cent, monetary policy should take advantage of this inertia.

It has been difficult to find convincing evidence that reducing inflation below double-digit levels yields significant benefits. "Shoe-leather" costs were never quantitatively significant in a world that counted non-interest-bearing money as a small fraction of wealth. The advantage of DSGE models is that money is not merely a store of value but plays a role in the pricing process: money magnifies the wedge that arises between the marginal rates of substitution through the random timing of price changes. Ortega and Rebei, however, showed that even this friction does not produce very large welfare losses. Howitt pointed to other important frictions in the economy, such as the non-indexation of long-term debt contracts as a source of significant cost. Non-indexation allows inflation to impede otherwise mutually beneficial contracts, such as those for long-term investments. More work is needed on the role played by non-indexation of the tax and accounting systems. More real-world monetary economics is needed in models before quantifying the benefits of targeting lower inflation.

Conclusions

Despite the many issues raised in the presentations and discussions, three general conclusions could be drawn from the conference. The first, and most prominent, is that the current system of inflation targeting seems to work well. Nevertheless, some papers presented at the conference provided evidence to support changes to Canada's current inflation-targeting regime.

The second conclusion is that communication is important, but should be kept simple. Third, there are still several issues related to inflation targeting that require further work. Although promising results have recently been reported concerning the potential benefits of price-level targeting, how monetary policy should react to asset prices, and the advantages of a lowering of the inflation target, it is not yet at a point where any definite policy prescriptions or significant changes to the present inflation-targeting framework can be put forward. Nevertheless, the evidence is encouraging and will no doubt lead to additional refinements in our understanding of the macroeconomy and our monetary policy framework in the future.

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Trends in Retail Payments and Insights from Public Survey Results

*Varya Taylor, Department of Banking Operations**

- *While the use of cash as a means of payment has been affected by the growing use of electronic alternatives, the volume and value of bank notes in circulation have continued to increase.*
- *In 2004, the Bank of Canada commissioned a national survey on the general public's willingness and propensity to use cash as a means of payment and as a store of value. The survey provided insights into consumers' payment habits and their perceptions of cash and its alternatives. It also presented a unique opportunity to assess how confident Canadians are in the security of bank notes.*
- *Statistical analyses show that the demand for bank notes is significantly related to income, age, education, gender, frequency of debit and credit card usage, and the perceived convenience of cash.*
- *From the results, a bank note confidence index was constructed as a benchmark for future surveys.*

Bank notes remain an important method of payment and store of value in the Canadian economy.[1] In 2005, there were 1.5 billion bank notes in circulation, for a total value of $43 billion, or $1,700 for every adult Canadian.[2] Over the past 10 years, the value and volume of bank notes in circulation have grown at average annual rates of 5 per cent and 3 per cent, respectively.

The main attributes of cash, namely, convenience, broad acceptance, and public confidence, explain why bank notes continue to be used by Canadians. Nevertheless, the payment environment is evolving. The growing use of credit cards and, particularly, debit cards has had an impact on cash usage at the point of sale (POS). As well, emerging payment technologies offered by financial or non-financial institutions will likely broaden consumer payment choices in the future.

Given the trends in retail payments, understanding how bank notes are used and perceived in society is increasingly important to a central bank. Towards this end, the Bank of Canada commissioned a public survey to assess some of the intangible factors underlying the demand for bank notes. The survey provided interesting insights into public payment habits and perceptions, including demographic traits that help to explain cash demand compared with the alternatives.

The survey also presented a unique opportunity to measure public confidence in the security of bank notes. By constructing an index based on attitudinal questions related to counterfeiting, the Bank can now track bank note confidence over time, using the initial results as a benchmark.

*This work builds on the original analysis done by Kim McPhail and is the result of the collective efforts of many people in the Department of Banking Operations, including Chantal Ayotte, Patrizia Mion, and members of the Counterfeit Situational Analysis Team. I am also indebted to Pierre Duguay and Sean O'Connor for their extensive comments, suggestions, and contributions.

1. The terms "bank notes" and "cash" are used interchangeably in this article and refer only to notes issued by the Bank of Canada.

2. Excluding $1, $2, and $1,000 bills, the value of notes in circulation falls to $1,600 per adult Canadian.

This article presents an overview of bank notes in circulation and the advances made by electronic means of payment, specifically debit and credit cards. It highlights the key survey findings on cash holdings, cash usage versus electronic payments, and public confidence in bank notes, and describes how the confidence index was constructed.

Bank Notes in Circulation

Since its creation in 1934, the Bank of Canada has been responsible for issuing the bank notes that Canadians use on a daily basis. To meet this demand, the Bank supplies bank notes to the public indirectly through financial institutions, which hold accounts at the Bank and obtain notes through the national Bank Note Distribution System. They also return to the Bank any notes that are considered unfit for further circulation.[3] The public can withdraw cash from automated teller machines (ATMs) or in person at financial institutions. Throughout this process, the Bank is also responsible for ensuring that the notes in circulation are of acceptable quality and are secure from counterfeiting.

Canadians continue to use bank notes as a means of payment and as a store of value, despite the growing use of electronic alternatives. The persistence of bank notes is explained by their unique qualities which, in combination, have yet to be surpassed by other payment instruments:

• *Convenience:* Cash is portable, accessible, and relatively cheap to use. It can be processed quickly during transactions and can be transferred from person to person without the use of technology, personal identification numbers (PINs), or signatures.

• *Protection of privacy:* Cash transactions do not require the disclosure of personal information, and pose no risk of identity theft.

• *Legal tender:* Bank of Canada notes are legal tender[4] in Canada, as are (to a certain extent) coins issued by the Royal Canadian Mint.

• *Payment finality:* The use of bank notes allows for a final means of settlement once the transaction has been completed.

• *Liquidity:* Because cash is readily accepted as a means of payment, it is the most liquid asset in terms of its convertibility into goods, services, and other financial assets.

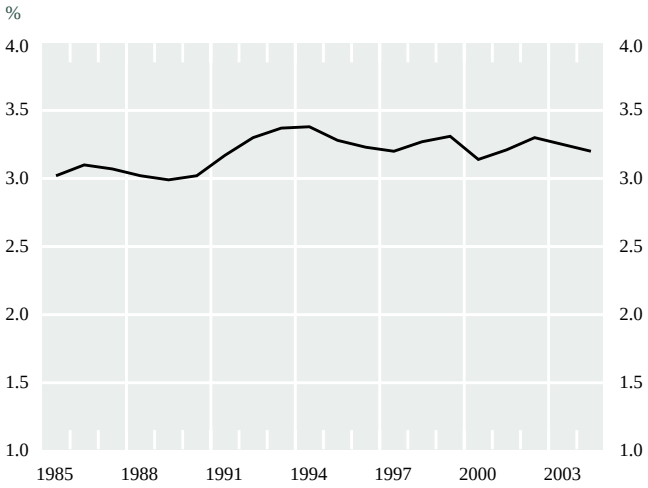
• *Confidence and acceptance:* Confidence in the use of cash is based on the credibility of the central bank in maintaining low and stable inflation (i.e., retaining the purchasing power of the currency) and providing security against the threat of counterfeiting.

The use of cash is not centrally recorded. Once bank notes have been released into circulation, the extent of cash usage and distribution must be estimated, generally through surveys and sampling techniques. Estimating the value of cash holdings in the economy is like piecing together a $43 billion puzzle (the average value of bank notes in 2005). A small fraction, about 8 per cent of the total value of bank notes in circulation, are held in the inventories of chartered banks. The survey results suggest that adult Canadians may hold as much as 30 per cent of the total value of notes in circulation. Aside from those that are lost, destroyed, or held abroad, the remaining notes outstanding must be held by retailers, non-retail businesses (including non-bank deposit-taking institutions, foreign exchange counters, cheque-cashing outlets, and casinos), and households (not fully represented by the sample).

Although the distribution of cash holdings and the flow of cash transactions need to be estimated, the Bank has observed a trend increase in the stock of notes in circulation. Rising prices, population growth, and increased economic activity help to explain why the value of notes in circulation has been increasing. Taking inflation into account, bank note circulation has

Chart 1

Value of Bank Notes in Circulation as a Percentage of Gross Domestic Product, 1985–2004



3. For more information about Canada's Bank Note Distribution System, see Bilkes (1997) or visit www.bankofcanada.ca/en/banknotes/fi.html.

4. A tender is an offer of payment of a debt. Merchants, however, are not legally required to accept cash payments for purchases.

grown in real terms over the past 20 years at an average annual rate of 3 per cent—faster than the population. Thus, the number of bank notes in circulation has also increased in per capita terms.

During the year, the demand for bank notes fluctuates with the seasonality of consumer spending, peaking in late December. However, as illustrated in Chart 1, over the period 1985 to 2004, the average annual value of notes in circulation grew broadly in line with economic activity.

Electronic Payments and the Relative Decline in Cash Transactions

Debit cards and credit cards are by far the most commonly used and widely accepted form of electronic payment at the point of sale.[5] On a per capita basis, debit and credit card usage is relatively high by international standards. In 2004, Canadians made 2.8 billion debit card transactions, or 88 transactions per person, worth over $124 billion.[6] The average value was $44. Canadians also made 1.8 billion credit card transactions, or 55 transactions per person, worth $181 billion.[7] The average value of credit card transactions in 2004 surpassed $100.

The growing use of electronic payments in retail transactions has been impressive. The combined volume and value of debit and credit card transactions have grown at average annual rates of 10 and 11 per cent, respectively, over the past five years. Because of the Internet, prospects for further growth continue to be positive. In addition to credit cards, Canadians now have the opportunity to use their debit cards for online purchases, through a recently introduced service called Interac Online.[8]

Since their introduction in 1994, debit cards have almost completely displaced cheques, and, to a certain extent, cash as a method of making retail payments at the point of sale. Credit cards may have also affected the use of cash at the point of sale, but debit cards currently represent the closest substitute. Considering the trends in electronic payments, there is some indication that cash usage at the point of sale has been in relative decline, despite the growth in the number of bank notes in circulation.

A slow but steady downward trend is observed, suggesting the displacement of cash in retail sales by debit and credit.

While the exact figures are unknown, various attempts have been made (e.g., Humphrey, Kaloudis, and Øwre 2004) to estimate either the volume or the value of cash payments. A rough estimation is to assume that all withdrawals from ATMs are made for the sole purpose of retail transactions. Canadians made 963 million ATM withdrawals in 2004, worth $92 billion;[9] the average value was $96. Assuming that an average cash transaction is worth $15, as indicated by our public survey data, each withdrawal of $96 would cover 6.4 cash transactions ($96/$15). Therefore, the total number of cash transactions for that year is estimated to be 6.2 billion—an average of 250 cash transactions per person over the year, or five cash transactions per week per person (based on the methodology reported in Gerdes et al. 2005). This estimation technique was applied to the period 1998 to 2004, and assumes that the average value of a cash transaction remains constant, adjusted for inflation. Chart 2a graphs the volume of each method of payment relative to the sum of estimated cash, debit, and credit card transactions. The value of ATM withdrawals is used to proxy the total value of cash transactions per year. Chart 2b graphs the value of each method of payment relative to the total value of estimated transactions. In both charts, a slow but steady downward trend is observed, suggesting the displacement of cash in retail sales by debit and credit.[10]

5. Debit cards allow for the immediate electronic transfer of funds from the cardholder's account to the merchant. Credit cards allow consumers to defer payment until the end of the billing period, generally one month. Most credit cards in Canada have revolving credit arrangements, where credit is repeatedly available up to a specified amount as periodic repayments are made. Charge cards, which require that the monthly balance be paid in full, are also used in Canada.

6. The Interac Association, which operates the national POS debit card system, provides data on its website (www.interac.ca/en_n3_31_idpstats.html#a2). The value of debit transactions includes cash withdrawn by the consumer at the point of sale.

7. Data are taken from the Bank for International Settlements (BIS) website at www.bis.org/publ/cpss74.pdf.

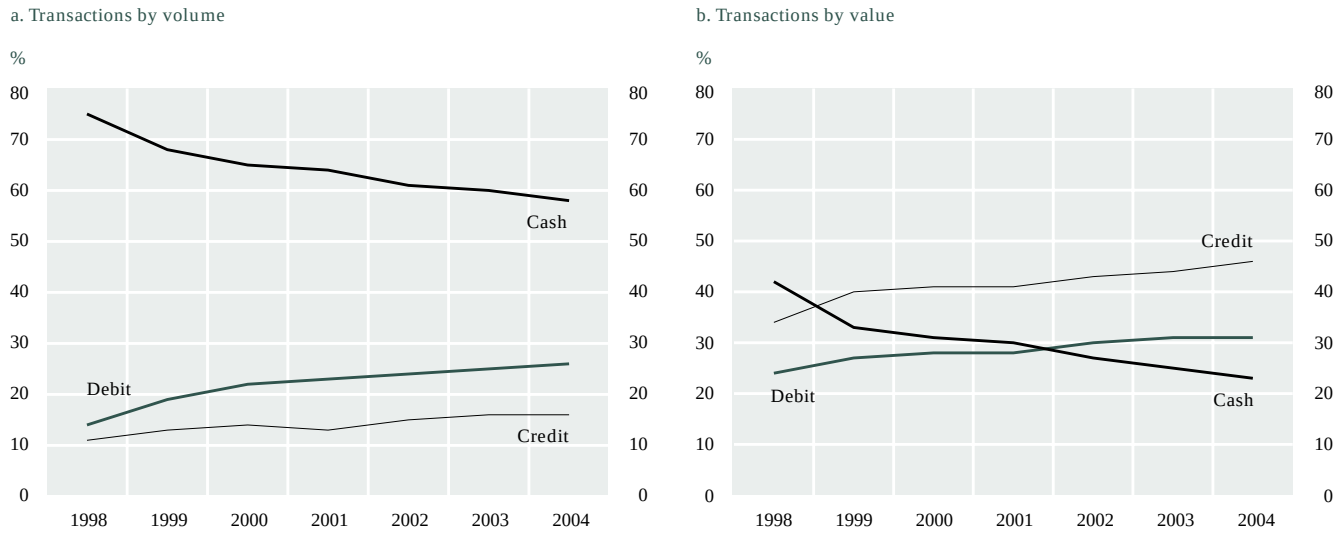
8. A number of Canada's major banks participate in this service, which allows consumers to pay for goods and services over the Internet by debiting their bank account directly.

9. Excludes other sources of cash withdrawals, such as private-label ATMs, cash-back from debit card transactions, and bank tellers, which would cause a downward bias in estimated cash transactions (BIS 2006).

10. Data on credit card transactions (BIS 2006) also include non-POS retail transactions, such as those made on the Internet, which cause an upward bias in credit card transactions at the point of sale.

Chart 2

Estimated Transactions, by Payment Method at the Point of Sale



The displacement of cash will likely continue if the public perceives electronic payments as a preferred substitute for cash. Canadians seem to adopt new technology fairly well, as indicated by the ease with which they adopted debit cards, and it may therefore become increasingly difficult for cash to withstand the competitive pressures of the new payment innovations on the horizon.

Public Survey on Cash Holdings and Usage

Traditionally, the Bank of Canada forecasts public demand for bank notes with economic models that incorporate macroeconomic variables, such as inflation, income, interest rates, and the number of ATMs, or through purely statistical time-series models (see Laflèche 1994). Missing in those equations are the intangible variables that capture changes in perceptions of convenience, habit, and confidence. One method of obtaining such data is through public surveys.

To this end, the Bank commissioned a national telephone survey to assess the general public's holdings of cash and their use of cash versus alternative methods of payment.[11] Participants were asked how much cash they held on hand at that moment and how much they kept for emergencies. Survey questions also focused on consumer payment habits and perceptions. For example, Canadians were asked how often they use various payment instruments and how convenient or safe they perceived such instruments to be. As well, the survey attempted to measure the public's confidence in bank note security, which is essential to its overall acceptance.

As with many surveys, some care should be taken when generalizing for the population as a whole, considering the measurement error that may arise when participants are reluctant to answer such questions candidly or may have difficulty recollecting precise details. This was most evident when participants were asked to recall the amount of cash they reserved for emergency use, leading to results that will likely require further analysis. Another caveat is related to the self-selection bias resulting from the high non-response rate. Only 12 per cent of the total number of eligible respondents contacted actually completed the interviews.

Survey Findings

Value of bank notes held for transactions

The survey asked individuals for the value of bank notes presently held in their purse or wallet, which allowed for a direct estimate of transactions balances. According to the survey, the average Canadian holds about $70 in bank notes for transactions purposes (or $30 if taking the survey median). Surprisingly, about 25 per cent of respondents reported having no bank notes in their possession at the time they were surveyed (Chart 3). Given that only 2 per cent of respondents

11. More than 2,000 adult Canadians participated in telephone interviews during January 2004. National results are statistically accurate within +/- 2.2 per cent, 19 times out of 20. However, when broken down by community size, province, income, level of education, age, and gender, results have wider confidence intervals.

Chart 3

Distribution of the Value of Bank Notes Held for Transactions Purposes

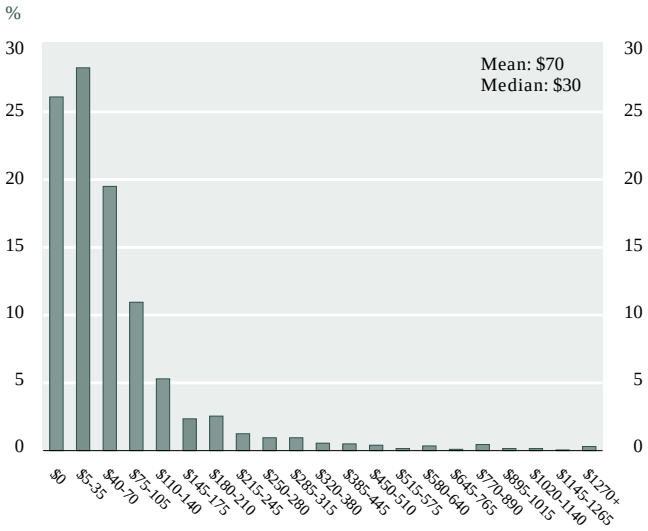
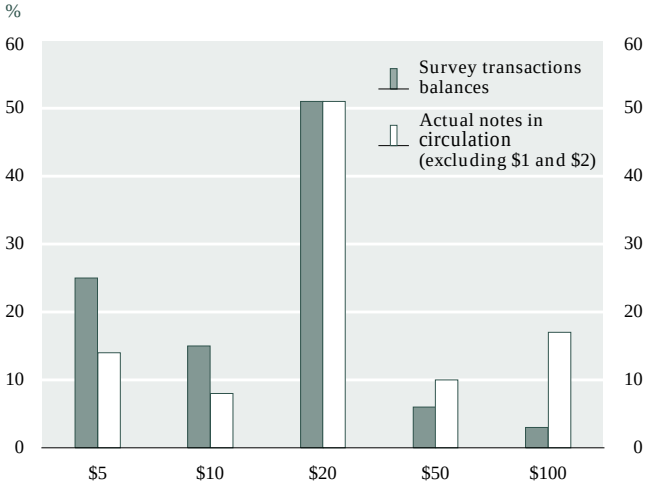


Chart 4

Denominations of Bank Notes Held for Transactions vs. Notes in Circulation



claim they never use cash, this suggests that a significant proportion of the population allow their in-pocket cash balances to deplete to zero before replenishing them at a bank or ATM. Indeed, ATMs are widely accessible in Canada, and most Canadians (64 per cent) use an ATM at least once a week. In comparison, 17 per cent of respondents use the "cash-back"[12] service associated with debit cards, and 13 per cent visit a teller at least once a week to obtain bank notes. Incidentally, there is a tendency to withdraw smaller amounts using the cash-back service offered by retailers, but larger amounts from ATMs and tellers.

The average Canadian holds about $70 in bank notes for transactions purposes.

Because respondents were asked to report the quantity of each denomination held in their purse or wallet, a comparison can be made with the actual composition of notes in circulation. According to the survey, the composition of notes held for transactions purposes is over-represented in $5 and $10 notes and under-represented in $50 and $100 notes (Chart 4). This suggests that the public uses $5 and $10 notes more frequently for transactions than the $50 and $100 notes, which are predominantly used for other purposes. The $20 note is well represented by the sample, likely because ATM withdrawals generally consist of $20 notes.

Correlations between bank note holdings and selected variables

The survey provided some insight into the factors underlying bank note demand. For instance, the value of bank notes held by Canadians for transactions purposes increases with household income (Chart 5). However, the ratio of cash holding to income decreases as income rises. Chart 6 shows how the average transactions balance as a fraction of weekly income declines as income increases. This broadly supports inventory theories of currency demand, which predict an income elasticity substantially less than one.

Transactions balances also increase with age, with a clear demarcation at age 50, suggesting that Canadians above that age, who may be less familiar or less comfortable with debit card technology, prefer to hold higher levels of bank notes to support more frequent transactions made with cash (Chart 7).

Those who rarely or never use debit cards hold more than double the cash balances of those who use debit cards every day. Indeed, frequent users of debit cards hold less cash, indicating that bank notes and debit cards are substitutes for each other (Chart 8).

Perceptions of convenience appear to affect cash holdings. The amount of cash held is highly correlated

12. Cash-back is a cash-withdrawal service available to customers when they use a debit card at the point of sale.

Chart 5

Average Value of Bank Notes Held, by Household Income

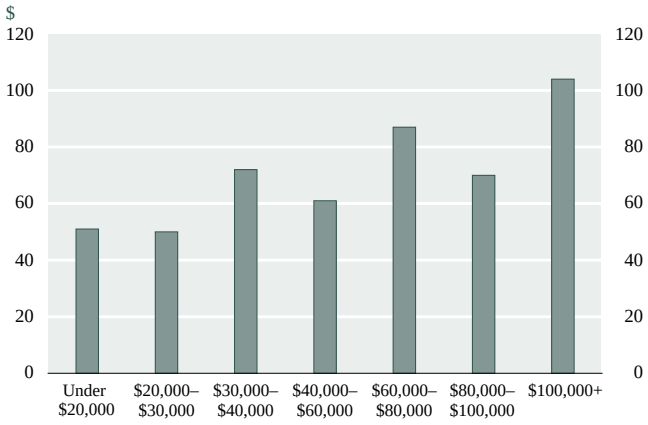


Chart 6

Average Value of Bank Notes Held as a Fraction of Weekly Income, by Income Category

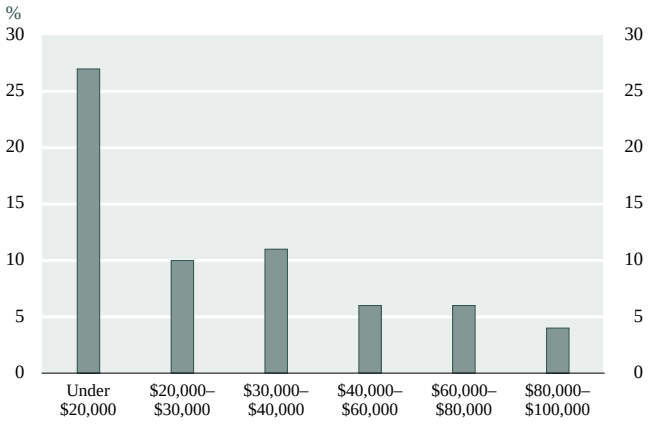


Chart 7

Average Value of Bank Notes Held, by Age

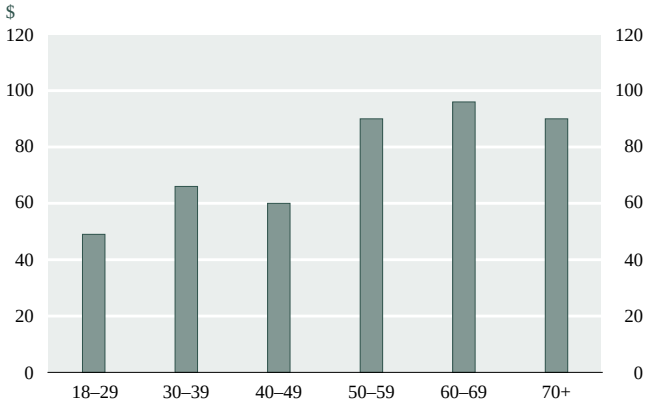


Chart 8

Average Value of Bank Notes Held, by Frequency of Debit Card Use

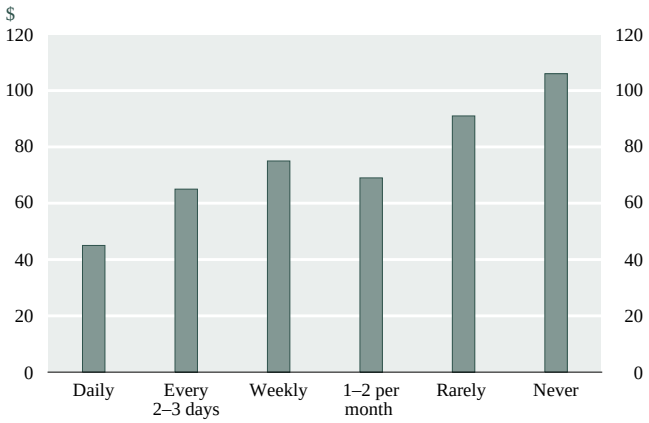


Chart 9

Average Value of Bank Notes Held, by Perceived Convenience of Cash

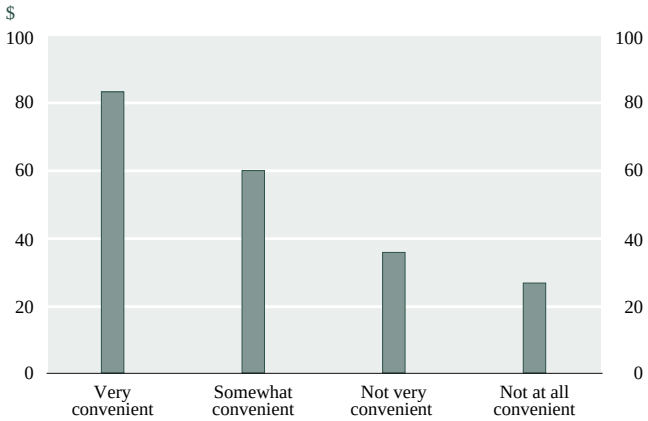
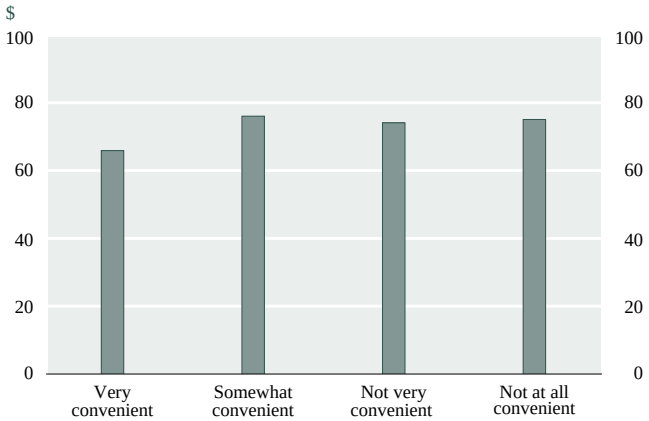


Chart 10

Average Value of Bank Notes Held, by Perceived Convenience of Debit Cards



with its perceived convenience (Chart 9) and negatively correlated with the perceived convenience of debit cards (Chart 10). Incidentally, 83 per cent of Canadians aged 18 to 29 find debit cards very convenient, and all but 2 per cent responded to the question. In comparison, only 45 per cent of Canadians aged 60 and older find debit cards very convenient, and 26 per cent did not respond.

Although not graphed, the perceived safety of cash was also highly correlated with cash balances. Other factors, such as privacy and payment finality, were not included in the survey but may well be equally important.

Regression analysis of transactions balances

Bivariate correlations are interesting, but since some of the determinants of bank note holdings are correlated—for example, income tends to rise with age—one cannot draw firm conclusions from them. Table 1 shows the results of regressions that attempt to disentangle the effects of individual variables on the demand for bank notes held for transactions purposes.

As noted earlier, a large number of respondents reported having no bank notes in their possession. The model explaining bank note demand may be different for these individuals. Thus, regressions were first run including these observations, and then excluding them. While the explanatory power of the regressions is statistically weak, the results are consistent with the survey indicators presented earlier.[13] The variables have the expected sign, and all the coefficients, except community size (population of the city or town), have some degree of influence on cash holdings. The variable for gender suggests that women hold less cash than men, on average. Other demographic variables, such as higher age and income, tend to increase average cash holdings, while higher education has the opposite effect.

The results also show that individuals with middle to very high incomes are likely to hold more cash balances than low-income individuals. In this case, a dummy-variable approach was used, where individuals whose income was less than $30,000 served as the benchmark against higher-income categories. For example, the coefficient on income greater than $100,000 suggests that, when all else is held constant, very wealthy people are likely to hold, on average, $41 more than low-income individuals ($37 more in the regression excluding $0 cash balances).

Table 1

Regression Analysis of Transactions Balances by Ordinary Least Squares

Explanatory variables	All observations included[1]	Observations of $0 excluded[1]
Constant (including average balances of males with household incomes under $30,000)	67.05 (3.59)	101.77 (4.20)
Gender (M = 0, F = 1)	-19.44 (-3.76)	-19.95 (-3.09)
Community size (per 100,000)	0.83 (1.46)	0.72 (1.07)
Age (in years)	0.83 (3.95)	0.75 (2.96)
Education[2]	-6.89 (-2.20)	-10.90 (-2.83)
Household income dummies		
Low: <$30,000	–	–
Medium: $30,000–$60,000	18.15 (3.04)	20.18 (2.60)
High: $60,000–$100,000	19.03 (2.82)	17.05 (2.02)
Very high: >$100,000	41.42 (4.33)	36.67 (3.31)
Convenience of cash[3]	17.00 (6.19)	15.49 (4.06)
Frequency of debit card use[4]	-6.54 (-3.84)	-6.65 (-3.21)
Frequency of credit card use[4]	5.51 (2.88)	6.44 (2.67)
Standard error of regression	102.55	112.11
Rbar squared	0.08	0.06
Number of observations	1619	1224

Notes: Standard errors are corrected for heteroskedasticity using Newey-West HAC. Outliers on transactions balances were defined as values greater than four times the standard error and removed from the regressions. Consequently, seven observations were omitted.

1. *t*-statistics in parentheses.
2. Education is a categorized variable, with responses ranging from "some/completed elementary" (1) to "post graduate/professional schooling" (5).
3. Convenience of cash is a categorized variable, with responses ranging from "not at all convenient" (1) to "very convenient" (4).
4. Frequency of debit/credit card use is a categorized variable, with responses ranging from "never" (1) to "daily" (6).

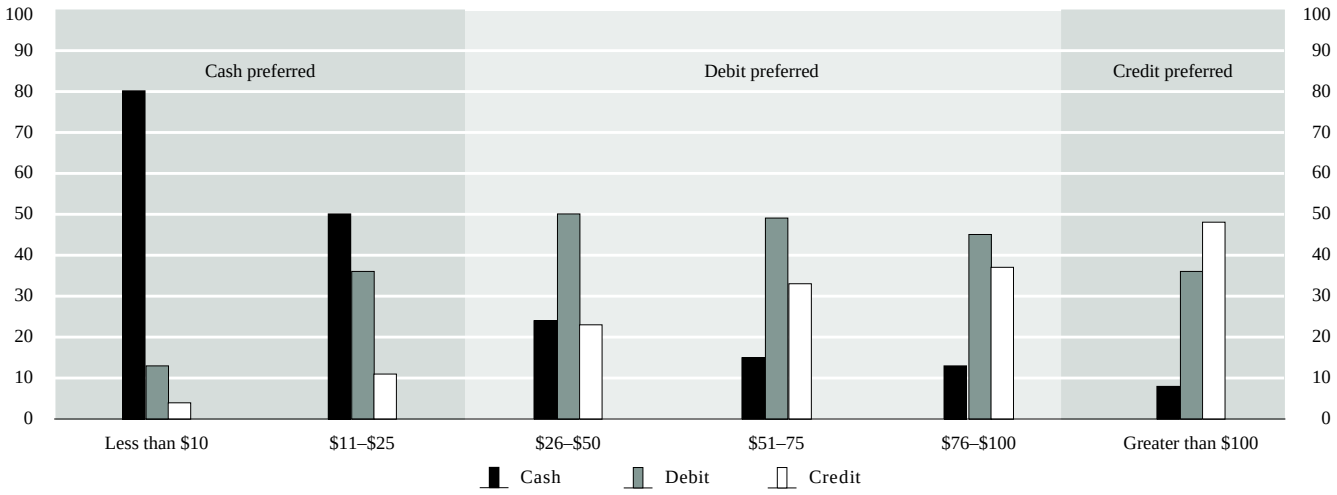
The perceived convenience of cash and the use of electronic payments are very significant in the regressions and go beyond what can be explained by the demographic traits of individuals. Not surprisingly, as the perceived convenience of cash increases, so do average cash holdings. It also appears that the increased fre-

13. The explanatory power of the regressions is low, with an $Rbar^2$ of about 8 per cent in the first regression and 6 per cent in the second. This is not unusual in cross-sectional analyses. In the present case, this is exacerbated by the long tail of the distribution of cash holdings among individuals, as shown in Chart 3.

Chart 11

Consumer Preferences for Payment Method

By transaction value



quency of debit card use decreases average cash holdings, clearly indicating a substitution effect between the two payment instruments. However, the most interesting result is the increase of cash holdings by individuals who are frequent credit card users. This suggests that cash and credit cards are not close substitutes. As shown below, there is a wide disparity between the preference for credit cards or cash in terms of the values of the transactions for which they are used (in other words, cash and credit cards are most preferred at opposite ends of the payment-value spectrum).

Payment method and transaction value

The value of the transaction appears to influence the choice of payment instrument. Since cash is used more frequently than any other payment method—72 per cent of survey respondents use cash at least once a week, followed by debit cards (64 per cent), and credit cards (36 per cent)—it is not unreasonable to assume that cash is used most intensively in small-value transactions. Distinct preferences according to the value of the transaction have been revealed in numerous studies, including Interac's annual consumer tracking survey and the Visa Payments Systems Panel Study in the United States (Evans and Schmalensee 2005). To confirm these preferences among consumers, the Bank of Canada conducted a separate survey on preferred methods of payment by transaction value (Chart 11).[14] The results were indeed consistent: cash is the most preferred method for making purchases less than $25; debit is most preferred for purchases between $25 and $100; and credit is most preferred for purchases greater than $100.

Cash is used more frequently than any other payment method.

Cash holdings for precautionary reasons

In addition to the amount of cash held in their purse or wallet, respondents were asked for the total value of Canadian bank notes they reserved for emergencies. About 40 per cent of respondents do not set aside bank notes for this purpose. Of those who do set aside precautionary balances, 24 per cent could not or would not report the amount. For those who reported the value of their precautionary balances, whether it was $0 or otherwise, the average value was $400 (Chart 12).

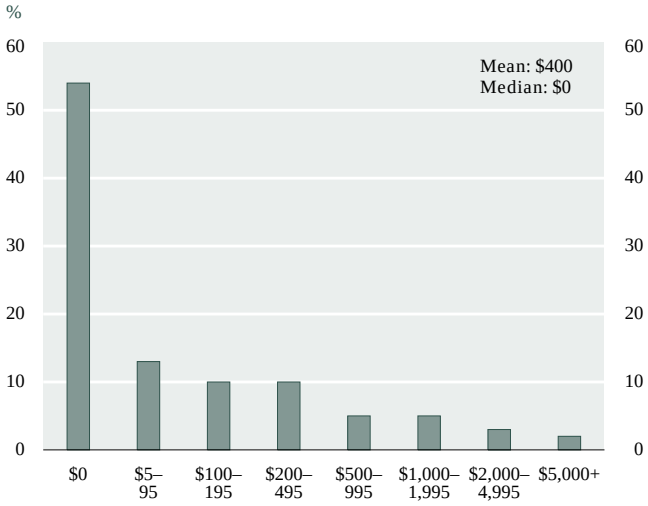
About 40 per cent of respondents do not set aside bank notes for use in case of emergencies.

14. Results based on a national survey of 1,000 Canadians, with a margin of error of +/- 3.1 per cent.

Chart 12

Distribution of Balances Held for Precautionary Purposes

For those who know how much they set aside



Survey results on precautionary cash holdings are not as reliable and are more ambiguous than the results on cash holdings for transactions. Further analysis is required before extrapolating for the Canadian public at large. However, assuming that the average Canadian holds $70 for transactions and $496[15] for precaution, cash holding by the public would account for roughly one-third of the total value of bank notes in circulation, or $14 billion.

Perceptions of counterfeiting and confidence in bank notes

A key objective of the 2004 survey was to explore the factors underlying confidence in bank notes. Individuals were asked questions about their perceptions of bank note security, as well as their experience and behaviour regarding counterfeiting and the authentication of bank notes.[16]

Results of the survey indicate that almost three-quarters of Canadians believe that counterfeiting is a problem, including 28 per cent who indicated that it is a "big problem." Yet surprisingly, a majority (69 per cent) thought it was unlikely that they would receive a counterfeit in the next six months. As well, approximately three-quarters of Canadians have confidence in the systems to remove counterfeit bills from circulation.

In recalling personal experience, 13 per cent claimed they have been offered or received a counterfeit (Canadian) bank note. When probed further, however, 23 per cent of those who reportedly received a counterfeit could not recall which denomination they received. Of those who reported receiving a counterfeit, the $20 note was the most frequently cited. As well, a large proportion of respondents (41 per cent) could not recall where the counterfeit notes were received, while over a third claimed to have received them at retail outlets. Finally, 53 per cent said that the likelihood of fraud or loss associated with bank notes was high to moderate.

Despite their concerns, the public accepts Canadian bank notes with relative ease. Most Canadians (76 per cent) never or almost never check the authenticity of the bank notes they receive in a transaction.

Bank Note Confidence Index

In a unique attempt to quantify Canadian perceptions of bank note security, the Bank devised a confidence index that can be used to measure and track public confidence over time (see box, page 34, for an explanation of how the confidence index was constructed). The index is based on responses to four survey questions:

1. To what extent is counterfeiting a problem?
2. How likely are you to receive a counterfeit note within the next six months?
3. What is the likelihood that you will experience fraud or loss when using cash?
4. How confident are you in the systems currently in place to remove counterfeit notes?

These four questions all relate to perceptions and not directly to experience. The index is therefore unique in that it quantifies valuable information on consumer confidence in bank notes that probably could not be obtained elsewhere.

The index is constructed to lie between zero and 100, with 100 reflecting the highest level of confidence. Based on the 2004 results, the confidence index came close to 50, a level that lies between "somewhat confident" and "not very confident."[17] The confidence survey was

15. The average value of notes held by respondents who reported a positive precautionary balance was $865. If those who did not reveal how much they held in precautionary balances are assigned an average of $900, then the average value for all respondents would be $496.

16. See the appendix for a graphical representation of the results.

17. The level of the aggregate index should be interpreted with caution because the calculated level of the index is sensitive to the assumptions used to construct it. It will be more important to focus on how the value of the index changes over time than to place too much emphasis on its level.

Constructing an Index of Bank Note Confidence

The survey included nine questions that were considered eligible for constructing an index of bank note confidence. Factor analysis was used to select the questions because it allows for the elimination of unnecessary questions while retaining those that provide the most information about confidence.

The nine questions are listed in Table B1, together with the results of the factor analysis, which focus on the three factors that contribute the most to explaining the survey results. By design, each factor is uncorrelated. The values in the table refer to factor loadings, which indicate the importance, or weight, of each question in explaining a factor. The bold figures indicate the questions that are most highly correlated with each factor.

The first factor identified by the statistical analysis (column 1) explains about 20 per cent of the variation in responses and appears to be related to perceptions of confidence. It is most influenced by perceptions of the likelihood of experiencing fraud or loss when using bank notes and of the severity of the counterfeiting problem, as well as by the perceived likelihood of receiving a counterfeit note within the next six months and the degree of confidence in the systems for detecting and removing counterfeit notes. All four questions measure attitudes and perceptions rather than experience and behaviour, and they intuitively appear to be appropriate indicators of confidence in bank notes.

The second and third factors each explain about 50 per cent less variation than the first. Judging from the questions that are most significant to these factors, they are related less to attitudes with respect to confidence and more to actual experience and behaviour with respect to bank notes and counterfeiting.

While experience may shape bank note confidence, attitudes to and perceptions of confidence are likely to exhibit persistence. For example, a person who had a note refused some time in the past, but not necessarily in the past six months, may continue to lack confidence in bank notes. Although the second and third factors provide useful ancillary information, they are not as relevant to current levels of confidence. Therefore, we did not consider these factors in constructing the confidence index.

The four attitudinal questions were selected for the index because they have the most weight within the first factor. Because the factor loadings of these questions are of similar magnitude (ranging from 0.56 to 0.67), each question received equal weight.

Table B1

Factor Analysis

	Factor		
	1	2	3
Survey question	Factor loadings		
In the past three months, have you had bank notes refused?	-0.08	0.20	**0.69**
In the past three months, have you seen signs in stores refusing $50 or $100 notes?	0.14	-0.04	**0.77**
How confident are you in the systems currently in place to remove counterfeit notes from circulation?	**0.56**	-0.13	0.24
How likely are you to receive a counterfeit note within the next six months?	**0.57**	0.29	0.00
To what extent is counterfeiting of paper money a problem?	**0.61**	0.13	0.08
How often do you check a bank note to determine if it is genuine?	0.03	**0.81**	0.01
What is the likelihood that you will experience fraud or loss when using bank notes?	**0.67**	0.04	-0.14
In the past six months, do you recall any media stories about bank notes?	-0.02	0.06	-0.06
How many times have you received a counterfeit note within the past year?	0.21	**0.70**	0.14
Eigenvalues	1.89	1.12	1.03
% of variance explained by the factor	21.0	12.5	11.5

Rotation method: Varimax

The index is calculated using a linear scale for the responses. Although this method is discretionary, it is the most straightforward. For example, "very confident" was assigned a value of 3; "somewhat confident," a value of 2; "not very confident," a value of 1; and "not at all confident," a value of 0. A non-linear scale may be more appropriate to capture the varying degree of differences between responses. For example, "very confident" could be assigned a value of 5, and "somewhat confident," a value of 3. However, choosing a non-linear scale is arbitrary, and the level of the index is sensitive to the form of non-linearity assumed. Consequently, we focus on the results of the linear model, for which scores were tabulated and presented as an index ranging from zero to 100.

repeated in 2005, using the same questions, and produced a score of 49, which was similar (i.e., generally within the original margin of error) to the score for the previous year.[18]

Conclusion

Cash remains a significant means of payment and a store of value in the Canadian economy, and thus the Bank of Canada continues to face increasing demand for bank notes. In recent years, however, cash has been somewhat displaced by electronic payment methods. The rate of further displacement is dependent on technological innovation and on the willingness of the public to adopt new methods and to change their existing habits. To date, a widely successful "e-money" scheme has not been developed in Canada, nor in many other countries, in part because of confidence and security concerns. As the development of new technology progresses, however, and becomes cheaper to use, the traditional role of cash in transactions might one day be considerably compromised.

For these reasons, an important research initiative of the Bank has been the development of surveys to explore the current use and holdings of cash by the public. The statistical and regression analyses provide a preliminary view of some of the important factors that explain the general public's demand for bank notes, including demographics and perceptions and use of electronic substitutes, particularly debit. Debit cards are in fact used most often by a younger generation more apt to change with technology and more likely to define payment choices in the future. Further research is therefore necessary to elaborate on these issues and to develop better models to incorporate these survey findings.

18. The 2005 survey on bank note confidence was conducted using a sample comparable in size to the one used in the 2004 survey.

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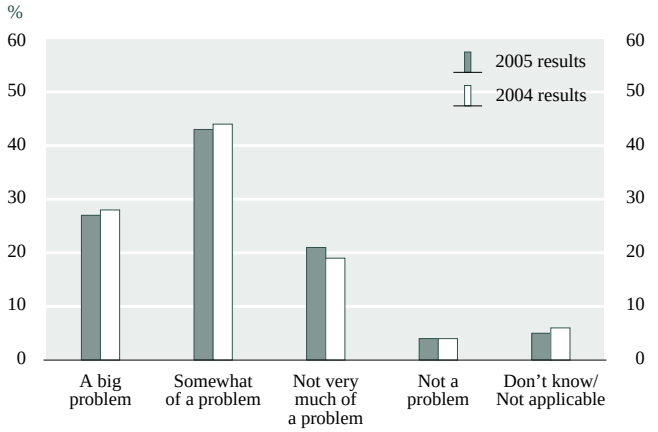
Appendix

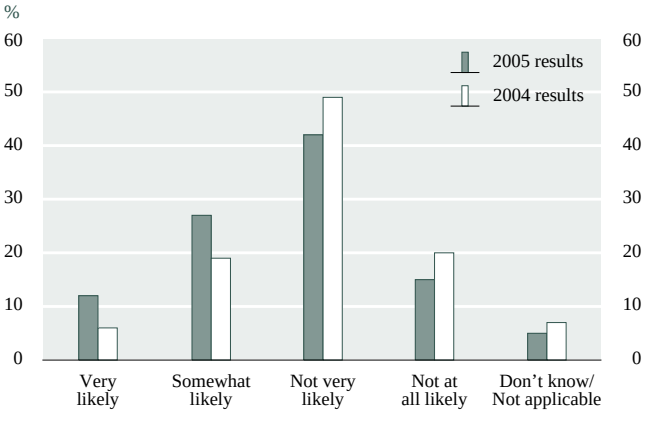
Chart A1

Survey Results: Bank Note Security

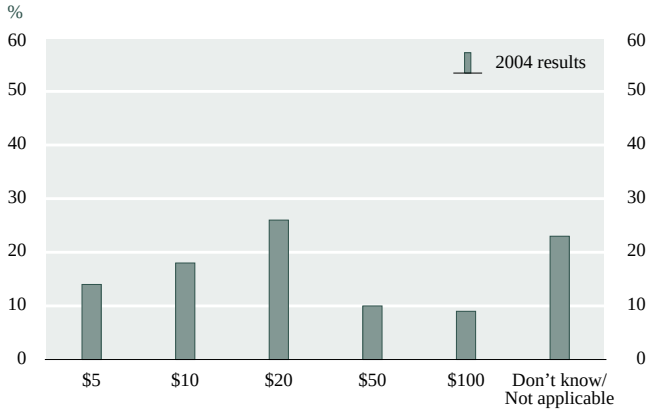
a. Perception of counterfeiting as a problem



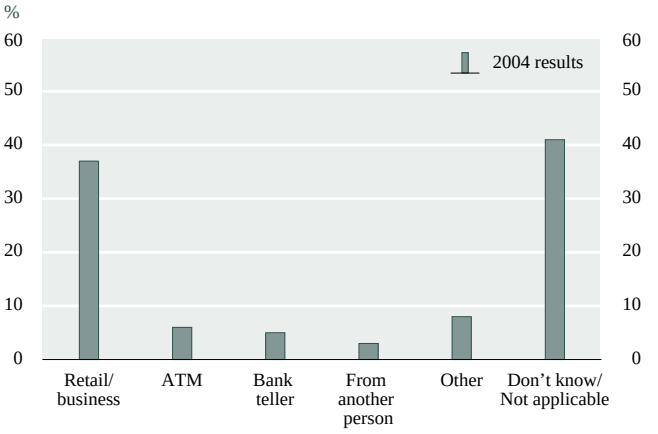
b. Likelihood of receiving a counterfeit note in the next 6 months



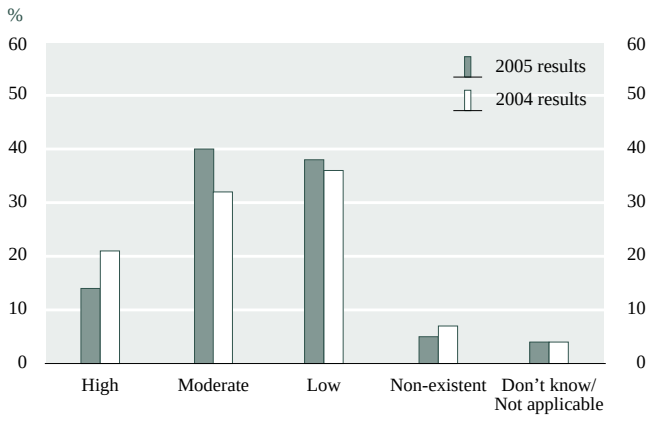
c. Denomination of counterfeit note reportedly received (among those who say they received counterfeits in the past year)



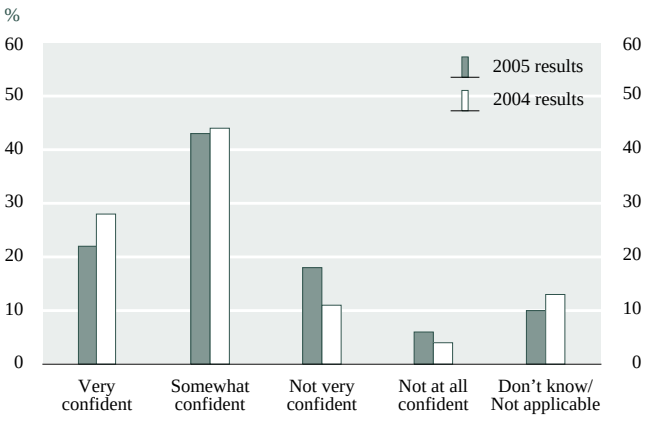
d. Where counterfeit notes were reportedly received



e. Likelihood of fraud or loss when using cash



f. Confidence in systems in place to remove counterfeit notes



The Evolution of the Government of Canada's Debt Distribution Framework

*Marc Pellerin, Financial Markets Department**

- *In 1998, the Government of Canada adopted a new framework for distributing its debt securities to financial market intermediaries and end investors.*
- *Minor modifications to the current framework were implemented in December 2005 in response to lower government borrowing needs, the high concentration of large users in both the primary and secondary markets for Government of Canada securities, and innovations such as the growth of electronic trading.*
- *The key changes made to the debt distribution framework were an increase in the size of bids that dealers can accept on behalf of customers at auctions of Government of Canada securities and reduced minimum bidding requirements for primary dealers. These changes are expected to attract continued broad and competitive participation in government auctions. In turn, this should support the government's objectives for its debt strategy: to raise stable, low-cost funding and to maintain a well-functioning market.*

The federal government meets its borrowing requirements mainly by issuing debt securities in domestic financial markets. Since the beginning of the 1990s, the government has issued and distributed debt securities mainly through auctions. The debt distribution framework is important to the Government of Canada for several reasons:

- A well-designed framework supports the ability of the government to sell its securities on a reliable basis at the best price.
- The debt distribution framework supports a well-functioning government securities market by promoting broad participation among dealers and investors. A well-functioning market in turn benefits the broader Canadian fixed-income market by providing investors and intermediaries with a range of assets that are free of credit risk and that also serve as effective pricing benchmarks and hedging instruments. It also allows for a more effective implementation of monetary policy. For these reasons, the market for government securities should be active, competitive, and accessible to interested parties.[1]
- In designing and implementing its debt distribution framework, the government aims to create the proper mix of obligations, privileges, and supporting arrangements for market participants that will help it to achieve its objectives.

* The author would like to thank Wendy Chan, Ashley Clark, Oumar Dissou, and Frank Furlan for their assistance.

1. See Arnone and Iden (2003) and Arnone and Ugolini (2005) for a detailed discussion on the rationale for, and objectives of, the debt distribution framework.

This article discusses how the debt distribution framework has evolved over time to enable the government to meet its debt management objectives. It begins with a brief history, showing how the government used the primary and secondary markets to develop the debt distribution framework. This is followed by a review of the most recent modifications to the framework, which became effective on 13 December 2005.

A well-designed framework supports the ability of the government to sell its securities on a reliable basis at the best price.

Brief History of the Debt Distribution Framework

1867 to World War I

Before World War 1, no formal debt distribution framework existed. The domestic capital market was almost non-existent; there were no organized secondary markets; and the government's financial requirements were modest. The government nevertheless began selling domestic debt just after Confederation, in January 1868, when the new Dominion of Canada called for tenders on $1.5 million of 6 per cent 10-year bonds.[2] The government planned to accept or reject bids for various amounts of bonds at different prices, and a sizable portion of the issue was sold directly to trustees and executors, charitable institutions, and individuals. Following this first issue, the government continued to tender domestic bonds, using the proceeds to repay the foreign debt (mainly denominated in sterling) issued by the provinces before Confederation. Between 1867 and 1900, however, roughly 91 per cent of the financing was still raised in sterling and in U.S. dollars on the London and New York markets. During that period, a limited amount of treasury bills, payable in sterling, were issued and sold to non-Canadian banks in the London market and in continental Europe.

World War I to 1953

With the start of World War I, the government was increasingly forced to rely on the Canadian market to meet its wartime financing needs. As financing in traditional foreign markets like the United Kingdom and the United States became progressively less available, given those countries' own war-financing needs, the government began to issue bonds almost exclusively in Canada. The sharp increase in the issuance of domestic bonds in an underdeveloped domestic market led to a change in the method of issuing Government of Canada bonds. The tender system was replaced by a system of syndication[3] in which primary distributors (banks and investment dealers) purchased bonds from the government for subsequent sale to the general public in exchange for a commission.

During World War I, large quantities of treasury bills (in Canadian dollars) were sold directly to chartered banks to provide financing to the government between war bond issues. In the absence of a secondary market, banks held treasury bills until maturity and did not regard them as a highly liquid asset. Canadian banks continued to use call loans in the New York market as an important source of funds to meet sudden demands for liquidity (see Bank of Canada 1972). The sale of treasury bills was discontinued in the mid-1920s, and a first auction of treasury bills was held in 1934.[4] Regular fortnightly auctions were introduced in 1937.

Financing during World War II was arranged much as it had been during Word War I, except that the government more directly targeted retail investors, whose savings had surged during World War II.[5] Although the government's financial requirements dropped significantly after World War II, a well-developed secondary market for bonds had grown in response to the extensive use of the domestic market to meet the government's borrowing needs. However, an active secondary market for treasury bills still did not exist.

1953 to 1998

The year 1953 was pivotal for the development of the debt distribution framework, when a formal designation

2. For more details, see Bank of Canada (1980) and Branion (1995).

3. The syndication system was in place until the beginning of the 1990s.

4. Shortly after the opening of the Bank of Canada in March 1935, the Bank, as fiscal agent of the Government of Canada, was called on to provide advice on the issuance of Dominion bonds and treasury bills, and to handle the technical aspects of the new issues.

5. The government issued two war loans in 1940 and nine Victory loans between 1941 and 1945, thus providing a total of $13 billion to retail investors. A co-operative method was established to sell these securities under the direction of the National War Finance Committee. National, provincial, and local committees sold the securities to individual investors, and these securities were also available through payroll deduction (Bank of Canada 1980; Watts 1993, 49).

Chart 1

Financing Requirements of the Federal Government

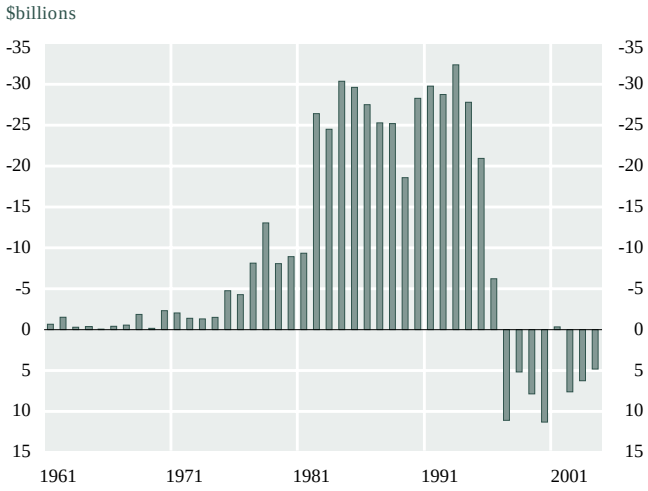
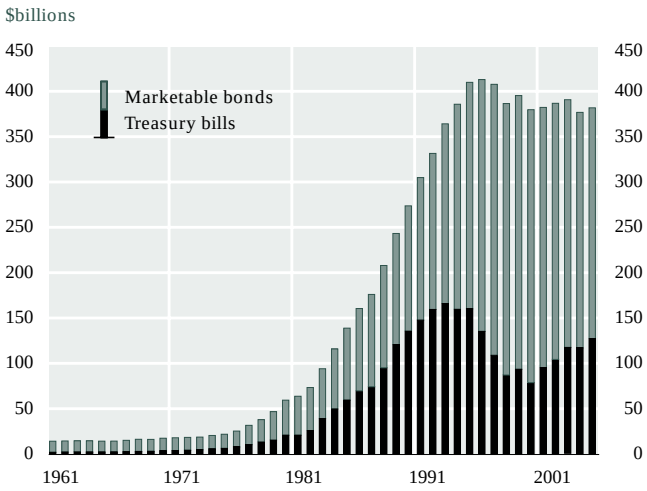


Chart 2

Outstanding Domestic Marketable Debt



of market "jobber" for treasury bills was established. The market-jobber function was created that year primarily to develop the domestic money market to help the Bank of Canada in the conduct of its monetary policy. The Governor of the Bank also saw the need for a secondary market for treasury bills to help develop other money market instruments and to enhance the efficiency of capital markets (see Fullerton 1986). As part of its strategy to expand the distribution of treasury bills beyond banks, the Bank invited interested investment dealers to assume jobber responsibilities (market-making or inventory-positioning) in exchange for privileged access to the Bank for the financing of their inventories of short-term (less than three years) Government of Canada securities.[6] A year later, the Bank encouraged the chartered banks to initiate day-to-day loans with market jobbers. These measures, combined with other initiatives implemented in the 1950s and 1960s, provided benefits to the government beyond those associated with the greater effectiveness of monetary policy.[7] In particular, the development of the money market widened the investor base for short-term government securities, which, in turn, contributed to the low cost of funding for the government.

The development of the money market widened the investor base for short-term government securities, which, in turn, contributed to the low cost of funding for the government.

In the 1970s and 1980s, the government increased its issuance of bonds and treasury bills to meet its growing financing requirements (Chart 1). Along with the growing size of the government debt (Chart 2), the secondary market for bonds developed to the point that the government and the Bank decided to reintroduce auctions for domestic marketable bonds.[8] The move began with the issuance of 2-year bonds in 1983, followed by a gradual expansion to other maturities. The last syndicated offering of regular coupon-bearing bonds took place in December 1991, for 30-year bonds.[9] The government's move to auctions for the issuance of securities denominated in its domestic cur-

6. Although dealers had to meet a set of requirements to obtain the status of jobber, acquiring the designation was not limited to a set of rules. The Bank regarded these requirements as guidelines and awarded jobber status in recognition of the dealer's presence in the Government of Canada securities market.

7. Providing the details of the measures implemented to develop a secondary market for treasury bills is beyond the scope of this article. See Lundrigan and Toll (1997) and Howard (1998) for more information.

8. Attracted by potential business opportunities as a result of growing government debt, foreign banks and dealers entered the Canadian fixed-income markets as primary distributors.

9. For Real Return Bonds (RRBs), syndicated offerings were used until the first single-price (Dutch) auction, which took place in April 1995. A Dutch auction is one where bonds are sold at the lowest accepted price (or highest yield), i.e., the price necessary to sell the full amount of the issue.

Chart 3

Treasury Bills: Share of Secondary Market Trading

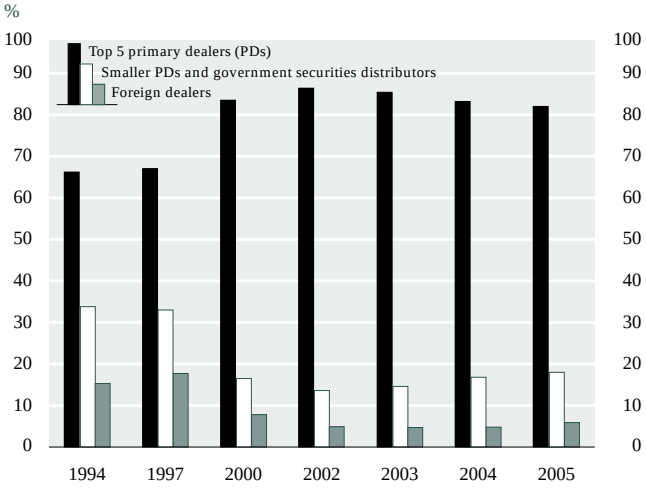
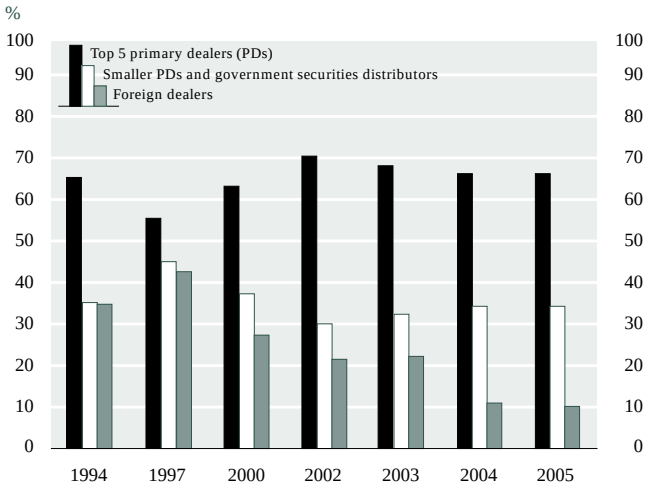


Chart 4

Bonds: Share of Secondary Market Trading



rency was also consistent with the evolution of similar practices among other major sovereign countries.[10]

In the 1970s and 1980s, along with the growing size of the government debt, the secondary market for bonds developed to the point that the government and the Bank decided to reintroduce auctions for domestic marketable bonds.

At that time, a maximum amount for competitive and non-competitive bids applied for both primary distributors and their customers.[11] As well, primary distributors and market jobbers were both expected to maintain a continuous presence in the secondary market and to participate regularly in auctions, at prices consistent with the fair market prices of securities. At every auction, market jobbers had to submit bids at reasonable prices comparable with those of their respective secondary market share, but with no specific requirements to win a particular amount of securities. Dealers' bidding limits included customers' orders, and auction participants were not required to report their net positions.

1998 to 2005

In 1998, the government made several important changes to support the integrity of the debt distribution framework.[12] The changes were motivated by: (i) expected lower auction sizes, owing to reduced government financing requirements (see Chart 1); (ii) the consolidation among major banks and investment dealers that had translated into increased concentration in the trading of Government of Canada securities (Charts 3 and 4);[13] and (iii) the growing influence of individual market participants (investors and dealers). Together, these factors were viewed as having the potential to create excessive concentration (or "squeezes") in the Government of Canada securities market that could reduce investors' and dealers'

10. Most industrialized countries use a debt distribution framework to market government securities. Compared with Canada, the debt distribution frameworks in other developed countries tend to require fewer obligations for dealers at auctions but more obligations in secondary markets, such as continuous market-making and minimum trading volumes during a given period of time.

11. Dealers and customers were allowed to submit non-competitive bids in addition to any competitive bids at each auction. Non-competitive bids were allotted at the average yield of the accepted competitive bids for each tranche of treasury bills and nominal bonds. For RRBs, non-competitive bids were allotted at the highest real yield of accepted bids. These rules are still in place. Non-competitive bids were introduced to favour broad participation at auctions, especially by non-sophisticated investors. Details are provided in Bank of Canada (1993, 1996a).

12. The government published its first discussion paper dealing with the proposed changes in December 1996. A second paper was released in April 1998, and a final document with the new rules was published in August 1998. See Bank of Canada (1996b, 1998a, 1998b).

13. The concentration remained high after 1998 and was a factor in the 2005 review (see the discussion in the next section).

willingness to acquire and trade these securities, thereby reducing liquidity and ultimately increasing the government's borrowing costs.[14] Such squeezes had occurred in the U.S. Treasury market in the early 1990s.

In response, the government introduced a number of initiatives to maintain the integrity of the auction process. Among the key initiatives, distinct bidding limits were established for dealers and customers. To reduce the risk that a market participant could accumulate an undue amount of securities, bidders were required to report their net positions in the securities being auctioned.[15] The Investment Dealers Association of Canada (IDA) introduced its Policy No. 5, "Code of Conduct for IDA Member Firms Trading in Domestic Debt Markets," establishing principles for trading securities in the fixed-income market in Canada. As well, primary distributors and market jobbers were replaced by government securities distributors (GSDs) and a subgroup of GSDs, defined as primary dealers (PDs). Like market jobbers, PDs were required to maintain markets in Government of Canada securities, and the new rules required minimum participation at each auction at a reasonable price as defined in the terms of participation. This reduced the risk of holding an "uncovered" auction in which the government could not sell all of the securities it offered for sale. Other GSDs were not required to make markets or to participate at each auction of government securities. In exchange for greater responsibilities, PDs were granted higher bidding limits on their own behalf and on behalf of customers than those allotted to other GSDs.[16] A further modification was made to support the secondary market for government securities. All GSDs' bidding limits at auctions were tiered, consistent with both their performance in auctions and their trading activity in secondary markets. These modifications were also designed to achieve the balance of interests that is necessary to make the debt distribution framework effective.

2005 Revisions to the Debt Distribution Framework

Factors leading to the review

In October 2004, the government published a consultation document on the Bank of Canada's website to generate discussion of the potential changes to the debt distribution framework.[17] The review was motivated by the continued existence of several factors that had led to the previous review in 1998. Overall, the analysis indicated that the debt distribution framework had met its objectives of raising stable, low-cost funding for the government while supporting a well-functioning market.[18]

The analysis indicated that the debt distribution framework had met its objectives of raising stable, low-cost funding for the government while supporting a well-functioning market.

Based on some ongoing trends, however, the government felt that minor adjustments were warranted. First, customers' winnings at bond auctions had declined steadily since 1999 (Table 1).[19] The winnings of foreign dealers had also declined compared with those of the large domestic PDs, mainly as a result of the departure of three U.S. PDs from the Canadian

14. "Squeezes occur when an auction participant, or group of participants, gains control of the stock of a security and withholds the supply from the cash or repo markets" (Bank of Canada 1998a). In a market where excessive concentration is persistent, dealers are reluctant to post quotes, which negatively affects the price-discovery process, thereby undermining the integrity of the auction process and the liquidity in the secondary market.

15. For example, a dealer or a customer might have acquired a significant quantity of a security that was reissued, which can be accomplished in several ways. Section 6.2 of the "Terms of Participation in Auctions for Government Securities Distributors" provides the rules that apply to the reporting of net positions. The same rules can also be found in section 4.2 of the "Terms of Participation in Auctions for Customers." Both are available on the Bank of Canada's website at www.bankofcanada.ca/en/markets/markets_auct.html.

16. PDs were granted other advantages not extended to GSDs, such as being the privileged counterparties of the Bank of Canada for the conduct of monetary policy.

17. For the complete consultation document, see Bank of Canada (2004). See also Bank of Canada (2005a, 2005b, 2005c).

18. Changes to the debt distribution framework were supplemented by initiatives to maintain a well-functioning market, including focusing on regular issuance in key maturity sectors for bonds and treasury bills, building large and liquid benchmarks to target sizes established in consultation with market participants, and introducing a new buyback program to support the issuance of new benchmark bonds. For further details on these initiatives, see the various annual "Debt Management Strategy" documents published on the Department of Finance website at www.fin.gc.ca/purl/dms-e.html.

19. Customers' winnings at RRB auctions have been higher because RRBs are difficult to obtain in the secondary market. RRBs are considered buy-and-hold securities and are not traded as actively as other Government of Canada securities.

Table 1

Distribution of Primary Auction Shares among Participants (%)

	1999	2000	2001	2002	2003	2004	2005
Bonds, excluding Real Return Bonds							
Primary dealers (PDs)	88.7	89.7	85.2	90.5	91.9	96.8	94.5
Non-PD government securities distributors (GSDs)	2.6	2.3	6.9	3.2	1.7	1.5	3.9
Customers	8.7	8.1	7.9	6.3	6.3	1.8	1.6
Foreign dealers*	31.4	28.6	19.0	17.9	15.9	18.6	14.0
Real Return Bonds							
PDs	48.3	45.7	39.4	50.7	33.9	51.3	49.1
Non-PD GSDs	4.9	2.0	4.4	1.3	0.6	0.9	0.8
Customers	46.9	52.3	56.2	47.9	65.5	47.8	50.2
Foreign dealers*	30.6	15.4	10.0	9.1	8.6	9.2	12.4
Treasury bills							
PDs	84.1	86.7	87.0	84.1	84.9	85.2	89.1
Non-PD GSDs	3.3	1.3	1.6	1.7	1.8	1.8	2.3
Customers	12.6	12.0	11.4	14.2	13.3	13.0	8.6
Foreign dealers*	16.1	13.4	14.3	13.9	8.7	12.0	13.7

* Foreign dealers are also included in the PD or non-PD GSD categories.

fixed-income market in 2001. As well, the concentration among the larger dealers trading in the secondary market was still high (Charts 3 and 4). In 1997, 30 dealers were distributing Government of Canada securities, compared with 19 today. Finally, the government noted an emerging trend in the greater use of electronic systems for trading fixed-income securities. Trading volume using electronic trading systems is growing but is still a very small percentage of the market.

The revisions

The changes to the debt distribution framework, which became effective on 13 December 2005, centred on two themes: broadening access to the auctions and maintaining the integrity of the auction process. Table 2 summarizes the changes, which are described below. Readers may also refer to the new "Terms of Participation in Auctions for GSDs and Customers," as well as to the "Standard Terms," which are available on the Bank's website.[20]

1. *Measures to attract broad and competitive participation at auctions*
   The competitive and non-competitive bidding limits that PDs and GSDs can submit on behalf of customers were increased. These changes were introduced to enable dealers to accept larger orders from customers and to provide greater access for customers at auctions. The government also affirmed that qualifying Alternative Trading Systems (ATSs)[21] could become GSDs. ATSs have the potential to provide an additional channel for the government to distribute its debt and to broaden and increase the participation of non-sophisticated investors at auctions. Finally, the government reduced the bidding obligations of PDs in order to support auction participation.[22]
2. *Measures to maintain the integrity of the auction process*
   All GSDs that are not PDs are required to participate periodically in auctions. This requirement was established to promote active participation in auctions among a range of participants in the domestic capital market.

The changes to the debt distribution framework, which became effective on 13 December 2005, centred on two themes: broadening access to the auctions, and maintaining the integrity of the auction process.

In designing the framework for the distribution of Government of Canada securities, the government sought to balance a number of interests. Broad participation is encouraged by allowing market intermediaries (i.e., GSDs) and customers to bid at auctions. GSDs

20. Details are available at www.bankofcanada.ca/en/markets/markets_auct.html under "Rules and Terms" and "Standard Terms for Auctions."

21. ATSs are electronic platforms used for the trading of securities.

22. The method of calculating the bidding limits of GSDs has also been modified to better reflect their participation in a broad range of government securities operations. See section 9 of the "Terms of Participation in Auctions for Government Securities Distributors" at www.bankofcanada.ca/en/auction/aucpa1v2.pdf for additional details.

enjoy a privileged status at auctions by virtue of the requirement for customers to submit orders through them. The resulting knowledge of customer orders provides distributors with market information that can help them to make more informed bids at auctions. Customers receive indirect assured access by submitting their bids (competitive or non-competitive) through GSDs. Customers may use as many GSDs as they choose to submit their bids. PDs are awarded higher bidding limits relative to other GSDs on the basis of their performance at auctions and their trading activity in secondary markets.[23] Higher bidding limits go hand-in-hand with bidding obligations for PDs, in order to support the consistent success of auctions.

23. PDs are also the sole counterparties: (i) for the Bank of Canada's open market operations to support the implementation of monetary policy; (ii) for term-repo operations that are typically conducted to offset the increase in the demand for bank notes; and (iii) for securities lending from the Bank of Canada's balance sheet to temporarily support the liquidity of the Government of Canada securities when these securities are unusually expensive on the repo market.

Table 2

Changes to the Debt Distribution Framework†

	Competitive bidding limits		Non-competitive bidding limits		Acceptable price range for submission of bids at auctions		Minimum participation requirements	
	1998	2005	1998	2005	1998	2005	1998	2005
Primary dealers (PDs)								
For own account	Treasury bills: 25 per cent Bonds: from 10–25 per cent	No change	$3 million	No change	Cut-off yield + 5 basis points**	**Cut-off yield + 10 basis points**	50 per cent of their maximum bidding limit at every auction	No change
For customers	Limited to the PD's bidding limit	**Limited to 25 per cent of the tender**	$3 million	• **$10 million** • **$3 million for RRBs***	None	No change	None	No change
In aggregate	Limited to 40 per cent of the tender	No change	$6 million	• **$13 million** • **$6 million for RRBs**	None	No change	50 per cent of their maximum bidding limit at every auction	No change
Government securities distributors (GSDs)								
For own account	Treasury bills: 10 per cent Bonds: from 1–9 per cent	No change	$3 million	No change	None	No change	None	**One successful bid (competitive or non-competitive) every six months on their own behalf or on behalf of customers**
For customers	Limited to the greater of 5 per cent or the GSD's bidding limit	**Limited to 10 per cent of the tender**	$3 million	• **$10 million** • **$3 million for RRBs**	None	No change	None	None
Customers	25 per cent	No change	$3 million	**$5 million**	None	No change	None	No change

† Changes appear in bold.
* Real Return Bonds
** Secondary market yield + 5 basis points in case of strong RRB auctions; on a trial basis since 1 June 2004

Conclusion

The debt distribution framework is evolving in response to changes in market conditions and in the government's funding requirements. The trend towards greater concentration in both the primary and secondary markets, along with financial innovations, will continue to represent a challenge for the future effectiveness of the framework. A sound and effective debt distribution framework is key to the government's objectives for its debt strategy of raising stable low-cost funding and maintaining a well-functioning market.

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Speeches

Introduction

Governor David Dodge spoke to the New York Association for Business Economics on 29 March about the global problem of large and persistent current account balances and the need for all countries to adopt policies that will allow market forces to resolve them. Governor Dodge said that the job of policy-makers is to provide a framework that helps market forces promote an orderly adjustment. On 30 March, in his remarks to Princeton University's Woodrow Wilson School of Public and International Affairs, Governor Dodge spoke of the need for an international institution to promote a new monetary order—a well-functioning, market-based global financial system. The Governor's talk centred on his view of the fundamental role of the International Monetary Fund in today's global economy and the changes that would need to take place for the evolution of an "ideal" IMF.

On 9 March, Deputy Governor Tiff Macklem spoke to the Global Interdependence Center in Philadelphia on the ways in which central banks have evolved to meet the challenges of the global economy, and how the lessons they have learned can be applied to the IMF.

All three speeches are reproduced in this issue of the *Review*. The full text of speeches given by the Governor can be found on the Bank's website (www.bankofcanada.ca), including:

3 May 2006	Opening statement to the Senate Committee on Banking, Trade and Commerce
27 April 2006	Opening statement following the release of the *Monetary Policy Report*
6 February 2006	Remarks to the Barbados International Business Association, Bridgetown, Barbados
26 January 2006	Opening statement following the release of the *Monetary Policy Report Update*
12 December 2005	Remarks to the Regina Chamber of Commerce, Regina, Saskatchewan
28 November 2005	Remarks to the Canadian Council for Public-Private Partnerships, Toronto, Ontario
9 November 2005	Remarks to l'Association des MBA du Québec (AMBAQ), Montréal, Quebec
14 November 2005	Remarks to a Conference on the occasion of the 80th anniversary of the Banco de Mexico, Mexico City, Mexico
4 November 2005	Remarks at the international symposium of the Banque de France, Paris, France

Global Imbalances: Why Worry? What to Do?

Remarks by David Dodge
Governor of the Bank of Canada
to the New York Association for Business Economics
New York, New York
29 March 2006

Today, I am going to discuss global current account imbalances—why we should worry about them, and what we can do to encourage their resolution. I will talk about the need to develop an international monetary system that supports market-based solutions to global imbalances and removes existing impediments to these market-based solutions.

Global Imbalances

Before I discuss why we need to worry about global current account imbalances, let me first explain what I mean by "global imbalances." I am referring to the persistent and growing current account deficit in the United States, mirrored by large and growing current account surpluses elsewhere, especially in Asia. These imbalances reflect the financial flows associated with mismatches in savings and investment on a global scale. Since the late 1990s, many economies outside the United States have increased their net national savings. At the same time, the United States has further reduced its net national savings and has relied more heavily on foreign borrowing.

Geographical imbalances are not a bad thing *per se*, nor are the capital flows that they generate. Indeed, there should be a process that works through world markets to allow savers in one country to lend to borrowers in another. Such a process leads to higher global economic growth, since countries with surplus savings can invest them in countries that do not generate enough savings internally.

In an ideal world, markets for goods, services, and capital function efficiently. Funds flow from areas with excess savings to areas with excess investment opportunities. In this ideal world, domestic labour markets operate without any barriers to the movements of workers. And there are no restrictions on the trade of goods and services or on the flow of capital across borders.

Under these perfect circumstances, as economies evolve, we would expect to see shifts in the flows of savings into regions where investment opportunities are particularly strong and where markets are offering favourable returns. These flows would generate periods of current account surpluses or deficits, but these would not be a cause for worry, since adjustment mechanisms in the market would resolve them. And since our world economy is a closed one—Mars missions notwithstanding, we still don't export to other planets—we would see savings increase in one part of the world to offset increases in domestic demand elsewhere.

Why Worry?

In this ideal world where markets operate efficiently, without distorting policy interventions, imbalances can resolve themselves in a smooth and orderly manner. But we don't live in an ideal world. Domestic labour markets in Europe and Asia are not very flexible, and reallocation of labour resources is difficult. Domestic fiscal and social policies often stifle investment and encourage excessive savings in some parts of the world and overstimulate consumption in others. And there are still persistent impediments to the free flow of goods and services across borders.

Meanwhile, some domestic banking sectors and capital markets continue to operate under rigid and inefficient regulations. And some important economies, particularly in Asia, are maintaining undervalued exchange rates through exchange market interventions and capital controls. In the process, they are accumulating excessive reserves.

Because of these issues—inflexible labour markets, inappropriate fiscal policies, barriers to open trade, and dysfunctional capital markets—market-equilibrating mechanisms are not being allowed to work as they should. And so there are risks that these current account imbalances will persist until they are resolved in a disorderly way.

What Are The Risks?

Let me spend a few minutes outlining these risks. The first risk is that private and public savings in the United States will rise and that spending will decline without a compensating increase in demand in the rest of the world. If that drop in U.S. demand is not matched by higher demand in other countries, the global economy could slide into a phase of very slow growth, perhaps punctuated by periods of outright recession. A second risk is that investors could dramatically reduce their exposure to the United States, which could cause major disruption in world financial markets. Instability in the financial sector could spill over into trade in goods and services, leading to an even more dramatic decline in demand and output. A third risk is that these events might also prompt governments to adopt wrong-headed protectionist measures, which would exacerbate the damage to the global economy.

There is no compelling reason to believe that historical and fundamental economic and financial constraints do not apply to the world economy today. There is every reason to believe that a market adjustment to these imbalances will take place.

Economic theory and history tell us that external indebtedness cannot keep growing indefinitely as a share of a country's GDP—even for a country like the United States with its reserve-currency status. There is no compelling reason to believe that historical and fundamental economic and financial constraints do not apply to the world economy today. There is no reason to believe that this time is different. There is every reason to believe that a market adjustment to these imbalances will take place.

If this adjustment is disorderly, it would affect the economy through a sudden drop in demand and prices and a resulting decline in economic output. It could also cause a painful correction in capital markets and exchange rates. In a worst case scenario, it could do both.

What Can We Do?

That is why we worry about the risks from current account imbalances, and why the Bank of Canada has been focusing on the implications of these risks. Policy-makers around the world have a responsibility to facilitate adjustments in a way that keeps the global economy growing at potential and mitigates the impact of these risks. Our job is to provide a framework that helps market forces promote an orderly adjustment.

So what can we collectively do to help prevent a disorderly adjustment? What insurance can economic and financial policy-makers take against these risks?

I said earlier that the resolution of global imbalances will require market-based solutions. In many cases, building the right framework will involve eliminating some of the policies that inhibit markets from resolving these imbalances. This was the theme of the G-7 discussions at Boca Raton two years ago. Let me briefly look back at what we called for in our statement following those meetings. Then I'll review what progress has been made.

Central bankers and finance ministers emerged from the Boca Raton meetings with a list of policy initiatives that are key to addressing global current account imbalances. This list included five priorities: first, microeconomic policies that increase flexibility and raise productivity growth and employment; second, the development of well-functioning domestic capital and financial markets; third, resumption of the Doha round of multilateral trade negotiations; fourth, sound fiscal policies; and fifth, flexible exchange rates that reflect economic fundamentals and promote smooth adjustments.

To deal with global current account imbalances in an orderly and efficient way that supports continued

growth, we have to make progress on all five of these policy fronts. It simply won't do for countries to pick one or two of these policy priorities and ignore the others. And we can't delude ourselves into thinking that economic imbalances will be resolved in an orderly way through exchange rate adjustments alone. Progress has to be extensive, international, and simultaneous.

To deal with global current account imbalances in an orderly and efficient way that supports continued growth, we have to make progress on all five of these policy fronts.

Let's review our collective progress on these priorities in the two years since our meetings in Boca Raton. I'll start with domestic microeconomic policies. Domestic reform is important because if each country works to get its own house in order, we increase the odds of doing the same on an international scale.

In well-functioning domestic economies, savings flow across sectors and regions without much risk of disruption, because market-based mechanisms—such as changes in relative wages and prices—are allowed to work. Authorities everywhere need domestic policies that promote well-functioning markets for goods, services, capital, and labour. In particular, labour markets need to be flexible enough to facilitate the movement of workers from sector to sector as the economy adjusts to events. If they are not, confidence is undermined: businesses hesitate to hire when labour market rules are restrictive, and households lack the confidence to spend when unemployment rates are high. By promoting domestic flexibility, policy-makers everywhere could support confidence and boost growth. This would be good for national economies, and it would also help to resolve global imbalances over time, provided that macroeconomic policies can smooth demand in the short run.

Since Boca Raton, we have seen some efforts to increase flexibility in some regions, but progress has been minimal. This is understandable because, politically, measures to increase the flexibility of labour markets can be very difficult. But labour market rigidities, particularly in Europe and Japan, remain significant barriers to adjustment.

The second policy priority is the development of domestic capital and financial markets. The goal is to have markets that are not distorted by capital controls and other interventionist policies. It is important that Asian policy-makers let their domestic financial systems do their job.

We must acknowledge the difficulty and the time that this will take. And we should acknowledge that progress has been made in the banking and financial systems of several countries since the Asian crisis of 1997–98. But even with that progress, it will still be some time before markets in that region are functioning at their optimal efficiency. And it will be some time before households in Asia have sufficient and appropriate incentives to reduce savings and increase their consumption.

This is not just an Asian problem. Europe, too, has a long way to go before it can establish a single euro capital market, let alone one that is open beyond the boundaries of that region. And I note, with some dismay, the rising economic nationalism with respect to foreign direct investment, not just in Asia and Europe, but in the United States as well.

The third priority we outlined in Boca Raton was resumption of the Doha round of multilateral trade negotiations. It is critical that all countries work to protect and enhance the free flow of goods and services by pushing the Doha round to a successful conclusion and by strengthening the World Trade Organization to ensure proper compliance with the rules of trade. All of us need to be vocal in resisting calls for protectionism. Yet, two years after Boca Raton, progress on trade appears to be stalled. Protectionism is a real and rising threat, and we see mounting restrictions on the flow of capital. Instead of more openness in trade and investment, we see signs of increasing insularity.

Our fourth priority was sound fiscal policy over the medium term. Countries should pursue policies that promote sustainable levels of household and government consumption and a low ratio of public debt to GDP. And while we didn't discuss monetary policy goals in the Boca Raton communiqué, we all recognize that prudent fiscal policy works best when it is combined with monetary policy that promotes low and stable inflation. Such policies give businesses and consumers confidence that the value of their money will not be eroded over time by high inflation or excessive rates of taxation. Sound fiscal and monetary policies are needed in the United States, Europe, and Japan to support investor and household confidence. Fiscal consolidation in the United States would also be helpful in resolving global imbalances.

The fifth priority is a policy of more flexible exchange rates that reflect economic fundamentals and promote smooth adjustments. Given the fact that labour markets are still fairly inflexible and that wages and prices are slow to absorb shocks, a floating exchange rate is an important adjustment mechanism for many economies, including Canada's. A market-based exchange rate can be a useful "shock absorber," helping the economy to react to external swings in demand more efficiently than a fixed exchange rate.

Some Asian economies have pursued an export-led growth strategy by fixing the value of their currencies to the U.S. dollar through persistent, sterilized, foreign exchange market intervention. This has resulted in an accumulation of excessive foreign exchange reserves and has exacerbated global imbalances.

In theory, there is nothing wrong with countries having fixed nominal exchange rates. But in practice, this leads to major problems, because real rates do have to adjust to external shocks. The first problem is that under a fixed rate regime, the economy must adjust to these shocks through sharp changes in domestic prices. This means that countries with current account surpluses should experience high rates of domestic credit expansion, leading to high inflation. But when authorities use sterilization policies to try to offset the domestic price effects of their foreign exchange intervention, they delay both domestic and global economic adjustment. Such intervention also provokes threats of protectionist measures, which could choke off the growth of international trade that has led to rising incomes worldwide. It was these kinds of "beggar-thy-neighbour" policies that we were seeking to avoid 60 years ago, when developed countries came together for the United Nations Monetary and Financial Conference at Bretton Woods, New Hampshire.

Increasing exchange rate flexibility is perhaps the most important of the five policy priorities that I have outlined today. But as I said before, the orderly resolution of global imbalances will require progress on all five policy fronts. The reward for such reform is better access to a growing world market. The gains for the citizens of emerging-market countries are more flexible economies, higher real incomes, and better living standards.

The International Framework

These and other reforms to resolve global imbalances can be achieved more easily if we also reform the financial institutions that oversee the world economy. I mentioned the Bretton Woods conference 60 years ago that created an international monetary order to help repair the damage of the Great Depression and the Second World War. Today, we must get on with the job of building an international monetary order for the 21st century—one that encourages market-based solutions to global imbalances.

To achieve these solutions, we need a framework that can manage a world where open economies interact with economies whose markets are not yet allowed to operate freely. We must accommodate the fact that some systemically important economies, including China, still prefer the stability of a fixed or quasi-fixed exchange rate regime. We need rules that will allow market signals to come through and market forces to work during what could be a lengthy period of coexisting fixed and floating exchange rate systems.

Today, we must get on with the job of building an international monetary order for the twenty-first century—one that encourages market-based solutions to global imbalances.

To build that framework and develop these rules, we need an international table around which we can all gather, and an institution to manage the development and the continued success of that framework. That institution should be the International Monetary Fund, but an IMF that is revitalized and is more representative

of the global economy in the 21st century. A renewed IMF could use its surveillance to be more forthright in terms of the policy outcomes that are implied by different regimes. It could and should be the umpire for the world economic order, unafraid to call out countries that aren't playing by the rules. It could provide the support for the market to work at peak efficiency, monitor risks, provide necessary early warnings, and help to correct vulnerabilities before they become crises. In short, a renewed IMF could help us move towards a well-functioning, market-based international financial system in which markets would provide incentives that would lead to an orderly resolution of global imbalances. I'll have more to say on this tomorrow in a lecture at Princeton University.

Conclusion

Let me conclude. We are all part of the global economy. A major economic disruption, such as a disorderly resolution of global imbalances, will affect every country. Collective action is needed now to minimize the chances of such a disruption. Domestically, policy-makers need to promote well-functioning markets for goods, services, capital, and labour. Internationally, policy-makers need to develop a framework that allows an orderly, market-based unwinding of global imbalances.

We don't need to create a perfect world. But we do need to make progress—real progress on better-functioning financial markets, more flexible currency regimes, more open international trade, and better fiscal and structural policies.

It is not realistic to suggest that overnight we can build the ideal market that I described at the beginning of my remarks. We don't need to create a perfect world. But we do need to make progress—real progress on better-functioning financial markets, more flexible currency regimes, more open international trade, and better fiscal and structural policies. Each country and each region has its work to do. Now is the time for all of us to get on with the job.

The Evolving International Monetary Order and the Need for an Evolving IMF

Lecture by David Dodge
Governor of the Bank of Canada
to the Woodrow Wilson School
of Public and International Affairs
Princeton, New Jersey
30 March 2006

Yesterday, I was in New York City, where I had the opportunity to talk to the New York Association of Business Economics about global current account imbalances, and about the pressing need to allow market-based mechanisms to resolve these imbalances. Most of my remarks dealt with what policy-makers should do to allow market-based mechanisms to work. But at the end of my speech, I mentioned that there is also an important international aspect to this issue. The world needs an international institution to promote a new monetary order—a well-functioning, market-based global financial system. This will be the subject of my remarks today.

Recently, Martin Wolf of the U.K. Financial Times used his column to pose an interesting question: If the International Monetary Fund did not exist, would we invent it?[1] His answer, if I may oversimplify, was no, because today's world does not have the courage and vision to create powerful multilateral institutions. I'm not sure that I agree with his answer or with his reasoning for it. But I am sure that this is exactly the kind of fundamental question we need to be asking.

Today, I'd like to take a slightly different approach to Wolf's question. Let me put it this way: If the IMF did not exist and we set out to create it from scratch, what would be its fundamental role in the global economy? What should an ideal IMF do, and what should it not do?

Some might suggest that these very questions are being asked and answered right now within the IMF, in the context of the internal strategic review initiated by Managing Director Rodrigo de Rato. Mr. de Rato is to be commended for taking on this task. The Executive Board of the IMF will discuss the internal review next week. But it seems to me that the review, while important and useful, has been focused on finding better ways for the existing institution to do what it already does. I want to approach this issue from a more basic level and ask what is required for the IMF to evolve into the best possible institution, designed for the global economy of the 21st century. For that evolution to take place, the key shareholders of the institution need to show leadership and vision.

To set the stage for my remarks today, I will briefly review how and why the current IMF came into being, and then I will consider how the global economy has evolved since the founding of the IMF. I will next elaborate on what I see as the fundamental role for the IMF in today's global economy, and then discuss the changes that would need to take place in order for the institution of today to evolve into the "ideal" IMF. I hope that my remarks will then lead to a vigorous discussion in the time remaining.

The Rise and Fall of Bretton Woods

So let me begin by going back 60 years to the original United Nations Monetary and Financial Conference at Bretton Woods, New Hampshire. The delegates—representing 45 nations—were nothing if not ambitious.

1. M. Wolf, "The World Needs a Tough and Independent Monetary Fund." U.K. Financial Times, (22 February 2006).

They ended up creating two, almost three, international institutions. There was the International Bank for Reconstruction and Development—now known as the World Bank—charged with providing aid for the rebuilding of Europe. Delegates also came close to creating the International Trade Organization, which was to be dedicated to keeping protectionism in check and facilitating freer international trade in goods and services. This organization eventually came into being a couple of years later as the General Agreement on Tariffs and Trade, which subsequently morphed into the World Trade Organization. And, of course, the third institution was the International Monetary Fund.

The IMF was meant to create an international monetary order that would allow trade to flourish again and post-war reconstruction to take place. The institution that these delegates created was very much a creature of its time, and its roles and responsibilities reflected the experience of the Great Depression. The great policy failure of the 1930s was the competitive "beggar-thy-neighbour" currency devaluations to which nations resorted. The Bretton Woods delegates sought to prevent countries from adopting such policies. The first of the Articles of Agreement that govern the IMF called on it "to promote international monetary co-operation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems." Exchange rates were to be fixed, and were to be adjusted only in the case of "fundamental disequilibrium." The delegates also correctly identified liberalized trade in goods and services and the development of economic specialization as crucial for the creation of wealth.

Permeating the Bretton Woods conference was a vital sense of co-operation, identified as the "spirit of internationalism" by Raghuram Rajan, the current Director of the IMF's Research Department in a recent lecture.[2] The Bretton Woods delegates were able to see how their own country's interest was clearly wrapped up in a collective interest. All represented nations understood that their own countries might sometimes need to shun politically expedient policies and, instead, "play by the rules of the game," thus promoting the common good of a well-functioning international monetary and financial order. Delegates also saw that the Fund could act as an impartial arbiter or umpire to call out countries that violated the rules by pursuing policies that impeded the free flow of goods and services.

The prime focus of delegates was to encourage trade flows, rather than to rebuild or develop international capital markets. This is understandable when you recall that as a legacy of World War II, governments controlled international capital flows tightly, and private capital flows were a tiny fraction of what they are today. Capital controls were symptomatic of the enormous faith that delegates had in the power of the state to direct economic activity and to control economic variables, including the correct exchange rate values among the world's major currencies. The controls were also symptomatic of the fact that outside the United States, capital markets had either atrophied because of the war, or simply were not yet well developed. Because of the stresses brought on by the war, the allocation of capital was much more state directed than market directed. These controls stayed in place for some years after the war, persisting longer in Europe than they did in the United States or Canada.

The Bretton Woods system of fixed exchange rates did not work all that smoothly, and its framework led to several crises along the way. During the quarter century that the system operated, Canada developed a reputation as the "bad boy" of the international financial system when we "temporarily" opted out of Bretton Woods in 1950. By that time, strong capital inflows into our resource sector, as well as sharply higher commodity prices, led to upward pressure on the Canadian dollar. In addition, there were speculative short-term capital inflows, which added to the pressure on the currency. To maintain the fixed exchange rate, Canadian authorities first intervened on a massive scale. Foreign exchange reserves rose by 40 per cent in less than three months, and the money supply grew rapidly at a time when the domestic economy was already operating at capacity. Ultimately, Canadian authorities decided that the best way to resolve these emerging imbalances was to let the Canadian dollar float. The alternative would have been higher inflation.[3]

One of the key lessons the Canadian authorities learned was that in an open economy, a market-based floating exchange rate was not at all incompatible with the goal of free international markets for goods and services. Indeed, we came to realize that allowing

2. R. Rajan, "The Ebbing Spirit of Internationalism and the International Monetary Fund." The 2006 Krasnoff Lecture, Stern School, New York University (New York, 8 March 2006).

3. After repegging the Canadian dollar in 1962, Canada again chose to float its currency in 1970. For a thorough discussion of the Canadian dollar through the Bretton Woods era, see J. Powell, A History of the Canadian Dollar. (Ottawa: Bank of Canada, 2005).

the relative price of the currency to be set in the market meant that we could concentrate on conducting monetary policy in our own best interest, rather than being preoccupied with aiming for balance in our external current account. In a rapidly changing global economy, it did not make sense to assume that the "correct" exchange rate could ever be known in advance. And even if the correct exchange rate could be identified at a point in time, the economic situation would soon change, and the level of the pegged exchange rate would no longer be appropriate. A market-based exchange rate proved to be useful as a "shock absorber," helping the economy react to shocks more efficiently than a fixed exchange rate.

The Evolution of the World Economy and the Role of the IMF

In 1971, the Bretton Woods system collapsed. Domestic capital markets in many countries had been restored and modernized. As well, there was recognition by some major industrialized economies that the Bretton Woods paradigm wasn't working. But the alternative was not yet clear. Just as central banks around the world spent much of the 1970s and 1980s searching for a monetary policy anchor, much time was spent searching for a new framework for the international financial system. By the 1990s, policy-makers—particularly in the OECD countries—started to come around to the idea that a framework of market-based policies was best both for national economies and for the global economy. This shift in paradigm, from the distrust of markets to the primacy of markets, set the stage for the rise of economic globalization.

If we held a new Bretton Woods Conference today, it is clear that delegates would design a different IMF, because both attitudes and circumstances are fundamentally different than they were at the end of World War II. International trade flows now constitute a much greater share of most countries' GDP. The transfers of goods, services, and technology, and the existence of supply chains across national borders, have brought enormous benefits in terms of growth and efficiency. As well, financial markets have become vastly larger and deeper—in economists' words, more complete. Private capital flows are now dominant, dwarfing the size of official flows.

Today, we need an international monetary order that does more than just facilitate trade. We need a system predicated on the idea that markets—not just for goods and services but also for capital—need to be free and open. And so let me now go back to my original question: What should the fundamental role of the IMF be in today's economy? The answer is that the role of the IMF must be to promote a well-functioning, market-based, international financial system. By "well-functioning," I mean a financial system that is both efficient and stable, so that markets can do their job in allocating savings to investments through the pricing of capital, and in smoothing economic adjustments through movements in relative prices.

Sixty years after the original Bretton Woods conference, now is the time for policy-makers to agree once again on the fundamental objective of the IMF. We need to agree that its role should be to promote a well-functioning, market-based, international financial system. We need to agree that the IMF should be the forum where we as shareholders collectively develop the appropriate framework—the rules of the game—to support the international financial system. And we need to agree that the IMF should be an independent, impartial umpire, ready to call out countries that are breaking the rules by imposing policies that distort trade flows, or policies that inhibit capital flows unnecessarily.

What does this mean in concrete terms? Before getting into detail, there is a complication that we need to deal with. We live in a world where all industrialized economies now profess to accept the market-based paradigm for the international financial system. But today's global economy consists of more than just the industrialized economies. There are emerging-market countries that are systemically important. These countries, particularly China, have the clout to influence the entire world economy. So, in developing the appropriate framework for the international financial system, in setting out the rules of the game, we need to make sure that everyone is at the table. We also need to recognize that some emerging-market countries are, and have, just that: markets that are emerging. And so while the principle of a market-based international financial system should be accepted by all, we need to recognize that some economies are in transition, and that until their markets fully develop, the rules of the game need to take this into account. For example, the removal of capital controls needs to be done with proper sequencing.

An Ideal IMF: What Would It Do?

So, if we were to create the IMF from scratch today, we would want it to have as its ultimate objective the pro-

motion of a well-functioning, market-based international financial system. But how should we turn that objective into concrete action? What would this ideal IMF actually do? How would it operate? And how would that differ from what the IMF does now? I will discuss four related issues here: surveillance, lending, representation, and governance.

First, let me talk about how surveillance can support a market-based international financial system. There are several points to be made here.

It is absolutely critical that surveillance take into account the growing interdependence of the global economy in order to maintain the stability of the international financial system. When policy errors in one country can lead to a financial crisis halfway around the world, we need to better understand the linkages between countries. Therefore, the IMF should use its surveillance, not just nationally but internationally, to identify externalities and potential policy spillovers. This would be invaluable in helping policy-makers to understand the implications of their actions. I am pleased to see that there has been progress in this area. Indeed, IMF staff have been working to develop GEM—the Global Economic Model—that can help to model spillover effects in the global economy. This work is tremendously valuable in that it provides authorities with a broader, multilateral perspective on their own policies. Policy-makers can see how their actions affect the global economy and, in turn, how these global repercussions will be felt back at home. This is a good start. But it is critical that greater emphasis be placed on this type of work in the future, to help us better identify spillovers.

A few minutes ago, I said that the IMF should be the forum where shareholders gather to collectively develop the appropriate rules of the game. I also said that it should be an independent, impartial umpire, ready to call out countries that break the rules. In other words, the IMF should have a secretariat function and an umpire function. IMF surveillance can, and must, do a better job of supporting both of these functions.

Let me start with the so-called umpire role. This is one area where the IMF has consistently fallen short of the mark. Too often, surveillance has shied away from the "ruthless truth-telling" that Keynes—one of the main architects of Bretton Woods—called for.[4] Instead of making the tough calls about the rules of the game, the IMF has sat in the umpire's chair and simply asked the players whether they thought that their shot was in or out. This needs to change. The IMF needs to be able to make calls impartially about whether countries are playing by market-based rules of the game. This would help policy-makers sitting around the table to decide what actions should come next. It would also help the market to apply the appropriate discipline to a country not playing by the rules.

Like any good umpire, the IMF should apply the same judgment to all players in the global economy. Much has been said about the way China and other countries continue to operate with a fixed exchange rate. I have previously argued that while greater exchange rate flexibility would be good for China, its citizens, and the global economy, the Chinese authorities must be allowed to choose the exchange rate regime they feel is best for them. But what the authorities should not do is frustrate market forces by thwarting the adjustment of real exchange rates through sterilization of their foreign exchange interventions. By "sterilization," I mean offsetting the effect of those interventions on the domestic money supply. Last month, U.S. Treasury Undersecretary Tim Adams called on the IMF to put more emphasis on exchange rates in its surveillance activities.[5] I certainly agree that the IMF needs to put greater emphasis on the interdependencies in the system, and exchange rates are clearly a part of those interdependencies.

But we have also seen examples of industrialized economies choosing to break the rules of the game. As I said yesterday in New York in the context of global imbalances, we now see examples of industrialized countries following policies that impede market forces—for example, restrictive labour policies in Europe. We have also seen unsustainable fiscal policies here in the United States. In Canada, we still have restrictions on foreign ownership of firms in certain sectors. And recently, we have seen legislators in the United States and Europe propose new restrictions on foreign investment flows. Again, the IMF as umpire should not shy away from making tough calls whenever they see the rules being violated, be it with respect to trade, capital flows, or other policies that distort financial markets. Making these calls loudly and forcefully could, as I said, help IMF members apply pressure for policy reform, and could certainly help the market to

4. Quoted by M. King, "Reform of the International Monetary Fund." Speech to Indian Council for Research on International Economic Relations, New Delhi, India (20 February 2006).

5. T. Adams, "Working with the IMF to Strengthen Exchange Rate Surveillance." Speech to the American Enterprise Institute, Washington, D.C. (2 February 2006).

apply its own pressure, thus maximizing the chances that welfare-enhancing, market-based policies would be adopted.

In a world where stability can be easily threatened by capital flows, we need to have a better sense of national balance sheets, a point that Bank of England Governor Mervyn King recently made.[6] Surveillance needs to answer questions such as: What is a country's net foreign asset position? How is it being financed? What are the currency and maturity mismatches? The goal is to better integrate financial sector surveillance into country reviews so that potential risks are identified earlier. This would also help the IMF in its secretariat role, allow national authorities to address problems early on, and give capital markets more information to help them price risk appropriately.

Earlier, I spoke about the need for capital markets in emerging-market economies to fully emerge. Ultimately, we hope that all countries will develop capital markets and the infrastructure to allow them access to global private investment flows. But in the transition period, we need to bear in mind that these markets work imperfectly at best, and are susceptible to overshooting and sudden reversals of capital flows. The IMF, therefore, has a role to play in furthering financial market development through its surveillance, through its advice and technical assistance, and through appropriately structured lending activities. I'll return to this point in a minute.

Let me make one more point about surveillance. We all know that markets work less efficiently, and can even fail, in the absence of the right policy framework. Markets can fail when they are impeded by information asymmetries or by a lack of proper transparency. The IMF has an important role here in helping to support markets so they can work at peak efficiency. The talented staff of the IMF certainly have a long history of expertise in this area from years of conducting surveillance, and this expertise should be used to maximum potential. Currently, it is not. The IMF could be a key supplier of an important public good: reliable information on, and judgment about, the performance of national economies. In addition, as I said, the IMF has a very important role to play in providing analysis of spillovers and interdependencies. The IMF has taken a good step in this direction through its Financial Sector Assessment Program and its Reports on the Observance of Standards and Codes. But it needs to do more—not to duplicate what markets provide, but to supplement it.

Having discussed surveillance, I will now turn to the second issue, which is lending. In a world where countries have unprecedented access to international capital flows, and where those who have borrowed from the IMF are doing everything they can to repay their loans early, some have argued that an ideal IMF should do no lending whatsoever. I certainly agree that the prime purpose of the IMF is not to make loans. In particular, long-term lending for development clearly falls outside of its mandate. Until such time as all countries can develop their own capital markets, it is the World Bank that should play this role, just as the European Bank for Reconstruction and Development recently helped many Eastern European countries make the transition to market economies.

However, as I mentioned earlier, a number of emerging markets do not have robust financial systems. And so there may still be a role for the IMF to maintain stability by providing temporary liquidity in extreme cases. But this very limited lending must take place only when it can be shown that the borrower is illiquid but not insolvent. And I would stress that there must be clear rules as to when this liquidity can be accessed, as well as clear lending limits that are known by all parties in advance.[7]

In terms of "emergency" lending, it would be far preferable to have the IMF focus on helping countries avoid problems in the first place, rather than lending funds to help them resolve balance-of-payments problems. The IMF could best support a market-based international financial system by working with countries to put mechanisms in place that help resolve problems before they turn into crises. In this regard, the institution has taken some steps in the right direction by stressing the use of collective-action clauses and encouraging parties to adhere to basic principles during debt restructurings.[8]

By restricting its lending role, the IMF can make a much greater contribution to a market-based financial system. Too often in recent years, Fund lending has impeded the very same market-based adjustments that the IMF should be encouraging. There are three important points

6. M. King, op. cit.

7. See A. Haldane and M. Kruger, "The Resolution of International Financial Crises: Private Finance and Public Funds." Bank of Canada Working Paper 2001-20, published jointly with the Bank of England.

8. See Principles for Stable Capital Flows and Fair Debt Restructuring in Emerging Markets. (Washington, D.C.: Institute of International Finance, 2005).

to be made here. First, a lack of clear rules about when the IMF would lend—and in what amounts—has caused uncertainty and unnecessary delay, thus making the timely and efficient resolution of crises more difficult. Second, there is nothing inherently wrong with the IMF providing financing which, if it occurred in the private sector, would be called "debtor in possession" financing. In those circumstances, the IMF can expect to be treated as a "preferred creditor," standing at the head of the line with respect to subsequent debt servicing. However, as in the private sector, this should only occur when this action would preserve or increase the value of outstanding claims. This brings me to my third point. Too often in the past, assistance was provided to countries that were assumed to be suffering only from temporary illiquidity, but which later proved to be insolvent. IMF lending in these cases simply added to an already unsustainable debt burden, placing additional costs on both debtors and creditors. As I said before, emerging-market economies may occasionally face problems for which timely financial assistance from the Fund would help. But this lending needs to be clearly delineated and constrained if it is to do more good than harm. All of this is to say that we need a fundamental review of the IMF's lending activities. Lending should not be the major focus of the IMF's mandate. Instead, it should play only a supporting role.

Next, let me talk about representation. For the IMF to successfully promote a well-functioning, market-based international financial system, it must be an effective forum, where global economic issues are discussed and solutions are found.[9] The IMF should be the place where national authorities gather around the table for a frank exchange on policy issues common to all. We need to rekindle the "spirit of internationalism" seen at Bretton Woods 60 years ago, and also seen at the OECD during the 1960s and 1970s, as that organization did its part to build a liberal economic order and a framework for freer trade. But it is difficult to build a shared sense of trust and responsibility if key players feel that they don't have an adequate voice. In this respect, it is clear that the IMF needs to give a larger voice to China and some other emerging-market economies, as they become more systemically important.

But as my colleague at the Bank of Canada, Deputy Governor Tiff Macklem, said recently, "with a larger voice comes greater responsibility."[10] Membership in the IMF carries with it a responsibility for supporting the goals of the institution. Members must have a shared understanding of how the international financial system should function, and of the IMF's role in supporting that system. So it seems to me that there really is no point for countries to demand, and receive, greater quota and voting power unless they believe in, and actively support, a market-based international financial system. It is absolutely true that Asian nations need to have greater quota and voting power to make the institution more legitimate in their eyes. But this should happen only if it will lead to an increased willingness among all countries to respect the rules of the game that are developed.

Having discussed surveillance, lending, and representation, the final issue I want to talk about is governance. Good governance begins with clear objectives. So, after establishing the IMF's fundamental objectives, the institution must improve its governance structures.

The IMF must ensure that it has clear lines of responsibility internally, and that it is transparent with respect to the reasons for its decisions. In other words, the IMF needs a governance structure that helps it achieve its goals and that holds its officials accountable. Currently, decision-making responsibilities are divided among the Board of Governors, the Executive Board, and the Managing Director and staff. But in practice, the division of responsibilities among these groups is not always clearly defined. Accountability is dispersed, and decision making lacks transparency. The IMF would be more effective if the Executive Board focused on setting strategic direction, and ensured that policies are sound and that objectives are met, rather than focusing on the day-to-day business of the institution. The Managing Director would be accountable for the secretariat and surveillance functions and be responsible for policy implementation. This framework would help to clarify that the responsibility for policy formulation rests with the Executive Board, and that the responsibility for implementation rests with the Managing Director. Towards this end, Mervyn King recently suggested establishing a non-resident Executive Board that meets periodically, rather than almost continuously, and that focuses on strategic direction and oversight.[11] This suggestion certainly merits consideration.

9. D. Dodge, "Reflections on the International Economic and Monetary Order." Speech to la Conférence deMontréal, Montréal, Quebec (30 May 2005).

10. T. Macklem, "Renewing the IMF: Some Lessons from Modern Central Banking." Speech to the Global Interdependence Center, Philadelphia, Pennsylvania (9 March 2006).

11. 1 M. King, op. cit.

We also need to consider how to enhance the vital role of the IMFC—the International Monetary and Financial Committee—within the institution. As well, we should think about whether there could be some useful role for various working committees to deal with specific issues as they arise.

Conclusion

Ladies and gentlemen, let me conclude. I've argued today that there is a role for the IMF in today's global economy. We need an institution to promote a market-based international financial system that works efficiently and is stable. This ideal IMF would have a sharper focus and a more international aspect to its surveillance, with clear rules governing a greatly reduced lending role. It would also be more representative than the current IMF, and would have an overhauled governance structure.

The prescription I have outlined today may sound radical. But we cannot afford to be put off by the size of the task. Progress may come only over time, but it does need to happen. The first and most important step on the path is to have all players in the global economy agree on the fundamental objective of the IMF. As IMF members gather next month in Washington for the institution's spring meetings, my great hope is that we will have a real discussion of these fundamental issues.

Let me close by recalling Martin Wolf's column in the Financial Times. Ultimately, Wolf agreed that the world needs to create a tough and independent IMF. But Wolf said it could not be done. It is up to us to prove him wrong. It is up to us to show that we do have the courage and the vision to build this important institution.

Renewing the IMF: Some Lessons from Modern Central Banking

Remarks by Tiff Macklem
Bank of Canada Deputy Governor
to the Global Interdependence Center
Philadelphia, Pennsylvania, U.S.A.
9 March 2006

I'm very pleased to be here in Philadelphia, and I'm grateful for the opportunity to speak to the Global Interdependence Center. Your group aims to foster dialogue "on the challenges and opportunities arising from our increasingly interdependent global civilization." The globalized economy has indeed generated tremendous opportunities to create wealth and to raise living standards. But as opportunities have arisen, so too, have challenges. As economies have become more interconnected through trade and financial flows in a truly global marketplace, economic developments in one location can quickly have repercussions on the other side of the globe. In 1997, what began as a currency devaluation in Thailand became a crisis with repercussions not just in Asia, but in countries as far away as Russia, Brazil, and Canada. So, the challenge we face is to find the best ways to reap the economic benefits of globalization while minimizing the risks of disruption.

Today, I'd like to discuss how the International Monetary Fund (IMF) can do its part to meet this challenge. The IMF was created some 60 years ago to oversee the global monetary system in an era of fixed exchange rates. But the world has changed dramatically in 60 years. Most major currencies have been allowed to float. Financial markets are much larger, much more sophisticated, and vastly more integrated than they were 20 years ago, let alone in the 1940s. Trade has expanded enormously, and major new players have entered the global trading network.

The IMF has responded to new challenges with professionalism. It's taken on new responsibilities and developed new expertise. Yet concerns have arisen that the Fund has not kept pace with the changes in the global economy. After 60 years, it's time to take a fundamental look at the role of the Fund in the global economy. Under Managing Director Rodrigo de Rato, the IMF has launched a strategic review of its role and activities. This is the opportunity to consider what kind of a Fund we need to meet the challenges of the global economy in the twenty-first century. But to do this right, we must be ambitious.

After 60 years, it's time to take a fundamental look at the role of the Fund in the global economy.

I'm also pleased to be part of your "Central Banking Series" of speakers, because central banks can bring a valuable perspective to the discussion. Central banks have a large stake in a sound international monetary order, and thus have a profound interest in the IMF. And central banks have had to adapt to the same forces in the global economy that have affected the IMF: the collapse of fixed exchange rates, the expansion of private capital flows, the evolution of financial markets, and so on.

What I propose to do today is discuss how the Bank of Canada and other central banks have evolved in response to these changing circumstances. Then I'll outline how the lessons central banks have learned can be distilled into four key principles. I'll conclude

by offering some thoughts on how these same principles could prove useful as we consider the IMF of the future.

The Principles of Modern Central Banking

For good reasons, Canada returned to a floating exchange rate in 1970.[1] With the collapse of the Bretton Woods system of fixed exchange rates shortly thereafter, other major industrialized countries followed Canada's lead. Unfortunately, the Bank of Canada, like many other central banks, did not take full advantage of the monetary independence that comes with having a flexible exchange rate. Without the anchor of a fixed exchange rate, and with no other monetary anchor in its place, Canada, like many other countries, suffered the effects of high inflation in the 1970s. Inflation reduced the ability of the price system to allocate economic resources efficiently; savings and investment decisions were distorted; and the economy went through boom and bust cycles.

Central banks, including the Bank of Canada, struggled with this problem, and from this bitter experience came a search for the right anchor. We, and others, experimented with monetary aggregates as intermediate targets. But deregulation and financial innovation weakened the reliability of money measures, and the relationship between money growth and inflation proved to be unstable. By the end of the 1980s, it became clear that price stability should be the Bank of Canada's pre-eminent objective, and that we should aim more directly at achieving it.

In 1991, Canada took the bold step of formalizing this objective with an explicit inflation target. Our inflation-target objective, which is established jointly with the Government of Canada, aims to keep inflation at the 2 per cent midpoint of a 1 to 3 per cent target range. The target has proven to be a very effective anchor. Inflation has been low and stable, and we've experienced solid growth in output and employment.

Canada was the second major country to adopt an inflation target. Today, more than 20 countries have such targets. In other words, there's a good deal of international experience with inflation targeting. As in Canada, this experience has been very positive: inflation targeting, working in tandem with a floating exchange rate, has generally resulted in low inflation and sustained economic growth.

Stepping back, and looking beyond these positive results, we can distinguish four key characteristics of a credible and effective monetary policy framework: clear objectives and effective tools; legitimacy; the effective use of markets; and transparency and accountability.

Let me say a few words about each of these in turn.

First, *clear objectives and effective tools*. The Bank of Canada's monetary policy has one clear objective—to keep inflation at 2 per cent. And it has one instrument with which to get the job done—the target for the overnight interest rate.

Second, *legitimacy*. The inflation target is not just the Bank of Canada's target, but also the government's. This adds legitimacy to the monetary policy objective, thereby strengthening it. But legitimacy also comes from our experience of low inflation and good economic outcomes, with the result that there is now broad support among Canadians for anchoring monetary policy to a low inflation target.

We can distinguish four key characteristics of a credible and effective monetary policy framework: clear objectives and effective tools; legitimacy; the effective use of markets; and transparency and accountability.

Third, monetary policy works best when it is *market based*. We learned some valuable lessons in the 1970s. We learned that direct controls on wages and prices do not work beyond the short run, and that they introduce a myriad of distortions, which reduce market efficiency. We also learned that direct controls on credit expansion are difficult to calibrate and enforce. They also reduce the efficiency of the financial system as it allocates resources in the economy. Today, monetary policy is implemented entirely through financial markets. By controlling the overnight interest rate, monetary policy influences interest rates along the yield curve, as well as other asset prices. These, in turn,

1. The floating exchange rate has served Canada's open economy well. Canada first adopted a floating exchange rate in 1950. In 1962, it returned to a fixed regime, but since 1970, it has allowed the dollar to float.

influence spending, and, ultimately, inflation. We have found that the transmission of monetary policy works most effectively when the central bank implements policy through markets, when it maintains a credible policy goal, and when it communicates its objectives and actions clearly.

This leads me naturally to the fourth characteristic—*transparency and accountability*. One of the most important things we have learned with inflation targeting is that monetary policy works best when it is well understood. The explicit inflation target is the centrepiece of our communications on monetary policy—it helps to anchor inflation expectations, and it makes it easier for us to explain our actions, and for people to judge our performance. It provides a strong incentive for us to meet the objective and to be accountable.

Taken together, these are the characteristics of effective, modern central banking. But I think that one can go further and say that these characteristics are useful *principles* that apply to the broader realm of public policy-making. Let me now turn to the topic of IMF renewal, and talk about how these same principles can be applied to the task at hand.

Principle-Based Renewal at the IMF

The place to start is *clear objectives and effective tools* for achieving those objectives. The IMF's first Article of Agreement states that it should "promote international monetary co-operation through a permanent institution which provides the machinery for consultation and collaboration on international monetary problems." In the globalized, market economy of the twenty-first century, what this really means is the *promotion of global financial stability by supporting a market-based international monetary order*. I hope that there's a broad consensus that this should be the objective of the IMF. I view the challenge facing the Fund as being how best to fulfill this objective.

The main tool is surveillance. But surveillance needs to be more effective. This means two things. First, surveillance should be more multilateral, putting greater emphasis on the linkages between members, the spillover of one country's policy choices on other countries, and the joint risks that this implies. The reality is that in an increasingly globalized economy, our understanding of these linkages and spillovers is not as good as it should be. The Fund staff is an enormously talented group of men and women. We have to ensure that they undertake the research and analysis needed to understand the changing nature of global linkages. But understanding these linkages is not enough. We need a forum where risks are debated openly, frankly, and comprehensively by national policy-makers. In turn, this implies less emphasis on bilateral communication between the IMF and a given country and more multilateral discussions among countries, supported by the IMF.

Making surveillance more effective also means strengthening the analysis of the linkages between the financial sector and the real economy. In recent years, the Fund has devoted considerable energy to developing sound standards and codes for assessing the financial infrastructure of its member countries. This financial sector surveillance needs to be better integrated into IMF country reviews. This will allow potential risks to be identified earlier so that authorities can address any problems, rather than calling on the Fund for financial assistance in the midst of a crisis. Achieving this integration may require re-thinking the Fund's internal structure to ensure that all facets of its work feed effectively into its surveillance and provide sound analysis of the interaction of economic and financial developments and risks, both within and between countries.

Let me now turn to the second key principle—*legitimacy*. The Fund's effectiveness, and hence its ability to promote global financial stability, is what ultimately gives it legitimacy and credibility. At the same time, its effectiveness depends on its legitimacy as a truly global institution, and on a shared sense of trust and responsibility among its members. Global issues can't be effectively addressed if key players feel that they don't have an adequate voice as IMF members. In this respect, it is clear that important aspects of the Fund's governance arrangements have not kept pace with changes in the global economy. In particular, quotas and voting power at the Fund need to better reflect the growing power of Asian and other emerging-market economies.

The issue of quota and voting power is complex and will persist for years to come, since Asia is likely to continue to grow faster than other major regions. This suggests the need for a comprehensive solution, and we should work towards this end. But we also need to be pragmatic. We need to make concrete progress on the quota issue in the short term to show that members are serious about aligning the representation of Asian members with their economic weight. Of course, with a larger voice comes greater responsibility. So let's be clear: a larger stake for Asian members implies that they should be prepared to shoulder their fair share

of the responsibility for promoting global financial stability as part of the international monetary order.

This brings me to the third principle—*effective use of markets*. As I have already highlighted, the role of the Fund in the twenty-first century should be to promote financial stability by supporting a market-based international monetary order. This means that the IMF must work to ensure that the international financial infrastructure is sound, that countries pursue sustainable policies, and that incentives encourage the appropriate pricing of risk and the efficient allocation of resources. It also means that the IMF should play a more active role in establishing the "rules of the game," clear rules that support a market-based international monetary order. Consider exchange rates, for example. Tim Adams, the U.S. Treasury's Under Secretary for International Affairs, recently called on the IMF to demonstrate "strong leadership on multilateral exchange rate surveillance." Specifically, he called on the IMF to "improve its tools and advocacy to persuade countries to exit unsustainable exchange regimes early on, rather than waiting for perfect circumstances that never come." More broadly, I would suggest that the IMF needs to bring pressure to bear on national public policies that thwart adjustment. Delaying adjustment does not make the need for adjustment go away. It simply increases the risk that the adjustment—when it comes—will be abrupt and disorderly.

The role of the Fund in the twenty-first century should be to promote financial stability by supporting a market-based international monetary order.

A highly visible example of this risk is the issue of "global imbalances," which is shorthand for the large U.S. current account deficit that is mirrored by large surpluses in Asia and, increasingly, in major oil-exporting countries. If these imbalances are to be resolved in a way that is consistent with maximizing global growth, significant adjustments are required. Markets can lead these adjustments, but they need to be allowed to work effectively. This means letting real exchange rates adjust in countries with large current account surpluses, like China; reducing unsustainable fiscal deficits in the United States; and making labour markets more flexible in Europe. The IMF should play a lead role in bringing the right players together, facilitating discussion, and relying on markets to achieve the necessary adjustments.

Markets should also play a greater role in crisis resolution. The Fund has been accused of doing too much "exceptional lending." Indeed, in some cases, this lending has delayed the needed actions and adjustments. Essentially, both sovereign borrowers and creditors wait to see if the Fund will put new money on the table. Strict implementation of exceptional-access limits—that is, clear rules of the game for the Fund's own activities—would reduce the uncertainty associated with Fund lending and create incentives for creditors and lenders to negotiate when negative economic shocks render debt levels unsustainable.

The Fund could facilitate these negotiations by offering its good offices to promote a timely, orderly restructuring of private claims. The Fund's effectiveness in this capacity depends critically, however, on its perceived independence. It will not be viewed as a disinterested adjudicator if it is also a major creditor. The Fund can reduce some of the uncertainty that impedes debt restructurings by providing independent analysis of the future growth prospects of the country concerned, advice on possible adjustment measures, and an assessment of the global economic and financial outlook. With this information at hand, creditors and debtors can then seek market-based solutions.

The fourth and final characteristic is *transparency and accountability*. I said earlier that the Fund needs to be clear about its main objectives and its policy framework. The IMF must also ensure that clear lines of responsibility within the organization support the framework. And it must be transparent about the reasons for its decisions. In other words, the Fund needs a governance structure that helps it achieve its goals and holds individuals accountable. Currently, decision-making responsibilities are divided among the Board of Governors, the Executive Board of Directors, and the Managing Director and staff. But the division of responsibilities among these groups is not, in practice, always clearly defined. Accountability is dispersed, and decision making lacks transparency.

The IMF would be more effective if the Executive Board focused on setting strategic direction, as well as ensuring that policies are sound and that objectives are met. The Managing Director would then be responsible for

policy implementation, and be accountable to the Board. This framework would help to ensure that the responsibility for policy formulation and implementation was clear and borne appropriately by the members of the Board and the Managing Director, respectively. Toward this end, Bank of England Governor Mervyn King has recently suggested establishing a non-resident Executive Board that meets periodically, rather than almost continuously, and that focuses on strategic direction and oversight. Accountability and transparency of the Board's decision-making would also be enhanced with more frequent and more timely reporting. Finally, and very importantly, surveillance and analysis must be, and seen to be, independent of political influence.

Conclusion

I'd like to conclude by underscoring a key point. The progress made by central banks in furthering the economic well-being of their citizens has largely been the result of determining the most appropriate objective—low and stable inflation—and determining how best to achieve it in a transparent and accountable fashion. For many central banks, this has meant inflation targeting. I've suggested that there are lessons here for the International Monetary Fund.

A more effective IMF really does matter. In a world of floating exchange rates, large private capital flows, and liberalized trade, we need an effective forum in which the issues that shape the global economy can be discussed with candour and good will, and in which problems can be resolved. The IMF could be that forum. But it needs to become more legitimate, that is, more representative of an international economic community where all members share responsibility for promoting the common good of international financial stability. The IMF needs to operate with clear objectives; effective, market-based tools to achieve these objectives; and a governance framework that supports sound decision-making and accountability.

The need for change is pressing. As the risks associated with global imbalances grow in importance, the IMF will be tested. I very much hope that a significantly more effective institution will emerge from the strategic review currently under way. If we can get it right, a more effective IMF will be central to maximizing the benefits of globalization.

The need for change is pressing. As the risks associated with global imbalances grow in importance, the IMF will be tested.

Indeed, the renewal of the International Monetary Fund is tremendously important, not just for Americans and Canadians, but for all nations in this increasingly interdependent world.

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Summary Tables

A1 Summary of Key Monetary Policy Variables

Monthly		Inflation-control target (12-month rate)			Policy instrument			Monetary conditions			Monetary aggregates (12-month growth rate)			Inflation indicators					
		Target range	CPI	Core CPI*	Operating band for overnight rate (end of month)		Overnight money market rate	Monetary conditions index (January 1987=0)	90-day commercial paper rate	C-6 trade-weighted exchange rate (1992=100)	Gross M1	M1++	M2++	Yield spread between conventional and Real Return Bonds	Total CPI excluding food, energy, and the effect of changes in indirect taxes	CPIW	Unit labour costs	IPPI (finished products)	Average hourly earnings of permanent workers
					Low	High													
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
2002	A	1-3	1.7	2.2	2.00	2.50	2.2440	-10.07	2.46	79.48	11.7	15.3	6.9	2.29	1.9	2.1	-	0.6	2.8
	M	1-3	1.0	2.2	2.00	2.50	2.2471	-9.31	2.68	80.79	11.7	14.3	6.7	2.24	2.0	1.9	1.0	-0.3	2.1
	J	1-3	1.3	2.1	2.25	2.75	2.4964	-9.12	2.78	80.99	12.8	15.5	6.8	2.32	2.1	1.9	0.5	0.6	2.5
	J	1-3	2.1	2.1	2.50	3.00	2.7418	-10.40	2.88	77.71	13.3	14.7	6.7	2.28	2.1	2.0	0.1	0.5	2.5
	A	1-3	2.6	2.5	2.50	3.00	2.7448	-9.68	3.09	78.90	13.9	15.2	6.7	2.18	2.2	2.4	1.1	1.3	2.7
	S	1-3	2.3	2.5	2.50	3.00	2.7447	-10.27	2.90	77.97	10.9	12.7	6.1	2.18	2.3	2.3	0.6	0.9	2.6
	O	1-3	3.2	2.5	2.50	3.00	2.7449	-10.06	2.83	78.63	11.5	12.6	5.6	2.18	2.5	2.4	1.0	2.1	2.4
	N	1-3	4.3	3.1	2.50	3.00	2.7431	-10.21	2.85	78.24	9.6	10.3	4.8	2.15	3.1	3.0	1.9	1.8	2.2
	D	1-3	3.9	2.7	2.50	3.00	2.7439	-9.80	2.83	79.24	7.0	8.2	3.9	2.09	3.3	2.4	1.2	2.1	1.7
2003	J	1-3	4.5	3.3	2.50	3.00	2.7439	-9.34	2.91	80.15	7.4	7.3	3.7	2.27	3.3	2.9	1.7	1.1	1.7
	F	1-3	4.6	3.1	2.50	3.00	2.7469	-8.61	2.97	81.78	6.8	6.4	3.3	2.40	3.3	2.9	2.1	1.1	1.7
	M	1-3	4.3	2.9	2.75	3.25	2.9920	-7.72	3.28	83.22	6.2	5.6	3.4	2.50	3.1	2.7	2.1	0.1	1.4
	A	1-3	3.0	2.1	3.00	3.50	3.2373	-6.92	3.35	85.07	6.6	5.2	3.0	2.28	2.8	2.1	3.0	-1.5	1.0
	M	1-3	2.9	2.3	3.00	3.50	3.2416	-6.02	3.27	87.60	7.0	5.3	3.5	2.12	2.5	2.2	2.2	-2.7	1.8
	J	1-3	2.6	2.1	3.00	3.50	3.2449	-5.11	3.11	90.45	7.7	5.2	3.2	2.04	2.1	2.0	2.1	-3.7	1.1
	J	1-3	2.2	1.8	2.75	3.25	2.9947	-6.60	2.89	87.07	10.0	6.6	3.5	2.25	1.7	1.9	2.3	-2.1	2.0
	A	1-3	2.0	1.5	2.75	3.25	2.9972	-6.68	2.80	87.11	9.5	6.6	3.5	2.29	1.7	1.7	2.4	-2.6	2.2
	S	1-3	2.2	1.7	2.50	3.00	2.7490	-5.93	2.64	89.52	8.6	6.5	3.4	2.15	1.8	1.9	1.6	-3.8	2.7
	O	1-3	1.6	1.8	2.50	3.00	2.7492	-4.85	2.71	92.25	6.9	6.1	3.1	2.38	1.8	1.8	1.5	-5.5	2.7
	N	1-3	1.6	1.8	2.50	3.00	2.7481	-4.73	2.73	92.54	8.5	6.8	3.1	2.38	1.8	1.7	0.7	-6.0	2.2
	D	1-3	2.0	2.2	2.50	3.00	2.7481	-4.68	2.66	92.87	9.6	7.6	3.9	2.41	1.5	2.1	0.7	-5.4	2.7
2004	J	1-3	1.2	1.5	2.25	2.75	2.4951	-5.77	2.37	90.68	10.4	8.3	3.8	2.66	1.5	1.5	1.1	-5.3	2.9
	F	1-3	0.7	1.1	2.25	2.75	2.4953	-6.21	2.25	89.82	12.9	9.7	4.4	2.53	1.0	1.2	1.4	-4.3	2.6
	M	1-3	0.7	1.3	2.00	2.50	2.2482	-5.72	2.10	91.55	14.0	10.5	4.7	2.65	1.1	1.2	0.7	-3.5	2.8
	A	1-3	1.6	1.8	1.75	2.25	1.9959	-6.98	2.05	88.28	15.2	12.0	5.1	2.85	1.2	1.7	1.0	-1.3	3.0
	M	1-3	2.5	1.5	1.75	2.25	1.9985	-7.08	2.07	87.98	15.8	13.1	5.1	3.00	1.2	1.8	1.0	2.8	2.8
	J	1-3	2.5	1.7	1.75	2.25	2.0005	-6.36	2.10	89.81	14.1	13.0	5.7	2.96	1.4	1.8	1.3	3.1	3.3
	J	1-3	2.3	1.9	1.75	2.25	1.9973	-6.03	2.12	90.65	10.9	11.6	5.4	2.98	1.4	1.9	1.1	0.6	2.4
	A	1-3	1.9	1.5	1.75	2.25	1.9979	-5.28	2.22	92.43	10.4	10.6	5.2	2.93	1.0	1.7	-	0.3	2.1
	S	1-3	1.8	1.5	2.00	2.50	2.2496	-4.22	2.50	94.63	10.1	10.4	5.2	2.72	1.0	1.6	1.1	-	1.9
	O	1-3	2.3	1.4	2.25	2.75	2.4960	-3.03	2.60	97.77	11.5	10.6	5.7	2.72	0.8	1.7	0.9	0.7	2.2
	N	1-3	2.4	1.6	2.25	2.75	2.4977	-1.82	2.74	100.95	10.6	9.9	5.3	2.73	1.1	1.8	1.1	-0.6	3.1
	D	1-3	2.1	1.7	2.25	2.75	2.4999	-3.02	2.57	97.89	11.6	10.8	5.6	2.81	1.3	1.7	2.0	-0.7	2.7
2005	J	1-3	2.0	1.6	2.25	2.75	2.4980	-3.35	2.56	96.96	11.1	10.4	5.8	2.71	1.2	1.6	0.9	-	3.0
	F	1-3	2.1	1.8	2.25	2.75	2.4971	-3.54	2.57	96.37	10.1	9.8	5.8	2.69	1.4	1.7	1.1	-0.5	2.5
	M	1-3	2.3	1.9	2.25	2.75	2.4794	-2.74	2.68	98.39	9.9	9.3	5.6	2.69	1.4	1.9	2.8	-0.7	3.2
	A	1-3	2.4	1.7	2.25	2.75	2.4954	-3.69	2.58	95.92	9.8	8.6	5.7	2.67	1.2	1.8	2.2	-0.5	3.2
	M	1-3	1.6	1.6	2.25	2.75	2.4866	-4.02	2.59	94.93	8.8	7.7	5.4	2.60	1.2	1.6	1.6	-2.2	2.4
	J	1-3	1.7	1.5	2.25	2.75	2.4936	-2.88	2.58	98.28	9.5	7.2	5.0	2.42	1.3	1.7	2.2	-1.5	2.9
	J	1-3	2.0	1.4	2.25	2.75	2.4922	-2.95	2.64	97.88	9.6	6.9	4.7	2.38	1.1	1.7	2.6	-0.7	3.1
	A	1-3	2.6	1.7	2.25	2.75	2.4882	-1.63	2.83	101.27	9.3	6.7	4.9	2.39	1.5	1.9	2.6	-0.3	3.4
	S	1-3	3.4	1.7	2.50	3.00	2.7421	-1.07	2.98	102.51	11.3	7.7	5.6	2.57	1.6	2.1	2.9	0.8	3.6
	O	1-3	2.6	1.7	2.75	3.25	2.9873	-0.66	3.14	103.30	11.3	8.4	5.5	2.67	1.5	1.8	3.0	0.6	3.7
	N	1-3	2.0	1.6	2.75	3.25	2.9883	-0.21	3.37	103.96	11.4	8.5	5.9	2.53	1.4	1.7	3.4	1.5	3.6
	D	1-3	2.2	1.6	3.00	3.50	3.2437	-	3.52	104.14	10.7	8.0	6.2	2.58	1.3	1.7	2.6	0.9	3.6
2006	J	1-3	2.8	1.7	3.25	3.75	3.2961	0.47	3.67	105.15	10.6	7.2	5.9	2.66	1.4	2.0		0.7	3.2
	F	1-3	2.2	1.7	3.25	3.75	3.4765	0.73	3.80	105.56	12.3	7.8		2.71	1.4	1.7		-1.0	3.2
	M				3.50	4.00	3.7269	0.20	4.00	103.29				2.64					3.1

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

A2 Major Financial and Economic Indicators

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

	Year, quarter, and month	Money and credit									Output and employment				
		Monetary aggregates					Business credit		Household credit		GDP in current prices	GDP volume (millions of chained 1997 dollars, quarterly)	GDP by industry (millions of 1997 dollars, monthly)	Employment (*Labour Force Information*)	Un-employment rate
		Gross M1	M1+	M1++	M2+	M2++	Short-term business credit	Total business credit	Consumer credit	Residential mortgages					
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	1993	9.4	5.1	-0.7	4.2	6.6	-6.3	0.7	2.3	7.6	3.8	2.3		0.5	11.4
	1994	13.2	8.4	1.4	1.9	6.8	1.6	4.7	7.9	6.4	6.0	4.8		2.1	10.4
	1995	6.6	0.8	-2.6	3.8	4.1	5.5	5.1	7.5	3.7	5.1	2.8		1.8	9.5
	1996	12.2	8.2	3.3	4.4	6.8	1.5	5.5	6.5	4.2	3.3	1.6		0.9	9.6
	1997	16.9	11.2	7.2	0.9	7.2	7.7	9.9	10.0	5.6	5.5	4.2		2.1	9.1
	1998	10.3	7.0	3.1	-1.1	5.5	11.5	11.5	10.1	4.9	3.7	4.1	3.8	2.5	8.3
	1999	7.6	6.0	4.3	3.6	5.3	2.4	6.3	7.1	4.3	7.4	5.5	5.6	2.6	7.6
	2000	14.7	10.6	8.8	5.9	7.0	6.5	7.3	12.6	4.8	9.6	5.2	5.5	2.5	6.8
	2001	12.1	10.3	9.6	6.6	7.6	-1.5	5.7	6.8	4.0	2.9	1.8	1.6	1.2	7.2
	2002	11.7	10.9	13.7	7.4	6.4	-6.0	3.8	6.5	7.4	4.2	3.1	3.2	2.4	7.7
	2003	7.9	5.0	6.3	4.7	3.4	-3.1	1.3	9.1	8.1	5.4	2.0	2.1	2.4	7.6
	2004	12.2	9.0	10.9	4.7	5.1	-0.5	4.0	10.3	9.6	6.1	2.9	3.1	1.8	7.2
	2005	10.2	7.9	8.3	4.6	5.5	5.7	5.8	12.0	9.8	6.1	2.9	3.0	1.4	6.8
Annual rates	2002 I	11.2	14.4	18.2	7.9	6.7	-10.7	3.7	6.6	7.6	7.7	4.9	5.9	3.0	7.9
	II	4.8	5.2	8.3	3.7	4.4	-6.8	2.1	9.0	8.9	11.0	3.4	4.8	4.3	7.7
	III	11.6	8.4	8.2	6.4	4.8	-3.6	2.3	9.4	8.1	5.7	3.8	3.0	4.3	7.5
	IV	9.9	6.8	6.9	4.7	3.3	1.0	2.3	10.3	7.3	7.4	2.3	1.9	2.7	7.5
	2003 I	1.3	0.4	2.3	4.1	1.4	-1.4	0.6	6.9	8.0	9.6	3.1	2.2	2.8	7.4
	II	5.9	2.3	3.7	5.1	3.5	-3.1	0.2	9.7	7.9	-3.3	-1.2	-0.1	0.2	7.7
	III	21.3	13.2	13.8	5.7	5.7	-7.8	1.1	11.0	8.8	4.9	1.3	2.0	1.2	7.8
	IV	5.8	5.1	8.0	1.3	3.0	-8.1	2.5	9.2	9.5	5.2	3.6	4.8	3.1	7.5
	2004 I	17.6	11.1	12.8	4.6	5.0	-2.1	4.1	11.0	9.3	6.7	2.6	2.5	1.5	7.3
	II	16.0	13.9	16.4	7.5	7.5	9.8	6.6	10.0	10.7	10.6	5.0	4.0	2.6	7.2
	III	3.1	4.4	6.6	5.5	5.5	6.7	6.2	10.8	10.3	6.8	3.5	4.0	0.6	7.1
	IV	8.6	6.6	6.2	3.1	4.2	4.0	5.2	10.7	10.1	4.1	2.1	1.8	1.4	7.1
	2005 I	14.1	10.9	10.4	5.7	5.6	6.0	6.7	11.5	8.8	3.4	2.1	2.5	0.9	7.0
	II	12.0	9.2	8.2	4.9	6.0	3.8	4.6	14.0	9.5	6.2	3.6	3.4	1.7	6.8
	III	5.7	1.3	3.7	1.6	4.4	7.9	6.3	13.5	10.2	10.5	3.5	4.2	1.5	6.8
	IV	12.8	10.3	11.0	5.9	7.5	5.3	5.5	12.3	10.9	8.3	2.5	3.0	2.4	6.5
	2006 I													1.6	6.4
Last three months		15.3	9.6	8.7	4.9	6.8	14.0	6.1	12.2	11.0			3.1	1.6	6.3
Monthly rates	2005 M	0.8	0.7	0.6	0.1	0.3	0.1	0.4	1.0	0.7			-0.1	-	6.9
	A	1.4	1.0	0.8	0.7	0.7	0.4	0.3	1.1	0.7			0.5	0.3	6.8
	M	0.3	0.5	0.6	0.2	0.4	0.1	0.4	1.2	0.8			0.4	0.2	6.9
	J	0.9	0.7	0.4	0.4	0.5	0.7	0.5	1.0	0.9			0.3	0.1	6.8
	J	0.2	-0.5	0.1	-0.4	-	1.1	0.6	1.0	0.8			0.3	0.2	6.8
	A	-0.1	-0.4	-0.1	0.2	0.4	0.1	0.4	1.0	0.8			0.6	0.1	6.8
	S	1.6	1.3	1.2	0.9	0.9	0.7	0.7	1.2	0.9			-0.1	-	6.7
	O	1.1	1.1	1.2	0.5	0.6	0.3	0.4	0.8	0.9			0.3	0.4	6.6
	N	0.7	0.4	0.4	-	0.3	-0.2	0.2	1.0	0.9			0.2	0.2	6.4
	D	1.4	1.1	1.0	0.9	1.0	1.6	0.7	1.1	0.9			0.4	-0.1	6.5
	2006 J	0.7	0.1	-	-0.1	0.1	1.8	0.6	0.9	0.8			0.2	0.2	6.6
	F	2.7	1.6	1.3			1.6	0.5						0.2	6.4
	M													0.3	6.3

A2 (Continued)

Capacity utilization rate		Prices and costs				Wage settlements		Bank of Canada commodity price index (unadjusted)		Securities mid-market yield			Year, quarter, and month
Total industrial	Manufacturing industries	CPI	Core CPI*	GDP chain price index	Unit labour costs	Public sector	Private sector	Total	Non-energy	Treasury bills 3-month	Canada 10-year benchmark bonds	Canada 30-year Real Return Bonds	
(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
80.6	79.9	1.8	2.1	1.4		0.6	0.8	0.5	3.0	3.87	6.57	3.78	1993
83.0	83.5	0.2	1.8	1.1		-	1.2	3.3	7.5	7.14	9.07	4.92	1994
82.1	83.9	2.2	2.3	2.3		0.7	1.4	8.3	11.1	5.54	7.11	4.42	1995
82.0	82.8	1.6	1.7	1.6		0.5	1.8	3.8	-1.2	2.85	6.37	4.09	1996
83.6	83.6	1.6	1.9	1.2		1.1	1.9	-3.7	-4.3	3.99	5.61	4.14	1997
84.6	84.3	0.9	1.3	-0.5	1.0	1.6	1.7	-15.3	-12.6	4.66	4.89	4.11	1998
86.0	85.8	1.7	1.4	1.7	0.1	1.9	2.7	6.7	1.5	4.85	6.18	4.01	1999
87.1	86.1	2.7	1.3	4.2	3.0	2.5	2.4	18.4	3.5	5.49	5.35	3.42	2000
84.4	81.7	2.6	2.1	1.1	3.1	3.3	3.0	-5.2	-6.9	1.95	5.44	3.76	2001
84.8	82.5	2.2	2.3	1.1	0.9	2.9	2.6	-5.9	-6.6	2.63	4.88	3.33	2002
84.4	81.3	2.8	2.2	3.3	1.9	2.9	1.3	20.1	8.8	2.57	4.66	2.79	2003
85.8	83.4	1.9	1.5	3.0	1.1	1.4	2.2	20.5	21.4	2.47	4.39	2.11	2004
86.1	84.4	2.2	1.6	3.1	2.3	2.2	2.4	23.0	3.8	3.37	3.93	1.44	2005
83.7	81.2	3.0	2.5	2.7	-0.8	3.1	2.1	15.9	12.3	2.30	5.79	3.68	2002 I
85.2	83.1	4.3	3.5	7.4	-0.8	2.7	2.3	40.0	-1.8	2.70	5.37	3.42	II
85.4	83.3	4.6	3.0	1.9	2.7	3.2	2.5	2.8	-1.5	2.83	4.92	3.25	III
84.8	82.4	3.5	2.0	4.9	4.6	3.3	3.6	20.4	-4.0	2.63	4.88	3.33	IV
85.5	82.8	5.2	3.6	6.4	1.4	2.9	2.4	82.0	14.1	3.14	5.13	3.08	2003 I
83.7	80.6	-1.9	-	-2.1	1.1	3.0	0.3	-17.4	14.8	3.07	4.37	2.99	II
83.5	79.8	2.0	1.5	3.7	1.3	3.2	2.3	0.6	20.8	2.58	4.64	3.08	III
84.9	81.9	1.8	2.5	1.4	0.2	2.3	1.6	17.6	19.5	2.57	4.66	2.79	IV
84.8	81.5	1.7	1.1	4.0	1.7	2.8	2.7	45.3	38.9	1.98	4.33	2.39	2004 I
85.6	83.0	3.4	1.7	5.0	1.2	-0.3	2.5	36.7	34.4	2.01	4.83	2.37	II
86.6	84.8	1.0	1.5	3.2	-0.2	1.8	1.0	5.4	1.5	2.45	4.58	2.32	III
86.3	84.4	3.0	2.0	1.7	2.6	2.1	2.7	13.7	-15.7	2.47	4.39	2.11	IV
86.2	84.8	1.0	1.6	1.4	2.6	2.6	2.4	16.3	25.6	2.56	4.39	2.08	2005 I
85.7	83.8	2.8	1.4	2.8	2.9	2.6	2.5	23.7	-1.2	2.48	3.81	1.87	II
86.1	84.1	3.9	1.4	6.6	2.7	2.9	2.7	62.5	-10.2	2.86	3.94	1.64	III
86.3	84.7	1.4	2.0	5.5	3.7	1.6	2.0	27.7	14.0	3.37	3.93	1.44	IV
								-27.0	28.6	3.86	4.23	1.59	2006 I
		0.8	1.9		3.7			-27.0	28.6	3.86	4.23	1.59	
		0.3	0.2		1.0			7.2	2.3	2.56	4.39	2.08	2005 M
		0.4	0.1		-0.1			1.6	-1.0	2.45	4.14	1.92	A
		-0.1	0.1		-0.4			-5.2	-3.0	2.46	4.02	1.86	M
		0.2	0.2		0.5			5.5	0.1	2.48	3.81	1.87	J
		0.3	-		0.4			1.5	-2.1	2.59	3.91	1.93	J
		0.4	0.2		-0.3			8.6	-0.1	2.72	3.78	1.73	A
		0.8	0.2		0.8			9.7	1.3	2.86	3.94	1.64	S
		-0.3	0.2		-			1.1	0.2	3.06	4.16	1.70	O
		-0.1	0.2		0.6			-9.3	1.7	3.31	4.06	1.65	N
		0.2	0.2		0.2			8.8	3.3	3.37	3.93	1.44	D
		0.5	0.2					-6.7	2.8	3.47	4.11	1.54	2006 J
		-0.3	0.2					-4.2	1.2	3.72	4.10	1.44	F
								-1.2	-0.1	3.86	4.23	1.59	M

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

A2 (Continued)

	Year, quarter, and month	Government surplus or deficit (-) on a national accounts basis (as a percentage of GDP)		Balance of payments (as a percentage of GDP)		U.S. dollar, in Canadian dollars, average noon spot rate
		Government of Canada	Total, all levels of government	Merchandise trade	Current account	
		(28)	(29)	(30)	(31)	(32)
	1993	-5.5	-8.7	1.8	-3.9	1.2898
	1994	-4.6	-6.7	2.6	-2.3	1.3659
	1995	-3.9	-5.3	4.4	-0.8	1.3726
	1996	-2.0	-2.8	5.1	0.5	1.3636
	1997	0.7	0.2	2.9	-1.3	1.3844
	1998	0.8	0.1	2.6	-1.2	1.4831
	1999	0.9	1.6	4.3	0.3	1.4858
	2000	1.9	2.9	6.2	2.7	1.4852
	2001	1.1	0.7	6.4	2.3	1.5484
	2002	0.8	-0.1	5.0	1.8	1.5704
	2003	0.1	-	4.7	1.5	1.4015
	2004	0.6	0.7	5.1	2.2	1.3015
	2005	0.4	1.7	4.9	2.2	1.2116
Annual rates	2002 I	0.6	-0.5	5.5	2.7	1.5946
	II	0.7	-0.2	4.8	2.0	1.5549
	III	0.7	-0.2	4.9	1.5	1.5628
	IV	1.1	0.5	4.7	1.2	1.5698
	2003 I	0.7	0.5	5.2	1.5	1.5102
	II	-1.1	-0.6	4.0	0.8	1.3984
	III	0.3	-	4.9	1.8	1.3799
	IV	0.3	0.1	4.7	1.9	1.3160
	2004 I	0.2	0.1	5.1	2.1	1.3179
	II	0.2	0.5	5.9	3.0	1.3592
	III	0.9	0.8	5.1	2.2	1.3072
	IV	1.1	1.3	4.4	1.6	1.2203
	2005 I	-1.2	1.3	3.9	1.3	1.2267
	II	0.8	1.5	4.1	1.5	1.2439
	III	0.5	1.7	5.2	2.2	1.2012
	IV	1.4	2.4	6.2	3.8	1.1733
	2006 I					1.1547
Last three months						1.1547
Monthly rates	2005 M					1.2161
	A					1.2360
	M					1.2555
	J					1.2402
	J					1.2227
	A					1.2040
	S					1.1776
	O					1.1776
	N					1.1811
	D					1.1610
	2006 J					1.1573
	F					1.1489
	M					1.1574

Notes to the Tables

Symbols used in the tables

R Revised

– Value is zero or rounded to zero.

Note:

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

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

A1

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

A2

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

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

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

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

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

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

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

(7) Total business credit (Table E2)

(8) Consumer credit (Table E2)

(9) Residential mortgage credit (Table E2)

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

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

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

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

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

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

(17) Consumer price index (Table H8)

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

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

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

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

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

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

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

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

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

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

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