
**Remarks by David Longworth
Deputy Governor of the Bank of Canada
to the World Hedge Funds Summit
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The Canadian Economy and Financial Markets in Perspective

Good morning. It's a pleasure to join you at this important gathering.

The hedge fund industry has been growing so quickly that meetings like this one are welcome—they provide a chance to step back and look at context and trends. And that's what I propose to do this morning. Specifically, I'd like to speak about volatility in both the real economy and in financial markets and discuss how it has been affected by monetary policy and financial innovation.

Of course, there's money to be made from the volatility of financial assets. Hedge funds, like other financial market participants, try to profit from price movements. Hedge funds are also a source of financial innovation and market liquidity. From the perspective of a central banker, I can say that on balance, at most times, hedge funds make markets more liquid and efficient. And in all likelihood, this has contributed to reducing financial volatility, at least in some important markets.

In Canada, as in other parts of the world, there has been a significant decline in macroeconomic volatility since the early 1980s. Over roughly the same time period, there has also been a reduction in the volatility of fixed-income markets. On the other hand, we have not seen a parallel decline in the volatility in the prices of other assets such as equities and housing, which, as Kenneth Rogoff and others have noted, raises some interesting questions.¹

This morning I'd like to look at these trends and discuss some of the factors—especially monetary policy and financial innovation—that have been driving them. But first, I think it would be useful to explain in what sense volatility matters, and where the interest of the public and the central bank lies. I'll leave time at the end of my remarks for comments and questions.

Why volatility matters

Central banks value stability. The Bank of Canada's ultimate goal is to contribute to the maximum economic growth that can be sustained over time, and thus to rising living standards for Canadians. The best way to achieve this goal, we've learned from experience, is to keep

¹ See, for example, Kenneth Rogoff. 2006. "Impact of Globalization on Monetary Policy." Available at <http://www.kc.frb.org/publicat/Sympos/2006/pdf/rogoff.paper.0829.pdf>

inflation low and stable. Low and stable inflation not only helps to mitigate fluctuations in production and employment, but also allows output levels to reach their sustainable maximum.

While central banks are best known for their monetary policy work, we also have a very large stake in the stability of the financial system. Importantly, financial *instability* can take a serious toll on the economy. During the Asian crisis of the late 1990s, for example, financial instability led to large declines in real output in a number of countries, as banks failed and there was contagion across the region. When financial markets are excessively volatile, investment decisions are more difficult to make, risks are harder to assess, and business investment in plant and equipment is inhibited. Central banks also value financial stability because monetary policy is transmitted through the financial system. As a participant in the financial system, the Bank of Canada relies on efficient markets to effectively transmit changes in its policy rate through the economy.

I should clarify what kinds of financial volatility are of concern to a central bank. Generally speaking, prompt adjustment in the prices of assets to new information is to be expected. Most of the time, these changes reflect the appropriate pricing and transferring of risk as circumstances change. When prices do *not* accurately reflect changing circumstances, however, resources are likely to be misallocated and efficiency suffers. Moreover, when volatility increases sharply in such a situation, and becomes pervasive across financial markets, the financial *system* can become impaired. That is, it becomes less capable of enabling price discovery, allocating credit, transferring risk, settling claims, or providing market liquidity. If the financial system were to lose any of these capabilities because of excessive volatility, the Bank of Canada would be concerned, mainly because of the potential for detrimental economic consequences. As a central bank, we tend not to worry about financial volatility for its own sake, but about the potential financial instability and economic cost of excessive financial volatility.

So, in a nutshell, both macroeconomic and financial stability are needed to sustain maximum economic growth over the long term. Excessive volatility in either economic or financial variables can exact a toll on the economy.

Let's turn now to what's been going on in the macroeconomic landscape over the past few decades.

Trends in Macroeconomic Volatility

In 1991, the Bank of Canada and the federal government introduced an explicit inflation target—the most significant change in Canadian monetary policy in many years.

In addition to helping achieve the important end goal of low and stable inflation, the inflation target has entailed three additional benefits. First, success in achieving the target has *anchored* inflation expectations, which in turn helps to keep inflation low and to stabilize the economy. Second, an explicit inflation target has made the central bank more accountable, since it provides a concrete objective to account for. Third, this accountability for a clear target has in turn encouraged the central bank to be more transparent in its operations and communications. I'll elaborate on the role of increased transparency later in my remarks.

Since 1995, the inflation target has been the 2 per cent midpoint of a 1 to 3 per cent control range. And since that time, inflation has, in fact, been close to 2 per cent. I think this chart tells a clear and interesting story.

Chart 1: Inflation since 1975 and the inflation control range since 1991.

As you can see, inflation in Canada was high and variable in the 1970s and early 1980s, and then declined in the mid-1980s and again after 1991. CPI inflation averaged 8.1 per cent from 1971 to 1980, 6.0 per cent from 1981 to 1990, and 2.1 per cent from 1991, when the inflation target was introduced, to the present. I should add that many other countries have also seen a sustained decline in inflation over the past decade and a half.

In Canada, the variability of inflation, measured by its standard deviation, declined in tandem with the rate of inflation. This pattern of declining volatility was equally true for core inflation and other underlying measures of inflation.

Low, stable, and—I should emphasize—*predictable* inflation tends to support sustainable economic growth. Let me elaborate on this idea by pointing to three of the macroeconomic benefits that accrued in the 1990s as inflation declined and stabilized close to the 2 per cent target. First, owing to greater certainty about the inflation outlook, there was a decline in the variability of relative wages, and thus a better allocation of labour. Second, we saw longer labour and financial contracts, with lower transaction and bargaining costs for firms and households, and a reduction in time lost to labour disputes. Third, there was a reduced need for individuals and businesses to protect themselves from unexpected inflation, resulting in a more appropriate allocation of resources.

Now let's look at output.

Chart 2: Quarterly GDP growth: 1981 to 2006

One of the most noteworthy macroeconomic stories in recent years has been a significant reduction in the variability of output across most G7 countries, a trend that has come to be called the "Great Moderation."

In Canada, the data show that the variability of quarterly real GDP growth declined from the 1980s to the 1990s, and has remained low this decade. Note that the chart shows output growth itself, not its volatility. And I should add that this decline in volatility is actually further progress in a significant, long-term decline in the volatility of GDP that has taken place—with a few interruptions—since the 1920s.

In the past 25 years, we've also witnessed lower variability in the *output gap*—the difference between actual output and the economy's capacity to produce in a sustainable fashion—and in the unemployment rate. Overall, the business cycle appears to have become less pronounced and, since 1991, Canada has avoided a recession.

What's been driving this reduction in the variability of output? Some research has emphasized the increased competition that has come with globalization, and improved inventory control, particularly in the durable goods industries. It's also likely that improved financial products for

households have played a role, allowing for smoother growth in consumption. But a key factor has been better monetary policy—the monetary policy that has delivered the low and stable inflation we’ve experienced since the early 1990s.

I’ll turn now to trends in financial volatility over the same period.

Trends in Financial Volatility

Here, we could start with a question: To what extent has the decline in macroeconomic volatility over the past 25 years been matched by a decline in financial volatility? The answer is that it depends on which market we look at. In brief, the volatility of fixed-income markets has declined significantly, but the volatility of other financial assets has not.

The decline of volatility in fixed-income markets is what economic theory would predict. A reduction in the level and variability of inflation should lead to lower interest-rate volatility, especially further out the term structure. As well, an economy in which output is less volatile should tend to have lower interest rate volatility.

Let’s look at the volatility of 90-day commercial paper rates since 1981.²

Chart 3: Volatility of 90-day prime corporate paper

From the early 1980s to the early 1990s, volatility at the short end of the market fell by more than half. Since 1995, when the Bank began targeting inflation at the midpoint of a 1 to 3 per cent inflation-control range, volatility for short-term interest rate instruments has fallen further, and since the late 1990s, it has remained in a historically low range.

I should add that although the decline in the volatility of short-term rates was almost certainly driven by the decline in the level and the variability of inflation, the most recent period was also likely influenced by changes in the way the Bank implements monetary policy. I’m referring to increased transparency and improved communication, which, all else being equal, should mitigate interest rate volatility. Since introducing an inflation target, the Bank of Canada has become increasingly open and transparent about its views in its *Monetary Policy Reports and Updates*, press releases, and speeches.

At the end of the year 2000, the Bank introduced “fixed announcement dates.” That is, we started to make our policy rate announcements eight times a year on a fixed schedule. This schedule has reduced uncertainty in financial markets about the timing of policy actions, and has helped to direct attention to the medium-term perspective of monetary policy. This focus has in turn allowed us to more effectively communicate our views on the future path of inflation. Of course, reduced market uncertainty should, in principle, lead to a decline in volatility. And the focus on macroeconomic fundamentals over the medium term helps market participants and the public to

² Volatility here refers to the second moment of the distribution of financial returns. The volatility of returns in Charts 3 to 6 has been computed using the exponentially weighted, moving-average-of-squared-returns methodology suggested by RiskMetrics. Returns for equities are calculated as the log difference in the level of the S&P/TSX Composite Index. Returns for bonds are approximated by multiplying the negative of the duration of the bond by the change in the benchmark bond’s yield to maturity. Returns for commercial paper are calculated as the log difference of the price of the instrument, which is calculated as the inverse of one plus the commercial paper rate.

better understand the Bank's assessment of the balance of forces that affect inflation in Canada and hence to anticipate the direction of monetary policy. Our research tends to confirm that the fixed announcement date process has, in fact, enabled financial markets to better price fixed-income instruments.³

Now, let's look at volatility at the longer end of the market.

Chart 4: Volatility of Canadian 10-year bonds

The volatility of the returns for benchmark Government of Canada 10-year bonds has also declined substantially over the period, as is evident in the chart. The past two years have been marked by sustained low volatility. Lower interest rates and reduced volatility have certainly benefited Canadian borrowers, and, by extension, improved the investment climate.

Chart 5: Volatility of Canadian and U.S. 10-year bonds: 1982-2006

Although both U.S. and Canadian 10-year benchmark bonds show a trend decline in volatility since the early 1980s, in the past six years or so, the volatility of Canadian 10-year bonds has been lower than that of their U.S. equivalent. The explicit inflation target in Canada may well be anchoring inflation expectations here more strongly than in the United States. Improved Canadian fiscal policy since the mid-1990s has also played a role in the relative decline in volatility in Canada, as the upside risk to the future path of the debt-to-GDP ratio has diminished.

However, when we turn to other asset markets—particularly equities, but also house prices and currency—we don't see any significant trend decline in volatility. The fact that there has not been a significant downward trend in stock market volatility or in the volatility of other financial assets—against a backdrop of lower macroeconomic volatility—is a bit of a puzzle. Let's look at the volatility of the Toronto Stock Exchange.

Chart 6: Volatility of the S&P/TSX Composite Index: 1981-2006

As you can see, there is no clear trend in the volatility of the S&P/TSX composite index over the past 25 years, although the past two years, on average, do show a reduced level of volatility. This recent decline in volatility has also been seen in the equity indexes of many other countries.

But as the chart shows, Canada has experienced similarly low levels of stock market volatility in the past, only to see it rebound to the high levels previously experienced. The recent decline in stock market volatility *may* presage a longer period of reduced volatility—but it's too early to

³ Research on the effect of the fixed announcement date process includes: Nicolas Parent (2002-2003, "Transparency and the Response of Interest Rates to the Publication of Macroeconomic Data," *Bank of Canada Review* [Winter 2002-2003] 29-34), who discovered that the publication of Canadian macroeconomic data has had a greater impact on Canadian short-term interest rates following the introduction of fixed announcement dates; Grahame Johnson (2003, "Measuring Interest Rate Expectations in Canada," *Bank of Canada Review* [Summer 2003] 17-27), who found that current money-market yields have become better predictors of future overnight interest rates; and Jason Andreou (2005, "Estimating the Impact of Monetary Policy Surprises on Fixed-Income Markets," *Bank of Canada Review* [Summer 2005] 11-19), who showed that there have been fewer surprises in target overnight interest rates, and that the impact of any surprise in the target interest rate on longer-term interest rates has diminished.

tell. In fact, as Kenneth Rogoff points out in a recent paper, a decline in short-run business-cycle volatility may *not* necessarily lead to a decline in asset-price volatility.⁴ Equity returns, he points out, should depend on long-run expected growth and volatility, and long-run expected volatility—that is to say, uncertainty about long-run growth rates—does not necessarily diminish in proportion to reductions in business-cycle volatility. Moreover, lower interest rates and lower risk premiums may make prices for long-term assets, such as stocks and housing, more sensitive to perceived changes in both risk and in the path of future interest rates, thus making these prices more variable. This possibility may, in fact, offset any reduction in financial market volatility that would otherwise stem from reduced macroeconomic volatility.

So far, I've focused on the impact that monetary policy and the decline in macroeconomic volatility has had on the volatility of bond markets. But other structural factors in financial markets have also affected financial market volatility.

Financial Market Structural Factors Affecting Volatility

Over the past 25 years, and especially in the past decade, we've seen a good deal of financial and technological innovation in financial markets. This innovation can, over time, help to increase efficiency and reduce volatility. Let me mention four aspects that are likely to prove important.

First, innovations in electronic trading and in back-office systems have resulted in lower trading costs and increased price transparency and competition, and, in the end, resulted in greater liquidity. Debt and equity markets have seen sharp rises in turnover. Increased market liquidity tends to place downward pressure on volatility—prices become less sensitive to large transactions and absorb news more easily. Trading in Government of Canada bonds, to take one example, is at an all-time high, and bid-ask spreads on these bonds are the narrowest ever experienced.

Second, we've seen important improvements in risk management at banks and other financial institutions. Substantial progress has been made in identifying and controlling the concentration of exposure to specific risks, especially market risk and credit risk.

Third, the introduction of derivative instruments, such as credit derivatives, has allowed a better distribution of risk across the system, as well as better risk management by institutions.

And fourth, there's been an increased use of active arbitrage strategies by a growing number of players, which brings me back to hedge funds. As I said earlier, hedge funds have had a largely positive impact on the efficiency of financial markets in Canada. But before I elaborate on this, I would like to step back and say a few words about the concerns that hedge funds could potentially pose for a central bank.

Given our role in promoting financial stability, it would be fair to say that any concerns we might have about the impact of hedge funds would stem largely from our concern about *systemic* risk. Potential concerns fall into two main categories.

⁴ Rogoff, *op. cit.*

First is the possibility that hedge funds could simultaneously implement similar investment strategies that exacerbate movements of prices away from fundamentals, potentially leading to financial problems for other investing institutions. However, the increasing number of good-sized hedge funds that employ different investment styles or strategies—including styles that assume that prices will return to fundamentals—is an important mitigating factor in this regard. In other words, the world is very different than it was at the time of the Long-Term Capital Management (LTCM) crisis in 1998.

A second potential concern is that counterparties could become overexposed to hedge funds. In their prime brokerage businesses, the banks are directly exposed to hedge funds. If several large hedge funds experienced simultaneous losses stemming from moves in market prices, the banks might suffer significant credit losses. And these losses could lead to a rise in systemic risk and, perhaps, a crisis characterized by a blurring of market, credit, and liquidity risks, all magnified by leverage. Prime brokers are now much more aware of the risks than at the time of LTCM, and are carefully monitoring their risk exposures. Moreover, banking supervisors around the world, including the Office of the Superintendent of Financial Institutions here in Canada, are well aware of the need to stay on top of the banks' risk-management practices in this area.

Potential systemic concerns continue to be monitored by central banks and other public-policy institutions, and there appears to be no reason to sound the alarm on these concerns at this time because of the mitigating factors that I've mentioned.

Another issue of broad interest relates to investor protection. It concerns the disclosure practices of hedge funds, as well as disclosure related to hedge-fund-based investment products, particularly those sold to retail investors. This important issue is being examined in Canada by the provincial securities commissions.

Overall, then, given the Bank's strong interest in promoting the efficiency and stability of the financial system, our focus with regard to hedge funds is the systemic nature of any risk. When it comes to supervision and investor protection, we rely on other bodies. Having said that, let me quickly add that it is important for all these agencies to share information effectively, something we strive to do in Canada.

So, how do hedge funds benefit financial markets? First, it's useful to note that the largely positive influence of hedge funds stems from their sophistication, their size, the diversity of their objectives and strategies, and the instruments they use.

Hedge funds add to the depth and liquidity of Canadian financial markets. And the ability of hedge funds to use leverage and their tendency to actively trade greatly amplifies their presence in the markets, and further adds to liquidity. Moreover, the variety of arbitrage strategies and instruments employed by hedge funds not only makes markets more complete, but also makes prices more reflective of underlying fundamentals. These prices in turn provide better signals for others to act upon. And of course to the extent that an investment decision is actually a *hedge*, risks become more effectively managed. The overall effect of increased liquidity and more effectively managed risk should, in principle, be lower volatility.

Now, by their very nature, these structural factors would tend to have an enduring impact on the reduction of volatility. Cyclical factors, however, may also have played a role in reducing the

volatility of equity markets—and possibly fixed-income markets as well—in the past couple of years. This suggests that at least part of the decline may be reversed in the future. As a recent BIS paper points out, “to the extent that cyclical factors played a role in containing volatility, some increase should be expected in the event of a [possible] slowdown in the global economy.”⁵

In plain English, we’ve seen robust growth in the global economy in recent years. Volatility typically rises at turning points. If growth in the global economy were to slow appreciably, we would likely see increased uncertainty and a rise in financial market volatility.

All this to say that it is too early to know the extent to which the effects of lower macroeconomic volatility and financial innovations will endure, and whether the recent decline in stock market volatility is the beginning of a trend in markets outside of fixed income, or whether it is largely due to cyclical factors.

Conclusion

Volatility is a fact of life in both the real economy and financial markets. But a reduction in the variability of output, inflation, and interest rates is generally to be welcomed. What is still unclear is whether we will see further declines in the volatility of rates on long-term bonds and of equity prices as markets adjust to the decline in macroeconomic volatility that we have already seen, and as financial innovations and technological improvements continue to be introduced and adopted.

What you *can* be sure of is the Bank of Canada’s commitment to low and stable inflation and to promoting the stability and efficiency of the Canadian financial system. Lower macroeconomic volatility has been hard won and has helped to sustain steady economic growth.

I’d be happy now to respond to your questions and comments.

⁵ BIS Paper No. 29. August 2006. “The recent behaviour of financial market volatility.” Available at: <http://www.bis.org/publ/bppdf/bispap29.pdf>