

# Opaqueness to transparency: the Bank of Canada's financial data strategy

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## 1. Introduction

*"Investments in financial data and the systems that support these data will enhance our research and analytic capabilities in the monetary policy, financial system, and funds-management functions."* Bank of Canada (2006)

The Bank of Canada is increasingly constrained in its ability to analyse and research issues related to its economic functions owing to limits on the availability and quality of financial data. Consultations with other central banks and a review of the literature indicate there is general agreement that existing data are not sufficient for the purpose of analysing financial stability and efficiency.<sup>2</sup> Indeed, most are at an early stage in setting up a financial data framework. For instance, more detailed information is required on balance sheet positions, on asset prices, and on indicators of liquidity of financial markets (Van den Bergh (2005)).

This paper documents a strategic medium-term plan for strengthening the collection and use of financial data by the Bank of Canada. It articulates the need to develop financial databases, and discusses various ongoing initiatives. The Bank has shown leadership in the field of financial statistics in recent years by actively promoting discussions, surveys and research, both within Canada and among other central banks, in determining how best to develop an appropriate data framework.<sup>3</sup> These preliminary steps were important before embarking on a new direction for the Bank.

The data strategy aims to provide a more complete picture of financial developments. This would allow us to describe and analyse financial change better and so contribute to the many forms of policymaking. Recent events in the global financial market emphasise the need for a comprehensive approach. Given the Bank of Canada's expertise in analysing the financial landscape, it has a comparative advantage in determining priorities for the development of related databases.

The primary objective is to redesign and enhance the Bank's securities database. Besides providing valuable information for policy and related advice, these data are used to estimate Canadian business credit published on the Bank website, sent to international organisations (the BIS, IMF and OECD), and are a primary source for Statistics Canada's Balance of Payment statistics. Other strategic elements include: building a Bank-wide data repository, signing a Memorandum of Understanding with Statistics Canada, and filling identified household data gaps.

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<sup>2</sup> See Davis (1999); O'Reilly (2004); Haymes and O'Reilly (2005a, b); White (2004); Stevens (2005); Smith (2005); St-Amant, Gauthier and Bandt (2008).

<sup>3</sup> In recent years, Bank staff has led several statistical developments at the international level through work related to the Bank for International Settlements (BIS), the Irving Fisher Committee (IFC), and the International Statistical Institute (ISI). Staff initiated two BIS surveys of central banks, published three papers in the *IFC Bulletin* and one *IFC Working Paper*, presented and discussed papers at IFC and ISI conferences, and hosted the first IFC joint event in June 2005.

This paper is organised as follows. Section 2 identifies benefits to financial policies and other strategic considerations. Section 3 envisions a target data environment modelled on the Bank's needs. Section 4 provides a broader context to the strategy. Section 5 details our learning from the experience of others in enhancing financial data. Section 6 discusses ongoing Bank initiatives to strengthen the collection and use of financial data. Section 7 concludes and emphasises the need to act in this area.

## 2. Motivation

Why did the Bank of Canada feel the need to develop a strategic plan for financial data? The Bank's vision for fulfilling its responsibilities is to be second to none among the world's central banks (Bank of Canada (2006)). Among other things, it means allocating resources to the highest-value-added activities, and, in the case of the plan for financial data, providing a clearer picture of financial developments in the economy. In view of the fact that policymakers, and those who advise them, face major challenges in their ongoing efforts to achieve the degree of understanding required for their work.<sup>4</sup>

In an ever-changing world, the Bank faces all kinds of unpredictable challenges, both large and small, as do most organisations. Being mindful of and proactive to these changes is a mark of a strong organisation (Coutu (2003)). The Bank has been active in responding to changes in the macro environment. For instance, in the context of accelerated globalisation and technological innovations, capital flows impacting the financial sector bring with them increased risks. In recognition of these risks, a key objective for the Bank is to promote the safety and efficiency of the financial system. Attention has also been focused in recent years on ensuring that the Canadian financial system has a proper framework to compete globally.

### 2.1 Strategic outcomes

Databases are a derived demand stemming from a central bank's responsibilities (Dodge (2003)). When mandates are changing there can be substantial uncertainty as to what the next set of important questions will be and, hence, what data will be needed to support it. Since the Asian crisis of the mid-1990s, many central banks have increased resources and the rigour of their analysis on potential threats to their financial systems as their responsibilities have shifted to focus more on the systemic risks involving the financial sector of the economy. In particular, the Bank undertakes extensive research on the financial system, and twice a year, updates Canadians on new developments, issues, and research in its *Financial System Review*.

High-quality data provide the foundation for sound analysis. However, a comprehensive database does not exist for the Canadian financial system. Data are neither as complete – through time and across instruments – nor as centralised or of consistent quality as is needed. Long periods of macro data, such as data in the System of National Accounts, are readily accessible from sources like Statistics Canada.<sup>5</sup> But neither these data nor the micro

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<sup>4</sup> Particularly with respect to work to support the Bank's policy advice on legislation, regulations, and practices affecting financial institutions, financial markets, and financial infrastructure arrangements.

<sup>5</sup> It should be noted that the Financial and Wealth Accounts at Statistics Canada provide a consistent macro database on the Canadian financial system. The integrated system of accounts provides a framework within which financial transaction balances of sectors of the economy may be examined and related to aggregate income and expenditure accounts. This allows for some broad insights into the basic structure of financial markets, and the financing of economic activity.

data from regulatory agencies like the Office of the Superintendent of Financial Institutions were specifically designed for addressing the types of questions arising on the financial system. Improving access to better data on the financial system and its participants will aid the Bank in its efforts to ensure a strong Canadian economy.

The remainder of this section will discuss the importance of the financial system to an economy and the various outcomes and motivating factors for the financial data strategy.

A well functioning financial system is important for several reasons:

- Financial markets play an increasingly important role as a source of capital.
- The financial system helps to ensure an efficient allocation of savings and capital, and hence sustained and robust growth. By helping firms – one of the main building blocks of the economy – to grow, the performance of the financial system is directly linked to an economy's health.
- The financial system plays a key role in the transmission of monetary policy actions to the economy. To the extent that the system does not function well and is relatively inefficient, a central bank's ability to provide for monetary stability is diminished.
- The financial system consists of various participants and a disruption in one can cause instability in the others as well as the economy as a whole.
- More and more individuals have a significant portion of their wealth linked to financial markets, either directly through stock ownership or indirectly through mutual funds and pension funds.

Four main outcomes are envisioned by the financial data strategy. In general, these outcomes represent better Bank policy to contribute more effectively to the economic wellbeing of Canadians. These outcomes are:

1. Better policy with respect to the stability of the financial system, leading to less of a downside risk on economic output.
2. Better policy with respect to the efficiency of the financial system, leading to a higher level of output through a better allocation of resources.
3. Better monetary policy leading to lower macroeconomic volatility and possibly a higher average level of economic output.
4. Better funds management policy leading to more cost-effective management of the government's debt and foreign exchange reserves.

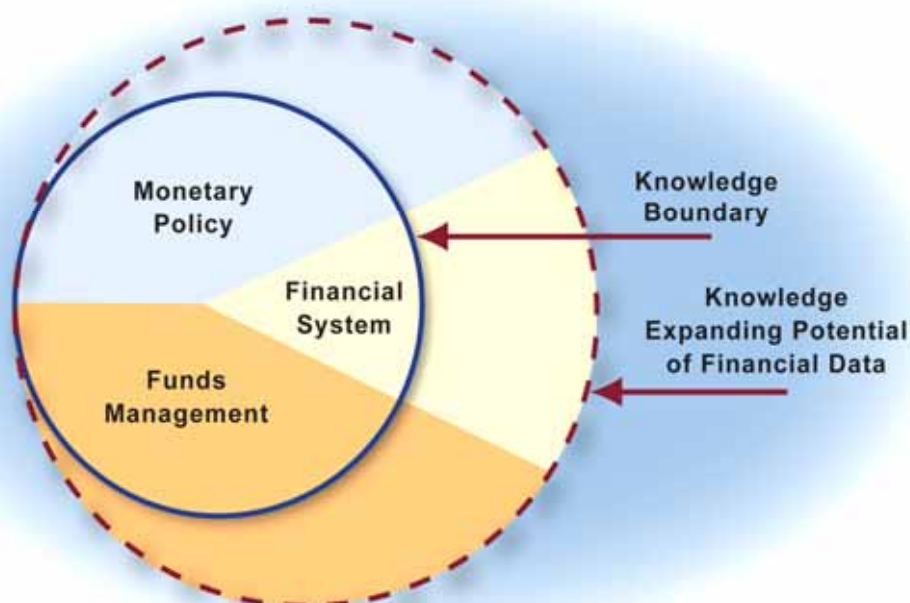
As illustrated in Figure 1, improved financial data are expected to provide the Bank with additional information needed to extend its understanding of important issues related to three key functions. More specifically, these data are primarily envisioned to target issues in the financial system, where the breadth and depth of our knowledge is relatively weaker, but also have obvious uses for addressing monetary policy and funds management objectives.<sup>6</sup>

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<sup>6</sup> Former Federal Reserve Board Chairman, Alan Greenspan, said, "I suspect greater payoffs will come from more data than from more technique". (Greenspan (2001))

Figure 1

## Expanding the Bank's Knowledge Boundaries: Financial Data



There are still some questions regarding the Bank's role in the promotion of financial stability. Similarly, there is considerable uncertainty with respect to how – and how well – the financial system is currently functioning. The improvement of financial data is a necessary step in examining the system, as well as understanding better the vulnerabilities arising in the household and business sectors. Once better defined and supported by the right data, financial system policy designed to improve stability and efficiency can promote a more efficient allocation of resources, less volatility and greater certainty, yielding a higher level of aggregate output.

Improved financial data will also support the Banks' monetary policy and funds management functions. The Bank, along with other central banks, is converging on the "best" linear aggregate model of the economy for use in monetary policy. However, there is the potential to improve monetary policy by moving beyond the linear model to more complex non-linear models with heterogeneous agents (firms and households) based on disaggregated data. Funds management policy is likely to benefit the least from new financial data. However, improvements are possible. A better understanding of the drivers of the government yield curve, that is, the pricing of government bonds and bills, and the functioning of these markets can help to improve the management of public debt. More detailed pricing information on a broad class of assets is necessary for the construction of an optimal portfolio selection model for the Exchange Fund Account.

On the external front there are three prominent drivers:

- **A rapidly evolving financial landscape** – The challenge of remaining up-to-date on developments in the financial world has never been greater – or more critical – for central banks. New industry trends and products are changing the way

businesses operate and structure themselves. A broadening and deepening of international capital markets continues to transform the manner in which commerce is conducted and, as financial markets become more globalised, the risks faced by domestic agents and the economy are more complex and external than ever before (Schembri (2005)). In response, there is a need to develop better policies (eg financial sector regulation reform), and ensuing demands for better sources of information. For example, the IMF is developing Financial Soundness Indicators, and several central banks are working with data providers to improve available financial data (Haymes (2008)).

- **Demand for comparability** – As globalisation and convergence continue, viewing and comparing financial statistics across countries and institutions is likely to increase. The ECB’s securities data are shared with several European central banks, and the BIS Data Bank continues to categorise and disseminate timely macro data. Several countries are taking an integrated approach to data collection activities, whereby agreements have been made (or legislation changed) to share information between statistical agencies and the central bank. More thought is being given to formal financial data exchanges between central banks as they begin to grapple with the challenges of what is required and how to assemble the information.
- **The need for micro data on households and firms** – Central bankers, academics, and other major users of financial data are placing a premium on the availability of various types of micro data. Whereas two decades ago central banks’ data focus was on monetary policy purposes, a more institutional approach is coming to the fore, along with demands for micro data, market flow and pricing information. The growing importance of the financial system for several central banks has driven these developments. With the added pressure of a rapidly evolving financial data environment, there is an increasing tendency for central banks to centralise data management as well as accommodate future growth in this area.

## 2.2 Effect on research, analysis and data management

The development of detailed, timely and relevant financial databases will result in:

1. Better research, in all three Bank functions, to understand the role played by financial factors in the economy;
2. Better analysis feeding into broad policy, as well as the *Financial System Review*, *Monetary Policy Report*, the Fixed Action Date process and other regular briefings; and
3. Better data management, resulting in easier access, information sharing, contract management and quality assurance (financial data expertise).

Expanding on points 1 and 2, the Bank has long been hampered in addressing a range of questions necessary to build a complete, integrated, analytical financial policy framework. The following questions exemplify the kinds of questions that could be addressed with appropriate data:

- What are the key risks in the Canadian financial system?  
eg Are particular sectors more vulnerable to shocks?
- How stable is the Canadian financial system?  
eg What is the impact of interest rates on the distribution of household debt and the debt service ratio? Does policy affect firms differently across their different dimensions?

- What is the role of financial frictions in the financial system and how does it affect the monetary transmission mechanism?  
eg How have financial “headwinds” affected firms’ behaviour and investment?
- Is the Canadian financial system efficient?  
eg What are the sources of asymmetric information affecting asset prices?

This is only a small sample of the types of questions that the Bank has faced recently that would have benefited from better data. Section 3 contains additional questions.

### 3. Target environment

This section describes the new data environment, one that responds to Bank of Canada needs. It begins with a summary of our approach, followed by the core data items and related drivers.

#### 3.1 Approach

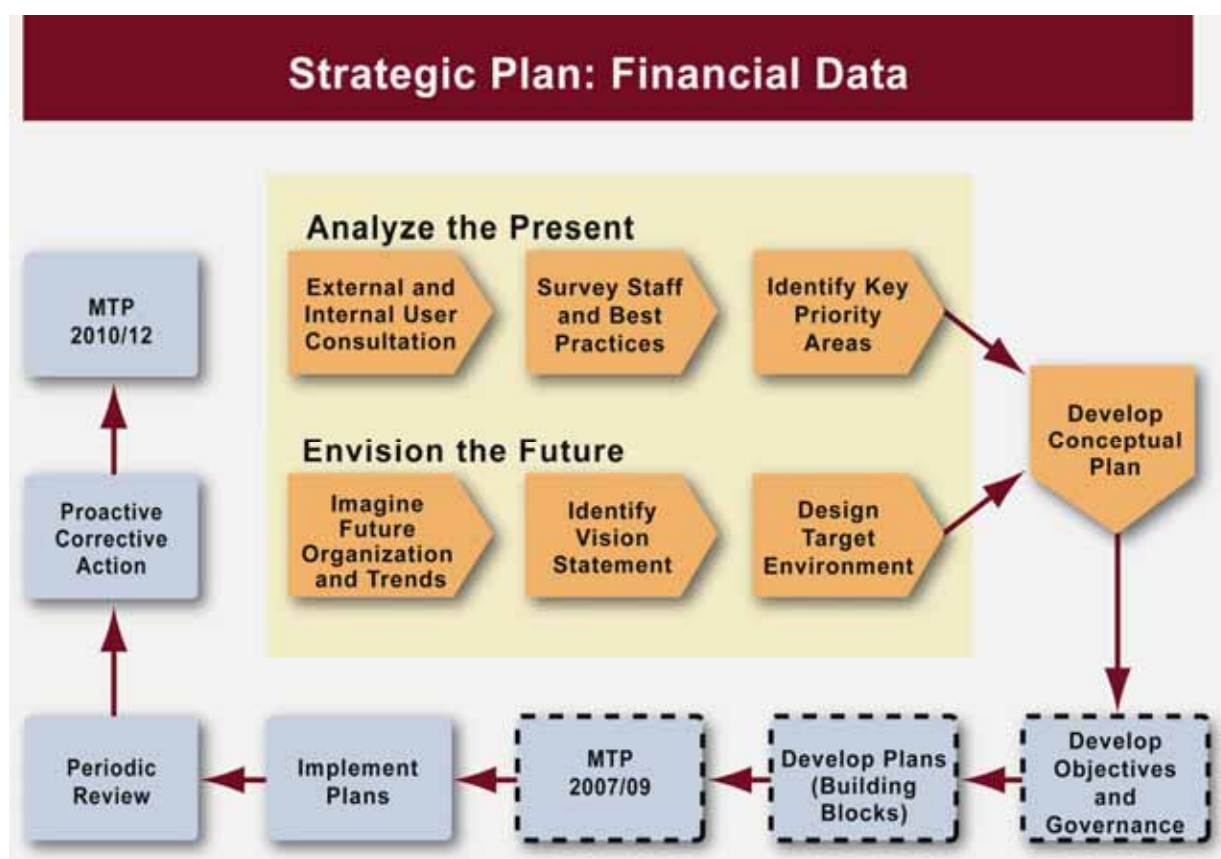
The Financial Data project evolved from a project initiated in late 2001, known as the Capital Markets Database project. The articulation of the need for such data arose in response to questions raised regarding the possibility of a “hollowing out” of Canadian capital markets. From this starting point, the idea of an enhanced capital markets database was broadened to one of information on the financial system. The main reason for this broadened concept was the increasing interest in the stability of the overall financial system, and recognition that existing databases had not been specifically designed to meet the needs of the evolving financial landscape from a financial system perspective.

As the flow chart (figure 2) illustrates, the strategy sets out a conceptual plan for the medium term. The middle boxes indicate work leading up to the plan, ie *analysing the present* and *envisioning the future*, and boxes to the left and bottom indicate future steps:

- ***To analyse the present.*** An extensive consultation process was undertaken to identify Bank data needs (current/future) and priorities, including a survey of senior staff responsible for providing policy advice. Several meetings were arranged with external organisations to determine the extent to which needs overlap.
- ***To envision the future.*** A target environment was designed according to a needs-based model, organisational objectives, data developments at other organisations, and emerging trends. Cost estimates were obtained from Statistics Canada and commercial vendors.

Steps leading up to the Bank’s strategic plan provided considerable insight in terms of how best to approach and achieve the overall vision. Implementation of the various solutions is ongoing (ie obtaining/redesigning databases and creating a governance structure). Part of this work includes continued outreach efforts to interested parties.

Figure 2



### 3.2 Core data items

The core target items include, ranked by priority:

1. Financial instrument data (Capital Markets Statistical System enhanced);
2. Financial statements (linked to debt and equity issuance data); and
3. Household balance sheet data.

The number one-ranked data need is the ability to cross-reference financial instruments with financial statements in a transparent and systematic way. Linkage of this information would allow for a better understanding of financial behaviours and their implications (eg systemic vulnerabilities). In addition, improved data on the household sector are required to study the distribution of household financial characteristics, and to determine how the distribution might change in response to shocks (eg to measure wealth effects and their impact on household consumption/investment /saving behaviour better and to identify the magnitude of risks).

The focus of the target environment is on data that the Bank will begin to collect and analyse over the medium term. Given that datasets are a derived demand, flexibility in evolving the target is crucial, since four or five years from now the Bank could have a different view. In other words, the environment for financial data is expected to evolve over time.

The remainder of this section provides a high-level, outcome-oriented motivation, along with specific questions, for each of the three targeted areas: financial markets, firms and households.

### 3.3 Specific drivers

#### 1. Financial markets

There is a continuing need to gather data on outstanding bonds and equities to construct measures of long-term business credit. This need is currently being met by the Bank's Capital Markets Statistical System (CMSS) – which permits the Bank to produce aggregate data on gross new issues, redemptions and net new issues. Relative to other sources that contain similar data on securities, a main advantage of the CMSS is that there are theoretical economic ideas underlying the data constructs. However, for the most part, these concepts were developed some 20 years ago. For example, it does not incorporate current standards for sector classification (ie the North American Industry Classification System). Furthermore, the CMSS is an old system using outdated and inflexible technology. It is time that the CMSS was updated to combine these data with the issuer's financial statements. Redesigning the CMSS (ie enhance and link its data) will result in:

- A replacement product that is different from the existing product in form, function and benefits;
- An innovative product based on user demands; and
- A long-term product that is accessible, visible and usable.

To date, the main use of CMSS data has been as part of the credit aggregates, reported in the *Bank of Canada Banking and Financial Statistics*, internal reports and elsewhere. Freedman and Engert (2003) is the most recent well known research that used these data to discredit the notion that Canadian credit markets were hollowing out. Current research is using aggregate CMSS data to determine whether it helps to measure important underlying economic developments, and whether it would improve forecasts. These data are also supplied to Statistics Canada, who benchmark them to their annual surveys. Statistics Canada considers CMSS to be the primary source of redemptions and net new issues, and supplies a broad range of capital markets data (issues, secondary transactions, positions and holdings) to the IMF and OECD.

It is important that policymakers have information similar to that available to the financial institutions and market participants being monitored and/or overseen. The existing database is straining under this challenge. Future research involving CMSS data is likely to focus much more on distribution. For instance, questions exist as to whether debt and equity are used differently across different sectors, and over the business cycle. At the broadest level, questions relating to the cost of capital, the functioning of financial markets and the behaviour of participants cannot be explored fully, because of inadequate data.

Based on staff consultations and the general research direction of the Bank, demand for improved CMSS data will increase substantially in the years to come. For example, market microstructure is a relatively new area in financial economics that seeks to explain price behaviour in financial markets by modelling the interaction and trading behaviour of individual market participants. Drivers of such research include: rapid growth of domestic and global financial markets, extensive deregulation, technological changes and management of risk. Hartman and Kwast (2005) discuss how to manage an active research agenda at a central bank, and they indicate that data are an important resource in producing state-of-the-art "micro" financial research.

#### **Questions:**

What sectors are facing higher default risk? How can policies improve the allocation of resources and the capacity to absorb shocks? How has the cost of capital changed across different dimensions over time? What are the incentives and barriers? What are the transaction costs associated with raising capital in Canada? Do firms change their borrowing behaviour over stressful episodes? How are innovative products and services impacting markets?



## **2. Firm**

Researchers are considering a number of different approaches to studying firms' activity. Aggregate data alone are not always sufficient to monitor these risks – subaggregates provide a clearer picture (eg by sector). In addition, firms can become so large or dominant in their sector that they take on systemic importance (eg Nortel and BreX). Improved firm-level data would yield a number of benefits:

- Permit the creation of detailed time series that would link distinct characteristics of individual firms – for example, balance sheet data, credit ratings and industry classification – to the amount and type of securities they issue. This would help deepen our understanding of how markets function.
- Identify financial imbalances to assess the financial situation of businesses. This would facilitate the monitoring of financial system stability, potentially helping to detect problems before they occur.
- Improve our understanding of the sources of innovative financing, and help explain why some asset classes have experienced less development in Canada than elsewhere.
- Facilitate research on the underlying factors of doing business in Canada (eg reporting, tax and legal environment), which affect organisational structure, investment, and financing decisions.
- Allow for a fuller understanding of risk-taking behaviour, and help policymakers make better decisions in times of crisis.

### **Questions:**

Do credit channels work differently in different sectors or for firms of different size? Does the age of a company foster or inhibit change? Does the exchange rate have different implications on debt and equity across sectors and firms? What is the distribution of firm assets? Based on firms' valuations and risk exposures, is there a bubble? What are the changing roles of financial and non-financial institutions in providing financing or sharing risks? Do reporting requirements and taxation issues across jurisdictions, within and outside Canada, create disadvantages? Do sector exposures shift during the business cycle, because of policy, or for other reasons? What kind of protection do firms have against a large shock?

## **3. Households**

High-quality data on the financial condition of the household sector has always been considered a priority for the Bank, owing to that sector's important implications for consumer spending and overall macroeconomic performance within the context of our monetary policy responsibilities. If data on the household sector were available on a more disaggregated and frequent basis, one could study a number of important issues. In recent years, increased attention has been paid to the evolution of household balance sheets in connection with financial stability issues. For example, policies designed to improve the financial stability of systemically or otherwise important institutions need to consider the consequent flow of risks to households and their ability to absorb such risks.

There is also a need for more frequent data with which to identify potential vulnerabilities. Published non-proprietary data (ie those from Statistics Canada) do not allow for the development of a disaggregated picture of the household sector's financial condition – these data are usually several years out of date and do not exist in sufficient detail (eg to derive a Financial Obligation Ratio). Moreover, linkages between financial variables and consumer spending or bankruptcy information are extremely limited in existing sources. These

shortcomings have diminished the Bank's ability to fully evaluate changes in the sector's risk profile, and from identifying potential impacts of policy initiatives.

The lack of timely disaggregated household data also prevents a fuller understanding of the financial behaviour of different household groups and cohorts. This may become particularly important as baby boomers begin to retire in the foreseeable future, thereby leading to changes in future obligations (eg increases in health care costs) and saving patterns (eg to buffer market shocks).

The IMF has indicated that similar gaps are prevalent across other industrialised countries, notably France, Germany, Japan, the Netherlands, the United Kingdom and the United States (IMF (2005)). For example, the Survey of Consumer Finances provides detailed balance sheet data for the United States, but it is available only every three years. Some central banks have begun to take steps to address the gaps. Sweden's central bank has augmented the analysis in its *Financial Stability Report* by presenting data on debt and wealth for households in different income categories (Sveriges Riksbank (2005)).

#### **Questions:**

To what extent are households exposed to a downturn in the housing market (eg a housing bubble)? How volatile are the asset holdings of households and unincorporated businesses? How are savings allocated across the demographics? How will this change in response to a shock or over time? How much does the debt distribution move around? Does it react wildly or smoothly relative to income? Does its reaction to various shocks change dramatically over time? How can certain groups that could be particularly vulnerable best be defined (eg low-income households with significant debt burdens)?

## **4. Broader context**

New information in the past has ultimately changed the way people think and behave. Prior to certain statistical developments, individuals, firms and governments did not have the ability to measure how the economy was performing or transforming. The development of the System of National Accounts (and ultimately GDP), for example, provided governments with a standard tool whereby it can develop macroeconomic policies that react to changes in the economy. Indeed, Canada has been well served over the years by its National Statistical Office. Considered among the best in the world, Statistics Canada continues to fulfil its mandate to "collect, compile, analyse, abstract and publish statistical information" on economic and social issues important to Canadians.

The need for central bankers to develop a financial data framework for financial stability, the financial aspects of monetary policy, and funds management has been well documented both within and outside Canada. In fact, several central banks have undertaken large, multi-year projects to address certain data gaps. Furthermore, often the Bank is expected to have informed views on a wide range of financial developments, which can be difficult without proper data. Placed in this context, it suggests that improved data must be one of the Bank's top priorities in going forward. Taking a longer-term perspective, these data will assist households and firms in two practical ways:

1. **Education:** to gain a clear understanding of financial developments; and
2. **Comparability:** to obtain a better sense of how they measure up to others.

Such a far-reaching data strategy will not be realised overnight; it will take several years to develop a data framework and related statistical concepts.

## 5. Learning from other organisations

### 5.1 Central banks

As mandates evolve, central banks are becoming more proactive in the development of, and access to, financial data:

- **Securities data** – Changes in the financial landscape have prompted an increased interest in security statistics by central bankers, market regulators, financial supervisors and private financial institutions. Central banks in England and Austria and the European Central Bank (ECB) have recently developed (and/or enhanced) security databases. The Bank of England recently introduced a new securities database to deliver more timely and accurate data. The ECB is probably the most advanced in this area, with an ongoing multi-year initiative involving several staff – the Centralised Securities Database is a security-by-security database that may become a universal standard. The IMF and BIS are currently leading a multi-country effort to create a *Handbook for Securities Statistics* that will provide a conceptual framework for the presentation of debt securities statistics.
- **Financial data research capabilities** – There is a growing emphasis by central banks to research and develop data. For example, the ECB created a division within its Statistical Department, the Statistics Development and Coordination Division, with a mission to “strive for an appropriate statistical description of the constantly evolving economic environment in order to contribute to providing the ECB and the general public with high quality statistics”.
- **Active input on statistical standards/practices** – Central banks, as major users and producers of data, are active in discussions involving statistical approaches, practices and standards. For example, the Federal Reserve Bank of New York increased its derivatives data collections in a number of ways to meet international standards, and the ECB is providing direct input in System of National Accounts (SNA) revisions.<sup>7</sup>
- **Household distributional data** – There is recognition of the importance of knowing the characteristics of the distribution across households of liabilities, assets, income and debt service in order to understand the tail of the distribution better. The need for longitudinal data is also evident. For example, the Reserve Bank of New Zealand recently sponsored a new longitudinal household wealth survey.
- **Cooperation with the National Statistical Office (NSO)** – In England, a Service Level Agreement was introduced between the central bank and NSO. In Australia, an outpost officer from the NSO works at the central bank. Some central banks have also been active in changing legislation to gain access to micro data collected by the NSO.

### 5.2 Irving Fisher Committee

The Irving Fisher Committee (IFC) has been instrumental in encouraging cooperation amongst central banks, and has been a strong proponent for advancing financial data

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<sup>7</sup> International statistical standards can be slow to adjust to change. For instance, the SNA 1993 measures the output of financial institutions using the Financial Intermediation Services Indirectly Measured (FISIM), which has been criticised for not calculating output properly, thereby underestimating the true economic contribution of the evolving modern bank. Some suggest central banks should be more proactive when it comes to statistical standards, despite the lack of consensus.

research on a number of fronts. For instance, it publishes data studies by central bankers, surveys its members, and sponsors conferences on various statistical challenges (eg measuring the financial position of the household sector and statistical requirements for analysing financial systems). William White, former Head of the Monetary and Financial Analysis Department of the BIS, and others have pointed out that changes affecting financial stability and financial statistics are often global in nature, and to keep up with these changes more work should be done on the international front to help address issues such as harmonisation, financial innovations and comparability.

In recent years, the IFC has begun sponsoring independent conferences outside of the biannual International Statistical Institute (ISI) conference. Its cosponsored workshop with the Bank of Canada on “Data Requirements for Analysing the Stability and Vulnerability of Mature Financial Systems” (June 2005) was the IFC’s first joint event. Besides providing useful pointers of what financial data are needed, a common theme of the workshop was that “central banks had been innovators in developing better data on the basis of existing sources or statistical exercises, and they would clearly benefit from each other’s experience”, (O’Reilly and Van den Bergh (2005)).

## **6. Moving forward**

The data strategy outlined in this paper reflects and enables the Bank of Canada’s long-term objectives, responsibilities and interests. This section discusses ongoing Bank initiatives to improve the collection and use of financial data.

### **6.1 Business and Capital Market Statistics (BCMS)**

The Capital Market Statistical System (CMSS) was created in the mid-1980s to provide a time series database on capital market activity. The system is being redesigned to understand financial behaviours and their implications for system-wide vulnerabilities better. The new system, the BCMS, will link financial market data (bonds and equities) to industry characteristics and to firms’ economic activity (financial statement data, NAICs sectoring, credit ratings etc). It will be flexible enough to capture evolving market developments and changing needs. Indeed, the overall objective in designing the BCMS is to create a flexible statistical system that concentrates on critical issues, without limiting its potential use going forward (ie flexible to new reporting requirements or participation in a Global Securities Database).

Our focus is quite different from that of other central bank security databases. First, we want to provide economists across the institution access to the micro data. At a minimum, we want to ensure: complete Canadian coverage; proper sector classification; storage of real-time data; and appropriate breakdowns by instrument, currency and maturity. Second, we want to link securities data to a firm’s fundamental information. Some new data types, such as financial statement data, will be accepted “as is” for the most part and automatically incorporated into the system. Third, we are actively partnering with other data providers to fulfil various needs (eg commercial data vendors, industry associations). In doing so, we aim to strike the right balance between meeting our data consumption needs and ensuring a fast, efficient tool.

Determining the content and structure of the future database is a critical step. The envisioned system will contain various areas where data can be stored and accessed. The system will allow for automatic feeds to substitute some of the manual entry of bond and equity data, and act as an additional check to improve data quality. For financial statement data, five potential vendors were investigated. Based on a review of their coverage, the number of variables and length of time series, we identified the Globe and Mail’s *Report on Business*

dataset as the most complete for Canadian financial statement information.<sup>8</sup> We are also developing a relationship with the Investment Industry Association of Canada that may result in an exchange of securities data.

The lack of an internationally agreed upon standard for securities statistics makes certain decisions to develop the BCMS tricky, although Bank staff are working with international organisations and other central banks to address the issue. Most standards adopted by securities data compilers are currently aligned with the Balance of Payments (BOP). The BOP systematically summarises transactions between residents and non-residents for each institutional sector. The concept of residence is based on a sectoral transactor's centre of economic interest, which can, at times, be ambiguous given the nature of global trade and financial transactions. For instance, when a parent company guarantees and utilises funds raised by a foreign affiliate, select international guidance includes:

- The BOP manual suggests assets should represent an actual claim that is legally in existence and that the incurrence of a contingent obligation does not establish such a claim or alter the ownership of the asset. However, options and financial derivatives can under the right circumstances (eg instruments under contract with a market value and do not extend to actual delivery) be treated as an asset or liability on the financial account.
- The IMF's guidance on external debt securities suggests contingent liabilities, such as guarantees, should not be part of the data, but strongly recommends collecting the information.
- The BIS "Guide to the International Banking Statistics" expanded its data collection activities to include exposures on an ultimate risk basis.

All things considered, when one encounters a complex financial instrument, or transaction, it can be difficult to make a proper assessment.

## 6.2 Financial Data Repository (FDR)

*"Most believed America to be on a "permanently high plateau" (in the phrase of the Yale economist Irving Fisher, uttered October 16, 1929, a few days before the market crash)". Black (2003)*

Central bank staff require ready access to relevant financial data to analyse ongoing economic developments properly and to conduct good empirical research. In particular, there is a trend toward the use of micro data for answering macroeconomic questions. The financial data strategy allocates a budget to areas within the Bank to allow for one-off data purchases. These discretionary funds have allowed the Bank to respond quickly to rapidly evolving financial markets (and risks) in recent years.

Such expenditures vary from year to year as purchases depend on specific work plan objectives that tend to evolve over the course of the year. The management of these funds is left with the departments. The advantage of this approach is that individual departments are responsible for prioritising their new purchase choices and deciding which items are worth buying each year. One of the concerns is our ability to access these data from other areas, although the Bank plans to address the issue (ie corporately manage access to these data).

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<sup>8</sup> *Report on Business* data include 229 annual financial variables for 2,400 firms, while the quarterly data contain 64 variables for 1,200 firms. The annual series goes back to 1974 and the quarterly series to 1985. Coverage has increased considerably over the years, from only a few hundred firms in the 1980s. The assets in the system account for about 60% of the non-financial sector reported by Statistics Canada, which researchers view as very good compared to other sources.

Data management at the Bank is a substantial activity. To maintain high-quality output, a multi-year project is underway to implement a new data management architecture.<sup>9</sup> The Bank currently uses FAME to store time series data. A recent review of other central banks confirmed this remains the common platform for time series storage. However, the Bank uses an increasing amount of data that can be considered non-time series, or relational data. These data cannot effectively be stored within FAME. Moving forward, a data warehouse is envisioned that can accommodate various types of data and be fed from multiple sources. Once established, staff will have easy access to Bank data through various data marts arranged according to subject matter.

### 6.3 MOU with Statistics Canada

*“A dynamic statistical system that reflects our ever-changing economy is essential to both government and private decision making. In particular, I support the recommendation for legislation to permit the statistical agencies to expand data sharing”.* Kroszner (2008)

In 2006, a Memorandum of Understanding (MOU) was signed between Statistics Canada and the Bank of Canada on facilitating Bank access to confidential business and household micro data for statistical research and analysis purposes. Requests for access to detailed survey and/or tax data on individual businesses or households are made on a project-by-project basis and assessed by a senior official at the Bank; followed by a Statistics Canada assessment. Each project requires a brief description of the work to be done, including the data and analytic software required, and a timeline to complete the work. Statistics Canada reviews the proposal within 10 working days. If it is determined that the agency can carry out the work quickly and efficiently, the Bank representative will be informed of this and of whether there are any associated costs.

There are two ways the MOU facilitates access to confidential micro data. First, Statistics Canada provides a dedicated employee to service the Bank’s requirements. To the extent possible, this person will be the liaison with the owners/producers of the files at the agency to clarify questions that arise from the use of the files. However, it is possible that in some projects there may be a need to draw upon other Statistics Canada resource centres in order to prepare datasets. Linkage of two or more datasets, “cleaning” of administrative or survey micro data files for research purposes, associated computer programming and methodological work, and other related statistical tasks might occasionally require capabilities beyond the expertise of the dedicated Statistics Canada employee. In such cases, additional costs are charged to the Bank on a case-by-case basis.

The second way to gain access is to become a “deemed employee of Statistics Canada” for purposes of completing the work. Hence, the Bank employee is subject to the same requirements of Statistics Canada employees under the Statistics Act, including signing the oath of secrecy. These Bank employees conduct their statistical work in a restricted area on the premises of Statistics Canada, designed and managed by the agency, with no external communication linkages from computer workstations. In addition, no confidential statistical information can be removed from the room on any medium. It should be noted that the Bank has no restrictions on what facts or conclusions, it reaches using Statistics Canada data.

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<sup>9</sup> The Bank is proposing a complete change in the way data are collected, verified, stored and accessed. The current technology platform used at the Bank is not high performance and does not compare well to today’s standards. In the case of data management, there is a large amount of manual intervention, which can lead to errors in handling. In addition, there are many local databases that are not easy to share, nor is there a corporate data store for non-time series data.

The MOU with Statistics Canada is facilitating access to a wider range of detailed confidential data, and a number of important projects have been started and/or completed that would not otherwise have been possible. Given that Bank researchers want to do much of the work themselves, most decide to use the “deemed employee” approach. This enhanced relationship continues to serve us well; resulting in several Working/Discussion Papers.

#### **6.4 Household data**

Increased attention has been paid to the evolution of household balance sheets in connection with financial stability issues in recent years. In addition, if financial channels are important for real activity, ignoring or underestimating the importance of these channels – especially during times when asset prices are growing or contracting strongly – may lead to inappropriate policy.

There are a number of data initiatives taking place to address the Bank’s demand for more timely and complete information on the household side. We expect Statistics Canada’s redesign of the Survey of Household Spending to include more frequent updates on household wealth. Implementation is expected in 2010 for reference year 2009. Previous wealth surveys (Survey of Financial Security) were conducted in 1978, 1984, 1999 and 2005.

Since 2004, the Bank has purchased a quarterly wealth survey from a commercial vendor given its timeliness and coverage. These data have been used more intensively over the last few years for both monetary policy and financial system analysis. To learn more about its data quality, it was recently compared with Statistics Canada’s wealth survey. The main findings are:

- The commercial data on debt and assets compare quite well with information from Statistics Canada, with some exceptions.
- Methodological differences (ie household and income definitions) may be key factors driving the observed discrepancies in the results.

The vendor data, therefore, seem quite robust, suggesting its continued use in Bank analyses. Over the last two years, we have made incremental investments in the survey by paying for additional questions on mortgage refinancing and household spending.

Household credit accounts for about 70% of the total loan exposure of banks in Canada. Hence, work is underway to improve understanding of the financial position of households under different scenarios and to estimate household default risk (Djoudad and Tractlet (2007)). One project uses the estimated default equation (from Statistics Canada’s 2005 wealth survey) and household-level vendor data to run various stress-testing scenarios.

Another key gap identified by the Bank is the lack of data linking information on the assets/debts of households with expenditure patterns. Such data would, among other things, allow for a better understanding of adjustments to higher interest rates in terms of magnitude and timing. Statistics Canada will pilot a new longitudinal survey in the fall that aims to cover socio-economic issues, including household assets and debts, income and expenditures. The design of the survey is based on the German Socio-economic panel, the British Household Panel Survey, and the Household, Income and Labour Dynamics in Australia. If the survey proceeds, we expect a broad picture of household spending (on food, shelter, clothing, transportation and other expenses) linked to household wealth.

In 2007, the Bank purchased an extensive micro database on consumer credit in Canada. The quality of these data is very good because the information has been obtained directly from financial institutions. A special historical cube was created for the Bank with data back to 1992. Going forward, these data will be used to provide a more in-depth analysis of consumer credit for monetary policy (eg distribution along product lines and utilisation rates

for lines of credit), and from a financial stability perspective, we are investigating potential leading indicator properties.

## 7. Conclusion

Recent financial market difficulties and tightening credit conditions are still unfolding before our eyes. Financial activity now represents a much larger share of aggregate economic activity than it did 20 or 30 years ago. Moreover, financial crises over the past several years have put pressure on central banks to tackle tough issues as they focus more attention and formalise financial system functions. These developments underscore the need to ensure access to relevant and timely financial data that support work on key Bank functions.

Similar to 70 years ago, prior to unemployment and GDP statistics, financial data are far from optimal. There is clear evidence that other central banks recognise the need to develop an infrastructure in order to build a more rigorous framework for examining implications of developments in the financial system. An internationally agreed methodological framework for security statistics would be a positive step.

Improved financial data would benefit several areas of work at the Bank of Canada. The financial data strategy positions the institution to meet its mandate well into the future. This new direction is consistent with the growing importance of financial issues in Canada (and in many other countries), which will increase the need for analysis and research using such data. The ultimate aim is to shed a brighter light on our transforming economy leading to better policies and regulation.

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