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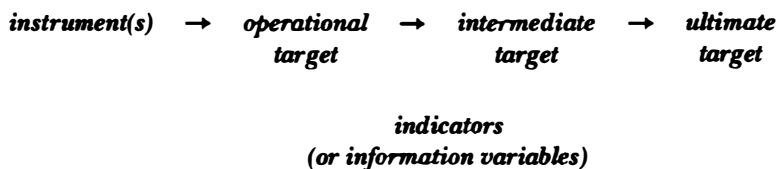# The Use of Indicators and of the Monetary Conditions Index in Canada

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In the process of formulating and implementing monetary policy, central banks focus on a series of variables, ranging from the ultimate target of policy, at one end, to the instrument of policy, at the other end, with operational targets, intermediate targets, and indicators or information variables in the middle. This paper first examines from a general perspective the way in which the different types of variables fit together in the making of policy. Next it sets out the role of the different variables in the Canadian policy framework. It then focuses on the use of the monetary conditions index (MCI), a combination of the short-term interest rate and the exchange rate, as the operational target of policy in Canada (in place of the short-term interest rate). Particular attention is paid to the reasons for the increased emphasis on the MCI, various ways in which it can be constructed, and some caveats about its use.

A Framework for Conduct of Monetary Policy

In conducting monetary policy, central banks typically make use of a wide variety of variables that play very different roles. In schematic terms the general approach to policy in most countries can be characterized as follows:

instrument(s) → *operational* → *intermediate* → *ultimate*
                          target   *target*   *target*

indicators
(or information variables)

At one end of the spectrum is the ultimate target of policy (e.g., a path to price stability,[1] perhaps reflected in a target range for the rate of increase in a specific price index), while at the other end is the instrument or instruments by which policy is implemented (e.g., the size of the balance sheet of the central bank, the discount rate and, in some countries, controls on the growth of certain components of commercial bank balance sheets). Because of the long lags and very indirect connections between the instrument and the ultimate goal, most central banks have found it helpful to make use of other variables that stand between the instrument and ultimate goal. These can be classified as intermediate targets, operational targets, and information variables or indicators.[2]

An intermediate target is a variable that is closely linked to the ultimate target of policy and that is influenced by changes in the instrument of policy. Examples of potential intermediate targets include monetary aggregates or credit aggregates, the exchange rate, and the rate of growth of nominal gross domestic product (GDP). The key perceived advantage of an intermediate target is that it enables the central bank to move its instrument settings more quickly and more accurately in response to a shock to the system than it could if it focused solely on current values of the ultimate target.[3] Thus, for example, since an aggregate demand shock normally results in a change in the demand for a monetary aggregate before it affects the rate of inflation,. targeting a monetary aggregate enables the central bank to respond more quickly than it could if it had to wait for the ultimate target variable to be affected. Of course, as discussed further below, if the response of the central bank is not to actual movements of the ultimate target variable but to projected movements in this

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[1]In a fundamental sense price stability is not the ultimate target but a means to an end, the end being a well-functioning economy, with high levels of employment and rising standards of living. For a succinct statement of the benefits of price stability and costs of inflation and the way in which price stability leads to an improvement in the functioning of the economy, see Bank of Canada (1990). For ease of exposition in this paper, however, price stability is referred to as the ultimate target of policy.

[2]See Freedman (1990), Friedman (1990), and Crockett (1994) for detailed discussions of these concepts.

[3]There are two possible reasons. Either the intermediate target variable leads the ultimate target variable in the economic process, or the two are contemporaneous but data on the intermediate variable are published earlier.

variable (where the projection is based in part on movements in various information variables or indicators), use of an intermediate target may or may not speed up the policy response. Thus, whether or not an intermediate target improves the policy process is an empirical question.

The movement by central banks away from the use of monetary aggregates as intermediate targets in recent years resulted in the main from changes in the financial structure that weakened the link between monetary aggregates and the ultimate target variable. In the end, whether a variable would or would not be helpful as an intermediate target is a matter of judgment and rests principally on how close and how stable is the empirical relationship between the intermediate target variable and the ultimate target. Of course, to be useful, an intermediate target must also respond to changes in the central bank instrument.

It is helpful to think of a central bank operating fairly directly upon an operational target when it changes the settings of its instrument variable. The operational target in most countries is a short-term interest rate. However, as I will argue later, in the case of a country with a floating exchange rate, it is preferable to use a monetary conditions index as the operational target for policy rather than the short-term interest rate.[4]

There are two main distinctions between the operational target and the intermediate target. The first distinction rests on how quickly and how directly an instrument change impinges on the targeted variable—for example, the effect on short-term interest rates shows up almost immediately whereas the effect on monetary aggregates tends to be spread out over a much longer period of time. The second distinction follows from the nature of the targets. The intermediate target is typically a nominal variable that can function as a nominal anchor to the system while the operational target (such as the short-term interest rate) will typically not be able to serve as the nominal anchor to the system.

While a monetary authority must have an instrument and an ultimate target, it need not have an intermediate target or an operational target.[5] Many countries have conducted policy in recent years without

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[4]It is also worth noting that the operational target is often treated as the instrument of policy in academic writings—for example, Poole (1970). Although this variable is typically very close to the instrument (in terms of responsiveness to changes in the instrument), in reality it is not itself an instrument, in the sense that the central bank does not control it directly.

[5]See McCallum (1988) for a model in which the instrument (monetary base) is directly linked to the ultimate target of policy (nominal gross national product in his setup).

an intermediate target and some have dispensed with an operational target (e.g., the United States between 1979 and 1982).

An indicator variable or information variable provides leading or contemporaneous information about potential movements in the ultimate target variable (or a variable linked to the ultimate target variable) but is normally not itself treated as an object to be controlled. For example, certain interest rate spreads (e.g., the spread between short-term rates and long-term rates) appear to contain information about future movements in real output growth, which, in turn, are a leading indicator of inflation. These spreads have not, however, themselves been used as an objective of policy.

The links between indicator variables and ultimate target variables can be based on either structural models or astructural models. The former are preferable, in the sense that policymakers are more comfortable with relationships that are based on a theoretical foundation and that are more likely to remain unchanged when there is a change in policy regime. In recent years, however, there has been increased reliance on astructural models, such as reduced-form models, information content models, and vector autoregression models.[6]

The Canadian Policy Framework

The ultimate target of policy in Canada is the achievement and maintenance of price stability. To make this goal more concrete, in February 1991 the Government of Canada and the Bank of Canada jointly announced targets for reducing inflation, which aimed at bringing the rate of inflation to a range of 2 to 4 percent by the end of 1992 and 1 to 3 percent by the end of 1995. In December 1993, the Government and the Bank extended the 1 to 3 percent target band to the end of 1998. On the basis of the experience with low inflation over the period, a decision will be made by 1998 on the target range for the price index that is consistent with price stability.[7]

Between 1975 and 1982 the Bank used the narrow monetary aggregate, M1, as its intermediate target variable. Mainly because of innovations by financial institutions, the demand for M1 became much less stable in the early 1980s and M1 was withdrawn as a target in Novem-

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[6]There is a risk that the usefulness of these models may diminish or even disappear if there is a regime shift. This might be the case if, in responding to shocks, monetary policy tried to exploit the information in these equations, which were themselves based on the earlier monetary policy reaction function.

[7]For further discussion of the experience with inflation-reduction targeting see Freedman (1994).

ber 1982. Since then the Bank has conducted policy without an inter-
mediate target.

For many years the short-term interest rate was the operational
target of monetary policy actions. More recently, the monetary condi-
tions index (MCI), a combination of the short-term interest rate and
the exchange rate, has become the operational target of policy. The
next section of this paper will discuss in considerable detail the rea-
sons for focusing on the MCI, the way in which it is constructed, and
some caveats regarding its use.

The principal instrument used by the Bank of Canada to influence
monetary conditions is changes in the supply of settlement balances
provided to directly clearing financial institutions.[8] From time to time
the Bank also uses Special Purchase and Resale Agreements (SPRA)
and Sale and Repurchase Agreements (SRA) to influence the one-day
rate, and outright purchases and sales of treasury bills to influence
three-month interest rates.[9]

To understand the role of indicators in Canadian monetary policy, it
is necessary to set out in somewhat more detail the way in which policy
is conducted in Canada. The key point to be noted is that Bank of
Canada actions to achieve a rate of inflation within the target bands
are directed to an inflation outcome between six and eight quarters in
the future. The reason for the forward-looking nature of policy is, of
course, the long (and variable) lags between monetary policy actions
(i.e., changes in instrument settings) and their effects on the rate of
inflation.[10]

Even in simple theoretical models, the achievement of price stability
or a specific rate of inflation quarter by quarter is usually not possible
or leads to instrument instability. And recognition of the difficulty of
achieving a target inflation rate in the short run lay behind the deci-
sion to set the first guidepost for the inflation-reduction targets at
the end of 1992, 22 months after their announcement. Moreover,
in the background note issued at the time the targets were introduced,
it was explicitly noted that monetary policy actions could not be
expected to reverse immediately the effects on inflation of unexpected
shocks to the demand for, or supply of, goods and services. Rather, the

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[8]More precisely, changes in settlement balances provided by the Bank of Canada initially
affect the one-day interest rate. Changes in the latter feed into short-term interest rates and the
exchange rate, thereby affecting monetary conditions.

[9]Details of the way in which the Bank's instruments are linked to the operational target are not
needed for purposes of the analysis in this paper. An account of this part of the policy process
can be found in Clinton (1991) or Montador (1994).

[10]The Bank of Canada uses a framework in which monetary policy operates through a
traditional type of transmission mechanism. See Duguay (1994) for details.

monetary policy actions would set in motion a process of adjustment that over time would return the trend rate of inflation to its target path.

Given the forward-looking nature of the policy process, projections and indicators obviously have to play an important role. Indeed, the Bank of Canada staff prepare a series of projections, reassessments and monitoring updates through the year, having a time horizon ranging between two quarters and seven years.[11] The projections are developed on the basis of a formal model projection, which also incorporates the input of sectoral specialists. The role of the latter is most important in the near-term outlook while the model itself plays the greater role in the outlook for the medium and longer term as well as for simulations of alternative scenarios.

All factors affecting aggregate demand and supply influence the inflation projection directly or indirectly. The elements feeding directly into the price determination process are the current and projected output gaps, the expected rate of inflation (which is based partly on past inflation and partly on forward-looking measures), indirect taxes, and the level of the exchange rate. The question of whether the latter two factors, and other supply shocks (such as shocks to energy prices), affect the level of prices or the rate of inflation remains open. If such shocks affect only the level of prices and not the ongoing inflationary process, they have only transitory effects on the rate of inflation and hence play less of a role beyond the short run than do the more fundamental factors such as the cumulative slack in the economy.[12]

In addition to the factors that enter directly into the model projection of future rates of inflation, there are a number of other variables that are monitored carefully for their information content. For example, certain measures of wages can assist in the analysis of the extent of inflationary pressures in the economy. Most useful in this regard are the collective wage settlements data because they are primarily forward-looking (although they too may incorporate a backward-looking element of catch-up).

The Bank of Canada also makes considerable use of financial aggregates to aid in its analysis of current and anticipated economic developments. These aggregates are typically interpreted from two perspectives. First, are they growing faster (slower) than would be expected on

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[11]See Duguay and Poloz (1994) for a detailed account of the role of economic projections in the decision-making process.

[12]Another open question concerns the linearity or nonlinearity of the response of inflation to demand shocks. See Laxton, Rose, and Tetlow (1993) for the view that inflation responds more strongly and faster to excess demand than to excess supply.

the basis of their demand functions? This would be a signal either of somewhat faster (slower) growth of current nominal spending than expected or of a disturbance in the relationship between the financial aggregates and their determinants. The judgment of financial sector specialists is an important input in the determination of which of these hypotheses is the more likely. Second, and more important in recent years, has been the use of astructural models linking financial aggregates to other variables further out the process. Thus, real M1 has proved to be a good leading indicator of output growth one to two quarters out. Similarly, broader monetary aggregates (such as M2 and M2+) are good leading indicators of the near-term rate of inflation.[13] And recent research has indicated that M2+ and even broader monetary aggregates have good forecasting properties for the rate of inflation four to eight quarters out. This property, if confirmed by further study, would make them extremely useful, given that the objective of policy actions is to influence the rate of inflation over four to eight quarters.[14]

These leading indicator measures are both of intrinsic interest and, as well, can provide alternative short-term projections that influence the judgment of sectoral specialists in the model-based projection exercises. Moreover, they provide a direct cross-check against the staff's projection exercise and may give an early indication of errors in the projection.

The Monetary Conditions Index as an Operational Target

The Role of the Operational Target

As just explained, the Canadian authorities have information from a variety of sources on demand and supply developments in the economy and on the inflationary implications of such developments over the near-term to medium-term horizon. They also have a target for the rate of inflation six to eight quarters out.

To achieve this target, given anticipated inflationary pressures, may well imply adjustments in the instruments of policy over that horizon. Rather than trying to set a target path for the instrument itself (i.e.,

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[13]See Muller (1992) for a summary of the Bank of Canada's research on the usefulness of financial aggregates as leading indicators. More recently we have also been examining the potential usefulness of interest rate spreads (particularly the spread between long and short rates) as leading indicators of output. See Cozier and Tkacz (1994).

[14]Credit aggregates have typically fared less well than monetary aggregates as indicators of future output and inflation. See Muller (1992) for a full account.

changes to the Bank of Canada balance sheet), it is much easier and more useful to set a provisional path for the operational target over the projection horizon that would be consistent with the achievement of the targeted outcome for the rate of inflation. In the main, this is because the standard macroeconomic model links changes in aggregate demand and inflation to changes in interest rates and the exchange rate and not directly to changes in the instrument variable. Also, because of the complex relationship in the Canadian system between the instrument and the operational target variable, it is not useful to calculate a path for the instrument variable beyond the very short run.

For most central banks, and for the Bank of Canada until a few years ago, the operational target of policy is the short-term interest rate. Thus, in terms of the above discussion, the staff would calculate a provisional target path for the short-term interest rate (as well as for many other variables, including the exchange rate) that would be consistent with the achievement of the ultimate target[15] if the path for the predetermined variables turned out as projected and if the assumed relationship between the operational target variable and the ultimate target variable used in setting the provisional path turned out to be accurate. In practice, because of such considerations, the provisional target path for the short-term interest rate in the projection was not taken literally by senior management. However, the process of generating it provided a useful basis for discussion of policy as well as a benchmark for judging the implications of unforeseen economic developments and for providing a framework for reconsideration of interest rates following such developments.

When a shock hit the system (or, indeed, when there was a change in view regarding the economic situation), action was taken to change the path for the operational target in order to offset the effect of the shock on the ultimate target. The size of the needed change was based on both model results and the judgment of the management of the central bank. As time passed, the effects on a variety of variables of the shock, and of the monetary policy action taken in response to the shock, were monitored very closely and further changes in the operational target were made as necessary. Of course, the process was far from mechanical. Typically, the shocks were not clear-cut events that could be calculated to have a precise effect on aggregate demand and inflationary pressures. Hence it was not possible to calculate with

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[15]If the central bank focused on an intermediate target, this would be used in place of the ultimate target in setting the path for the operational target.

precision the change in the operational target needed to offset the shock.[16]

Thus, for example, in the latter part of the 1980s, the Bank of Canada (and virtually every other forecaster) underestimated the strength of aggregate demand in the Canadian economy. As new information arrived that indicated the presence of more demand pressures than had previously been expected, tightening monetary policy actions were taken progressively. In such circumstances, instead of a once-and-for-all increase in interest rates to offset a given shock, there was a sequence of increases in interest rates (with some pauses in between the jumps) that reflected the periodic reinterpretation of the strength of aggregate demand and inflationary pressures. A similar sequence occurred on the downside of the cycle in the early 1990s as the economy turned out to be weaker and more disinflationary than anticipated by the Bank or by private forecasters.[17]

Reasons for Using a Monetary Conditions Index

As indicated earlier, the operational target in Canada for many years was the short-term interest rate. Several years ago, however, the Bank of Canada began to focus increasingly on a broader concept of monetary conditions as the operational target, using a construct that included both the short-term interest rate and the exchange rate. The broadening of the concept of monetary conditions to include the exchange rate was based on two main considerations. First, in a flexible exchange rate regime monetary policy operates through two channels—the interest rate and the exchange rate. Since the relative movements of the two variables will depend on market responses to central bank actions, they can differ appreciably in different circumstances. Second, if there are exogenous shocks to the exchange rate, monetary policy actions should typically offset their effects on aggregate demand.

The role of the MCI as a way of capturing the effects of both short-term interest rates and the exchange rate in the transmission mechanism of monetary policy can best be illustrated by the case of a shock to aggregate demand, which leads to a change in the target path for

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[16]This uncertainty was, of course, compounded by the lack of certainty regarding the precise linkages between changes in the operational target variable and changes in aggregate demand and inflationary pressures.

[17]Both on the upside and the downside of the interest rate cycle, the Bank also acted to smooth the short-term interest rate movements. On the downside, in particular, there was a perceived need to act in such a way as to increase the likelihood that the decline in short-term interest rates would be durable and that it would be reflected in interest rates all across the maturity spectrum.

the operational target and to the need for central bank actions to achieve the revised path. Consider, for example, a situation in which the central bank, in response to an expansionary demand shock, decides that a less stimulative path for monetary conditions would be appropriate. Typically, restrictive monetary actions following a decision to tighten monetary conditions would lead to both a rise in short-term interest rates and an appreciation of the domestic currency. The particular "split" between the change in short-term interest rates and the change in the exchange rate following restrictive actions by the central bank[18] would be determined by the markets and would depend on such factors as the length of time the market expected the higher interest rates to last and how sensitive movements in the expected exchange rate were to movements in the actual exchange rate.

For example, if short-term interest rates rose by 1 percentage point and the increase was expected to last one quarter, and if the expected exchange rate remained unchanged, the exchange rate would appreciate by 0.25 percent.[19] In reality, of course, there would be considerable uncertainty about the duration of the interest rate change. As well, the expected exchange rate tends to adjust in response to a change in the actual exchange rate. Hence, the exchange rate response to an interest rate change can vary widely.

Tightening actions by the central bank could thus result in a small increase in interest rates and a significant appreciation of the currency, or a substantial increase in interest rates and a small appreciation of the currency. Although both of these outcomes would have similar overall effects on aggregate demand, the former would affect mainly the exchange-rate-sensitive sector (i.e., traded goods) while the latter would affect mainly the interest-rate-sensitive sector (i.e., investment in machinery and equipment, construction, and spending on durable consumer goods).[20] If the central bank focused only on interest rate changes, it might tighten excessively in the case where most of the initial reaction to the change in the instrument occurred through an appreciation of the exchange rate, since it was not taking sufficient account of the downward pressure on aggregate demand that was taking place through the currency appreciation. By focusing on a

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[18]In the Canadian case the Bank of Canada would reduce the supply of settlement balances available to directly clearing financial institutions, which would have a direct effect on the one-day rate of interest and then feed out to short-term interest rates and the exchange rate. This type of action is equivalent to reducing the supply of reserves in a system where reserve requirements are imposed on financial institutions. In Canada such requirements are in the process of being eliminated and will disappear completely in mid-1994.

[19]Purchasers of the domestic asset following the interest rate change would thus earn a higher rate of interest but would lose a corresponding amount on the expected depreciation.

[20]The lags with which spending would be affected might also be different.

combination of interest rate changes and exchange rate changes, the central bank can avoid the potential error of injecting or removing too much or too little stimulus to the economy through ignoring one of the key channels through which monetary policy operates.[21]

A second set of circumstances in which the concept of monetary conditions is helpful is that in which there is an exogenous shock to the exchange rate. Here, the target path for monetary conditions is assumed to be unchanged while the actual MCI has moved as a result of the exchange rate shock. Suppose, for example, that there is a loss of confidence in the domestic currency (say, for political reasons) and that a sharp depreciation takes place as a result of a desire by investors to shift out of assets denominated in the domestic currency. The depreciation, in itself, is expansionary. If the central bank was previously satisfied with the setting of monetary conditions in the economy, it would now be faced with an overly expansionary situation and hence should take action to return monetary conditions to their previous level. If the bank focused on a monetary conditions index, the need for tightening action would show up directly since the index would show the easing resulting from the currency depreciation.[22] In the absence of such a construct, there is a greater likelihood that the central bank would not take timely action to offset the expansionary effect of the depreciation and hence monetary conditions might be inappropriately eased until a more complete assessment of the exchange rate change is done in the next staff economic projection.

This is not to say that the central bank would always fail to react when it was appropriate to do so following an exogenous exchange rate change. Rather, the lack of a direct mechanism signaling the need to take action to offset the easing of monetary conditions resulting from the depreciation would make it more likely that action would be delayed.

In both sets of circumstances in which the MCI helps to ensure that appropriate attention is paid to the exchange rate change, its usefulness is greatest in the period between formal projections. Presumably, the staff would capture appropriately the effect of an exchange rate change at the next quarterly projection exercise. But, between projec-

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[21]This does not, of course, mean all errors will be avoided. The difficulty of assessing the effects of shocks on aggregate demand remains, as does the difficulty of assessing the precise effect on demand of changes in interest rates and the exchange rate. But the potential error of ignoring the exchange rate channel of monetary policy will be avoided by focusing on monetary conditions rather than just on interest rates.

[22]The direction of response (i.e., tightening actions by the authorities) is the same as would be needed in the case where the depreciation was taking place in the context of a disorderly exchange market and the authorities wished to calm the market. The magnitude of the change and the duration of the period of tightness would typically not be the same, however.

tions, the MCI provides a continual reminder to policymakers to take account of changes in the exchange rate when considering adjustments in short-term interest rates.[23]

The Construction of the MCI

The MCI is the combination of the short-term interest rate and the exchange rate, less their values in a base period. Thus it measures the degree of ease or tightening in monetary conditions from some (arbitrary) date. There is thus no meaning to be attached to the measure of the level of the MCI, since it is constructed as a change from the base date.

There are a variety of conceptual ways in which the MCI could be measured. Thus, the MCI could be constructed in terms of the effect of the interest rate and exchange rate changes on either aggregate demand or prices. It could also be calculated in real terms or in nominal terms. Consider, first, an MCI in real terms which is based on the effects on aggregate demand of changes in interest rates and the exchange rate. This version of the MCI is measured as a weighted sum of the change (in percentage points) in the short-term real interest rate (defined for purposes of this construct as the three-month commercial paper rate less a measure of the expected rate of inflation over the three months)[24] relative to the base period and the percent change in the real effective exchange rate relative to the base period.[25] Note the use of the percentage point change in the interest rate and the percent change in the exchange rate in the calculation. These reflect the ways in which the two components of the MCI affect aggregate demand.

The relative weights on the components of the MCI are based on a number of empirical studies that estimate the effect on real aggregate demand over six to eight quarters of changes in real interest rates and real exchange rates.[26] In deciding on the weights, use was made of

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[23]In countries where projections are done less frequently than in Canada, the usefulness of the MCI would be even greater.

[24]There are, of course, a variety of ways of measuring expected inflation. Currently, in constructing the MCI, the Bank of Canada uses a model-based measure, which has both backward-looking and forward-looking components.

[25]Note that it is not the bilateral exchange rate but the effective or multilateral exchange rate that enters into the calculation. The latter is the appropriate measure since it captures the movement in the Canadian dollar versus the currencies of Canada's major trading partners, appropriately weighted for their importance in Canadian trade. (The weight of the U.S. dollar in the effective exchange rate is about 0.82.)

[26]Movements in real interest rates and the real exchange rate were not so collinear over the estimation period as to preclude estimation of their separate effects on aggregate demand. Indeed, the correlation coefficient of the changes in the quarterly averages of the two variables over the 1980 to 1993 period was -0.22.

structural models, vector autoregression (VAR) models and reduced-form models. Although these models give quite different answers on the separate effects of interest rate changes and exchange rate changes on aggregate demand, they give reasonably similar results on the relative sizes of the effects. Roughly speaking, there appears to be about a 1:3 ratio of effects. That is, a 1 percentage point change (100 basis points) in the real interest rate has about the same effects over time on real aggregate demand as a 3 percent change in the real effective exchange rate.[27]

The units of measurement of the MCI being in terms of real interest rate changes, this version of the MCI is defined as:

MCI = [Real interest rate − real interest rate at base period] + (1/3)
[(Real effective exchange rate index/real effective exchange rate index at base period) − 1] (100)

Thus, one can interpret the MCI most simply as the percentage point change in real interest rates equivalent to the combined change in real interest rates and the real exchange rate since the base period.[28] Moreover, since the MCI is always measured relative to a given base period, subtracting the MCI at two points of time gives a measure of the degree of tightening or easing between those two points of time.

In practice, the Bank of Canada focuses much more on the nominal MCI than on the real MCI over the short term.[29] The main reason is the lag in calculating the real MCI over this horizon because of the need for price measures from Canada's major trading partners in calculating the real effective exchange rate. Moreover, for the relatively short horizon for which the MCI is most useful (i.e., between the quarterly projection exercises),[30] the nominal MCI serves almost as well as the real MCI, since the price measures that underlie the real MCI change much more gradually than do the nominal interest rates and the nominal exchange rate. Thus, while there is some drift over time between the levels of real and nominal MCI, they tend to move

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[27]See Duguay (1994).

[28]Other normalizations are also possible but the interpretation of the MCI in terms of interest rate equivalents has an intuitive appeal.

[29]It would be more appropriate to use the real MCI if one was analyzing policy actions over a longer term.

[30]The desired or provisional target path of the MCI is also calculated as part of the medium-term projection exercise. And it is this target path that is used as the basis for assessing developments in monetary conditions between projection exercises. Of course, as noted earlier, there is less risk of making an error by ignoring the aggregate demand effects of changes in the exchange rate in the course of a projection exercise than in the period between projections.

Chart 1. Monetary Conditions Index
(January 1987=0)
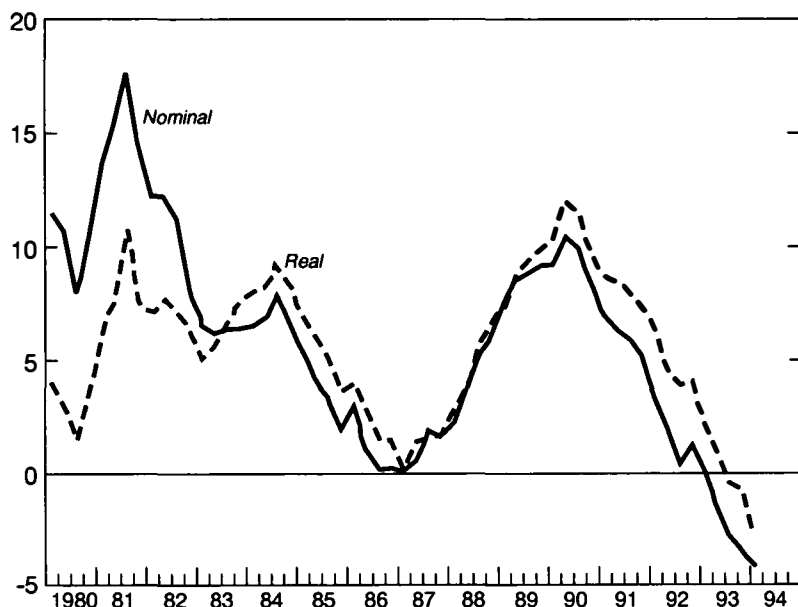
together in the shorter term (see Chart 1). The correlation coefficient of the levels of the quarterly averages of the real and nominal MCI over the period 1980-Q1 to 1993-Q4 is 0.74 while the correlation coefficient of changes in the quarterly averages of the two series over the same period is 0.88.

The construction of the two measures of MCI discussed thus far is based on the relative longer-term effect on real aggregate demand of changes in short-term interest rates and the effective exchange rate. An alternative approach focuses on the effects of changes in the two variables on changes in prices over six to eight quarters. Because the exchange rate has a direct effect on prices in addition to its indirect effect via aggregate demand, it has a greater weight when the focus is on prices rather than on aggregate demand. Empirically, the best estimate of the relative weights in this case is 1:2 rather than the 1:3 in the earlier construct. That is, a 2 percent change in the effective real exchange rate has the same effect on prices as a 1 percentage point change in real interest rates. Once again, the MCI can be constructed in terms of changes in real interest rates and the real exchange rate from a base period or in terms of their nominal counterparts.

Under what circumstances would one use the MCI constructed on the basis of relative effects on aggregate demand and under what circumstances would one use the MCI constructed on the basis of relative effects on prices? In Canada we tend to focus on the former because it is the output gap, along with expected inflation, that is the principal driving force behind increases and decreases in inflationary pressures and it is changes in aggregate demand that are a key determinant of changes in the output gap. Of course, as just noted, exchange rate changes also have direct effects on the level of prices in the economy, but these will likely not turn into an ongoing wage/price spiral unless they take place at times in which inflationary expectations are strong. We thus distinguish between developments that affect the price level once and for all and those that affect the process of inflation.

That said, it is important not to overstate the distinction. There are times when the markets will have difficulty disentangling the level effect on prices from an ongoing rate of inflation. Nonetheless, for purposes of analysis, we use the MCI that is based on aggregate demand and, where necessary, take into account the direct effect on prices of exchange rate changes.

Some Caveats on the Use of the MCI

Like all aids to policy, the MCI must be used with care and not treated as a mechanical means of making policy. There are also a number of specific reasons why one must use the MCI with care.

(1) Although the MCI is better conceptually than short-term interest rates as the operational target for policy, it remains an operational target and it should not be treated in any sense as a fundamental measure of monetary policy. For one thing, neither the interest rate nor the MCI provides a nominal anchor for the system. Moreover, monetary policy's ultimate concern is the rate of monetary expansion and the way it impinges on inflation.

(2) In the very short run, one has to avoid the temptation to use the MCI in an overly mechanical fashion—that is, a central bank should not try to maintain a precise MCI target as the exchange rate moves up and down on a day-to-day basis. First of all, the operational target for the MCI should itself not be taken as a very precise measure, given the uncertainties about assessments of the economy and about the links between changes in the MCI and changes in aggregate demand or inflation. Second, the exchange rate can be quite volatile on a day-to-day basis and it would be inappropriate to try to offset the effect on the MCI of every slight move in the exchange rate by adjusting short-

term interest rates. Only if the market has found a new trading range for the exchange rate that is different from the earlier trading range and that appears likely to last for some period of time, would action be taken to offset the effect on the MCI of the exchange rate change.

(3) At times, central bank actions in the very short run cannot be devoted to achieving the desired MCI because they are needed to cope with disorderly markets. For example, suppose that there was a sharp loss of confidence in the Canadian dollar and the latter began to fall in such a way as to generate extrapolative expectations and snowballing movements. In order to help stabilize market expectations, the bank might well have to encourage (or validate) a rise in short-term interest rates that was considerably larger than the rise needed to offset the effect of the exchange rate depreciation on the MCI. Over time, of course, as expectations of further weakening of the currency dissipate, short-term rates could decline to levels more consistent with the desired MCI.

(4) There were two examples used above in establishing the case for using the MCI as an operational target for policy. In the first, an expansionary demand shock led to a tightening in desired monetary conditions while actual monetary conditions remained unchanged, thereby requiring restrictive action by the central bank. In the second case, the shock (a change in market sentiment about the currency) resulted in an easing of actual monetary conditions while desired monetary conditions remained unchanged. In response, the central bank had to take restrictive actions. There are also cases in which a shock leads to changes in the same direction of both actual and desired monetary conditions. The central bank would have to take little or no action in such cases.

There are two examples of particular interest in this regard. When world prices of raw materials increase, the rise involves an expansionary shock to the Canadian economy and is usually accompanied by an increase in the value of the Canadian dollar. Typically, such a terms-of-trade improvement has direct effects on employment and profits in the industries in question. It also has significant indirect effects on the economy, as the boom in prices of raw materials spills over into industries that supply the raw materials industries and, more generally, into higher real wages and a generalized positive economic environment. In such circumstances, it is appropriate for the real exchange rate to rise (both because the equilibrium real exchange rate appreciates as the terms of trade improve and because the appreciation helps to choke off inflationary pressures set off by the boom). Hence the rise in the actual MCI (as the Canadian dollar appreciates) would be associated with a rise in the desired or target path for the MCI. Of course,

the increase in the desired MCI following the terms-of-trade improvement need not be exactly the same as the rise in the actual MCI that the market itself might generate. Hence some further adjustment of the actual MCI might be necessary. Nonetheless, the key point is clear—the rise in the actual MCI in these circumstances is associated with a rise in desired or targeted MCI and does not automatically require action by the central bank. The reverse scenario holds for falling export prices.[31]

Another case where the desired MCI rises along with the actual MCI occurs when the market responds directly to new information regarding the strength or weakness of aggregate demand.[32] Suppose, for example, that a data release indicates that the economy is expanding at a more rapid rate than anticipated. In recent years, such an announcement has tended to lead to upward pressure on the currency, in part because of the increased likelihood of an increase in interest rates. However, given that the faster growth will tend to lead to higher desired MCI, in this case as well there may be no need for action in response to the tightening of the MCI. Nonetheless, as in the earlier case, the market-generated movement in the actual MCI might not be exactly the same as the rise in the desired MCI and some further adjustment might be necessary.

Concluding Comments

The MCI has proved to be a very useful conceptual and practical tool in the conduct of policy. Most importantly, it ensures that exchange rate changes are taken into account appropriately when policy decisions are being made. But its importance should not be overrated. Many other shocks hit the economy besides exchange rate changes and these must also be taken into account in the policymaking process.[33] And the MCI must be used with care because of the various caveats set out above in this paper. Nonetheless, properly used, the MCI can help policymakers to steer through a very uncertain world.

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[31]For a detailed discussion of terms-of-trade effects on policy stance in an economy with inflation targets, see Archer (1993). For an empirical analysis of the effect of terms-of-trade changes on the exchange rate, see Amano and van Norden (1993).

[32]This can be contrasted with the first example discussed above, where the expansionary shock is not associated with market pressure on the exchange rate.

[33]For example, the MCI, as presently constructed, does not take explicit account of changes in long-term interest rates. Hence, when these behave in an atypical way, the desired MCI should be adjusted to take such movements into account.

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