

Commentary: Implications of a Changing Economic Structure for the Strategy of Monetary Policy

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Introduction

Carl Walsh has given us an excellent overview of the recent literature on the implications of uncertainty and changing economic structure for the strategy of monetary policy, as well as adding some new results of his own. I propose to deal with the three of the subjects that he covers, from the perspective of what I find useful as a policymaker. The subjects are: imperfect or noisy information, various categories of robust rules, and the role of robust control.

Before delving into those topics, however, I would like to make one general comment. I agree with Walsh that “strategies that are based more closely on the ultimate objectives of policy are likely to be more robust to shifts in the economy’s structure or to uncertainties about the transmission process.” Moreover, the establishment of a clear policy objective and the conduct of policy within a transparent framework for meeting that objective have proven to have positive results in many countries. At the Bank of Canada, we have found that the progress made in these areas since the adoption of inflation targets in 1991 has reduced the private sector’s uncertainty about how the Bank will act in response to economic developments.¹ As well, it has reduced the persistence of inflation and

tended to moderate the variability of inflation and of other important economic variables.²

Imperfect or noisy information

Central banks pay a lot of attention to measures of capacity pressures and underlying inflation. Measures of both concepts are imperfect and noisy.³ Walsh has written and talked about the importance of output gap measurement error for policy. He notes that “the optimal response to the best estimate of the state is unaffected by data uncertainty—certainty equivalence still applies. Imperfect information does not support the conclusion that the central bank should rely less on *estimates* of the [state] in formulating monetary policy, since optimal responses to estimates of inflation and the output gap are not reduced.”⁴

Walsh measures the output gap by filtering actual output alone. In practice, central banks are more sophisticated, often starting by using multivariate filters or Kalman filters, which importantly include inflation, and then examining a number of measures of capacity. For example, the Bank of Canada starts with such a multivariate filter and then uses a wide range of indicators to come to a consensus as to the likely size of the output gap.⁵ These indicators include traditional CAPU measures (Statistics Canada’s measure of capacity utilization in the nonfarm goods sector); measures of overall tightness in the labor market; measures of labor shortages (especially for skilled labor); and information from the quarterly survey of firms conducted by the bank’s regional offices. Measures of underlying inflation, cost pressures, inflation surprises, and inflation expectations are also used to form a view of demand pressures on capacity.^{6, 7}

Measures of recent inflation based on the total CPI can be viewed as noisy measures of underlying inflation. In particular, they include considerable short-run volatility coming from certain components of the CPI. Movements in these volatile elements typically tend to reverse themselves fairly quickly.⁸ Moreover, the total CPI incorporates components for which the prices are not determined in markets resembling

the sticky-price markets captured in the theoretical models used to derive modern Phillips curves. Thus, the total CPI is a noisy measure in a second sense as well. These components, which include both flexible prices for products such as fruit, vegetables, gasoline, fuel oil, and natural gas as well as mortgage interest rates, are (fortunately) often the volatile components that one would exclude to get at measures of underlying inflation.⁹

The point overall is that more information is available at the disaggregated level that helps to reduce uncertainty about the underlying state of the economy, both in terms of capacity and inflation. Moreover, on the capacity side, certain structural changes are likely to move the equilibrium value of only some of the indicators of capacity pressures (perhaps only labor market but not product market measures, or vice versa) and thus raise the probability that the underlying causes of the structural change can be more readily identified and (at least partially) appropriately adjusted for.

Four approaches in the literature to robust rules

I would like now to turn to four approaches in the literature to the development of robust rules. This is not meant to be an exhaustive list. Rather, I have chosen these four approaches because they feature in one way or another in Walsh's paper.

Approaches that avoid using the level of the output gap

Because I have just been discussing noisy measures, I find it useful to start with the approach in the literature that Walsh stresses in dealing with noisy measures of the output gap. This approach is to adopt simple rules that do not use the level of the output gap. Walsh (2003) has proposed a rule that includes the change in the output gap, while Jensen (2002) argues that nominal income growth targeting can improve over inflation targeting, even before taking into account uncertainty about the output gap. In both cases, the focus is on closed-economy new Keynesian models with no transmission

lags.¹⁰ Recently, my colleague Jean-Paul Lam (2003) has shown that these results do not carry over to open-economy models, which are new Keynesian in spirit but which possibly incorporate transmission lags. CPI inflation targeting by a central banker who is somewhat more conservative than the general public¹¹ performs similarly to Walsh's rule and much better than Jensen's rule, even before transmission lags are added to the open-economy model. The addition of transmission lags, which have been considered an important feature of economies by central banks implementing inflation targeting and were incorporated in Svensson's famous 1997 article, tips the balance strongly in favor of CPI inflation targeting implemented by a conservative central banker.

ROE rules

The "robust, optimal, explicit instrument rules" (ROE rules) proposed by Giannoni and Woodford (2002a, 2002b), and Svensson and Woodford (2003) are robust to the serial correlation properties of the disturbances. Svensson (2003), however, characterizes these rules as "completely impracticable." He notes that "even in...two very simple models, the optimal reactions are quite complex as soon as there is a role for deviations from the simple model and judgment regarding those deviations. This complexity makes verifiability impossible, although verifiability is necessary as soon as there is a time-consistency problem...."

Taylor rules

If ROE rules (the most sophisticated rules) are impracticable, then what about the other extreme—the simple rules proposed by Taylor (1993)? Carl notes that "research has suggested that simple instrument rules perform well in a variety of models." Work undertaken at the Bank of Canada (Côté, Kuszczak, and others, 2002, and Côté, Lam, and others, 2002) using 12 open-economy models of the Canadian economy, however, has shown that "simple policy rules are not particularly robust." The range of models considered in this work was much

greater than in most U.S. studies and included money-based models, an open-economy limited-participation model, and a vector-error-correction model based on the disequilibrium between the money stock and long-run money demand. If the range of models is narrowed, however, a simple rule that places a weight of 2.0 on the deviations of inflation from the target and a weight of 0.5 on the output gap performs relatively well. The output from this rule is one of many pieces of policy advice provided to the bank's governing council prior to each fixed announcement date for the policy interest rate.¹³ I would not particularly characterize this as a "guideline." Rather, I would see it as a benchmark against which significant deviations need to be understood by policymakers. And substantial deviations do occur—the last two years in Canada, and no doubt many other countries, providing plenty of evidence on that score.

Quasi-robustness by overestimating inflation persistence and inflation inertia

The results that Walsh presents in sections 3 and 4 of his paper suggest that a policymaker concerned with robustness might wish to overestimate both inflation persistence and inflation inertia. I would conjecture as well that, at least in models where the output gap leads inflation, a policymaker might also wish to overestimate output persistence. I assume that in most of these type of models, this would lead to rules in which policymakers would react more in total, and by more in the first period, to shocks in the inflation and output equations than he or she would if basing policy on estimated persistence and estimated inertia.¹⁴

Policymakers do tend to get quite concerned when inflation is persistently away from its target or when output is persistently away from potential. Therefore, it is likely, for example, that policymakers would be particularly open to the type of reaction just mentioned when inflation was quite far from the implicit or explicit target and continuing to move away from the target.

Robust control—is it practiced by policymakers?

As Walsh notes, in the approach to robust control recently popularized in economics by Hansen and Sargent, optimal policy aims to minimize the worst-case outcome that could arise in the model misspecification that makes the policymaker look as bad as possible. In commenting on Hansen and Sargent (2001), my colleague Tiff Macklem (2001) argues that in normal times “observed [monetary] policy outcomes do not look much like those implied by robust control” because they are much less aggressive than what would be suggested by robust control—at least in the context of simple, linear-quadratic, backward-looking models. (I would add that although policymakers may have followed quasi-robust behavior in certain episodes in response to concerns about inflation persistence and inertia, this is far from assuming the worst-case scenario.) Macklem goes on to argue, however, that “there are numerous examples of situations in which central banks changed interest rates aggressively in what looks to be an attempt to take out insurance against financial instability and the possibility that financial instability may endanger price stability.” Two of the examples that he cites are the cuts in policy rates (in the United States, Canada, and other countries) following the stock market crash of 1987, and the cuts in policy rates in the United States following the difficulties at Long-Term Capital Management in September 1998. I would add to this list, the cuts in policy interest rates in many countries the week after September 11, 2001.

Concluding comments

In concluding, I would like to make some comments on some of the elements of Walsh’s conclusions before making some general remarks about where we are and where we should go from here.

“Simple rules can play a useful role as guidelines for central banks.” It will be useful for central banks to continue to do research on robust simple rules. But in the end they will probably be most useful as benchmarks in internal discussions. They will not be guidelines in the

strong sense in which Svensson (2003), for example, appears to understand that term.¹⁵

“The form of the policy rule can matter...” Most definitely.

“Uncertainty about the level of the output gap suggests using a first difference rule.” Maybe yes, maybe no. The case is not yet proven. If there were only one measure of capacity pressures and it was very noisy, the case for completely avoiding the level of the output gap would be stronger. And some of the work on various approaches to monetary policy that I alluded to earlier suggests that the first difference rule is not as robust across various kinds of models, as might be assumed from Walsh’s current and earlier work. What is clear, however, is that measures of the output gap are very uncertain and this uncertainty needs to be taken into account. At a minimum, this suggests the use of multivariate filtering methods and downweighting noisy measures of the output gap relative to measures of trend inflation.

“A ‘quasi-robust’ approach suggests central banks should err on the side of treating disturbances as quite persistent and the inflation process as backward-looking.” There probably is, and should be, a tendency in this direction. It is a matter of degree, however, and realistic estimates of the inflation process would suggest that it is much less backward-looking than we thought 15 years ago.^{16, 17} As Carl notes, it is “unreasonable... to assume agents’ expectations do not adjust across different policy regimes in ways that affect the dynamic behavior of the economy.”

“A risk-sensitive policymaker will undertake precautionary policies.” History appears to indicate that when there are major economic or (especially) financial disruptions, policymakers will act as if they are risk-sensitive and will undertake precautionary policies.

The theoretical and empirical literature on how to take uncertainty into account and how to develop robust rules or procedures for the conduct of policy continues to expand. Walsh has done us a valuable service in summarizing and extending recent contributions to this literature.

Progress is being made and insights are being gained by academics and policymakers alike. But, for the policymaker in particular, many unanswered questions remain. In part, difficulties arise because there are many types of uncertainty. Even in simple models, robustness to one or two types of uncertainty leads to very complicated rules, which probably cannot be implemented. And simple rules are sometimes proving not to be as robust as we thought—whether across wider classes of models or across more types of uncertainty.

One possible approach to the research agendas for researchers working at or with central banks is to narrow the range of relevant models somewhat and to re-center it as well. What I am thinking of here is centering the exercise on models where there are transmission lags (i.e., returning to the insights in Svensson 1997) and where expectations are both backward-looking and forward-looking in both the inflation and output equations. Most central banks would want to make sure that the appropriate open-economy features were included. Within this class of models there should be concentration on parameter uncertainty, persistence uncertainty, and—most importantly—uncertainty regarding the measurement of the output gap.

Author's note: The views expressed in this paper are those of the author. No responsibility for them should be attributed to the Bank of Canada. The author would like to thank Jean-Paul Lam, Tiff Macklem, and Pierre Duguay for comments on earlier drafts of this comment.

Endnotes

¹Jenkins and Longworth (2002).

²Dodge (2002) and Longworth (2002).

³In addition, there is the point made by McCallum (1993) that Taylor rules are typically written in terms of the current values of economic variables, which are typically not known at the time that decisions are made.

⁴Pearlman (1992).

⁵Jenkins and Longworth (2002).

⁶“Indicators of Capacity and Inflation Pressure for Canada” can be found on the Bank of Canada’s Web site: www.bankofcanada.ca/en/indinf.htm. Martin and Papile (2003, forthcoming) discuss the usefulness of various measures of capacity pressure that are gathered in the quarterly survey of firms.

⁷Dotsey and Hornstein (2003), Levin, and Wieland (2001) discuss whether real-time information on money also helps policymakers make better decisions in the face of uncertainty, including uncertainty about the output gap.

⁸Bank of Canada (2001) and Macklem (2001b).

⁹The Bank of Canada’s core measure of inflation excludes those six components as well as (1) intercity transportation prices, which are volatile because they are heavily influenced by supply shocks to the price of aviation fuel and by temporary airline seat sales; (2) tobacco prices, which are volatile because of changes in tobacco taxes and other factors; (3) the effect of changes in indirect taxes on the remaining components.

¹⁰In the model used by Walsh in the paper at this symposium, there are almost no dynamics and almost everything is a “jumper,” so past levels do not matter much. A change rule tends to do well because when a shock hits, the model jumps to a new equilibrium path and the jump gets picked up in the change. If the adjustment were more gradual with more dynamics, it would likely be more important to keep track of the cumulative changes or, in other words, the level.

¹¹That is, a central banker who places a lower relative weight on the output gap than is found in the social loss function.

¹²Lam notes that the various modification that he makes to the model used by Walsh tend to make the central bank’s policy response more inertial. This therefore tends to make the policy closer to optimal monetary policy under commitment, which is quite inertial in forward-looking models (Woodford 1999).

¹³For another, quite innovative, piece of policy advice going to the governing council that is expressed in terms of a simple rule, see Rowe (2002).

¹⁴This being said, however, the estimated inertia in inflation has come down considerably in countries with explicit or implicit inflation targets. This is at least partly the result of longer-run inflation expectations being much less volatile when there are no longer ongoing shifts in monetary policy regimes.

¹⁵Svensson (2003) finds “the idea of a simple instrument rule as a mere guideline not sufficiently specific to be operational. When shall the rule be followed and when not?” In comparison, Walsh states that “Simple rules can play a useful role as guidelines for central banks.” Walsh’s meaning of guideline is not fully spelled out. In particular, it is not clear if he intends something that is operational, in the sense of leading to a clear action.

¹⁶For evidence on this, see Kalaf and Kichian (2003), and Clifton, Leon, and Wong (2001).

¹⁷It has taken time to be able to identify this shift econometrically and further time to incorporate it into the models used at central banks. During this lag, we likely have effectively been working with more persistence and backward-lookingness than in the true model. But this “quasi-robust” idea suggests that was not so bad and that it may be appropriate even in the new steady state of lower and more stable inflation.

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