The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly supposed. Indeed the world is ruled by little else … Not indeed immediately, but after a certain interval.

John Maynard Keynes 1936
The General Theory of Employment Interest and Money

1. Introduction

This paper highlights similarities between monetary policy, today, and the writings of Knut Wicksell, 100 years ago. The Bank of Canada well serves a broad purpose, for the bank has been a leader in modern monetary policy. Anyone who follows the subject, anywhere, will be familiar with the main features of the approach. What may surprise you is the strength of the parallels with Wicksell, as indicated in the table.

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Wicksell published his masterpiece, *Interest and Prices*, in 1898. John Crow, as a new Governor, committed the Bank of Canada to price stability in 1988; the bank adopted the overnight interest rate as the policy instrument in 1994; it revamped its operational framework around the rates on its deposit and advances in 1997. Many other central banks adopted similar measures at about the same time.

One hundred years of solitude

The delay is something to explain. The sentences omitted, in the passage from Keynes at the top, famously go: “Practical men, who believe themselves to be quite exempt from any intellectual influences are usually the slaves of some defunct economist … some academic scribbler of few years back.” I left out these playful lines because they do not help at all for understanding this Wicksell puzzle.

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1 The Wicksell items in the column in the table are all in this book, except the third, which is in a 1917 essay.
First, we have a lot more than a few years to explain.

Second, Wicksell has never been defunct. He was a giant, recognized by peers in his own generation, and subsequent generations, as much for his work on capital theory and on the role of government as for that on money, and the founding father of the Swedish school of economics. Moreover, Wicksell was more than an academic scribbler. He wrote clearly and concisely (the popularity of his natural rate owes much to the alternatives being 4 times longer). And he was not shy about promoting his ideas in public, achieving notoriety in Sweden. Although this may not have helped his credibility in central banking circles, Wicksell’s influence was evident in the Riksbank’s adoption of a price stability goal in the 1930s—which, under the demanding circumstances of the Great Depression, went quite well (Jonung, 1979).

Third, the Bank of Canada (like several central banks) does not deny intellectual influences—indeed, the bank speaks proudly of its intellectual assets, and actively cultivates academic connections. More to the point, bank veterans have long been aware of Wicksell. Despite this familiarity, bank economists developed a Wicksellian approach to monetary policy without direct reference to the author. My own example might be illustrative. As an undergraduate, I stumbled across Wicksell in Blaug’s Economic Theory in Retrospect during an idle moment in the LSE library. In contrast to sixties’ monetarism and Keynesianism, Wicksell looked refreshingly free of baggage. He still does. But he was never on the curriculum. Over the years his name popped up, as the natural interest rate seeped into the mainstream, especially after Milton Friedman borrowed from it for the natural rate of unemployment. Apart from this instance, I did not recognize the Wicksellian encroachment into modern monetary policy as it happened. It dawned on my consciousness only recently. To check the idea, I picked up the author’s own work for the first time this year.

**Outrageous fortune**

So how to account for the gap between the author and the widespread application of his monetary policy? All I can suggest is accidents of geography, language and history. Wicksell published mainly in Swedish and German. The English translation of *Interest and Prices* appeared—10 years after his death—in 1936. Could timing be worse? Keynes

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2 Authorities such as Karl Gustav Cassel, Bertil Ohlin, Lord Robbins, and James Buchanan acknowledged his deep influence.

3 A Malthusian, his forecasts for the economy and population were as gloomy as they were wrong (Part V, *Selected Essays*). Wicksell worried about sex and alcohol and the working class; he was an advocate of birth control. The latter does not shock any more, but I was startled to read, first, that Sweden was on the verge of overpopulation in the early 1900s, and, second, that the solution was emigration to Siberia, of all places (pp 160-1). Wicksell’s foibles in no way diminish the man, rather they measure up to his greatness.

4 Harry Johnson (1962) is the best account of what was on the monetary policy curriculum: a vast outpouring of research, with all sorts of trade-offs and complications. Johnson, a famously lucid synthesizer, was yet unable to distil any clear guide as to what monetary policy was supposed to do. Central banks were even more opaque than the academics, perhaps deliberately. For example, in trying to help the Porter Commission, the Bank of Canada turned down opportunities to be more specific, and stuck to the mantra “appropriate credit conditions.”
was grabbing all the attention—and did so into the 1960s. As the Keynesian revolution subsided, along came Friedman’s monetarist counter-revolution. Noisy mid-century debates drowned out the reasonable voice of Wicksell.

Central bankers, especially, should have been more attentive to him. For Wicksell’s arguments provide a logical justification for delegating monetary policy (he was among the first to use the term) to an independent central bank. Neither Keynesianism nor monetarism is capable of doing so. The former would coordinate monetary and fiscal policy, which might be done better inside the ministry of finance, while the latter would program a computer to keep M growing at a constant rate, and remove all discretion from the central bank.

Wicksell stands the test of time better than either of these schools. Keynesianism ran into trouble in a post-WW2 economy usually operating near full-employment, and verging on inflation. Monetarism rested on an assortment of claims, which may have had plausibility at the outset, but which were soon undone by accelerating financial innovation, and which, in the 1990s, were put to rest by the successful commitment of discretionary monetary policy to low inflation.

Disclaimer
My discussion rests entirely on published material, which traces the path of official thinking well enough: I have no insider revelations to offer. Given the topic, there is a sense in which I implicate the Bank of Canada. The views in the paper are nevertheless my responsibility, alone. Former colleagues may, or may not, share them; none is going to like everything here. Some would even object to the Wicksellian label.

2. Theory of monetary policy

2.1 Overview
To confront problems that can be sidestepped in the open-economy case Wicksell deliberately chose a closed-economy setting, (e.g. pp 111-3).\textsuperscript{5,6} Today’s core model has 3 equations, often written in terms of deviations from long-run equilibrium values:

- *aggregate demand function*, which in the short run determines the output gap as a function of the deviation between the actual interest rate and the equilibrium rate
- *Phillips curve*, which in the short run, determines deviations of inflation from the policy target as a function of the output gap (augmenting for inflation expectations has no great effect if these are anchored by the target)
- *policy rule* to set the actual interest rate relative to the equilibrium rate, as a function of the deviation of inflation from target (e.g. a Taylor rule or, in the

\textsuperscript{5} Page references are to *Interest and Prices* (1898) unless otherwise noted by date.
\textsuperscript{6} Under a fixed exchange rate, both the rate of inflation and the domestic interest rate are for all intents and purposes exogenous. Wicksell saw that the fundamental monetary questions with fixed exchange parities lie in the “degree of freedom” (his expression) for monetary policy in the \textit{n}-country system as a whole, not in the \textit{n-1} fixed exchange rates (p 27, *Selected Essays*). The small-country model also evades basic issues in floating exchange rate mode. For example, currency depreciation may offer a way out of a deflation trap for one country, but not for all countries together: at least one has to solve the problem at home.
bank's Quarterly Projection Model, QPM, an inflation-forecast rule—Armour et al, 2002)

Long-run equilibrium is defined by these conditions:

- the inflation rate is equal to the target rate (the policy rule is thus the nominal anchor for the system)
- the output gap is zero
- the interest rate is equal to the exogenous long-run equilibrium rate (Wicksell’s natural rate)

This model is astonishingly close to Wicksell, following the revolutions and counter-revolutions, syntheses and innovations, of the intervening years.

Both the bank and Wicksell pay formal respect to the Quantity Theory of Money. If the lineage of this Grande Dame commands their reverence, her waywardness arouses their caution. Bank folklorists tell, with no bitterness, the story of her abandonment of Governor Bouey: the moral concerns the volatility of the lady, not her futility—and the valour of the man for taking her on. Nowadays devotees tend to her in the West Tower, safely away from the kitchen. Wicksell was on the same wave-length. His treatment of the Quantity Theory spares her the heavy lifting; the interest rate does that. But from time to time he assures the reader she is well, and esteemed.

2.2 Natural interest rate and aggregate demand function

The rate of interest which would be determined by supply and demand if no use were made of money and all lending were effected in the form of real capital goods. p 102.

This is the first of 2 definitions of the natural interest rate provided by Wicksell. Since this one is in terms of aggregate demand and supply, you could see it as the rate at the intersection of the down-sloping IS curve and the vertical representing potential output.

He called the actual rate, at which banks lend and businesses borrow, the bank interest rate or the money interest rate. The former expression is more convenient for us, since bank rate conveys the idea of a short-term rate managed by a visible hand, and since we use money rate in juxtaposition to real rate. All interest rates in this discussion are real, including the money rate.

The bank rate \( r \) enters the aggregate demand function:

\[
y = f(r).
\]

The bank rate is not in general equal to the natural rate. Commercial banks administer bank rate. The influence of “routine and experience” leads them to adjust their lending

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7 Wicksell was aware of the impact of inflation on interest rates; the Bank of Canada is keenly aware. If inflation expectations are stable, however, as they were then (around zero), and are now (around 2%), the distinction between real and nominal rates is not too important.
rates too slowly (pp 118-9). The market achieves equality between the bank rate and the natural rate only over time, in the long run.

I could not find in Wicksell a clear equivalent to today’s potential level of output (surely he would have called it the natural level of output). But his discussion of the business cycle depends on a limit to supply, which we might as well label potential output. Long-run equilibrium is given by

\[ y^{\text{pot}} = f(r^n), \]  

which implicitly determines the natural rate \( r^n \), since \( y^{\text{pot}} \) is determined by factors outside the model.

Bank of Canada models too have an aggregate demand function with a similar long-run equilibrium interest rate. In addition, the bank acknowledges that it, not the market, sets the short-term interest rate in the short run, but not the long run.

It is convenient for many purposes to write the model in terms of deviations from equilibrium:

\[ y - y^{\text{pot}} = f(r - r^n) \]

This brings out Wicksell’s interest rate mechanism: the deviations between the bank rate and natural rate that he thought drove the business cycle.\(^8\)

In the early 1990s, findings that the slope of the yield curve was a good predictor of short-run changes in GDP attracted the bank’s attention. As a result, the differential between a long-term and a short-term interest rate is the monetary policy variable in the bank’s workhorse model, QPM.\(^9\)

Clinton (1994) connected this approach to Wicksell. The task at hand was to explain empirical results from Cozier and Tkacz (1994), which strongly confirmed the predictive power of the term spread.\(^{10}\) I argued that the expected future short-term rate, beyond some horizon, would rationally be equal to the natural rate. The consensus estimate of the lag effect of monetary policy suggests that this horizon is about one year. The expectations theory would predict, from this, that the impact of a shock to the short rate on the long-term bond yield should be quite small (e.g. the coefficient of the short rate in an equation for the 20-year rate should be about 1/20 or 0.05). Estimated impulse-response functions confirmed this, implying that the natural rate has a high weight in the

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\(^8\) At one point Wicksell insists that in long-run equilibrium bank and natural rates do not have to be equal (p 120). This stricture only complicates the story, however, and Wicksell himself must have found it tedious, because he does lapse. We might as well define equilibrium in terms of equality of the 2 rates. Interest differentials can be introduced through risk premiums, and a range of longer-term maturities.

\(^9\) And in the well-known Amano-van Norden model of the exchange rate.

\(^{10}\) Some bank economists adhered to a real-business-cycle explanation, in terms of inter-temporal reallocations of output and consumption. This does not, however, stand up to scrutiny (Clinton, 1994).
determination of the bond yield. Therefore, the slope of the yield curve gauges the natural-actual rate deviation. Wicksell’s interest rate mechanism can therefore explain the predictive power. By the same token, one can say that QPM, embodies the mechanism, with the bond yield capturing movements of the natural rate of interest.

Wicksell himself had neither the expectations theory nor a yield curve to work with, so he could not test his theory in this way. His only comment on the term structure was that the long rate would be higher than the short rate, and follow the short rate (pp 75, 91-93). This is not satisfactory analysis from a modern perspective, as it ignores expectations, and the implications of the natural rate for the expected future short-term rate. Economics has progressed, after all.

2.3 Price level or inflation and output gap

The immediate precondition and reason for every change of price, of any kind whatsoever, and no matter what its ultimate causes might be, is always a disproportion that has come into being between the money rate of interest and the natural or real rate of interest on capital. 1908, p 35.

There is a certain rate of interest which is neutral in respect to commodity prices, and tends neither to raise nor to lower them. p 102.

The second definition of the natural interest rate is in terms of the price level. Wicksell regards the two as equivalent, in line with his view that inflation or deflation results from an imbalance of aggregate demand and supply.

“Easier credit sets up a tendency for production to expand; but [not] … if the available means of production, labour and so on, are almost fully occupied…. the excess of demand (brought about by easier credit) over supply … is the decisive fact in forcing up prices…” (p 90). This thought may be conventional today, but it was not in 1898, when the emphasis was on the stock of money rather than the flow of spending (Ohlin’s “Introduction”).

In the light of the behaviour of prices in the 19th century, it was natural for Wicksell to focus on fluctuations around a constant long-run average. He nevertheless goes out of his way to describe how a prolonged divergence of the actual interest rate from the natural rate leads to a cumulatively rising and eventually an accelerating price level (pp 95-8). “The upward movement of prices will in some measure ‘create its own draught’.” Expectations adjust upwards, and speculative buying pushes up the inflation rate … “as prices continue to soar and profits are easily earned the movement may rapidly reach fever point. There is almost no limit to the rise in prices…”

This accelerationist model, which depends on the adjustment of expectations, finds an echo in the vertical long-run Phillips curve, an integral part of the bank’s thinking since the 1970s (Fortin, 2003). There is no Phillips curve in Wicksell, of course, and to complicate matters, from our viewpoint, Wicksell usually goes directly from interest rate
to price level (as in the quotations at the start of this section). We can get there, however, starting with a Phillips curve:

$$\Delta p = g (y - y^{opt})$$

and then substituting the interest rate deviation for the output gap, from equation 3:

$$\Delta p = h (r - r^n)$$

which corresponds to Wicksell’s simplest statements of the inflation process. His descriptions, however, are often much more cumbersome than that. He goes into numerous examples and details regarding capital goods, intermediate goods, the distribution of income, and so on. The modern version of the inflation process by-passes all this.

2.4 Policy rules

So long as prices remain unaltered the banks’ rate of interest is to remain unaltered. If prices rise, the rate of interest us to be raised; and if prices fall, the rate of interest is to be lowered; and the rate if interest is henceforth to be maintained at its new level until a further movement of prices calls for a further change in one direction or the other.

The Wicksell policy rule is:

$$r - r^n = \gamma \Delta p$$

which may remind you of the Taylor rule. This sets the deviation of the policy interest rate as a function of the deviation of inflation from a 2% target \((\Delta p - 0.02)\), and the output gap:

$$r - r^n = \gamma (\Delta p - 2.0) + \phi (y - y^{opt})$$

For every point increase in inflation above target, the Taylor rule raises the real interest rate 50 basis points, and for every point increase in the output gap, again 50 basis points \((\gamma = \phi = 0.5)\).

The inflation target in the Taylor rule means that policymakers never try to undo the effect of an undesired change in prices; they never look back. In the above quotation Wicksell writes as though he agrees. But sometimes his target reads like a constant level. In his day one did not fuss about stationary versus non-stationary stochastic series.

There are nevertheless material differences between the 2 rules.
The first is Taylor’s 2% target versus Wicksell’s zero. From a modeling viewpoint, any constant rate may do—but not from the viewpoint of economic policy—an issue taken up in section 4.

The second is that the output gap is not in the Wicksell rule. But this is omission is less than meets the eye. Its role in the Taylor rule is just to indicate pressure for future inflation, and it can be dropped without much loss, especially as measurement of the gap is subject to a wide margin of error. Indeed, the Bank of Canada sees relies more on the information in the opposite direction: it uses the movement in core inflation rate to check the sign and size of the current gap.

The third difference is more subtle. Wicksell “does not mean that banks ought actually to ascertain the natural rate. That would, of course be impractical, and would also be quite unnecessary. For the current level of commodity prices provides a reliable test of the agreement or diversion of the two rates.” (p 189). Economists today, however, are prepared to take a stab at the natural rate, using, e.g. the growth rate of potential output, or the long-term bond yield. This reflects advances in theory and in the availability of data, and a greater belief in quantitative methods. It takes nothing from Wicksell, of course, as it implies a more direct application of his idea than he thought feasible. In practice, moreover, policy is bound to lean on his pragmatic iterative approach to the natural rate, at least from time to time, to benchmark the direct estimates.

Bank of Canada modelers have investigated inflation-targeting rules in numerous variants. Distinctive in their approach is a focus on inflation-forecast-based rules. The most sophisticated is the QPM reaction function, which sets the short-term interest rate so as to eliminate any current or potential deviation of inflation from target over a horizon of 6-7 quarters (Armour et al, 2002). Because of concerns that the results might be too dependent on the specific structure of that model, bank economists also use simpler inflation-forecast-based rules, and according to Côté et al (2002) currently favour one that is not very different from Taylor.

All this research refines, and adapts for use, Wicksell’s original suggestion. No central banker will ever concede that policy follows a mechanical rule, and nor should they, but the modelers’ findings nevertheless have a visible impact on the formulation of policy at the Bank of Canada. For example, the forward-looking rule, to achieve target within a 6-7 quarter horizon, is explicit in the bank’s media releases following interest rate decisions, and in other policy statements.

This completes my comparison of models. The correlation with Wicksell is high. The next section provides a sidelight on some of Wicksell’s other ideas. You can skip straight to section 4 if monetary policy is your main interest.
3. Theory sidelights

3.1 Business cycles

All these difficulties and complications at once disappear when it is changes, brought about by independent factors, in the natural rate of interest on capital, that are regarded as the essential cause of such movements. p 167.

Wicksell derives his theory of business and price fluctuations by considering how a wide variety of shocks might affect the economy. These include exogenous changes to: productivity; supply of credit or bank loan rate; money supply; and the wage level. He examines his theory against all the cases. Much debate with his contemporaries involved coming up with a new hypothetical disturbance; they would then argue about its implications. Wicksell is open to hypothetical shocks of all shapes and colours.

Even so, “The main cause of the business cycle, and a sufficient cause, seems to be the fact that technical and commercial progress cannot by its very nature give rise to a series which proceeds as evenly as the growth in time of human needs.” (Cited by Ohlin, p ix.) Movements in the natural rate of interest are, then, the prime mover.

This may read like late-20th century real-business cycle theory—but wait until Wicksell brings lagged adjustment of the interest rate into the picture. In new classical theory you do not find this: “There is nothing so far to bring the rate of interest on money into coincidence with the rate which would be determined if capital goods were lent in kind” (p xxvi, Wicksell’s italics)—or this: “… there is no reason for any rapid movement of the money rate into line with the natural rate, and a deviation between the two rates, with its dues effect on prices, can persist for a considerable time” (p xxvii).

In modern macro models, such as QPM, deviations from potential output may result from an array of disturbances to demand or supply side. Shocks to investment demand, or to potential output, could in principle lead to changes in the long-run equilibrium interest rate in these models. However, bank policy analysis does not emphasize natural rate shocks the way Wicksell did.

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11 Professor David Davidson would often set Wicksell off.
12 Duguay (1994) specifies an aggregate demand function in first differences, which could imply a non-stationary natural rate of interest.
3.2 Quantity Theory

The Quantity Theory is theoretically valid so long as the assumption of ceteris paribus is firmly adhered to. But among the “things” that have to be supposed to remain “equal” are some of the flimsiest and most intangible factors in the whole of economics—in particular the velocity of circulation of money. p 42.

Classification is not necessary. However, since Wicksell identified himself as a Quantity Theorist, to avoid confusion I am obliged to disassociate him from the Modern Quantity Theory—as per Friedman’s restatement, or monetarism.13

For Wicksell the demand for money, or velocity, is not stable or predictable (see above). And the supply of money, is not pinned down by exogenous factors. One of his imaginative devises is a pure credit economy, in which the money supply is indefinitely elastic (pp 62-80). Obviously an abstraction, but all the way through Wicksell relates the model to actual banking practice. It helped him to explain why the supply of money in the real world was not closely linked to a monetary base.

Moreover, if you think it matters, you could argue that his view of the Quantity Theory transmission mechanism is more Keynesian than monetarist, in that he insists on the interest rate channel. Thus: “… the explanation offered by the Quantity Theory—that rising prices are due to an excess of money, falling prices to a scarcity—does not accord with actually observed movements of the rate of interest …” (p 167).

To me, Wicksell’s Quantity Theory is no more than monetary neutrality. In steady state equilibrium, if all nominal magnitudes change by an equal proportional amount, no real variables are affected. Conversely, if you control one nominal magnitude constant, you fix the overall price level. The control variable could be money, operating through a real balance effect (p 40);14 it could be something else. These are innocuous thought experiments in a timeless world. They imply no particular direction of causality: many different shocks, real or monetary, could set the process off. The equilibrium price level that Wicksell envisaged is a neutral equilibrium: stable in the way of a cylinder on a rough plane (pp 100-1): it is not unstable, but it can be permanently displaced by a variety of shocks.

This gets us to policy. To offset such shocks, the central bank should apply intelligent monetary policy. Wicksell argues tirelessly for a watchful discretionary management of money. And he recommends active use of the interest rate to this end. In contrast, under the Modern Quantity Theory, the money stock anchors the price level well enough; discretionary policy does more harm than good; and the interest rate is a variable best left to find itself.

13 Humphrey (1997) attempts a monetarist reconstruction of Wicksell, which studiously avoids Wicksell’s emphatic dismissal of all the relevant empirical assertions, as well as his advocacy of an active discretionary policy.
14 This seems to be the earliest explicit statement of the effect, which is usually attributed to Pigou or Patinkin.
Where does the bank sit with the Quantity Theory?

To diversify its model portfolio, the Bank of Canada invests significant resources in models in which the quantity of money matters. These vary over a wide range, from single equations, to state-of-the-art general equilibrium theory and structural VECMs (Longworth, 2002). The bank has uncovered evidence that certain monetary aggregates have predictive power not captured by other variables. This research has not, however, penetrated policy-making to any depth. Unpredictable shifts repeatedly undermine confidence in the aggregates. The weight put on money supply in policy decisions can be gauged by its virtual absence from the bank’s regular interest rate announcements. If it is there at all, it is to reinforce the message in other data.

After all the water under the bridge, present central bank views on the Quantity Theory are not so different from Wicksell’s. In a long-run sense money is neutral, intrinsically linked one-for-one with the price level. Money stocks have to be watched. Theory and evidence suggest, however, that the money-inflation relationship is quite weak, and no firm basis for policy formulation.

3.3 Price level measurement

Monetary economists around the turn of the century—Fisher and Jevons, as well as Wicksell—made original contributions to index number theory and its practical application. Having concluded that general price stability should be the standard, rather than the price of gold, they followed up with research to measure movements in the general price level. In the absence of price indexes, it was difficult to gauge the size of general price fluctuations, and hence to analyze monetary history, a fact which caused Wicksell some frustration.

The Bank of Canada has resumed the tradition of researching the price numbers. It has thoroughly examined possible bias in the CPI (Crawford, 1998); and its work on core inflation (Macklem, 2001) has stimulated Statistics Canada to produce, in addition to the CPI, a “core” CPI that omits highly volatile items, and better captures the underlying trend. The bank’s close, ongoing interest keeps up the pressure for high quality data.

Wicksell, we can only imagine, would be amazed and delighted at the headlines and analysis in the business pages that follow Stat Can’s monthly CPI release, and, above all, at the central bank’s starring role.
4. Politics of monetary policy

4.1 Who’s in charge?

Co-operation between the banks of a single country for the regulation of interest rates is, already, of course, a matter of everyday procedure. 1898 p 192.

But all of this presupposes that the banks or the authorities in charge of monetary administration do actually have the power to regulate the general level of prices. 1908 p 37.

In my opinion [a true central bank] ought, first, to be a purely state institution. 1917 p 78.15

Wicksell was convinced that money could and should be managed to provide price stability, and that this would be an enormous social benefit. He devoted his energy and intellect to the cause. But where did—or should—this responsibility rest? The idea that the primary function of the central bank is monetary policy took shape during Wicksell’s working life. In 1900 the notion was just perceptible; by the 1920s the major central banks had taken charge.16 Wicksell was prominent in, and influenced by, the development: his early writings are vague on the location of responsibility; his later writings pin it down.

Thus, in 1898 Wicksell is after co-operation between the banks, and in 1908, the banks or the authorities in charge of monetary administration. In 1917, when he settled on the central bank, he was not much ahead of the crowd. But it took another 70 years to establish the objective of price stability, or low inflation. This is strange, because the objective provides the logical basis for central bank independence.

In the 21st century, most central banks have a price stability mandate, or some facsimile. We have learned a lot about how to structure the set-up to this end, and about the need to clarify key aspects of central bank governance—such as mandate, independence, relationship with the government, accountability.

In Canada, the formal arrangements have changed little since the Bank of Canada was established in 1934. In the wake of the Coyne Affair, prior to becoming Governor, Louis Razminsky insisted on a clarification of the responsibilities of government and central bank, which was put into the Bank of Canada Act in 1967. The government is ultimately responsible for monetary policy, and in the event of an irreconcilable difference the Minister of Finance may send a public, written, directive to the Governor specifying the

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15 The context is an argument for a Scandinavian monetary union, but the case for making the central bank responsible for monetary policy applies just as well to a single country.
16 The Swedish central bank evolved, during this period, in step with Wicksell’s thinking. The Riksbank website summarizes the history. A state commercial bank until the 1890s, the Riksbank became a true central bank just before 1900, decades behind the Bank of England, and not far ahead of the Federal Reserve System or, for that matter, the Bank of Canada.
action the bank must take, and the timing. The directive power, in effect, strengthens the operational independence and accountability of the bank.\textsuperscript{17} It ties the government to the Bank of Canada’s conduct of monetary policy; ministers cannot criticize what they command.\textsuperscript{18}

No legislative reform has had nearly as much impact as the vigorous efforts of John Crow, Governor between 1987 and 1994, to strengthen monetary policy and the role of the central bank.

Crow would have liked a price stability objective in the Bank of Canada Act.\textsuperscript{19} In its absence, for guidance to the policy mandate, the Governor studied the preamble, an artful concoction of good intentions. It contains the wise provision “so far as may be possible through the scope of monetary action.” This was one blade of the scissors Crow would wield. Furthermore, the Act gives the Bank of Canada considerable independence: to what purpose? It has to be because of an objective that needs shielding from routine politics. Second blade. The scissors—irresistible logic—cut away the superfluous, to reveal the preamble as the thing itself, unaccommodated price stability. No other objective made sense.

At first the argument sounded shockingly one-sided, but in the end it was persuasive. Debate now is less about the single objective, more about how it should be defined. By virtue of John Crow, Wicksell moved into the Bank of Canada, quiet and unrecognized.

The 1991 inflation-control targets had 2 features, often overlooked, which the Governor regarded as crucial. First, it contained a long-run commitment to price stability. Second, it was a joint announcement by the bank and the government, confirming that in Canada the central bank helps set the objective, and is not just an agency to that end.

Central banks are a work in progress. Their monetary policy function is not very old. Nothing is carved in stone. Debate goes on about the mandate, and the meaning of low inflation and price stability, and other such weighty subjects. But the overall framework, at home and abroad, looks set for a while, and adaptable enough to survive. Political events and the local environment embellish the facade and affect the plumbing of every central bank; only policy wonks care. More important is the common structure underneath. Wicksell had the blueprint.

\subsection*{4.2 Price stability or low inflation}

The ideal position, affording common advantage to the overwhelming majority of the various groups of interest would undoubtedly be one in which, without interfering with the inevitable variations in the relative price of commodities, the general average level of

\textsuperscript{17} Some academics get this backwards, e.g. in calibrating an “index of central bank independence.”

\textsuperscript{18} Compare the situation in the United States, where Secretaries of the Treasury do not hesitate to urge the Fed to loosen up.

\textsuperscript{19} For Crow’s views we can rely on his lively memoir \textit{Making Money}. 

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prices—in so far as this conception can be assigned a definite meaning ...—would be perfectly invariable and stable. 1898 p 4.

This could be John Crow. The former Governor and Wicksell are anti-inflation hardliners, and both have an engaging turn of phrase. “Those people who prefer a continually upward moving to a stationary price level forcibly remind one of those who purposely keep their watches a little fast so as to be more certain of catching their trains.” (p 3). Wicksell’s distaste for inflation was reinforced by his view that it created speculative excesses, and hence crises, which would trigger slump and deflation (p 213).

Wicksell expresses equal dislike of inflation and deflation—that Crow has less to say against the latter you can put down to the difference in environment. To reinforce their case, both men emphasize the ethics as well as the economics of a commitment to price stability.

The Bank of Canada since 1993 aims at 2% inflation. Crow could not accept this much water in the wine of price stability, and did not seek reappointment to a second term. In the most recent restatement of the objective (2001) the bank allows that it does not see clear gains from a lower target. This says something, because the bank researches these issues in depth, and is not inclined to downplay the potential benefits of further movement towards price stability.

The Bank of Canada, uniquely, has also intensively studied and debated the implications of using the price level as a policy objective rather than the inflation rate. Whereas the consensus (e.g. Fischer 1994) dismisses the price level objective, citing high output volatility and deflation risk, the bank’s research suggests the case is not closed. Indeed, if the objective is specified sensibly (e.g. a slightly rising price level—why not 2% p.a.?), and if an appropriately smooth policy rule is applied (i.e. a longish target horizon, or a small $\gamma$ in the policy rule), a price-level target has attractive features. For example, because it has memory, a credible price level objective would be an extremely effective solution to a deflation trap: a price decline would require, and create expectations of, a spurt of above-target inflation.

If there is a link to Wicksell here, it is that both he and the bank are preoccupied, perhaps to a fault, with exploring every aspect of theory and measurement that may relate to the price-level objective.

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20 This maximizes the probability that the outcome will be in the official 1-3% range.
21 Crow also detected a subtle erosion of the authority of the bank, which he thought should be more than an agency pursuing a numerical objective set by the government.
22 Duguay (1994a) and Coulombe (1997) provide original ideas and excellent discussions.
23 The issue is between a trend-stationary process (finite variance around the trend) and a non-trend-stationary process (unbounded variance). Finite variance in the price level has obvious virtues over unbounded variance if a nominal anchor is important.
4.3 Instrument—framework for interest rate control

[The central bank] ...could set a rate of interest on deposits that was only very slightly lower, or preferably no lower at all than the rate of interest the bank itself asked ... I see no real reason for the traditional state of affairs, in many places fixed by law, according to which central banks ought not to grant any interest on deposits. 1917 p 78.

In keeping with his focus on the interest rate as a policy instrument, and a lack of interest in monetary quantities for this purpose, Wicksell came to recommend a method of policy implementation based on the deposit and discount rates of the central bank. He was concerned that the operating framework, rudimentary as it was, did not allow sufficient policy influence over interest rates; the purpose of his recommendation was to ensure close control over the level of short-term interest rates.

This was very far-sighted. For most of the 20th century, central bankers and academics highlighted reserve requirements and reserve supply. Legal minimum requirements forced banks to hold zero-interest reserves at the central bank. Changes in the supply of reserves, relative to the requirement, were the instrument. The ability of the central bank to control the level of its liabilities—liquidity provision—was the key operating variable. Short-term interest rates went wherever they would go, as a by-product of, as John Crow would say, an appropriate pace of monetary expansion.

In the early 1990s, however, the Bank of Canada, along with many central banks, got rid of reserve requirements, and in the late 1990s it started to pay interest on reserves (now called settlement balances). The latter provides a floor for the overnight interest rate in the money market, just as in Wicksell’s description. At the top end, the lending rate of the central bank—Bank Rate in Canada, discount rate in Wicksell—provides the ceiling. This arrangement allows the central bank to control the short-term interest rate within fine tolerances (Clinton, 1997, Howard, 1998).

Central bank quantities, such as bank reserves or high-powered money, used to give opaque signals about monetary policy, which a special caste of economist-scribblers would demystify for the masses. These no longer have any policy significance at all, and the Brahmins have another life. The central bank’s instrument is the short-term interest rate. Transparent and Wicksellian.

4.4 Moderating the cycle

[Measures] that are apt to ensure that money retains a constant value are likely to be, at the same time, a means of stabilizing, not disturbing the steady course of business life. 1908 p36.

The inflation-targeting framework acts as an automatic stabilizer for the economy. For example, a negative shock to demand leads to interest rates being lower than they otherwise would have been. This has the effect of moving output back towards potential output and inflation back to its target midpoint. David Dodge, 2002.
Wicksell is brief, the Governor is technical, the thought is the same. Inflation control is not just useful in itself; one of the payoffs is a more stable economy. A policy of monetary stability requires short-run demand management to stabilize the cycle, while minimizing the risk that this will degenerate into chronic over-stimulation policies. Deflation and inflation are resisted equally: the constraint on discretion ensures a degree of symmetry.

The Bank of Canada spends much time analyzing the output gap because of its implications for future inflation. Although keeping output at its potential level is not the target for the central bank, its actions in pursuit of low inflation normally have this effect.

Wicksell observes that it is not the nature of economic progress to be smooth; late-20th century real-business cycle theory re-establishes the point. The best that monetary policy can do is to prevent unstable prices, which would add unnecessary disturbance to the economy.

5. Concluding thoughts
An eminent trio of monetary theorists born before 1900—Irving Fisher, Keynes, and Wicksell—came to the conclusion that the central bank could stabilize the value of money, and that it should do so. A fundamental re-examination of monetary theory, and the several monetary controversies of the 19th century, lay at the core of their reasoning. It was driven by the failure of existing theory to adequately explain observed trade and price fluctuations, and by innovations in banking and payments systems.

A characteristic of their work was their diligence to the operational, all the way from instrument to objective. They made recommendations for the framework of policy implementation, for strategic guidelines (or policy rules), and for broad price indexes to measure the value of money.

In all this, these economists broke open the idea of monetary policy. With uncanny timing their work started during the hey-day of the gold standard, and was ready to apply—just-in-time delivery—as that system started to run into difficulties in the 1920s.

The unique feature of Wicksell’s contribution was that its clear and practical guidelines could have done much to alleviate all the monetary catastrophes of the 20th century, inflation as well as deflation. That his ideas took so long to be adopted is therefore no small loss.

Keynes shines brilliantly, and at once changes everything. Wicksell illuminates steadily, hardly noticed in the practical realm. Yet in the 21st century, his conception of monetary policy—alert and intelligent management of the interest rate to the end of price stability—rules Crow, Thiessen, Dodge, Greenspan, and all.
References

Amano-van Norden

