SBP Research Bulletin
Volume 5, No.1, May, 2009

The 21st Century Neo-Wicksellian Monetary Order

Kevin Clinton*

"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

JEL Codes: B10, E40, E50
Key Words: Neo-Wicksellian, quantity theory of money, natural interest rate

1. Introduction

This paper highlights striking similarities between monetary policy, today, and the writings of Knut Wicksell, 100 years ago.[1] The success, and apparent robustness, of this approach means that the story is of more than just academic interest.

Anyone following monetary policy will be familiar with the main features of the conventional modern approach. What may surprise you is the strength of the parallels with Wicksell, as indicated in Table 1.

* The author is former Research Adviser at the Bank of Canada. Pierre Duguay, Charles Freedman, David Laidler, John Murray, Tom Rymes, and Michael Woodford made helpful comments on an earlier draft.

[1] After a first draft, I learned about Woodford (2003), which also draws out these similarities. Woodford goes much further, using modern theory, inter-temporal optimization and rational expectations, etc., to discover useful new implications of the Wicksellian approach for inflation targeting.

Table 1. Monetary Policy Parallels

Conduct	Wicksell	Modern or neo-Wicksell
Objective	stable price level	low inflation or price stability
Instrument	commercial bank interest rate	Canada: 2% target short-term interbank rate
Implementation keystone	central bank discount and deposit rates	Canada: overnight rate central bank discount rate and deposit rate
Policy rule	adjust interest rate in response to actual deviations from objective	Canada: bank rate and deposit rate adjust interest rate in response to actual and anticipated deviations from objective
System		
Banking	pure credit system—no bank reserves	zero reserve requirement
Axis of monetary transmission mechanism	commercial bank rate relative to natural (neutral) interest rate	short-term rate relative to natural (neutral) interest rate
Inflation/deflation gap	unobservable gap between demand and potential output	unobservable gap between demand and potential output

Wicksell published *Interest and Prices*, his most comprehensive statement on monetary policy, in 1898.[2] No central bank, except the Swedish Riksbank in the 1930s, ever studied this work as a design for practical use. Yet by pragmatic steps, one by one, central bankers adopted measures that they could have found in Wicksell. Perhaps the reinvention was due to an impelling logic in the original package; it surely was not due to a conscious revival of the author.

At the Bank of Canada, John Crow, soon after becoming Governor, announced a commitment to price stability in 1988.[3] Reserve requirements were phased out in the early 1990s. Under Gordon Thiessen, the bank adopted the overnight interest rate as policy instrument in 1994, and it revamped its operating framework around the rates on its overnight deposits and advances in 1999.[4] The installation of Wicksell was therefore complete by the end of the century. Many other central banks adopted similar measures at about the same time.

[2] The Wicksell items in the table are all from this book, except the third, which is in a 1917 essay.
[3] Governor Crow's memoir, 2002 provides an entertaining account of his views, and of Canadian monetary history.

[4] For background, see Clinton (1997).

The substance of the paper starts, in section 2, by trying to explain why the approach, which would have conceivably avoided the disastrous monetary policy mistakes of the twentieth century, fell by the wayside. The conclusion is that this was just bad luck. Section 3 describes the extent to which Wicksell anticipated the broad outline and many if not all key details, of the current monetary policy model. Advances in economic science may have modified components, but the structure remains intact. Section 4 looks at several issues that preoccupied Wicksell i.e., business cycles, the quantity theory of money, price indexes, countercyclical monetary policy and which provide a sidelight on thinking then and now. Section 5 is about the framework for the conduct of policy, the definition of central bank responsibility, the price stability objective, and the mechanism for interest rate control. Concluding thoughts are in section 6.

2. One Hundred Years of Solitude

Puzzling Loss—and Reinvention

A sentence omitted, in the passage from Keynes at the top, famously goes: "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 the puzzling loss of Wicksell's monetary policy.

First, we have a lot more than a few years to explain. Second, Wicksell was never defunct. He was the founder of the Swedish school of economics, and recognized internationally by peers in his own and following generations for contributions in various fields of economics.[5] Nor was he a mere scribbler. He wrote clearly and concisely, and is still readable today. He was among the first to use the term *monetary policy*. And he was notorious in Sweden for his radical ideas.[6] Although this may not have helped his credibility in central banking circles, Wicksell's

[5] The Swedish school included Karl Gustav Cassel, Bertil Ohlin and Gunnar Myrdal. Outside Sweden, Lionel Robbins and James Buchanan acknowledged Wicksell's influence (biographies in *The Concise Encyclopedia of Economics*.) Since the 1960s, David Laidler and Axel Leijonhufvud have been his main torch bearers.

[6] A Malthusian, his forecasts for the economy and population in the 20th century 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). In 1910 he spent 2 months in jail for a satire on the Immaculate Conception. Wicksell's foibles in no way diminish the man; rather they measure up to his great intellectual honesty, rigor and courage.

influence was evident in the Riksbank's adoption of a price stability goal in the 1930s—which, given the circumstances, went relatively well (Jonung, 1979).

Third, many central bankers acknowledge intellectual influences. Every governor of the Bank of Canada has had a keen and active interest in economics; the bank speaks proudly of its intellectual assets; and it cultivates academic connections. More to the point, many bank veterans have been aware of Wicksell, and at least one actually read *Interest and Prices*. Despite this more or less vague familiarity, the bank groped ahead piecemeal towards a neo-Wicksell regime in the 1990s, without conscious reference to the original author.

Other central banks followed the same path, at the same time.[7] In the 1990s, by pragmatic steps, borrowing one from another, the practitioners assembled a new paradigm for monetary policy, unconscious that they were reinventing Wicksell.

Outrageous Fortune

What accounts for the loss of Wicksell's monetary policy for so long?

A large part of the explanation, I have no other, lies in intertwined accidents of geography, language, and intellectual history. The successful experiment in Sweden in the 1930s did not make the waves that an application in a large economy might have done. Moreover, Wicksell published his main work—books and articles in learned journals in German, and numerous essays in Swedish. But he wrote only a couple of articles in English, which may be the necessary language to establish the big new idea in political economy.

As for intellectual history, Wicksell's ideas had to compete with 2 potent alternatives, Keynesianism and monetarism, as well as their extraordinarily persuasive advocates. The English translation of *Interest and Prices* appeared 10 years after the author's death in 1936. Could timing be worse? Keynes was grabbing all the attention and did so for decades.

The post-WW2 Keynesian consensus, among economists and central bankers alike, downgraded the effectiveness of monetary policy. At the same time, this consensus assumed that monetary and fiscal policy should share responsibility for a comprehensive list of macroeconomic goals. Its view of monetary policy instruments was just as diffuse in addition to regular bank reserve provision, there

[7] For example, Alan Blinder, former vice-chairman of the Federal Reserve Board, writing in 1998, cites Wicksell once, for the idea of a neutral interest rate.

were reserve requirements, liquidity ratios, direct credit controls, interest rate controls, other actions to affect the entire term structure of interest rates, debt management, and so on with much emphasis on institutional particulars.[8] By the early 1960s conventional monetary policy was as blurred as it would ever get. This vagueness created an appetite for something more solid, even before the practical results deteriorated badly. Friedman's monetarist counter-revolution hit the spot for many young academics.

In the 1970s, the loose thinking was exposed in practical terms, as inflation accelerated and economic performance in general deteriorated, and monetary policy seemed to have no answer. Major central banks, including the Bank of Canada, turned to money supply targets for backbone.

Wicksell lost opportunities here, if only he had had a Milton Friedman to promote his distinctive approach to policy, (David Laidler and Axel Leijonhufvud, the pre-eminent Wicksell scholars of the last 30 years, focused rather on the theory). Until Woodford (2003), there was no clear recognition from economists that Wicksell offered a complete package for monetary policy. Keynesians had doubts about the effectiveness of monetary policy and did not in any case want a single, price stability, objective. Modern quantity theorists favored the price stability objective, but not the rest of the Wicksellian regime, e.g. discretionary management of an interest rate instrument, to say nothing of the shadowy role of the money supply.[9]

Monetarist/rational expectations theorists reinforced this antipathy, especially as regards the interest rate instrument. Who could judge if the interest rate level was appropriate? When it was no longer so? If movements were real, or just nominal, or some combination? A rigorous and influential attack, by Sargent and Wallace (1975), prove that whereas their money supply rules were consistent with stable rational expectations equilibrium, their interest rate rules were not. A small difficulty was that their rules excluded feedback from the price level, or any other endogenous variable (Woodford, 2002). This was easily overlooked, and the

---

[8] For conventional views see the Report of the Commission on Money and Credit (1961) in the United States, and the Radcliffe Report (1959) in the United Kingdom. Harry Johnson (1962) surveyed the field. Although renowned for lucid syntheses, Johnson could not distil a clear message as to what monetary policy was about. In Canada, the Porter Commission Report (1964), was somewhat more concrete. However, in its submissions to Porter, the Bank of Canada, declining invitations to be specific, stuck to the mantra "appropriate credit conditions."

[9] Laidler (1972) presents a Wicksellian model, in which the price level is anchored by an interest rate feedback rule, which in turn derives from commercial bank cash reserve management. The latter, although endogenous, is not explicit, and no cash reserve, or other monetary quantity, appears in the model. The feedback rule could just as well be interpreted as a monetary policy rule.

Sargent-Wallace argument dominated respectable monetary theory in the 1970s and 1980s.

Central banks nevertheless persisted with an interest rate, for many years so ineffectively that it looked as though Sargent-Wallace might be right. However, they got better at it, and eventually, in the 1990s, showed that the interest rate could work in practice, if not in theory. Theory bends to facts: before the end of the decade the interest rate staged a friendly takeover of policy rules in mainstream models.

If the academics were otherwise preoccupied all these years, what excuses central banks' neglect of Wicksell? Central bankers should have been attentive from the outset. Wicksell's arguments provide a logical justification for delegating monetary policy 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. Central bank silence on Wicksell is probably explained by the reluctance, until the 1990s, to assume responsibility for anything so transparent.[10]

So it was that nobody who counted on the big stage, no heavyweight academic or central banker, went to bat for Wicksell. After Keynes, he was neither for the *avant garde*, nor for practical men. It did not have to be that way. His policy ideas had rigor and timeliness, a directness that makes them easy to explain at any level, and they were operational. At various crucial moments, a forceful, charismatic advocate, in America or England, might have made all the difference.

Although, to this day, Wicksell's fame remains limited, his ideas have come back, just by wearing well. Keynesianism ran into trouble in a post-WW2 economy usually operating near full-employment, and verging into serious inflation in the 1970s. Monetarism rested on an assortment of propositions, which had plausibility at the outset, but which soon came undone. High substitutability among financial assets, and financial innovation, made the link between monetary quantities and nominal objectives much looser than monetarists had estimated. But it was the effectiveness of the neo-Wicksell approach, which Bernanke *et al.*, (1998) call

[10] In part this was due to the confused state of monetary policy described above, and in part by an ingrained penchant for secrecy (Acheson and Chant, 1972). The shift towards openness, with respect to the instrument, the objective, and everything in between, in the meantime, especially since 1990, is remarkable.

"constrained discretion," that completely undermined the monetarist critique of discretionary policy. Its success in maintaining low inflation, during vibrant growth of output and employment, as well as the recent slowdown, has finally put to rest the notion that some predetermined growth rate of money supply would do the job better.

3. Theory of Monetary Policy: A Comparison

To confront problems that can be sidestepped in the open-economy case, Wicksell deliberately chose a closed-economy setting, (e.g. pp 111-3).[11,12] 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 exogenous equilibrium rate (Wicksell's natural rate)
- *Phillips curve*, which in the short run, determines deviations of inflation from the policy target as a function of the output gap[13] (augmenting for inflation expectations is not necessary if the price stability objective is credible as seems to be the case both now and then)
- *policy rule*, which sets 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 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)

---

[11] Page references are to *Interest and Prices* (1898) unless otherwise noted.

[12] 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 lie in the "degree of freedom" (his expression) for monetary policy in the n-country system as a whole, not in the *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.

[13] This is an accepted modern definition even though Phillips' original work was on the relationship between *wage* changes and *unemployment*.

- the output gap is zero
- the interest rate is equal to the natural rate

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

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 two definitions of the natural interest rate provided by Wicksell in 1898.[14] Since this one is in terms of aggregate demand and supply, you could picture it as the rate at the intersection of the down-sloping IS curve and the vertical representing potential output (Blinder, 1998).

Wicksell called the actual rate, at which banks lend and businesses borrow the *bank interest rate* or the *money interest rate*. The former may be 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* to mean *nominal rate*, in juxtaposition to *real rate*. There is no distinction between nominal and interest rates in this discussion; expected inflation is constant.

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

$$y = f(c) \tag{1}$$

where, y is the natural logarithm of output. 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 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.

Wicksell does not make a distinction between *actual* and *potential* levels of output. A possible interpretation is that Wicksellian demand is unobservable, and

[14] Laidler (1991) points out that he later added a third definition: the marginal product of capital (Wicksell, 1907). An excursion into Wicksell's capital theory would, however, be beyond the scope of this paper, as well as my competence.

that actual output is at potential. In modern macroeconomics, in contrast, observed output reflects demand, and potential output is unobservable.

In either case, long-run equilibrium is given by

$$y^{pot} = f(r^n) \tag{2}$$

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

Writing the model in terms of deviations from equilibrium, the output gap (actual *minus* potential) is a decreasing function of the interest rate deviation (actual *minus* natural):

$$y - y^{pot} = f(r - r^n) \tag{3}$$

This is the simplest description of the interest rate mechanism that Wicksell thought drove swings in business activity.[15]

Term Spread as Wicksell Interest Rate Deviation

Empirical work has shown that the slope of the yield curve was a good predictor of short-run changes in output. A handy summary of this work for advanced economies, and its implications, is in New York Federal Reserve Bank (2006); perhaps more interesting for Pakistan, Mehl (2006) finds that the yield curve is also a good predictor in emerging market economics.

Clinton (1994) connects the term spread to Wicksell. The task at hand was to explain empirical results for Canada (e.g. Cozier and Tkacz, 1994), which strongly confirmed the predictive power of the long-short differential.[16] I argue 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

---

[15] At one point Wicksell insists that in long-run equilibrium bank and natural rates do not have to be equal (p. 120). This only complicates the story. We might as well define equilibrium in terms of equality of the two rates. Interest differentials can be introduced through risk premiums, and a range of longer-term maturities.

[16] 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).

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. As the converse of the low weight on the short rate, the natural rate must have a high weight in the bond yield. Therefore *the long-short rate spread gauges the natural-actual rate deviation*. The predictive power of the spread can be attributed to Wicksell's interest rate mechanism. 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 hence the implications of the natural rate for the expected future short-term rate.

Price Level or Inflation and Output Gap

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 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).

The second definition of the natural interest rate is in terms of the price level. The two are equivalent, because 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, labor 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 in 1898 the emphasis was on the stock of money rather than the flow of spending (Ohlin, 1936).

In the light of the behavior of prices in the 19th century, Wicksell understandably focuses on long swings, over decades, around a constant long-run average. His careful discrete-period analysis is confined to static price expectations. Even

within this framework, he is able 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'." Informally, he does envisage expectations adjusting upwards, with speculative buying: "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 price."

This accelerationist view finds an echo in the vertical long-run Phillips curve, an integral part of the monetary policy thinking since the 1970s (e.g. Fortin, 2003). Wicksell, however, has no Phillips curve, and goes directly from interest rate to price level (as in the quotations above). We can get an equation like that; by substituting the output gap out of the standard modern model (it is, after all, unobservable). From a Phillips curve, expressed in terms of the inflation rate, $\Delta\pi$, and the output gap,[17]

$$\Delta p = g(y - y^{pot}) \tag{4}$$

and equation 3, we have:

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

On the surface, equation 4 corresponds to Wicksell's statements of the inflation process. Some qualification, however, is in order. Given its derivation from the output gap, which fluctuates at *business cycle* frequency, equation 4 does not describe the *lower* frequency inflation/deflation cycles that intrigued Wicksell. To update his concerns, for the Western economies, we should be explaining the buoyant stability of the 1950s and 60s, the stagflation of the 1970s and 80s and the low inflation of the 1990s and 2000s. Output gaps do not do much in this context, at least beyond transition phases. Today we point to expectations shifts, for which we have various tractable hypotheses within mainstream theory. In contrast, techniques 100 years ago were not up to endogenous evolution of price expectations.

Policy Rules

So long as prices remain unaltered the banks' rate of interest is to remain unaltered. If prices rise, the rate of interest is to be raised; and if prices fall, the rate of interest is to be lowered; and the rate of interest is henceforth to be

[17] Thus p is the natural logarithm of the price level.

maintained at its new level until a further movement of prices calls for a further change in one direction or the other (p. 189).

Although discretion and judgment is always intrinsic to the conduct of monetary policy, central banks often consult policy rules for the interest rate derived by their economists. Wicksell was the first to spell out such a rule, which may be written:

$$\Delta r = \gamma \Delta p \tag{5}$$

We may compare equation 5 to the famous Taylor rule:

$$r - r^n = \gamma(\Delta p - 0.02) + \emptyset(y - y^{pot}) \tag{6}$$

Taylor thought the numerical approximation $\gamma = \phi = 0.5$ described actual Fed policy in the 1980s and 90s quite well. His inflation target never has policymakers undo the effect of an actual change in prices. For modeling purposes the target may be set at an arbitrary level. For practical purposes, 2% is obviously relevant, whether it is the right level is a question taken up in section 5.

In the above quotation Wicksell is ambiguous (as is equation (5), taken alone) as to whether policy should target just the inflation rate going forward, or the price level, such that past errors have to be unwound. In his day one did not fuss about stationary versus non-stationary stochastic series, but economic common sense says the variance of the natural rate is bounded. The Wicksell policy rule, combined with this, would produce a price level with finite variance.[18] It is therefore a long-run *price-level* rule.

But Wicksell's rule would behave for all intents and purposes like an inflation rule. Consider a single shock to the natural rate; prices change. Following the Wicksell rule, the actual interest rate homes into the natural rate, and once there, prices are stable at a new level. Given the long-swings that Wicksell envisaged, prices could be displaced for decades before a shock to the natural rate, in the opposite direction, sent them back towards the original level. In the very long run, after repeated disturbances of this kind average out, the rule would ensure that prices would fluctuate around a given level. But in real time it might not look as though the central bank was stabilizing prices around any particular level.

[18] Woodford (2002) provides a proof.

To put the point another way, the adaptive rule in equation (5) would not necessarily be an efficient rule for price stability.[19] If the central bank has any information about the natural rate, about the output gap, or about the Phillips curve, it can design a more effective rule.

Wicksell's rule "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. There is more confidence in measurement, which reflects improvements in theory, quantitative technique, and data. Blinder describes two methods employed at the Fed: solving a complete macroeconomic model; and computing long-run averages of actual rates. Other measures might be derived from the growth rate of potential output, or long-term bond yields.

Central bank econometricians have investigated inflation-targeting rules in numerous variants. They have focused particularly on *inflation-forecast-based* rules. The theoretical pay-off from refinements in the rule is a reduction in the variance of inflation and output. But the substantial margins of error in measurements of unobservables, in models, and in coefficient estimates, mean that such a gain is not guaranteed. Moreover, central banks essentially use the core inflation rate to calibrate their estimates of potential output; an unexpected change in the inflation rate of any significance would soon lead to a careful re-look at the current estimate of potential. This iterative feedback means that inflation in the end dominates the policy rule, and in effect brings the bank to something like Wicksell's proposal.

This completes the comparison of models. The conclusion is that the modern approach involves constructive modifications that leave untouched Wicksell's basic proposals. The next section provides sidelights on certain themes.

4. Sidelights

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).

---

[19] Humphrey (2002) suggests a simple mechanical improvement to the Wicksell rule, based on control theory.

Wicksell explains his theory of business and price fluctuations by considering how a 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.[20] Wicksell is open to hypothetical shocks of all shapes and colors.

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 twentieth 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 due effect on prices, can persist for a considerable time" (p. xxvii).

His insistence on slow adjustment of the interest rate is all the more significant in the light of the long swings, lasting decades, on which he focused empirically. Wicksellian cycles are of a distinctly lower frequency than those in post-WW2 business cycle theory.

Another difference is that Wicksell's particular emphasis on natural rate shocks has not been taken up. Modern macroeconomic models are routinely subjected to an array of experimental disturbances. Shocks to investment demand, or to potential output, could in principle lead to changes in the neutral interest rate in these models, but typically the modelers do not centre their analysis on this.[21]

---

[20] Professor David Davidson would often set Wicksell off.

[21] Duguay (1994) specifies an aggregate demand function in first differences, which could imply a non-stationary natural rate of interest. The new neoclassical model Goodfriend and King (1998), which could be interpreted as a Wicksellian model, has an endogenous natural rate. But these authors, like other modern authors, do not feature movements in the natural rate as the centrepiece of their analysis.

Moderating Cycles

[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, p. 36).

The Bank of Canada has also repeatedly made this argument. An example, from an analytical context, is Freedman's (1996) analysis of persistent demand shocks, the kind that interested Wicksell), which argues that the policy response under a symmetric inflation target is countercyclical. In more general terms, bank governors have underlined this attribute of the regime (e.g. Dodge, 2002).

On this argument, inflation control is useful not just in itself but as a means to a more stable economy. A numerical inflation-control target *requires* discretionary demand management to stabilize the cycle, and imposes constraints that minimize the risks of chronic error in either direction.

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 is identified with the quantity theory, it is necessary for clarity to disassociate him from the *modern* quantity theory—as per Friedman's restatement and monetarism.[22]

For Wicksell the demand for money, or velocity, is not stable or predictable. And the supply of money is not pinned down by exogenous factors. One of his imaginative devices is a pure credit economy, in which the money supply is indefinitely elastic (pp 62-80). It helped him to explain why the supply of money was not closely linked empirically to a monetary base. More fundamentally, in the pure credit economy, monetary policy can stabilize the price level using the interest rate. Wicksell had no need to pursue the point, but it is implicit in his theory that policy is set without reference to a nominal quantity. His pure credit

[22] Humphrey (1997) attempts a monetarist reconstruction of Wicksell, which studiously avoids Wicksell's denial of all the relevant empirical assertions, as well as his advocacy of an active discretionary policy.

system is a good enough description of the twenty first century model, with near-zero bank reserves, and central bank control of short-term interest rates.

It can be argued that his view of the money 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).

Wicksell's quantity theory is surely 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, and all real variables remain constant, you fix the overall price level. The control variable could be money (p. 40); it could be something else. These are innocuous thought experiments in a timeless world. They imply no particular direction of causality. The equilibrium price level is a neutral equilibrium: stable in the way of a cylinder on a plane (pp 100-1): it is not unstable, but it can be permanently displaced by many different shocks, real or monetary. [23]

To offset such shocks, the central bank should apply intelligent monetary policy. Wicksell argues for a watchful discretionary management of money, via the interest rate. 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 best left alone.

After all the water under the bridge, present central bank views on the money supply are not so different from Wicksell's. In a theoretical long-run sense money is neutral, intrinsically linked one-for-one with the price level. Large changes in money stocks have to be watched; there is always the possibility that they might embody a significant shock. In a low inflation environment, however, the money-inflation correlation is quite weak, and has no firm basis for policy formulation.

Price Level Measurement

Monetary economists, Irving Fisher and William Stanley Jevons, as well as Wicksell, made seminal contributions to index number theory, as well as to its

[23] Wicksell's theory allows exogenous changes in money to have effects on prices. The regime he recommended would, however, avoid or counteract them. Laidler (1991) shows how his judgment about the empirical importance of money supply disturbances evolved: in 1898 Wicksell thought such events had been rare, but he later acknowledged that gold discoveries led to "the much higher price level during the decade [*sic*] 1893-1913" (1915, p 125).

practical application. Having concluded that general price stability should be the standard, 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.

For example, the Bank of Canada has resumed the monetary tradition of research on price indexes. It has thoroughly examined possible bias in the CPI (Crawford, 1998). Its interest in capturing the underlying trend has stimulated Statistics Canada to produce, in addition to the CPI, a series that omits highly volatile items. The bank's own core inflation rate, which Statistics Canada publishes, removes the effects of changes in indirect taxes from the preceding (Macklem, 2001). The central bank's close, ongoing interest keeps up the pressure for relevant, high quality data.

Wicksell, we can only imagine, would be amazed and delighted at the headlines and analysis in the business pages that follow the monthly CPI releases, and, above all, at the attention paid to the central bank's possible monetary policy reactions.

5. Framework to Conduct Monetary Policy

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).[24]

[24] The context is an argument for a Scandinavian monetary union.

Central Bank Evolution

Wicksell was convinced that money could and should be managed to provide price stability, and that this would provide an enormous social benefit. 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.[25] Until the twentieth century conventional thinking saw the gold standard as the best basis for monetary stability. In 1900, the notion that intelligent policy should be used to this end was still just an emerging minority view; by the 1920s circumstances forced central banks in this direction, even as they tried to restore the gold standard.

Wicksell was prominent in, and influenced by, the development of modern central banking: his early writings are vague on the location of responsibility for monetary policy; his later writings pin it down.

Thus, in 1898 Wicksell was 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*, which was to be an institution for government policy, and not the uneasy private/state blend of the day, he was a few years ahead of the crowd. But it took another 70 years to establish price stability, or low inflation, as the overriding objective. In retrospect, this is passing strange, because this objective provides a strong logical basis for central bank independence.

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

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 neo-Wicksell 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 need

[25] The Swedish central bank is a good example. The Riksbank had been primarily a state commercial bank until the late 1890s, when it assumed public responsibilities of the kind the Bank of England had had for decades, e.g. lender of last resort (Riksbank website, history pages). In this sense, the Riksbank became a central bank not far ahead of the Federal Reserve System or, for that matter, the Bank of Canada. If the essence is monetary policy, as we may be inclined to think today, central banks proper first emerged in the 1920s and 1930s.

care. More important is the common structure underneath. Wicksell had the blueprint.

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

Clearly, Wicksell was a price-stability hardliner, perhaps, to quote Mervyn King, "an inflation nutter" 1997. Thus, he was even against low, or "creeping" inflation: "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 and for that matter, deflation was reinforced by his view that price instability created speculative excesses, and hence crises, which would trigger slump and deflation (p. 213).

Since the global disinflation of the early 1990s, many central banks have adopted explicit low *inflation* targets, with many targeting 2 percent, or a range centered around 2 percent.[26]

Whether it is justified or not, the adoption of low inflation as an objective, rather than price stability, stands out as the main difference between Wicksell and neo-Wicksell.

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 with his pure credit banking model, Wicksell came to recommend a method of policy

[26] The Bank of Canada's 1-3 percent range is typical. Aiming at 2 percent maximizes the probability that the outcome will be in the official range.

implementation based on the deposit and discount rates of the central bank. He was concerned that the operating framework, rudimentary as it then was, did not allow sufficient policy influence over interest rates. His recommendation was to ensure close control.

This, again, was very far-sighted. For most of the twentieth 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, and the reserve requirements provided a fulcrum. But in the 1990s, for reasons of allocative efficiency, many central banks in the industrialized world phased out minimum reserve requirements. The fractional reserve model obviously no longer applies; advanced banking systems in the twenty first century are pure credit systems.

This was also in line with a movement towards increased transparency in the conduct of monetary policy. Central banks used to give abstruse signals about monetary policy through the provision of bank reserves, which a special caste of economist-scribblers would demystify for the masses. The reserve, or excess reserve quantities no longer have any policy significance at all, and the Brahmins have another life. The central bank's instrument is simply the short-term interest rate.

6. Concluding Thoughts

So far that it can be ascertained with reasonable certainty if and when changes in the purchasing power of money have occurred in reality, we have acquired an objective basis for attempts to prevent such changes by rational methods. It has to be admitted that even then, it is no easy task that lies before the combined forces of economic science and economic practice; but provided only the theorists are done with their part of the task, the practitioners will surely find ways to apply their teachings to the extent, that is, that they are forced to do so by necessity. (1902, p. 31).

Before Keynes, Wicksell came to the conclusion that the central bank *could* stabilize the value of money, and that it *should* do so. Since money is a social contrivance, it makes little sense to leave its value to the vagaries of gold production and commercial banking, and so on. There has to be a way of *managing* money that improves on this.

Such thoughts broke open the idea of monetary policy. With uncanny timing, Wicksell's thinking was ready to apply just before the gold standard ran into terminal trouble in the 1920s. The recommendations for stabilizing the value of money as gauged by broad price indexes, for the framework of implementation, for strategic guidelines (or policy rules) are practical and unambiguous, less open to interpretation than Keynes, and useful without modification in a wide range of situations.

Wicksell's optimism that policymakers would soon adopt his proposals was reasonable, given their relevance and the quality of the argument. That policymakers, with the single exception of the Swedish Riksbank in the 1930s, did not appreciate their merit was a huge lost opportunity. Wicksell's approach would have been a vast improvement when it really counted, during the Great Depression of the 1930s, and the Great Inflation of the 1970s and 1980s.

In the twenty first century, Wicksell's conception of monetary policy, intelligent management of the interest rate for price stability is now a commonplace. After more than a decade and a half, which has seen major economic disturbances, we have ample information on which to judge the performance of the neo-Wicksellian monetary order. The results have been very good in comparison to the preceding regimes. And, since no alternative is on the radar screen, this monetary order looks set to last for a while. After a century of trial and error, monetary policy may have found its firmest basis yet.

References

Armour, Jamie, Ben Fung, and Dinah Maclean (2002). "Taylor Rules in the Quarterly Projection Model." *Bank of Canada, Working Paper* 2002-1.

Bernanke, Ben, Thomas Laubach, Frederic Mishkin and Adam Posen (1999). "Inflation Targeting: Lessons from the International Experience." *Princeton*.

Blaug, Mark (1962). *Economic Theory in Retrospect*. Irwin: Illinois.

Blinder, Alan (1998). *Central Banking in Theory and Practice*. The MIT Press: Cambridge, Mass.

Clinton, Kevin (1994). "The Term Structure of Interest Rates as a Leading Indicator of Economic Activity: A Technical Note." *Bank of Canada Review*. Winter 1994-95.

——————— (1997). "Implementation of Monetary Policy in a Regime with Zero Reserve Requirements." *Bank of Canada Working Paper*. 97-8.

The Concise Encyclopedia of Economics. *The Library of Economics and Liberty*, http://www.econlib.org.

Cozier, Barry and Greg Tkacz, (1994). "The Term Structure and Real Activity in Canada." *Bank of Canada Working Paper* 94-3.

Crawford, Allan (1998). "Measurement Biases in Canadian CPI: An Update." *Bank of Canada Review*. Spring.

Crow, John (2002). *Making Money*. Wiley, Canada.

Dodge, David (2002). "Inflation Targeting in Canada: Experience and Lessons." *Central Bank Governor's Panel on Inflation Targeting.* Atlanta, Georgia. January.

Duguay, Pierre (1994). "Empirical Evidence on the Strength of the Monetary Transmission Mechanism in Canada: An Aggregate Approach." *Journal of Monetary Economics*. 33. 39-61.

——————— (1994a). "Some Thoughts on Price Stability versus Zero Inflation." Bank of Canada. Federal Reserve Bank of New York (2006). "The Yield Curve as a Leading Indicator." *Current Issues in Economics and Finance* (12) 5, July/August.

Fortin, Pierre (2003). "The Bank of Canada and the Inflation-Unemployment Trade-Off." Conference on Macroeconomics, Monetary Policy and Financial Stability. Festschrift for Charles Freedman. *Bank of Canada*. June.

Freedman, Charles (1996). "What Operating Procedures should be Adopted to Maintain Price Stability?—Practical Issues." *Achieving Price Stability*. *Symposium* sponsored by the Federal Reserve Bank of Kansas City.

Humphrey, Thomas (1997). "Fisher and Wicksell on the Quantity Theory." *Federal Reserve Bank of Richmond Economic Quarterly*. 83/4 Fall.

——————— (2002). "Knut Wicksell and Gustav Cassel on the Cumulative Process and the Price-Stabilizing Policy Rule." *Federal Reserve Bank of Richmond Economic Quarterly*. 88/3 Summer.

Johnson, Harry (1962). "Monetary Theory and Policy." *American Economic Review*. June.

Jonung, Lars (1979). "Knut Wicksell's Norm of Price Stabilization and Swedish Monetary Policy in the 1930s." *Journall of Monetary Economics*. 5. October.

King, Mervyn (1997). “Changes in U.K. Monetary Policy: Rules and Discretion in Practice,” *Journal of Monetary Economics*, 39(1), 81-97.

——————— (2002). *No money, no Inflation—the Role of Money in the Economy*. Bank of England, March.

Laidler, David (1972). “On Wicksell’s Theory of Price Level Dynamics.” *Manchester School*. June. pp 125-144.

——————— (1991). *The Golden Age of the Quantity Theory*. Princeton.

Macklem, Tiff (2001). "A New Measure of Core Inflation.” *Bank of Canada Review* (Autumn): 3–12.

Mehl,Jérôme, Arnaud (2006). “The Yield Curve as a Predictor and Emerging Economies.” *Bank of Finland, Institute for Economies in Transition.* http://ideas.repec.org/p/ecb/ecbwps/20060691.html

Ohlin, Bertil (1936). “Introduction.” in Wicksell, *Interest and Prices*.

Sargent, Thomas and Neil Wallace (1975). “"Rational Expectations, the Optimal Monetary Instrument and the Optimal Money Supply Rule.” *Journal of Political Economy.*

Wicksell, Knut (1898). *Interest and Prices (Geldzins und Güterpreise): A Study of the Causes Regulating the Value of Money*. Translated by R.F. Kahn, 1936. MacMillan: London.

——————— (1904). *The Monetary Problems of the Future*. Chapter 15. 1999. Selected Essays.

——————— (1915). *Lectures on Political Economy.* Vol II. Money. Translated by E. Classen, (1935). Edited by Lionel Robbins. Routledge and Kegan Paul: London.

——————— (1908). *Stabilizing the Value of Money: A Means of Preventing Crises*. Chapter 16. 1999. Selected Essays.

——————— (1917). *The Scandinavian Monetary System after the War*. Chapter 21. 1999. Selected Essays.

——————— (1999). *Selected Essays in Economics: Volume II*. Editor: Bo Sandelin. Translated by Timothy Chamberlain. Routledge: London & New York.

Woodford, Michael, (2003). *Interest and Prices.* Princeton.

Comments

After discussing the reasons why Knut Wicksell's ideas related to monetary policy, espoused more than 100 years ago, remained dormant for most of the 20th century, the paper highlights the various themes of Wicksell approach and their similarity with modern thinking on monetary policy. The main message of the paper is that Wicksell was ahead of his times in establishing the important role of monetary policy in stabilizing the value of money and that it was a huge lost opportunity on the part of the economic profession to ignore his ideas for so long.

Since there is no concrete model /idea that is proposed or tested in the paper, I provide some broad but critical remarks on the topics touched in the paper. In particular, I have tried to elaborate the modern monetary policy framework more than focusing on Wicksell's ideas themselves. Since the paper attempts to draw parallels between the two, the remarks may clarify some issues.

First of all, in discussing the reasons for the loss of Wicksell's monetary policy, the author essentially points the finger towards 'outrageous fortune'. We can probably add one more factor. Monetary policy before 1970s was never geared towards addressing domestic considerations as the global economy either operated under the Gold Standard or the Bretton Woods era of fixed exchange rates. This explains the neglect of Wicksell's ideas who probably wanted the state institutions to focus on stabilizing domestic price levels through adjustments in the domestic interest rates.

While there is no denying that Wicksell was amongst the first to clearly articulate the role of interest rate(s) in stabilizing the general price level – the centre piece of the modern framework – the paper exaggerates somewhat the parallels with modern theory of monetary policy, which is a much broader framework than what is outlined in the paper and used for comparison with Wicksell's ideas.

The prevalent monetary policy framework argues for the minimization of a 'loss function' of the central bank. Theoretically, the inclusion of variables in this function depends on the sources of economic distortions/sub-optimality. The implied optimal monetary policy then seeks to neutralize these distortions and attempts to restore the constrained efficient equilibrium. Inflation targeting is just an example, a popular one at the moment I must add, of the modern approach. Other monetary policy objectives can and have been shown (Walsh (2003)) to dominate the inflation targeting objective. Confining the modern theory to only one of its popular examples does not do justice to its breadth and intellectual history.

Even if these theoretical considerations are put aside, there are practical differences in the price level objective, as proposed by Wicksell, and low inflation objective as proposed by the author. Inflation targeting is inherently forward-looking, with monetary policy being aimed at keeping future inflation within the defined target zone; a central bank does not seek to compensate for past breaches of the inflation target. For example, if the inflation over-shoots the inflation target in one period, the central bank does not seek to compensate for that by reducing inflation below the target; it merely seeks to bring inflation back to the target (involving a higher price level). Therefore, under an inflation targeting regime "bygones are bygones" and the central bank worries only about the future path of inflation.

Price-level targeting[27] – the objective outlined by Wicksell – although is quite similar to inflation targeting and shares many of its benefits, the two regimes have a fundamental difference. Unlike inflation targeting, price-level targeting does not allow "bygones to be bygones". More specifically, if there is an unexpected increase in prices then according to price level targeting the monetary authority will attempt to tighten monetary policy so as to restore the price level back to the target in order to prevent the base drift in the price level. Under inflation targeting no action will be taken and the new level of prices would be maintained[28.]

Moreover, the level of prices that Wicksell talked about and what is alluded to in the above paragraphs include only the goods prices. A debate has been brewing, within the confines of the modern approach, for more than a decade now on the possible role of asset prices (financial as well as real) in monetary policy formulation. This debate has intensified even more in the wake of current global financial meltdown and recession. Arguably, the interest rates were not adjusted sufficiently to puncture the asset price bubble(s) that set the stage for the crisis because the conventionally defined prices were stable. In other words, had Wicksell been alive he probably would have supported the monetary policies

---

[27] The only country that has adopted formalized price-level targeting is Sweden – Knut Wicksell's home – between 1931 and 1937. Berg and Jonung (1998) argue that the price-level targeting allowed Sweden to have less deflation, and one of the least severe depressions in that period. They suggest that price-level targeting can be used to raise inflation expectations in the face of deflation. This is one of the reasons why price-level targeting is suggested in Svensson (2001) as a solution for the deflation problem in Japan.

[28]Gavin and Stockman (1988) show that this base drift problem under inflation targeting leads to a higher level of uncertainty about the future price level. The central bank may miss its inflation target by a very small percentage in some years, but if these misses are not offset, they will accumulate and may become quite large over a long time horizon.

pursued by the major central banks before the crisis. The array of unconventional and controversial monetary policies being pursued at the moment in advanced economies simply show that monetary policy is more than looking at goods prices and changing interest rates.

The 'core model' outlined in section 3 is an over simplification of today's framework and undermines the intellectual pedigree of the model. Moreover, the author's use of quotes from Kunt Wicksell's 1898 book to formulate equations is not convincing, especially equation (1) which is then used to 'derive' equation (4). In particular, Wicksell proposed a direct relationship between interest rate and prices and no effort was made to link price level to output. Also, the definition of natural rate used by Wicksell refers to the supply and demand of real capital goods, not the supply and demand of total output. I list below broad elements of the modern approach used to analyze monetary policy (Gali, 2003), some of which are (implicitly) acknowledged by the author.

First, it integrates Keynesian elements (imperfect competition and nominal rigidities) into a dynamic general equilibrium framework that until recently was associated with the Real Business Cycle or new Classical paradigm. While Wicksell lived in the 'Classical' age he was aware of the role of government regulation of market forces in providing greater stability to the standard of value, facilitating contracting and market exchange. In this sense, the author is correct in pointing the costs of ignoring Wicksell for so long.

Second, it is firmly grounded in inter-temporal optimization and thus with each equation being structural, the Lucas critique (the idea that people's behavior changes in response to a change in policy) can be respected as the model is applied to policy questions. One of the implications of deriving equations is that one gets a forward-looking element build into the economic decision making process, i.e., the role of expectations is fundamental in the modern framework (Kerr and King, 1996) for an early example of this). The author has completely ignored this important difference.

Third, it permits an explicit utility-based welfare analysis of the consequences of alternative monetary policies. This is the point I made earlier that the spirit of the modern approach cannot and should not be confined to a narrowly defined regime, such as inflation targeting.

Author is correct in highlighting Wicksell's important insights regarding the active role of monetary policy, i.e., changes in interest rate engineered by a central bank, in achieving price stability. However, I had some difficulty in understanding the

interpretation of the quote given on page 12. A careful reading of Wicksell's chapter 11 reveals that he was referring to the 'difficulties and complications' related to movements in general price level and not the business cycles.

In conclusion, it was a joy reading the article and indeed Wicksell was very far-sighted in outlining the contours of the important relationship between interest rates and prices and an active role of state institutions in stabilizing the value of money.

Hamza Ali Malik
Director, MPD
State Bank of Pakistan

References

Berg, C. and L. Jonung (1998). "Pioneering Price-level Targeting: The Swedish Experience 1931 – 1937", *Sveriges Riksbank, Working Paper* No. 290.

Gali, J. (2003). "New Perspectives on Monetary Policy, Inflation, and the Business Cycle", in "Advances in Economic Theory", (eds.), *Dewatripont, M., Hansen, L., and S. Turnovsky*, Vol. III, pp. 151 – 197, Cambridge University Press.

Gavin, W., and A. Stockman (1988). "The case of Zero Inflation", *Federal Reserve Bank of Cleveland, Economic Commentary*, September.

Kerr, W., and R. King (1996). "Limits on Interest Rate Rules in the IS Model", *Federal Reserve of Richmond, Economic Quarterly*, Vol. 82/2, pp. 47-75.

Svensson, Lars (2001). "The Zero-Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap", *Monetary and Economic Studies* 19, pp. 277 – 312.

Walsh, Carl (2003b). "Speed Limit Policies: The Output Gap and Optimal Monetary Policy", *American Economic Review* 93(1), March, pp. 265 – 278.

Comments

The paper draws attention to century old economic ideas of Swedish economist Knut Wicksell that have astounding similarities with modern practices of monetary policy. He argues that central banks in present times focus on low inflation or stable prices as advocated by Wicksell times ago. Moreover, an increasingly popular instrument of monetary policy is some form of short-term interest rate and it was precisely the Wicksell instrument. Knut Wicksell, born in 1851 in Stockholm, was professor of economics in University of Lund, Sweden and one of the most influential economists of his time. His views over the role of money in creating price changes, a dispute in which he and Irving Fisher were the central players, predated the mid-twentieth century clash between Keynesian and monetarist views of price stabilization policies.

The author attempts to give some explanation of why Wicksell's work was overlooked in the discipline of economics for such a long period. He suggests that it was due to intertwined accidents of geography, language, and intellectual history. The successful experiment of Wicksell's ideas in Sweden in the 1930s did not make the waves that an application in a large economy might have done. Moreover, Wicksell mostly wrote in Swedish or German; only a couple of articles were written in English, which may be the necessary language to establish the big new ideas in political economy. The English translation of his remarkable book *Interest and Prices* appeared ten years after his death.

However, Wicksell was not completely overlooked as stated by the author. A number of prominent economists referred to his work in different times. Although his theories were unable to get popularity among professionals due to absence of proper baking from analytical tools, many writers did notice his views. For example, Uhr (1951) evaluated life and contributions of Wicksell with a comment that "(his) philosophy may be characterized as experimentalist on the positive side and as devoid of orthodoxy on the negative side. Neither he nor his followers have been imbued by strong preconceptions in favor of laissez faire systems. They were willing to bid the "unseen hand" farewell and place increasing reliance on deliberate, rationally conceived economic policy as constituting the best prospect for achieving greater stability and internal harmony in the economy. Because their outlook was focused on, and to some extent enabled them to anticipate, the course of economic change, it avoided doctrinaire allegiance to particular positions and opposition to all others that has vitiated much of the reasoning among various "schools" outside as well as inside the Marxist camp."

Haavelmo (1978) notes that Wicksell wanted to formulate a theory which can explain, in a genuinely fundamental and convincing way, changes in the absolute price level (or, in other words, in the value or purchasing power of money). The Currency Theory implies that it is changes in the quantity of money which are essential and in fact constitute the driving force. The Banking Principle, on the other hand, can be interpreted to the effect that the quantity of money plays a more passive role; it adjusts in accordance with the cash requirements created by changes in the value of transactions when the price level is forced up or down by other factors.

Blaug (1986) introduced Wicksell's work as an attempt at integrating general equilibrium theory the Austrian theory of capital and interest, and the marginal productivity theory of income distribution. He also made distinction between the natural and money rates of interest. The money, or market, rate of interest is the observed rate at which banks carry on credit transactions. The natural rate is a bit more complicated. Wicksell defined it as the rate that is neutral for commodity prices and the rate at which the supply and demand for capital are in equilibrium in an economy not using money at all.

Wicksell also presented his views on fiscal policy (Webb, 1934); and he was also regarded as pioneer in econometrics (Akerman, 1933). Robinson (1958) and Osborn (1958) made reflections on Wicksell Effect that concerns the evolution of an economy in which investment is taking place, capital-labour and capital-output ratios are increasing, rising degree of mechanization and also lengthening the period of production.

It seems the author has mistaken Wicksell point of view in certain cases; like; (a) in section 3.1 the author describes Wicksell model as close economy model while in reality Wicksell very well incorporates open economy dynamics in his discussions, and is well aware of the extent and consequences of cross border capital flows due to relative interest rate changes; (b) in section 3.2 while commenting on the Wicksell definition of neutral interest rate, the author considers it in terms of aggregate demand and supply while in reality it is demand and supply of capital that is referred to in the definition as it becomes clear in further readings of the original text; (c) in section 4.1 an abstract from Wicksell Interest and Prices (Chapter 11) has been given and taken it as Wicksell's reflections on business cycle; however, it is actually related to different factors of price movements. Wicksell's views on business cycle were reflected in his various lectures and that is "cumulative process" model of business cycles. He can be regarded as the founder of unified theory of money, employment, and the business cycle. When the loan (market) rate of interest is below the natural rate, the demand

for loans by entrepreneurs exceeds the quantity of savings in the economy. Banks expand credit by creating checking accounts (demand deposits) rather than by supplying savings and an economic expansion occurs that must, other things being equal, drive up prices. Although Wicksell's process does not demand a monetary change to begin, it is perfectly consistent with and this is what the Austrians later emphasized a lowering of the market interest rate through central bank monetary injections (Formaini, 2004).

Muhammad Farooq Arby
Senior Joint Director, RD
State Bank of Pakistan

References

Formaini, Robert L. (2004). "Knut Wicksell: The Birth of Modern Monetary Policy." *Economic Insights*, Federal Reserve Bank of Dallas, Vol 9, No. 1

Blaug, Mark (1986). *Great Economists before Keynes: An Introduction to the Lives and Works of One Hundred Great Economists of the Past*. (New York: Cambridge University Press), 272–75.

Uhr, Carl G. (1951). "Knut Wicksell: A Centennial Evaluation." *The American Economic Review*, Vol. 41, No. 5 (Dec., 1951), pp. 829-860.

Webb, Ursula K. (1934). "Taxation and Production: The Wicksell Analysis." *The Review of Economic Studies*, Vol. 2, No. 1 (Oct., 1934), pp. 18-30

Haavelmo, Trygve (1978). "Wicksell on the Currency Theory vs. the Banking Principle." *The Scandinavian Journal of Economics*, Vol. 80, No. 2.

Osborn, Edward (1958). "The Wicksell Effect." *The Review of Economic Studies*, Vol. 25, No. 3 (Jun., 1958), pp. 163-171

Robinson, Joan (1958). "The Real Wicksell Effect." *The Economic Journal*, Vol. 68, No. 271 (Sep., 1958), pp. 600-605

Akerman, Johan (1933). "Knut Wicksell, A Pioneer of Econometrics Source." *Econometrica*, Vol. 1, No. 2 (Apr., 1933), pp. 113-118