Indirect Convertibility, Inflation Targeting, and Monetary Policy Rules[1]

J. Stephen Ferris and J. A. Galbraith
Department of Economics
Carleton University
Ottawa, Canada
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Introduction

In this paper the proposal for indirect convertibility (henceforth, IC)] put forward by Greenfield and Yeager (1983, 1989) is reexamined and reinterpreted to show that IC can provide a practical monetary policy rule for central banks currently engaged in inflation targeting. One reason for such a reexamination is the renewal of interest in monetary policy rules, as represented by the recent outpouring of econometric work on (implicit) policy rules [Taylor (1993), McCallum (1999), Poole (1999), and Williams (1999)]. Although the policy rules econometric work has not focused specifically on inflation targeting, further econometric work on monetary rules would benefit from a deeper understanding of the theoretical issues involved and the additional dimension that IC can bring to that analysis. In addition, inflation targeting in its own right continues to command much policy support and IC both promotes that and offers a monetary policy rule of its own.

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Nevertheless, the monetary rule for inflation targeting that can be extracted from IC may appear neither original nor unique. A similar rule might be suggested from the current econometric approach of discovering the "best" operating rule. Hence the contribution of IC lies not in the originality of its rule but on its ability to clarify the nature of the "optimal" rule derived by econometric means. IC does so by offering an analytical framework that can encompass the econometric work on the monetary rules relevant for inflation targeting. Without such a framework, a rule for inflation targeting, formulated solely on econometrics, runs the risk of missing the insights and implications of a rule derived from the IC approach. Furthermore, an IC framework helps relate the econometrics of monetary policy rules to the practice of inflation targeting, since current econometric work deals with a wider range of rules than those restricted to inflation targeting.

Thus it is our intent in this paper to show how IC, broadly interpreted, yields a monetary policy rule suitable for use by inflation-targeting central banks. In demonstrating this, much of the paper will be devoted to an explanation and analysis of IC. To this end, the first substantive section of the paper will show that IC differs from inflation targeting by relying explicitly on a rule rather than on discretion to pursue similar price objectives. This rule is developed formally in the second section of the paper. The third section develops the important point that the IC rule works only through the monetary effects it induces. This opens the way in the fourth section for a discussion of how the IC rule, developed in the context of free banking, could be reapplied for a central bank purpose. The

concluding section shows how an inflation-targeting central bank could operate under a generalized IC rule and what that practice would entail relative to today's inflation-targeting activities.

I. IC Compared With Inflation Targeting

For purposes of comparing IC with IT, IC can be interpreted as a proposal for tying the value of the monetary unit[2] to a comprehensive basket of goods and services that does not trad directly against any representatives of the monetary unit (Greenfield and Yeager, 1989). Althou not stated explicitly, the aim is to fix the basket price of the monetary unit, usually at 1 basket pe monetary unit. This can be taken as a price target for IC. To make this fully disclosed price targ effective, the institutions involved must also commit, and be accountable for, the action necessa to achieve the target. This can be taken to be a target rule to be followed under IC.[3]

In addition to imposing a target rule, IC also spells out precisely what must be done, in terms of timing and degree of action. In other words, the proposal also imposes a very specific operational rule, in addition to the target rule, on those taking up the proposal.

In apparent contrast with IC, IT adopts an explicit inflation rate (or price level) target.[4] This, however, is just another way of expressing a price target and so does not represent a significant differentiation from IC. In addition, like IC the existence of the target also calls for a public commitment to act in way consistent

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[2] In the original proposal for IC, the unit is defined, in non-monetary terms, as a chosen bundle of items, with all media of exchange (such as currency and deposits) being denominated in the bundle-defined unit. This has come to be known as monetary separation, under which nothing is considered to fit the description of a monetary unit. Operationally, however, IC can be analyzed without invoking monetary separation. This enables IC to be developed within the context of existing monetary unit arrangements, and this is now the common practice. [See, for example, Dowd (1995) and Schnadt and Whittaker (1993).]For a contemporary treatment of IC that uses monetary separation, see Selgin and White (1994).

[3] This is defining rule in the sense of a pre-commitment to future action and, in this context, there is a commitment to aim for the target [Rowe (1989).

with attaining the target. The action to be taken, however, unlike IC, is left to the discretion of the committing institutions (in this case, central banks). That is, discretion, and not an operational (or instrument) rule, determines what is done to meet the target.

There are other, but not significant, differences between IC and IT. Neither, for example, adopts the same criteria for choosing the components of the basket of goods whose monetary value is to be stabilized. Similarly, IC prefers scaling the quantities within the basket to have the nominal (and market) price of the basket equal one monetary unit on the date IC is to take effect.[5] IT, on the other hand, is typically developed in the context of stabilizing a price index. In addition, the frequency at which prices are reported thereafter, and hence when intervention may be called for, differs across the two approaches, with IC proposing continuous pricing and IT based on periodic pricing. Finally, IC is advanced for the institutional setting of free banking while IT is currently analyzed only in relation to central banking. All these differences, however, are subsidiary to the fundamental difference arising from IC using an operational rule while IT does not.

The similarity in focus on maintaining purchasing power between the current practice of IT and the recent proposal for IC naturally suggests asking whether the IC operationa] rule necessary for its successful operation could be

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[4] The literature on inflation targeting is now voluminous. Important current articles that describe differing practices across countries include the papers in Bernanke et al (1998), Leidermand and Svensson (1995) and Lowe (1997).

[5] This is only implied in the IC literature. It means letting “bygones be bygones” at the start up, which is exactly what happens on the start up of IT. That is, there is no attempt to make a monetary correction first in order to move the current price level, on start up, to some other level before commencing either IC or IT.

made into a practical rule that inflation targeting central banks could adopt in lieu of discretion. Our affirmative answer can be easily represented by first expressing the IC rule more formally than usual so that our subsequent analysis of the applicability of the rule for IT can be based on this more general theoretic foundation.

II. The IC Operating Rule

To be used for IT purposes, the IC rule has to be formally extracted from the literal statement in which it is usually embodied. That statement requires the institutions implementing IC (originally developed for the institutional setting of free banking) to commit to making the monetary unit convertible (redeemable) into a single tradable item termed the medium of redemption (henceforth, MOR) at an exchange ratio equal to the current value of the basket.[6] At the current market price of the MOR, this means a commitment to exchange enough units of the MOR for each monetary unit to provide a monetary value equal to the current price of the basket. In this indirect way, then, the monetary unit can be said to have a value equivalent to one basket.

Those who undertake IC must honour the commitment by paying out the requisite number of MOR units, a number that will vary with the basket price. In the original IC proposal, the commitment was to be made by each bank in a free banking system, but it is not much of an extension to see that this commitment could also be made by a central bank. (For the time being, however, the analysis will replicate IC in the context of its designated free banking institutional setting.)

Just how much of the MOR must be paid out in any given period can be specified more formally from the general statement of the IC condition. To this end, the commodity "gold" will be used as the MOR and the term "dollar" taken to represent the monetary unit. At the time when IC is launched, then, there will be a dollar price for gold, p_g, and a dollar price for the basket to be stabilized, p_b. To keep in line with the IC literature, we scale the quantities in the basket such that the average price of all its components at prevailing market prices work out to $1. Through time p_b is calculated from the market prices of its components and so may vary away from its initial value of $1. The MOR price, p_g, is the current market price of gold.

The IC commitment requires banks to pay out enough units of gold, U, per dollar to create a dollar value of gold equal to the current basket price, p_b. (The two-way nature of this commitment, which can also be expressed as paying out dollars for gold, is ignored for simplicity of expression.) This way of expressing the rule for meeting the IC commitment makes U the independent variable or the variable subject to change by bank action.

When IC is originally adopted, p_b is set at $1 and a dollar is the exchange equivalent to a basket. The condition mandated by IC is fully met. It follows that there is nothing that banks need do under IC nor will IC impose any additional requirement on the banking system as long as p_b remains equal to $1. Action is required only when the latest basket price calculated departs from $1. Suppose then that there arises a time, t = 1, when the latest basket price is calculated and

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[6] Even under strict monetary separation, in which the basket price is usually not thought variable, variations in the basket price are sometimes allowed (Yeager and Greenfield (1989),

publicly revealed to be greater than \$1, denoted as p_b^1 > \$1. Suppose also that at that same point in time the gold price is observed to be p_g^1. Maintenance of the IC rule means that the banks now need to determine the required quantity of U to pay out.

Because the quantity of U can be determined only after p_b^1 > \$1 has been announced and the current market price of the MOR, p_g^1, has been observed, the required quantity of U set by the banks can be set only for the next period of time, t = 2. We designate this required quantity as U_2. For purposes of analysis, the length of the time interval between t=1 and t=2 may be nearly non-existent (as in the original version of IC where pricing is continuous) or as long as the conventionally accepted interval for recalculating the basket price (such as a month). What is important is the sequencing of the price observation before the quantity is set and, whatever the time interval used, the quantity arrived at in the U_2 solution must hold until the next basket price is calculated.

Given p_b^1 and p_g^1, the rule for determining U_2 is simply $U_2 = p_b^1 / p_g^1$. This is because the rule must meet the IC condition that the number of units of gold per dollar paid out valued at their current price must equal the current price of the basket, that is, U_2 x p_g^1 must equal p_b^1. U_2 is then found by cross multiplication.

This way of expressing IC is, of course, a unit setting rule for the next period and while this is an obvious way to express banks' obligations under IC, it is a less useful way of expressing the rule for comparison with inflation targeting.

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p.416).

Here a price setting rule is more helpful since in the pursuit of price stability under inflation targeting, the variable that is typically subject to change is a price rather than a unit quantity. Fortunately, the IC unit setting rule converts easily into a price setting one.

To see this, note that the determination of the number of units of gold per dollar, U_2, will also determine its inverse, the number of dollars exchanged per unit of gold. This is the gold price in t=2, i.e. p_g^2 where $p_g^2 \equiv 1/U_2$. Substituting in the unit setting rule solved for above, we can see that $p_g^2 = 1/U_2 = p_g^1/p_b^1$. It then follows that whenever p_b^1 is calculated and announced as different from $1, banks can use the observed gold price p_g^1 to set a new exchange price for gold in t=2. Expressing its obligations in terms of meeting this new price will satisfy the IC obligation so that using a price setting rule instead of a unit setting rule does not affect the ability to meet the IC commitment.

From the price setting rule it can be seen that whenever $p_b^1 > 1$, $p_g^2 < p_g^1$, and vice versa. This property enters the next, and most useful, formulation of the IC rule. Here our focus is on deriving an IC formula for determining how much the MOR price must be altered for any observed change in the targeted basket price. This is our preferred form of the IC rule because it allows the target to be transformed easily from a basket price of $1 to more general representations of price stability such the constancy of a price index or a low inflation rate. Such a reformulation facilitates the comparison of the IC rule to inflation targeting, since the latter relies exclusively on either an index number or inflation rate target.

What is solved for under the price change formulation of the IC rule is the expression (p_g^2 – p_g^1)/ p_g^1 – the required percentage by which p_g^1 must be altered given the observed percentage change in the basket price. This can be solved for in the following steps:

(1) p_g^1 x U_2 = p_b^1, from the IC commitment.

(2) p_g^2 x U_2 = 1, from the relationship between unit price, and units per dollar.

(3) U_2 (p_g^1 – p_g^2) = p_b^1 – 1, by subtracting (2) from (1).

(4) (p_g^1 – p_g^2) / p_g^1 x U_2 = (p_b^1 – 1)/ p_g^1, by dividing both sides of (3) by p_g^1.

(5) (p_g^1 – p_g^2)/ p_g^1 = (p_b^1 – 1)/ 1 x 1/(p_g^1 x U_2) = (p_b^1 – 1)]/1 x 1/ p_b^1, by dividing both sides of (4) by U_2 and substituting from (1).

The left-hand side of (5) is the desired percentage change in the gold price when the basket price moves above 1 by the percentage shown in the right hand side of the equation, namely, (p_b^1 – 1)/ 1. Since p_g^1 > p_g^2, the signs of the percentage changes are opposites. It should also be noted that the required gold price change is always related to the deviation in the basket price from 1. This confers on the $1 basket price the nature of a price objective. Therefore, it does not matter what the previous basket price was prior to p_b^1 – it could have been 1 or something else – the basket price deviation is always calculated from 1. The gold price that is subject to change by the banks is always the price associated with U_2. Of course, if p_b^1 is already at 1, or has recently fallen (risen) to 1 from a higher (lower) level, banks following IC need make no change in the prevailing gold price.

As $1/p_b^1$ in (5) is typically very close to1 when $p_b^1 \neq 1$, little is lost if this factor is ignored for purposes of simplifying the IC percentage change rule.[7] Further, this approximation allows the expression of required change to be symmetric in both directions about the basket price of 1. With this adjustment, then, the IC price setting rule can be stated simply as requiring the percentage change in the current gold price to be equal but opposite in sign to the percentage deviation of the current basket price from 1. This will be the form of the IC rule adopted for further analysis.

III. The Working of the IC Rule

It is generally accepted that whatever the form of the IC rule followed, the rule works only through its monetary effects on prices (Dowd, 1996, 299). Through these effects, the rule serves to restore the basket price to $1 whenever the basket price moves away from its target value of $1. It should be noted that the rule calls only for the behavior, or reaction, necessary to induce the required monetary effects. IC itself is not dependent on how that reaction is described. A simple description for a gold-type MOR, when banks follow the IC rule to reduce the market price of gold, is to consider them as creating more eager buyers for gold and so initiating a kind of open-market operation in the gold market. The outcome of banks selling more gold for medium of exchange is a general tightening of monetary conditions and a resultant downward pressure on the

[7] The form given below would be fully correct if the percentage changes where calculated using an average of initial and ending prices. That is, the discrepancy appears because the same absolute change forms a higher percentage when the change is in a downward rather than an upward direction.

basket price. This need not rule out other competing descriptions for how monetary conditions are tightened.[8]

In short, IC stabilizes purchasing power only by inducing changes in monetary conditions. In this general sense, then, IC works on the same principle as discretionary monetary policy. That is, both rely on a deliberate change in a policy variable to alter monetary conditions in a way that achieves some larger price or stabilization objective. In this vein, our discussion of IC can be interpreted also as a rule for pursuing a zero inflation target.[9]

Realizing that IC works through the effects of monetary changes on prices means that the IC rule need not be tied to any particular price measure or to any particular rate of change. In other words it can work for any number of stability standards, including those expressed as index numbers or inflation rates. When the actual measure is off target, whether that be a set point or a range of acceptable values, the MOR variable is changed by the extent called for by the rule and in the direction required for producing the desired monetary effects on prices. As long as the rule can generate the monetary effects on which the effectiveness of the rule depends, it is immaterial whether the target is a fixed

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[8] Thus the IC literature sees the transmission, process in terms of arbitrage affecting the money supply in a price stabilizing direction, as the gap between the MOR price set by banks and by the market is eliminated. Furthermore, if interest rate changes play a major role in the adjustment to the accompanying monetary effects, the reaction process can be described entirely in terms of those interest rate changes, as is now the preferred central bank description for the monetary transmission process. [See The Bank of England, 1999]).

[9] Of course, a constant price level target does not tolerate “by gones” as an inflation target does. This, however, reflects only a difference in attitude as to what constitutes acceptable price stability. It does not affect the operational approach, so that both IC and IT can work with whatever measure of price stability is adopted.

price level – as in the original IC version – or an inflation rate – as in inflation targeting.[10]

Being dependent as it is on monetary effects, IC has to face the general problem of lags between changes in monetary conditions and their effects on prices. Inflation-targeting central banks deal with this problem by basing their price stabilizing operations on a forecast of inflation far enough into the future to allow for the lag. In other words, it is the deviation of the inflation forecast from the target, not current inflation from the target, that triggers the move in the control or policy variable. The IC rule could deal with monetary lags in exactly the same way by substituting a forecast of inflation for its current measure.[11] For the IC rule to have its desired effect on future prices, monetary conditions must be altered in the appropriate direction. And to bring about that desired direction, monetary effects need not be based on continuous or periodic current pricing. Replacing the current price by the forecast price in the price-change rule for IC would allow for monetary lags while still observing the intent of IC.[12]

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[10] The specification of the target, however, does affect the magnitude of the response called for because an inflation rate is expressed as an annualized value, much like an interest rate. This is a different kind of number than a simple percentage deviation in an MOR price. Thus, a 1 per cent price rise in a month translates roughly into a 12 per cent inflation rate. So how much the MOR price should be altered in this case depends very much on the target specification. How allowance can be made for this is covered, implicitly, in the text forthcoming.

[11] To preserve the transparency and credibility of the original IC proposal, the forecast should be made by an institution other than the one charged with the responsibility for implementing the IC forecast rule. This is directly analogous to the case under the traditional IC rule that the current price level must be calculated and announced by an agency other than the one charged with maintaining the constancy of the price level. Also, the forecast should be based on the current setting for the MOR, on the assumption of no change being made in the MOR setting.

[12] The recognition of the lag of monetary effects on money prices implied in the use of the forecast price allows IC to escape what has often been called “the Wicksell paradox”, especially when the MOR is not part of the basket This problem, also known as the “paradox of IC” [Dowd, 1996] can arise when the IC rule is activated by current prices and yet can produce effects only on future prices. By tying the rule to prices that can be influenced by the rule, the short run complications associated with having the MOR price fall to zero and/or running out of MOR reserves disappear. Another problem that disappears with the use of forward-looking basket

The effectiveness of IC also depends on inducing the right degree of change in monetary conditions when the price objective is not being met. To this end, the right degree might not result from a simple one-for-one change in the MOR price for any given deviation of the actual from target, as specified in the basic IC formulation. It may well be that some coefficient other than 1 when applied to the percentage deviation from the price objective would produce a more appropriate change in monetary conditions. In the absence of having more specific information, and having the advantage of establishing a clear and precise commitment statement, a coefficient of one might well be the best that can be done.[13]

Recent econometric work on monetary policy rules, however, suggests that a better outcome might be achieved. That is, econometric work could be directed at determining what coefficient would generate a more effective IC rule. Such an empirically determined coefficient could have a value of 1, but could also have a value higher or lower than 1 and could differ across countries under different circumstances. To be useable for IC purposes, the coefficient need only be pre-determined and committed to publicly, provided by a source external to the committing institutions, and considered generally acceptable to the community at large.

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pricing is disruption for the MOR market, which can occur under periodic basket pricing using continuously-available current prices for the basket contents.

[13] This is essentially the same reason given by Fisher (1920) for choosing the one-to-one percentage change rule and adopting frequent price revaluation as a way of keeping this ad hoc adjustment rule on target. Dowd (1996), however, argues that an inappropriate fixed adjustment coefficient of one might well introduce instability to the adjustment process of prices through time.

To adopt an empirical, as opposed to a conceptual, coefficient means only a minor restating of the formal price-change IC rule. That is, the IC rule now states that the percentage change in the MOR price must be in a direction opposite to the deviation of the basket price from its pre-committed target by an amount equal to the percentage deviation from the target times the publicly provided coefficient. Any value other than one does not alter the nature of the rule – it only improves its effectiveness and allows the rule to become economy-specific.

In short, IC works through monetary conditions being changed as a result of following a precise rule to hit a price/inflation target. As such, it must use expected rather than current prices in order to allow for the lags between a change in conditions and their ultimate effect on prices. For even greater effectiveness, the rule could also draw upon publicly available information to provide a coefficient for determining the optimum MOR price change for the desired price effect.

IV. Applying IC to Central Banking

Because the IC rule can be generalized in the foregoing manner, the generalized IC rule offers a ready-made monetary policy rule for present day, inflation-targeting central banks. Currently, these banks use discretion to vary an administered interest rate (their policy variable) in order to change monetary conditions (an intermediate target) to correct the deviation between their forecast for the rate of inflation and an pre-announced inflation target. (In some cases the deviation is from a single valued target; in other cases it is the distance from the

outer bound of an inflation range. In all cases, however, the target is compared to a forward-looking rather than current rate of inflation.) Following an IC rule would accomplish the same thing automatically.

For a central bank currently operating through short-term internal interest rates to adapt an equivalent IC rule, the central bank could continue to use the same non-market financial instrument as its "MOR". Doing so would cause no inherent problem since there is nothing to prevent the IC rule from being expressed in terms of a non-market interest rate (rather than a price). In the context of free banking, the MOR rate could be thought of as a short-term bank loan rate; in the proposed case of central banking the MOR rate would be the current short-term central bank rate.[14] The only difference made by the use of interest rates rather than security prices is that the rate must now be moved in the same direction as the deviation of the expected basket price from target. Higher interest rates become the counterpart to the lower security prices for correcting unwanted higher prices. Otherwise, varying an interest rate to induce price stabilizing monetary effects is no different, in principle, from varying a commodity-type price for the same purpose.

There is an important operating difference that arises, however, because non-market or administered interest rates do not self-adjust for changes in inflationary expectations, as do market-clearing rates. Therefore a change in inflationary expectations – say an increase – will mean a reduction in the real

[14] Coats (1989) and Walters (1990) make the case for using a financial security as an MOR. Their analyses use the price of the security rather than its interest rate or yield as the policy instrument, but the two dimensions are equivalent ways of representing the same policy instrument.

value of an unaltered administratively set rate. This fall in real value of a set nominal rate represents an easing of monetary conditions at a time when either neutrality or tightening is called for (should the forecast price be above target). To counteract this unintended effect, then, the MOR rate has to be restored to its former real value. Then this restored, or inflation-adjusted, nominal interest rate now becomes subject to the IC rule. Once that adjusted rate has neutralized the expected change in inflationary expectations the coefficient in the rule can then have its value determined econometrically (and may be less than one). The alternative is to use the previously set nominal rate and apply a coefficient that causes the set rate to change by more than the inflationary change. In the context of the current monetary policy rules literature this is known as imposing a Taylor property on the interest rate rule.

A final modification that can be made for an IC rule that uses as its MOR an administered interest rate is in the terms of the units in which the interest rate change is expressed. This is the outcome of using inflation rates (rates of change in prices) in place of price levels. Because the absolute difference between the levels of interest rates and inflation rates is typically small, it is convenient and becoming conventional to express the expected inflation rate and the inflation target rate in terms of basis points, such as 200 and 300, in lieu of 2% and 3%. The difference between the two sets of basis points – here 100 basis points – is then used to calculate by how many basis points the inflation adjusted MOR rate should be altered. That will be less than 100 basis points in the case shown if the adjustment coefficient in the rule has been established at less than 1.

These modest modifications then allow a self-administered interest rate to serve as proxy MOR and in this form the IC rule becomes suitable for use by present day inflation targeting central banks.

V. Central Bank Operations under IC

To operate under an IC rule, as now presented here, a central bank practicing inflation targeting faces only minor adjustments in current practice. Because the IC rule works best when the forward-looking view in use has a definite end, the biggest change might be thought to be the adoption of a fixed inflation horizon. Perhaps surprisingly, however, many of the IT central banks have already adopted this practice (see Siklos, 1999). Similarly, under IC, price forecasts should be publicly disclosed and even without IC being practiced, some central banks already reveal their forecasts. In this sense, IC proposes no additional constraint on current IT practices. It merely converts some discretionary practices, such as the use of a fixed inflation horizon, into a firm commitment.

There would, of course, be a loss of discretion. Both the timing and the extent of any interest rate change needed to hit the inflation target, at a fixed horizon, would now be determined automatically by the IC rule. In following the rule there would be no fine-tuning. For example, if it were thought that the cost of over forecasting inflation were greater than under forecasting it, discretion likely would select a more modest change in interest rates than would the rule. This need not be a major problem under IC if the forecasts are not consistently biased and the lag in recognizing whether a rule-based change was excessive was

short. In that case, more frequent forecasting would catch actions that initiated either over- or under-shooting.[15]

Aside from the fine-tuning constraint, IC imposes no other restrictions on central bank IT behavior. Thus, as it does now, an inflation-targeting central bank may still move its interest rate instrument for technical reasons unrelated to inflation targeting. At present when other market interest rates move in response to forces not closely connected with the outlook for inflation and a central bank adjusts its policy rate to stay in line with the market, that central bank is said to be "following the market". The move can also be described as adjusting the real value of the policy rate to keep it in a neutral policy stance. This kind of neutral adjustment is also called for under the IC rule – the IC control rate has to be kept at a real level sufficient to avoid inducing monetary effects when none are required. The IC rule then works off this level, and the information and knowledge required to set the proper rate under the IC rule are no different from what a discretionary central bank would have to have. Even under an IC rule, then, the practice of following the market would still need to be observed.

The same degree of freedom as IT central banks now have to consider objectives other than inflation targeting would also exist under the IC rule. When the price objective is being met, the MOR pricing rule can be interpreted to mean more than just keeping the MOR price unchanged. That is, when the basket price equals $1, there is no requirement under IC to change the existing MOR price. However, the MOR price could be changed if such a change did not lead

[15] On the other hand, if there was a true asymmetry in adjustment costs, the IC rule could be adapted to cover that case. The coefficient for upward adjustment would be different than for

the basket price to depart from $1. There would then be no need for the central bank to have to reset the MOR price.[16] In other words, there can be a range of MOR prices for a given state of the economy that are not in conflict with meeting the overall price objective.[17]

This possibility would leave banks under IC, and so a central bank, free to move the MOR or policy variable, as desired, when the inflation target was being met and the move did not cause inflation to depart from the target. In this case, with the target being met and not being affected by an unrelated interest move, a central bank can give consideration to addressing other macro economic objectives through a rate movement not related to inflation targeting.[18]

Nor, given the nature of the IC rule, should rigidity prove a major obstacle. Given the establishment of a well-chosen policy instrument (the MOR in IC terminology), and agreement on all aspects of the inflation target, the only rigid element in the IC rule would be the coefficient of adjustment for calculating the amount by which to change the policy variable. Since this coefficient can be empirically determined, that is determined by our best structural knowledge of the operation of the economy, its level could be made the subject of public enquiry and agreement, just as the inflation objective is, and so altered as structural conditions dictate. This would provide for the same flexibility as now exists under an IT discretionary approach, in which a central bank needs to take any structural shift in

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downward adjustment.

[16] This is more likely to be the case if the MOR is not one of the items in the basket.

[17] Patinkin (1996) sees Fisher's proposal (1920) as differing from IC in fixing the price of the MOR at all points in time.

[18] This is in accordance with a widely held belief that even under a firm and explicit commitment to inflation targeting a central bank can pursue other objectives. See Bernanke et al. (1999).

the economy into account. A coefficient that was subject to change only over a period of time would not be in violation of the spirit of an empirically based IC rule.

Introducing empirical content into an IC type operational rule, however, does not make the rule the same as a current monetary policy rule like any now cropping up in econometric studies of monetary policy That is, while the determination of an IC-like adjustment coefficient could be arrived at solely on the basis of the econometric work, the current empirical approach, aimed at discovering or formulating what a central bank does, is not based on the same forward-looking information set that would become available under IC. If the econometric work could, or did, the result might suggest adoption of an IC type operational rule, without any reference to IC itself. Thus, although a knowledge of IC may not be absolutely necessary to formulating the rule it contains, knowing the IC background can prove useful for providing the framework, and guidance, for arriving at a purely econometrically inspired operational (or instrument) rule for an IT central bank.

In any case, however arrived at, under the appropriate conditions, a central bank practicing IT could operate by an IC rule. To do so would mean adding a further constraint, to that already imposed by IT, on the use of discretion. Therefore, the issue raised by suggesting an operational rule for IT central bank becomes a question of how much discretion should be given up. The answer lies in assessing whether the supposed gains from the loss of discretion caused by adopting IT can be further enlarged by giving up more discretion for an operational rule to supplement IT.

VI. Conclusions

From the interpretation of indirect convertibility [IC] developed in this paper, IC can be seen as a ready-made monetary policy rule suitable for adoption by a central bank practicing inflation targeting [IT]. Examination of the properties of such a rule can both enlighten and guide not only the on-going discussions of inflation targeting but also the newly developed interest by econometricians in monetary policy rules.

The connection between IC, on the one hand, and inflation targeting, on the other, becomes clear with the realization that IC, despite being obscurely defined and narrowly specified, only works through having the same kind of monetary effects on prices as inflation targeting requires. At a more general level, there is a connection through the focus of both being the preservation of purchasing power.

Extracting the IC rule from its basic statement, which in accordance with the statement will generate monetary effects, has shown how the rule can be specified in terms or variables acceptable for a central bank. In particular, the rule can use the preferred policy variable of the central bank, usually an endogenous short-term interest rate. In addition, the rule fits any well-specified and quantified measure of price stability, including inflation rates, established either as a point or a range. This allows for the use of inflation forecasts in the rule to match the current forward-looking approach of central banks to inflation targeting.

Following an IC rule for inflation targeting by a central bank means that the bank's interest rate will change automatically every time the inflation forecast departs from the target at some pre-selected point in the future. A central bank with a given horizon for meeting its explicit inflation target already operates in the same way. It moves an interest rate to hit a target, although it may use some discretion in timing the move and determining the extent. This discretion is lost in accepting the rule but so is the political debate over moves based on discretion rather than on a rule. No other loss of discretion occurs by adopting the rule.

Of interest for the econometric work on monetary policy rules is the use the IC rule can put that work to for making the rule specific for a particular economy. In return, a purely empirically based proposal for an operational rule suited for IT central bank would benefit from awareness of IC. In particular, IC draws attention to the conditions and specifications for a properly constructed rule – something that might not be so readily apparent from empirical research alone.

In short, it might be concluded that the explicit and outright acceptance by central banks of inflation targeting is, albeit unintended, a move away from unrestrained discretion in monetary policy in return for considerations, such as improved credibility, accountability, and transparency. It is now time to ask whether by accepting a further containment in discretion by embracing IC might add to the foregoing consideration.

References

Bank of England, 1999, The Monetary Policy Committee, The transmission mechanism of monetary policy, London: The Bank.

Bernanke, Ben S., Thomas Laubach, Adam S. Posen and Fredrich Miskin, 1999, Inflation Targeting, Princeton: Princeton University Press.

Coats, Warren L., 1989, In search of a monetary anchor: a "new" monetary standard, IMF Working Paper; WP/89/82, Washington: International Monetary Fund.

Dowd, Kevin, 1995, "The Mechanics of Indirect Convertibility", Journal of Money, Credit and Banking 27 (1): 67-88.

Dowd, Kevin, 1996, Competition and Finance: A Reinterpretation of Financial and Monetary Economics, New York: St. Martin's Press.

Fisher, Irving, 1920, Stabilizing the Dollar, New York: MacMillan.

Fisher, Irving, 1926, The Purchasing Power of Money, New York: MacMillian.

Greenfield, Robert, L., and Leland, B. Yeager, 1983, "A Laissez-Faire Approach to Monetary Stability", Journal of Money, Credit and Banking 15 (3): 302-315. (Reprinted in George Selgin, ed., The Fluttering Veil, Indianapolis, Liberty Fund, 1997.)

Leiderman, Leonardo and Lars Svensson, 1995, InflationTargets, London: Center for Economic Policy Research.

Lowe, Phillip 1997, Monetary Policy and Inflation Targeting, Australia: Reserve Bank of Australia.

McCallum, 1999, “Recent Developments in the Analysis of Monetary Policy Rules,” Federal Reserve Bank of St. Louis Review 81 (6): 3-11.

Patinkin, Don, 1996, “Indirect Convertibility and Irving Fisher’s Compensated Dollar: A Note,” Journal of Money, Credit and Banking, 28(1): 130-31.

Poole, William, 1999, “Monetary Policy Rules?” Federal Reserve Bank of St. Louis Review 81 (2): 3-58.

Rowe, Nicholas, Rules and Institutions, 1989, New York, Philip Allan.

Schnadt, N. and J. Whittaker, 1993, “Inflation-proof Currency? The Feasibility of Variable Commodity Standards,” Journal of Money, Credit, and Banking 25 (2): 214-21.

Selgin George and Lawrence H. White, 1994, “How would the Invisible Hand Handle Money?” Journal of Economic Literature 32, 1718-49.

Siklos Pierre, 1999, “Inflation-Target Designs: Changing Performance and Persistence in Industrial Countries,” Federal Reserve Bank of St. Louis Review 81 (2): 47-58.

Taylor, John, B., 1993, “Discretion versus Policy Rules in Practice,” Carnegie-Rochester Conference Series on Public Policy, 2, 195-214.

Williams, John C., 1999, “Simple Rules for Monetary Policy,” Finance and Economics Discussion Series Paper 1999-12, Board of Governors of the Federal Reserve System.

Yeager, Leland B., 1983, “Stable Money and Free-Market Currencies,” Cato Journal 3: 305-26. (Reprinted in Selgin, idem.)

Yeager, Leland B., and R. Greenfield 1989, “Can Monetary Disequilibrium be eliminated?” Cato Journal 9: 405- 21. (Reprinted in Selgin, idem.)

Walters, Alan, 1990, Sterling in Danger: The Economic Consequences of Pegged Exchange Rates, Funtana.