

FMM WORKING PAPER

No. 26 · June, 2018 · Hans-Böckler-Stiftung

RECOVERING KEYNESIAN PHILLIPS CURVE THEORY: HYSTERESIS OF IDEAS AND THE NATURAL RATE OF UNEMPLOYMENT

Thomas Palley*

ABSTRACT

Economic theory is prone to hysteresis. Once an idea is adopted, it is difficult to change. In the 1970s, the economics profession abandoned the Keynesian Phillips curve and adopted Milton Friedman's natural rate of unemployment (NRU) hypothesis. The shift was facilitated by a series of lucky breaks. Despite much evidence against the NRU, and much evidence and theoretical argument supportive of the Keynesian Phillips curve, the NRU hypothesis remains ascendant. The hypothesis has had an enormous impact on macroeconomic theory and policy. 2018 is the fiftieth anniversary of Friedman's introduction of the NRU hypothesis. The anniversary offers an opportunity to challenge, rather than celebrate it.

* Email: mail@thomaspalley.com; Washington, DC; FMM Fellow.

Recovering Keynesian Phillips curve theory: hysteresis of ideas and the natural rate of unemployment

Abstract

Economic theory is prone to hysteresis. Once an idea is adopted, it is difficult to change. In the 1970s, the economics profession abandoned the Keynesian Phillips curve and adopted Milton Friedman's natural rate of unemployment (NRU) hypothesis. The shift was facilitated by a series of lucky breaks. Despite much evidence against the NRU, and much evidence and theoretical argument supportive of the Keynesian Phillips curve, the NRU hypothesis remains ascendant. The hypothesis has had an enormous impact on macroeconomic theory and policy. 2018 is the fiftieth anniversary of Friedman's introduction of the NRU hypothesis. The anniversary offers an opportunity to challenge, rather than celebrate it.

Keywords: Natural rate of unemployment, Keynesian Phillips curve, Friedman, Tobin.
JEL ref.: E00, E12, E20, E30, E60.

Thomas Palley
Washington, DC
mail@thomaspalley.com

1. Hysteresis and path dependency of economics

Economists have recognized the significance of path dependency in the economy via the concept of hysteresis (Cross, 1993). Interestingly, that same concept can also be applied to economic theory (Palley 2017-18), although it has not been widely done so.

The notion of path dependency of economic theory works as follows. Ideas get adopted by economists and, once adopted, they become hard to reverse. One reason for that is economic ideas are useful to vested interests, and those interests will work to defend ideas that benefit them. A second reason is sociological forces. Economics is governed as a club, and club members have a personal interest in protecting their past work on which their reputations and standing are built. Newcomers desirous of entering the club will also have an incentive to conduct research that is appealing to the club's

gatekeepers, which affects the path of research. A third reason is psychology. Change of ideas is difficult, so that accepted ideas acquire *status quo* bias which protects them. Consequently, economic interests, sociology, and psychology combine to lock-in ideas once they have taken root.

Milton Friedman's 1967 presidential address to the American Economic Association (AEA), titled "The Role of Monetary Policy (Friedman, 1968)", marked a hysteretic fork in the road of ideas. In it, Friedman argued for abandoning Keynesian Phillips curve theory and adopting his natural rate of unemployment (NRU) hypothesis. The economics profession bought into Friedman's hypothesis, and that has significantly shaped the course of macroeconomic understanding over the past fifty years, and still does so.

This paper argues the choice was a grave mistake which sent macroeconomics down a wrong path. However, every so often an opportunity arises to recover a path that was abandoned, and the fiftieth anniversary of Friedman's address represents such an opportunity. In that spirit, the paper argues for reversing the wrong turn made fifty years ago and recovering the path that was mistakenly abandoned.

2. The role of monetary policy revisited

Friedman's AEA presidential address (Friedman, 1968) consists of four sections. The first section discusses the revival of belief in the potency of monetary policy after World War II. That revival occurred because of the non-reemergence of stagnation and deflation after the war, and the emergence of a new problem of inflation. Friedman then argues that the revival of belief in the real economic potency of monetary policy has gone too far and needs to be substantially reeled in.

The second section is titled “What monetary policy cannot do” and it is divided into two sub-sections. The first sub-section addresses “Pegging of interest rates”, and Friedman argues the monetary authority is unable to peg the market real interest rate in the long-run. Essentially, this sub-section revives the Wicksellian approach to real interest rates. There is a long-run equilibrium real interest rate. Moves by the monetary authority to lower the interest rate below that equilibrium rate will initially meet with success. However, that success will increase demand and income, which will increase liquidity preference and inflation, causing a rise in nominal interest rates that restores the equilibrium real interest rate.

The second sub-section is titled “Employment as a criterion of policy”, and it challenges the power of monetary policy to target the unemployment rate. If it were not for this sub-section, it is likely Friedman’s address would have fallen into relative obscurity. The sub-section introduces and defines the concept of the natural rate of unemployment which has proved so influential:

“The “natural rate of unemployment,” in other words, is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility, and so on (Friedman, 1968, p.8)”

Along with this theoretical account of the determination of the NRU, Friedman also makes clear the NRU is affected by institutions and policy choices, but not monetary policy:

“To avoid misunderstanding, let me emphasize that by using the term “natural” rate of unemployment, I do not mean to suggest that it is immutable and unchangeable. On the contrary, many of the market characteristics that determine its level are man-made and policy-made. In the United States, for example, legal minimum wage rates, the Walsh-Healy and Davis-Bacon Acts,

and the strength of labor unions all make the natural rate of unemployment higher than it would otherwise be. Improvements in employment exchanges, in availability of information about job vacancies and labor supply, and so, would tend to lower the natural rate of unemployment (Friedman, 1968, p.9)”

The logic of the challenge to Keynesian Phillips curve theory is that attempts by monetary policy to drive unemployment below the NRU will initially succeed as policy drives up nominal wages and prices, causing workers to supply more labor. However, workers will subsequently realize real wages have not risen, and they will then withdraw their labor. At that stage, the economy will revert to the NRU, but at a higher inflation rate owing to the faster rate of money growth aimed at lowering unemployment.

For Friedman, the only way the monetary authority can keep unemployment below the NRU is by accelerating the rate of money growth, thereby accelerating the inflation rate and continuously fooling workers into thinking they are receiving higher wages than they actually are. Consequently, there is no Keynesian Phillips curve trade-off between inflation and unemployment, but there is an “accelerationist” Phillips curve offering a trade-off between accelerating inflation and unemployment.

The third and fourth sections of the address are respectively titled “What monetary policy can do” and “How should monetary policy be conducted?” These two sections connect with themes that had been present from the outset in Friedman’s work on macroeconomic stabilization policy (Friedman, 1948). In the third section, he argues the role of monetary policy is to avoid “being a major source of economic disturbance (Friedman, 1968, p.12).” Additionally, monetary policy should aim provide a stable background for the economy and “keep the machine well oiled (Friedman, 1968, p.13)”. These two recommendations derive from his monetarist critique of the Federal Reserve (Friedman and Schwartz, 1963), which blamed the Fed for causing the Great Depression

by mistakenly tightening monetary policy in response to the Great Crash of 1929.

In the fourth section, Friedman argues for conducting monetary policy by “adopting publicly the policy of achieving a steady rate of growth in a specified monetary total (Friedman, 1968, p.16).” That recommendation connects with his long-standing opposition to discretionary macroeconomic stabilization policy and his monetarist advocacy of a money supply growth rule.¹

3. Triumph of the NRU: Friedman’s multiple lucky breaks

Late 1960s macroeconomics was dominated by the Keynesian ISLM model augmented with a Phillips curve to explain price and nominal wage inflation. By the end of the 1970s the situation was completely changed and macroeconomics was dominated by Friedman’s NRU hypothesis. That remains the case today. In part, this abrupt take-over was the product of internal developments in Keynesian economics, which are discussed in the next section. However, it also reflects multiple lucky breaks from which Friedman benefitted.

The Phelps model of money-wage inflation and inflation expectation dynamics

A first lucky break was the simultaneous and independent development of a similar “accelerationist” theory of the inflation – unemployment relation by Phelps (1967, 1968). Friedman developed the persuasive rhetorical language of the “natural rate” of unemployment. He also introduced his ideas in a presidential address to the AEA, giving them rapid and extensive dissemination. That process was accompanied by Phelps’ (1967, 1968) formal modelling of the money-wage inflation dynamics contained in Friedman’s

¹ Forder (2017) argues that Friedman’s objective in his address was to advocate “rules” rather than “discretion”, and it is an accident of history that events transpired such that it has come to be viewed as aimed at critiquing the Keynesian Phillips curve.

NRU hypothesis. Together, the two approaches complemented each other, multiplying their persuasiveness.

The economics profession's inflation expectations amnesia

A second lucky break concerns the economics profession's reception of Friedman's NRU hypothesis and its associated "accelerationist" Phillips curve. Neo-Keynesians had long been aware of the significance of inflation expectations for money wage contracting and inflation. This was clear and explicit in Samuelson's and Solow's (1960) seminal article that brought Phillips curve theory to the US, in which they write:

"All our discussion has been phrased in short-run terms, dealing with what might happen in the next few years. It would be wrong, though, to think that our Figure 2 menu that relates obtainable price and unemployment behavior will maintain its shape in the longer run. What we do in a policy way during the next few years might cause it to shift in a definite way.

Thus, it is conceivable that after they had produced a low-pressure economy, the believers in demand-pull might be disappointed; i.e., prices might continue to rise even though unemployment was considerable. Nevertheless, it might be that the low-pressure demand would so act upon wage and other expectations as to shift the curve downward in the longer run – so that over a decade, the economy might enjoy higher employment with price stability than our present day estimate would indicate (Samuelson and Solow, 1960, p.193)."

That framing of the Phillips curve fully recognizes the importance of inflation expectations and anticipates many aspects of the Friedman – Phelps hypothesis by almost a decade.² This early Keynesian recognition of the importance of inflation expectations is

² Moreover, remarkably, Samuelson and Solow anticipate the phenomenon of hysteresis of the unemployment rate in the very next paragraph: "But also the opposite is conceivable. A low-pressure economy might build up within itself over the years larger and larger amounts of structural unemployment (the reverse of what happened from 1941 to 1953 as a result of strong war and postwar demands). The result would be an upward shift of our menu of choice, with more and more unemployment being needed just to keep prices stable (Samuelson and Solow, 1960, p.193)."

now fully acknowledged by mainstream economists.³ However, as documented by Forder (2009), the economics profession of the late 1960s and early 1970s seems to have treated Friedman's expectations critique of the Phillips curve as if it were entirely new and original, and something Keynesian Phillips curve theorists had overlooked. That reception gave Friedman's hypothesis an enormous and unwarranted boost.

One reason it may have occurred is that policy discussions and textbook treatments of inflation expectations had been too casual, implying a fixed trade-off in which inflation expectations were peripheral. A second reason may have been that Samuelson and Solow describe the effects of a low-pressure economy on inflation expectations, reflecting the policy context of the late 1950s. In contrast, Friedman was concerned with the inflationary implications of the over-heated economy of the second-half of the 1960s, so that the symmetric implications of Samuelson's and Solow's analysis may not have fully registered.

The evolution of actual macroeconomic outcomes

A third lucky break concerns the evolution of actual inflation and unemployment outcomes. Soon after Friedman published his address, macroeconomic events began to transpire in ways that superficially seemed to confirm his NRU hypothesis. That appeared to lend prescience and empirical support to Friedman, even though events were better accounted for by Keynesian inflation theory augmented by other factors. Moreover, the irony was additionally cruel given the theoretical possibility of such patterns had already been anticipated by Samuelson and Solow (1960).

³ For instance, in the 2018 *Journal of Economic Perspectives* symposium celebrating the fiftieth anniversary of Friedman's presidential address, both Mankiw and Reis (2018, p.83) and Hall and Sargent (2018, p.121) explicitly acknowledge this.

Table 1 shows inflation, the unemployment rate, and the federal funds interest rate for the period 1965 – 1975. During the mid-1960s the US economy appeared to be smoothly sliding up the Keynesian Phillips curve. As the economy approached full employment in 1966, and especially given the US was fighting a full-blown war in Vietnam, Keynesian macroeconomic analysis called for policy tightening. However, at this stage, the political business cycle (Nordhaus, 1975) kicked in. Confronted by the upcoming 1968 election, the Johnson administration preferred to maintain its existing policy course rather than bite the bullet of policy tightening. The result was increased inflation and a further small decline in the unemployment rate.

Table 1. U.S. GDP inflation, unemployment rate, and federal funds interest rate: 1965 – 1975.
 Source: Inflation and federal funds rate, Economic Report of the President, 2014, Tables B-3 and B-17. Unemployment rate, Bureau of Labor Statistics, series LNU04.

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
GDP inflation (%)	1.7	2.8	2.7	4.2	4.9	5.4	5.2	4.5	5.7	10.1	9.1
Unemployment rate (%)	4.5	3.8	3.8	3.6	3.5	4.9	5.9	5.6	4.9	5.6	8.5
Federal funds interest rate (%)	4.07	5.11	4.22	5.66	8.21	7.17	4.67	4.44	8.74	10.51	5.82

In 1969, the new Nixon administration stepped on the policy brakes by raising interest rates. That caused a rise in the unemployment rate, but inflation increased slightly and was slow to come down owing to its inertial nature. The resulting counter-clockwise

inflation – unemployment dynamics were completely consistent with Keynesian Phillips curve theory with adaptive expectations. However, perhaps because of the novelty of the situation and the profession’s belief that Keynesian Phillips curve theory had omitted inflation expectations, the pattern was viewed as confirming Friedman’s hypothesis.

In 1971-72, with the approach of another presidential election, the political business cycle kicked in again. Now, the Nixon administration decided to reflate the economy despite the fact inflation had not completed its downward readjustment. Consequently, inflation remained pegged at its existing higher level, which was interpreted as giving further credence to Friedman’s NRU hypothesis.

Finally, in 1973 came the first OPEC oil price shock which was passed through into price inflation. Given the energy intensive nature of the early 1970s US economy, the inflation impact was large. Furthermore, it triggered an echo wage – price inflation spiral as capital and labor fought over who was to bear the cost. Simultaneously, higher oil prices resulted in redistribution of income from the US to OPEC, which lowered US aggregate demand and caused unemployment to increase.

This combination of effects generated the new phenomenon of “stagflation”, which showed up in the data as a further deterioration in both inflation and unemployment. Neither Keynesians nor Friedman had anticipated these events. However, since they manifested themselves as higher inflation and higher unemployment, Friedman was credited with anticipating them, which helped further spread the NRU.

Again, the irony is cruel, since Friedman insisted inflation was a purely monetary phenomenon and his theory gave no place for events like the OPEC oil shock and income distribution conflict. In contrast, Post Keynesian inflation theory explicitly identified the

separate phenomenon of conflict inflation, which it distinguished from demand-pull inflation caused by an over-heated economy.

The weak state of Phillips curve econometrics

A fourth lucky break favoring Friedman was the weak state of Phillips curve econometrics, whereby early empirical estimates of the inflation process were woefully under-specified. That caused them to perform badly when confronted by the developments of the early 1970s, leaving Phillips curve theory vulnerable. Subsequently, empirical models of inflation were structurally updated and their performance improved (e.g. Gordon, 1977). However, even those improved models could not resolve the fundamental problem that the Phillips curve breakdown period (1974 – 1992) may be better explained by a socio-political “conflict inflation” theory in which there is no Phillips trade-off, while there is a trade-off either side of the breakdown period. That alternative hypothesis required the passage of time for proof, yet during the interval the data appeared to confirm Friedman’s NRU hypothesis.

Politics and the turn to neoliberalism

A fifth lucky break concerns politics. The mid-1970s saw the US begin its long (and still intact) embrace with neoliberalism, which was formally inaugurated with the election of Ronald Reagan in 1980. Friedman had long advocated such a political shift via his highly visible public intellectual activity on behalf of *laissez-faire* and against government economic activism. That said, the timing of the shift was fortuitous as it added powerful political support for the NRU hypothesis.

That support showed up in economic policy endorsements via finance ministries, central banks, and the multilateral institutions. In turn, those endorsements helped spread

and entrench the NRU hypothesis via the sociological channel of academic patronage provided by those institutions.

Neoliberalism was (and is) favorably disposed to the NRU hypothesis for three major reasons. First, the hypothesis provided justification for backing away from the Keynesian monetary policy commitment to full employment on grounds that monetary policy cannot deliver such an outcome, except at the cost of accelerating inflation. Second, the hypothesis implicitly questioned the welfare gains of such policy, even if it could deliver. That is because monetary policy operates by fooling labor market participants about real wages, and such fooling means optimizing agents are tricked into transactions that are welfare reducing.⁴ Third, the hypothesis argued against New Deal labor market features, such as the minimum wage and strong trade unions, on grounds that they increased the natural rate of unemployment. That was music to the ears of political proponents of neoliberalism, who were committed to breaking the power of unions and redistributing income back to capital from labor.

Lucas's introduction of rational expectations into macroeconomics

A sixth, and perhaps most important, lucky break was the introduction of rational expectations (RE) into macroeconomics by Lucas (1972, 1973). This is an instance where Friedman was truly fortuitous on multiple levels, particularly as he was a believer in extreme inertial adaptive expectations (AE). Thus, in his presidential address, Friedman writes:

“I can at most venture a personal judgment, based on some examination of the historical evidence, that the initial and unanticipated effects of a higher and unanticipated rate of inflation last for something like two to five years; that this initial effect then begins to get reversed; and that a full adjustment to the new

⁴ Mathematically speaking, policy induces agents to mistakenly violate the constrained utility maximization first-order conditions that determine the optimal level of transacting.

rate of inflation takes about as long for employment as for interest rates, say, a couple of decades (Friedman, 1968, p.11).”

RE served to bolster and promote Friedman’s NRU hypothesis in multiple important ways. First, it sharpened and strengthened its neoliberal political appeal. Friedman’s accelerationist theory left open the possibility of targeting lower unemployment at the cost of accelerating inflation. RE closed off that possibility, as once labor market participants learned the monetary authority was accelerating inflation to lower unemployment, they would incorporate that policy behavior into their inflation expectations and money wage demands. That would then undo the ability of accelerationist monetary policy to lower unemployment.

RE also strengthened the neoliberal claim that full employment monetary stabilization policy was not even necessary. For Friedman, the inertial adaptive nature of expectations meant economies could take considerable time to gravitate back to their natural equilibrium. That feature even made for some overlap with neo-Keynesian thinking, and it suggested there might be a role for macroeconomic stabilization policy to speed up the return to natural equilibrium. RE stripped away that argument. With RE, all that was needed was for government to publicly and credibly announce its policy, and agents would immediately incorporate that information into their expectations, enabling a quick return to natural equilibrium. Sargent (1983) later used this argument to advocate “cold turkey” anti-inflation policy.

Second, RE was hugely instrumental in attracting economists to the NRU hypothesis by sprucing it up with appealing mathematical modelling which was richly rewarded by the economics club. The economics profession has long had a proclivity toward mathematical modelling, and many economists may even conflate mathematics

with science. Those features were already in place in the era of Keynesian ISLM dominance, but RE played into them forcefully by introducing new mathematical and statistical techniques, and new opportunities for showcasing those techniques and modelling skills. As Tobin wrote about RE theorists:

“Their innovations in analytic technique and econometric method are powerful, and it is no wonder that they excite some of the best young minds of our profession, just as Keynesian theory and the early stirrings of econometrics excited my own generation (Tobin, 1980, p.22).”

In the 1960s monetarist debates, the neo-Keynesians held a significant advantage over Friedman regarding the appeal of their mathematical modelling techniques. In the 1970s, the advent of RE reversed that and gave Friedman’s NRU hypothesis a significant modelling appeal advantage over the neo-Keynesians. That mathematical and technical appeal of RE had profound sociological impacts, creating new standards for publication and tenure which favored advocating the NRU hypothesis. RE also offered professors bucket loads of new and tricky exam questions that helped popularize it. That may sound trite, but it should not be dismissed. In a 2005 conference, Robert Solow remarked one reason why Duesenberry’s relative consumption hypothesis was abandoned by the economics profession in the 1950s was its failure to offer interesting exam questions relative to other hypotheses about consumption (Palley, 2010, p.54). In a sense, RE made macroeconomics even more technique driven, and its effect was to lock-in the dominance of a particular idea (the NRU) that fit beautifully with the new techniques.

In addition to technical appeal, the combination of RE and the NRU hypothesis also introduced challenging and interesting policy questions that further augmented the appeal of the new research agenda. Ironically, and again fortuitously for Friedman, RE provided a theoretical justification for Friedman’s “rules” approach to monetary and

macroeconomic policy. Whereas Friedman had rationalized his preference for rules via loose hand-waving regarding provision of a stable macroeconomic environment, RE provided a rigorous justification for framing policy in terms of rule design and selection.⁵ The irony is Friedman was an opponent of RE, yet he ended up being a massive beneficiary of it.⁶

The mistaken neo-Keynesian response to RE

A seventh lucky break for Friedman was the mistaken response of neo-Keynesians to the RE revolution, which threw Friedman's critics off the scent of the trail regarding the Phillips curve. Neo-Keynesians recognized that the central economic issue was the magnitude of the coefficient of inflation expectations in the Phillips curve equation, and why it might be less than unity (Tobin, 1971a, 1971b). The challenge was to explain why rational economic agents, not subject to money illusion, might accept nominal wage settlements that included less than full incorporation of inflations. However, RE shifted the research agenda away from "incorporation" of inflation expectations to "formation" of inflation expectations (Palley, 2012), which is where economics remains trapped.⁷ For instance, Akerlof et al. (2000) derive a Phillips curve in which agents have near-rational

⁵ RE requires agents to form expectations about policy, which leads to thinking of policy in terms of rules: if outcome A transpires, adopt policy action P_A . That rules formulation then provides a rich game-theoretic framework in which policymakers should develop optimal policy rules, taking account of the fact that economic agents are taking account of the policy rule chosen by the policymaker. That framework leads to issues of time consistent policy design (Kydlan and Prescott, 1977), policy credibility, policy disclosure, and independent central banks.

⁶ Even more ironically, Mankiw and Reis (2018) propose adding a new chapter to the story of Friedman "the fortunate", by praising him for his belief in adaptive expectations: "From a modern perspective, Friedman's assumption that expectations are sluggish rather than rational seems prescient (Mankiw and Reis, 2018, p.85)." Having benefitted hugely from the advent of RE in the 1970s, despite being a believer in extreme inertial AE, Friedman is now poised to benefit again from the profession's retreat from Lucas's (1972, 1973) excessively simplistic formulation of RE.

⁷ The focus on formation of expectations was an understandable response. First, RE was posed as an alternative to adaptive expectations. Second, at the time, microeconomics was infused with discussions of "satisficing" behavior by agents rather than full rationality, the argument being satisficing made sense in a world in which computational ability and information were limited and costly to acquire.

expectations at low rates of inflation, which results in less than full incorporation of inflation at low inflation. The problem with that formulation, is the resulting Phillips curve trade-off lacks a welfare justification because it implicitly relies on agents being fooled into incorporating less than full inflation.

The mistaken Post Keynesian response to RE

Finally, Post Keynesians also responded mistakenly to the RE revolution. This was a self-inflicted injury, but it was yet another lucky break for Friedman. The combination of Friedman's (1968) revival of classical macroeconomics and RE created new classical macroeconomics (NCM). Tobin (1980, p.22) was at pains to emphasize that the important policy results of NCM stemmed from Friedman's classical macroeconomics with its labor market clearing assumption:

“The two pillars of the new classical macroeconomics are *rational expectations* and *continuous market clearing*. Of the two, I shall argue, it is the second which is crucial for the far-reaching implications of the doctrine (Tobin, 1980, p.22, original italics).”

However, under the influence of Davidson (1982-83), many Post Keynesians identified RE as the core problem by mistakenly conflating RE with probability (Palley, 1993 [1996, chap. 5]). The Post Keynesian “probability” critique of econometrics is absolutely correct. Econometrics rests on axiomatic probability theory, which cannot hold in a non-ergodic world. However, RE theory is about agents deriving model consistent expectations, and it has no necessary connection to axiomatic probability theory and the assumption of an ergodic world. The only thing it imposes is that agents form expectations using the model of the world they believe (Palley, 1993 [1996, chap. 5]).

Of course some RE theorists placed RE in the context of models that assumed an ergodic world, but that constitutes a mistaken application of RE rather than a generic

critique of RE *per se*. The failure to recognize this meant most Post Keynesians threw out the RE baby with the probability bath water, leaving them out of the important conversation triggered by RE.⁸

4. What's wrong with the NRU?

The previous section argued the intellectual take-over of macroeconomics by Friedman's NRU hypothesis was greatly aided by a succession of lucky breaks, especially the introduction of RE theory. However, there was also something deeper in neo-Keynesian macroeconomics that created the opening for Friedman, and that something also explains what is fundamentally wrong with the NRU.

On the opening page of *The General Theory* Keynes laid out his fundamental conception of the economy:

“I shall argue that the postulates of the classical theory are applicable to a special case only and not to the general case, the situation which it assumes being a limiting point of the possible positions of equilibrium. Moreover, the characteristics of the special case assumed by the classical theory happen not to be those of the economic society in which we actually live, with the result that its teaching is misleading and disastrous if we attempt to apply it to the facts of experience (Keynes, 1936, p.3).”

Keynes' statement contains two essential points, one negative and the other affirmative.

The negative point is classical economics is built on assumptions that are inconsistent with the real world. The affirmative point is macroeconomic equilibrium, in the economy we inhabit, consists of a continuum of possible outcomes.

⁸ It also true that RE generates much less interesting results in Keynesian macro models (Palley, 1993 [1996, chap.5]). In NCM models, RE serves to undermine many important policy propositions. In contrast, in Keynesian models there is no equivalent negative effect on policy, and RE might even strengthen the impact of policy to the extent agents accurately internalize policies aimed at affecting their behavior. Policy rules and policy credibility are fully consistent with a Keynesian perspective. However, Post Keynesians excluded themselves from those debates via their mistaken opposition to RE which provides the theoretical foundation for rules and credibility.

Keynes' framing of the challenge of macroeconomics explains what is wrong with Friedman's NRU hypothesis, and it also helps understand why there was an opening for Friedman. With regard to the what is wrong, Friedman's presidential address was a double threat to Keynesian economics. First, it sought to restore the unrealistic assumptions of classical macroeconomics. Second, it sought to restore the classical focus on the limiting point of the continuum equilibria, which can be labelled the NRU.

As regards the opening Friedman exploited, this was provided by neo-Keynesian macroeconomics which had become increasingly schizophrenic. In 1960s macroeconomics, the long-run Phillips curve represented Keynes' notion of a continuum of possible equilibrium outcomes. However, the Phillips curve was an empirical relation tacked on to the Keynesian macro model. As Tobin elegantly observed, it was "an empirical finding in search of a theory, like Pirandello characters in search of an author (Tobin, 1972 [1975, p.45])", and that lack of theoretical justification made it vulnerable.

At the same time, neo-Keynesian macroeconomics (especially US neo-Keynesianism) had been persistently backtracking on the theoretical notion of a continuum. That backtracking was embodied in the reinterpretation of *The General Theory* as a special case built on price and nominal wage rigidity. The backtracking had begun with Modigliani's (1944) famous paper showing how nominal wage rigidity blocked off restoration of full employment in the ISLM model. By the late 1960s that had become received neo-Keynesian doctrine, as reflected in the influential Barro and Grossman (1971) article which re-conceptualized Keynesian macroeconomics as general disequilibrium economics.⁹

⁹ The Barro and Grossman (1971) model placed Keynesian aggregate demand theory with price and nominal wage in a Walrasian general equilibrium context. Instead of markets clearing via price adjustment,

In that theoretical schema, sluggish price and nominal wage adjustment means the restoration of full employment general equilibrium is a slow grinding process. Such a framing is not so different from Friedman's framing, cast in terms of extreme inertial adaptive inflation expectations: "this price expectation effect is slow to develop and also slow to disappear. Fisher estimated that it took several decades for full adjustment and more recent work is consistent with his estimates (Friedman, 1968, p.6)."

The claim of significant overlap between late 1960s neo-Keynesian macroeconomic theory and Friedman's macroeconomics is affirmed by Hall and Sargent (2018), two preeminent proponents of new classical macroeconomics, who write:

"This brand distinction followed a tribal distinction between "saltwater" and "freshwater" macroeconomists described in Hall (1976). It is unfortunate that many commentators have misconstrued Hall's tongue-in-cheek account of schools of macroeconomics as indicating a broader schism between coastal and mid-west approaches to macroeconomics. No such schism existed or exists among researchers actually working in the research trenches (Hall and Sargent, 2018, p.127)."

Putting the pieces together, one sees the door through which Friedman entered. Neo-Keynesianism was a house divided. On one hand, it notionally supported the idea of a continuum of equilibria, as represented via the Phillips curve. However, the Phillips curve was vulnerable owing to lack of theoretical support. On the other hand, it interpreted Keynesian economics as a special case of price and nominal wage rigidity. Absent those rigidities, the economy would gravitate to full employment, which Friedman labelled the NRU.

That division created an opening for Friedman. Later, when inflation –

there are disequilibrium quantity spill-overs across markets and clearing takes place via quantity adjustment.

unemployment outcome deteriorated, events were interpreted as disproving the Phillips curve concept and Friedman's NRU hypothesis was embraced. Thereafter, economics quickly turned down the hysteretic path leading back to classical macroeconomics, a turn which neo-Keynesians had unintentionally assisted to a significant degree.¹⁰

In sum, the NRU hypothesis represented the "camel's nose" of classical macroeconomics, which late 1960s neo-Keynesian economics had effectively invited into the tent. Once inside, it quickly drove out the Keynesian construction of macroeconomic equilibrium. Friedman's (1968) presidential address still retained vestiges of the Keynesian framework via its accelerationist framing of the Phillips curve, but Lucas (1972, 1973) expelled those vestiges by replacing AE with RE. That made it look as if RE was the problem, when the real problem was Friedman's classical construction of the labor market.

These arguments make clear the macroeconomic features needed to recover Keynesian Phillips curve theory. First, macroeconomic equilibrium must be characterized by a "continuum" of outcomes defined over inflation and the unemployment rate. Second, there must be a negative relation between inflation and the unemployment rate. Third, monetary policy must be able to systematically exploit that relationship, in the sense of choosing a point on the continuum.¹¹

¹⁰ From the beginning, support for Keynesian theory was always weaker in the US than UK. Reflecting the pragmatic nature of US culture, US economists were willing to embrace Keynesian policy, but they were much more resistant to Keynes' (1936) implied deep critique of the market system.

¹¹ Blanchard (2018) has recently suggested that hysteresis models of unemployment (see for instance, Blanchard and Summers (1987)), offer an alternative to Friedman's NRU hypothesis. However, such models do not restore the Keynesian Phillips curve. In the rational agent hysteresis model, monetary policy surprises can have permanent effects. However, anticipated (i.e. expected) monetary policy is neutral because agents incorporate it into their wage setting. Consequently, the model does not challenge Friedman's claim about what monetary policy can do (i.e. monetary policy still cannot target employment or real output). At best, it adds a small caveat regarding the permanent effects of surprise monetary policy, which by definition cannot be used to systematically manage the macro economy.

5. The Keynesian alternative: recovering the path not taken¹²

The late 1960s Phillips curve was given by:

$$(1) w = f(u - u^*) + \lambda\pi^e \quad f(0) = 0, f_u < 0, f_{uu} > 0, \quad 0 < \lambda \leq 1$$

$$(2) \pi = w - a$$

$$(3) \pi^e = \pi$$

w = nominal wage inflation; u = actual unemployment rate; u^* = rate of unemployment (frictional and structural) associated with full employment; π^e = expected inflation; π = actual inflation, a = labor productivity growth. Equation (1) is the expectations augmented Phillips curve. The function $f(\cdot)$ determines the nominal wage inflation impact of labor market excess demand or supply. Equation (2) is the representative firm's marginal cost condition expressed in rates of change, whereby price inflation is equal to nominal wage inflation less labor productivity growth. Equation (3) is the long-run equilibrium condition in which inflation expectations are fulfilled.

For simplicity, assume $a = 0$. Appropriate substitution and algebraic manipulation then yields the long-run Phillips curve, which is given by:

$$(4) \pi = f(u - u^*)/[1 - \lambda] \quad d\pi/du = f'/[1 - \lambda] < 0$$

According to equation (4), if there is full feedthrough of inflation expectations into nominal wage setting (i.e. $\lambda = 1$), the long-run Phillips curve is vertical in accordance with Friedman's logic so that $u = u^*$ and $\pi = \pi^e$. That suggests the coefficient of inflation expectations is critical for the Keynesian Phillips curve. Given that rational labor market participants are concerned with real wages, the challenge is to explain why participants would incorporate less than full inflation expectations in their nominal wage bargains.

¹² This section draws heavily on Palley (2012), providing simplifications of models presented therein.

Equation (1) helps understand the history of attempts to theorize the Keynesian Phillips curve. The equation has three components. First, there is the disequilibrium Marshallian nominal wage adjustment mechanism, $f(\cdot)$. Second, there is the coefficient of inflation expectations, λ . Third, there is the contribution of inflation expectations, π^e . Attempts to theorize the Keynesian Phillips curve have experimented with all three components, and that is key to distinguishing the different theories.

As noted earlier, the Phillips curve was an empirical finding in need of a theoretical explanation. In his 1971 AEA presidential address, Tobin provided a “deep theory” of the Phillips curve, which he rationalized in terms of stochastic macro equilibrium:

“One rationalization might be termed a theory of stochastic macro equilibrium: stochastic, because random inter-sectoral shocks keep individual labor markets in diverse states of disequilibrium; macro equilibrium, because the perpetual flux of particular markets produces fairly definite aggregate outcomes of unemployment and wages... The theory therefore requires new disequilibria are always arising. Aggregate demand may be stable, but beneath its stability is never-ending flux: new products, new processes, new tastes and fashions, new developments of land and natural resources, obsolescent industries and declining areas (Tobin, 1972 [1975, p.45-46]).”

Tobin’s 1971 presidential address constitutes a reply and rebuttal of Friedman’s 1967 address. However, Friedman’s good luck was Tobin’s bad luck. Though delivered just four years later, events had already started to move in Friedman’s favor and against Tobin. Phelps’ mathematical modelling of Friedman’s accelerationism quickly gave Friedman’s NRU deeper traction among economists. As already discussed, inflation – unemployment outcomes started to deteriorate because of the political business cycle, and soon worsened further owing to the OPEC oil price shock. That worsening was erroneously interpreted as confirmation of Friedman’s NRU hypothesis. Additionally,

Lucas's RE revolution had gotten underway, enlisting the economics profession on the side of the NRU hypothesis which fit so well with RE.

In contrast, Tobin never developed an equivalent formal mathematical model, and the full logic of his model was opaque. In terms of equation (1), Tobin's presidential address seems to focus on the disequilibrium Marshallian excess demand function. However, it turns out that does not generate a long-run Phillips trade-off.

Why? In a multi-sector economy with N sectors there will be a distribution of sectoral unemployment rates $[u_1, \dots, u_N]$, with an economy-wide average unemployment rate of $u = \sum u_i / N$. Each sector will have its own inflation rate $[\pi_1, \dots, \pi_N]$ determined by its sector Phillips curve, with an economy-wide average inflation rate of $\pi = \sum \pi_i / N$. Given the concavity of the disequilibrium nominal wage adjustment mechanism, $f(\cdot)$, an increase in the variance of sector unemployment rates (σ) brought about by a mean preserving spread will tend to increase the economy-wide inflation rate.

The aggregate Phillips curve can be written as

$$(5) \quad w = f(u - u^*, \sigma) + \lambda \pi^e \qquad f_\sigma > 0, f_{\sigma\sigma} \geq 0$$

The long-run Phillips curve is given by

$$(6) \quad \pi = f(u - u^*, \sigma) / [1 - \lambda]$$

In the short-run, increased dispersion of sector unemployment rates, holding the mean constant, will increase the inflation rate so that there is a short-run inflation bias in the economy. However, equation (6) shows there is still no long-run Phillips trade-off if the coefficient of inflation expectations is unity.

In that event, stepping on the policy pedal to reduce unemployment causes a rise in the general inflation rate. However, that rise in the inflation rate then gets incorporated

into inflation expectations in all sectors, nullifying the employment effect of stepping on the pedal. In the long-run, the economy reverts to the natural rate of unemployment, and the inflation rate depends exclusively on the rate of nominal demand growth (which Friedman identified with money supply growth). In sum, Tobin's (1972) suggestion that multi-sector effects be incorporated in the Marshallian nominal wage adjustment mechanism does not deliver a Keynesian Phillips curve.

Akerlof et al. (2000) present another model which produces a backward bending Phillips curve. Their focus is on formation of inflation expectations, with workers having near-rational expectations at low rates of inflation. When inflation is low, workers only partly recognize inflation.

A simplified version of their model is as follows. Inflation expectations are given by:

$$(7) \pi^e = \alpha\pi \quad 0 \leq \alpha < 1 \text{ if } \pi < \pi^{\wedge}; \alpha = 1 \text{ if } \pi \geq \pi^{\wedge}$$

There are now two regimes: the low inflation regime where $\pi < \pi^{\wedge}$, and the high inflation regime where $\pi \geq \pi^{\wedge}$. Combining equation (7) with equations (1) and (2), generates distinct long-run Phillips curves for each regime given by:¹³

$$(8.a) \pi = f(u - u^*)/[1 - \alpha\lambda] \quad \text{if } \pi < \pi^{\wedge}$$

$$(8.b) \pi = f(u - u^*)/[1 - \lambda] \quad \text{if } \pi \geq \pi^{\wedge}$$

Even if the coefficient of feedthrough of inflation expectations is unity, there is a long-run trade-off as long as $\pi < \pi^{\wedge}$. However once inflation equals or exceeds, the trade-off disappears and the Phillips curve becomes vertical as in the NRU hypothesis.

Akerlof et al. (2000) therefore show that the manner of "formation" of inflation

¹³ Rowthorn (1977) developed a similar model, but without the appeal to behavioral economics or the complexities of aggregation of monopolistically competitive firms.

expectations can generate a long-run Phillips curve. In a sense, they add a third alternative to AE and RE. AE produces an accelerationist Phillips curve. RE produces a vertical Phillips curve. Near-RE produces a Keynesian Phillips curve for low inflation regimes, and a vertical Phillips curve for higher inflation regimes.

However, their theory is problematic for two reasons. First, the model implies some form of permanent money illusion as long as inflation is low. Second, the policy welfare implications are questionable since any gain in employment comes by fooling workers into taking a pay cut, which undercuts workers' optimizing decisions. That makes it an impure Keynesian construction.

A third operationalization of the Tobin's deep theory of the Phillips curve was provided earlier by Palley (1994). That model focuses on the coefficient of inflation expectations and "incorporation" of inflation expectations. The economy consists of many equal sized sectors, and sectors below full employment (i.e. with unemployment) only partially incorporate inflation expectations into their nominal wage settlements.

A highly simplified version of the model is given by:

$$(9) \quad w = f(u - u^*, \sigma) + s(u)\pi^e \quad f_\sigma > 0, f_{\sigma\sigma} \geq 0, \quad 0 \leq s \leq 1, s_u < 0$$

$$(10) \quad \pi = w - a$$

$$(11) \quad \pi^e = \pi$$

$$(12) \quad \pi = g^D - a$$

$s(u)$ = share of sectors at full employment, g^D = growth of nominal demand. Equation (9) is the Phillips curve. Equation (10) is the representative firm's marginal cost condition. Equation (11) has inflation expectations equal to actual inflation, so that workers are fully informed about inflation. Equation (12) is the macroeconomic constraint whereby

aggregate inflation is restricted to equal nominal demand growth less productivity growth. Once again, for simplicity, it is assumed $a = 0$.

Equation (9) is the critical equation. Sectors at full employment fully incorporate inflation expectations, but sectors with unemployment do not incorporate any inflation expectations. Why? The argument is workers are resistant to real wage cuts to restore full employment imposed from within the employment relationship. That is because firms always have an incentive to opportunistically seek wage cuts. However, workers accept real wage cuts imposed from outside the employment relation by inflation because they know their employer did not impose it. Additionally, workers resist nominal wage cuts because they are often nominal debtors (Palley, 1990).

Consequently, workers in sectors with unemployment do not incorporate inflation expectations in their nominal wage contracts, while workers in full employment sectors fully incorporate expectations. That pattern helps increase demand in sectors with unemployment relative to those with full employment.

Appropriate substitution and algebraic manipulation then yields the long-run Phillips curve given by

$$(13) \pi = f(u - u^*, \sigma) / [1 - s(u)]$$

The Phillips curve is negatively sloped, and the slope increases in absolute size as the unemployment rate falls. That follows from the $s(u)$ denominator term, which increases as unemployment falls because more sectors reach full employment.

Furthermore, workers have RE and are fully aware of the inflation rate, so that there is no fooling involved. That shows RE is fully compatible with the Keynesian perspective, as argued earlier. No fooling also means inflation has beneficial welfare

impacts by helping sectors with unemployment adjust faster (i.e. by greasing the wheels of labor market adjustment).

Equation (12), the long-run macroeconomic constraint, implies that inflation must adjust to equal nominal demand growth. That reveals the inner logic of Tobin's deep theory. The steady drip of nominal demand growth produces inflation in sectors at full employment, but increases real demand in sectors with unemployment because their nominal wage settlements do not incorporate inflation expectations. If nominal demand growth slows, that causes slower adjustment in sectors with unemployment, raising the aggregate unemployment rate.¹⁴

The above model can be modified to also generate a backward bending Phillips curve (Palley, 2003). The necessary requirement is agents change their behavior and increase their extent of incorporation of inflation expectations as inflation increases. Consequently, the number of sectors which fully incorporate inflation expectations into nominal wage bargains increases as inflation increases. That behavior change progressively undoes the labor market grease effect of higher inflation, causing the Phillips curve to bend back. That provides an alternative to Akerlof et al. (2000), without recourse to fooling.

Lastly, the model can be modified to incorporate Post Keynesian conflict inflation (Palley, 2009). That can be done by making the share of sectors that incorporate inflation expectations and the extent of incorporation a positive function of a socio-economic variable capturing the degree of capital – labor conflict. That modification adds a Post

¹⁴ This is another point on which Tobin's (1972) AEA address was misleading. Tobin persistently refers to the level of aggregate demand being the factor determining where the economy settles on the Phillips curve. However, the decisive factor is the rate of nominal demand growth, which is the steady drip of grease that enables sectors with unemployment to adjust.

Keynesian conflict dimension to Keynesian demand-pull cost-push inflation.

6. Empirical evidence against the NRU hypothesis

Milton Friedman's luck appears to have no end (possibly reflecting an ideologically favorable disposition of the economics profession toward his ideas). Earlier, it was noted how the Keynesian Phillips curve was quickly abandoned on questionable empirical grounds. Just as the empirical case against the Keynesian Phillips curve was over-stated, so too the empirical case against the NRU hypothesis has been significantly over-looked.

The central claim of the NRU-RE hypothesis is that anticipated monetary policy is ineffective, and only monetary surprises matter. Mishkin (1982a) reported findings that strongly reject that claim and show anticipated monetary policy has similar effects to unanticipated policy. In another paper, Mishkin (1982b) reported similar findings for anticipated aggregate demand policy.

Estimates of the NRU have also been enormously volatile and variable, on a scale that makes the 1960s and early 1970s Phillips curve seem relatively stable. Staiger et al. (1997) show the estimated NRU (also known as NAIRU) has proven highly unstable, varies considerably according to the price deflator used to estimate it, and is subject to very large standard errors that make it near useless as a guide for monetary policy. Table 2 shows their estimates plus standard errors, using the PCE deflator, which is the Federal Reserve's preferred price deflator. In 1984.1 the estimate was 6.9 percent, with a confidence interval running from 2.9 percent to 8.3 percent. Ten years later, it had fallen to 5.6 percent, with a confidence interval from 2.8 to 7.7 percent.

Table 2. Estimates for the NRU in the US plus 95 percent confidence intervals.
 Source: Staiger et al (1997, p.39).

	1984.1	1989.1	1994.1
PCE deflator	6.9 (2.9, 8.3)	6.4 (4.2, 8.5)	5.6 (2.8, 7.7)

Brainard and Perry (2000) estimate a Phillips curve with time varying parameters, and find the coefficient of inflation expectations has varied considerably, but other parameters have been relatively constant. The coefficient was low in the 1950s and 1960s, rose in the 1970s, and has fallen since then. That is consistent with a Keynesian Phillips curve in which either high inflation or social conflict or both cause the coefficient of inflation expectations to vary (Palley, 2009).

Blanchard (2018, p.113) reports that estimates of the simplest most naïve Keynesian Phillips curve show that the coefficient of inflation expectations has been below unity for most of the period 1962-2016. The exception is the years 1974 – 1992, but these were the years of OPEC oils shocks and significant conflict over income distribution when additional different inflationary dynamics were likely present, and those dynamics are absent from Blanchard’s regressions.

Shortly before his death, Eisner (1997) presented results discrediting the non-accelerating inflation rate of unemployment – the alternative term for the NRU. In the US economy, unemployment rates below the NRU do not produce accelerating inflation, and that pattern has been strengthening.

Palley (1997) shows that the duration of unemployment is reduced by expected inflation. That is inconsistent with the RE-NRU hypothesis, and consistent with Tobin's (1972) deep theory of the Phillips curve whereby inflation reduces unemployment by greasing the wheels of labor market adjustment.

Lastly, Akerlof et al. (2000) report evidence that the Phillips curve is backward bending. According to their estimates, the US Phillips curve bends back at four percent inflation, using total unemployment as the measure of labor market slack and the CPI as the measure of inflation.

The fact that the Phillips curve is non-linear, probably backward bending, and subject to repeated structural shocks (such as OPEC and globalization), explains why it has been so hard to estimate and why it has been so unstable. But instability is not grounds for rejecting the theory, particularly when that instability is structurally explainable. Instability means policy will likely make more errors, but it is still better to guide policy and public discussion with the right theory than the wrong theory.

The bottom line is the empirical evidence does not favor the NRU and, if anything favors the Keynesian Phillips curve. Despite that the economics profession has a strong and continuing attachment to the NRU, and resists the Keynesian Phillips curve.

7. Fifty years is enough: why the NRU must go

Economic theory is prone to hysteresis. Once an idea is adopted, it is difficult to abandon.

In the late 1960s and early 1970s, the economics profession abandoned the Keynesian Phillips curve and adopted Milton Friedman's NRU hypothesis. The shift was facilitated by a series of lucky breaks.

Despite much evidence against the NRU, and much evidence and theoretical argument supportive of the Keynesian Phillips curve, the NRU hypothesis remains firmly ascendant. That is clearly evidenced by the fiftieth anniversary symposium celebrating Friedman's NRU, published in the AEA's flagship *Journal of Economic Perspectives* (JEP, 2018 (1)).¹⁵ Indeed, the ascendancy seems more entrenched than ever, despite the visible failures of macroeconomics over the past decade. Back in 1997, the *JEP* published an earlier symposium on the NRU hypothesis. Compared to that symposium, the 2018 symposium is less critical and less pluralistic.¹⁶

The NRU hypothesis has had an enormous impact on macroeconomic theory and macroeconomic policy, and via those channels has had an enormous impact on economic outcomes, including the worsening of income distribution. With regard to theory, it was key to the demolition of the Keynesian Phillips curve and restoration of classical macroeconomics. With regard to macroeconomic policy, the NRU hypothesis was instrumental in the retreat from the post-war commitment to full employment, the

¹⁵ The symposium had three papers, two of which enthusiastically endorsed the NRU, while the third endorsed the NRU but admitted the possibility of doubts. Enthusiastic endorsements were provided by Mankiw and Reis (2018) and Hall and Sargent (2018). Blanchard (2018) supports the NRU but inoculates himself against placing his chips on the wrong color, writing: "Policymakers should keep the natural rate hypothesis as their null hypothesis, but also keep an open mind and put some weight on alternatives (Blanchard, 2018, p.99 – 100)." The *JEP* symposium also belies the title of the journal by only including one perspective, providing further evidence of the entrenched monopoly standing of the NRU hypothesis.

¹⁶ What little criticism there is in the 2018 symposium, was reserved for Friedman's recommendation that monetary policy target money supply growth (Mankiw and Reis, 2018, p.89-91). Today, that recommendation is not followed by central banks who, instead, target nominal interest rates via an interest rate rule. Mankiw and Reis credit the new policy stance to Woodford (2003). However, this stance has long been advocated by Post Keynesians (for instance, see Moore, 1988), whose theory of endogenous money discredited money supply targeting thirty years ago, as part of discrediting monetarism.

argument being monetary policy has no long-run impact on real variables. The NRU hypothesis also played an important role in justifying the labor market flexibility agenda, endorsed by neoliberal policymakers and politicians. That agenda has worked to lower minimum wages and weaken trade unions and other sources of worker bargaining power. In doing so, it has contributed to widened income inequality. The argument was these features are labor market rigidities that increase the NRU. In making that argument, the NRU created a united front between macro and micro economists, as the latter had always favored the so-called labor market flexibility agenda.

These deleterious impacts speak to the importance of ditching the NRU. 2018 is the fiftieth anniversary of Milton Friedman's introduction of the NRU hypothesis. The anniversary offers an opportunity to challenge rather than celebrate it. James Tobin was Milton Friedman's great neo-Keynesian intellectual rival and 2018 is also the centenary of Tobin's birth. Tobin offered a compelling explanation of the Keynesian Phillips curve, which never got the hearing it deserved because the economics profession had already begun its hysteretic move down the path of ideas mapped out by Friedman. It would be an ironic twist if the NRU's fiftieth anniversary became the occasion for adopting Tobin's deep theory of the Phillips curve, with its Keynesian "continuum" conception of macroeconomic equilibrium.

References

- Akerlof, G.A., Dickens, W.T., and Perry, G.L. (2000), "Near-Rational Wage and Price Setting and the Long Run Phillips Curve," *Brookings Papers on Economic Activity*, 1, 1 - 60.
- Barro, R.J., and Grossman, H. (1971), "A general disequilibrium model of income and employment," *American Economic Review*, 61, 82 - 93.
- Blanchard, O. (2018), "Should we reject the natural rate hypothesis?" *Journal of Economic Perspectives*, 32 (1), 97 – 120.
- Blanchard, O. and L. Summers (1987), "Hysteresis in Unemployment," *European Economic Review*, 31, 288 – 295.
- Brainard, W.C. and Perry, G.L. (2000), "Making policy in a changing world," in Tobin and Perry (eds.), *Economic Events, Ideas, and Policies: The 1960s and After*, Washington, DC: Brookings Institution Press.
- Cross, R. (1993), "On the Foundations of Hysteresis in Economic Systems," *Economics and Philosophy*, 9 (1), 53 – 74.
- Davidson, P. (1982-83), "Rational Expectations: A Fallacious Foundation for Studying Crucial Decision Making Processes," *Journal of Post Keynesian Economics*, 5, 182-97.
- Eisner, R. (1997), "The decline and fall of the NAIRU," paper presented to the American Economic Association, January 4 – 6, 1997.
- Forder, J. (2017), "What was the message of Friedman's Presidential Address to the American Economic Association?" *Cambridge Journal of Economics*, 42 (2), 523 – 541.
- (2009), "The historical place of the 'Friedman – Phelps' expectations critique," *The European Journal of History of Economic Thought*, 17 (3), 493-511.
- Friedman, M. (1968), "The Role of Monetary Policy," *American Economic Review*, 58, 1 – 17.
- (1948), "A Monetary and Fiscal Framework for Economic Stability," *American Economic Review*, 38(3), 245 - 264.
- Friedman, M. and Schwartz A.J. (1963), *A Monetary History of the United States, 1867-1960*, Princeton, N.J.: Princeton University Press.
- Gordon, R.J. (1977), "Can the inflation of the 1970s be explained?" *Brookings Papers on Economic Activity*, 8:1, 253 – 277.

Hall, R.E., and Sargent, T.J. (2018), “Short-run and long-run effects of Milton Friedman’s Presidential Address,” *Journal of Economic Perspectives*, 32 (1), 121- 134.

Keynes, J.M. (1936), *The General Theory of Employment, Interest and Money*, London: MacMillan.

Kydland, F.E., and Prescott, E.C. (1977), “Rules Rather Than Discretion,” *Journal of Political Economy*, 85, 473 – 492.

Lucas, R.E., Jr. (1972), “Expectations and the Neutrality of Money,” *Journal of Economic Theory*, 4, 103 – 124.

----- (1973), “Some International Evidence on Output – Inflation Trade-offs,” *American Economic Review*, 63, 326 – 334.

Mankiw, N.G., and Reis, R. (2018), “Friedman’s presidential address in the evolution of macroeconomic thought,” *Journal of Economic Perspectives*, 32 (1), 981 - 96.

Mishkin, F.S. (1982a),” Does anticipated monetary policy matter? Another look,” *Journal of Political Economy*, 90, 22 – 51.

----- (1982b), “Does anticipated aggregate demand policy matter? Further econometric results,” *American Economic Review*, 72, 788 – 802.

Modigliani, F. (1944) “Liquidity preference and the theory of interest and money,” *Econometrica*, 12, 45 – 88.

Moore, B.J. (1988), *Horizontalists and Verticalists: The Macroeconomics of Credit Money*, Cambridge: Cambridge University Press.

Nordhaus, W.D. (1975), “The political business cycle,” *Review of Economic Studies*, 42 (2), 169 – 190.

Palley, T.I. (2017-18), “A Theory of Economic Policy Lock-in and Lock-out via Hysteresis: Rethinking Economists’ Approach to Economic Policy,” *Economics: The Open-Access, Open-Assessment E-Journal*, 11, 1 – 18.

----- (2012), “The Economics of the Phillips Curve: Formation of Inflation Expectations versus Incorporation of Inflation Expectations,” *Structural Change and Economic Dynamics*, 23 (3), 221 - 230.

----- (2010), “The Relative Permanent Income Theory of Consumption: A Synthetic Keynes-Duesenberry-Friedman Model,” *Review of Political Economy*, 1, 41 – 56.

----- (2009), “The Backward Bending Phillips Curve: Competing Micro-

foundations and the Role of Conflict,” *Investigacion Economica*, LXVII (20), October/December, 13 – 36.

----- (2003), “The Backward Bending Phillips Curve and the Minimum Unemployment rate of Inflation (MURI): Wage Adjustment with Opportunistic Firms,” *The Manchester School of Economic and Social Studies*, 71 (1), 35 – 50.

----- (1997), “Does Inflation Grease the Wheels of Adjustment? New Evidence from the U.S. Economy,” *International Review of Applied Economics*, 11, 387 - 398.

----- (1994), “Escalators and Elevators: A Phillips Curve for Keynesians,” *Scandinavian Journal of Economics*, 96 (1), 111 – 116.

----- (1993), “Uncertainty, Expectations, and the Future: if we don't know the Answers, what are the Questions?” *Journal of Post Keynesian Economics*, Fall, 1-20.

----- (1990), “A Theory of Downward Wage Rigidity: Job Commitment Costs, Replacement Costs, and Tacit Coordination,” *Journal of Post Keynesian Economics*, 12, 466 - 486.

Phelps, E.S. (1967), “Phillips curves, expectations of inflation and optimal unemployment over time,” *Economica*, 34, 254 – 281.

----- (1968), “Money Wage Dynamics and Labor Market Equilibrium,” *Journal of Political Economy*, 76, 678 – 711.

Rowthorn, R.E. (1977), “Conflict, Inflation, and Money,” *Cambridge Journal of Economics*, 1, 215 – 39.

Samuelson, P.A., and Solow, R.M. (1960), “Analytical Aspects of Anti-inflation Policy,” *American Economic Review*, 50, 177 – 194.

Sargent, T.J. (1983), “The ends of four big inflations,” in R.E. Hall (ed.), *Inflation*, Chicago: University of Chicago Press.

Staiger, D., Stock, J.H., and Watson, M.W. (1997), “The NAIRU, unemployment and monetary policy,” *Journal of Economic Perspectives*, 11 (1), 33 – 50.

Tobin, J. (1980), *Asset Accumulation and Economic Activity*, Chicago: Chicago University Press.

----- (1972), “Inflation and Unemployment,” *American Economic Review*, 62, 1 – 26, reprinted in *Essays in Economics: Volume 2*, New York: North-Holland, 1975, 33 – 60.

----- (1971a), “Phillips Curve Algebra,” in *Essays in Economics, Vol. 2*, Amsterdam: North Holland Press, 11 – 15.

----- (1971b), “The Wage-Price Mechanism,” in *Essays in Economics, Vol. 2*,
Amsterdam: North Holland Press, 17 – 32.

Woodford, M. (2003), *Interest and Prices: Foundations of a Theory of Monetary Policy*,
Princeton: Princeton University Press.

Impressum

Publisher: Hans-Böckler-Stiftung, Hans-Böckler-Straße 39, 40476 Düsseldorf, Germany

Contact: fmm@boeckler.de, www.fmm-macro.net

FMM Working Paper is an online publication series available at:

https://www.boeckler.de/imk_108537.htm

ISSN: 2512-8655

The views expressed in this paper do not necessarily reflect those of the IMK or the Hans-Böckler-Foundation.

All rights reserved. Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.