Phillips curves, behavioral economics and post-Keynesian macroeconomics

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Abstract

Post-Keynesians have questioned the relevance of behavioral economics on methodological grounds, citing the predominant focus of the behavioral literature on possible deviations of individual behavior from extreme standards of perfect optimization. The very limited influence of behavioral economics on post-Keynesian economics is unfortunate, however: it would a serious mistake to ignore the insights and empirical evidence from behavioral economics. The influence of norms of fairness on wage formation and inflation is used to illustrate this argument.

Key words: distributional conflict,.inflation, wage norms, wage stickiness, path dependence, methodology

JEL numbers: E12, E31, E71

1 Introduction

Having noted the limited impact of behavioral economics on the Post Keynesian literature, Jefferson and King (2010-11), identify two obstacles to engagement between post-Keynesians and behavioral economics: a tendency among some post-Keynesians to "rely excessively on key authorities, such as Keynes and Kalecki, and on established texts" and, more importantly, "the close association between some forms of behavioral economics and mainstream analysis", including an emphasis on constrained optimization (p. 229). Thus, from a post-Keynesian perspective, the interesting strands of behavioral economics are to be found mainly in the 'old behavioral economics' which is seen as less focused on optimization. But even this school, they argue, may not have adequately "recognized or prioritized uncertainty" in its analysis (p. 230). Overall, they suggest, there is "scope for successful engagement between behavioral and Post Keynesian economics if it is based on explicitly stated common ground, defined in terms of methodology" (abstract, p. 211).

These reservations with respect to behavioral economics and its relevance for post-Keynesian economics appear to be widespread. They are echoed, for instance, in Lavoie's highly acclaimed text on post-Keynesian economics (Lavoie

2014, 30(2), 2021 pp. 409-444.) which discusses microeconomic behavior in some detail. Like Jefferson and King, Lavoie emphasizes methodological differences between post-Keynesians and behavioral economists, faulting 'new behavioral economics' for its failure to "go beyond the cognitive illusions view" and for merely documenting systematic deviations from an insane standard of perfect rationality (p. 86).[1] He notes that many behavioral economists see their findings as relatively minor refinements of orthodox theory, but points to greater affinity between post-Keynesians and 'old behavioral economics', as exemplified by Herbert Simon.

It is undoubtedly correct that many contributors to behavioral economics view their work as providing refinements to traditional models of optimization. Moreover, the use that has been made so far of behavioral economics in macroeconomic theory has been disappointing, often amounting to the addition of a few behavioral elements to models that are otherwise quite orthodox. The obvious example is DSGE models, where behavioral elements have been introduced to overcome striking empirical failures. The introduction of habit formation and 'hand-to-mouth' households, for instance, have been used to improve the fit of the consumption part of the models while retaining the centrality of optimizing representative agents.

One may also have reservations with respect to the (rather limited) literature on behavioral macroeconomics that attempts a more drastic break with orthodoxy. But these reservations, I shall argue, do not render irrelevant the findings of behavioral economics for attempts to develop convincing alternatives to the prevailing orthodoxy. Nor does the importance of behavioral findings depend on whether behavioral economists themselves claim adherence to mainstream or post-Keynesian paradigms (or as may sometimes be the case, feel agnostic about the broader implications of their findings).

All macroeconomic models contain relations that describe the aggregate outcomes of the behavior of numerous decision makers. The decisions are made within a structural and institutional setting, but it would be a serious mistake to ignore evidence about systematic behavioral patterns at the microeconomic level. The findings of behavioral economics can and should be used to mount a strong critique of mainstream theories but also, more importantly, as inputs in the further development and strengthening of post-Keynesian theory.

This essay uses wage formation as the main example to illustrate the argument. Section 2 outlines the dominant post-Keynesian positions on wage setting and inflation before turning to behavioral contributions that complement and, in some cases, question these positions. Section 3 discusses post-Keynesian uses of old behavioral economics. Section 4 offers a few concluding comments.

[1] Other prominent surveys by Hein (2014) and Blecker and Setterfield (2019) devote less attention to microeconomic behavior and make no reference to behavioral economics.

2 Inflation and Phillips curves

2.1 Post-Keynesian positions

Distributional conflict is the recurrent theme in post-Keynesian writings on inflation. Workers have wage targets, while firms have profit targets that translate into implied targets for real wages. If the targets are mutually inconsistent, the result is inflation: workers demand and get nominal wage increases, and firms respond by raising prices. Post-Keynesian texts, including Hein (2014), Lavoie (2014) and Blecker and Setterfield (2019), present variations of this model.

Simple versions of the model treat the targets as exogenous and, abstracting from technical change and assuming constant labor productivity, equations (1)-(2) represent a typical specification of wage and price inflation:

$$\hat{w} = \alpha(\omega_w - \omega) \tag{1}$$

$$\pi = \hat{p} = \beta(\omega - \omega_f) \tag{2}$$

where ω, ω_w and ω_f denote the actual real wage and workers' and firms' target real wage, respectively; w, p and π are the money wage, price and rate of price inflation, and a 'hat' over a variable denotes proportional growth rate.

Equations (1)-(2) imply that the real wage follows a differential equation,

$$\hat{\omega} = \hat{w} - \pi = \alpha(\omega_w - \omega) - \beta(\omega - \omega_f) = \alpha\omega_w + \beta\omega_f - (\alpha + \beta)\omega$$

This dynamic equation for the real wage has a unique, stable stationary solution,

$$\omega \to \omega^* = \frac{\alpha\omega_w + \beta\omega_f}{\alpha + \beta} \tag{3}$$

Substituting this solution into equation (2), the inflation rate also converges to a stationary value:

$$\pi \to \pi^* = \frac{\alpha\beta}{\alpha + \beta}(\omega_w - \omega_f) \tag{4}$$

Long-run inflation is the consequence of distributional conflict, with the inflation rate determined by the difference between the two wage targets (a difference often referred to as the aspiration gap).

The model can be modified by introducing a constant rate of labor saving technical change. Specifying targets in terms of the share (rather than the wage rate), this version generates convergence to a stationary solution for the wage share.

Another straightforward extension of the basic model allows a dependence of the wage targets on current conditions in the labor and goods market. Thus, it seems likely that workers' target will be increasing in the employment rate, while firms' target may depend on the utilization rate of capital. If employment and utilization evolve endogenously over time, the dynamics of the system can become complicated. But stationary solutions still satisfy equations (3)-(4), the only difference being that the two targets now depend on the stationary values of employment and utilization.

Conflicting claims – modeled as wage setting and price setting equations along the lines of (1)-(2) – are perfectly consistent with mainstream macroeconomics. Indeed, Blanchard's (2021) text on intermediate macroeconomics uses this framework in its analysis of inflation and Phillips curves, focusing on the limiting case where firms achieve their target (corresponding to $\beta \to \infty$). Crucially, however, Blanchard adds inflation expectations as an influence on wage formation; from the perspective of mainstream theory, expected price inflation influence wage inflation, while expected wage inflation may influence price inflation. Formally,

$$\hat{w} = \alpha_0(\omega_w - \omega) + \alpha_1\pi^e \tag{5}$$

$$\pi = \beta_0(\omega - \omega_f) + \beta_1\hat{w}^e \tag{6}$$

The equations have been cast here in terms of inflation expectations, but the analysis and conclusions are unchanged if it is 'experienced inflation' or formal indexation rather than expected inflation that enters the equations.

Post-Keynesian models have considered this extension with the conditions that $\alpha_1 \leq 1, \beta_1 \leq 1$ and $\alpha_1\beta_1 < 1$. These parameter restrictions ensure that the model still produces a finite stationary inflation rate, even when the aspiration gap is positive (when workers' target wage exceeds firms' target):

$$\omega^* = \frac{\alpha_0(1-\beta_1)}{\alpha_0(1-\beta_1)+\beta_0(1-\alpha_1)}\omega_w + \frac{\beta_0(1-\alpha_1)}{\alpha_0(1-\beta_1)+\beta_0(1-\alpha_1)}\omega_f \tag{7}$$

$$\pi^* = \frac{\alpha_0\beta_0}{\alpha_0(1-\beta_1)+\beta_0(1-\alpha_1)}(\omega_w - \omega_f) \tag{8}$$

If $\alpha_1 = \beta_1 = 1$ and $\omega_w > \omega_f$, however, there are no stationary solutions: the numerator on the right hand side of equation (8) is positive, while the denominator equals zero. Putting it differently, if workers' wage target is an increasing function of the employment rate and firms' target is constant, the model produces a 'natural rate of unemployment'.[2] The employment rate, which influences workers' wage target, has to adjust so as to eliminate the aspiration gap. The post-Keynesian parameter restrictions exclude this mainstream implication of the model.

Some post-Keynesian models go further, imposing conditions on the shape of the relation between the employment rate of workers' wage target. Thus, it is often assumed that the function describing workers' target real wage has a flat segment

$$\omega_w = f(e);\ f' = 0 \text{ for } e_1 < e < e_2; \quad f'(e) > e \text{ for } 0 < e_1 \text{ or } e > e_2$$

If firms' target is constant, this restriction on the relation between employment and wage targets implies that the price Phillips curve will also have a flat segment: variations in employment between e_1 and e_2 leave the inflation

[2] A dependence of firms' target on the utilization rate will be irrelevant for the stationary solution if stationarity is associated with an exogenous 'normal rate of utilization'.

rate unchanged. In support of a flat segment, it is argued that coordinated wage bargaining makes workers' target wage rate insensitive to variations in the employment, while constant markups and labor productivity ensure that there will be no pressure on prices from variations in utilization rates within a wide interval [3]

Most Post-Keynesian discussions of inflation and Phillips curves, finally, include broader comments and observations: labor market institutions and norms of fairness are seen as having a strong influence on wage targets, and the degree of distributional conflict and the aspiration gap may be path dependent. Lavoie's analysis of inflation, for instance, concludes by the summary statement that

> In the post-Keynesian view of inflation, price inflation is explained mainly by historical and cultural features, tied to the size and strength of the aspiration gap, which itself may have been affected by the past evolution of aggregate demand" (Lavoie 2014, p. 573).

2.2 Behavioral economics, wage setting and fairness norms

George Akerlof has addressed the implications of a behavioral approach for several macroeconomically important issues, including wage setting and unemployment. His analysis has mainly focused on wage norms and the observation that workers react to wages that are seen as unfair. If workers are unionized, the obvious reaction – demanding an increase – may be backed by threats of collective action, including strikes or work to rule campaigns. Non-unionized workers do not have the same options, but unfair treatment still has consequences for the firm; increased labor turnover can raise hiring and training costs, while lower levels of effort can reduce productivity and affect the quality of output.[4]

Akerlof and Yellen (1990) formalized this argument and also provided evidence from different fields, including psychology, sociology and personnel management, in support of the underlying mechanism. Their formal model shows that if firms have to pay fair wages, the result can be unemployment. The mathematical model, however, was essentially like any other efficiency wage model of unemployment. If wages influence effort, labor market equilibrium may be associated with unemployment: there are unemployed, qualified workers who would want to work at the prevailing wage.[5]

Post-Keynesians could point out, correctly, that although fairness-based unemployment is involuntary from the perspective of individual workers, it has nothing to do with aggregate demand deficiencies and Keynesian involuntary

[3] The argument is outlined briefly in Hein (2014) and Lavoie (2014) and in greater detail in other contributions, e.g. Hein (2002) and Kriesler and Lavoie (2007).

[4] Behavioral, experimental and econometric studies support workers' willingness to punish firms for unfair treatment, even if the punishment is costly to themselves (e.g. Fehr and Gachter 2000).

[5] An extension of the model with heterogenous workers generated more interesting conclusions: if fairness is defined over relative wages, groups with low wages also tend to experience high rates of involuntary unemployment.

unemployment. They can also object that wages are set in nominal terms and that expected price inflation may affect wage inflation less than one-for-one. Furthermore, neither the importance of fairness in wage setting nor the role of relative-wage norms is new. In the *General Theory*, Keynes had identified relative-wage concerns as a source of nominal wage stickiness (a stickiness that should be welcomed because without it the economic system was likely to become violently unstable), and post-Keynesians have themselves discussed fairness as an important factor in wage determination.

These objections have merit, but Keynes's narrow and sketchy discussion of how relative-wage concerns can lead to nominal wage stickiness clearly does not exhaust the issue. It also leaves unanswered questions. What is so special about a fall in nominal wages? If workers were to expect a ten percent rise in the general wage level, it would seem that a relative-wage concern should lead them to reject wage offers below ten percent; there would be stickiness of nominal wage inflation, not nominal wages. The behavioral literature, moreover, suggests that although Keynes was right about the negative effects of wage cuts on worker morale and productivity, the main source of stickiness may be slightly different. In a survey of business people, labor leaders, business consultants and counselors of unemployed people, Bewley (1998) finds that workers' own previous money wage represents an important reference point for perceived fairness, with cuts in money wages therefore having adverse effects on morale and productivity.

Bewley's finding is supported by other behavioral evidence. Citing research from cognitive psychology, Shafir et al. (1997) report that when evaluating options, decision makers often entertain multiple representations contemporaneously and that framing effects (the choice of representation) can affect the decision. When this happens, decisions reflect a mixture of the assessments associated with the different representations, the relative salience of the representations determining their weights in this mixture. Applying these findings of framing effects and multiple representations to economics, decision makers, they argue, are influenced by both nominal and real variables. Nominal assessments, which are much simpler, become more salient and are weighted more heavily when inflation is low; high inflation rates, conversely, tilt decision makers toward real assessments.

A behavioral explanation of nominal wage stickiness follows if this perspective is combined with the well-documented presence of loss aversion (people perceiving losses relative to a reference point as more severe than equivalent gains relative to the reference point).[6] Akerlof et al. (1996) show how downward money wage stickiness (not surprisingly) generates a downward-sloping long-run Phillips curve. More surprising, perhaps, the behavioral findings can lead to more complex outcomes.

Nominal representations are salient when inflation is low but lose salience when inflation rates are high. One would therefore expect nominal representations to dominate wage setting when inflation is low, while real representations

[6] Loss aversion is also used as the key element in McDonald (2021)'s analysis of Keynesian unemployment.

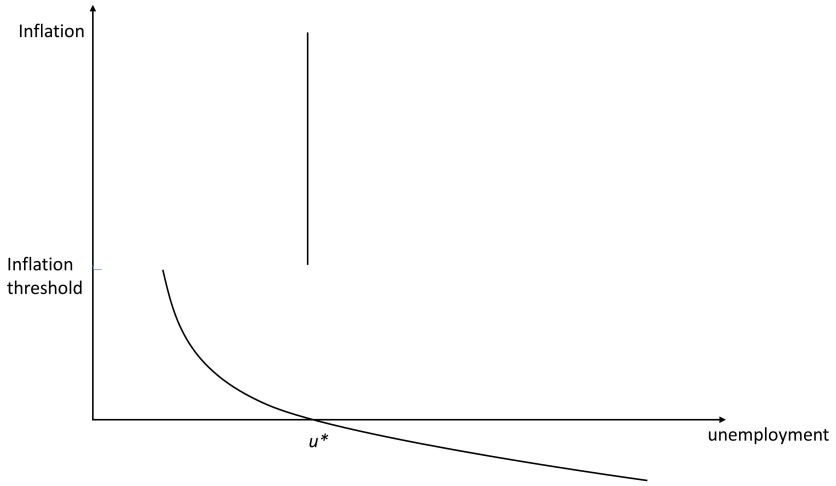

Figure 1: Long-run Phillips curve in the Rowthorn model

dominate for high inflation. The shift in relative salience of the two representations implies that the long-run Phillips curve may be neither vertical (as suggested by the natural rate hypothesis) nor monotonically downward-sloping (as suggested by Akerlof et al. 1996).

His terminology was different, but Rowthorn (1977) anticipated this more complicated outcome. There may be an inflation threshold, he argued, above which wage setters rely on real representations; below the threshold, by contrast, they ignore inflation. As a result, the long-run Phillips curve may have a vertical segment at a 'natural unemployment rate' at which inflation can take any value above the threshold. For inflation rates below the threshold, by contrast, the curve becomes downward sloping, with a minimum sustainable unemployment rate that is below the natural rate (see figure 1).[7]

Moving beyond the question of wage stickiness, the role of fairness norms in wage setting invites other observations. Although predetermined in the short run, norms evolve over time. Persistent violations of a norm gradually undermine its power, while an outcome that have been sustained for prolonged periods can gain the status of a social norm. In the words of Hicks (1975, p. 65), if a system of wages is well established, it "has the sanction of custom. It then becomes what is expected; and (admittedly on a low level of fairness) what is expected is fair". Other economists have made similar comments about dependent wage norms, but it is reassuring to see these insights confirmed by more systematic

[7] Seemingly unfamiliar with Rowthorn's paper, Akerlof et al. (2020) present a model with the same key assumption and implications. Behavioral evidence, they argue, suggests that "when inflation is low, a significant number of people may ignore inflation when setting wages and prices" (p. 3).

findings in the psychological and behavioral literature (e.g. Kahneman et al. 1986).

As a simple formalization, assume that workers' target real wage is linear in the employment rate

$$\omega_w = a + be \tag{9}$$

The gradual adjustment of norms towards outcomes can be captured in a simple way by letting the term a change in response to deviations of actual from fair wages,

$$\dot{a} = \mu(\omega - \omega_w) \tag{10}$$

The dynamics of the nominal wage is still given by equation (5) and, for simplicity, inflation expectations are adaptive,

$$\dot{\pi}^e = \lambda(\pi - \pi^e) \tag{11}$$

Keeping it simple, the markup is taken to be constant, and the real wage equals firms' target:

$$\omega = \omega_f = \bar{\omega}_f \tag{12}$$

Hence,

$$\pi = \hat{w} \tag{13}$$

Using equations (5) and (9)-(13), we have

$$\dot{a} = \mu(\omega_f - a - be) \tag{14}$$

$$\dot{\pi}^e = \lambda(1 - \alpha_1)\pi^e + \lambda\alpha_0(a + be - \omega_f) \tag{15}$$

In the 'post-Keynesian case' with $\alpha_1 < 1$, the dynamic system (14)-(15) has a unique, stable stationary solution for any given value of the employment rate:

$$a^* = w_f - be \tag{16}$$

$$\pi^* = \pi^{e\,*} = 0 \tag{17}$$

Equation (17) shows that in this version of the conflicting claims theory, the long-run Phillips curve becomes horizontal, and not only that: the inflation rate converges to zero for any rate of employment.

Matters are qualitatively different if $\alpha_1 = 1$. Equation (14) is unaffected, but equation (15) simplifies, and the change in expected inflation becomes proportional to the change in workers' wage aspirations as described by the value of a. Formally, using equations (5), (9)-(11) and (14)), we have

$$\dot{\pi}^e = \lambda\alpha_0(a + be - \omega_f) = -\frac{\lambda\alpha_0}{\mu}\dot{a} \tag{18}$$

Both a and π^e now become stationary if $a = \omega_f - be$. The model still produces convergence to a stationary point, and the expression for a^* is unchanged. The stationary value of a depends on the employment rate, and this dependence

now carries over to inflation. A change Δe in the employment rate induces a long-run change in a ($\Delta a^* = -b\Delta e$) and, using equation (18), it follows that

$$\Delta\pi^* = \Delta\pi^{e*} = -\frac{\lambda\alpha_0}{\mu}\Delta a^* = \frac{\lambda\alpha_0 b}{\mu}\Delta e \tag{19}$$

Equation (19) produces neither the post-Keynesian result (associated with $\alpha_1 < 1$ and $\mu > 0$) nor a mainstream natural rate of unemployment (associated with $\alpha_1 = 1$ and $\mu = 0$). A permanent increase in aggregate demand and employment raises the long-run inflation rate but by a finite amount. In the absence of stochastic shocks, this particular specification produces a stable, downward-sloping, linear Phillips curve.

Equations (14)-(15) also imply the presence of inflation hysteresis: a positive shock to the initial values of the state variables a or π^e will have no effect on the stationary solution for a, but the stationary solution for π^e (and therefore also the stationary solution for actual inflation π) will increase. If policy makers pursue a fixed inflation target, the positive shock will be offset by contractionary policy and a decline in the stationary solution for the employment rate; inflation hysteresis will be transformed into employment hysteresis; Skott (2005, 2023 chapter 6) analyzes these issues in greater detail.[8]

2.3 Discussion

There are clear similarities between the post-Keynesian view outlined in section 2.1 and the behavioral story in section 2.2. In both cases, the story is one of conflicting claims; there is an emphasis on social norms and conventions; the natural rate hypothesis is rejected.

But there are also differences. The post-Keynesian analysis, first, imposes conditions on the pass-through from past to current inflation, rejecting not only propositions of a well-defined natural rate of unemployment, but also ruling out the possibility that the long-run Phillips curve may become vertical at high inflation rates. Is it reasonable to impose these post-Keynesian parameter restrictions on the rate of pass through? If inflation has been running at 100 percent and is expected to continue doing so, workers will experience significant erosions of their real wage, even if α_1 is close to one. The behavioral plausibility of imposing $\alpha_1 < 1$ in equation (5) becomes questionable, it would seem, at least when inflation rates are high.[9] This intuitive argument finds support in

[8] The Akerlof and Yellen model of fair wages missed this implication, but their contribution set the stage for extensions that incorporate the path dependence of social norms, including wage norms. In their model model with heterogenous labor path dependent norms produce relative-wage hysteresis, an implication that becomes particularly interesting in light of the large increase in earnings inequality that occurred in many OECD countries from the late 1970s.

[9] Blecker and Setterfield (2019, p. 219-220) note that the rate of pass-through may depend on the speed of inflation. Their formulation avoids vertical Phillips curve by assuming the absence of any feedback effects from wage inflation to price inflation: firms adjust prices without taking into account expected wage increases, an assumption that seems behaviorably questionable.

behavioral evidence on multiple representations and the dominance of the ones that are salient.

Rowthorn's anticipation of this argument could perhaps be seen as an indication that behavioral economics has added nothing new. I think such a conclusion would be incorrect. Rowthorn's paper has become influential primarily because of its focus on distributional conflict as the source of inflation; his suggestions about the influence of inflation on wage setting have received far less attention. Post-Keynesian inclinations have been to reject the presence of vertical segments of the Phillips curve (thereby diminishing the significance of Rowthorn's distinction between states of high and low inflation), while mainstream economists have insisted on the 'rationality' of decision makers and the validity of the natural rate hypothesis. Both groups need strong arguments to give up these prior presumptions, and Rowthorn's brief, intuitive comments had little effect on subsequent post-Keynesian or orthodox expositions. Many hypotheses are hard to dismiss out of hand, and behavioral evidence is essential to decide which ones deserve to be taken seriously. The behavioral findings, it turns out, imply that the Rowthorn hypothesis does have support.[10]

Second, post-Keynesians posit the presence of a range of employment and utilization rates within which inflation remains constant. This conclusion may be attractive – if it holds, demand policy can be used to influence output and employment without having to worry about inflationary effects. But the behavioral plausibility of the assumption is not obvious. Had there been compelling econometric evidence for Phillips curves with a flat segment and positive slopes above and below this segment, one could reasonably use this as a benchmark assumption. This is not the case, however. Some empirical studies of the Phillips curve, including Eisner (2003), have suggested that the shape of the Phillips curve may be concave (rather than convex), and I know of one study that finds a flat segment in estimates of the Phillips curve for the US (Filardo 1998). Most studies, however, find convex wage Phillips curves and linear or convex price Phillips curves. The interwar evidence and the missing disinflation in the aftermath of the financial crisis in 2008 offer striking illustrations of the insensitivity of inflation to variations in unemployment in depressed economies, and examples of strong inflation effects of changes in employment within a normal range are legion.

As indicated above, finally, post-Keynesian discussions of inflation often make reference to conventions and norms of fairness, including suggestions that norms and conventions change endogenously. The above formalization of endogenous adjustments is simple and has intuitive appeal as well as evidence to support the basic mechanism. But it may be too simple, and other intuitive mechanisms can produce very different outcomes. As an example, Skott (2005, 2023, chapter 6) discusses the sensitivity to changes in functional forms, but one can also point to a more fundamental tension within a post-Keynesian conflicting-claims approach to inflation.

[10] Speaking for myself, I became familiar with Rowthorn's paper shortly after its publication but, while not finding the assumptions implausible, failed to be persuaded that the basic hypothesis behind the Phillips curve in figure 1 had empirical support.

Kalecki (1943) pointed to the way in which prolonged periods of near full employment can erode discipline in the factories. This cumulative effect of high employment is plausible but has effects that are completely opposite to those associated with the adjustment of norms towards outcomes. Kalecki's argument implies that distributional conflict will intensify gradually if employment is kept high; path dependent norms and conventions suggest that the initial effect of a rise in employment is to raise the aspiration gap but that distributional conflict gradually subsides as norms adjust. It is easy to set up formal models that include both mechanisms – after all, many models imply that changes in a variable can have several, potentially offsetting effects. One mechanism could be deemed as invariably dominant or the mechanisms may operate with different adjustment speeds; or the question can be left open with a general suggestion that one mechanism may dominate in some historical contexts, the other when circumstances are different.

The point here is not to make claims about the relative weight and importance of the two mechanisms. We shall probably never achieve full and definite answers to that question. But it would be desirable to go beyond general statements about the dependence of the degree of conflict and the rate if inflation on historical, cultural and institutional features.

Howell et al. (2007) have provided an insightful analysis of the misleading claims about the employment-generating virtues of deregulating the labor market. But the absence in their study of clear and definite patterns in the relation between labor market institutions and economic performance does not suggest that institutions are unimportant or that we should not examine the effects of different institutional settings on wage and price setting. Likewise, perfect optimization and rational expectations can be rejected as a description of microeconomic behavior without dismissing the relevance of contemporary insights into microeconomic behavior and the way it deviates systematically from optimization. Behavioral evidence from psychology, sociology and behavioral economics can help identify and untangle macroeconomically relevant behavioral assumptions.

Theory has policy implications, and the issues are important. Post-Keynesians recognize the great damage that has been done by macroeconomic policies based on a belief in the natural rate hypothesis, austerity policy in Europe being a prime example. But as noted by Rowthorn (1977, p. 229), it appears that many countries were "pushed over the expectations threshold" in the late 1960s and 1970s, leading to "an economic crisis characterised by a combination of high unemployment and fast inflation". Policy based on a belief that aggregate demand can always be expanded without inflationary consequences clearly can also have costly consequences.

3 Old behavioral theory and post-Keynesian theory

While dismissive of new behavioral economics, post-Keynesians have expressed greater interest in, and affinity with, older strands of behavioral economics. Often, however, the lessons that post-Keynesians draw from this literature stay at a general level. As an example, consider the listing in Lavoie (2014, p. 91) of procedures suggested by Keynes and Simon for decision making under conditions of uncertainty.

The first procedure states that "when a satisfactory solution has been reached, stop searching". Elaborating on this procedure, Lavoie explains that the decision maker "sets aspiration levels that allow him to distinguish between what is acceptable and what is not", thereby avoiding the problem of ranking all possibilities. This is fine, but for the procedure to become operational we need to know what constitutes a satisfactory solution. Presumably, the range of satisfactory outcomes depends on circumstances – the range of satisfactory consumption decisions, for instance, may depend on past, present and expected future income. Without some detail on how the satisfactory range is determined, the procedure tells us very little. Depending on the determination of the range, it may even generate outcomes that are quite similar to those derived from constrained optimization.

The second procedure says "take the present and the recent past as guides for the future". This rule may seem more operational. But when decision makers take the present and recent past as guides, what do they look at? Do wage setters assume that future price *levels* will be like some average of current and recent price levels, or do they believe that current and recent *inflation* rates will persist? Or are they perhaps guided by a some other simple economic model of the determination of inflation by present and recent variables? These different hypotheses are consistent with the procedure but have radically different implications for wage formation and the Phillips curve.

Similar questions can be asked with respect to all eight procedures on Lavoie's list. The procedures seem plausible but don't tell us much beyond the fact that decision makers do not operate as envisaged by models with perfect optimization and rational expectations. The lack of detail does not invalidate the procedures. In fact, they are presented by Lavoie as describing decision "on a general plane" with specific procedures pertaining to different areas like firms' payback periods for investment and households routine consumption decisions.

Addressing consumption decisions, Lavoie devotes considerable space to 'post-Keynesian theory of consumer choice'. The discussion focuses mainly on lexicographic preferences and their implications for the substitutability between goods. Lexicographic preferences are well-defined, complete, reflexive and transitive, and therefore perfectly compatible with mainstream microeconomic theory.[11] More importantly, the specification of preferences over the composition

[11] Lavoie's illustration on pp. 109-114 of the implications of lexicographic preferences for ecological economics points to limitations of marginal analysis: it may give misleading con-

consumption at a point in time says nothing about the macroeconomically important, intertemporal consumption and saving decisions, decisions that new behavioral economics have helped shed light on.

Satisficing, conventions and rules of thumb "reflect the rationality of reasonable agents" and have "microeconomic foundations that are more solid, from a realist point of view, than those of the standard mainstream models" (Lavoie 2014, p. 95). But without the study of decision making by individual agents, how will we ever be able to say anything more precise about the influence of conventions and the determination of the range of satisfactory outcomes? An emphasis on procedural rationality makes the detailed examination of actual behavior even more pressing for post-Keynesians than for economists who assume exogenously given preferences and perfect rationality. To be clear, the need for studies of individual behavior obviously does not deny the crucial importance of structural and institutional forces; studies of individual behavior are necessary but by no means sufficient.

4 Conclusion

Most 'new behavioral economists' may see themselves as quite mainstream. But researchers sometimes interpret their own research findings in one way while their readers see them quite differently. A behavioral economist may view behavioral economics as merely providing minor refinements of traditional microeconomic theory, but why accept this assessment?

Evidence on the role of fairness norms, framing effects and loss aversion in wage setting undermines the natural rate hypothesis, while present bias and other behavioral findings pull the rug from under macroeconomic saving and consumption theories that are based on microeconomic assumptions of intertemporal optimization. Had the assessment been correct, furthermore, would that have made it sensible for economists who want to base their theories on realistic assumptions to dismiss the behavioral evidence? Whatever their methodology, vision, or political leanings of the researchers, behavioral economics may produce information and research that can be extremely useful. Clearly, not all behavioral results are equally convincing, interesting or useful from the perspective of post-Keynesian macroeconomics. But dismissing the possibility of engaging with – and learning from – researchers who may come from a different school of thought can only, it seems to me, hurt the post-Keynesian tradition.

The questionable use of behavioral evidence to patch up models with untenable core assumptions does not justify a wholesale rejection of behavioral economics. We can and should be dismissive of the way in which mainstream macroeconomists have introduced behavioral modifications in DSGE models, but that should not make us overlook the importance of behavioral evidence.[12]

clusions if the change that is being contemplated is not marginal. Lexicographic preferences represent an extreme case in which errors remain, even if the size of the change approaches zero.

[12] As Fung (2010-11, p. 247) observes,

Post-Keynesian models – like all macroeconomic models – contain behavioral relations that describe the aggregate outcomes of the behavior of individual decision makers. In the formulation of these relations, whether they are stated verbally or formalized mathematically, it should be recognized that individual behavior is shaped by a social context and subject to structural constraints. It would be a serious mistake, however, to ignore the insights and empirical evidence from behavioral economics, old and new, even if some contributors to this literature see their research as falling within the orthodox economic paradigm.

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the findings and tools of behavioral economics are resources that can be put to either productive or unproductive use. Post Keynesians may dislike the unproductive use to which neoclassical economists have put these resources, but they have only themselves to blame if they do not show in their own work how these resources can be put to productive use.

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