A Belated Reply to Janet Yellen’s 1980 Critique of Post-Keynesian Economics

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Abstract: Thirty years before Janet Yellen became Chair of the U.S. Federal Reserve, she wrote a blistering polemic entitled “On Keynesian Economics and the Economics of the Post-Keynesians” (1980). Ms Yellen criticized the Post-Keynesian theory of output and income distribution, vigorously defended the neoclassical synthesis, and extolled the virtues of the “standard Keynesian IS-LM model.” In this belated reply, I respond to Yellen’s criticisms of Post-Keynesian economics, expose some flaws in her own distinctive version of the IS-LM model, and outline a few implications of Ms Yellen’s ironic epiphany, “A Minsky Meltdown: Lessons for Central Bankers” (2009), for contemporary debates in macroeconomics.

Keywords: Janet Yellen, Hyman Minsky, Neoclassical Synthesis, IS-LM, Post Keynesian

JEL classifications: B22, B50, E12
1. Introduction

Janet L. Yellen, Chair of the U.S. Federal Reserve, has a distinguished record of publication, which includes many influential papers on subjects ranging from labour economics to monetary policy.¹ One paper of interest is Yellen’s polemic, “On Keynesian Economics and the Economics of the Post-Keynesians” (1980). The title of the paper is an allusion to Axel Leijonhufvud’s book, *On Keynesian Economics and The Economics of Keynes* (1968). But whereas Leijonhufvud was trying to rescue Keynes from the clutches of the “neoclassical synthesizers,” Yellen’s aim was to defend this same neoclassical synthesis and “the standard Keynesian IS-LM macro-economic model” against criticisms advanced by Post Keynesians such as Paul Davidson, Sidney Weintraub, G.C. Harcourt, and Jan Kregel (Yellen 1980, p. 15).² At the conclusion of her caustic review, Ms Yellen proclaims, “there’s nothing in the amended Post-Keynesian model to deprive [the neoclassical] synthesis of its validity, however much they [Post Keynesians] despise it” (p. 19).

Yellen’s article is worth revisiting not only because she now rules the monetary roost, but also because her paper is one of the few neoclassical engagements with Post-Keynesian economics since the “Cambridge Controversies” of the 1950s and 60s (Harcourt 1972). Although these controversies no longer command the attention they once did, several issues raised in Yellen’s paper are still current. The IS-LM model she commended in 1980 is still widely used as a pedagogical devise, continues to fascinate macroeconomists (see De Vroey and Hoover 2005; and Young and Zilberfarb 2000), and has been redeployed by Paul Krugman (2014a) to explain why monetary policy is ineffective at the “zero lower bound,” and why the U.S. Federal Reserve’s program of
quantitative easing has not produced the high inflation predicted by some of its critics. Yellen’s polemic also provides a revealing vantage point from which to appreciate her timely embrace of the iconic Post Keynesian, Hyman Minsky, during the recent financial crisis. In this belated reply, I respond to the main elements of Yellen’s critique of Post-Keynesian economics, expose some deficiencies in her unique formulation of the IS-LM model, and conclude with a brief coda on Ms Yellen’s ironic 2009 speech, “A Minsky Meltdown: Lessons for Central Bankers,” and its ramifications for contemporary debates between conventional and unconventional schools of thought.

2. YELLEN ON THE POST-KEYNESIAN THEORY OF OUTPUT AND INCOME DISTRIBUTION

To fix ideas, Yellen points out that, “just as in the IS-LM model, the Post-Keynesian model requires as a condition of short-run equilibrium that desired expenditures be equal to output, or equivalently, that savings equal investment” (p. 15). However, unlike the standard IS-LM model, which gives “alternative values of output and the interest rate consistent with equilibrium in the commodity market,” the Post-Keynesian model “gives alternative combinations of output and the real wage consistent with commodity market equilibrium” (p. 16). Taking investment as exogenous, and assuming the propensity to save out of wages is less than the propensity to save out of profits, Yellen writes,

\[ S_w \left( \frac{wN}{P} \right) + S_\pi \left( Y - \frac{wN}{P} \right) = I \]

where \( s_w \) and \( s_\pi \) denote saving out of wages and profits respectively, \( w \) and \( P \) denote the money wage and the price level, \( N \) and \( Y \) denote employment and real output, and \( I \) represents real investment.³ Yellen construes [1] as “the Post-Keynesian equivalent of
the IS curve” in the standard Keynesian IS-LM model. In her interpretation of the model, “an increase in the real wage raises aggregate demand and output,” so that “the Post-Keynesian IS curve relating $Y$ and $w/P$” is “upward sloping” as in figure 1 below (p. 16).

Figure 1 here

I think it’s fair to characterize Yellen’s account as a rather idiosyncratic depiction of Post-Keynesian Economics circa 1980. Ms Yellen starts off on the right foot, taking investment as exogenous and incorporating the different saving propensities out of wages and profits into equation [1]. Once in possession of these ideas, the Post-Keynesian notion that saving may adjust to investment through changes in the distribution of income is within easy grasp. Yet Ms Yellen does not grasp it. Instead, she envisions an economy in which investment, aggregate demand, and real wages all rise together (see figure 1), a vision that misrepresents both Post-Keynesian theory and the algebra of her own equation [1].

To begin with, it’s clear that in [1] above an increase in the real wage, taken by itself, will increase total wages, $\left(\frac{wN}{p}\right)$, while reducing total profits, $\left(Y - \frac{wN}{p}\right)$, by the same amount. Since $s_w < s_p$, an increase in the wage share at the expense of the profit share reduces aggregate saving, so that, all else remaining the same, an increase in the real
wage entails less saving and is therefore incompatible with a higher level of investment. If we now allow output to vary, then investment and the real wage can rise together, as in Ms Yellen’s account, provided that output less real wages, i.e., profits, increase by an amount that generates saving sufficient to offset the increased investment less any additional saving from the rise in real wages. In other words, equilibrium requires that

\[ s_\pi \Delta \left( Y - \frac{wN}{P} \right) = \Delta I - s_w \Delta \left( \frac{wN}{P} \right) \]

If the increase in output is less than the amount required by [2], then, retaining the assumption of fixed saving propensities, the price of wage goods must rise to maintain equilibrium in the commodity market.

To summarize, the extra saving required to offset an increase in investment may be generated by either an increase in output, or by a decrease in the real wage, or by some combination of the two. These possibilities are illustrated in table 1 below, which displays three consistent combinations of investment, output, and the real wage: a Baseline; a Yellen Scenario in which investment, output, and the real wage rise together; and a Post-Keynesian Scenario in which investment and output rise, while the real wage falls. In all scenarios, \( s_w = .05, s_\pi = 0.7, w = 10, \) and \( N = 20. \)

Table 1 here

The scenarios in table 1, as well as the more general formulation in [2] above, demonstrate that, Yellen’s claim to the contrary notwithstanding, the equilibrium
combinations of I, Y, and w/P do not all lie on an upward sloping curve as in figure 1 above.

Yellen turns next to an alternative formulation of the Post-Keynesian model in which I/Y replaces I as the exogenous variable. In equation [3] below, \( \alpha \) represents I/Y, and \( n \) denotes N/Y (the reciprocal of output per worker).

\[
[3] \quad \frac{w}{P} = \frac{s_\pi - \alpha}{n(s_\pi - s_w)}
\]

According to Yellen, “the IS curve in this case is horizontal,” i.e., the real wage remains constant as the ratio of investment to output rises (p. 16). Looking at [3], however, it’s obvious that, all else remaining the same, the real wage, w/P, falls as the ratio of investment to output, \( \alpha \), rises. The reason, of course, is that as the investment-to-output ratio rises, the ratio of saving-to-output must also rise, and given that \( s_w < s_\pi \), the profit share of output must rise as well.

Although the profit share must increase when the ratio of investment-to-output rises, the real wage may remain constant, as Yellen supposes, provided that labour productivity, 1/n, increases sufficiently. But this is, by no means, the only possibility. Yellen’s contrary claim notwithstanding, the real wage in [3] may rise, fall, or remain unchanged as the investment-to-output ratio increases.

We can now see what is missing from Yellen’s interpretation of Post-Keynesian economics circa 1980. Ms Yellen was preoccupied with the standard (Kahn-Keynes) income multiplier in which saving and investment are balanced by changes in total output and income, and she entirely missed the distinctive Post-Keynesian contribution in which
the price of consumption goods and the distribution of income adjust to bring saving into balance with investment even though this relationship is incorporated within Yellen’s own equations, [1] and [3].

After reaching the dubious conclusions summarized above, Ms. Yellen returns to equation [1], which, she now complains, is “incomplete” and “determines nothing at all, although some Post-Keynesian literature suggests otherwise” (p. 16). Yellen is willing to make an exception in the case of Nicholas Kaldor who closes his model by assuming that output is given. Yellen characterizes Kaldor’s model as a “flexible mark-up model” in which prices are a mark-up over “a fixed money wage rate,” and equilibrium is achieved “via price flexibility with output prices rising whenever aggregate demand exceeds Y and vice versa” (p. 16). Letting \( \Pi/Y \) stand for the profit share of national income, and \( I/Y \) for the investment share of total output, Yellen replicates Kaldor’s scheme in [4] below.

\[
[4] \quad \frac{\Pi}{Y} = \frac{I - s_w}{s_p - s_w}
\]

Although [4] captures the gist of Kaldor’s approach, Yellen’s interpretation does not. To begin with, she imagines that firms choose a level of output based on “the real wage they face” (p. 16). Ironically, this statement comes only a few sentences after Ms. Yellen has characterized Kaldor’s model as one in which “output is set exogenously at some level, \( Y = Y \)” (p. 16, my stress). Leaving this discrepancy aside, Yellen’s supposition that firms select a level of output “based on the real wage” is also inconsistent with her description of how Kaldor’s model works, viz. that “output prices [rise] whenever aggregate demand exceeds Y and vice versa.” Since the money wage
bargain is struck before output prices have adjusted to balance supply and demand, the real wage will only be determined after firms have chosen their level of output. Unless wage contracts are indexed to the future price of wage goods, the real wage cannot be determined in the labour market alone; it must be determined, at the end of the day, in the commodity market.

The second way of closing this model, Yellen continues, is to assume a fixed mark-up over unit labour costs. If m denotes the mark-up, w denotes the money wage, and n stands for N/Y, then prices are given by P = mwn, and the real wage by w/P = 1/mn. In this model, “firms’ pricing policies determine the real wage and [the] share of output accruing to workers and the multiplier determines the level of output as follows:"

\[
[5] \quad Y = I/[s_\pi - (s_\pi - s_w)/m]
\]

“The denominator of [5] is the economy’s average propensity to save and an increase in investment raises output by the standard income multiplier, while an increase in the mark-up lowers output and the real wage” (p. 17). This “is a consistent model,” Yellen allows, but, she quickly adds, if I/Y replaces I, “this small switch in assumption produces a model which, although widely discussed, is nevertheless inconsistent” (p. 17).

Does this “small switch” from I to I/Y really produce a model that is “inconsistent”? In fact, it does not. We know I/Y = S/Y, and we can divide Y into wages and profits, W and Π, respectively, and then multiply each by the appropriate saving propensity, s_w or s_\pi, which yields

\[
[6] \quad \frac{S}{Y} = s_w \frac{W}{Y} + s_\pi \frac{\Pi}{Y}
\]
Since the wage share, W/Y, equals the reciprocal of the mark-up, 1/m, and the profit share, Π/Y, equals 1-1/m, we can write

\[ I/Y = S/Y = S_\pi \left(1 - \frac{1}{m}\right) + S_w \frac{1}{m} \]

Equation [7] includes all the variables from Yellen’s equation [5], except that investment, I, has been replaced by the investment-to-output ratio, I/Y, Ms Yellen’s would-be troublemaker. Yet [7] is perfectly consistent. It says the ratios, I/Y and S/Y, are equal to the sum of saving out of the profit share, \( S_\pi \frac{\Pi}{Y} \), plus saving out of the wage share, \( S_w \frac{W}{Y} \).

Yellen mocks Post Keynesians who “are fond of stating” that, in Kaldor’s model, Π/Y is a function of I/Y, “regardless of how Y is determined” (p. 17). On the contrary, she objects, “this is clearly incorrect, for if the mark-up is fixed and the resulting real wage differs from that given by [3],” i.e.,

\[ \frac{W}{P} = \frac{s_\pi - \alpha}{n(s_\pi - s_w)} \]

“the model has no solution at all.” “This problem,” Yellen maintains, “is responsible for a great deal of confusion by Weintraub, Kregel, and others” (p. 17).

Actually it is Ms Yellen who is confused here. Is it not a violation of logic to characterize Kaldor’s model as “a flexible mark-up model,” and then object that, “if the mark-up is fixed and the resulting real wage differs from that given by [3], the model has no solution at all” (p. 17, my stress)? The point of Kaldor’s model, after all, is to show
how the price level and the distribution of income adjust to bring saving into equilibrium with investment when output is given. To complain that the model does not work if the mark-up is fixed is rather like complaining that competitive markets do not work if prices cannot adjust.

3. **Yellen’s “Standard Keynesian IS-LM Model”**

In addition to criticizing the Post-Keynesian model of “distributional effects and aggregate demand,” which we have just reviewed, Yellen also argued for the superiority of the “standard Keynesian IS-LM model.” I’ve tried to show that Ms Yellen’s criticisms often fail to make contact with Post-Keynesian economics circa 1980, and that several of her conclusions do not follow from her premises. Let’s now take a critical look at Yellen’s preferred alternative, a rather unique version of IS-LM.

Although graphical representations of the IS-LM model typically display the interest rate on the vertical axis and output on the horizontal axis, Yellen replaces the rate of interest with the real wage on the vertical axis, while output remains on the horizontal axis (see figure 1 above). In Ms Yellen’s version of the “standard Keynesian IS-LM model,” the IS curve slopes downward, the real wage falling as the marginal product of labour diminishes. Although few economists express much enthusiasm for the standard IS-LM model, Ms Yellen’s version is even less appealing. It is built on assumptions that are not only questionable in their own right, but also inconsistent with one another. Yellen implicitly assumes that a market economy typically operates at less than full employment. Yet this implicit Keynesian premise is hard to square with the following two explicit classical premises Ms Yellen adopts, i.e., “perfect competition” and
continuously” clearing markets (p. 18). Given these two premises, it’s hard to understand why there would be idle resources lying about. On the other hand, if this ill-fitting combination of perfect competition, continuously clearing markets, and unemployment is hard to swallow, the alternative is no more appetizing. If the assumptions of perfect competition and continuously clearing markets are retained, then to accommodate an increase in output, we must assume that the economy’s production possibility curve shifts outward whenever firms decide to increase their investment spending, otherwise investment and output cannot rise together. It is difficult to find either logical coherence or empirical relevance in these assumptions.

In Yellen’s version of the IS-LM model, “the supply of output and demand for labour are inversely related to the real wage” (p. 17), which declines as the marginal product of labour diminishes. Although this line reasoning is familiar, it’s hardly Keynesian. On the contrary, it belongs to the classical theory from which Keynes “struggled to escape”! If demand remains unchanged as the real wage falls, then firms will no doubt find it profitable to expand employment and output. But Keynes devoted many pages of the General Theory to explaining why neither prices nor sales revenue will remain constant as wages fall (Keynes 1936), and Ms Yellen had apparently forgotten these arguments when she declared, “a money wage rate sufficiently low will permit a full neoclassical equilibrium” in the “standard Keynesian IS-LM model” (p. 18).

Yellen also derives from her IS-LM model the proposition that “there must be a price level sufficiently low that the full employment output can be sold at the full employment real wage” (p. 19). Indeed, Ms Yellen finds this conclusion, “reached by the neoclassical synthesis,” so unassailable she writes, “there’s nothing in the amended Post-
Keynesian model to deprive that synthesis of its validity, however much they despise it” (p. 19). There are many things that could be said in response to this brash assertion, but I hope two will suffice. To begin with the ironical, let me note that more than three decades after the publication of Ms Yellen’s defence of the IS-LM model, Paul Krugman has invoked the same model to show, not that “a price level sufficiently low” will bring about full employment as Ms Yellen claimed, but that a price level sufficiently high is required to achieve this result (Krugman 2014a). And let me complete this brief response to Yellen’s conjecture by pointing out that output and the real wage are not determined simultaneously. Rather, firms choose a level of output based on the nominal wage they face in the labour market (among other considerations), and then the real wage, as well as the volume of profits, are determined in the market for goods – goods that have been produced at wages already agreed to.⁷

There is another aspect of Ms Yellen’s “standard Keynesian IS-LM model” that is interesting because of its important role in the neoclassical synthesis, viz. the assumption of “smooth factor substitutability,” which presumes that labour and capital can be readily substituted for one another as their relative price changes (p. 17). Ignoring the difficulties associated with the nature and measurement of capital in the neoclassical production function, there remains the troubling premise that aggregate demand is unaffected when capital is substituted for labour and vice versa. In choosing between a labour-intensive and a capital-intensive production technique, an individual firm may ignore whatever miniscule effect its choice of technique might have on demand for the firm’s own output. But this convenient omission cannot be extended to the economy as a whole because aggregate demand depends on both the total amount paid to “factor inputs” and the
allocation of these payments among workers, suppliers, lenders, and landlords, assuming these groups have different saving propensities.

4. Coda: Janet Yellen’s Minsky Moment

One of the Post-Keynesian economists Janet Yellen mentions by name in her 1980 critique is Hyman Minsky. Ms Yellen acknowledged that Minsky and Paul Davidson had “discussed monetary factors at length,” but she also insisted that “no Post-Keynesian has shown how money should be incorporated into their model of distribution and growth” (p. 19). Furthermore, Yellen declared, if money were incorporated into the Post-Keynesian model discussed in her paper, the result would be “all but indistinguishable from standard Keynesian theory” (p. 19). Ms Yellen was mistaken on both counts: money had been incorporated into models of growth and income distribution by several Post Keynesians prior to 1980; and the result was, in fact, quite distinguishable from the “standard Keynesian theory” that emerged from the neoclassical synthesis. The first point is easily established by reference to some pre-1980 works by Paul Davidson (1968, 1972), B. J. Moore (1975), S. J. Moss (1968), and Minsky (1975, 1976) himself. The second point is taken up below.

Let us return to Ms Yellen’s claim that, if “monetary factors are included [in the standard IS-LM model], then there must exist a price level sufficiently low that the full employment output can be sold at the full employment real wage” (p. 19). This view of the relationship between employment and the price level not only differs from the Post-Keynesian view, it is virtually the antithesis of it. These two perspectives diverge for several reasons, but two of the most important are: 1) the Post-Keynesian proposition that
profits are a function of investment spending; and 2) Minsky’s emphasis on the fact that firms must pay their creditors as well as their employees and suppliers. In sharp contrast to Yellen’s contention that full employment can be achieved if the price level is “sufficiently low,” a student of Minsky would quickly point out that if prices fall far enough, some businesses will default on their debts, investment spending will be scaled back, profits will plummet, employment and output will contract, and, depending on the magnitude and pace of the changes involved, a self-reinforcing downward spiral may ensue.

Let’s leave Yellen’s ill-conceived critique of Post-Keynesian monetary theory behind and “fast forward” twenty-nine years to 2009, when Ms Yellen, now President and CEO of the Federal Reserve Bank of San Francisco, presented a paper to the 18th Annual Hyman P. Minsky Conference held at the Levy Institute of Bard College. The San Francisco Federal Reserve Bank CEO told the Conference that Minsky has become “required reading,” and that “the dramatic events of the past year and a half are a classic Scenario of the kind of systemic breakdown that he – and relatively few others – envisioned” (Yellen 2009a, p. 1). More specifically, Yellen cited Minsky’s work in explaining how “a ‘perfect storm’ in financial markets” was exacerbated by a recession that “deepened the credit crunch as demand and employment fell, and credit losses of financial institutions surged” (p. 5). This created “an adverse feedback loop” in which “a process of balance sheet deleveraging . . . spread to nearly every corner of the economy” (p. 6). Taking stock of the economic state of affairs in 2009, one year before becoming Vice Chair of the U.S. Federal Reserve, Ms Yellen writes,
“Consumers are pulling back on purchases, especially on durable goods, to build their savings. Businesses are cancelling planned investments and laying off workers to preserve cash. And, financial institutions are shrinking assets to bolster capital and improve their chances of weathering the current storm. Once again, Minsky understood this dynamic” (p. 6).

When the facts changed, Ms Yellen changed her mind. And she did so graciously, acknowledging “the irony” in the title of her 2009 Conference paper, “A Minsky Meltdown: Lessons for Central Bankers” (p. 1). Moreover, the “lessons” Ms Yellen learned from the “Minsky Meltdown” led the (now) Federal Reserve Chair to question several aspects of the “New Keynesian synthesis” and its mathematical expression in a “DSGE model with nominal rigidities” (Yellen 2009b, p. 1). In particular, Yellen challenged “the reigning macroeconomic orthodoxy,” which regards “financial markets as frictionless and efficient” and rejects the very idea of “an asset bubble.” These beliefs, Yellen argued, are contradicted by “pervasive financial market failures with devastating macroeconomic consequences,” and periodic “credit booms” that generate “adverse feedback loops between financial markets and real economic activity” (2009b, pp. 2-4).

Despite this public epiphany, a sceptic might ask whether Ms Yellen, or any other recent convert to Minsky’s work and related ideas, fully appreciate the inconsistency between these ideas and the assumptions of contemporary mainstream macroeconomics, with its commitment to the model of competitive general equilibrium, continuously clearing markets, and rational expectations, and its concomitant rejection of out-of-equilibrium behaviour, path dependence, positive feedback loops, paradoxes of saving and deleveraging, and other “anomalies” that lie beyond the scope of conventional
macroeconomics. Perhaps Ms Yellen’s recent volte-face will initiate a renewed engagement with the “economics of the Post Keynesians.”

1 Many of Yellen’s important papers are listed and briefly summarized in Matthews (2013).

2 Henceforth, references to Yellen’s 1980 article will include only the page numbers in parentheses.

3 I’ve substituted $\pi$ for $p$ throughout to avoid confusion.

4 This is not to deny the possibility of “wage-led growth” (see Marglin and Bhaduri 1990, Taylor 2004), but rather to point out that Yellen provides no explanation of how an increase in the real wage raises investment and output.

5 See Bhaduri (2007) on the dynamics of the “two-sided multiplier” where saving adjusts to investment through changes in the level of income (Kahn 1972, Kalecki 1971, and Keynes 1936) or its distribution (Keynes 1930, Hicks 1937, Kaldor 1956, and Pasinetti 1962).

6 In Kaldor’s own model (1955-56), the ratio of investment to output, $I/Y$, is the independent variable, which, in dynamic equilibrium, must equal the product of the growth of output capacity, $G$, and the capital/output ratio, $v$, that is, $I/Y = Gv$.

7 Although Yellen recognizes that Post Keynesians “argue that labour cannot determine the real wage via money wage bargains,” she offers no argument against this view, simply asserting that the real wage “is determined in the labour market” (17, 18).

8 The prospects are not promising. See, for example, Paul Krugman’s recent diatribe (2014b) in which he accuses Post Keynesians of being engaged in a “desperate attempt to claim that the Great Recession and its aftermath somehow prove that Joan Robinson and Nicholas Kaldor were right in the Cambridge controversies of the 1960s.”

References


Table 1

Illustrative Equilibrium Values for [1] Above

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<th>Scenario</th>
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