An Essay on Horizontalism, Structuralism and Historical Time

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Abstract

This essay views the debate between horizontalism and structuralism in Post Keynesian monetary theory through the lens of the history versus equilibrium debate in Post Keynesian macrodynamics. It is argued that the value of this approach is twofold. First, it establishes the sense in which a horizontal credit supply curve drawn in quantity of credit/interest rate space is a general rather than a special case. Second, it demonstrates that what debate remains between horizontalists and structuralists can be accommodated within a single, unified Post Keynesian monetary theory.

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1. Introduction

An essential feature of Post Keynesian monetary theory is the principle of an endogenous money supply. According to this theory, commercial banks are retailers of credit who sell credit upon demand to credit-worthy borrowers at a price of their own making. This retail price of credit is established by marking up the wholesale price of credit – i.e., the rate at which commercial banks can, themselves, obtain credit, which we can interpret for simplicity as the central bank's discount rate.[1] Given the commercial interest rate and the number of credit-worthy borrowers, the demand for credit thus determines the quantity of credit created by commercial banks, which in turn determines the aggregate money supply (the quantity of broad money in circulation). This process, through which loans create deposits, necessitates an endogenous supply of reserves by the central bank in order to ensure that the liquidity of commercial banks is maintained at all times. The central bank thus loses the absolute control over the quantity of reserves (and hence, via the traditional money multiplier, the total money supply) with which it is seemingly invested by virtue of its status as monopoly supplier of reserves to the banking system. Instead, the monetary system is characterized by the "reverse base multiplier" process:

$$B = (1/m)\, M \qquad [1]$$

where B denotes the monetary base, M is the total (broad) money supply and $1/m$ is the reciprocal

[1] Depending on the precise institutional configuration of the banking system, the wholesale price of credit may not literally be the central bank's discount rate. It may instead be a market rate of interest that the central bank deliberately manipulates in accordance with a target value – for example, the federal funds rate in the US banking system.

of the traditional money multiplier. In equation [1], *B* responds endogenously to variations in *M*, which are determined (as described above) by credit-creation decisions made by the private sector. Of necessity, monetary policy thus becomes a matter of the central bank determining the value of the discount rate.

On these first principles, Post Keynesian monetary theorists are essentially agreed. But beyond agreement on the basic principles of money's endogeneity, the development of Post Keynesian monetary theory has been characterized by considerable dissent and debate. One important aspect of this debate concerns the shape of the credit supply curve drawn in quantity of credit/interest rate space.[2] A stylized characterization of the issues at stake runs as follows. According to horizontalists, the commercial interest rate can be regarded as exogenous to the credit market. As the quantity of credit expands, then, it does so in a "fix price" market, thus yielding the perfectly elastic or "horizontal" credit supply schedule from which the tradition takes its name.[3] But horizontalism has been charged with being a special case. For example, Davidson (1991) argues that *any* non-zero elasticity of the credit supply curve suffices to make the supply of money endogenous.[4] The perfect elasticity posited by horizontalism is, therefore, sufficient for endogeneity, but is not

[2] This is by no means the only debate in Post Keynesian monetary theory, of course. However, it has an important pedigree, having been identified in the past by protagonists on both sides of the debate as the critical issue separating the traditions identified below as horizontalism and structuralism (Pollin, 1991; Lavoie 1996). This is perhaps not surprising, given the centrality of the credit-creation process to the consensual core of endogenous money theory as described above (see also Lavoie, 1996, p.278).

[3] See, for example, Kaldor and Trevithick (1981), Lavoie (1985) and Moore (1988) on the horizontalist position; see Lavoie (2007) for a recent survey of horizontalism.

[4] See also Davidson (2006). The discussion in Cottrell (1994, pp.596–201), who describes horizontalism as "radical endogeneity theory", is also consistent with the view that a more general case for the endogeneity of money exists once structuralist considerations are introduced.

necessary, rendering horizontalism a special case. The more general case is captured by structuralism. Structuralists posit that interest rates are determined endogenously and will rise as the quantity of credit that is endogenously created within the economy increases. This gives rise to an upward sloping credit supply schedule in quantity of credit/interest rate space.[5] Horizontalists have objected to the designation of their theory as a "special case", however, critiquing the processes that structuralists hold accountable for the endogeneity of the interest rate. The result has been a heated debate between the two traditions concerning the "correct" shape of the credit supply curve.

As a result of all this, Post Keynesian monetary analysis appears "fractured", characterized by two hostile and seemingly irreconcilable theories of the endogenous money supply process. The argument in this paper is that this impression is false – that there can be, and to an extent *already is*, agreement that the horizontal credit supply curve is not a special case, and that the existence of an indeterminate *dynamic* credit supply schedule provides a general framework capable of accommodating both horizontalist and structuralist arguments. As will become clear, these arguments rest on the distinction between logical and historical time and, in particular, the claim that any construct (including, for example, a credit supply schedule) that is akin to a determinate long run equilibrium relationship is anathema to the methodological foundations of Post Keynesian economics.

The remainder of the paper is organized as follows. Section 2 demonstrates the generality of the horizontal credit supply schedule. In section 3, the idea of a dynamic credit supply schedule is introduced. The necessary indeterminacy of this construct is shown to provide a framework of

[5] See, for example, Wray (1990), Pollin (1991) and Palley (1996) on the structuralist position; see Dow 92007) for a recent survey of structuralism.

analysis capable of accommodating both horizontalist and structuralist arguments regarding the credit supply process. It is also shown that there is already *de facto* recognition of this in the literature. Finally section 4 offers some conclusions.

2. The Generality of the Horizontal Credit Supply Curve

At first glance, the identification of horizontalism as a special case may seem obvious. Since *any* non-zero interest-elasticity of the credit supply schedule is consistent with the endogeneity of money (because it implies that an increase in the demand for credit will cause an increase in the quantity of credit supplied, thus increasing the aggregate money supply), it follows that any *non-vertical* credit supply schedule depicts an endogenous money environment. And since it is possible to draw many upward sloping credit supply schedules but only one horizontal schedule, the latter inevitably appears to be a special case.

But this reasoning is based on a "geometric illusion". More precisely, it commits the basic Classical error identified by Joan Robinson of confusing movement through space with movement through time. The horizontal credit supply curve should be interpreted initially as an *instantaneous* rather than an *inter-temporal* construct. This instantaneous credit supply curve describes conditions at a point in time, not movement through historical time. More concretely, the instantaneous credit supply schedule simply shows that given the central bank's current discount rate (δ) and the mark-up (θ) currently established by commercial banks, on the basis of which the current value of the commercial interest rate (r) is established as:

$$r = (1 + \theta)\delta \qquad [2]$$

the amount of credit supplied in the current period (and hence the size of the money supply) is

indeterminate. The quantity of credit supplied is, of course, determined by the *demand* for credit (from credit-worthy borrowers) at the current interest rate, which commercial banks can only accommodate having already formulated and quoted the terms of trade as established in [2]. In this sense, a horizontal credit supply curve is nothing less than the *only plausible representation* of the credit supply conditions that prevail at any given instant, given the assumptions that we have made above about the production and pricing of credit by commercial banks – all of which are consistent with the generic Post Keynesian conception of endogenous money, as described in the previous section. Far from being a special case, then, the horizontal credit supply curve is thus revealed as very much the general case.

Note, moreover, that the duration of the "instant" to which this general case, horizontal instantaneous credit supply schedule applies will depend on the institutional configuration of the banking system. In particular, it will depend crucially on the length of the market period for which commercial banks conventionally keep their mark ups fixed, together with the frequency with which the central bank conventionally makes decisions as to whether or not to change the discount rate. In short, the "instant" is defined by the conventional pricing procedures of the central bank and commercial banks, and is thus likely to be a discrete interval of calendar time. It is important to bear this in mind throughout the discussion in the following section, which makes the distinction between instantaneous and *dynamic* credit supply schedules with the latter purporting to describe credit supply conditions over time. Clearly, in light of what has been said above, "over time" must here refer to events over intervals of calendar time longer than the institutionally defined "instant" discussed above.

Once we accept the generality of the horizontal credit supply schedule as a representation

of instantaneous credit supply conditions, we must conclude that "we are all horizontalists now". In fact, this idea is not new. Support for it can be found in the literature, not least from amongst structuralists. Hence the argument made above is anticipated by Palley (1996, p.585, footnote 1), who qualifies his own claim that the horizontal credit supply curve is a special case by noting that, in the context of the "immediate market period" (analogous to the "instant" described above), it is no such thing. Wray, meanwhile, argues that:

> structuralists (wrongly) sought to refute a horizontal loan supply curve on the argument that over an expansion interest rates tend to rise because mark-ups rise as perceived risks grow. However, [the] horizontal loan supply curve is at a point in time while theirs is a plot of interest rates over time.[6]
>
> (Wray, 2006, p.275)

The conclusions reached here do not mean that structuralism is irrelevant, however. On the contrary, structuralist concerns remain potentially relevant in the formulation of the *dynamic* credit supply schedule. Having established the sense in which the horizontal credit supply curve is a general case, it is to discussion of this dynamic credit supply schedule and its shape that we now turn.

3. The Indeterminacy of the Dynamic Credit Supply Curve

The key to understanding the generality of the horizontal credit supply curve established above is that the latter does *not* show that, *over time*, credit demand can (indeed, must always)

[6] In addition to acknowledging the generality of the horizontal instantaneous credit supply schedule, this quotation may appear to suggest that structuralism offers the only plausible description of the dynamic credit supply schedule. As will become clear in the next section, whilst some structuralists are guilty of this erroneous assertion, it is not clear that it appropriately describes Wray's intent.

increase or decrease without limit without this having any effect whatsoever on the commercial interest rate.[7]

In order to discuss credit supply conditions *over time*, we need to move beyond equation [2] to consideration of the dynamic credit supply schedule, which we can write in the first instance as:

$$r_t = (1+\theta_t)\delta_t \qquad [3]$$

Equation [3] once again relates the value of the commercial interest rate to the value of the discount rate and commercial banks' mark up. This time, however, the equation explicitly purports to describe the behaviour of the commercial rate over time, as a result of any variations in the discount rate and/or the mark up. As will become clear below, it is consideration of [3] that renders relevant certain structuralist arguments that have no role to play in determining the shape of the instantaneous credit supply schedule – though as will become clear, this does *not* mean that the resulting dynamic credit supply schedule will necessarily be upward sloping.

Let θ_0 and δ_0 denote the values of θ and δ, respectively, in some initial instant. We now write:

$$\theta_t = f_t(Y_t) \quad , \quad f_t' \geq 0 \qquad [4]$$

$$\delta_t = g_t(Y_t) \quad , \quad g_t' \geq 0 \qquad [5]$$

Equations [4] and [5] express the *possibility* that θ and/or δ will vary over time with nominal income (Y), the assumption being that increases/decreases in Y are accompanied by increases/decreases in

[7] Once again, the reader is reminded that when we talk of variations in credit demand over time in this section, we are referring to intervals of calendar time longer than the institutionally defined "instant" discussed in the previous section.

the demand for credit arising from the finance motive. Note that equations [4] and [5] express only the *possibility* that θ and/or δ will vary with *Y*, because the first derivatives of these equations may be either greater than or equal to zero. More importantly, f_t and g_t (and hence their derivatives) are time varying, so that we can have $f_t^{'}, g_t^{'} \neq 0$ even if $f_{t-1}^{'}, g_{t-1}^{'} = 0$ (or *vice versa*). Moreover, note that the precise evolution of f_t and g_t (and hence their derivatives) remains unspecified. This is because f_t and g_t are understood to be transmutable in novel ways – there are no "missing equations" that can be introduced to close the system in [3] – [5] so as to give rise to a determinate relationship between r_t and Y_t. Instead, the system remains intrinsically open, and the relationship between r_t and Y_t will *not* be characterized by event regularities since the causal event $\dot{Y}_t$ will not always have the same effect (as measured by $\dot{r}_t$). In other words, for intervals of calendar time longer than the "instant", it is impossible to make "whenever *x* then *y*" statements of the form "whenever nominal income expands, commercial interest rates rise" (structuralism) or "whenever nominal income expands, commercial interest rates remain the same" (horizontalism).[8]

On the basis of [5] and [5], we can write:

$$\dot{\theta}_t = f_t^{'}\dot{Y}_t$$

$$\dot{\delta}_t = g_t^{'}\dot{Y}_t$$

Combining this information with the initial conditions θ_0 and δ_0 and equation [3], it follows that over any time horizon $t = 0, ..., n$ that is longer than the "instant" defined in the previous section, the

[8] Events during the "instant" are characterized formally below.

dynamic credit supply schedule is given by:[9]

$$r_t = (1 + \theta_0 + \int_{t=0}^{n} f_t' \dot{Y}_t dt)(\delta_0 + \int_{t=0}^{n} g_t' \dot{Y}_t dt) \qquad [6]$$

Note that if $f_t' = g_t' = 0$ for all *t*, then we will observe $r_t = r_{t-1}$ for all *t* and the dynamic credit supply schedule will be horizontal. But if $f_t' \neq 0$ and/or $g_t' \neq 0$ for some *t*, then we will observe $r_t > r_{t-1}$ for some *t* and the dynamic credit supply schedule will be an upward sloping step function. In short, the dynamic credit supply schedule in [6] encompasses both horizontalist and structuralist positions regarding the shape of the credit supply schedule.

Now suppose that we are in the midst of an economic expansion, as a result of which nominal income is expanding over time ($\dot{Y}_t > 0$), facilitated (in a manner in keeping with endogenous money theory) by a succession of increases in the demand for and hence supply of credit. Are there monetary forces at work that could, in principle, cause $f_t' > 0$ and/or $g_t' > 0$ for some *t*, thus giving rise to changes in r_t in equation [6] as the quantity of credit supplied increases, and hence an upward sloping dynamic credit supply curve?

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[9] During the "instant", institutional features of the banking system render [4] and [5] "conditionally closed" (Setterfield, 2007). Specifically, we will observe $f_t' = g_t' = 0$ for $t = 0, ..., k$ (this last expression defining the interval of the instant during which both the mark up and the discount rate are always constant). We therefore have $r_t = (1 + \theta_0)\delta_0$ from [6] which, given that θ_0 and δ_0 are historically given data, is equivalent to [2].

According to structuralists, of course, there are:[10] The classic structuralist argument is that an increased supply of credit affects commercial banks' liabilities and hence their costs and hence the commercial interest rate via changes in the mark up (Pollin, 1991). Alternatively, an increased supply of credit might trigger an increase in the discount rate via a central bank reaction function (Palley, 1996). Finally, changes in the degree of financial fragility in the non-bank private sector may provoke a response from commercial banks – who perceive an increase in lender's risk – in the form of increased mark ups (Wray, 1990). The general expectation amongst structuralists is, therefore, that some or all of these processes will result in increases in θ and/or δ over the course of an expansion, giving rise to an upward-sloping dynamic credit supply schedule.

But horizontalists have a history of explicitly objecting to these mechanisms. To take but one example, horizontalists might take issue with the notion that the financial fragility of the non-bank private sector is increasing over the course of an expansion. And even if it is, they might argue that commercial banks' response would be to interpret this development as reducing the proportion of new loan applications that can be deemed credit worthy, and hence the volume of new loans that they should grant at the *same* rate of interest.[11] For either of these reasons, we would observe $f_t^{'} = 0$ for all *t*. This means that θ would remain constant over time, so that (given δ) credit would expand *without* an accompanying change in the commercial interest rate, giving rise to a horizontal dynamic credit supply schedule.

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[10] The interpretation of "structuralism" in what follows is rather catholic. Note, however, that it is in keeping with the interpretation of some structuralists themselves – see, for example, Dow (2007, p.36).

[11] See, for example, Lavoie (1996) and Rochon (1999, 2001, 2006) for these arguments and for reactions to and critiques of other structuralist claims.

The point to be made here is not that any of these arguments is necessarily true as a matter of monetary theory. Rather, the point is a methodological one: that Post Keynesians should not be attempting to substantiate either horizontalist or structuralist arguments as a matter of *a priori* logic, and thus seeking to establish that the dynamic credit supply schedule is either horizontal or upward sloping *in principle*. To do so would be to insist that "missing equations" can be introduced into the analysis that, once substituted into [6], render the resulting relationship between the commercial interest rate and nominal income *closed* – i.e., equation [6] would express an event regularity of the form "whenever nominal income increases, the commercial interest rate rises" or, alternatively, "whenever nominal income increases, the commercial interest rate stays the same". This would permit the drawing of *a* dynamic credit supply schedule that is either upward sloping or horizontal. But in the process, it would rule out the possibility that there is, in fact, no foreclosed relationship between nominal income and the commercial interest rate, and that this relationship is, instead, *open*.[12] And since it is open systems that are congruent with the Post Keynesian conception of historical time whilst closed systems belong in the domain of logical time (see, for example, Lang and Setterfield, 2006–07), this is tantamount to providing a logical time account of an economic process unfolding in historical time. As such, it violates one of the first methodological principles of Post Keynesian economics – that economic processes unfold in historical time and that economic analysis must be congruent with this.

Ironically, the methodological point made above is already widely accepted by both

[12] Note that closure is not always and everywhere a bad thing, even when the system that is being analysed is open. This point is illustrated by the discussion in footnote 9 above. See also Setterfield (2007) for discussion of the *conditional* closure of equations such as [6] which, in the present context, may at times help to elucidate structuralist and horizontalist claims or even provide useful accounts of spatially and temporally specific monetary regimes.

horizontalists and structuralists. But each tradition insists that only their *own* analysis recognizes and is consistent with this point. Hence in her survey of structuralism, and having explicitly made the distinction between logical time and historical time analysis, Dow (2007, pp.46–8) presents a model that "shows the credit supply curve as a dynamic relation over time, having some positive slope, although this is not necessary to the analysis" (p.46). This construct is consistent with the dynamic credit supply schedule in [6]. But she is critical of Lavoie's (1996) horizontalist argument that as aggregate income (and hence the quantity of credit created) expands, revisions in the discount rate and/or commercial banks' mark up can be adequately treated as "shift factors" that displace an otherwise horizontal credit supply curve (Dow, 2007, p.45). And yet Lavoie's argument is *also* consistent with the dynamic credit supply schedule in [6]. Indeed, horizontalist claims about the indeterminacy of the dynamic credit supply schedule can be traced all the way back to Moore (1988, p.265).

Meanwhile, Lavoie (2007, p.23) reiterates his argument about shifting horizontal credit supply schedules but, in the process, is critical of structuralists such as Palley (1996) and Fontana (2003) for adhering to the view that the dynamic credit supply schedule is necessarily upward sloping. In truth, Lavoie's criticisms have some merit. Hence although Palley (1996, p.585, footnote 1) admits the general case interpretation of the horizontal (instantaneous) credit supply schedule identified in section 2, he goes on to claim that "[horizontalist] models are only concerned with the immediate market period, and therefore pay no heed to policy reactions and feedbacks, the effects of which are only felt in subsequent market periods." Similarly, Fontana (2003) bases his discussion on "the distinction between a single period analysis and a continuation [multi-period] analysis" (p.291), but proceeds to identify horizontalism uniquely with single period analysis and

structuralism uniquely with continuation analysis (p.307).[13] Hence both Palley and Fontana claim that *only* structuralists address the dynamic credit supply schedule in equation [6] – a claim that, as has already been demonstrated, is false. But Lavoie (2007) can nevertheless be criticized for his *choice* of structuralists. Hence arguing from a structuralist perspective, Arestis and Howells (1996) present a model of shifting credit demand and supply schedules which trace out a dynamic credit supply relation that could be summarized by [6]. Chick and Dow (2002), meanwhile, effectively claim that Post Keynesian analysis must focus on the relationship in equation [6] in order to properly treat credit creation as a dynamic process.

In short, even as horizontalists and structuralists continue to accuse one another of wrong doing, they are now articulating their views in very much the same conceptual framework. This framework seeks (either implicitly or explicitly) to be consistent with the distinction between the instantaneous and dynamic credit supply schedules made in this paper, and hence the basic Post Keynesian methodological principle that movements through historical time are ultimately indeterminate – they cannot be characterized by movements along a path (or towards a fixed point) that, defined by ahistorical Lucasian "deep parameters", is structurally invariant with respect to the process of adjustment itself. Hence as Wray (2006, p.275) recognizes, "horizontalism is not inconsistent with a rising mark-up over time as risks in the economy increase, and the structuralist concern with innovation and evolution of practice can be incorporated within [the horizontalist] framework". And so it can, as long as it is recognized by all parties that the result of this general Post Keynesian monetary theory is an indeterminate dynamic credit supply schedule that is neither horizontal nor upward sloping in principle, but may be either in practice.

[13] See also Fontana (2004).

It is important to understand that none of this implies that there is nothing left of the horizontalist versus structuralist debate. The argument presented above is that, for methodological reasons, it is inconsistent with Post Keynesian economics to insist that the dynamic credit supply schedule is necessarily horizontal or upward sloping *in principle*. So there is no useful debate to be had on this point. But since the dynamic credit supply schedule can be *either* upward sloping *or* horizontal *in practice*, it is possible to debate the shape of the credit supply curve *in practice* – that is, to argue that one or the other curve better represents either a current or past (but always spatially and temporally specific) monetary regime. This debate – which is always spatially, historically and institutionally context-specific – is perfectly legitimate. Of course, it may be the case that some horizontalists and structuralists would argue that this is all that they had in mind all along. But even if this is true, the vexed nature of the debate between these traditions suggests that the point was lost, and that there is value in clearly and explicitly re-stating it and ensuring that it is central to future debate. Not the least reason for this would seem to be that once the methodological grounds for properly contextualizing the horizontalist versus structuralist debate are recognized, it becomes clear that this debate can be contained in the context of an otherwise unified Post Keynesian monetary theory. We neither have nor require two mutually exclusive and irreconcilable theories of the credit creation process.

4. Conclusions

The debate between horizontalists and structuralists over the shape of the credit supply curve has, at times, produced more heat than light, either by virtue of its neglect of time or else because of unwarranted ascriptions of such neglect by one tradition to the other. Once historical time is

explicitly recognized as the context of the endogenous money creation process, we can see the sense in which both: (a) the horizontal credit supply curve constitutes a general case representation of the instantaneous credit supply conditions; and (b) both horizontalism and structuralism can be reconciled as parts of a general theory of an indeterminate dynamic credit supply schedule. Post Keynesian monetary analysis is not (and does not need to be) characterized by two seemingly irreconcilable theories. The resulting "reconciliation" between horizontalists and structuralists does not, however, preclude debate. On the contrary, as has been argued above, scope remains for debate over the precise monetary mechanisms that are operative in any spatially, historically and institutionally limited context, and hence the resulting shape of the dynamic credit supply schedule *in practice*. Indeed, it is tempting to assert that the importance of appeal to the institutional environment in this context-specific debate would continue a long-standing tradition in monetary theory (of various stripes), which has never had the look and feel of a so-called "pure" theory developed in isolation from concrete historical circumstances. Whether or not this is true, the most important points that emerge from the foregoing analysis and that impinge on the horizontalist versus structuralist debate are as follows. First, the dynamic credit supply schedule may be either upward sloping or horizontal, depending on precise sequences of events in historical time. Second, to deny this and instead identify *either* an upward sloping *or* a horizontal dynamic credit supply schedule *a priori* is equivalent to identifying a determinate long run equilibrium position and as such, is anathema to the methodological foundations of Post Keynesian economics.

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