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Endogenous Money and the Natural Rate of Interest: The Reemergence of Liquidity Preference and Animal Spirits in the Post-Keynesian Theory of Capital Markets

by

Philip Pilkington
Kingston University

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Levy Economics Institute
P.O. Box 5000
Annandale-on-Hudson, NY 12504-5000
<http://www.levyinstitute.org>

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Abstract

Since the beginning of the fall of monetarism in the mid-1980s, mainstream macroeconomics has incorporated many of the principles of post-Keynesian endogenous money theory. This paper argues that the most important critical component of post-Keynesian monetary theory today is its rejection of the “natural rate of interest.” By examining the hidden assumptions of the loanable funds doctrine as it was modified in light of the idea of a natural rate of interest—specifically, its implicit reliance on an “efficient markets hypothesis” view of capital markets—this paper seeks to show that the mainstream view of capital markets is completely at odds with the world of fundamental uncertainty addressed by post-Keynesian economists, a world in which Keynesian liquidity preference and animal spirits rule the roost. This perspective also allows us to shed new light on the debate that has sprung up around the work of Hyman Minsky, calling into question to what extent he rejected the loanable funds view of financial markets. When Minsky’s theories are examined against the backdrop of the natural rate of interest version of the loanable funds theory, it quickly becomes clear that Minsky does not fall into the loanable funds camp.

Keywords: Capital Markets; Financial Economics; Financial Market Theory; Macroeconomics; Monetary Economics; Monetary Theory

JEL Classifications: E00, E12, E40, E43, E44

Introduction

The crowning jewel of post-Keynesian monetary theory over the past few decades is what has become known as the theory of endogenous money. In light of recent developments in “New Consensus Macroeconomics,” however, it has become clear that the debate over whether money is endogenous or exogenous has evaporated. New consensus macroeconomics utilizes innovations such as the Taylor Rule to argue that central banks set interest rates and allow the quantity of money to float just as in post-Keynesian endogenous money theory. Even central banks, like the Bank of England, have begun to explicitly absorb the lessons of endogenous money while continuing to maintain that “the amount of money created in the economy ultimately depends on the monetary policy of the central bank” (McLeay et al., 2014). The debate has therefore shifted to a place it was already in when Keynes was writing the *General Theory*. The debate is not over whether there exists a rate of interest that balances savings and investment at a full-employment equilibrium or what has come to be known as a “natural rate of interest.” In what follows, we will analyze in detail the implications of this shift and consider the relationship between the natural rate of interest theory and the loanable funds model that the post-Keynesian endogenous money theorists sought to overturn. We will then try to show how the natural rate of interest theory implicitly relies on what has come to be known as the Efficient Markets Hypothesis (EMH) in the financial economics literature. Finally, we shall examine a debate that has arisen, questioning whether Hyman Minsky’s theories are at odds with post-Keynesian endogenous money theory in light of what has already been discussed.

Endogenous Money and the Natural Rate of Interest

The development of post-Keynesian endogenous money must be understood in terms of the rival paradigm that is in place at any given period in time. In its modern form, post-Keynesian endogenous money theory can be traced back to Nicholas Kaldor’s critiques of the monetarists. The monetarists claimed that the money supply was exogenously determined by the central bank and had direct effects on the price level in the economy. Kaldor wrote that the money supply was actually the dependent variable and that the price level and, hence, the money supply, was largely dictated by the level of money wage rates (Kaldor, 1970).

Prior to the rise of monetarism in the United Kingdom in the 1970s, monetary policy was generally viewed as a tool of secondary importance in the management of economic

activity—the primary tool being Keynesian fiscal policy. This view arose from the findings of the Radcliffe Committee in 1957. The Radcliffe Committee was set up to determine just how effective monetary policy was in steering economic activity. The findings of the committee indicated that monetary policy was an unreliable tool in managing the level of economic activity and advised that it take a back seat to fiscal policy. It was largely because of the findings of the committee that the discussion of monetary policy was left largely in abeyance in the UK until the rise of monetarism in the 1970s in response to chronic inflation of those years (Kaldor, 1982).

Sometime after Kaldor's original statements, but still during the monetarist era, Basil Moore took up the question and reframed it in terms of what he referred to as “horizontalism” and “verticalism.” For Moore, horizontalism reflected the post-Keynesian view that the central bank set a certain rate of interest as a policy target and then let the quantity of money float, while verticalism reflected the monetarist position that the central bank set the money supply and let the interest rate float. The horizontalism/verticalism distinction referenced the shape of the money supply curve in the standard ISLM diagram (Moore, 1988). Moore also concurred with Kaldor that the key determinate driving the price level and hence the money supply was—at least in the 1970s—the level of money wages (Moore, 1983).

As can be seen, the debate at this time was largely concerned with countering the then-dominant monetarist claim that the money supply is an exogenous variable and that the interest rate is endogenous. However, since then, monetarism has fallen out of favor and has been replaced by New Consensus Macroeconomics (Galbraith, 2008). New consensus macroeconomics integrates the view that the interest rate is set as a policy variable by the central bank and the money supply is allowed to adjust to meet this target. Thus, for example, the *New Keynesian* economist David Romer writes:

The main change [from the ISLM model] is that it replaces the assumption that the central bank targets the money supply with an assumption that it follows a simple interest rate rule. (Romer, 2000, p154)

As we can clearly see, this would, on the face of it, put Romer firmly in the horizontalist camp according to Moore because he is replacing a vertical money supply curve with a horizontal one that is then adjusted by the central bank. Marc Lavoie (Lavoie 2011), however, has made the case that this is simply “old wine in new bottles.” In fact, the new consensus theory actually has very similar implications for macroeconomic policy as the old verticalist monetarist models

insofar as fiscal policy is thought to be largely ineffective. The difference is that in contrast to the verticalist monetarist models that assumed that since the money supply was exogenously determined by the central bank it should be used to conduct policy (Friedman, 1968), the new consensus horizontalists assume that the interest rate is in fact the real policy target of the central banks. This is summarized in what has become known as the Taylor Rule which is usually written as such:

$$(1) \quad i_t = \pi_t + r_t^* + a_\pi(\pi_t - \pi_t^*) + a_y(y_t - \bar{y}_t)$$

Where i_t is the short-term nominal interest rate, π_t is the rate of inflation, π_t^* is the target rate of inflation, r_t^* is the assumed real equilibrium interest rate, y_t is the logarithm of real GDP and \bar{y}_t is the logarithm of potential output, which is derived from linear trend rates. a_π and a_y should be positive, according to Taylor. As Philip Arestis (in Hein et al., 2011, pp92) points out, the Taylor Rule, when integrated into new consensus macro models, implicitly assumes that there exists a natural rate of interest which the central bank can target in order to generate both full employment and relative price stability. This natural rate is assumed to be the rate below which there will be a substantial trade-off between inflation and real output (i.e., if real output accelerates so too will inflation). This, of course, is familiar to many as the natural rate of interest, as sketched out by Knut Wicksell (Wicksell, 1898), and this is the reason why the natural rate has received renewed interest at central banks (see: Anderson, 2005).

Today then, in light of recent developments in mainstream economic theory, the debate between post-Keynesian endogenous money theorists and their new consensus opponents is no longer about whether or not the money supply curve is horizontal or vertical, but rather whether or not there exists a natural rate of interest that central banks can integrate into their policies to ensure full employment and price stability.

This, of course, brings us precisely back to the debate that was implicitly being worked out during Keynes's own time, as to whether monetary policy alone was a sufficient mechanism by which to control fluctuations in economic output, or whether, by contrast, monetary policy was a weak instrument that needed to take a backseat to fiscal policy— as, for example, the Radcliffe Committee had insisted in 1957. In short, it brings us back to the question of whether the natural rate of interest hypothesis is a sufficient condition allowing for the resurrection of the loanable funds model.

Loanable Funds and the Natural Rate of Interest

Wicksell originally formulated the natural rate hypothesis in order to save the quantity theory of money from the attacks of those, who, like Thomas Tooke and the Banking School (Tooke, 1838), argued that the money supply was actually endogenous. Wicksell was concerned that if the money supply was indeed endogenous, then marginalist economic theory would have a rather large hole in it. In his monumental work *Interest and Prices* he thus sought to salvage what he thought to be the essence of the quantity theory of money. He did this quite explicitly and wrote in the preface to that book:

The Quantity Theory... even in the form in which it is presented in Ricardo's truly classical writings about money, is open to too many objections, as pointed out by later writers, to be accepted without modification. The only possible course seemed to me to attempt to push on in the footsteps of the great master—to follow up the logical consequences of the fundamental conception which had given rise to the *Quantity Theory*, so as to arrive at a theory which should be both self-consistent and in full agreement with the facts. (Wicksell, 1898, pp. xiii-xxiv – emphasis added)

Thus, Wicksell saw his task as integrating the indisputable fact that the money supply is endogenous with the essential claim of the quantity theory, which states that an increase in the money supply beyond a certain point would lead to inflation. By doing this, monetary policy could still be seen as a viable means that the central monetary authority could use to exert control over economic activity and the price level. Axel Leijonhufvud has argued in this vein by claiming that the Wicksellian framework is actually the correct modern restatement of the loanable funds theory in light of the fact that banks do indeed extend the money supply endogenously (Leijonhufvud, 1979). Further, Leijonhufvud claims that the Keynesian liquidity preference theory of interest rates demolished the Wicksellian framework. For Keynes, there was no natural rate of interest that balanced the economy at full employment. Thus there was no singular rate of interest that balanced savings and investment perfectly. Meir Kohn writes that:

[Leijonhufvud] suggests that Keynes was forced to find a new mechanism to determine the rate of interest, because, by defining saving as identically equal to investment, Keynes had destroyed the basis for the loanable funds theory: if saving and investment are identical, the rate of interest cannot be determined by their equality (Kohn, 1981, p. 860).

It was Keynes's rejection of a natural rate of interest that set him apart from Wicksell. Similarly today, it is the rejection of the natural rate by post-Keynesians that set them apart from the new

consensus theorists. The reason that Keynes's theory rejects the rate of interest as equilibrating the demand and supply for loanable funds, is that he views the generation of income and expenditure as being causal and the rate of interest as merely being an effect. Keynes writes that "[the] novelty [of my theory] lies in my maintaining that it is not the rate of interest, but the level of incomes which ensures equality between savings and investment." (Keynes, 1937, p241).

For Keynes, this means that there is in fact a natural rate of interest for every level of employment (Keynes, 1936, Chapter 17) and that the level of employment is ultimately determined by the level of investment. The level of investment is dictated by what Keynes calls the "marginal efficiency of capital." The marginal efficiency of capital is the expected or prospective yield that a capital asset will turn over in its lifetime. While Keynes argues that this prospective yield must be higher than the going rate of interest on perfectly safe assets, he makes sure to distinguish his theory of investment from the old marginalist theory by showing that the marginal efficiency of capital is an inherently subjective judgment based on investor expectations, and that these expectations are far more important than the influence of the rate of interest, which is of secondary importance. He writes:

The schedule of the marginal efficiency of capital is of fundamental importance because it is mainly through this factor (much more than through the rate of interest) that the expectation of the future influences the present. The mistake of regarding the marginal efficiency of capital primarily in terms of the *current* yield of capital equipment, which would be correct only in the static state where there is no changing future to influence the present, has had the result of breaking the theoretical link between to-day and to-morrow. Even the rate of interest is, virtually, a *current* phenomenon; and if we reduce the marginal efficiency of capital to the same status, we cut ourselves off from taking any direct account of the influence of the future in our analysis of the existing equilibrium. The fact that the assumptions of the static state often underlie present-day economic theory, imports into it a large element of unreality. (Keynes, 1936, Chapter 11—Emphasis Original)

According to Keynes, when investors are undertaking such judgments about the future, they are not engaged in mathematical calculation based on risk assessments and the going rate of interest, but are instead driven by "a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities... Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die; —

though fears of loss may have a basis no more reasonable than hopes of profit had before” (ibid, Chapter 12). In the eleventh chapter of the *General Theory*, Keynes introduces the marginal efficiency of capital as the means by which investors make decisions about when and how much to invest. He understands this concept as introducing into his analysis a degree of subjective judgement about the future in these decisions. In the twelfth chapter, Keynes then introduces the famous notion of the animal spirits to explain what drives these expectations about the future. It is this framework that gives Keynes’s economics its specific flavor and distinguishes it from the standard marginalist theory of investment.

The Efficient Markets Hypothesis and the Natural Rate of Interest

If we examine Keynes’s theory carefully, it sheds light on the fact that the natural rate theory actually has its foundations in the idea of perfectly rational agents with perfect information engaged in mathematical calculations that drive economic activity. That is, the natural rate theory depends on the microeconomics of behavior that characterizes marginalist economics. In the Wicksellian theory, the money rate of interest is set by the central bank. It is then thought that if the money rate of interest can be lined up with the natural rate—which is ultimately determined by the real yield on productive capital goods—a stable equilibrium growth path can be achieved. However, we must also assume that there are numerous other interest rates in the economy that are anchored by the risk-free money rate of interest as set by the central bank. These rates can be thought of as being generated by taking the risk-free rate as a base rate and then adding a markup for the level of risk the lender determines the borrower to represent. The higher the level of risk perceived by the lender, the higher the spread between the risk-free rate and a given rate in the market for funds.

Thus, in order to assume that savings and investment are being perfectly balanced, we must not only assume that investors are undertaking investment activity based on the price of money (i.e., the rate of interest) at any given time, but also that every lender is pricing in the risk of the borrower correctly—i.e., they are lending to the borrower at the “correct” or “natural” rate of interest given this specific borrower’s risk. This entails that investors act, not in line with the animal spirits theory of Keynes, but instead in line with price incentives. It also entails that all lenders are perfectly rational and have access to perfect information regarding the default risk of borrowers. If they were not rational or did not have access to this information, then there is no guarantee that the series of interest rates generated by a money rate of interest set in line

with the natural rate would channel investment in a manner that ensured a stable equilibrium growth path. Thus the theory of the natural rate of interest implicitly relies on the EMH of capital markets which was developed some 70 years after it and which states that asset markets always price in information about risk perfectly and are not subject to instability and crashes (Shiller, 2003).¹

To clarify, this considers the natural rate of interest in its original conception. In Wicksell's theory, the natural rate of interest balances savings and investment perfectly. Wicksell considered it a "real" rate that would emerge from real savings and the productivity of actual capital goods. If the money rate of interest—that is, the actual rate of interest set by the bank—falls lower than the natural rate of interest, then there will be an inflationary boom, whereas if the money rate of interest rises above the natural rate, there will be deflation.² Leijonhufvud sums this up as such:

When nominal income is rising, investment exceeds saving by the net addition to loanable funds injected by banks. When nominal income is falling, banks let loanable funds 'leak out' so that savings exceed investment. In income equilibrium, saving should equal investment; this requires that banks do no more and no less than intermediate the desired savings of the household sector. When they behave themselves 'neutrally' the excess demand for final goods at the prevailing level of money prices should be zero. (Leijonhufvud 1979, p25)

Now consider what happens if we introduce risk into this system. In such a case, we must take into account that some investments will fail—that is, they will use up resources that would otherwise go toward consumption in order to come into being—but they will not add to output. Therefore, savers will have to take into account various risk estimates in the form of

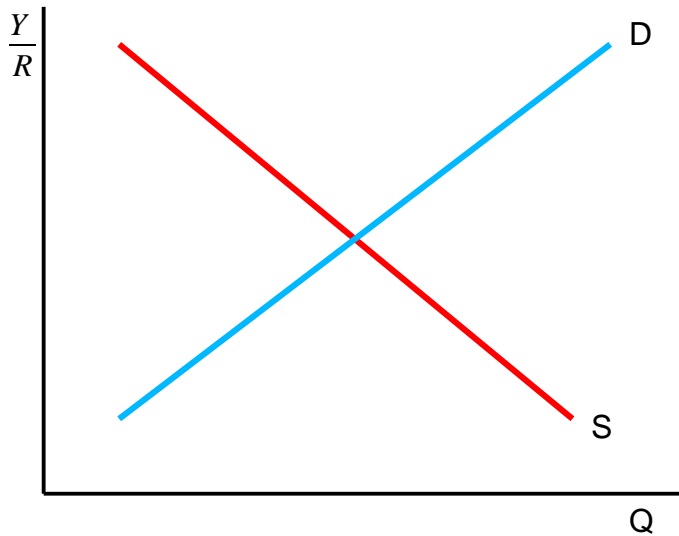
¹ We should make clear, of course, that when Wicksell came up with the natural rate of interest, he did not have the EMH in mind, as it would not be invented for over half a century. Rather this is an instance, one that is quite common in science (see: Feyerabend, 1975, p107), where a theory from the past can only be fully understood when a theory from the present is in place to illuminate the former theory's underlying implicit assumptions.

² Wicksell also gives us hints that these fluctuations will generate business cycle dynamics by linking deflation with unemployment. He writes: "But it is a different matter when a rise or fall occurs in the money prices of all, or of most, commodities. Adjustment can no longer proceed through changes in demand or through a movement of factors of production from one branch of production to another. Its progress is much slower, being accomplished under continual difficulties, and it is never complete; so that a residue, either temporary or permanent, of social maladjustment is always left over. A lasting *fall* in the prices of all... commodities is generally recognised as no less significant an evil. While it is true that with the same wages the workers would be able to obtain more of the necessaries of life, this advantage is frequently outweighed by the other consequences of a fall in prices. Business is paralysed, and growing unemployment and falling wages result." (Wicksell 1898, pp 1-2)

This paves the way for the Austrian interpretation of Wicksell, where a divergence of the money rate from the natural rate leads to boom-bust phenomena (Garrison, 1997).

probabilities when they make decisions regarding not only how much to save but also how to allocate their savings. It is conceivable that using these probability estimates, savers can then balance their time preferences in some rational manner. That is, they may be able to take into account the rate of failure of projects in the future and factor this into their consumption/saving decisions to ensure that resources are used in such a manner that inflation and deflation do not result. To the best of our knowledge, no economist has ever formulated such a model, but it is at least conceivable on principle.

For Wicksell's theory to be coherent when the notion of risk is taken into account, every specific interest rate in the economy must be set in a rational manner in line with the level of objective risk that must be given to each investment project. There must thus be a different natural rate of interest for each investment project, which reflects its true underlying risk relative to its return. Even if the central bank can set the money rate in line with something resembling a natural rate of interest—perhaps they might set it in line with the lowest risk investment projects' natural rate—the capital markets will still have to line up all the other rates of interest on various heterogeneous projects with their specific natural rates. So, in order for Wicksell's theory to hold, each interest rate must be set in line with the central bank money rate of interest plus a markup premium that takes full account of the objective risk of the capital project underlying this specific rate of interest relative to its objective return. This view of the capital markets can be summarized as that of the EMH. Investors/savers have access to perfectly clear knowledge of potential investments. Thus, they view potential investments as a series of given objective probabilities and they assign these probabilities a price—a required yield or rate of interest—that is inversely proportional to the risk of the investment not paying off. This can be summarized in the following diagram.



The lines in this graph represent the demand for and supply of an asset or series of assets. On the horizontal axis the quantity of the asset/assets supplied and demanded is represented, while on the vertical axis, the yield or interest rate, Y , divided by the risk, R , is depicted. When the interest rate rises relative to the objective risk of the investment, a smaller quantity of the asset/assets is supplied because the issuers of the asset do not want to pay high interest payments for low-risk investment projects while a larger quantity of the asset/assets are demanded because capital market investors want high-yielding assets that have a low objective level of risk. In the above diagram the equilibrium point can thus be thought of as the point at which objective risk is perfectly balanced with the interest rate in any given asset class or across the market. At equilibrium, we can assume that all information is being reflected in financial market prices and thus that all interest rates are aligned with their particular natural rate. The equilibrium point on the diagram, if applied to the market as a whole, can be thought of as a whole series of natural rates of interest that will balance the economy at the optimum level of full employment output. This series of interest rates, if arrived at by the capital markets, will generate a stable equilibrium growth path with no inflation or deflation.

Now, what happens when we introduce the idea that interest rates on such investments might not be set in line with probabilistic risk at all, but rather are set in line with the liquidity preferences of the investors, which in turn are subject to their subjective evaluations of the future? What we then get is an identical result to what we find in Wicksell when the money rate of interest diverges from the natural rate—namely, over or underinvestment. If savers/investors are more risk averse than is justified by the objective probabilities, then the rate of interest will

be set too high relative to the full-employment or natural rate, while if the savers/investors are less risk averse than is governed by the objective probabilities, then the rate of interest will be set at a level too low relative to the full-employment or natural rate.

What we see emerge here is, of course, Keynes's classic liquidity preference theory of interest rates which states that interest rates on assets are set in line with that asset's perceived riskiness and the level of risk aversion that the investment community holds at any given moment in time.³ Indeed, we can restate this theory clearly in terms of the Wicksellian theory of capital markets by saying that in Keynes's formulation, it is not only the central bank that determines the money rates of interest but also the liquidity preference of the capital markets.⁴ In addition to this, we can restate the implicit theory of investment in the Wicksellian theory in Keynes's terms: for Keynes the investment undertaken at any given moment in time is not merely the result of the interest rate but also of the animal spirits of the investment community. This introduces two points into the theory where both the price of investment—the interest rate—and the demand for investment are set in line with the subjective evaluations of the future. The price of investment is set in line with Keynes's liquidity preference theory, while the demand for investment is set by the animal spirits of investors in fixed capital goods.

The essence of the loanable funds theory, against the post-Keynesian theory, is not whether or not interest rates rise endogenously as economic activity increases, but instead whether or not there can be said to be a series of natural rates of interest that balance the supply and demand for loanable funds without generating inflation or financial instability.⁵ It is because

³ It should be noted that we have all the while been taking the mainstream theory at face value. If we introduce true uncertainty—i.e., if we recognize that investments are made in a non-ergodic environment—then there is no such thing as the hypothetical objective probabilities that investors might potentially use to balance their savings and consumption through time. In a non-ergodic universe, then, it is not that investors misrecognize probabilities and become “irrational,” but rather that there is no basis for them to even conceive of such probabilities. Thus there is no way for them to objectively price risk. We will shortly see that this is precisely the universe that Minsky's theories seek to describe.

⁴ One might note the superficial similarities between what we have just described and the boom-bust cycle of the Austrian Business Cycle Theory (ABCT). The key difference, however, is that the ABCT assumes that only central bank action can affect the money rate on interest. As we have seen, however, unless we assume perfect foresight on the part of savers/investors there is no logical reason to assume that they will set the money rate of interest in line with the natural rate. It would be interesting to consider how Austrian theorists, who generally recognize Knightian uncertainty as being operative in capital markets, would respond on this point. The only viable response to this so far as we can see is to advocate some form of the EMH and rational agents, but if Austrians were to do so it would no longer be clear what would distinguish them from, for example, New Classicals.

⁵ Note that this means that those economists who hold to the tenets of behavioral finance, yet nevertheless hold to the loanable funds theory, are actually being internally inconsistent. Once we allow that asset pricing—and thus the whole gamut of interest rates across the economy—is not the result of perfectly rational agents with perfect access

Minsky rejects every aspect of this natural rate hypothesis that puts him firmly in the post-Keynesian endogenous money camp. As we shall see, because Minsky integrates Keynes's animal spirits theory of investment, it is his focus on liquidity preference and his insistence that investors are faced with a world of uncertainty that distinguish him from the natural rate theorists.

Minsky, Liquidity Preference, Animal Spirits and Uncertainty

Lavoie (1997) has stated that Minsky adhered to loanable funds theory insofar as his theory that financial instability interest rates rise endogenously as the economy grows and perceptions of risk increases, and thus the money supply cannot be thought to be truly endogenous. Indeed, Lavoie goes as far as to say that, "the financial instability hypothesis owes more to the famous defenders of the natural rate of interest than to Keynes' economics" (ibid, p75). L. Randall Wray (2006), on the other hand, has stated that despite this, Minsky's work should nevertheless be located firmly in the post-Keynesian tradition of endogenous money. We will now examine this debate in light of the ideas that we have explored in detail above.

Minsky discusses interest rates with reference to Keynes's rebuttal to Jacob Viner's critique of the *General Theory*. Minsky highlights the fact that, for Keynes, the price on capital assets at any given period of time is determined not by a rational calculation of risk (which would require a knowable future), but is instead subject to swings of optimism and pessimism as the economy moves through historical time, and subjective assessments shift. This leads to the inevitable conclusion that all investment decisions have a fundamentally speculative component. Minsky writes that, "businessmen, as they play the mixed game of skill and chance that is business, are inevitably speculators" (Minsky, 1976 pp86).

As we have already seen, this completely negates the idea that there is some natural rate of interest that balances savings and investment at a full-employment equilibrium level. Instead Minsky is refocusing attention on Keynes's theory of liquidity preference. What investors are really doing in capital markets, according to Minsky, is deciding what their liquidity preferences are—that is, they are deciding, at any given moment in time, how much they are willing to steer their investments into assets with low levels of liquidity versus those with high levels of

to information, the loanable funds theory completely disintegrates insofar as the series of interest rates across an economy must be seen as subject-to-optimistic or pessimistic whims of investors engaged in essentially speculative activity.

liquidity. Thus, while the risk-free rate of interest may indeed be set by the central monetary authority, all other interest rates in the economy are determined subjectively by investors who are essentially engaged in speculation.

This point has already been made by Wray (2006), who, in his rebuttal to Lavoie, stresses the dimension of risk and uncertainty in Minsky's analysis. Wray points out that Minsky fully subscribes to the horizontalist idea that central banks set the risk-free rate of interest, but that, nevertheless, other interest rates in the economy may rise or fall on the basis of the speculative behavior that essentially characterizes capital markets. Wray writes:

The supply of internal funds is 'horizontal' (at the supply price of capital goods), but the supply of external funds is upward sloping due to lender's risk. This has nothing to do with loanable funds, but rather can be attributed to hesitation of lenders to take increasingly large positions in the liabilities of each particular firm – and in liabilities of firms in general. While Minsky uses the term 'risk', he does not mean this in the Knightian sense; rather the future is 'uncertain' in a Keynesian sense, but financial institutions (and their borrowers) operate conventionally, with rules of thumb, on whirlwinds of optimism and pessimism. (ibid, p285)

As we have already seen, Wray is absolutely correct in saying that this upward-sloping supply of "external funds" has "nothing to do with loanable funds." Indeed, Minsky's analysis itself, based as it is on interest rates that are effectively set through speculative investments, is completely contrary at a fundamental level to the loanable funds theory, which, as we have seen, requires that all risk is priced into lending correctly in order to achieve its results. Rather, as we have already stated, Minsky's is a restatement of Keynes's liquidity preference theory in light of endogenous money.

Wray's paper does not quite make this connection, but at the beginning of the paper, Wray does defend Keynes's liquidity preference theory (ibid, pp280-281). The reason that Wray does not make the connection explicit is because he has not considered the role of the natural rate of interest which was exactly what Keynes was attacking with his twin theory of liquidity preference and its obverse, animal spirits (Leijonhufvud, 1979). Once it is recognized that both Keynes's and Minsky's theories of the interest rate are in fact means by which to criticize the natural rate hypothesis by introducing confidence and uncertainty into the analysis, it becomes clear that it is now once again this—the question of the natural rate of interest—that is at issue in contemporary debates over the Taylor Rule and, consequently, the natural rate.

The point at which the rubber meets the road in Minsky's analysis is when he incorporates his speculative view of investment into his theory of the price of assets. In Minsky's theory, the fact that the price of capital assets is related to the risk-free, exogenously set rate of interest is of secondary importance. Of primary importance is the speculative nature of the pricing of these assets (Minsky, 1976, pp88). Thus, it is no surprise that Minsky's theory leads to a fundamentally different view of the functioning of capitalist economies than that of the loanable funds theorists. This can be seen quite clearly in the reasons he gives for fundamentally rejecting the marginalist/neoclassical paradigm which he sees as being based on a "static production function" and "invariant-preference-systems"—that is, rational actors:

In the alternative interpretation, the core of Keynes' system consists of an analysis of capitalist finance in the context of uncertainty, and of how capitalist finance affects the valuation of items in the stock of capital assets and thus the pace of investment. This core of Keynesian economics is fundamentally inconsistent with the static production function and invariant-preference-system constructs which are the basis of the neoclassical synthesis. (ibid pp129— emphasis in original)

Thus it should now be clear why Minsky cannot be placed in the loanable funds camp. Although he does see bank interest rates as having effects on the rate of capitalist investment, they are, like they are in Keynes's theory, of secondary importance. What are of key importance are the speculative decisions undertaken by investors in the face of uncertainty. The fact that these decisions are speculative automatically puts Minsky at odds with the loanable funds theorists whose constructs do not function without the implicit assumption of rational agents with perfect information, which generate a series of natural rates of interest across the capital markets, which in turn are transmitted to real investment projects by entrepreneurs undertaking similar types of decisions.

Conclusion

In conclusion, we can now see clearly that post-Keynesian monetary theory can no longer be distinguished from the mainstream theories due to the fact that the money supply curve is horizontal, as this is also the case in new consensus formulations of the Taylor Rule. Today, the distinguishing feature of post-Keynesian monetary theory is that it rejects the idea of a natural rate of interest that balances savings and investment to produce full-employment equilibrium. New consensus macroeconomics seeks to resurrect the loanable funds model of the economy by positing a natural rate of interest—just as Wicksell did at the turn of the 20th century.

The natural rate theory, however, when examined in light of recent developments in financial economics, shows itself to be implicitly reliant on some version of the EMH, in that it requires that interest rates across the economy—what Wicksell called “money rates of interest”—have to be set in such a manner that savings and investment are brought into an equilibrium that generates full employment. If savers and investors set the money rate of interest too high, inflation will result, while if they set it too low, there will be deflation and unemployment. In order to get all the interest rates in the economy to line up with their natural rates, investors must be perfectly rational and have full objective information about these investments. If they do not, we have no reason to assume that capital markets can ever achieve this series of natural rates of interest that will result in a stable growth equilibrium path for the economy.

Post-Keynesian monetary theory must now fall back on the version of monetary theory Keynes put forward in the *General Theory*, modified in light of the insights of endogenous money. Post-Keynesian monetary theory must again insist that capital markets are subject to the whims of investors in the form of the latter’s liquidity preference, and that the demand for investment is subject to the whims of entrepreneurs in the form of their animal spirits. Understood in this light, Minsky’s theory of financial instability should not only be included in the post-Keynesian endogenous money tradition but should also be seen to make an extremely important contribution to the critique of the mainstream view, which, as we have seen, implicitly relies on the assumption of rational actors with perfect information in order to generate its modern day loanable funds results.

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