# Lachmann and the existence of multiple natural interest rates

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## “The legacy of Ludwig Lachmann”

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# LACHMANN AND THE MULTIPLICITY OF INTEREST RATES

- The concepts of natural and equilibrium interest rates are commonly used in economic theory and policy.
- There has been a controversy surrounding the way to identify precisely what this rate is/should be, and several authors have expressed doubts regarding its unicity.
- The value of the natural rate of interest is often taken for granted, whereas it depends upon many variables and parameters – which can lead to multiplicity of simultaneous rates.

# LACHMANN AND THE MULTIPLICITY OF INTEREST RATES

"**The natural of 'equilibrium' rate provides a benchmark for the measuring the stance of monetary policy**, with policy expansionary (contractionary) if the short-term real interest rate lies below (above) the natural rate. This role is illustrated clearly in monetary policy rules such as the Taylor (1993) rule, according to **which the real interest exceeds the natural when inflation exceeds its target rate**, and vice versa, all things equal."

San Francisco FED Working Paper 2016-11, p.1

# LACHMANN AND THE MULTIPLICITY OF INTEREST RATES

- Lachmann has a unique role in the debate surrounding the multiplicity of interest rates, as he understood in depth both sides of the initial argument (Hayek vs Sraffa) as well as the subsequent contribution made by Keynes in Chap 17 of the General Theory.
- Lachmann's direct contributions to the debate can be found in Lachmann's 1956 Capital and its Structure, and in an article published in 1986 entitled "Austrian Economics under fire: the Hayek-Sraffa Duel in Retrospect".
- Lachmann tried to reconcile Hayek's conclusions with Sraffa's critique and Keynes considerations on specific commodity rates.

# LACHMANN AND THE MULTIPLICITY OF INTEREST RATES

- We believe, however, that other writings of Lachmann's help shed additional light on the issues at stake.
- In particular, Lachmann's emphasis on the heterogeneity of preferences and expectations, as well as his reluctance to treat capital phenomena in "equilibrium terms" (Lachmann 1986b: *Market as an economic process*).
- The result of incorporating elements of Lachmann's radical subjectivism into the analysis of multiple interest rates could provide new dimensions to the problem.

# LACHMANN AND THE MULTIPLICITY OF INTEREST RATES

- This presentation will be organised as follows:
  - In the first section, we will present the central aspects of the initial debate between Hayek and Sraffa: the interaction of natural and equilibrium rates, and the reasons why there can be multiple interest rates.
  - The second section will be devoted to the analysis of futures markets, which are a feature of the real world whose functioning enables to calculate, compare and – according to Keynes and Lachmann – equalise the specific rates of interest of various commodities ('own-rates').
  - The third section will provide new insights based on the incorporation of some of the features of Lachmann's economic framework, in the form of open questions.

# 1- NATURAL VS EQUILIBRIUM RATE

- The term "natural rate of interest" was coined by Knut Wicksell in his 1898 book *Geldzins und Güterpreise (Interest and Prices)*, chapter 8:

- "There is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them. This is necessarily the same as **the rate of interest which would be determined by supply and demand *if no use were made of money and all lending were effected in the form of real capital goods***. It comes to much the same thing as to describe it as the current value of the natural rate of interest on capital."

# 1- NATURAL VS EQUILIBRIUM RATE

- Friedrich von Hayek made use of this concept in his 1931 book *Prices and Production*:

- "This equilibrium rate, as I prefer to call it, [Wicksell] christens the natural rate of interest. In a money economy, the actual or money rate of interest ("Geldzins") may differ from the equilibrium or natural rate, because the demand and the supply of capital do not meet in their natural form but in the form of money, the quantity of which available for capital purposes may be arbitrarily changed by the banks." (pp.20-21)

# 1- NATURAL VS EQUILIBRIUM RATE

- In his review of the book published in the *Economic Journal (Dr. Hayek on Money and Capital)*, Sraffa (1932a) criticised the confusion between natural interest and equilibrium rates:

- "If money did not exist, and loans were made in terms of all sorts of commodities, there would be a single rate which satisfies the conditions of equilibrium, but **there might be at any one moment as many 'natural rates' of interest as there are commodities**, though they would not be equilibrium rates. The 'arbitrary' action of the banks is by no means a necessary condition for the divergence." (p. 49)

# 1- NATURAL VS EQUILIBRIUM RATE

- While Sraffa acknowledges the possibility that natural interest rates converge in the context of a stationary economy, he is adamant at emphasising their divergence in a context of economic instability (be it growth or depression):

- "**[I]n times of expansion** […] **there is no such thing as an equilibrium (or unique) natural rate of interest**, so that the money rate can neither be equal to, nor lower than it: the 'natural' rate of interest on producer's goods, the demand for which has relatively increased, is higher than the 'natural' rate on consumers' goods, the demand for which has relatively fallen (p. 51).

# 1- NATURAL VS EQUILIBRIUM RATE

- Hayek (1932) subsequently accepted some of Sraffa's criticism, ending up contradicting himself:

- "I think it would be truer to say that [...] there would be no single rate which, applied to all commodities, would satisfy the conditions of equilibrium rates, but **there might, at any moment, be as many 'natural' rates of interest as there are commodities, all of which would be equilibrium rates**." (p. 245)

# 1- NATURAL VS EQUILIBRIUM RATE

- Sraffa (1932b) then reasserted and clarified his critique in a rejoinder:

"Dr. Hayek's ideal maxim for monetary policy, like that of Wicksell, was that the banks should adopt the "natural" rate as their "money" rate for loans: the only obstacle which he saw was the difficulty of ascertaining in practice the level of the "natural" rate (p. 108 of the book). I pointed out that **only under conditions of equilibrium would there be a single rate**; and that when saving was in progress there would at any one moment be many "natural" rates, possibly as many as there are commodities; so that it would be not merely difficult in practice, but altogether inconceivable, that the money rate should be equal to "the" natural rate." (p. 250)

# 1- NATURAL VS EQUILIBRIUM RATE

- He did not miss the opportunity to point Hayek's contradictions:

"And whilst Wicksell might fall back... upon an average of the "natural" rates weighted in the same way as the index number of prices which he chose to stabilise, this way of escape was not open to Dr. Hayek, *for he had emphatically repudiated the use of averages*. **Dr. Hayek now acknowledges the multiplicity of the "natural" rates, but he has nothing more to say on this specific point than that they "all would be equilibrium rates.**" The only meaning (if it be a meaning) I can attach to this is that his maxim of policy now requires that the money rate should be equal to all these divergent natural rates." (pp. 250-251)

# 1- NATURAL VS EQUILIBRIUM RATE

- Since **Hayek rejected the use of indices** (i.e. weighted baskets of books to calculate inflation), he **couldn't identify a single equilibrium rate** calculated from various natural rates (as this would involve the use of calculations he disapproved of).
- Therefore, most people at the time (and since) concluded that 'Sraffa won'.
- However, the equilibrium rate Sraffa had in mind was based on the **classical definition of equilibrium**, based on the comparison of relative costs over the long run (Ferlito, 2015), similar to what Sraffa notes R in his 1960 book, *Production of Commodities by means of Commodities*.

# 1- NATURAL VS EQUILIBRIUM RATE

- As a result of the previous debate, in the *General Theory of Employment Interest and Money published in 1936*, Keynes amended his views regarding the existence of a unique natural rate of interest:

"In my *Treatise on Money [published in 1930]* **I defined what purported to be a unique rate of interest, which I called the *natural rate of interest*** — namely, the rate of interest which […] preserved equality between the rate of saving […] and the rate of investment. […] **I had, however, overlooked the fact that in any given society there is, on this definition, a *different* natural rate of interest for each hypothetical level of employment**. And, similarly, for every rate of interest there is a level of employment for which that rate is the "natural" rate, in the sense that the system will be in equilibrium with that rate of interest and that level of employment. "

# 1- NATURAL VS EQUILIBRIUM RATE

- In *Capital and its Structure* published in 1956, Lachmann acknowledged the importance of Sraffa's remarks, but also pointed a shortcoming in his approach:

"Mr. Sraffa in 1932 was, to our knowledge, the first to point out that in this whole field **the crucial distinction is between equilibrium and disequilibrium and not between a barter economy and a money economy**. He developed the notion of own-rates, without actually coining the word, in an appropriate setting of forward markets, though unfortunately he considered these in isolation and **failed to realize how, in a system of intertemporal markets, the market forces tend to re-establish equilibrium once it has been disturbed**." (p. 76)

# 1- NATURAL VS EQUILIBRIUM RATE

"[Sraffa] came to interpret Wicksell's 'natural rate' as an average of 'actual' own-rates as they would exist, side by side, in a barter economy, and not as the result of the operation of market forces. **He thus substituted a statistical device for an analysis of market relationships**. **In Keynes' system, by contrast, an over-all commodity rate does exist**." (pp. 76-77)

- We shall now proceed to show how the equalisation of the various specific interest rates is supposed to take place.

# 2 – FUTURES MARKETS AND OWN-RATES

- In his review of *Prices and Production*, Sraffa uses a real-world example of commodity borrowing:

"**Loans are actually made in the present world in terms of every commodity for which there is a forward market**. […] When a cotton spinner borrows a sum of money for three months and uses the proceeds to purchase spot, a quantity of raw cotton which he simultaneously sells three months forward, **he is actually 'borrowing cotton' for that period**. (pp.49-50)

# 2 – FUTURES MARKETS AND OWN-RATES

- Sraffa then shows how to calculate the specific interest rate on a given commodity:

"The rate of interest which he pays, per 100 bales of cotton, is the number of bales that can be purchased with the following sum of money: **the interest on the money required to buy 100 bales, plus the excess (or minus the deficiency) of the spot over the forward prices of the 100 bales**." (p.50)

# 2 – FUTURES MARKETS AND OWN-RATES

- Keynes (1936) provides a similar example in Chap 17:

Let us suppose that the **spot price of wheat is £100 per 100 quarters, that the price of the 'future' contract for wheat for delivery a year hence is £107 per 100 quarters, and that the money-rate of interest is 5 per cent**; what is the wheat-rate of interest? £100 spot will buy £105 for forward delivery, and £105 for forward delivery will buy **105/107×100(=98)** quarters for forward delivery. Alternatively £100 spot will buy 100 quarters of wheat for spot delivery. Thus 100 quarters of wheat for spot delivery will buy 98 quarters for forward delivery. **It follows that the wheat-rate of interest is *minus* 2 per cent per annum**.

# 2 – FUTURES MARKETS AND OWN-RATES

- The associated formula is:

$$\textbf{Wheat rate of interest} = \frac{(1 + \textbf{Money rate of interest}) * \textbf{Current spot price of wheat}}{\textbf{Futures price of wheat}}$$

(Note that the futures price of wheat is a contractual price, distinct from the actual spot price in the future.)

# 2 – FUTURES MARKETS AND OWN-RATES

- Keynes then proceeds to explain what the commodity-rates are equal to, from a 'real' perspective:

"Let us consider what the various commodity-rates of interest over a period of (say) a year are likely to be for different types of assets. Since we are taking each commodity in turn as the standard, the returns on each commodity must be reckoned in this context as being measured in terms of itself."

# 2 – FUTURES MARKETS AND OWN-RATES

"There are **three attributes** which different types of assets possess in different degrees; namely, as follows:

(i) Some assets produce a yield or **output *q***. […]

(ii) Most assets, except money, suffer some wastage or involve some cost through the mere passage of time (apart from any change in their relative value), […] i.e. they involve a **carrying cost *c***. […]

(iii) Finally, the power of disposal over an asset during a period may offer a potential convenience or security, […]we shall call its **liquidity-premium *l***."

# 2 – FUTURES MARKETS AND OWN-RATES

- "It follows that the total return expected from the ownership of an asset over a period is equal to its yield *minus* its carrying cost *plus* its liquidity-premium, i.e. to ***q − c + l.***
- That is to say, **(*q − c + l*) is the own-rate of interest of any commodity**, where *q*, *c* and *l* are measured in terms of itself as the standard. "

# 2 – FUTURES MARKETS AND OWN-RATES

- From what precedes, we can infer the following:

$$q - c + l = \frac{(1 + \textbf{Numeraire rate}) * \textbf{Current spot price}}{\textbf{Futures price}}$$

- This in turn signifies that any change in the own-rate of interest of a commodity will have two aspects:
  - On the left-hand side of the equation, a change in the own-rate of commodity will come from a variation in its yield, its carrying cost or its liquidity premium.
  - On the right-hand side, a change will come from a variation in the numéraire rate of interest, the current spot price of the commodity or its futures price.

# 2 – FUTURES MARKETS AND OWN-RATES

- As Lachmann (1956) put it:

"Let us first assume a barter economy with forward markets for each commodity […]. If a present house sells for 100 tons of 'spot' copper, and a house available a year hence for 100 tons of twelve months' forward copper, and the own-rate for both copper and houses is 10 per cent, then the house available a year hence must sell for 90 tons of spot copper. […] **The good with the lower own-rate would be sold, and its spot price would fall until the own-rates become equal.** It is in our understanding this over-all rate of exchange of present for future goods, as it would establish itself in a barter economy, with an intertemporal market for most goods, which Wicksell had in mind when he spoke of 'the natural rate of interest'." (p.75)

# 2 – FUTURES MARKETS AND OWN-RATES

- Reasserted in Lachmann (1986a):

"In a barter economy with free competition commodity arbitrage would tend to establish an overall equilibrium rate of interest. Otherwise, if the wheat rate were the highest and the barley rate the lowest of interest rates, it would become profitable to borrow in barley and lend in wheat. Inter-market arbitrage will tend to establish an overall equilibrium in the loan market such that, in terms of a third commodity serving as *numéraire*, say steel, it is no more profitable to lend in wheat than in barley. **This does not mean that actual own-rates must all be equal, but that their disparities are exactly offset by disparities between forward prices**." (p.238)

# 2 – FUTURES MARKETS AND OWN-RATES

- It is absolutely undeniable that Lachmann (1956, 1986a) made outstandingly precise and relevant contributions to the debate initiated by Hayek and Sraffa in 1932.
- However, we feel Lachmann merely sought to achieve consistency within a Wicksellian/Hayekian thinking framework.
- In other words, we think Lachmann did not push his remarks far enough, and did not incorporate his heterodox views into the debate.

# 3 – OUT OF EQUILIBRIUM

- The real world is characterised by:
  - Uncertainty
  - Costs of transaction
  - Heterogenous preferences
  - Heterogenous expectations

- This is clearly acknowledged by Lachmann in *Market as an economic process* (1986b):
  - "we are forever moving from an irrevocable past into an unknowable future" (p. 89)
  - "the subjectivism of expectations has to complement the subjectivism of preferences" (ibid)

# 3 – OUT OF EQUILIBRIUM

- There is a general agreement that **the natural rate of interest is unique and equal to the equilibrium value if the economy is in (intertemporal) equilibrium**.
- However, the characteristics listed previously create forces that go against the constitution of an equilibrium.
- Lachmann tried to rescue Hayek's analysis and the Austrian Business Cycle Theory, but it contradicts other aspects of his economic thinking.

# 3 – OUT OF EQUILIBRIUM

- We list a few issues that arise from the listed points.
- 1) In a pure barter economy characterised by uncertainty and diverging expectations, the forward prices of various commodities could greatly fluctuate due to the gap between various modes of valuations.
- 2) Furthermore, if agents have heterogenous preferences and expectations, why should they use the same numéraire? Various numéraires (a bit like bimmetalism) make it harder to calculate own-rates of interest.

# 3 – OUT OF EQUILIBRIUM

- 3) The cost of transaction may not be the same for every type of transaction, depending on the numéraire and the goods traded.
- 4) Is the interference due to the issuance of money by banks only, or more generally to the interference resulting from the creation of financial tools and assets (shares, debt instruments, derivatives, etc) in general?