Note E. Wicksell’s Monetary Theory

1. THE DETERMINATION OF THE ABSOLUTE PRICE LEVEL

As already noted, Wicksell denied the relevance of utility analysis for monetary theory. But despite this formal methodological declaration, he developed a cash-balance approach based implicitly on the services that money holdings as such provide. The striking passage in Interest and Prices in which this is made clear is also the one which provides a description, unique in the literature, of the *tâtonnement* by which the absolute price level is determined. It reads:

Now let us suppose that for some reason or other commodity prices rise while the stock of money remains unchanged, or that the stock of money is diminished while prices remain temporarily unchanged. The cash balances will gradually appear to be too small in relation to the new level of prices (though in the first case they have not on the average altered in absolute amount. It is true that in this case I can rely on a higher level of receipts in the future. But meanwhile I run the risk of being unable to meet my obligations punctually, and at best I may easily be forced by shortage of ready money to forgo some purchase that would otherwise have been profitable.) I therefore seek to enlarge my balance. This can only be done—neglecting for the present the

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1 Attached to Chapter VIII:1.
2 See beginning of Note D.
3 London, 1936. Trans. R. F. Kahn from the original German of *Geldzins und Güterpreise* (1898).
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2. The Demand Curve for Money

On the basis of the rectangular hyperbola which he draws in his Lectures II, Wicksell is usually lumped together with Walras and economists of the Cambridge school as having maintained that the demand for money has uniform unitary elasticity. Nevertheless, closer examination of Wicksell's discussion makes it quite clear that he intended his rectangular hyperbola to represent the market-equilibrium curve of Figure III-3 of the text, and not the demand curve of Figure III-1b.

In particular, a reading of this discussion shows that Wicksell is not concerned with the "demand for money"—he does not even mention this term—but with the relationship between the quantity of money and its equilibrium exchange value. Wicksell emphasizes that money is like other goods in that an increase in its given supply decreases its value, but that it has the "special peculiarity" that this inverse dependence is necessarily of proportionate one. This is what he illustrates by the rectangular hyperbola mentioned above. The diagram in which this hyperbola is drawn—and in which it is contrasted with the corresponding curves for commodities—is reproduced here as Figure N-1. It is significant that the term "demand" does not appear in this diagram at all. It is also significant—and again just what our interpretation leads us to expect—that though the discussion on which this diagram is based makes use of "elasticity of demand" in the Marshallian sense, Wicksell does not use this term to describe the properties of the rectangular hyperbola which he presents.

Further evidence in support of our interpretation is provided by a comparison of the foregoing diagram with the one presented by Wicksell in his theory of value. Here he analyzes the market for commodity B in terms of the diagram reproduced in Figure N-2, where D is expressly designated as the demand curve, and S as the supply. In sharp distinction to Figure N-1, the price variable now appears on the horizontal axis. But this apparently mysterious reversal of axes is

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6 Lectures II, pp. 147–48.
precisely what the logic of Wicksell’s argument—as it has been interpreted here—requires. For the demand and supply curves of Figure N-2 describe the outcome of a conceptual individual-experiment which takes to price of the commodity as the independent variable; hence, in accordance with mathematical custom, this variable appears on the horizontal axis. But the market-equilibrium curves of Figure N-1 describe the outcome of a conceptual market-experiment which takes the price as the dependent variable; hence, in accordance with this same custom, it now appears on the vertical axis. Thus the difference between these two diagrams is not a chance one, but the systematic reflection of their differing conceptual frameworks.\(^{13}\)

\(^{13}\) It should be emphasized that, as Mr. Bent Hansen has kindly verified for me, this distinction between the two diagrams characterizes all the Swedish editions of Wicksell’s Lectures as well.

\[\text{Figure N-1.}\]

\[\text{Figure N-2.}\]

3. **The Relationship Between Relative Prices and Money Prices**\(^{14}\)

Despite the fact that Wicksell devotes a complete chapter of his *Interest and Prices* to the question of “Relative Prices and Money

\[\text{In this connection we should note that the rectangular hyperbola which Walras draws in his monetary theory appears in a diagram in which—just as in his earlier theory of exchange—price appears on the horizontal axis. See Elements, ed. Jaffé, comparing pp. 94–103 with p. 335. Cf. also above, p. 569.}\]

\(^{14}\) Attached to Chapter VIII:3.
Prices, he fails to make his view on this question completely clear. For one thing, he retains the same term "money prices" both when he considers money which is an abstract unit of account and when he considers money which is a concrete medium of exchange. This alone suffices to create serious exegetical pitfalls. Thus at one point in the chapter he writes:

The exchange of commodities in itself, and the conditions of production and consumption on which it depends, affect only exchange values or relative prices: they can exert no direct influence whatever on the absolute level of money prices.

Similarly, in the Lectures we find: The quantities demanded "are expressed in [terms of] the n - 1 ratios between the money prices of the n commodities." Both passages provide what seems to be a clear statement of the invalid proposition that demand depends only on relative prices. But this is actually not the case; for in both passages it is clear from the context that Wickens is assuming money to be an abstract unit of account; hence the "price ratios" he is referring to are—in our terminology—the ratios of accounting, and not money, prices.

Thus his statements are completely unobjectionable.

A little later in this chapter Wickens does, however, refer to the case of money which has concrete existence and which can therefore act as a "store of value." But even here he leaves his position uncomfortably obscure. In particular, he writes:

... one thing is certain: money prices, as opposed to relative prices, can never be governed by the conditions of the commodity market itself (or of the production of goods); it is rather in the relations of this market to the money market, in the widest sense of the term, that it is necessary to search for the causes that regulate money prices.

The implication here is unmistakable that relative prices can be "governed by the conditions of the commodity market itself." But there is no way of knowing if this ambiguous phrase refers to the "conditions" of equilibrium in the commodity market itself—in which case it is an expression of the invalid dichotomy—or to the "conditions" of the initial given quantities in this market—in which case it is not.

4. The "Cumulative Process"

A correct appreciation of the place of the "cumulative process" in Wickens's monetary theory must start from the understanding that Wickens always regarded himself as an adherent of the quantity theory and as one of its loyal defenders against critics. At the same time, however, he consistently opposed mechanical formulations of this theory and emphasized the importance of rationalizing it in economic clearly demonstrates—to use our terminology—the determinacy of money prices and indeterminacy of accounting prices.

Interest and Prices, p. 24, italics in original. See also ibid., p. 49 that "relative prices are the only things that really matter so far as production and consumption are concerned."

This in case it is an expression of the first—and valid—dichotomy described in Chapter VIII: 3 above.

Attached to Chapter X: 3 (end), and XV:1.

In addition to the references to Interest and Prices and Lectures II given in this section, the reader might also find it profitable to consult Wickens's "Influence of the Rate of Interest on Prices," Economic Journal, XVII (1907), 213–19.
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terms. This, indeed, was his explicit purpose in writing the vivid passage cited in full on pp. 581–82 above. It must also be stressed that the “money” which Wicksell associated with the quantity theory was the metallic currency which served as legal tender and as the ultimate reserves of the banking system. In particular, he did not include in it demand deposits. Instead, he regarded the expansion of demand deposits as an increase in the “virtual velocity” of the metallic bank reserves, enabling them to carry out a larger volume of payments. 25

It is against this background that Wicksell defined his major analytical task: One of the “weaknesses” of the Quantity Theory ... [is that it] assumes an almost completely individualistic system of holding cash balances,” whereas such balances have been “replaced in practice by a kind of collective holding of balances, arising out of the acceptance by banks of deposits.” 26 In particular, an increase in the quantity of metallic money in a modern economy goes primarily to supplement bank reserves, and not private cash balances. Hence there exists no direct real-balance effect to drive prices upwards. It is therefore necessary to supplement the traditional quantity theory with an explanation of how an increase in bank reserves ultimately brings about an increase in prices. And this is the role of the “cumulative process.” 27 28


26 *Interest and Prices*, p. 41.

27 In addition to the references in the three preceding footnotes, see *Interest and Prices*, pp. viii, xxii–xxiii, 79–80, 101; *Lectures II*, p. 160.

28 That Wicksell was an advocate of the quantity theory has been duly emphasized by Marquet in his *Theory of Prices*, Vol. I, Chapters VI-X. In particular, Marquet takes Ohlin to task for implying the contrary in his Introduction to the English translation of *Interest and Prices* (p. xiv; cf. *Marquet, Theory of Prices*, p. 184, footnote 73, and p. 221, footnote 43).

In this connection Wicksell seems to have suffered more from his “introducers” than from his critics. Thus in his Foreword to Wicksell’s *Value Capital and Rent*, Shackle returns to Ohlin’s implication that Wicksell was an opponent of the quantity theory (ibid., pp. 8–9). Shackle bases himself primarily on Wicksell’s statement that the validity of the quantity theory depends on the “flimsy” assumption that the “velocity of circulation of money” remains unchanged (*Interest and Prices*, p. 42). But, as is clear from what has just been explained in the text, this is simply a misunderstanding of Wicksell’s usage of “velocity.” In particular, Wicksell meant nothing more damaging to the quantity theory by this statement than did Fisher when he made the equation of exchange depend on M’ as well as M. Cf. also *Interest and Prices*, pp. 61–62.

29 The remainder of the present study reproduces with minor changes the contents of my “Wicksell’s ‘Cumulative Process,’” *op. cit.*, pp. 836–44.

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The details of this process can best be seen by following through Wicksell’s analysis of what is in many ways his “standard case.” Assume a gold-standard world, and consider one particular economy, A, which does not produce gold. Start off from a position of equilibrium. Assume now that this equilibrium is disturbed by the discovery of new gold fields in economy B. Wicksell now distinguishes between two effects of the discovery of gold, both of which tend to increase prices in the non-gold-producing country, A. First, there is a direct effect due to the increased demand of B for the goods of A. This causes a price increase in A without any change in the interest rate. 29 If the gold were to be kept entirely in the hands of private individuals in A, there would be no further effects. If, however, some of the gold is transferred directly to A’s banks by foreign capitalists, or is deposited there by the public of A, then there is an additional effect.

The banks, finding themselves with excess reserves, will desire to expand their loans. In order to attract borrowers, they will reduce the bank rate. This will have two consequences: “in the first place saving will be discouraged and for that reason there will be an increased demand for goods and services for present consumption. In the second place [since the real rate—the marginal efficiency of capital—depends only on real factors, which have not changed] the profit opportunities of entrepreneurs will thus be increased.” Hence they will increase their bank borrowings. The new demand deposits that will thus be placed at their disposal 31 will enable them to increase their “demand for goods and services, as well as for raw materials already in the market for future production.... Owing to the increased income thus accruing to the workers, land-owners, and the owners of raw materials, etc., the prices of consumption goods will begin to rise, the more so as the factors of production previously available are now withdrawn for the purposes of future production. Equilibrium in the market for goods and services


30 *Lectures II*, pp. 190–91, 199; *Interest and Prices*, pp. xxvi, 106, Chapter IX.

31 Throughout his analysis it is clear that Wicksell assumes an expansion in bank credit to be a fundamental intermediate step of the process. For detailed textual evidence, see Marquet, *Theory of Prices*, Vol. I, pp. 183 ff. Marquet refers to *Interest and Prices*, pp. xxiv, 27, 76, 82 (footnote), 83 f., 85, 101, 105, 110, 135, 144, 152, 190; and to *Lectures II*, p. 197.

Wicksell’s failure to make this assumption even more explicit is another reflection of the already emphasized fact that he did not consider demand deposits as constituting part of the money supply proper.
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will therefore be disturbed. As against an increased demand in two directions there will be an unchanged or even diminished supply [since we are assuming full employment], which must result in an increase in wages (rent) and, directly or indirectly, in prices.\textsuperscript{32} Again, it must be emphasized that “only in so far as new gold is deposited in the banks in the form of ‘capital’, i.e., without being drawn out in cheques and notes soon after, can it give rise to a lowering of interest rates and in that way affect prices.”\textsuperscript{33}

The resulting price increase is, to use Wicksell’s term, “cumulative”; that is, a given discrepancy between the bank rate\textsuperscript{34} and the real rate will, if maintained indefinitely, bring about a continuous, and not merely a given, increase in prices. In other words, after the initial increase in prices, “a further rise in prices [does not] require a further fall in the rate of interest.” It must be emphasized that by “cumulative process” Wicksell does not mean a self-generating one, that is, one which carries within itself all the elements necessary for its own perpetuation. Specifically, as we have just seen, even if the discrepancy between real and market rates were to be maintained during subsequent periods, prices could not continue to rise unless bank credit continued to expand. Nor does Wicksell mean that the process continues because it generates expectations of further price rises. For he assumes that entrepreneurs generally anticipate future prices to be the same as present ones. He does recognize that this assumption is not always true. But, as we shall see soon, he makes it clear that he considers the case of elastic

\textsuperscript{32} Lectures II, pp. 194–95; cf. also Interest and Prices, pp. 87 ff. The assumption of full employment is explicitly made on p. 195 of the former reference.

In his Interest and Prices Wicksell considers only the indirect effect, and so insists that no change in prices can take place without a prior change in the interest rate. In Lectures II Wicksell not only modifies this stand by introducing the direct effect, but goes as far as to relegate the indirect effect to secondary importance, stating that “contrary to Ricardo’s view, [it] does not happen as a rule” (Lectures II, p. 215).

(Cf. also the passage from Wicksell’s Preface to the first Swedish edition of Lectures II cited by Ohlin in his Introduction to Interest and Prices, pp. xv–xvi. This Preface is omitted from the English translation.)

In the light of Viner’s study of the treatment accorded to the direct and indirect effects in the classical literature, it is interesting to note that Wicksell attributes his earlier view to the classical school [ibid.; Jacob Viner, Studies in the Theory of International Trade (New York, 1937), pp. 394–403].

\textsuperscript{33} Lectures II, p. 215.

\textsuperscript{34} In what follows, this term is used interchangeably with “market rate,” since, in Wicksell’s system, this is initially set by the banks.

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price expectations to be a special one, outside his main field of investigation.\textsuperscript{35}

The question then arises: Are there any forces which bring the cumulative process to an end? Do there exist any “limits … which restrict the power of the banks” to maintain indefinitely a rate lower than the real one?\textsuperscript{36} Taking account of the effect of higher prices on the reserves of the banks, Wicksell answers this question in the affirmative. First of all, the high prices will cause an external drain, forcing the banks to raise their rate. But this is not a sufficient answer; for if other countries are expanding at the same rate, this influence will not be operative.\textsuperscript{37}

Wicksell then introduces the fundamental restrictive element in this process: If the banks maintain their rate below the real one, the resulting expansion of bank loans will ultimately bring about an internal drain. For “when there are no [bank] notes of small denomination and where metallic money is used in business, then on this assumption [of a continuous rise in commodity prices] the increased demand for gold for internal business would soon empty the bank’s vaults.” Hence, in order to protect their reserves, the banks must raise their rates. In this way, “the two rates of interest … reach ultimate equality, but only after, and as a result of, a previous movement of prices.”\textsuperscript{38(39)} When this equality is reached, there will be no further incentive for entrepreneurs to increase their borrowings from the banks. Throughout this process of adjustment the marginal efficiency of capital—that is, the real rate of interest—remains unchanged: for the prices of productive services and investment goods rise in the same proportion as the anticipated

\textsuperscript{35} The quotation in this paragraph is from Interest and Prices, pp. 93–94.

Supporting evidence for the second half of this paragraph will be found in the references cited in footnote 32 above; Interest and Prices, p. 95; and Lectures II, pp. 185 and 196. Cf. also the discussion below of the “divergent case.”

\textsuperscript{36} Interest and Prices, pp. 111 ff.

\textsuperscript{37} Lectures II, p. 189; Interest and Prices, pp. 78, 113.

\textsuperscript{38} An implicit assumption of the analysis is that there is no rationing of credit. Cf. Margen, Theory of Prices, Vol. 1, pp. 223 ff.

\textsuperscript{39} The two citations in the text are from Lectures II, p. 189, and Interest and Prices, p. 135, respectively. Italics in original. There will also be an internal drain into industrial use; cf. Interest and Prices, p. 113; Lectures II, pp. 124–25.

For other passages dealing with the process described in the text, cf. the following: Lectures II, pp. 90, 124–26, 164, 179, 186, 194, 196, 198, 201–202, 204; Interest and Prices, pp. xxvi–xxvii, 113–17. Cf. also the passage from Interest and Prices, pp. 108–11, cited on p. 368 above.
prices of the goods they produce. Thus the system is brought to a new equilibrium position: one in which the market rate of interest is the same as it was before the disturbance, but prices are, and remain, at a higher level.\footnote{\textit{Lectures II}, pp. 198–99. Cf. also \textit{Interest and Prices}, p. 95.}

Thus the operation of a cumulative process does not imply that the system is unstable, and that, after the initial disturbance, it continuously moves away from an equilibrium position. On the contrary, through its effects on bank reserves, the cumulative process in Wicksell’s analysis plays the role of the fundamental equilibrating mechanism forcing the banks to eliminate any discrepancy between the rate they set and the real rate, and thus restoring equilibrium to the loan market.

Underlying the preceding analysis is a simple hypothesis about the dynamic behavior of the market rate. Wicksell assumes that banks never alter their interest rates unless they are induced to do so by the force of outside circumstances. They raise the rate when their gold stocks are threatened with depletion, or their current obligations are so great that their disparity in relation to their gold holdings is regarded as dangerous, or, still more, where both of these things occur together, as is often the case.”\footnote{This passage makes it clear that Wicksell considers a decrease in absolute reserves and an increase in deposits as being two distinct phenomena, even though each causes a decline in the reserve ratio. In fact, the general tenor of Wicksell’s presentation is that banks are much more sensitive to the former than they are to the latter. This interpretation is supported by some explicit passages.\footnote{But, however, the spring which serves to transmit the power between the natural and the money rates of interest; but the spring must first be sufficiently stretched or compressed. In a pure cash economy, the spring is short and rigid; it becomes longer and more elastic in accordance with the stage of development of the system of credit and banking.” (\textit{Interest and Prices}, pp. 135–36.)

There is a similar passage some twenty-five pages before: “... it is clear that in an elastic monetary system where there is only a small reaction against an alteration in prices [i.e., a small internal drain], a fairly constant difference between the two rates of interest could be maintained for a long time, and the effect on prices might be considerable.” (\textit{Ibid.}, p. 110.)

Unless Wicksell is assuming the difference in sensitivity just described, it is hard to see why there should be the difference he indicates between a cash and credit economy.\footnote{\textit{Compare this with the passages from Hume, Thornton, Ricardo, and Mill cited in Note 3 below.}}}

\footnote{\textit{Interest and Prices}, pp. 107, 167–68; \textit{Lectures II}, pp. 205–7.}

\textit{Wicksell’s Monetary Theory}

most important of all, it is a necessary dynamic assumption of Wicksell’s system as presented above. For if bankers were guided, not by their absolute reserves, but solely by their reserve ratio, then they would raise their rates and slow up the expansion of their loans as soon as their reserve ratio declined. In this way the cumulative process could conceivably be brought to an end without an internal drain; correspondingly, the movement of prices would not be the necessary intermediate step of the argument that it is in Wicksell’s presentation.

This exclusive concentration on the level of absolute reserves also explains why Wicksell does not incorporate into his analysis another equilibrating mechanism: namely, as prices rise, the demand for loans at any given rate of interest increases, since entrepreneurs need more money to carry out their projects. Ordinarily, one would say that this would tend to raise the rate of interest. But if we accept Wicksell’s assumption that bankers change the rate only in response to changes in their absolute reserves, this increase in demand cannot directly affect the rate. Consequently, this influence is never even mentioned in Wicksell’s analysis.\footnote{\textit{Compare this with the passages from Hume, Thornton, Ricardo, and Mill cited in Note 3 below.}}

Wicksell emphasizes that it takes time for this equilibrating process to work. Indeed, it is the lag in the adjustment of the market rate to the real rate which enables him to explain the fact that historically rising prices and rising interest rates go together. Wicksell stresses that it is not the level of the market rate which counts, but its relation to the real rate. If the market rate is only slowly moving up toward equality with the real rate, then throughout the period of adjustment the expansion of bank loans is continuing, and with it the increase of prices. Hence the data do not contradict his theory.\footnote{\textit{Interest and Prices}, pp. 107, 167–68; \textit{Lectures II}, pp. 205–7.}
prices.” In such an event, “to put an immediate stop to any further rise in prices, it would not be sufficient for the banks to restore the rate of interest to its original level.” Wicksell’s position here seems to be that even in this case the system will return to equilibrium, but that the return will be a spiraling one. That is, the market rate will first rise above the real rate, and then, as the anticipated price rises fail to materialize, it will fall back to equality with it. He does admit that in the case of a speculative fever there may be “no limit to the rise in prices.” But he gives scant attention to this possibility, and explicitly declares that it is outside his main field of interest.45

On the basis of the preceding exposition it is also quite easy to see the conditions under which the divergent case—in which prices continue to rise indefinitely—can occur. Two situations must be distinguished: If there is a banking system operating with required gold reserves, “the condition on which the banks could maintain a rate of interest permanently below the real rate would therefore be an incessant flow to them of new gold, and under such circumstances commodity prices would also rise continuously.”46

If, however, there is a Wicksellian “ideal bank” or “pure credit” system,47 no such condition is necessary. In this system no one desires to use gold; all money is in the form of demand deposits and bank notes. Hence banks have no need to maintain any gold reserves, are never in any danger of an internal drain, and are thus free to set and maintain indefinitely any market rate they choose. If this rate is less than the real one, bank credit and demand deposits will expand. By increasing the quantity of money in this way, the banks can bring about any specified price level by maintaining a discrepancy between the market and real rates until the desired price level is reached, and then equalizing the rates at that point.48

It is within the preceding context that we must understand the frequently quoted passage in which Wicksell writes:

45 Interest and Prices, pp. 96–98. In his Lectures II, Wicksell devotes only five lines to this subject (p. 207).
46 Lectures II, p. 198.
47 Described in Lectures II, pp. 84–91; Interest and Prices, pp. 68 ff.
48 Cf. the references on p. 589, footnote 31, and p. 591, footnote 39. It might also be noted that in his Preface to Interest and Prices (p. xxvi), Wicksell restricts the conclusion that the market and real rates must be equalized to the “monetary system of actual fact.” Cf. also ibid., p. 80, and especially pp. 110–11. Cf. also the discussion which now follows of Wicksell’s passage, ibid., pp. 100–101.

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It should now be clear that, in so far as our hypothetical conclusions are in accordance with reality, the movement and equilibrium of actual money prices represent a fundamentally different phenomenon, above all in a fully developed credit system, from those of relative prices. The latter might perhaps be compared with a mechanical system which satisfies the conditions of stable equilibrium, for instance a pendulum. Every movement away from the position of equilibrium sets forces into operation—on a scale that increases with the extent of the movement—which tend to restore the system to its original position, and actually succeed in doing so, though some oscillations may intervene.

The analogous picture for money prices should rather be some easily movable object, such as a cylinder, which rests on a horizontal plane in so-called neutral equilibrium. The plane is somewhat rough, and a certain force is required to set the price-cylinder in motion and to keep it in motion. But so long as this force—the raising or lowering of the rate of interest—remains in operation, the cylinder continues to move in the same direction. Indeed, it will, after a time, start “rolling”: the motion is an accelerated one up to a certain point, and it continues for a time even when the force has ceased to operate. Once the cylinder has come to rest, there is no tendency for it to be restored to its original position. It simply remains where it is so long as no opposite forces come into operation to push it back.

It is, of course, clear that such forces can never be entirely absent, no matter how developed the credit system may be, if a precious metal or some other material substance serves as a monetary basis. The simple quantity theory is no longer adequate to deal with the nature of these reactions and with the manner of their operation. It is this question which we shall shortly be considering.49

It would be a serious misunderstanding of Wicksell’s analysis to interpret this passage as making an absolute distinction between the two types of equilibria.50 Such an interpretation is directly refuted by the demonstration above that Wicksell uses the cumulative process as an equilibrating mechanism bringing the system to one definite level of money prices. But even aside from this fundamental objection, the internal evidence of this passage, as well as of its counterpart in Lectures II, shows that Wicksell is not making a general distinction, but is restricting his analysis (as he must, to be consistent) to the case of a pure credit economy.

49 Interest and Prices, pp. 100–101. All but the first italics are in the original.
This evidence is unmistakable. There is, in the first place, the first italicized phrase of the passage.\textsuperscript{51} Secondly, in the corresponding passage in \textit{Lectures II}\textsuperscript{52} the statement that the equilibrium of money prices is only a neutral one is explicitly restricted to the case of "a monetary system of unlimited elasticity"—an alternative term Wicksell uses to describe his pure credit system.\textsuperscript{53} Finally, the concluding paragraph of the above-quoted passage removes any doubt that might remain. In fact, this concluding paragraph (which is the last one of Chapter VII) clearly sets the stage—and gives the cue—for the analysis of the equilibrating cumulative process which Wicksell goes on to describe in Chapter VIII.\textsuperscript{54}

Thus, when read with the qualification upon which he himself insists, Wicksell’s dramatic contrast reduces to a commonplace. When, in addition, we recall that throughout this process of moving from one point of "neutral" equilibrium to another the volume of demand deposits is continuously changing,\textsuperscript{55} it is immediately apparent that, under corresponding conditions, even relative prices would be in "neutral equilibrium"! For what Wicksell is essentially saying is that the level of money prices is indeterminate as long as the quantity of money is not fixed, and that continuous changes in the quantity of money will cause continuous changes in the "price" (value) of money relative to other commodities. But the same statement can be made for the relative price of potatoes—if the quantity of potatoes in the market is continuously changing. Conversely, the equilibrium of money prices can be just as stable as that of relative prices—provided that in each case the initial quantities remain unchanged.

Indeed, one cannot read the foregoing passage without feeling that the emphasis which Wicksell places upon it is simply a reflection of his failure to include demand deposits in his definition of the money supply.

\textsuperscript{51} Not italicized in the original.
\textsuperscript{52} \textit{Lectures II}, p. 197.
\textsuperscript{53} In support of this interpretation of "unlimited elasticity," cf. \textit{Lectures II}, p. 194, lines 6–15; \textit{Interest and Prices}, pp. 110, 135.
\textsuperscript{54} On this whole discussion, cf. the references in footnote 48 on p. 594.

\textsuperscript{55} Though Rosenstein-Rodan quotes from the passage cited here in support of his interpretation, he significantly omits both the first italicized phrase and the final paragraph (op. cit., p. 275, footnote 2).

\textsuperscript{56} For the broader implications of the cumulative process as a simultaneous \textit{milieu} in the commodity and bond (bank-loan) markets, see Chapter XV:1 above.
Note F. Newcomb, Fisher, and the Transactions Approach to the Quantity Theory

1. The Real-Balance Effect

Newcomb's work is of particular interest to us because of his emphasis on the fact that changes in the quantity of money affect prices only through their prior effect on the demand for commodities. Indeed, he explicitly writes this demand as a function of the quantity of money. Furthermore, the form of his function is such that it is unaffected by an equiproportionate change in the price level and in the quantity of money. Nevertheless, it would be a mistake to accept all this as definite recognition of the real-balance effect. For nowhere in his argument does Newcomb bring in that crucial intermediate stage where the monetary increase makes individuals feel that their cash balances are larger than needed so that they can expand their purchases accordingly.

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Newcomb, Fisher, and the Transactions Approach

That is, Newcomb fails to distinguish sufficiently, if at all, between money considered as an income or expenditure flow, and money considered as a reserve balance.

Though drawing his inspiration from Newcomb, Fisher greatly Improved his predecessor's exposition of this point. In particular, the following passage clearly reveals Fisher's understanding of each component of the tripartite quantity-theory thesis, and of the real-balance effect in particular:

Suppose, for a moment, that a doubling in the currency in circulation should not at once raise prices, but should halve the velocities instead; such a result would evidently upset for each individual the adjustment which he had made of cash on hand. Prices being unchanged, he now has double the amount of money and deposits which his convenience had taught him to keep on hand. He will then try to get rid of the surplus money and deposits by buying goods. But as somebody else also must be found to take the money off his hands, its mere transfer will not diminish the amount in the community. It will simply increase somebody else's surplus. Everybody has money on his hands beyond what experience and convenience have shown to be necessary. Everybody will want to exchange this relatively useless extra money for goods, and the desire so to do must surely drive up the price of goods. No one can deny that the effect of every one's desiring to spend more money will be to raise prices. Obviously this tendency will continue until there is found another adjustment of quantities of money to expenditures, and the V's are the same as originally. That is, if there is no change in the quantities sold (the Q's), the only possible effect of doubling M and M' will be a doubling of the p's; for we have just seen that the V's cannot be permanently reduced without causing people to have surplus money and deposits, and there cannot be surplus money and deposits without a desire to spend it, and there cannot be a desire to spend it without a rise in prices. In short, the only way to get rid of a plethora of money is to raise prices to correspond.

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7 See the dedication page in the Purchasing Power of Money (New York, 1911).

8 Ibid., pp. 153–54. The bracketed expression "of money" is inserted on the basis of the following passage two pages earlier: "He adjusts this time of turnover [i.e., F] by adjusting his average quantity of pocket money, or till money, to suit his expenditures [ibid., p. 152]."

9 For a similar passage, see Fisher's Elementary Principles of Economics (New York, 1912), pp. 242–47.
2. The Question of Stability Analysis

Clearly, there is a type of stability analysis in the preceding passage. But I am troubled by the fact that Fisher presents it within a comparative-statics framework, and not (as in the stability analysis of his value theory) within a static one. Consequently, I wonder if Fisher would have applied the foregoing argument to show (like Wicksell) that if the p's fall while M remains constant, the p's will be forced up again. This would be an unjustified quibble—were it not for the evidence of the literature that just such an incomplete recognition of the real-balance effect has repeatedly manifested itself.

3. The Relationship Between the Monetary Equation and the Commodity Equations

The contention of Chapter VIII.3 that Fisher failed to understand the proper relationship between the monetary equation and the commodity equations is based primarily on the following passage from the Purchasing Power of Money, reproduced together with its crucial footnote:

'It is a... fallacious idea that the price level cannot be determined by other factors in the equation of exchange because it is already determined by other causes, usually alluded to as "supply and demand." This vague phrase has covered multitudes of sins of slothful analysts in economics. Those who place such implicit reliance on the competency of supply and demand to fix prices, irrespective of the quantity of money, deposits, velocity, and trade, will have their confidence rudely shaken if they will follow the reasoning as to price causation of separate articles. They will find that there are always just one too few equations to determine the unknown quantities [i.e., money prices] involved.* The equation of exchange is needed in each case to supplement the equations of supply and demand.


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10 Attached to Chapter VIII.1.
13 Attached to Chapter VIII.3.
14 Pp. 174–75, italics in original. Part of this passage has already been cited in the text, p. 184. The work cited in Fisher's footnote was reprinted in New Haven, 1925. All references are to this reprint.
15 Cf. also the equation added on p. 59 of the Mathematical Investigations in the Theory of Value and Prices.
17 Indeed, this is the way I understood it until W. J. Baumol (in a letter written in the spring of 1953) suggested the possibility set out in the next sentence.
for Fisher may tacitly be assuming that this doubling of prices is accompanied by a doubling of money holdings, so that there is no real-balance effect. That this is not a far-fetched possibility is suggested by the parallel discussion in his Elementary Principles of Economics, which begins with the explicit assumption "that we change our monetary unit so that what is now fifty cents should be called a dollar."18 On the other hand, this discussion in no way indicates that Fisher was aware of the crucial importance of this accompanying increase in the quantity of money. This is particularly noticeable in his subsequent statement that "if previously people were willing to take [a certain quantity of sugar] ... at one price, they are now willing to take it at double that price, because this double price means in purchasing power exactly the same thing as the original price."19 The equally necessary "and because their initial nominal money holdings have also doubled" is significantly absent.

Actually, the Elementary Principles of Economics provides just as convincing proof as the Purchasing Power of Money that Fisher was guilty of the invalid dichotomy. Chapter XV of the former—in which the passages just cited appear—is essentially an elaboration of the two passages from the latter cited earlier in this section. The reader must study this Chapter XV for himself and see if he can leave it with any other impression than that of the invalid dichotomy. It should particularly be emphasized that the final, summarizing paragraph of this chapter is the source of the revealing passage cited in full at the end of Chapter VIII:3 above.20

18 Elementary Principles, p. 274.
19 Ibid., p. 275.
20 Note also how this chapter constantly develops the theme that "individual prices, such, for instance, as the price of sugar, presuppose a price level" (ibid., p. 258).

It might finally be noted that A. G. Hart also interprets Fisher's Elementary Principles this way—though without realizing that the dichotomy is invalid. Cf. his Money, Debt, and Economic Activity (2nd ed.; New York, 1953), p. 144, footnote 4.

Note G. Marshall, Pigou, and the Cambridge Cash-Balance Approach to the Quantity Theory

I. THE REAL-BALANCE EFFECT

The Cambridge cash-balance tradition begins, of course, with Marshall2 and continues with Pigou,3 Keynes,4 and Robertson.5

2 Attached to Chapter VIII:1.
4 For the real-balance effect, see Money Credit and Commerce, bottom of p. 43; Official Papers, p. 52. On the other hand, it might be noted that in his Economics of Industry (London, 1881), Marshall analyzes the consequences of a general decline of prices without making any mention of this effect [Book III, Chapter I, §5; as reprinted in Readings in Business Cycles and National Income, ed. A. H. Hansen and R. V. Clemence (New York, 1953), p. 102].

6 J. M. Keynes, Tract on Monetary Reform (London, 1923), pp. 74–79.
7 For the real-balance effect, see bottom of p. 75. For the terming of Fisher’s theory as “artificial,” see bottom of p. 78. Cf. also Keynes’ review of Fisher’s Purchasing Power of Money, in Economic Journal, XXI (1911), 394–96.
Supplementary Notes

None of these writers provides as vivid or systematic a picture of the real-balance effect as do Wicksell and Fisher. Nevertheless, they do at various points indicate their recognition of this effect.

2. The Absence of Stability Analysis

One of the central motivations of the Cambridge cash-balance approach is the desire to integrate monetary theory and value theory. Thus Marshall goes out of his way to show how the value of money can be determined by the use of ordinary demand and supply curves. Pigou systematically organizes his analysis of the "Value of Money" under the successive section headings "The Demand for Legal Tender Money," "The Supply of Legal Tender Money," and "Demand and Supply." And Robertson stresses that his book on Money is "the second volume of a series [namely, Cambridge Economic Handbooks], its connection with its predecessor—Mr. Henderson's Supply and Demand—is to be found in the emphasis laid on the theory of money as a special case of the general theory of value."

It is the contrast it affords with this obvious desire that lends crucial significance to the failure of Cambridge economists to carry over to their monetary theory the stability analysis of their value theory. Thus Marshall's graphical analysis of international trade in Appendix J of Money Credit and Commerce has a detailed discussion of stability conditions, but his graphical analysis of the determination of the value of money in Appendix C is void of even an allusion to such a discussion. This omission must also be contrasted with Marshall's well-known discussions of stability conditions in his ordinary theory of value.

Marshall, Pigou, and the Cash-Balance Approach

The same asymmetry characterizes Pigou—who refers to the latter discussions in their appropriate contexts, but who makes no attempt to apply them to monetary theory. Similarly instructive is the absence of stability analysis in Robertson's Money as compared with its presence in Henderson's Supply and Demand.

It is particularly interesting to see how this asymmetry is perpetuated in the early textbooks which drew their inspiration from Marshall. Thus both J. S. Nicholson and S. Chapman present simple stability discussions in their value-theory chapters and omit such discussions in their monetary-theory ones. But at the same time, Chapman concludes his discussion of the quantity theory by emphasizing that "the reader will now perceive that the theory of money fits into the ordinary theory of the determination of the value of things by demand and supply."

3. The Unitary Elasticity of Demand for Money

In the well-known Appendix C to his Money Credit and Commerce, Marshall presents a diagram, reproduced here as Figure N-3, in which the demand curve for gold in its monetary use is represented by the

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20 Pp. 27-38.
27 We might note that David Barbour does present the beginnings of a stability analysis when he asks what happens if "all prices and wages ... are increased fivefold." His argument—which is not very complete—is, however, carried out entirely in terms of the effect of such a price rise in generating an internal drain and thereby reducing bank reserves; the effect on the real value of individual cash reserves is completely ignored. It should also be emphasized that Barbour's thinking on monetary theory does not show any Marshallian influence. [The Standard of Value (London, 1912), p. 37; see also pp. 38-40, 44.]
28 Attached to Chapter VIII: 2.
rectangular hyperbola \( dd' \). Similarly, "supply is ... shown by a vertical straight line \( BS \) representing a given aggregate stock of gold."\(^{24}\) If gold has only monetary uses, its equilibrium value is then determined by the intersection of \( dd' \) and \( BS \) at \( A \). If, however, it also has non-monetary uses, its equilibrium value is determined by the intersection of \( DD' \) with \( BS \)—where \( DD' \) represents the composite demand curve for both types of uses. In his classic essay on the "Value of Money," Pigou essentially restricts himself to the monetary demand, refines and elaborates Marshall's discussion considerably, but also emphasizes that the demand curve for money has the form of a rectangular hyperbola and is therefore of uniform unitary elasticity.\(^{25}\)

![Graph showing demand and supply curves](image)

**Figure N-3.**

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Marshall, Pigou, and the Cash-Balance Approach

It must be emphasized that, unlike Wicksell,\(^{26}\) Marshall and Pigou are definitely referring to a demand curve and not a market-equilibrium curve.\(^{27}\) Correspondingly, they are definitely using "unitary elasticity of demand for money" in the ordinary Marshallian sense of elasticity. That this is the intended usage can be seen from the fact that the only distinction Marshall draws in Appendix C between his rectangular hyperbola and any other demand curve is that the former refers to a stock and not a flow.\(^{28}\) It can be seen even more explicitly from the footnote at the end of the Appendix, in which Marshall refers the reader to the specific demand and supply curves of the Principles for an extension of his analysis to more complicated cases. This footnote concludes with the observation that even in these cases "the representative currency-demand curve for gold would be a rectangular hyperbola."

The case of Pigou is also clear. In what other than the usual Marshallian sense can we understand the passage in which he writes that "when the supply of legal-tender money varies in a given measure, the resultant change in the value of money will be less, the more elastic is the demand. Since, however, the demand for money always has an elasticity equal to unity, this proposition has no practical implications."\(^{29}\) To this can be added the equally revealing passage cited at the beginning of Chapter VIII:2 above.

As has, however, been noted in the text,\(^{30}\) if the assumptions of Marshall's ordinary demand curve are transferred to his money demand curve, then the latter should indeed be represented by the rectangular hyperbola of Figure II-1b. I hesitate, however, to make such a transfer because it has implications at odds with other characteristics of Marshall's analysis. In particular, the whole point of Marshall's approach is to organize the forces which determine the equilibrium price into two categories—demand and supply—which, ideally, are mutually exclusive. Now, the distinguishing feature of the demand curve in Figure II-1b is that it depends on the supply of money. Surely this interdependence of demand and supply—so unusual for Marshall—would have been explicitly pointed out by him. This consideration is

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\(^{24}\) Money Credit and Commerce, p. 283.


\(^{26}\) Above, Note E:2.

\(^{27}\) *Op. Cit.* pp. 48-50 above.

\(^{29}\) *Money Credit and Commerce*, p. 282.


\(^{30}\) P. 170-71.
even more telling with reference to Pigou. For though he does point out that “the demand schedule and the supply schedule for money are not strictly independent of one another,” he does not base this observation on the grounds referred to in Figure II-1b.\footnote{E. Cannan, “The Application of the Theoretical Apparatus of Supply and Demand to Units of Currency,” Economic Journal, XXXI (1921), reprinted in Readings in Monetary Theory, p. 10. See also his Money: Its Connexion with Rising and Falling Prices (4th ed., rev.; London, 1923), pp. 66–70.}

Marshall and Pigou made the phrase “unitary elasticity of demand for money” a standard fixture of the literature on monetary theory.\footnote{Ibid., pp. 69–71; “The Application ...,” op. cit., pp. 10–12.} This phrase is, however, used indiscriminately to refer now to a demand curve, now to a market-equilibrium curve, and now to both at the same time. Thus Chapman writes:

... if the quantity of commodities remains fixed, an increase of money causes depreciation of money and a decrease of money appreciation of money. The latter proposition is sometimes expressed quantitatively in technical language by saying that the elasticity of demand for money is unity (see pp. 42–44).\footnote{Op. cit., pp. 217–18, italics and page references in original.}

This by itself is a perfect description of the market-equilibrium rectangular hyperbola in Figure III-3; but the pages to which Chapman refers at the end of the passage provide an explanation of the elasticity of demand of a Marshallian demand curve! Similarly, Taussig writes:

Hence when there is twice as much money, the same number of commodities will be offered for the money, and prices will be twice as high as before. In other words, using a phrase already explained, the elasticity of demand for money is unity.\footnote{Ibid., pp. 126–30.}

Once again, though the first sentence describes a market-equilibrium curve, the only context in which Taussig has “already explained” the phrase “elasticity of demand” is in connection with a Marshallian demand curve.\footnote{Note also that subsequently, on p. 252, Taussig writes: “Herein the position of money is unique. As regards the immense majority of commodities, demand is elastic in some cases, inelastic in others, but rarely so balanced that the same sum is always spent on any one. Here again he seems to be using elasticity in the Marshallian sense.}

Finally, we can consider the example of Cannan, who, for the most part, uses “unitary elasticity of demand” in the Marshallian sense,\footnote{Op. cit., pp. 578–79. Cf. also above, pp. 567–68.} but who also argues in the market-equilibrium sense that this elasticity may be less than unity because the expectations generated by a rising price level might cause it to rise more than in proportion to the quantity of money.\footnote{Op. cit., p. 197.}

It might finally be noted that descriptions of the demand curve for money as having unitary elasticity in the Marshallian sense have continued to characterize the more recent literature—as the examples of Samuelson\footnote{Foundations of Economic Analysis, p. 121. Cf. also his Economics: An Introductory Analysis (2nd ed.; New York, 1951), p. 346 (bottom).} Chandler,\footnote{Op. cit., p. 549–50.} and Hart\footnote{Attached to Chapter VIII:3.} show.

4. THE RELATIONSHIP BETWEEN MONETARY THEORY AND VALUE THEORY\footnote{Attached to Chapter VIII:3.}

To the best of my knowledge, the only discussion by Cambridge economists of the relationship between monetary theory and value theory that is relevant to our present inquiry occurs at the beginning of Pigou’s essay on the “Value of Money.” Here Pigou writes:

For the present purpose [of determining the value of money] it is convenient to adopt a plan similar to that employed by Dr. Marshall in his unpublished paper on the “Pure Theory of Foreign Trade,” which has been reproduced in Professor Pantaleoni’s Pure Economics, and to assume that the value of all commodities other than money in terms of one another is determined independently of the value of money. On this assumption, the value of any combination of commodities in general can be cited in terms of any single commodity. The aggregate of all commodities is represented by so many bushels of wheat; and the value of money by the number of bushels of wheat which a unit of it will purchase. This value is governed, like the value of everything else, by the general conditions of demand and supply. An investigation of
the causes upon which the value of money depends means, therefore, just as it would do if we were concerned with lead or tobacco, a detailed analysis of these two groups of forces. To this analysis, therefore, we may at once proceed.43

The crucial question is the meaning of the phrase which has been italicized. If this means "determined independently by value theory," then Pigou is clearly involved in the false dichotomy discussed at length in Chapter VIII.3. But what else can the phrase mean? It cannot refer to the determination of relative prices that takes place in the first stage of the first dichotomy of Chapter VIII.3.44 For in this stage the forms of the demand functions are already known, and, in particular, their dependence on the amount of real balances already specified; hence one of the major tasks Pigou sets himself (viz., the determination of the demand for money) is already accomplished. Furthermore, as emphasized in the text, this first stage constitutes all of economic analysis; all that remains is the arbitrary specification of the quantity of money. This is hardly the fitting point of departure for an essay whose purpose is to show how demand-and-supply analysis can be applied to the problem of money.

Further light on this question is cast by the passage in Marshall to which Pigou seems to be referring. This passage reads as follows:

The pure theory of foreign trade ... is based upon the hypothesis that two countries, say England and Germany, carry on trade with each other but only with each other. ... It is assumed that the pure theory of domestic values has provided the means of measuring the value in England of all the various wares exported by England in terms of any one of them. Suppose cloth of a definite quality to be one of them; then the value, in England, of all the wares which England exports may be expressed as that of a certain number of yards of cloth. So the value in Germany of all the wares which Germany exports may be expressed as that of, say, a certain number of yards of linen.45

The parallels between this passage and Pigou's are quite clear. Hence, if Pigou is "adopting" Marshall's plan, he is assuming that "the value of all commodities other than money in terms of one another" has been "independently determined" by the "pure theory of domestic values." But this is the essence of the invalid dichotomy.46

44 Cf. p. 173.
46 Cf. p. 183 above.