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Robert W. Clower

NEW DIRECTIONS
FOR KEYNESIAN ECONOMICS

QUADERNI DELL'ISTITUTO DI ECONOMIA

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Siena, gennaio 1987

The New Classical Economics, heralded a few years back as "the wave of the future in macroeconomics", now appears to be on its way out, leaving Keynesian economics in much the same state of disarray as the Monetarist counterrevolution placed in the early 1970's. New Classical Economics and Monetarism notwithstanding, few economists have ever seriously doubted the validity of Keynes's contention that "... the existing economic system is [not] , in any significant sense, self-adjusting" (JMK, XIII, p. 486). But equally few economists find themselves in agreement with Keynes because of anything in the *General Theory*; concensus obtains rather because of a shared conviction that, on the self-adjustment issue, Keynes's "vision" was vaguely right even when his analysis was clearly wrong.

But if light on the future direction of macroeconomic analysis is not to be found in the New Classical Economics, in Monetarism, or in conventional Keynesian economics, under what lamp post should we look? My purpose in this paper is to suggest an answer to this question. I start, as Keynes and most of his early interpreters started, by outlining a simplified aggregative model of classical theory which can plausibly be claimed to represent an essentially self-adjusting monetary economy. Later I ask (as so many economists since Keynes have asked): what characteristics of the classical theory might plausibly be altered to yield a model consilient with Keynes's "vision"? Once this rather special question has been answered, we may hope quickly to resolve the more general issue that is our main concern.

1. The Classical Tradition

No classical theory of short-run adjustment is to be found in the pre-Keynesian literature[1], probably because no classical writer thought it purposeful to attempt to reduce the complexities of real-time trading processes to analytical order. So my version of short-run classical theory is less a description of what any pre-Keynesian writer actually said than an account of what I think a Nineteenth Century "true believer" in the self-adjusting capabilities of the economic system might have said had he been trained in modern theory.

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Taking our cue from John Hicks's influential 1937 paper on "Keynes and the Classics"[2], let us start by considering a fiat money economy with just four classes of non-money commodities: consumption goods (c), capital goods (k), labor (n) and loans (b). Suppose that the number of traders and the physical volume of trading in each commodity is sufficiently great that, even in the very short run, no seller or buyer either imagines himself or is, in fact, capable of significantly influencing the terms of trade by his own actions: more succinctly, *assume that any trader can buy or sell any desired quantity of any commodity on short notice at the "going" price.* For future reference, let us call this assumption the *Thick Market Hypothesis.* Then, whether we regard the typical trader as one of many transactors in an organized auction market or as a market-maker in his own right, we may suppose that short-run sale and purchase decisions are governed at every point in time by the prevailing (average) market prices, $p_c, p_k, p_n = w$, and $p_t = 1/r$.

Still following Hicks, let us further assume that the money wage rate, w, is given and that capital goods already in use are specialized to particular trades and have no second-hand market. Then we may set out our "classical" model as a system of three price-adjustment equations:

(1) $dp_c/dt = a_c \left[d_c(p_c, p_k, w, r, Y_n, M) - s_c(p_c/w) \right]$,

(2) $dp_k/dt = a_k \left[d_k(p_c, p_k, w, r, M) - s_k(p_k/w) \right]$,

(3) $dr/dt = a_b \left[x_b(p_c, p_k, w, r, M) \right]$,

where d, s and x stand for "demand", "supply" and "excess demand", M represents the quantity of money, and Y_n represents the realized money earnings of workers[3].

On the Thick Market Hypothesis, it is plausible to suppose that the motions of this system in the neighborhood of an equilibrium point are stable and heavily damped; hence, the average "observed" values of the dependent variables p_c, p_k, and r may be presumed to be given as reduced-form solutions of the excess demand equations. The qualitative properties of these solutions are standard.

Here it will suffice to remark that, assuming no money illusion, relative prices and the rate of interest - hence output and employment - will vary with changes in the quantity of money. Monetary neutrality holds only if we assume flexible money wage rates and add a wage-adjustment equation to the system[4].

This model captures the essential flavor of classical theory. Except as a "temporary abode of purchasing power", money has no significance as an asset because in normal circumstances it offers its holder no return and is no more "liquid" than any other commodity. Money plays a special role in the economy only because it enters into one side of every exchange transaction and so - through real balance effects - directly influences the absolute level of money prices. Individual economic activities are coordinated by "the price system". If changes in underlying parameters ("animal spirits", the "propensity to hoard", etc.) produce temporary inconsistencies in consumption, production or trading plans, these inconsistencies are quickly reconciled through movements in prices, any consequent changes in output and employment being incidental.

There are extreme cases, of course, in which the system could get into trouble. A sudden collapse in the marginal efficiency of capital, for example, might yield so low a price for capital goods that gross real investment would go to zero and remain there pending the elimination of excess capacity through gradual wear and tear. Similar consequences might ensue if trading in loans came to be dominated by speculative "bulls" and "bears" whose gambling proclivities pushed the real rate of interest to a level where new investment was chronically unprofitable. Notice, however, that in both these cases the underlying source of delayed adjustment is the absence of a market for second-hand capital goods. In effect, the assumption that existing capital goods can't be traded (as also the assumption that the money wage rate is given) is a violation of the Thick Market Hypothesis. Thus our discussion of extreme cases merely reinforces earlier indications that the classical conception of the economic system as naturally self-adjusting is intimately connected with the validity of the Thick Market Hypothesis.

II. Keynes's General Theory

Turning now to the *General Theory*, we have no need to invent a model; we can start with Keynes's summary of the analytical core of his argument, as set forth in Chapter 18 (pp. 247-9) of the *General Theory*. This summary has been formalized in various ways by later interpreters and critics; but John Hicks's 1937 "interpretation" sets out the nearest thing to a canonical representation of the Keynesian model, so let us settle for that (Modigliani's 1944 model has achieved much the same status, but is less general because it treats capital goods and consumption goods as identical rather than distinct commodities).

First we need some additional notation. Let Y denote total income, defined as the sum of income produced in the consumption goods industries, $Y_c = p_c s_c(p_c/w)$, and income produced in the investment goods industries, $Y_k = p_k s_k(p_k/w)$:

$$Y = Y_c + Y_k.$$

Similarly, let E_c and E_k denote total expenditure on consumption and investment goods: $E_c = p_c d_c(\cdot)$; $E_k = p_k d_k(\cdot)$.

Then, continuing as before to treat the money wage rate and the quantity of money as given parameters, we may express Hicks's schematic model of Keynes's "General Theory"[5] as

$$(4) \quad M = L(r, Y),$$
$$(5) \quad Y_k = E_k(r, Y),$$
$$(6) \quad Y_k = Y - E_c(r, Y).$$

This system of three equations may be presumed to determine solution values of Y, Y_k and r from which, taking account of earlier definitions and underlying production functions, we can work out corresponding solution values of employment and output. But in what sense can the system (4)-(6) be said to represent a "theory of output and employment" rather than a "theory of price"?

To answer this question, let us first rewrite the system to reveal the price variables that are suppressed in the present formulation. Making use of earlier definitions of Y, Y_k, E_k and E_c, and carrying out appropriate simplifications (specifically, the cancellation of price variables that appear on both sides of the last equations), we obtain

$$M = L(r, p_c/w, p_k/w),$$
$$s_k\{p_k/w\} = d_k(r, p_c/w, p_k/w),$$
$$s_c\{p_c/w\} = d_c(r, p_c/w, p_k/w).$$

This system, though formally equivalent to the system (4) - (6), is more naturally regarded as a "theory of price" than a "theory of output and employment". We may clinch the issue by expressing the model as a set of differential equations:

$$(1^*) \quad dr/dt = b_r\left[M - L(r, p_c/w, p_k/w)\right],$$
$$(2^*) \quad dp_c/dt = b_c\left[d_c(r, p_c/w, p_k/w) - s_c\{p_c/w\}\right],$$
$$(3^*) \quad dp_k/dt = b_k\left[d_k(r, p_c/w, p_k/w) - s_k\{p_k/w\}\right].$$

This system differs from our earlier "classical" model in just two major respects. First, the excess demand for bonds is expressed in terms of "liquidity preference" rather than the demand and supply of "loanable funds". But this is merely a matter of form; for since money enters into one side of every transaction, we might also express the excess demands for consumption and investment goods in "liquidity preference" terms ("The reward for parting with liquidity is immediate gratification through consumption, or the expectation of a stream of future profit, or...")[6]. Second, the money variable is omitted from the excess demand functions in (2*) and (3*); but this merely reflects an implicit signification error in the underlying Hicks model. From a conceptual standpoint, therefore, the Keynesian system (1*)-(3*) is formally indistinguishable from our earlier classical model (1)-(3) and cannot plausibly be regarded as possessing behaviour properties that would permit us to reach any but "classical" conclu-

sions[7].

Now, there can be no doubt that to accept the system $(1^*)-(3^*)$ - and so the system $(1)-(3)$ - as a model of Keynes's *General Theory* is equivalent to imputing to Keynes a faith in the efficacy of the price system that is utterly at variance with his actual beliefs. But neither can there be serious doubt that Hicks's simple model of the *General Theory* accurately reflects the substance - the letter if not the spirit - of Keynes's formal analysis. The crux of the matter is that Keynes in the *General Theory* not only failed to reject but positively embraced an essentially classical (more accurately, neo-classical) theory of short-run output determination, and thereby implicitly adopted the Thick Market Hypothesis as a basis for his own theory of aggregate supply.[8] Keynes's theory of aggregate demand, though outwardly novel because it makes the current level of total expenditure depend upon the prevailing level of output and employment, actually involves no significant departure from classical tradition. So the theoretical foundations of the *General Theory* are, albeit unintentionally, incompatible with the beliefs that led Keynes to write it.

III. Salvaging the General Theory

Evidently the central message of Keynes's *General Theory* can be salvaged only by discarding the conventional theory of short-run supply. But we cannot discard the conventional theory of short-run supply unless we also discard the conception of market organization on which it is based; for the conventional theory merely expressed how rational sellers would behave if their trading activities were confined to thick markets.

The *General Theory* contains no hint that Keynes was in any way dissatisfied with the conventional theory of supply; indeed, the conventional theory plays a central role in his claim that real wages generally move in the same direction as output over the trade cycle. It was not until 1939, in his response to criticisms of this claim by Dunlop and Tarshis,[9] that Keynes explicitly voiced doubts about the assumptions underlying his earlier analysis of aggregate supply and, more particularly, questioned the validity of what I have called the Thick

Market Hypothesis by linking producer discretion in short-period pricing policy with trading in thin rather than thick markets.[10]

A thick market, as noted earlier, is one in which traders can be presumed to know within narrow limits the price at which any desired quantity of a commodity can be bought or sold on short notice. A thin market is one in which the opposite presumption holds: trading volume is too slight to permit traders to gauge, even within broad limits, the price at which desired sales or purchases can be completed on short notice. The crucial difference is that, for thick markets, it makes sense to suppose that the short-run revenues of individual producers are determined by their output choices, while for thin markets the same supposition makes no sense at all. Let us explore the implications of the second case.

Consider a representative producer whose short-run average variable and average total costs are represented by the curves AVC an ATC in Fig. 1. By hypothesis, the producer has no useable information about his probable short-run sales at alternative asking prices, so there can be no question of choosing a combination of price and output that maximizes short-run profit. Over the long run, the producer can hope the influence sales by appropriate market maneuvres (advertising, temporary price cuts, etc.), but more immediately he is largely at the mercy of impersonal (and predetermined) market forces. Under these conditions, probably the simplest and most sensible strategy is for the producer to set his asking or list price at a reasonable level and hope for the best in the way of sales volume. What seems "reasonable" to the producer will depend, of course, on past sales experience, on present and prospective costs, and on present and prospective competition. Here, les us interpret "reasonable" to mean a price (p_o in Fig. 1) high enough to ensure that average total costs are covered for a range of sales levels significantly less than capacity output, s^*.[11].
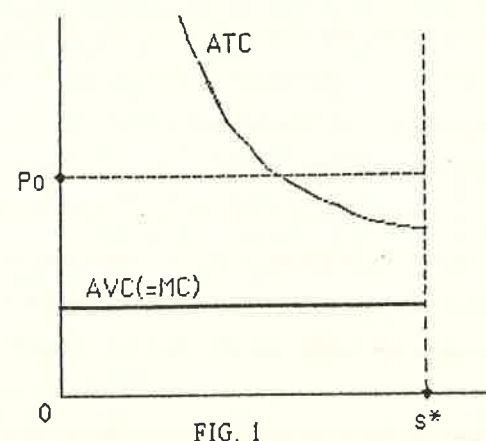
FIG. 1

Then since the "asking" or "list" price exceeds average variable (and marginal) cost for all outputs less than s*, the producer will be willing to produce and sell any less-than-capacity output at his posted price. But the amount that can actually be sold will depend upon customer demand at that price, which will depend on a host of conditions over which the producer has no short-run control. In these circumstances, it is plausible to argue that the producer will adjust output passively to match average sales at the posted price, holding buffer stocks of inventories to avoid frequent transient adjustments of output. Thus, on average, short-run output will move in the same direction as realized sales.

Taking account of the preceding argument, but referring now to an economy in which all produced goods are traded in thin markets, let us suppose that aggregative short-run output and interest-rate behavior may be characterized by the adjustment equations

$$(7) \qquad dq_c/dt = h_c \left[d_c(\cdot) - q_c \right],$$

$$(8) \qquad dq_k/dt = h_k \left[d_k(\cdot) - q_k \right],$$
$$(9) \qquad dr/dt = h_b \left[x_b(\cdot) \right],$$

where q_i (i = c,k) represents current output as contrasted with "supply", and $(\cdot) = (p_c, p_k, w, r, Y, M)$ - the argument Y rather than Y_n appearing in $(\cdot)$ because, under our present assumptions, producers as well as workers may be "income constrained" in the short run.

The system (7)-(9) accurately portays what has come to be regarded as the distinctive feature of Keynesian economics: aggregate output is determined by aggregate sales and prices play no role in the short-run adjustment of income to changes in effective demand. This, of course, is the route to salvage of Keynesian economics that is taken in most textbooks, usually without notice to the reader that the underlying assumptions concerning short-period output variations are completely at odds with the conventional profit-maximization model of supply presented in later microeconomic sections of same text. It also corresponds to the extreme case of what Hicks has dubbed "fix-price theory"[12].

Apart from being a crude caricature of Keynes's analysis, the system (7)-(9) seriously misrepresents the role of prices in the short-run adjustment process. In situations involving significant unused capacity, producers can be expected to engage in competitive selling activities (temporary discounts, rebates, prize contests, etc.) in an effort to boost short-run sales, so average transaction price will tend to fall. Similarly, in situations involving little unused capacity, producers can be expected to compete for factors in ways that increase both variable and fixed costs, and some of these increases will be passed on in the form of higher asking prices. Arguing heuristically, we may suppose that both sorts of adjustment are adequately described by the aggregative equations

$$(10) \qquad dp^*_c/dt = g_c \ d_c(\cdot) - s^*_c \ ,$$
$$(11) \qquad dp^*_k/dt = g_k \ d_k(\cdot) - s^*_k \ ,$$

where p_j^* is an index of transaction prices and s_i^* is an index of production capacity[13]. Combining these relations with (7)-(9), we obtain a system of five adjustment equations to describe short-run movements in quantities, transaction prices, and the rate of interest.

The equation for dr/dt in this system calls for no special comment; we may view the loan market as "thick" and rapidly self-adjusting even in a Keynesian model. But the remaining four equations - two dealing with adjustments in output quantities and two dealing with movements in average transactions price - pose problems whose solutions are distinctly problematical.

To see this, suppose that the system starts in temporary equilibrium with capacity fully utilized and sales occurring only at posted list prices. Next, suppose that the equilibrium is disturbed by a decline in "animal spirits", "confidence", or what have you, causing investment expenditure to fall. Then investment goods output will quickly decline, because the speed of adjustment coefficients in equations (7) and (8) are, by hypothesis, large numbers. Prices will not decline noticeably in the short run because the adjustment coefficients in equations (10) and (11) are - again by hypothesis-relatively small. Both "workers" and "capitalists" are income constrained, because neither goods nor services are particularly "liquid" (though prices are "administered", and therefore known, quantities sold are unpredictable); so as investment output drops the demand for consumption goods will also decline, via the familiar multiplier process.

Now, initially at least, no counteracting forces will operate to stem the decline. Real balance effects will have no bite, because transaction prices will not fall noticeably; and though the money volume of transactions will decline, the potential effect of this on spending will be attenuated by rising uncertainty about future needs for cash to meet payrolls, etc. - hence a rise in the demand for precautionary balances. There will perhaps be some tendency for spare cash to go into loans; but this tendency will not be strong, because with sales falling and becoming more uncertain, producers will find it increasingly difficult to synchronize purchases with sales, and this will mean that average money balances will tend to increase even at lower volumes of monetary trans-

actions (cf. Clower and Howitt, 1978, in Clower, 1984, pp. 168-70). Nor are matters likely to improve as the decline continues; for in thin markets trade credit (mainly in the form of bookkeeping entries) is likely to play a prominent, and perhaps dominant role as a short-run means of payment[14]. As sales decline and business confidence weakens, trade credit outstanding will shrink, possibly by substantial percentage amounts, even though currency and deposits subject to check are largely unchanged.

There is no need to carry the story further. Notice that nothing of substance in the above argument is changed if we relax the assumption of fixed wage rates and add a "thin" market for labour services to our model. In that more general case, as for the more restricted model (7)-(11), "observed" short-run behavior cannot be adequately characterized by static, reduced-form solutions of the adjustment equations. In effect, the normal state of the economy is one of Brownian motion; the system, even if asympotically stable, is so lightly damped that the probability of ever being in the neighborhood of equilibrium is close to zero.

Conclusion

No doubt more might be said about the reasons why the *General Theory* ultimately failed to convey Keynes's intended message, and about alternative ways in which Keynes's "vision" might be salvaged; but this is not the place to say it. Instead, let me conclude by drawing attention to some of the more immediate research implications of the preceding argument.

It seems to me that the key to further progress in macroeconomics lies in improved understanding of short-run price and quantity behavior in thin markets. For a variety of reasons, I doubt that conventional analytical methods will be of much use for this purpose. No doubt we may continue to presume that business firms - manufactures, service providers, wholesalers, retailers, banks and other financial institutions - seek to maximize present wealth; but this presumption will lead us nowhere unless we are able to specify relevant criterion functions and constraints, which does not presently appear to be fe-

asible for firms that operate in thin markets. I say "not presently feasible" because I view the problem not as unsolvable but merely unsolved. My suspicision is that the problem cannot be satisfactorily resolved unless we take more seriously than heretofore has been our habit the role of transactions costs and related economies of scale as determinants of market organization and performance. And even in the best of cases, I doubt that any solution of the problem will yield neat models or precise conclusions. The analysis of business behavior in thin markets promises to be very messy by comparison with conventional thick-market analysis.

There is serious question also whether established comparative-statics techniques can be fruitfully used for short-run analysis. If, as seems to be the case, there is little probability that a thin-market economy will ever be found in the neighborhood of equilibrium, we must be prepared to work with explicitly dynamical models of market adjustment. Of course, if our underlying theories of business behavior are "messy" then our prospects for achieving professional concensus on the best way to model the stylized dynamical facts are rather bleak. All the same, I see no reason to be discouraged. The present situation of macroeconomics, like that of Ulysses as he set sail from Troy, is serious but not hopeless. We can, if we wish, continue to play innocuous intellectual games with macromodels that have no conceivable value for describing observable behavior. But surely our proper course is treat the description of reality as a challenge and get on the work of reconstructing microeconomics to deal meaningfully with the Economics of Thin Markets.

NOTES

(1) One finds numerous threads of such a theory, particularly in Hume, Thornton, Tooke and Mill (Cf. Hicks, 1967); but that is all.

(2) The full title is "Mr. Keynes and the Classics: A Suggested Interpretation".

(3) Y_n is included in d_c because, with the money wage rate given, the earnings of workers cannot be presumed to correspond to the money value of services offered for sale; i.e., the demand function for consumption goods is not independent of the current level of output. But this is just a Keynesian (or Marshallian) flourish; for since Y_n may be presumed to depend on prices via the demand for labor, it need not be included as an explicit argument in d_c.

(4) In the augmented system, equilibrium money prices and the money wage rate are directly proportional to the quantity of money, as implied by the "classical" quantity theory. This merely indicates the redundancy of the quantity theory in any model for which the classical invariance proposition holds; it does not validate the quantity theory - or the quantity equation - as a "behavior" relation. Hicks's 1937 version of classical theory is flawed in this respect.

(5) Hicks also has a model of Keynes's "special theory" in which the liquidity preference equation takes the form $M=L(r)$; but that will not concern us until later.

(6) Cf. Boulding, 1944, pp. 55-63.

(7) This is essentially the conclusion Hicks reached in his 1937 paper, though he studiously refrained from stating it explicitly either in that paper or in his 1957 *Economic Journal* review of Patinkin's *Money, Interest and Prices* (reprinted with minor revision as Chapter 8 of Hicks, 1967, pp. 143-154.

(8) Patinkin disputes this in various of his recent writings, but (to my mind) not at all convincingly. On this, see Patinkin, 1976, p. 93; Tarshis, 1978, pp. 60-63 (in Patinkin and Leith, 1978).

(9) Reprinted in *JMK*, Vol. VII, Appendix 3 (see especially pp. 406-408).

(10) Curiously, Keynes seems to have been more aware of the difficulties of the "theory of short-period supply" in the early 1930's than during the writing of the *General Theory*. In a letter to Hawtrey of Nov. 28, 1930, for example, responding to Hawtrey's criticisms of the *Treatise*, Keynes says: "I repeat that I am not dealing with the complete set of causes which determine volume of output. For this would have led me an endless long journey into the theory of short-period supply and a long way from monetary theory; - though I agree that it will probably be difficult in the future to prevent monetary theory and the theory of short-period supply from running together. If I were to write the book again, I should probably attempt to probe further into the difficulties of the latter; but I have already probed far enough to know what a complicated affair it is". (JMK, Vol. XIII, pp. 145-6).

(11) Cf. P.W.S. Andrews, "Competitive Prices, Normal Costs and Industrial Stability", in Andrews and Brunner, 1975, pp. 29-31. This is not the place to review recent work on so-called "customer markets"; suffice it to say that there is little dispute among economists about the "stylized facts" though there is (of course) much dispute about how they should be interpreted. For some recent comments on this topic, see A. Okun, 1981, Chapter 4 (esp. pp. 138 ff); E.S. Phelps, 1985, pp. 383-404; R.E. Hall and J.B. Taylor, 1986, pp. 389-94; R.J. Gordon, 1981, pp. 502-4.

(12) See Hicks, 1966, Chaps. 7-9; Hicks, 1982, pp. 231-5.

(13) This is no more than a rough schematic representation. The microeconomic theory of price adjustment in thin markets is still in its infancy. For discussion

of some of the difficulties that confront us in this area, see Bushaw and Clower (1957), Chapter 7, pp. 185-9; Phelps, *et. al.* 1970, pp. 309-337 (Phelps and Winter) and pp. 369-93 (Gordon and Hynes).

(14) This is a direct consequence of the desire of makers of thin markets to attract a clientele of "regular" customers in order to reduce sales uncertainty; trade credit as distinct from bank credit plays little role in thick markets precisely because there is no significant sales uncertainty in this case.

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