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FOSTER AND CATCHINGS AND THE POLLAK
PRIZE ESSAYS: A WINDOW ON THE MONETARY
THEORY OF THE 1920's

by

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Profits by William Trufant Foster and Waddill Catchings was published in 1925. The book was certain to be controversial--their previous book, *Money,* had aroused considerable interest and debate--but to make doubly sure, the Pollak Foundation, which had sponsored both books, offered a prize of $5,000 (1925 dollars!) for the best adverse criticism of the new book. Four hundred and thirty-five essays were submitted from all over the world; authors included fifty professors of economics, as well as accountants, bankers, editors, engineers, lawyers, statisticians, and businessmen. The essays were judged by a panel of distinguished economists including Seymour Harris, Wesley Mitchell, and Allyn Young. The winning essay and three runners-up were published by the Pollak Foundation in a collected volume, and the contributions of several other distinguished entrants--Robertson, Hayek, Hansen, Commons, and Durbin--eventually ended up in print in one form or another. These published works provide a unique glimpse into the monetary theory of the 1920s, just before the Keynesian Revolution.[1]

The work of Foster and Catchings and professional reactions to it are also of considerable interest in their own right. Although Roosevelt's New Deal is often considered the first example of Keynesian stabilization policy, it derived its inspiration less from Keynes than from Foster and Catchings.[2] Moreover, as noted in the *Treatise* and in the *General Theory*, Keynes himself was substantially influenced by Foster and Catchings and by other "monetary heretics" such as Hobson, Douglas, and Gesell.[3] These writers raised the question, not heard much since James Mill and Say had refuted Malthus, of the

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[1]The best general discussions of the debate are to be found in Durbin (1933) and Wright (1948).
[2]See Hayek (1929) for more on the background of the Pollak Prize contest and on the widespread influence of Foster and Catchings.
[3]Keynes (1930, p178) and (1936, Chap 23).

sufficiency of aggregate demand in a monetary economy. Foster and Catchings were, perhaps, the most sophisticated of this new wave of "underconsumptionists."[4]

The views of Foster and Catchings could be summarized in the three following propositions (Robertson, 1929): (1) trade depressions are the only important cause of poverty; (2) "the trade cycle is a purely monetary phenomenon"; (3) the monetary cause of trade depression is bound up with the phenomena of profit and saving. The following quotations from *Profits* illustrate the third, and most distinctive of the three propositions: "First, there is no possibility of attaining the economic aim upon which all are agreed unless consumers somehow obtain enough money, year in and year out, to buy the goods about as rapidly as they are produced; second, the present money and profit economy does not enable consumers long to obtain the required money; third, there is consequently no possibility of sustained economic progress" (p. 231). "The system itself ... normally and persistently, decade after decade, fails to provide consumers with enough money to acquire the goods which they are perfectly able and willing to produce" (p. 233). "As industry is now financed and corporate savings are now effected, the flow of money to consumers does not long keep pace with the flow of goods" (p. 399).

1.   Foster and Catchings and their critics

Foster and Catchings present their argument through a series of "Cases"--simple numerical examples--in Part V of *Profits*. We shall follow the same method, considering first the circular flow of money payments in a stationary economy and then going on to examine the problems of growth.

For their first two cases Foster and Catchings make the following assumptions (p268): "(1) A single corporation produces and sells to consumers for final consumption everything that is sold in the entire community....(2) This corporation is the source of all consumers' income, and all the money that the corporation disburses is paid out as wages, or as wages and dividends. Thus wages cover all costs of production. (3) The price level remains unchanged. (4) The total volume of money in circulation remains unchanged. (5) The velocity of money and the circuit velocity of money remain unchanged. (6) There are no taxes and no government expenditures. (7) Wages are paid in the unit of time in which the goods are produced; whereas goods are sold and dividends are paid in the succeeding unit

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[4]See Hansen (1927) and Haberler (1937) for discussion of the relation of the work of Foster and Catchings to other theories of the business cycle.

of time. (For convenience each unit of time is called a year.) (8) All wages and dividends are spent for goods in the unit of time in which they are received."

As Robertson (1929) and Novogilov (1927) note there is some inconsistency between the timing of dividend payments in assumption (7) and the requirement, stated elsewhere by Foster and Catchings, that dividends be paid out only after goods are sold. In working through the cases I shall adopt the convention that wages for labor used to produce output in period t are paid in period t; the output is sold in period t+1; and the resulting profits are paid out as dividends in period t+2

The flow of money payments in a stationary economy are shown in Table 1, which corresponds to Case II of Foster and Catchings The numbers in bold show the lags in the system: period t sales are from period t-1 output; period t dividends are from period t-1 profits.

Table 1: Stationary State

	t	t+1	t+2
Output, units	**100**	100	100
Sales, units	100	**100**	100
Wages, $	90	90	90
Dividends, $	10	**10**	10
Receipts, $	100	100	100
Profits, $	**10**	10	10

Unlike most other underconsumptionists, Foster and Catchings recognized that there was no problem of insufficient money demand in a stationary state. The underconsumptionist arguments were typically of the "A+B" variety: the price of goods sold included both elements A and B, but only element A was distributed in a way that would eventuate as demand for the same goods. Ergo, the goods could not be sold except at a loss. For instance, the A payments were wages paid at the final stage of production of consumer goods and the B payments were for intermediate products, the latter being "lost" to demand. Economists were quick to point out the fallacy in this argument: production of intermediate goods gives rise to wage payments too, and--in a stationary state, assuming labor the only input--the sum of all these payments would just suffice to buy the output of final goods. For Foster and Catchings, the A+B problem involved the timing of payment of

wages and dividends: wages were paid out ahead of sales, and dividends out of profits after the sales had been made, so there was no guarantee that the right purchasing power would be "there" when needed. Unlike most other underconsumptionists, however, Foster and Catchings realized that the problem would be solved by the overlapping nature of the stationary state. In the stationary state, *last* period's profits and the wages for this period's output (*next* period's sales) would be spent in the current period and would just suffice to buy the goods offered for sale at the normal price.

Suppose the stationary state were to be disturbed in some way, would the economic system continue to provide consumers with just the right amount of purchasing power--that is, just enough to take goods off the market without a loss? In particular, suppose with Foster and Catchings (Cases III through IX) that not all profits were distributed as dividends. Clearly, if the retained earnings were held as cash--"hoarded"--there would be a deficiency of purchasing power, just as there would be if the hoarding were done by consumers. But this possibility seems unlikely in normal circumstances: saving is more likely to take the form of lending to finance investment, or of direct investment, than of the holding of barren cash. If retained earnings were used for investment, then, would there be a deficiency of purchasing power?

Consider an investment in working capital, retained earnings being used to increase output by hiring more workers, as shown in Table 2. In period t+1, instead of distributing period-t profits as dividends, the corporation uses the money to hire more workers, increasing the wage bill to $100, and expanding output to 110 units. Total purchasing power remains at $100--the fall in dividends of $10 being offset by an increase in wages of the same amount. Sales remain at 100 units--the output of period t--so there is no immediate disturbance to the price level. However, in period t+2 sales are up by 10 units while purchasing power remains at $100. (Whether investment in working capital is sustained, as in the Table, or dividend payments resumed, makes no difference.) The result is a fall in the price level to 90 and a resulting disappearance of profits.

Note that the problem occurs, not as a direct result of the act of saving itself, but as a result of the increased output caused by the consequent investment.[5] Clearly an investment in *fixed* capital would have much the same effect, the only difference being that the increased output would be longer in coming, so that the problem would be longer deferred. Foster and Catchings consider and reject a number of ways out. For instance holding the additional output off the market to keep prices up or selling it on credit only put off the

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[5]As Hansen (1927, p44) notes, precisely the same sort of deflationary pressure would be caused by an increase in productivity. The saving-investment nexus is not necessary for the occurrence of this sort of problem.

problem--unless the firm wishes to go on accumulating unsold inventories or accounts receivable indefinitely.

Table 2: Investment of Retained Earnings

	t	t+1	t+2
Output, units	100	111	111
Sales, units	100	100	111
Wages, $	90	100	100
Dividends, $	10	0	0
Receipts, $	100	100	100
Profits, $	10	10	0
Price Index	100	100	90

The basic problem, then, is that an increase in output must, if the quantity of money and velocity are held constant, result in a fall in prices. As Robertson (1929) points out, reduced to this level, Foster and Catchings's argument hardly seems novel or surprising. But this is not all they have to say. They also assert (a) that a fall in prices is not consistent with equilibrium, and so leads to recession; and (b) that *laissez-faire* will not normally provide a monetary expansion in the form required to maintain effective demand. They do not deny that it is possible in principle to furnish the necessary purchasing power--indeed, they suggest how, through counter-cyclical public works it can be done--but they do assert that *laissez-faire* will not do so automatically.

Let us examine each of these two assertions in turn.

1.1. Are falling prices consistent with equilibrium?

Foster and Catchings's critics (e.g., Robertson,1929; Souter, 1927; Hansen, 1927, p177) point out that there are some crucial implicit assumptions about the labor market in the scenario described in Table 2. Foster and Catchings seem to be assuming that the supply of labor is perfectly elastic, and that it is perfectly elastic at a constant *nominal* wage. That is, the corporation expands output in proportion to the increase in its wage bill

by proportionally expanding its labor force. Moreover, the nominal wage paid is unaffected by the fall in the price level. As a result, in the example of Table 2 the real wage rises from period t+1 to period t+2 by 11%. It is this increase that accounts for both the non-payment of period-t+1 profits as dividends--the money is used to finance the pay raise--and the disappearance of profits from period t+2 onward.

Robertson (p149, fn. 2) reworks the numerical example under the alternative assumption of a constant real wage. The results are shown in Table 3. With the fall in price level in period t+2 the nominal wage falls and the wage bill is reduced to $90. This enables period-t+1 profits to be distributed as dividends. Moreover, the real value of these dividends is increased by the deflation.

It is not true then that a fall in the price level is necessarily inconsistent with equilibrium.

Table 3: Investment of Retained Earnings
with a Constant Real Wage

	t	t+1	t+2
Output, units	100	111	111
Sales, units	100	100	111
Wages, $	90	100	90
Dividends, $	10	0	10
Receipts, $	100	100	100
Profits, $	10	10	10
Price Index	100	100	90

In their dialog with their critics Foster and Catchings were never really successful in articulating why a fall in prices was not in principle a satisfactory solution to the problem. When challenged they generally fell back on empiricism: past experience of business fluctuations showed that falling prices were associated with *dis*equilibrium--with contraction, unemployment, and business failures. But they never really explained why this should be so.

Economist critics, such as Robertson, Souter, and Durbin, interpreted the empirical evidence somewhat differently. They made the important distinction between a steady long-term fall in prices caused by growing productivity and the sharp sudden drop in prices associated with a contraction. The former had not historically been a problem; the latter had. Explanations of why generally focussed on contractual rigidities--fixed money wages,

sticky rates of interest; such rigidities were a problem in the face of an *unanticipated* price fall in prices.[6]

The reason for such an unanticipated fall in prices is the uncoordinated nature of economic expansion: individual firms make their own plans in ignorance of what other firms are doing, there being no market mechanism to coordinate these plans *ex ante*. Indeed Souter (1927) argued very cogently that contrary to the claims of Foster and Catchings there was nothing inherently monetary about this problem: the same sort of coordination problems would occur in a real exchange economy if, as one should expect, the process of growth was uneven across sectors and firms. Perhaps the use of money and of nominal contracts exacerbated the problem, but the basic cause was the (inevitable) disappointment of expectations.

Hayek (1931) went further than the others and argued that, far from being a problem, falling prices were to be desired during a process of growth. The only way to prevent falling prices would be through monetary inflation and it was the latter, not falling prices, that was the cause of business fluctuations. Inflation caused a distortion in the process of capital accumulation that could not be sustained and that would inevitably bring on a crisis.[7]

1.2. Is monetary expansion the answer?

Foster and Catchings consider monetary expansion in their Cases X and XI, represented here in Table 4. Instead of using retained earnings to expand its output in period t+1, to hire more workers, the corporation borrows new money created by a bank.[8] The result is an increase in the wage bill of $10. Since dividends are not diminished, receipts in period t+1 rise to $110, and, since sales are as yet unchanged, the price level rises to 110. In period t+2 the increase in output is sold and as a result the price level falls to 99. Deflation occurs here just as it did before with only slight modification. Prices rise initially, but must fall to below their original level once the increased output reaches the market.

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[6]The best discussion of this issue is Fisher (1933).

[7]See Durbin (1933) for an excellent exposition of Hayek's views and a discussion of their relation and relevance to the Foster and Catchings debate.

[8]The interest on this loan is ignored by Foster and Catchings.

Table 4: Investment financed by monetary expansion

	t	t+1	t+2
Output, units	100	111	111
Sales, units	100	100	111
Wages, $	90	100	100
Dividends, $	10	10	10
Receipts, $	100	110	110
Price Index	100	110	99

This is a classical A+B problem: the corporation borrows, and so adds to purchasing power, only $9 of the $10 expected sales revenue--the part represented by wage costs; the $1 represented by profits is not borrowed in advance and so is not there as part of the required purchasing power. Foster and Catchings argue that the problem with monetary expansion as it normally occurs is that the new money comes into existence as working capital loans; since these cover only the out-of-pocket costs of production, consumers will lack the purchasing power needed to cover the full price of the additional goods produced.

Foster and Catchings go on to deny that a *continuing* expansion can solve the problem. They consider a case in which the corporation increases its borrowing each period at an arithmetic rate as illustrated in Table 5. The price level now declines gradually from its higher period-t+1 level rather than falling precipitously to below its original level. However, this is still a deflationary situation with its attendant problems.

Table 5: Continuing expansion at arithmetic rate

	t	t+1	t+2	t+3
Output, units	100	111	122	133
Sales, units	100	100	111	122
Wages, $	90	100	110	120
Dividends, $	10	10	10	10
Receipts, $	100	110	120	130
Price Index	100	110	108	107

Novogilov (1927) criticizes this analysis on the grounds that it miscalculates profits.[9] Foster and Catchings seem to be calculating profits as receipts minus *current* wages whereas it should be receipts minus the wage cost of output sold--the previous period's wages. The effects of a recalculation are shown in Table 6. The price level now continues to rise throughout the expansion.[10]

Novogilov suggests that the price decline found by Foster and Catchings is not the result of any inherent "A+B" problem but rather the result of the excessive saving that Foster and Catchings have imputed to the corporation. They have the corporation retaining an increasing fraction of its profits from period t+1 on, and it is this that causes prices to fall. If instead there is no increase in saving, if all profits are distributed, as in Table 6, prices will rise. Indeed, with investment proceeding in the absence of voluntary saving, an increase in the price level is essential to bring about the "forced saving" required to maintain balance in the goods market.[11]

Table 6: Continuing expansion at arithmetic rate: Profits recalculated

	t	t+1	t+2	t+3
Output, units	100	111	122	133
Sales, units	100	100	111	122
Wages, $	90	100	110	120
Dividends, $	10	10	20	30
Receipts, $	100	110	130	150
Profits,$	10	20	30	40
Price Index	100	110	117	123

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[9]Which is why I have left the profits row out of Tables 4 and 5.

[10]One could ask, from a circular flow point of view, how these dividends are actually paid out. Where does the money come from? Suppose that all wages are financed by bank loan: wages paid for output produced in period t are borrowed from the bank at the beginning of period t and repaid at the end of period t+1 after that output is sold (interest is as usual ignored). On these assumptions, at the end of period t+1 the corporation repays to the bank $90 of the $110 receipts for that period, leaving it with just enough to pay out in dividends the $20 in profits.

[11]Notice that the real wage is declining here: implicitly the nominal wage is assumed fixed. Also real profits are rising more slowly that nominal profits. See Hayek (1932) for more on forced saving.

It is also quite possible in principle to have just the right amount of saving going on to keep the price level stable throughout the growth process. In fact, Bickerdike (1924, 1925, 1927) works out the algebra of such a growth process.[12] Souter (1927) also has such an example.

The problem then is clearly not whether growth *can* take place without deflation (or inflation) but whether it *will*. There is no obvious reason why saving and investment should balance in an environment of elastic bank credit.[13] Of course, in a convertible money regime, the expansion of bank credit would eventually be forced to a halt by a loss of reserves, with obvious deflationary consequences.[14]

2. Foster and Catchings as precursors of modern macroeconomics

Many of the features that we associate with modern macroeconomics were present in the writings of the underconsumptionists in general and of Foster and Catchings in particular: the focus on saving-investment problems; the consideration of disequilibrium (i.e., poorly coordinated) states; analysis of the economy as a whole using simple aggregative models; the advocacy of active stabilization policy.

2.1. Saving and investment

In Durbin's view (1933, p93) the chief contribution of the underconsumptionists is their recognition that, unlike a switch in demand between two consumption goods, an increase in the desire to save can lead to general disequilibrium: "The competitive economic system ... cannot adapt itself as easily to changes in the Rate of Saving as it can to vertical changes in the relative demand for, and output of, finished commodities."

The critics, while many conceded that an imbalance of saving and investment could be a problem, found Foster and Catchings's explanation of business fluctuations to be wanting.

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[12]Bickerdike looks at geometric rather than arithmetic growth. Actually Novogilov takes Foster and Catchings to task for assuming arithmetic growth since it implies decline investment, in percentage terms, in the face of rising profits.

[13]As Wicksell had made abundantly clear. The work of Wicksell was not, however, generally known to English-speaking economists at this time.

[14]Foster and Catchings dismiss rather lightly (p329) the possibility that an increase in velocity could accommodate increased output without a fall in prices. The circular flow they describe is a very elementary one: a more sophisticated version would certainly leave some room for such effects. Robertson (1929) and Souter(1927) provide examples. See also Kohn (1981) where it is shown that an increase in the direct investment of retained earnings increases velocity.

Durbin rejected on empirical grounds the contention that autonomous changes in the desire to save could be the basis of a theory of the business cycle: Foster and Catchings's story would suggest that investment is high at the crisis and low in the recovery while empirically the opposite is the case. Novogilov (1927, p99) mentions the possibility of reverse causation: a fall in production causes a fall in purchasing power, which causes a further fall in production. He also, along with Hayek, faults Foster and Catchings for concentrating on working capital to the exclusion of investment in fixed capital, and suggests that an imbalance between the output of consumer goods and the output of producer goods could be an important factor in the cycle.

There is very little mention of the rate of interest in all this. Foster and Catchings scarcely mention it, and their critics bring it up only half-heartedly as a possible equilibrator of saving and investment. Durbin argues that in a deflation the fall in interest rates will offset to some degree, but not entirely, the fall in profitability. He suggests, moreover, that the stimulus to investment of a lower rate of interest will be more than offset by the prospective unprofitability of expansion in an already depressed economy.

2.2.   Disequilibrium

Foster and Catchings clearly believe that the normal state of the economy is one in which coordination fails. While equilibrium is possible in principle, it is not attained automatically in practice. Their framework is full of rigidities and frictions: the price level, the money wage, and the rate of interest are all assumed explicitly of implicitly to be rigid. A state of chronic unemployment is assumed implicitly when the corporation is allowed to expand its employment indefinitely at a constant wage.

Hayek (1931) is the one who is most critical of them for this. Indeed, his criticism becomes intelligible only when one realizes that he is *assuming* the economy to be in perpetual equilibrium. He berates Foster and Catchings for failing to see that investment and the production of consumer goods are competing activities, rather than being complementary. He argues that prices *should* fall to maintain equilibrium.

Bickerdike (1927) too wants to get back to equilibrium analysis: "The primary question to be determined, however, is not whether the sudden introduction of either increased production or of saving can be postulated without disturbance, but whether a smooth rate of growth, with corresponding saving, can exist." (p75) (This may be one of the earliest examples of "drunkard's search" by a formal theorist--a redirection of inquiry away from

questions of stability, which are difficult to answer, towards questions of existence, which are easier.)

Wright (1941) has a good discussion of the distinction between the kind of equilibrium steady state considered by Hayek and Bickerdike and the "economics of disturbance" considered by Foster and Catchings. Most of the participants in the debate clearly recognized the distinction and agreed that it was the latter that was relevant to a discussion of the business cycle.

2.3. Aggregative analysis

Foster and Catchings present their argument in the form of a rudimentary, aggregative, general equilibrium model, which they analyze using a series of numerical examples (very much like the Tables above). The novelty of this approach is recognized by Souter (1927, p45, italics in original): "The authors claim to present irrefragable proofs of the truth of [their] propositions by means of a series of simple 'cases'. It will not be necessary to exhibit errors in their arithmetic, which indeed we believe to be correct. Nor do we attack in principle the *method* of demonstration by simple cases. It appears to us the most fruitful method for the study of the *closed system* in economics, and this study is badly needed."

In work that appeared at roughly the same time, Bickerdike (1924,1925) went a step further, using algebraic rather than arithmetic analysis.

To my knowledge these were the first examples of this sort of aggregative analysis since the Classicals, and it seems at least possible that they influenced others, such as Robertson and Keynes, to proceed in a similar fashion.

2.4. Stabilization policy

Foster and Catchings argue that there is no automatic mechanism to guarantee a sufficient flow of purchasing power to consumers and that policy intervention is therefore necessary to stabilize the economy. They state their position very clearly in their comments on Souter's essay (1927, p11-13, italics in original):

> Our whole series of Cases in Part V is designed to show that savings cause a deficit in consumer purchasing power, *unless the deficit is made up in some way.* Throughout our Cases we retain that qualification. ... We agree that there may be occasions when the balance of supply and demand might best be achieved by permitting the price level to rise. We agree that by a "judicious regulation of bank

advances, the supply of money in circulation may be controlled so as roughly to keep pace with increased production." ...

To be sure, in so far as [Souter] contends that "the real problem is how to make the output of goods conform to the prospective flow of money", he is stating precisely the traditional and firmly established view which we are doing our best to discredit. We contend, on the contrary, that the real problem of society is how to make the flow of money to consumers conform with the increased output of goods.

Society can make little progress as long as it continues to try to keep down the volume of production to prospective demand. The way of progress is precisely the opposite. The aim should be to keep demand up to output, no matter how rapidly industry succeeds in making actual output approach potential output. Consequently, as we say in *Profits* (page 349), the Government should direct its fiscal policies, including currency measures, the central banking system, taxation, and disbursements, not toward limiting production to available consumers' money demand (as Mr. Souter and orthodox economists in general advocate), but rather toward sustaining consumers' demand on a level with available production.

Some of their critics, while finding fault with their diagnosis of the problem, were in agreement on the recommended cure. For instance, Robertson (1929):

When they come to a discussion of practical remedies, they are happily led to advocate one which can be, and has been, approved by many who would endorse neither their nor any other purely monetary theory of the trade cycle. Their prescription ... turns out to be our old friend (whom we owe, I believe, originally to Mr. and Mrs. Webb), the planning of long range programmes of construction by central and local governments and big corporations, with a view to putting them into operation in such a way as to counteract the variations of private demand. ... On the question of principle the present writer, at all events, is in entire accord, and would like to put in the hands of every member of the British Cabinet a copy of this sentence from [Foster and Catchings's] *The Road to Plenty* (p. 201): "When production is far below capacity, and many workers are unemployed because demand for their products is insufficient, it is far better for the Government to spend money on public works that to use the money to pay debts."

Other critics were less sympathetic. For instance, Hayek (1931, p220):

The proposals of Messrs. Foster and Catchings seem to have had an extraordinary effect. President Hoover's pledge to carry out, within practical limits, such a regulation of public works as would alleviate unemployment, has been a powerful lever to their argument. In a recent pamphlet they announce that Senator

Wagner from New York has already brought a Bill before Congress for creating a "Federal Unemployment Stabilization Board" with very similar functions to their "Federal Budget Board." So far it has not been proposed that this Board should finance public works with additional bank money, and even Messrs. Foster and Catchings have guarded themselves from demanding the execution of this part of their proposals--even in connection with the Hoover Plans. Instead they have concentrated on a criticism of the Federal Reserve Board in raising its discount rate at a time of falling prices and falling employment. It is pressure of this sort which constitutes a danger both in America and elsewhere if such theories gain further popularity.

3. Foster and Catchings and Keynesian economics

The overall similarities between the views of Foster and Catchings, and of other underconsumptionists, and those of Keynes should be fairly obvious from the above. Keynes himself discusses these similarities in the *Treatise* (1930, pp. 178-9), in the *General Theory* (1936, Chap 23), and in a radio address in 1934 (Keynes, 1973, pp. 485-92). His favorite under-consumptionist in these discussions seems to be Hobson, but he does mention Foster and Catchings specifically in the first reference.

Keynes explains the difference between his views and theirs (at the time he wrote the *Treatise*) as follows (1930, pp. 178-9, italics in original):

> At bottom these theories have, I think, some affinity to my own. But they are not so close as might be supposed at first sight. ... They attribute the phenomena of the Credit Cycle to a periodic over-production of instrumental goods, with the result that these instrumental goods facilitate a greater production of consumption-goods than the purchasing power in the hands of the public is capable of absorbing at the existing price-level. ... [According to] my theory, it is a large volume of saving which does *not* lead to a correspondingly large volume of investment (not one which *does*) which is the root of the trouble.

> Mr. J. A. Hobson and others deserve recognition for trying to analyze the influence of saving and investment on the price level and on the Credit Cycle, at a time when orthodox economists were content to neglect almost entirely this very real problem. But I do not think they have succeeded in linking up their conclusions with the theory of money or with the part played by the rate of interest.

The method of the *Treatise* is similar to the one used by Foster and Catchings--a simple aggregative model of the circular flow--except that Keynes replaces Foster and Catchings's

numerical "cases" with the algebra of his "fundamental equations" (not an unqualified success). The approach in both cases is dynamic--a sequence analysis of a changing economy in which expectations are not necessarily satisfied. The underlying monetary theory is the same, understanding money in terms of transactions and flows of payments.[15]

The *General Theory*, however, is indeed revolutionary in its departures from this general intellectual framework. The most important innovation is, of course the income-expenditure multiplier, which allows Keynes to develop a new type of equilibrium analysis. The latter is the second major difference--the abandonment of sequence analysis of the type used by all participants in the Foster and Catchings debate, and by Keynes himself in the *Treatise*, in favor of the static equilibrium analysis of the *General Theory*. The third departure is the new liquidity preference theory of money: transactions and flows give way to asset demands and stocks.[16]

In other ways, however, Keynes moved closer to Foster and Catchings: in contrast to the *Treatise*, and like Foster and Catchings, the *General Theory* assumed and defended price rigidities; the cycle was seen as a movement of employment, rather than one of prices.

Later Keynesian work drew even closer to Foster and Catchings. In particular there are striking similarities with the growth literature that began with Harrod (1939). Once it was recognized that the investment in the Keynesian model would eventually have to increase capacity and would therefore create new problems of effective demand, the concerns of Foster and Catchings were brought back onto center stage.[17]

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[15]Given his later identification with the flow theory of money, and opposition to Keynes's liquidity preference theory, it is ironic that Robertson criticized Foster and Catchings for the confusion of their flow analysis as follows (1929, p164, italics in original): "That passage could not have been written by anyone who had at his command the powerful weapon, forged originally by Petty and sharpened by Marshall and Pigou--the conception of the *proportion of resources over which people wish to keep command in the form of money* as the ultimate determinant of the velocity of circulation."

[16]See Kohn (1986) for a more detailed discussion of how the *General Theory* differed from preceding work.

[17]There is striking similarity, in particular, between the respective discoveries of Novogilov (1927) and of Domar (1946) that exponential growth could sustain the necessary effective demand.

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