

Università degli Studi di Siena  
**DIPARTIMENTO DI ECONOMIA POLITICA**

LUCA FIORITO

An institutionalist's Journey into the Years of High Theory  
John M. Clark on the Accelerator, the Multiplier, and their Interaction

n. 481 - Maggio 2006

**Abstract:** This note deals with the origins of Samuelson's multiplier-accelerator model. In clarifying the historical background of the model, we will offer a brief reconstruction of John Maurice Clark's contributions to the ideas underlying the accelerator, the multiplier, and their interaction. We will show that 1) Clark's theoretical contributions were quite significant, and 2) that they emerged out of the intellectual movement known as American Institutionalism.

**JEL Classification:** B220; B310; B250; E200.

**Luca Fiorito**, Università di Palermo, Dipartimento Studi su Politica, Diritto e Società.

“I am myself enough of an ‘institutionalist’ (whatever that may mean) to have more than a lurking distrust of formulas and equations! But not enough of an institutionalist to ignore their importance...”<sup>1</sup>

### *The issue*

A few years ago, an article by Arnold Heertje and Peter Heemeijer (2002) triggered an articulate and stimulating debate among scholars on the intellectual origins of Paul Samuelson’s multiplier-accelerator model (1939a; 1939b)<sup>2</sup>. The discussion—which involved the participation of Samuelson himself—centered on whether, and to what extent, Samuelson’s 1939 seminal contributions were inspired by Roy Harrod’s *The Trade Cycle* (1936). Heertje and Heemeijer argue that “there is little factual support for Samuelson’s suggestion ascribing the model mainly to Alvin Hansen, his mentor in the days of the creation of the model” (Heertje and Heemeijer 2002, 207). Instead, they provide convincing evidence indicating that it was Roy Harrod who actually played the major role in developing the ideas leading to the multiplier-accelerator interaction. “Theoretically speaking,”—they assert—“it was Harrod who provided the most important contribution to the model. His interesting 1936 work *The Trade Cycle* contained valuable ideas regarding the combination of the multiplier and accelerator” (217).

Among the contributions which animated the debate, Daniele Besomi’s contribution stands out for its depth and originality. Besomi not only advances further qualifications about Harrod’s formulation of the multiplier-accelerator model and its possible influence on Samuelson—which need not to be discussed here—but also suggests a richer story with people such as Michal Kalecki and John Maurice Clark as legitimate contestants to the title of precursors in this field<sup>3</sup>. However, Besomi immediately adds: “I am not fully convinced of either of these candidates: they both included the accelerator principle in their explanations, but neither coupled it with a full-blown multiplier, although both clearly had in mind that such a relationship was necessary for closing the model” (307). As to Clark—the author to whom this note is devoted—Besomi correctly points out that Samuelson himself, in his original formulation of the model, (1939b) quotes a lengthy passage from Clark (1932) as textual evidence that the Columbia economist was well aware of the interdependence between fluctuations in consumption and in investment. Nevertheless, Samuelson laments that Clark, together with the other “adherents to the accelerator principle,” failed to systematically analyze the implications of such interdependence “even to the extent of the construction of arithmetic examples illustrating the mutual interactions of these two principles [accelerator and multiplier]” (Samuelson 1939b, 787).

The aim of this note is to assess the role played by Clark in laying down the general theoretical framework which led to Samuelson’s model. This will be done by providing a brief sketch of his ideas on the accelerator, the multiplier, and their combined effects. Some related unpublished correspondence is presented in the appendix. Before launching into the discussion, however, it should be pointed out that our concern here is not solely with showing that Clark can claim some sort of priority in the formulation of the model or of the ideas underlying it. The mere search for precursors can be a tricky game for the historian of ideas—and, we may add, particularly for the historian of economic thought. What we will attempt to show, instead, is that similar ideas can emerge within different scientific (and sociological) communities. How these ideas are presented, shaped, and conceptualized is then largely a matter of the influence exercised on the single author by the intellectual framework within which he lived, studied, and exercised his profession.

### *Clark, the Accelerator, and the Multiplier*

Our story begins with Clark’s famous essay on “Business Acceleration and the Law of Demand,” published in 1917 in the *American Economic Review*. Although other writers had previously formulated the principle of the accelerator (T.N. Carver, A. Aftalion and F. Bickerdike, just to name a few), we cannot but agree with George L.S. Shackle when he affirms that Clark was “its most careful early expositor” (1967, 266).

---

<sup>1</sup> J. M. Clark to J. M. Keynes, July 24, 1941. Quoted in Dorfman (1970, 13).

<sup>2</sup> See the papers contained in the 2003 Summer issue of *History of Political Economy*.

<sup>3</sup> A third contestant, the Swedish economist Erik Lundberg, was introduced by Siven (2003).

Interestingly, by Clark's own admission, his study on the accelerator was inspired by his reading of Wesley C. Mitchell's *Business Cycles* (1913) and no reference is made to any other proponent of the principle<sup>4</sup>.

Clark's formulation of the accelerator was not explicitly related to a theory of firm's behavior but merely assumed the existence of a more or less definite ratio between output and the capital stock needed for production. On this basis Clark showed, in a now familiar way, how increases in the rate of demand for a firm's output would result in a magnified change in the demand of the firm for capital equipment, with the maximum demand for durable producers' goods *preceding* the maximum point of demand for the final product. As to the statistical testing of the principle, Clark restricted his empirical analysis to the case of the US railroad industry for the period 1900-1917, and concluded that the figures, "as far as they go, bear out the statement that the demand for cars varied with the rate at which traffic is increasing or diminishing rather than with the absolute value of the traffic" (Clark 1917, 249). The applicability of these results for a typical industry to aggregate business cycle analysis was accomplished by a generalization of a particular instance to the general case on the basis of the implicit assumption that most of the firms face generally similar conditions at each stage of the business cycle.

It should be noted—a point often neglected in the secondary literature on the subject—that in his 1917 paper Clark briefly discussed the amendments to the theory necessitated if excess capacity existed, and the unsymmetrical operation of the accelerator on the downward phase of the cycle (230-232). Clark also introduced other barriers to the action of the accelerator principle, namely: 1) the limitations imposed by the separate problems of financing additional capital equipment; 2) prohibitive changes in the relative prices of capital and other factors; 3) uncertainty of producers regarding permanency of an increase in demand leading to unwillingness to undertake capital expansion; 4) possible delay in acquiring additional capital stock due to lack of idle capacity in producers' goods industries (232-233). All these specific aspects were to be developed by other authors in later writings on the accelerator<sup>5</sup>.

Clark discussed and redefined the principle of acceleration in some of his later writings (1924; 1935b). However, the essence of the theory remained substantially the same. The only significant modification is a qualification Clark was somehow "forced" to make because of the pointed criticism of his original formulation advanced by Ragnar Frish—a criticism which led to a controversy between the two men in the pages of the *Journal of Political Economy*<sup>6</sup>. The issue at stake was that of replacement investment. Frish maintained—and Clark conceded *this* point—that replacement investment may continue to increase for a short time after the increment of investment for new capital equipment has begun to decline. Replacement investment may, in fact, continue to increase because of the increase in the total stock of capital goods which has occurred over time due to the increased demand for the final product.

Furthermore, the controversy with Frish is relevant also for another reason. Clark's second rejoinder to Frish, in fact, contains the passage referred to by Samuelson in 1939. As mentioned above, Samuelson quotes *this* passage as textual evidence of Clark's understanding that the volume of consumption demand is itself influenced by the level of investment through income payments to the factors producing producers' goods. According to Clark:

"[I]f we take as our initial fact a moderate decrease in the rate of growth of consumer demand (such as needs no particular explanation), this may result—with a lag—in a positive decline in rates of production of durable producers' or consumers' goods. This in turn reduces purchasing power, unless offset by opposite movements elsewhere, and results in a positive decrease in consumers' demand, presumably extended to more commodities than those originally affected. And this in turn further extends and intensifies the shrinkage of durable goods, etc." (Clark 1932, 692-693 quoted in Samuelson 1939, 787)<sup>7</sup>.

Clark's words quoted above indicate that in 1932 the American economist had in mind some form of cumulative process generated by a functional relation between production, purchasing power and consumption. However, the actual working of the process is not described, while the multiplier mechanism is

---

<sup>4</sup> In this connection, Hansen holds that Clark's work "has all the earmarks of an independent study and in fact was probably narrowly influenced by Aftalion" (Hansen, 369). Hansen's view is supported by Clark's later recollections. See: John M. Clark to Paul A. Samuelson: April 21, 1953. John Maurice Clark Papers, Rare Book and Manuscript Library, Columbia University. The letter is reproduced in the appendix.

<sup>5</sup> See Knox (1952) for an excellent survey on the literature concerning the accelerator and the theory of derived demand.

<sup>6</sup> See Frish (1931; 1932a, 1932b) and Clark (1931; 1932).

<sup>7</sup> Clark's passage quoted by Samuelson is actually longer than the one reproduced here.

only adumbrated. This leads us to a quite controversial question. Was Clark aware at the time, and to what extent, of the mechanism underlying the multiplier?<sup>8</sup>

Clark's first discussion of the multiplier appeared in a paper on "The Cumulative Effects of Changes in Aggregate Spending as Illustrated by Public Works" which he presented in December 1934 at the annual meeting of the American Economic Association. That paper was published the following year on the *American Economic Review* (1935a), and expanded as Chapter IX of his *Economics of Planning Public Works* (1935c). Interestingly, in a footnote of his *Strategic Factors in Business Cycles* (1935b, 85 n15) Clark states that his recognition and use of the multiplier principle preceded his reading of Kahn (1933). In his later correspondence with a Columbia friend and colleague Joseph Dorfman, Clark reaffirmed his claim,

"When I worked out my asymptotic form of the multiplier, published in 'Economics of Planning Public Works,' I noted that it furnished another kind of mechanism whereby the increase in total income resulting from an increase in investment might tend to taper off...I dreamed up this asymptotic multiplier in 1930, when R.F. Kahn was well along with his essentially similar concept, so he has priority."<sup>9</sup>

As in the case of the accelerator, therefore, Clark seems to have discovered the multiplier mechanism independently from other authors' earlier contribution<sup>10</sup>.

Leaving aside questions of priority and influence, Clark's version of the multiplier contains two aspects which deserve to be emphasized. The first aspect concerns the time element involved in the multiplier. As Clark wrote in a later reappraisal of his 1935 monograph on public works: "[t]he reader may note that my assumptions as to time are different from those which appear to underlie Keynes's form of this theory. *The kind of adjustment I have in mind does not appear to be one that can take place instantaneously.*" (Clark 1941, 47: emphasis added)<sup>11</sup>. Clark, in fact, discussed the process described by the multiplier process through the analysis of the subsequent cycles of expenditures generated by a continuous flow of primary injections—something akin to the "period analysis" started by Dennis Robertson (1926) and later popularized and refined by Fritz Machlup (1939). Accordingly, Clark introduced the concept of *income propagation period*, by which he meant the time lag between successive waves of expenditure of the additional net income deriving from the primary investments. The final impact of the primary investments does therefore **depend** not only on the value of the marginal propensity to consume, but also on that of the income propagation period.<sup>12</sup>

The second aspect deals with Clark's cautious attitude towards theoretical formulations. As in the case of the accelerator, in his discussion of the multiplier the Columbia economist listed a series of factors which may hinder—or interfere with—the working of the mechanism: Among these factors Clark included: 1) the possible "crowding out" of private investments by public spending programs (Clark 1935c, 84); 2) the impairment of business confidence by "unlimited deficit financing;" (Clark 1935c, 86) and 3) the possibility of a fall in private capital investment due to the expectation that growth of demand will cease after deficit spending disappears (Clark 1935c, 89-90). To these, a fourth point should also be added: 4) Clark's skepticism upon the idea that the same propensity to consume can be presumed for each subsequent stage of income generation. "Actually," he wrote, "there is...the probability that the percentage of leakage will decrease as industrial conditions grow better, as individuals have less urgent need to get out of pressing debt, and as those with available savings find more opportunity to invest them in such ways that they will actually

---

<sup>8</sup> In this connection, it should be noted that Clark's rejoinder to Frish, albeit published in 1932, was actually written and submitted to the *JPE* in 1931.

<sup>9</sup> John M. Clark to Joseph Dorfman: May 12, 1956. Dorfman Papers, Rare Book and Manuscript Library, Columbia University. See also John M. Clark to Paul A. Samuelson: April 21, 1953. John Maurice Clark Papers, Rare Book and Manuscript Library, Columbia University. The letter is reproduced in the appendix.

<sup>10</sup> The view of Clark as an independent discoverer of the multiplier has been challenged by Robert Dimand (1990; 2002).

<sup>11</sup> It should be noted, however, that Keynes never thought of an instantaneous multiplier. In *The Means to Prosperity* he clearly recognized the problem involved by the existence of time-lags but dismissed it on the following ground: "[t]he amount of time which it takes for current income to be spent will separate each repercussion from the next one. But it will be seen that seven-eighths of the total effects come from the primary expenditure and the first two repercussions, so that the time-lags involved are not unduly serious" (Keynes 1933, 343).

<sup>12</sup> Clark's **analysis** of the "non-instantaneous" multiplier has also some important monetary implications, which are discussed in Fiorito (2001; 2004).

be spent for productive equipment.” (Clark 1935c, 89). For these reasons, Clark concluded, “estimates of stimulative effects, based on such an approach as the Kahn-Keynes formula, are hardly worth carrying beyond, let us say, one year, even as rough approximations.” (Clark 1935a, 19).

### *The multiplier-Accelerator Interaction*

We can now go back to the accelerator. The Clark-Frish controversy in the *JPE*, Frish’s essay on impulse and propagation problems (1933), and the publication of Clark’s NBER monograph on *Strategic Factors in Business Cycles* (1935b), all seemed to have the effect of reviving interest in the principle of acceleration, which had apparently declined somewhat during the 1920s. As a result, the accelerator was subjected to further statistical testing during the latter 1930s, first by Simon Kuznets in 1936 and again by Tinbergen in 1938. Kuznets’ essay is crucial to our discussion.

Similar to Clark’s, Kuznets’ empirical testing focused almost entirely on the railroad industry, albeit covering a considerable larger period of time (1891-1930). Kuznets’ method of approach was that of considering two derived time series, one representing the theoretical demand for additional railroad capital equipment computed on the basis of the accelerator principle, and the other representing the actual demand for additional railroad capital equipment minus replacements. After these series were computed, the problem became merely one of comparing the two series and seeing how closely they coincided in time. Among other things, the results indicated that the amplitude of changes in actual orders was smaller than that of changes in theoretical demand for additional units of equipment. Kuznets concluded that the statistical evidence indicates “...that the magnification of changes in the demand for equipment, expected on the basis of the hypothesis tested, fails to materialize” (263).

Clark replied to Kuznets the very following year, in an “Additional Note” to the reprint of his 1917 essay included in his *Preface to Social Economics* (1936b). There Clark discussed some of the analytical points raised by Kuznets’ empirical test and admitted that his original version of the accelerator needed further refinements especially in “its handling of maintenance and replacements” (354). But the addendum contains also what may be considered Clark’s clearest exposition of the interaction between the multiplier and the accelerator. The salient passage is reproduced below in its full length:

“The important thing is, of course, what behavior should be expected with the principle in question [the accelerator] operating under actual conditions. For this purpose the behavior of replacements should be carefully reconsidered. But more important is the fact that the interaction between consumers’ purchases and the production of capital goods runs in both directions; and that the greater part of the fluctuations in the total amount of consumers’ spendings or purchases are the result of fluctuations in their incomes, in which fluctuations in the production of durable goods play an important or controlling part... An original disturbing impulse may come from either side; **on** either side it can start a series of interactions, mutually reinforcing one another. In the case of the production of durable capital goods, some six to eight months might be expected to elapse after an original impulse before the activity of production showed anything like the full effects. It would presumably take a shorter time for the resulting income to be distributed and to take effect on movements of consumers’ purchases—let us say, on the average, two or three months. This picture is still highly simplified, but may contain enough of the important elements to afford a basis for prediction of an approximate normal pattern of behavior. What would such a pattern be?

If we start with an upward inflection of consumers’ purchases, then the first period of six to eight months would witness an upward curve in production of capital goods, reaching a substantial amount by the end of the period, while the first effects of the reaction on consumers’ purchases would have begun to show themselves in a slight reinforcement of the original rise. In the second period, consumers’ purchases would continue to rise, and production of capital goods also; but the latter might now be rising in something like a straight line. The natural result would be a straight-line in consumers’ purchases, with a slight lag. As this continued, the production of capital goods might soon reach a point at which it would taper off and cease to increase, though remaining at a higher level than at first, the result would be to put an end to the derived increase of consumers’ purchases; and bring about a downward (relative) inflection of this curve. The result of this, with a lag, would be to start a decline in production of capital goods, which would in turn result in a decline of consumers’ purchases, relative to their secular trend, and probably a positive decline unless the secular trend is very strongly upward. This would in turn drive the

production of capital goods below its initial level. This downward movement would then ultimately reverse itself as a result of a similar series of interactions in the reverse direction. The whole cycle might be expected to take an amount of time approximately equal to four times the sum of the two lags (from thirty-two to forty-four months). Or possibly longer. The high points of production of capital goods would lag behind the mid-points of the rises in consumers' purchases by six to eight months (possibly more) and would lead the high points of consumers' purchases by two or three months, or more if the upward secular trend of the latter is substantial" (Clark 1936b, 354-55).

This passage is revealing and puzzling at the same time. It reveals that in 1936 Clark had quite a definite idea of the possibility of combining the accelerator and the multiplier into a "closed" model, in the sense that, given certain initial conditions, it would generate fluctuations of capital stock and income. As to the assumptions, prices are fixed and potential supply of producers' goods is unlimited, while producers of consumers' goods face variations in demand by adjusting their production through an increase (or reduction) of their stock of capital goods. Both the accelerator and the multiplier are "lagged," although the "two or three" months involved in the multiplier are not to be considered as a "lag" in the Robertsonian sense of the term, but rather as the time necessary for the income generated by the increased production in the producers' goods sector "to be distributed and to take effect on movements of consumers' purchases"<sup>13</sup>. The process described appears to be of an endogenous nature, since it works symmetrically in both directions and no reference is made to exogenous barriers such as the ceiling imposed by full employment or an inelastic credit system<sup>14</sup>.

The puzzling aspects concern the exact nature of the functional relation between production, purchasing power and consumption. The movement of production between the turning points is made quite clear, with the accelerator and the multiplier reinforcing each other, but when it comes to explaining the turning points themselves Clark's exposition is lacking and requires a good deal of interpretative effort. Problems arise when Clark, in the second period of his example, introduces a drop in the rate of growth of capital goods production, followed—with a lag—by a correspondent drop in (the rate of growth of) consumption. Capital goods production, he continues, would soon "taper off and cease to increase," with the consequence that the derived consumption would also stop to increase. This would mark the beginning of the downturn phase of the cycle.

What is left unexplained here is the cause of the initial dampening on the effect of the accelerator. In fact, the existence of time-lags, is not *per se* a sufficient condition for the generation of cycles, unless specific hypotheses are made about the magnitude of the relevant parameters—qualifications ignored by Clark and first introduced by Samuelson in his elegant mathematical analysis. A possible interpretation is that Clark is reasoning in terms of a nonlinear theory where the structural parameters are allowed to change during the different phases of the cycle. As far as the capital/output ratio is concerned, this possibility, however plausible, is not supported by a textual scrutiny of Clark's several writings on the accelerator principle. Instead, as we have seen above, Clark had explicitly considered the possibility of an endogenous decline in the marginal propensity to consume during the upward phase of the cycle in his treatment of the multiplier. Such a decline would be consistent with the triggering of a downturn, but is neither mentioned nor implied in Clark's description of the multiplier-accelerator interaction.

### *Concluding Remarks*

John Maurice Clark was an institutionalist—albeit the most theoretically inclined among them. As many interpreters have pointed out, the definition of institutionalism as a definite school of thought is quite a complicated and problematic matter<sup>15</sup>. On the other hand, it is our contention that institutionalism can be understood and, most importantly, "used" as a historiographic category, if we think of it not as a clear-cut paradigm, but as an intellectual movement, as a network of people working on loosely related, **yet** still interconnected, research programmes (Rutherford 2000; Asso and Fiorito forthcoming). In this connection, the reconstruction offered in this note provides some useful insights. Clark, in fact, developed the accelerator

<sup>13</sup> This period of time depends on the length of the "income propagation period." See above.

<sup>14</sup> Clark had explicitly mentioned these exogenous factors in his *Studies in the Economics of Overhead Costs* (1924, 393-394).

<sup>15</sup> Clark himself admitted that institutionalism is a "rather elusive movement...which means so many different things to so many different people that doubt has arisen whether it has any definable meaning at all" (1936a, 6).

concept out of his study of Mitchell's *Business Cycles*, while his formulation of the multiplier emerged out of a research on public works for the National Planning Board where he collaborated with Mitchell and the other institutionalists who clustered around the NBER<sup>16</sup>. Moreover, Clark's most comprehensive discussion of the multiplier-accelerator interaction was published in 1936 as a reaction to the constructive criticisms he had received the previous year by Kuznets. Interestingly, Kuznets himself was at that time closely affiliated with institutionalism—namely with Mitchell with whom he was associated for many years at the NBER, and to whom, as he stated in his Nobel Prize Lecture, “I owe a great intellectual debt” (1992).

Apart from these general considerations, the question remains as to whether Clark's analysis preceded, and to some extent influenced, that of Samuelson. As to the priority issue, Clark's 1936 “Additional Note,” published the same year of Harrod's *Trade Cycle*, contains more than an intuitive description of the interaction between the multiplier and the accelerator. Clark's lack of mathematical skills, however, prevented him to phrase his analysis in rigorous formal terms. This, in part, may explain Clark's “vagueness” in stating the exact functional relationships between production, purchasing power and consumption. But Clark's vagueness is also—and mainly—the consequence of his “institutionalist” attitude towards mechanical formulas. For Clark, in fact, both the accelerator and the multiplier were true only as a first approximation, i.e. under ideal conditions. To understand them the theorist would need—much more than mathematical accuracy—a vast fund of “institutional knowledge” about the real working of the business system, and, perhaps even more important, an analysis of the psychological frames of reference of business firms and individuals, which determine the way in which and the speed with which they respond to changes in economic conditions.

As far as influence is concerned, Samuelson was well aware of Clark's studies on the accelerator and the multiplier but he nonetheless criticizes Clark for having stopped at the threshold of the problem. Samuelson based his judgment on a single and rather obscure quote from Clark's rejoinder to Frish and it appears quite probable that the more telling discussion of the multiplier-accelerator interaction contained in the 1936 addendum might have escaped his attention. But there is a curious aspect here which deserves to be pointed out. In another passage of his reply to Frish—a passage which might have not escaped Samuelson's attention—Clark spoke explicitly of an endogenous theory of the cycle and urged mathematical economists to find an explanation **to** the limits and persistence of fluctuations without relying on external causes. Referring to fluctuating magnitudes Clark wrote:

“We have, then, a problem of mutually interacting forces, returning on each other in a vicious circle of cumulative disturbance. Viewed from this angle, the challenging problem is not why there are cyclical fluctuations, but why there is any limit to the fluctuations, short of zero on one side, or the full capacity of existing productive equipment on the other...*The problem of defining limits of fluctuation on this assumption seems to be one to which the techniques of mathematical analysis are peculiarly adapted; and I sincerely hope that this discussion may stimulate some mathematical economists to produce a solution*” (1932, 693: emphasis added).

The challenge launched by Clark in 1932 was to be taken a few years later, and with success, by the raising star of American economics.

---

<sup>16</sup> Clark's monograph on public works was favourably reviewed in major journals by leading institutionalists such as Morris Copeland, and Sumner Slitcher. See Fiorito (2001).



## Appendix

John M. Clark to Paul A. Samuelson: April 21, 1953

Dear Samuelson:

I appreciate your letter, with its good wishes, very much, also the reprint which I look forward to examining. I have reason to regret that I have not had enough foresight to ask in advance for the kind of reprint of things I have contributed recently to collaborative volumes. I could have made good use of such reprints if I had them.

About the genesis of the “accelerator principle” I am afraid I have no definite picture of the precise process. It grew out of my reading of Wesley Mitchell’s original volume of business cycles, in which he emphasized monetary or financial factors, and it seemed to me that there was a physical or technical factor implied in his description of the cumulative processes (or if that is too strong a term, at least implicit in the process) and that it might usefully be separated out for purposes of analysis. Of course, the distinction between the two sectors of demand for capital—replacements and net additions—was well understood, so the separating out of the element of net addition and putting it into a simplified theoretical model was a pretty natural step. I had it in mind when I came across Mr. Leigh’s railroad figures, and they seemed very pertinent. I did not think I realized at the time that this was a peculiarly available selection of figures, because it involved a sector of demand for capital which responded to a demand for the proximate end product—namely, freight transportation—which registered the general state of economic activity, while the item of capital demand involved was sufficiently limited so that the effect was not confused by the reverse impact of capital demand on flow of purchasing and demand for ultimate products—Or not too much confused?

Your question reminds me of a couple of other instances: the proposition about the sum of the marginally-imputed products absorbing the total product, and the conditions necessary to this, and the working out of a rough form of the R.F. Kahn-type multiplier. I remember where I got the answer to the first: namely in a hotel room where my father and I had gone to meet David Kinley. I had been wrestling with the problem, and figured out a geometrical solution. Later, I talked it over with my friend, Charley Cobb, and he converted it into a case of Euler’s theorem. Before trying to publish it, I did some investigating, and discovered Wicksteed’s monograph, and Flux’s review, which converted Wicksteed’s demonstration into a case of Euler’s theorem. So that had clearly been anticipated.

As to the multiplier, I got that idea as one answer to the problem why an expansion, with its cumulative effects which were well recognized, should turn into a contraction. And it occurred to me that if the expansionary effects of an increasing capital investment returned in cumulative fashion, but diminished by “leakages,” that could produce a series of the type, the sum of which to infinity is a finite quantity, and also that the time-profile of that series would be an asymptotic curve, concave downward, increasing at a diminishing rate. Combine this with the accelerator principle, with time lags, and you could get a model that would convert the expansion into a contraction; as you showed in your article in equating the accelerator principle with the multiplier. I always wished that you had made more deviations from mathematical “elegance,” and explained, in language that a non-mathematician could assimilate, how or “why” the various results that you showed in that article came from the various combinations of factors worked out. I did not do anything at the time with this idea, being very busy with other work, and in any case, R.F. Kahn must have been well along with his multiplier study (which was published, I think, maybe a couple of months after I got the notion) so that he properly had priority.

I am afraid that none of these recollections give you the precise psychological point you are fishing for. I may not have taken note of that sort of thing at the time and at any rate I do not remember it now.

With best wishes,

Sincerely yours,

J.M. Clark

## References

- Asso P.F, and L. Fiorito. Forthcoming. "Was Frank Knight an Institutionalism?" *Review of Political Economy*.
- Besomi D. 2003. "Harrod, Hansen, and Samuelson on the Multiplier-Accelerator Model: A Further Note," *History of Political Economy*, 35 (2): 305-322.
- Clark J.M. 1917. "Business Acceleration and the Law of Demand: A Technical Factor in Business Cycles," *Journal of Political Economy*, 25 (3): 217-235.
- Clark J.M. 1924. *Studies in the Economics of Overhead Costs*. Chicago: University of Chicago Press.
- Clark J.M. 1931. "Capital Production and Consumer-Taking: A Reply," *Journal of Political Economy*, 39 (6): 814-816.
- Clark J.M: 1932. "Capital Production and Consumer-Taking: A further Word," *Journal of Political Economy*, 40: 691-693.
- Clark J.M. 1935a. "Cumulative Effects in Aggregate Spending as Illustrated by Public Works," *American Economic Review*, 25 (1): 14-20.
- Clark J.M. 1935b. *Strategic Factors in Business Cycles* New York: NBER in cooperation with the Committee on Recent Economic Changes.
- Clark J.M. 1935c. *Economics of Planning Public Works*. A study made for the National Planning Board of the Federal Emergency Administration of Public Works. Washington, D.C.: U.S. Government Printing Office.
- Clark J.M. 1936a. "Past Accomplishments and Present Prospects of American Economics," *American Economic Review*, 26 (1): 1-11.
- Clark J.M. 1936b. *Preface to Social Economics: Essays on Economic Theory and Social Problems*. New York: Farrar & Reinhart.
- Clark J. M. 1941. "Investment in Relation to Business Activity and Employment." In W. C. Mitchell *et al.*, *Studies in Economics and Industrial Relations*, University of Pennsylvania Bicentennial Conference. Philadelphia: University of Pennsylvania Press: 37-51.
- Clark J.M. 1970 (1931). *The Costs of the World War to the American People*. New Haven: Yale University Press. Reprinted with an introductory essay by Joseph Dorfman, New York: Augustus M.Kelley Publishers.
- Dimand R.W. 1990. "The New Economics and American Economists in the 1930s Reconsidered," *Atlantic Economic Journal*, 18 (4): 42-47.
- Dimand R.W. 2002. "John Maurice Clark's Contribution to the Genesis of the Multiplier Analysis: A Response to Luca Fiorito," *History of Economic Ideas*, 10 (1): 85-91.
- Dorfman J. 1970. "Some Documentary Notes on the Relations Among J.M. Clark, N.A.L.J. Johannsen and J.M. Keynes." Introduction to the reprint of J. M. Clark, *The Costs of the World War to the American People*, New York: Augustus M.Kelley Publishers.
- Fiorito L. 2001. "John Maurice Clark's Contribution to the Genesis of the Multiplier Analysis (with some unpublished correspondence)," *History of Economic Ideas*, 9 (2): 7-37.
- Fiorito L. 2004. "John Maurice Clark and the Multiplier. A Note," *Research in the History of Economic Thought and Methodology*, 22-A: 161-174.
- Frish R. 1931. "The Interrelation Between Capital Production and Consumer Taking," *Journal of Political Economy*, 39 (5): 646-654.
- Frish R. 1932a. "Capital Production and Consumer-Taking: A Rejoinder," *Journal of Political Economy*, 40 (2): 253-255.
- Frish R. 1932a. "Capital Production and Consumer-Taking: A Final Word," *Journal of Political Economy*, 40 (5): 694.
- Frish R. 1933. "Propagation Problems and Impulse Problems." In *Essays in Honour of Gustaf Cassel*. London: Allen & Unwin: 171-205.
- Harrod R.F. 1936. *The Trade Cycle*. Oxford: Clarendon Press.
- Hansen A.H. 1938. *Full Recovery or Stagnation?* New York: Norton.
- Heertje A., and P. Heemeijer. 2002. "On the Origins of Samuelson's Multiplier-Accelerator Model," *History of Political Economy*, 34 (1): 2007-2018.
- Kahn R.F. 1933. "Public Works and Inflation," *Journal of the American Statistical Association*, 28 (181): 168-173.
- Keynes J.M. 1933. *The Means to Prosperity*. New York: Harcourt, Brace.

- Knox A.D. 1952. "The Acceleration Principle and the Theory of Investment: A Survey," *Economica*, New Series, 19 (75): 289-297.
- Kuznets S. 1935. Relation between Capital Goods and Finished Products in the Business cycle." In *Economic Essays in Honor of Wesley Clair Mitchell*. New York: Columbia University Press: 211-67.
- Kuznets S. 1992. *Autobiography*. Available at: <http://nobelprize.org/economics/laureates/1971/kuznets-autobio.html>.
- Machlup F. 1939. "Period Analysis and Multiplier Theory," *Quarterly Journal of Economics*, 54 (1): 1-27.
- Mitchell W.C. 1913. *Business Cycles*. Berkeley: University of California Press.
- Robertson D. 1926. *Banking Policy and the Price Level*. London: P.S. King.
- Rutherford M. 2000. "Institutionalism Between the Wars." *Journal of Economic Issues*, 34 (2): 291-303.
- Samuelson P.A. 1939a. "Interactions Between the Multiplier Analysis and the Principle of Acceleration," *Review of Economic Statistics*, 21 (2): 75-78.
- Samuelson P.A. 1939b. A Synthesis of the Principle of Acceleration and the Multiplier," *Journal of Political Economy*, 47 (6): 786-797.
- Shackle G.L.S. 1967. *The Years of High Theory: Invention & Tradition in Economic Thought 1926-1939*. Cambridge: Cambridge University Press.
- Siven C.H. 2003. "Heertje, Heemeijer, and Samuelson on the Origins of Samuelson's Multiplier-Accelerator Model," *History of Political Economy*, 35 (2): 323-327.
- Tinbergen J. 1938. "Statistical Evidence on the Acceleration Principle," *Economica*, New Series, 5 (18): 164-175.