Hayek’s Early Cycle Theory Re-examined

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1 Introduction

This paper examines two aspects of Hayek’s cycle theory of the early 1930s, as expressed in the two complementary works Monetary Theory and the Trade Cycle (original German edition 1929, English translation 1933, reprinted 1966; henceforth referred to as MTTC) and Prices and Production (first edition 1931, revised edition 1935). The first aspect concerns Hayek’s methodological approach to the analysis of the trade cycle, his particular conception of the task of monetary theory, and the connection between equilibrium analysis and the cycle. In this context I consider two relationships: that between Hayek’s work and Keynes, and that between Hayek and New Classical analyses of the cycle. Both Keynes and Robert Lucas found something to commend in Hayek’s general methodological positions (although Keynes obviously flatly rejected the substantive conclusions of Hayek’s work, and it seems to me that Lucas would not be very comfortable with those conclusions either), and this potentially makes Hayek an interesting focal point.

The second aspect concerns Hayek’s analysis of the role of changes in the ‘structure of production’ over the course of the cycle, and the connection between such changes and the credit system. This is the object of investigation in lectures 2 and 3 of Prices and Production; it is also the object of a searching critique in Sraffa’s Economic Journal review of 1932. I propose to set out an explicit formal example of the kind of transition between structures of production that Hayek discusses. With the help of this ‘transition table’ we can assess the merits of certain of Sraffa’s objections; I believe that this approach also sheds some light on the questions raised by Hicks in his Hayek Story (1967).[1]

2 The tasks of monetary theory

Hayek starts from two bases in his analysis of the trade cycle. First, he argues that ‘equilibrium theory’, by which he understands moneyless Walrasian general equilib-
rium, must be the reference point for such analysis. This is the only coherent economic theory we have, he says, and if we simply set it aside in approaching the business cycle—assuming without argument that markets frequently fail and that there generally exist unused resources—we will never succeed in producing an explanation of the cycle. At best we may arrive at an empirically accurate description of the relative timing of the movements of macroeconomic variables, but we shall never produce real understanding. This is the aspect of Hayek’s general position which is most congenial to Robert Lucas, and it is to this effect that Lucas cites Hayek at the beginning of his essay ‘Understanding Business Cycles’ (1977).

Second, Hayek nonetheless takes it for granted (in contrast to recent analyses of ‘Real Business Cycles’) that the economy is not in a continuous state of equilibrium over the course of the cycle. Rather the cycle is characterized by discrepancies between supply and demand and large-scale failures of adjustment. Trade cycle theory cannot be simply the application of Walrasian theory to a ‘special case’, namely the cycle; the prime task is to ‘extend’ the ‘scheme of explanation’ of Walrasian theory in order to account for the disequilibrium process of the cycle. This general position is taken up between pages 44 and 71 of MTTC, which provides a fuller account of Hayek’s methodological background than Prices and Production. Two quotations will serve to illustrate the argument.

The simple fact that economic development does not go on quite uniformly, but that periods of relatively rapid change alternate with periods of relative stagnation, does not in itself constitute a problem. It is sufficiently explained by the adjustment of the economic system to irregular changes in the data—changes whose occurrence we always have to assume... The real problem presented to economic theory is: Why does this adjustment not come about smoothly and continuously, just as a new equilibrium is formed after every change in the data? (MTTC, p. 55)

It is the task of Trade Cycle theory to show under what conditions a break may occur in that tendency towards equilibrium which is described in pure analysis—i.e. why prices, in contradiction to the conclusions of static theory, do not bring about such changes in the quantities produced as would correspond to a new equilibrium situation. (ibid., pp. 70–71)

The secret of such disequilibrium, according to Hayek, lies in the non-neutrality of money, so that monetary theory and cycle theory must develop hand in hand.

At this point in the argument, both Keynes and Lucas can find something to agree with. Keynes could readily accept the general program of trying to explain why ‘equilibrium theory’ (or ‘classical theory’ as he called it) breaks down, rather than simply taking its failure as a brute empirical fact. He would also agree that the non-neutrality of money has a good deal to do with the issue. In his reply to Hayek’s review of his Treatise on Money, Keynes, while disagreeing with Hayek on many issues, quoted with approval the following passage from the last lecture of Prices and Production:

2We should note that Hayek uses the word ‘data’ in its literal sense to mean what is given—i.e. from the point of view of economic theory, preferences and technologies—and not in the sense of statistical information.

3For this reason it seems to me that Kim Kyun (1988) does not have the relationships between Hayek, Keynes and Lucas quite right. Kyun accepts too uncritically Lucas’s implication that Keynes merely abandoned or bypassed the problem that had exercised Hayek.

The task of monetary theory is a much wider one than is commonly supposed: ... its task is nothing less than to cover a second time the whole field which is treated by pure theory under the assumption of barter, and to investigate what changes in the conclusions of pure theory are made necessary by the introduction of indirect exchange. The first step towards a solution of this problem is to release monetary theory from the bonds which a too narrow conception of its task has created. (Hayek, 1935, p. 127)

The ‘too narrow conception’ to which Hayek adverts is the quantity theory, with its insistence that money only matters for the determination of the general price level. Keynes was shortly to develop his own approach to the general task identified by Hayek, under the rubric of ‘A Monetary Theory of Production’ (Keynes, 1973, pp. 381 et seq.).

Lucas, on the other hand, would be much more wary of talk of disequilibrium, but his own theory bears a resemblance to Hayek’s insofar as a departure from what would be the Walrasian equilibrium under full information occurs in response to the non-neutrality of (unanticipated) money. That is, the Lucas theory works in the general manner prescribed by Hayek, reconciling the phenomena of the cycle with equilibrium theory, via the effectivity of money (albeit an effectivity that is much more circumscribed than in Hayek).

The next step in Hayek’s argument is more congenial to Keynes than to Lucas. Hayek is very clear that he wants a monetary theory of the cycle, yet he is critical of the quantity theory, and, unlike Lucas, he does not appeal to arbitrary monetary policy in order to explain the cycle. Indeed, he states that “a theory which has to call upon the deus ex machina of a false step by bankers, in order to reach its conclusions is, perhaps, inevitably suspect” (MTTC, p. 145). Of course, he is not ruling out the possibility of bankers making false steps, but he wants a more general theory which does not rest on (in more modern jargon) exogenous changes in the stock of money. The notion of the cycle as simply the trail left by a willful monetary authority Hayek finds a priori unconvincing.

In fact the type of disturbance which Hayek appeals to for the initiation of the cycle looks very much like Keynes’s famous shift of the Marginal Efficiency of Capital (MEC) schedule. Some context is required: in the tradition of Wicksell, Hayek regards as central the relationship between the current actual rate of interest (the ‘money rate’) and the ‘natural rate’ which would preserve saving/investment equilibrium. Departure from Walrasian equilibrium occurs when these two rates diverge, and Hayek always assumes that the initial departure is in the direction of over-expansion, with the money rate below the natural rate. But how does this come about?

The situation in which the money rate is below the natural rate need not, by any means, originate in a deliberate lowering of the rate of interest by the banks. The same effect can be obviously produced by an improvement in the expectations of profit or by a diminution in the rate of saving, which may drive the ‘natural rate’ above its previous level; while the banks refrain from raising their rate of interest to a proportionate extent... The decisive significance

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5There is an interesting echo of Marx in Hayek’s idea that ‘indirect exchange’, with the intermediation of a money which is not itself an object of ultimate demand, is the key to the possibility of trade cycles. Compare Chapter 3 of Capital, where Marx says that “the circulation of commodities differs from the direct exchange of products not only in form, but in its essence”, and argues that the forms of commodity circulation “therefore imply the possibility of crises” (Marx, 1976, pp. 207, 209).
of the case quoted is not, in my view, due to the fact that it is probably the commonest in practice, but to the fact that it must inevitably recur under the existing credit organization. (MTTC, pp. 147–8, emphasis in the original).

Later on, he lists some of the developments which might spur the above-mentioned ‘improvements in the expectations of profit’ (or MEC shift in Keynes’s terminology):

New inventions or discoveries, the opening up of new markets, or even bad harvests, the appearance of entrepreneurs of genius who originate ‘new combinations’ (Schumpeter), a fall in wage rates due to heavy immigration; and the destruction of great blocks of capital by a natural catastrophe, or many others. (ibid., pp. 168)

Unlike theories which rely on ‘bankers’ mistakes’ (exogenous monetary shocks), Hayek counts his own monetary theory of the cycle as an *endogenous* theory: the claim is that shifts in expected profitability, caused by factors such as the above, are inevitable in the development of a capitalist economy, while the money rate of interest necessarily (under the current arrangements) fails to act as an adequate shock absorber in the face of these shifts. Two further questions then arise: Why can’t the rate of interest play a fully equilibrating role? And what is the mechanism whereby the ‘money rate’/‘natural rate’ divergence generates the cycle?

The second of these questions will be examined in the next section of the paper. As for the first, I shall be brief: my aim here is not to give a complete exposition of Hayek’s theory. His basic argument is that even in the absence of central bank accommodation, the private banks will generally be in a position to extend their lending (and hence create deposits) at an unchanged rate of interest, in the face of increased loan demand from optimistic entrepreneurs. First, profit-maximizing banks will wish to move to lower reserve ratios. Before the increase in optimism, any expansion of lending would have required a lowering of the interest rate, but now extra loans become relatively more profitable and “the greater loss of profit entailed by keeping the cash reserve intact will, as a rule, lead the bank to a policy which involves diminishing the size of this non-earning asset” (MTTC, pp. 172–3). Secondly, “in the upward phase of the cycle, the risks of borrowing are less; and therefore a smaller cash reserve may suffice to preserve the same degree of security” (p. 173). Thirdly, the bankers who are approached first will not be able to raise their lending rates initially for fear of losing custom to their competitors. And once the credit expansion is started it will tend to cumulate. Any laggard in the expansion process “will continue to receive cash at the clearing house as long as it does not adjust itself to the new standard of liquidity” (p. 174). Even if the bankers wished to limit the expansion of their lending to match the inflow of ‘genuine saving’ there is a fallacy of composition inherent in the idea that they can so discriminate. The banker receiving a deposit inflow has no way of telling whether that reflects an increase in the public’s desire to save, or simply another

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6It is interesting to note that Hayek and Keynes occupy the same cell in Leijonhufvud’s (1983) ‘Swedish flag’ taxonomy of cycle theories. The ‘flag’ diagram categorizes theories according to whether the impulse and the propagation mechanism for macro disturbance are real or nominal respectively. Hayek and Keynes are both in the ‘real/real’ corner: the impulse is expected profitability and the propagation stems from the failure of a *relative* price (the rate of interest) to offset the disturbance. By contrast, monetarist theories have a nominal impulse, and sticky-wage/sticky-price theories (whether monetarist or ‘Keynesian’) have a nominal propagation mechanism, since it is failure of the general price level to offset an aggregate demand shock that leads to real effects.
banker’s credit expansion (pp. 163–5). The inflation which eventually results from the credit expansion will in the end force the banks to raise their lending rates, but, Hayek claims, not before the damage is done.

Against this background, some of the criticisms raised in Sraffa’s review of Prices and Production seem to miss the mark. It is not fair to say that the active ingredient in Hayek’s theory is the arbitrary initiation by the banks of an unbalanced expansion of loan-financed expenditure (unbalanced, that is, in favour of the purchase of producer goods). Hayek’s banks are essentially passive: they respond to loan demands stemming from optimistic entrepreneurial expectations, and the unintended result is the ‘unbalanced expansion’. If they were bullish regarding consumers’ incomes they might respond favourably, at an unchanged interest rate, to an increase in the demand for consumer loans, but Hayek assumes that a spontaneous upsurge in the latter kind of loan demand is unlikely. A simultaneous ‘balanced’ upsurge in the demand for both producers’ and consumers’ loans (which would generate a ‘neutral’ inflation without distortion to the structure of production) could only be a special coincidence.

It is also not quite true to say that Hayek’s analysis leads up to (or is oriented in advance towards) advocacy of a fixed supply of money as the cure for the cycle, a cure which ought to be “found desirable by every right-thinking person” (Sraffa, 1932A, p. 43, with sarcasm). It is certainly part of Hayek’s theory that such a policy could in principle hold the money rate of interest equal to the natural rate, ensuring that investment is financed only by previously intended saving, and hence cut out avoidable macro fluctuations, and at times he seems to come close to recommending it. On the other hand he spends a long time discussing the formidable practical difficulties in the way of such a proposal and effectively concludes that they are insurmountable (1935, pp. 113–125, 131). He also offers what might be seen as a ‘second best’ argument, suggesting that the ‘constant money’ policy would reliably produce the desired effect only if, per impossibile, all prices were perfectly flexible and all long-term nominal contracts were based on correct price expectations (1935, pp. 131, 161).

Clear enough in Prices and Production, Hayek’s reluctance to advocate constant money as a practical policy, as opposed to a theoretical reference point, is even more sharply registered in MTTC. Here the policy is frankly described as “purely Utopian” (p. 190); Hayek emphasizes the fact that it would require “the complete abolition of all bank-money—i.e. notes and cheques”. Furthermore, he is not even sure that the benefits of such a policy, were it feasible, would necessarily outweigh the costs of interfering with the kind of flexible credit system that the capitalist economies have evolved: “the stability of the economic system would be obtained at the price of curbing economic progress”; “the utilization of new inventions... would be made more difficult” (pp. 190–91).

There is a spectrum of possible responses to Hayek’s question (as cited by Keynes)—i.e. What changes in the conclusions of moneyless general equilibrium theory are de-

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7I should point out that the background here is drawn from MTTC, which was not available in translation when Sraffa wrote his review of Prices and Production.

8Sraffa: “... an extraneous element, in the shape of the supposed power of the banks to settle the way in which money is spent, has crept into the argument and has done all the work” (1932A, p. 49).

9This phrase is shorthand: strictly speaking, what has to be held constant, on Hayek’s theory, is the stock of money multiplied by its velocity of circulation.
manded by a serious investigation of the role of money? The minimal response is given by Lucas: the only change we need make is to recognize that unanticipated exogenous changes in money will have temporary real effects as changes in the general level of prices are, for a short while, misread as relative price changes. An intermediate response comes from Hayek himself: the ‘elasticity’ of the means of payment in the credit systems of developed capitalist economies means that shifts in the expected profitability of investment will tend to generate trade cycles characterized by persistent disequilibrium in the ‘structure of production’, i.e. persistent mismatch between the proportions in which real resources are devoted to the production of producer and consumer goods respectively, and the proportions in which monetary demand is divided between these classes of goods. While the Lucas problem could easily be disposed of by means of a stable, predictable monetary policy, there is evidently no simple panacea for the Hayekian cycle. The maximal response is Keynes’s: on the one hand, the special role of money as an asset (not merely means of payment) disables the ‘classical’ interest mechanism; on the other, the fact (not itself adventitious) that wages are decided in money terms disables the classical supply/demand mechanism for the aggregate labour market (i.e. the workers cannot directly offer their services for a lower real wage in times of high unemployment). The conclusion drawn by Keynes is not just that the monetary economy is vulnerable to cyclical imbalances, but that it will typically operate below full employment, and will be vulnerable to extended depressions which will not necessarily sort themselves out.

Put another way, Hayek wanted a resolution of the ‘apparent contradiction’ (MTTC, p. 33n) between equilibrium theory and cyclical disequilibrium. Lucas’s resolution rests on the claim that, in a sense, it’s really all equilibrium, but the moving equilibrium departs from its ‘natural’ trajectory from time to time as a result of price-misperceptions. Hayek also works in terms of what one might call ‘optimization under misperception’, but the misperception runs much deeper and is much less easily corrected than in Lucas. Individuals doing what appears best at the time get the aggregate economy into a nasty tangle which takes a long time to sort out, and furthermore the initiating factor is not external interference, but is intrinsic to a capitalist economy with an ‘elastic’ system of credit. Keynes’s resolution—the most radical—involves the idea that we should not expect the monetary macroeconomy to behave like a Walrasian system at all.

3 Transitions in the structure of production

In the preceding section I have in a sense drawn Hayek closer to Keynes than is customary. But now—with Hayek’s capital theory and its implications for macrotheory, as expressed in Lectures 2 and 3 of Prices and Production—we come to a realm where the two decisively part company. Keynes was not totally dismissive of Hayek on this point. Indeed in 1931 he was willing to concede rather a lot, in relation to the Treatise on Money.

Dr Hayek complains that I do not myself propound any satisfactory theory of capital and interest and that I do not build on any existing theory. He means by this, I take it, the theory of capital accumulation relatively to the rate of consumption and the factors which determine
the natural rate of interest. This is quite true; and I agree with Dr Hayek that a development of
this theory would be highly relevant to my treatment of monetary matters and likely to throw
light into dark corners. (Keynes, 1973, pp. 252–253)

Nonetheless, Keynes found Hayek’s attempt to incorporate capital theory into macro-
economic analysis a “frightful muddle”, prompting the famous barb that Prices and
Production shows “how, starting with a mistake, a remorseless logician can end up in
Bedlam” (ibid.). And by the time of the General Theory (1936, esp. chs. 16 and 17)
Keynes had developed his own views in a quite contrary direction, and had come to
doubt the value of the concept of the ‘natural rate of interest’ altogether. \[10\]

Just how muddled was Hayek on this matter? Keynes at least credited Hayek with
‘remorseless logic’, but Sraffa, who engaged with the details of the argument of Prices
and Production more closely than Keynes, was unwilling to concede even that. Not
only were Hayek’s conclusions bizarre and incredible, but the argument leading up
to them was incoherent. Hayek’s formidable Austrian analysis of the period of pro-
duction and the relations between producer and consumer goods—his “terrific steam-
hammer”—not only failed to “crack the nut” of cycle theory, but mainly served to ob-
scure the main issue and was itself a “maze of contradictions” (Sraffa, 1932A, p. 45).
One can understand the frustration of Sraffa, the remorseless logician par excellence,
faced with the twists and turns of Hayek’s argument. Contradictions there undoubtedly
are, and if anything is to be salvaged from the central sections of Hayek’s book it can
only be through a sympathetic reading which attempts to repair the argument in the
ways most favourable to the author’s general thrust. It seems to me that this task is not
without interest.

First, a brief overview. We have already noted Hayek’s view that the trade cycle
starts when a shift to more optimistic expectations of future profit on the part of en-
trepreneurs leads to an expansion of credit and bank-money at an initially unchanged
rate of interest. Why does this create a problem? Unlike many others, Hayek is not
particularly concerned about the rise in the general price level that may be induced
by the monetary expansion, or at least he does not consider it germane to the trade
cycle: if the inflation were balanced, its real effects would be nil. What matters is
that there occurs a shift in the structure of demand in favour of producer goods, but,
he claims, if this shift is not validated by an increased desire for saving, it will prove
unsustainable. New bank credits for the producers drive a wedge between investment
and desired saving—i.e. ‘forced saving”—and Hayek maintains that the effects of such
forced saving will necessarily be largely undone through an eventual counter-shift in
demand in favour of consumer goods, which in turn ends the boom and precipitates a

The argument that is supposed to sustain this theory is developed in two main
stages. Lecture 2 of Prices and Production deals primarily with the comparative statics
of steady states featuring zero net investment. Hayek compares an initial state (call it
A) and a second state (B) which eventually arises if there is an increase in the capital
intensity of production (‘lengthening of the period of production’, ‘increase in the de-
gree of roundaboutness’) stimulated by increased saving. These states are represented
by diagrams showing the allocation of resources and the pattern of money flows be-

tween the various stages of the production process. Hayek then considers a third state, C, which results if the same change in the structure of production as in B is obtained by means of credit expansion (as opposed to increased voluntary saving). He argues that—unlike A and B—C must be unstable, on the verge of crisis. Lecture 3 then goes into the disequilibrium dynamics of the movements between the states identified above, in terms of the shifts in relative prices and outputs over time.

To elucidate (I hope!) this most mysterious core of Hayekian cycle theory, I offer an extended version of the diagrams used in Hayek’s Lecture 2. My version will display the entire transition between two ‘structures of production’, albeit on very simplified assumptions. I begin by setting out these assumptions.

Assumptions regarding production

1. Production takes the form of a linear sequence of stages, whereby work in progress is handed from one producer to another, until it eventually reaches the consumer. At the first stage, the producer uses only ‘original means of production’, in Hayek’s phrase, and I shall further simplify by assuming that labour is the only such original means (or, if you like, raw materials are free goods). Subsequent stages employ both labour and intermediate output generated by the previous stage. This is essentially as in Hayek: here we have the ‘non-circularity’ of the structure of production which is typically assumed in Austrian capital theory (i.e. intermediate outputs from a given stage of production are not fed back into any of the higher stages).

2. Each ‘stage’ is an independent enterprise or object of property, which sells its output to the succeeding stage (or to the consumers, in the case of the final stage) and purchases its non-labour input from the previous stage (except for the first stage which uses labour alone). This is assumed by Hayek in Lecture 2.

3. Each stage of production is accomplished in the same period of calendar time. As in Hayek.

4. Production is characterized by fixed coefficients, for labour and produced inputs. This is not in Hayek, but will simplify the analysis of transition. We can ask later how much difference relaxation of this assumption would make.

Assumptions regarding nominal values

5. The value of each commodity (i.e. work in progress at the various stages) is equal to its total labour content. Departure from this principle will be made only for the final consumer good during the transition period, as explained below.

6. The money wage is constant and equal to unity.

Assumptions 5 and 6 may seem quite contrary to the spirit of Hayek’s analysis, but they will be used simply to establish a benchmark for the investigation of transition. One of the problems that has faced commentators on Hayek’s theory is the excessive
degrees of freedom of the Hayekian dynamics, and these admittedly drastic simplifications will reduce the degrees of freedom to a more manageable number. One further point should be made here: it may appear that assumption 5 in particular—prices equal to labour values for intermediate goods—actually rules out the Hayekian mechanism of transition, which depends upon variations in relative prices. Nonetheless, as will be seen below, I obtain a benchmark transition between structures of production by, in the first instance, approaching the transition as an optimal planning problem. One can then ask under what conditions market mechanisms might be able to duplicate such a transition path; and in the same vein, by examining the pattern of financial surpluses and deficits which arise in the course of the optimal transition, under the initial simplifying assumptions, we can see what forces may be acting to push nominal values away from the initially assumed levels.

Table 1 shows the transition between two systems of production on the above-noted assumptions. The two systems are those set out in Hayek’s Figures 2 and 4 (1935, pp. 44, 56). Hayek’s original examples are retained intact except for a simple change of units, but the mode of presentation differs from Hayek’s. Before examining the transition itself, let me offer a word on the nature of the table, and on the two systems which appear before and after the transition respectively. The columns of the table show the synchronic structure of the economy in each period. In the first system (which is shown intact in period 0) there are five stages, each employing 7 units of labour. (Note that these stages are numbered 3 to 7, simply for consistency with the post-transition structure.) In the second system (fully established in period 8) there are 7 stages, each employing 5 units of labour: production is more ‘roundabout’, and the period of production is longer. The total labour supply is assumed to be fixed at 35 units: there is full employment both before and after the transition. The physical output of consumer goods per period will be higher under the new system than under the old, although this is not shown in the table. The variables shown in the table are defined as follows:

\[ L = \text{labour employed (which also equals wages paid, under assumption 6 above)}; \]
\[ P = \text{expenditure on purchases of produced inputs}; \]
\[ Y = \text{income from sales}; \]
\[ F = \text{financial surplus or deficit, } (Y - L - P). \]

Indexing the stages by \( i \) and the periods by \( t \), we have:

\[ Y_{i,t} = P_{i+1,t}, \quad i = 1, 2, \ldots, 6 \]
\[ P_{i,t} = a_i L_{i,t}, \quad i = 1, 2, \ldots, 7 \]

The first of these relations says that the current income of each stage (apart from the final one) derives from the expenditure on intermediate output of the succeeding stage. The second says that there is a fixed relationship (specific to each stage) between the inputs of labour and intermediate product. Note that the \( a_i \) values differ between the two production systems.

At the foot of each column the total employment (and hence total wages) in each period is displayed as \( \sum L \). Finally \( \sum F \) is the total (net) financial surplus or deficit, adding up across all the stages in each period.
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Table 1: Transition between structures of production
The rows of the table represent the ‘history’ of each stage of production. I assume that there is continuity of ownership of each stage across the transition between systems. The progress of output over time, towards final consumption, should be thought of as a diagonal movement from top left to bottom right of the table: processing starts at the first stage (i.e. Stage 3 under the old system, Stage 1 under the new) in period $t$, then passes to the next stage in period $t + 1$, and so on.

Many transition paths, differing with respect to the timing of the reallocation of labour, are possible between the two production systems. I obtain a definite reference path by approaching the issue as a planning problem under the following assumptions. First, once the transition is decided upon, we wish to get the new production process running at full intensity as soon as possible. In the final equilibrium for the new structure, each of the seven stages will employ 5 units of labour (a 1/7 share of the total labour available); our first requirement therefore means that 5 units of labour must be transferred into the new Stage 1 in period 1 of the transition, 5 units into Stage 2 in period 2, and so on. (There is, of course, no point in transferring labour into stage 2 before the product of stage 1 becomes available for further processing.) Second, we wish to maximize the output of consumer goods during the transition (in other words, minimize the loss of output due to transitional disruption of the old process). The consumer good is assumed to be readily storable, so the precise time-profile of output doesn’t matter so long as any production ‘deficit’ (relative to the output level that would have prevailed in the absence of a change in structure) occurs towards the end of the transition. Third, subject to the foregoing, we wish to minimize the labour input over the transition period. This means that the old process should continue to deliver its full output of final goods for as long as possible (which turns out to be until period 4), hence making maximal use of the past labour applied before the transition was contemplated. These requirements jointly dictate a specific pattern of allocation of labour, shown by the L-values in each cell of the table. Below the lower double line we see the old system being phased out, and above the upper double line we see the new system coming in. In between these lines, we find the old system running at reduced intensity.

What are the consumers doing during the transition? Since I am interested in following up the second case examined by Hayek—in which the transition is not driven by an increase in saving on the part of consumers—I shall assume that they simply spend all of their current income on the consumer good each period, i.e. they carry out no financial saving. This expenditure is shown as income of Stage 7 in the succeeding period. The price of the finished consumer good adjusts to clear the market each period, so there is no inventory accumulation on the part of the Stage 7 producers. (That is, if any ‘real saving’ is going on, in the form of storage of the consumer good for future consumption, this is carried out by the consumers themselves.)

Let us examine Table 1 in more detail. In period 1, Stage 3 (i.e. the first stage of the old process) gives up labour to the new stage 1; in period 2, Stage 4 gives up labour to Stage 2, and so on. In period 3 employment falls. This is true ‘structural unemployment’: due to the assumption of fixed coefficients there is simply nothing useful for the 2 (i.e. 35 − 33) extra units of labour to do. Employment continues to

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11Hayek relies on this assumption in Lecture 3 of *Prices and Production*. Sraffa, quite reasonably, regards the assumption as unwarranted, but we shall accept it for the sake of argument here.
fall until period 5; but from period 6 it rises again due to the re-expansion of Stages 6 and 7, as work in progress starts to come through from the higher stages of the new process. As for the financial side, our assumptions above mean that wages are equal to employment throughout the table, while intermediate output is always sold at a unit price which just covers the unit cost of production. The income \((Y)\) value for each cell in rows 1 to 6 is determined by the purchase of intermediate output \((P)\) value in the cell below, since each stage sells its output directly to the succeeding stage. These \(P\)-values are in turn determined by the optimal \(L\)-values, via the assumption of fixed coefficients in production. Stage 7 deals directly with the consumers, and income here equals the total wages \(\sum L\) paid out in the previous period.

Consider, then, the pattern of financial surpluses and deficits to which this transition gives rise. In periods 1 and 2 the deficits of the newly-started Stages 1 and 2 are equal to the surpluses of Stages 3 and 4 respectively. In period 3 the surplus of Stage 5 is greater than the deficit of Stage 3, and similar net surpluses also emerge in periods 4 and 5. Finally, in periods 6 and 7, net deficits emerge which sum to equal the cumulated value of the previous net surpluses. These features seem to suggest that it is possible for the whole transition to be financed through a series of inter-stage investments: it appears that, on the assumptions made here, no monetary expansion is required, even though the worker-consumers carry out no financial saving.

How does this square with Hayek? In his analysis, the case where the monetary value of final output remains the same after the transition as before (as in my table and in his Figure 4) is said to require an overall monetary expansion. The reason for this is that the total value of transactions per period increases with the addition of the two extra stages of production. This can be seen by adding up the \(Y\)-values in columns 0 and 8: the sums are 105 and 140 respectively, for a difference of 35. Since I have changed Hayek’s units by a factor of 7/8, this corresponds with his figure of a 40 unit expansion of money supply. Hayek’s conclusion depends on the assumption that money makes only one ‘move’ per period. For instance, when the Stage 7 producers receive their income from consumer spending, they do not immediately pass this on in settlement for the delivery of intermediate product from Stage 6, but rather hold the money for a full period first. The Stages carry transactions balances equal to their respective purchases of intermediate goods. Absent monetary expansion, therefore (as in the case where the transition is purely saving-driven), there must be a deflation sufficient to shrink the transactions-balance requirements of the new system to match the pre-existing stock of money. It should be noted, however, that even in the case where the aggregate value of final output remains unchanged (and the total money value of transactions therefore increases), there is still an implicit fall in the unit price of the consumer good, since the new process produces a larger physical volume of output.

If we assume, contrary to Hayek, that all transactions among the Stages are settled simultaneously each period, then no monetary expansion would be required to sustain the new system. Money balances are then needed only with respect to the payment of wages and expenditure on final consumer goods, which have the same aggregate money value after the transition as before.

Two points emerge from this. First, it is not obvious that the move to the new system must involve monetary expansion, even in the absence of any financial saving by consumers. Second, even if the 35-unit monetary expansion does occur, then on
Hayek’s own assumptions this will be entirely ‘absorbed’ in increased transactions balances held by the Stages. As Sraffa correctly observes (1932B, p. 250) there will be no ‘extra money’ left over for the payment of higher wages. This in turn means that once the transition is completed there is no way for the consumers to reverse it. Their nominal wage income returns to its original value of 35, at which aggregate price they are just able to purchase the increased real output of consumer goods flowing from the new, lengthier production process. There is simply no basis for regarding the situation shown in column 8 as inherently unstable. The fact that the transition was accomplished without any voluntary saving on the part of consumers is quite irrelevant to the stability of the resulting system.

Hayek therefore over-reaches himself when he tries to claim that the end product of such a transition (if it is not financed by the voluntary saving of consumers) is necessarily problematic. But he may be on firmer ground when he argues that such a transition may be disrupted before it is completed. Table 1 shows the transitional costs faced by consumers. In periods 5 and 6 there is a sharp reduction in real final output. Since the old process is still operating, though at reduced intensity, and the new process is not yet delivering, the quantity of labour input may be used as a proxy for real output. The total cumulated labour input for the old process running at full intensity is 35, but in periods 5 and 6 this cumulated input falls to 10 (as seen in the sum of the $L$ and $P$ values for Stage 7) so that real final output drops to $2/7$ of normal. If the consumers had no idea of what was going on and had not carried out any real saving, in the form of stockpiling the consumer good during periods 1 to 4, this would be a nasty surprise. And if they continue to spend the whole of their incomes on this reduced supply of consumer goods, the result would be a drastic rise in price. This is the point of vulnerability, the point at which Hayek suggests the transition may be aborted, as entrepreneurs respond to the rise in the relative price of final output by moving back towards a shorter production process.

If, however, we raise the question of whether the transition might be disrupted before completion, we should also consider the problem of how it gets started in the first place. My analysis of the transition is linked to a certain pattern of reallocation of labour between the stages. What if this does not materialize as assumed above? Suppose that in period 1 the start-up of the new Stage 1 is financed by a new bank loan, while none of the existing stages are planning to cut back on employment. There will then be an excess demand for labour at the old wage rate, and the wage will rise. It is not clear which among the old Stages will then give up labour. There is no reason to suppose that Stage 3 will give up the 5 units, as required to initiate the optimal transition (optimal, that is, under the planning assumptions outlined above). Further, if wages rise immediately it then becomes likely that consumer goods prices will rise.

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12 Not only do consumers lack the means to disrupt the new system, but why should they want to? They gain from the improvement in real productivity, and if they were somehow able to force disinvestment in the new process this would reduce their real incomes over any but the shortest time-horizon.

13 Note though that, on the assumptions made here, this would be completely irrational from a social point of view. If the new system is almost on stream, it will actually take longer to produce a greater output of consumer goods by re-starting the shorter process at higher intensity, than by pressing on with the more roundabout process. On the other hand, if production coefficients are not fixed there may be something to be gained through an appropriate re-allocation of resources in favor of immediate consumption.
too, and it is not even clear that the transition will proceed at all.

As Sraffa says (1932A, p. 52), a smooth transition of the type represented in Table 1
could probably be achieved only by advance planning. In a market system, if consumers
simply started carrying out financial saving in period 1, this would surely lead to a
reduction in output of consumer goods in the next period, and we would immediately
be off the optimal transition path, even supposing that the labour shed from Stage 7
were immediately allocated to starting up the more roundabout process.

Let us return, however, to the logic of the argument that the transition might be
aborted, if it is embarked upon without the acquiescence of the consumers. The basic
idea here is conveyed more effectively by the simple illustration offered on p. 94 of
Prices and Production, than by the tortuous dynamic argument of Lecture 3. I quote
the illustration:

The situation would be similar to that of a people of an isolated island, if, after having
partially constructed an enormous machine which was to provide them with all necessities,
they found out that they had exhausted all their savings and available free capital before the
new machine could turn out its product. They would then have no choice but to abandon
temporarily the work on the new process and to devote all their labour to producing their daily
food without any capital.

In general terms this seems like a genuine possibility, but as Hicks (1967) points
out, the key question is how such a process of excessive investment could get far
enough along to create this sort of problem. Here we must examine the role and nature
of the lags implicit in Hayek’s story.

Hayek has the process starting with an expansion of loan-financed investment ex-
penditure. His argument requires that this expenditure begins to alter the structure of
production; but then, with a time lag, wages start to rise and nominal consumer de-
mand increases. This increase in nominal demand coincides with temporarily reduced
real output of consumer goods, hence generating a sharp rise in the relative price of
consumer goods that aborts the transition by pulling resources back into the shorter
production process. Timing is of the essence in this story. If wages and nominal con-
sumer demand were to rise right away, the transition would not even get under way:
the result would just be a balanced inflation. Three kinds of lag may be identified in
Hayek’s story. First, there is a lag between starting the transition, and the inevitable re-
duction in real output of consumer goods. That this lag is quite possible on the general
assumptions made by Hayek is clearly shown in Table 1. But it will not by itself get
the argument going: it becomes relevant only if the transition actually gets underway,
and this is what is at issue. The burden must be borne by one or both of two further
lags: that between the expansion of investment spending and increase in wages, and
that between increased wages and increased consumer demand. Let us discuss these in
turn.

The investment-wage lag. We have noted above, with Sraffa, that according to the
comparative static exercise in Hayek’s Lecture 2, wages do not (cannot) rise at all,
since the monetary expansion which Hayek envisages is entirely absorbed, on his own
assumptions, by inter-stage transactions balances. That implies that no excess demand
for labour emerges in the transition, which in turn implies a pattern of voluntary saving
and cross-investment by the directors of the Stages. If we drop this assumption then
the attempt to start up the new process on the strength on new bank credits is bound to generate an excess demand for labour. As Hicks notes, “we are beginning (it is insisted) from a situation in which there is full employment of labour. Labour is a producers’ good; wages are flexible; so the money wage must go up” (1967, p. 208). Yet Hayek wants to insert a lag at this point. He talks of the entrepreneurs who initially embark on the new process spending their new funds on producers’ goods, and “outbidding the entrepreneurs who used them before” (1935, p. 86), which is in line with Hicks, but in his reply to Sraffa (Hayek, 1932, p. 242) he is quite explicit on the investment-wage lag. I quote \textit{in extenso}, for it seems to me that this raises an important problem for Hayek’s argument as a whole:

Every individual entrepreneur can increase his real capital only by spending more on capital goods and less on labour used in current production (or, what amounts to the same thing, more on labour which is invested for a relatively long period). He can, however, spend more on capital goods than on wages only so long as wages have not risen in proportion to the additional money which has become available for investment. Ultimately, incomes must rise in that proportion, since even the money used for the purchase of new capital goods must ultimately be paid out to the factors which make these new capital goods. \textit{[fn. Except for such amounts as may be absorbed in cash holdings in any additional stages of production.] But they will rise to the full extent only when all the new money has passed backwards through the successive stages of production until it is finally paid out to the factors. There will, therefore, always be a considerable lag between the increase in the money used for productive purposes and the corresponding increase in the incomes of the factors—and the consequent increase in the demand for consumers’ goods.

Recognizing that if wages rise in proportion to the monetary expansion without delay his process cannot get started, Hayek insists on a substantial lag in the increase in factor incomes.\textsuperscript{14} But is his reasoning sound? He argues that it takes time for increased expenditure on producer goods to ‘work its way back’ to the factors of production. Glance back at Table 1. We have already noted that physical output (work in progress) can be thought of as moving diagonally downwards and to the right over time. Hayek seems to have in mind that money moves along the other diagonal, upwards and to the right. That is, of the income derived by Stage 7 from sales to consumers in a given period, part is paid out in wages and part proceeds to Stage 6 in the following period as payment for intermediate product, and so on. As money income passes upwards over time, the proportion spent on wages at each Stage rises, while the cumulated proportion of the original consumer spending passing back to the factors of production also rises towards unity. So far so good, if we are considering the effects of an increase in consumer spending. But investment in a new, more roundabout process must presumably begin at the highest Stage, i.e. precisely where the proportion of expenditure flowing directly to the ‘original means of production’ is highest, if not unity. In arguing for an investment-wage lag, Hayek seems to have forgotten what he said about the very nature of production in Lecture 2. We already know that the ‘financial’ assumptions of Lecture 2 (according to which wages don’t rise at all) are incompatible with the dynamic argument of Lecture 3, but this new problem is more severe. If the ‘highest-order’

\textsuperscript{14}Sraffa jumps on the footnote in the middle of this passage, pointing out that this ‘qualification’ actually takes care of the entire monetary expansion under the assumptions of Lecture 2. But we have now abandoned Lecture 2, and are trying to discern the logic of Lecture 3 per se.
industries—those supposedly at the ‘beginning’ of the production sequence, and which first feel the impact of increased investment demand—in fact spend a large proportion of their outlays on produced inputs rather than original factors, then the key Austrian assumption of ‘non-circularity’ is subverted. Then, as Hicks (1983, p. 99) points out, “there is no period of production; there is no roundaboutness.” These terms become undefined, and it is back to the drawing board for the whole Hayekian theory.

The wage-consumption lag. If we avoid assuming an investment-wage lag on the grounds that this is incompatible with the general theory of production employed by Hayek, we are driven to the wage-consumption lag as the only other candidate for allowing the Hayek process to get started. Wages do rise when the bank-financed investment spending starts up, but workers choose not to spend their extra income; they carry out financial saving. To make the process work, Hayek’s consumers must behave as follows: (a) they are satisfied with their original level of real consumption, and don’t try to spend any more when their wages rise; but (b) when consumer goods eventually appear in short supply and prices rise, then people start spending as much as possible. (They stop saving, and perhaps draw down the cash balances they have accumulated earlier.) That is, faced with an increase in their nominal incomes, consumers increase their nominal spending if and only if the prices of consumer goods are rising. One can sympathize with Hicks’s judgment (1967, p. 209) that this ‘most extraordinary lag’ is not theoretically acceptable.

If neither of the lags postulated by Hayek is plausible, his argument falls as an explanation of the trade cycle, even if one accepts his presuppositions in Austrian capital theory and his analysis of the ‘elastic’ credit system. Nonetheless, as Hicks says, there remains something of interest in Hayek’s construction.

Granted the initial change in the producer-price/consumer-price ratio, and granted that it can be maintained, the effect on the production process will be of the kind that Hayek describes. The queer thing about the Hayek theory … is not the answer that Hayek gives to his question; it is the lack of justification, within the model as set out, for the question being asked at all. (1967, pp. 208–9)

Hicks proceeds to ask if there may be another question which fits the Hayek answer, and suggests that the appropriate question might concern the effects of over-ambitious investment in a centrally-planned economy. To expand on Hicks’s point, suppose the authorities start up a grandiose investment project without due attention to the curtailment of consumption implied in the medium-run. At first things seem OK, because consumer goods already in the pipeline continue to come forward; but then there comes a point where the completion of the project requires a further diversion of resources away from consumption. Either the authorities press on regardless, or perhaps, subject to intense political pressure from consumers, they relent and hence fail to complete the project. The visible result is an unfinished or under-utilized capital project, but this does not reflect general ‘over-capacity’—a problem which might be cured by an expansion of demand; rather it reflects a structural imbalance which could be corrected only if consumers were willing to tolerate a reduced real standard of living for a longer period. Hayek’s lag is acceptable here, since by assumption the allocation of resources to

\footnote{Even then, the Hayek ‘answer’ does not necessarily fit—too many of the Hayekian preconditions are contingent rather than universal—but it might.}
investment is decided by fiat of the planners, while wages are also centrally controlled.

4 Conclusion

We have examined both the methodological bases of Hayek’s cycle theory, and the detailed mechanics which are supposed to generate an unbalanced boom and subsequent crisis from a starting point in credit expansion in favour of bullish entrepreneurs. The latter, we have found, is not without interest, but is nonetheless unpersuasive as an analysis of the trade cycle in capitalist economies—even if one approaches the theory more charitably than Sraffa, with the aim of repairing its logic where possible. In closing, let us briefly revisit Hayek’s formulation of the problem to be addressed by trade cycle theory (or, one might say, by macroeconomics in general): What difference must a serious analysis of money make to the conclusions of ‘equilibrium theory’?

If this question retains its validity, it is interesting to see how far back towards square one we are driven by the failure of Hayek’s substantive ‘over-investment’ theory of the cycle. For Hayek, as we have seen, the key feature of money which overturns the conclusions of moneyless equilibrium theory is its elasticity: the banks are able to create additional means of payment via their lending even when there has been no augmentation of the real resources at society’s disposal, nor any increase in consumers’ willingness to save. This feature gains its importance because it is the necessary condition for the initiation of over-investment: it would appear, then, that if the latter is abandoned as the motor of the cycle, the relevance of Hayekian monetary elasticity is put in question. It is worth noting that Keynes (1936, esp. chapter 17) emphasizes what is in a sense the opposite feature of money, namely its low elasticity of production. When there occurs an autonomous increase in the demand for money balances (as opposed to reproducible goods), employment falls, because the labour withdrawn from the production of goods does not (cannot) get allocated to the production of additional money. (Here, of course, the departure from full-employment equilibrium occurs in the downward direction, as against Hayek’s initial over-expansion.) For Robert Lucas (or Milton Friedman for that matter), on the other hand, what matters is that the supply of money can be varied arbitrarily, without reference to changes in real productivity, hence generating the inflations or deflations that ‘fool’ agents into moving their current supply of labour away from the full-information level. This is somewhat closer to Hayek, but nonetheless quite distinct from the latter’s endogenous elasticity via bank lending in the face of shifts in the perceived profitability of investment: the Lucas/Friedman story would work equally well (if not better!) with a pure fiat money. It may be possible to construct an alternative theory in which the Hayekian endogenous elasticity of the means of payment regains an important role in the mechanism of the cycle, but absent such an alternative it seems that this aspect of his theory stands or falls with the idea of over-investment.

References


17
Sraffa, P. 1932A. Dr. Hayek on money and capital, *Economic Journal*, March