Imperfect Competition and the Trade Cycle: Aborted Guidelines from the Late 1930s*

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The cyclical behavior of wages and prices was a major concern in trade cycle analysis on the eve of the Second World War. An ambitious research program, integrating into macroeconomics imperfect competition and other elements of industrial economics, was elaborated at both the theoretical and empirical levels—and then suddenly discontinued. However, this program was sufficiently ripe to include the main ingredients of the early New Keynesian economics that emerged a half century later: imperfectly competitive product markets (with costly price adjustments, economies of scale, and cyclical behavior of markups), imperfectly competitive labor markets (with wage negotiations, long-term contracts, and efficiency wages), and coordination failures.[1] The program thus provided an interesting set of potential guidelines—but guidelines that remained mostly unused for decades.

Imperfect competition was in some sense present in macroeconomics from the beginning. It was certainly implicit in John Maynard Keynes's *General Theory*: unemployment, other than the frictional kind, could not have been the main theme of the book had the author assumed the labor market to be perfectly competitive. Even if Keynes did not provide a complete analysis of wage determination, money wages explicitly appeared, already in the *Treatise on Money*, as the result of contractual arrangements between entrepreneurs and workers, typically represented by trade unions.[2] Besides, the *General Theory* also assumed imperfect competition in product markets, although in a discrete and simplified way characterized by a constant degree of competition.[3]

Yet, it was the development of another major theme of macroeconomic theory, business cycles, that pushed imperfectly competitive output markets to the fore, principally under the lead of Roy Harrod, who began to write on the trade cycle in 1925 and on imperfect

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[1] See for instance the two volumes of readings edited by N. Gregory Mankiw and David Romer (1991), or the overviews by Robert J. Gordon (1990), David Romer (1993), and Corrado Benassi, Alessandra Chirco, and Caterina Colombo (1994).

[2] Cf. Keynes 1930, 1:149–53; and 1936, 7–13.

[3] In the published version of the *General Theory*, Keynes (1936, 245) "take[s] as *given* . . . the degree of competition" (our emphasis), not necessarily the maximal one. His position with respect to such less-than-perfect competition in the output markets evolved after the first proof of the book (cf. Keynes 1973, 2:502). Compare the comment on the "first postulate" of classical economics as formulated in the published version (Keynes 1936, 5) with the one in the first and second proofs (Keynes 1973, 2:352–53).

competition in 1927, building a bridge between the two fields in the articles "Doctrines of Imperfect Competition" (1934), and "Imperfect Competition and the Trade Cycle" (1936a), just before the publication in the same year of his "essay" on the trade cycle (1936b).[4] Both Harrod and Keynes were referring, in the same year, to a supposed feature of business cycles, namely countercyclical real wages, a feature contested two years later by statistical observations collected by John T. Dunlop (1938) and Lorie Tarshis (1939) and discussed principally by the former. This empirical evidence, as well as other more speculative considerations, induced an important flow of theoretical arguments developed by several authors in a very short period (1938–39) and involving the reciprocal influences of output market power and economic fluctuations. These kinds of theoretical arguments completely disappeared after the war from the forefront of economic analysis, be it in macroeconomics (which came to favor perfectly competitive models) or in industrial economics (which emphasized static models), until the New Keynesian revival of the 1980s. Only the empirical studies, stripped of the research program they helped generate, continued to operate as what Thomas J. Sargent (1987, 468) called the *Dunlop-Tarshis observation* "alleging the failure of real wages to move countercyclically."[5]

Here we shall study the birth and development of this aborted research program on imperfect competition and the trade cycle. We will show that it delineated the main themes of New Keynesian economics and that it guided in fact its analysis of the role of markup variation in the generation of business cycles. We start in section 1 with the arguments for the supposed countercyclicality of real wages, as expressed in Keynes's and Harrod's writings, and with the evidence given by Dunlop and Tarshis to show that it was a mistaken belief. In section 2, we continue with the determinants of wage formation on the employees' and employers' sides, as discussed by Dunlop (1938). Section 3 will be devoted to the cyclical behavior of markups, resulting from rigid output prices and from variable degrees of collusion along the cycle. Section 4 concludes.

1 A Contested "Stylized Fact" in the Light of Imperfect Competition

At the beginning of the *General Theory*, Keynes (1936) conjectures that the change in real wages is almost always in the opposite direction of a change in money wages. This supposed feature of the trade cycle would nowadays be called a "stylized fact," following Kaldor 1961.[6] As we show in the first subsection, Keynes suggests that his conjectural stylized fact results from two hypothesized relationships between employment and wages: one positive, concerning money wages; the other negative, concerning real wages. The fact itself, however, was soon challenged by the statistical observations collected by Dunlop and Tarshis, necessitating a reexamination of the underlying relationships between employment and wages in the light of imperfect competition. In the second subsection,

[4] See Besomi 2003.

[5] See the extensive survey by Andrea Brandolini (1995), who separates the (very few) pre-econometric studies of the first two decades after the Dunlop-Tarshis observation and the (more numerous) econometric studies starting with Bodkin 1969.

[6] "In choosing a particular theoretical approach, [the theorist] ought to start off with a summary of facts which he regards as relevant to his problem. Since facts, as recorded by statisticians, are always subject to numerous snags and qualifications, and for that reason are incapable of being accurately summarized, the theorist, in my view, should be free to start off with a 'stylized' view of the facts—*i.e.* concentrate on broad tendencies, ignoring individual details, and proceed on the 'as if' method, *i.e.* construct a hypothesis that could account for these 'stylized' facts, without necessarily committing himself to the historical accuracy, or sufficiency, of the facts or tendencies thus summarized" (Kaldor 1961, 178).

we will further show that in his contemporaneous paper "Imperfect Competition and the Trade Cycle," Harrod (1936a) derives what is essentially the same stylized fact from the procyclicality of three classes of variables: money rewards to prime factors, commodity prices, and profits, in increasing order of amplitude of their fluctuations.

1.1 Keynes's Conjectured Correlation between Real and Money Wages

Keynes's conjecture is stated and justified in chapter 2 of the *General Theory*:

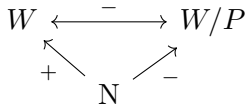
> It would be interesting to see the results of a statistical enquiry into the actual relationship between changes in money-wages and changes in real wages. In the case of a change peculiar to a particular industry one would expect the change in real wages to be in the same direction as the change in money-wages. But in the case of changes in the general level of wages, it will be found, I think, that the change in real wages associated with a change in money-wages, so far from being usually in the same direction, is almost always in the opposite direction. When money-wages are rising, that is to say, it will be found that real wages are falling; and when money-wages are falling, real wages are rising. This is because, in the short period, falling money-wages and rising real wages are each, for independent reasons, likely to accompany decreasing employment; labor being readier to accept wage-cuts when employment is falling off, yet real wages inevitably rising in the same circumstances on account of the increasing marginal return to a given capital equipment when output is diminished. (1936, 9–10)

This passage is recalled by Keynes ([1939] 1973) in his reply to two articles providing the statistical inquiry he called for. The first article is by John T. Dunlop who, as an American graduate student on a fellowship for a year in Cambridge, examined the question using British data for the period 1860–1937. His paper, the draft of which Keynes read and commented on in a letter dated 9 April 1938 (Keynes 1979, 284–85), was published in the *Economic Journal* in September 1938. Dunlop (1938, 421) reaches the following conclusion: "Increases in wage rates have usually been associated with increased real wage rates, while decreases in wage rates have equally often been associated with a rise or fall in real wage rates." The second article is by Lorie Tarshis, who had the privilege of attending Keynes's lectures during the four years preceding the publication of the *General Theory*.[7] It is a short note based on U.S. monthly data for the period 1932–38 and was published in the *Economic Journal* in March 1939. Like Dunlop, Tarshis (1939, 153) refutes Keynes's conjecture, reaching the even stronger conclusion that "when money wages are rising, it is generally found that real wages are rising, and when money wages are falling, real wages are usually falling."

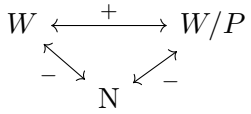
As already mentioned by Keynes in the passage quoted above, and as repeated in the 1939 article, the relationship supposed to be observed between the movements of real and money wages should be deduced from two hypothesized relationships: one, concerning the labor market, between money wages and employment; the other, concerning product markets, between real wages and output. Keynes's argument goes as follows. Money wages W are assumed to decrease in response to a decrease in output and employment N ("labor being readier to accept wage-cuts when employment is falling off"), so that we

[7] Tarshis attended all four series of Michaelmas Term lectures given by Keynes from 1932 to 1935, first as a reader for the economics tripos then as a senior scholar. His notes were one of the main sources of Rymes 1989.

have a positive relationship between the two variables ($N \xrightarrow{+} W$).[8] This is what Keynes (1930, 1:151) calls an *induced* (as opposed to *spontaneous*) change in money wages. Now, because of the assumed decreasing marginal productivity of labor in the short period, an expected decrease in "effective demand" leads to lower prices P and, at given W, higher real wages, thus triggering a decrease in output and employment N ("real wages inevitably rising in the same circumstances on account of the increasing marginal return to a given capital equipment when output is diminished"). We thus obtain a negative relationship between real wages and employment ($W/P \xrightarrow{-} N$), corresponding to a movement along the labor demand curve.[9] Finally, when we make expected and actual prices coincide, at short-period equilibrium, we get the conjectured negative relationship ($W \xleftrightarrow{-} W/P$) between observed money and real wages. Putting together the three relationships, of which two are causal, represented by arrows that point in only one direction, and one simply reflects the conjectural resultant of the former, we obtain the following diagram:



As already mentioned, Tarshis (1939) refutes Keynes's conjecture by giving evidence of a positive correlation ($W \xleftrightarrow{+} W/P$) between real hourly wages and money earnings per hour. He further concludes in a postscript, from empirical observations, that "changes in real hourly wages are in general opposite in direction from changes in man-hours of work" (154), corroborating the negative relationship between real wages W/P and employment N. This leaves us with the new following picture of the three relationships, with an *implicit* negative relationship between employment and money wages and no causality involved:



For our purpose, the key ingredient in this picture is in fact the negative relationship between real wages and employment under perfect competition. For Keynes ([1939] 1973, 394), this negative relationship fitted a "belief . . . widely held by British economists up to the last year or two" and that goes back at least to Marshall and extends to Pigou (395–99).[10] Keynes attributes to his two predecessors the view that the benefits of an expansionary policy stimulating effective demand result from pushing prices up and, given the supposed stickiness of the money wage, from "deceiving, so to speak, the working classes into accepting a lower real wage" (401), compatible with a higher employment.

[8] Symmetrically, "since each group of workers will gain, *cet. par.*, by a rise in its own wages, there is naturally for all groups a pressure in this direction, which entrepreneurs will be more ready to meet when they are doing better business" (Keynes 1936, 301).

[9] Note that the labor demand curve, expressing what Keynes calls the first fundamental postulate of classical economics, is fixed in the short period. Variations of effective demand (for output) induce movements along the curve. The labor supply curve, expressing the second fundamental postulate, does not play any role in Keynes's analysis, since the second postulate is rejected (workers are off the labor supply curve).

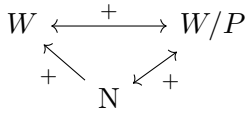
[10] Keynes refers to Marshall's memoranda for the Gold and Silver Commission in 1887 and for the Indian Currency Committee in 1899 (in Marshall 1926), as well as to Pigou's *Theory of Unemployment* (1933), in spite of the nonorthodox view admittedly defended by the same Pigou in his *Industrial Fluctuations* (1927). We will not address this topic further in the present article, which concentrates on contributions in the late 1930s and their relationship to modern macroeconomic theorizing.

Keynes's position in the *General Theory* coincided with the same belief in countercyclical real wages, although for different reasons:

> Like Marshall, Prof. Pigou based his conclusion primarily on the stickiness of money wages relatively to prices. But my own readiness to accept the prevailing generalisation, at the time when I was writing my *General Theory*, was much influenced by an *à priori* argument, which had recently won wide acceptance, to be found in Mr. R. F. Kahn's article on "The Relation of Home Investment to Employment," published in the *Economic Journal* for June 1931. The supposed empirical fact, that in the short period real wages tend to move in the opposite direction to the level of output, appeared, that is to say, to be in conformity with the more fundamental generalisations that industry is subject to increasing marginal cost in the short period, that for a closed system as a whole marginal cost in the short period is substantially the same thing as marginal wage cost, and that in competitive conditions prices are governed by marginal cost. (Keynes [1939] 1973, 399–400)

Hence, if the negative relationship between employment and real wages is to be discarded, one has to move from a closed to an open system, from the short to the long period, or from perfect to imperfect competition. Notice that the last move opens the way both to decreasing marginal costs and to disconnected changes in prices and marginal costs because of a variable degree of competition. Tarshis (1939, 153) commented precisely on the nonrealistic character of Keynes's assumptions of rising marginal costs and constant degree of competition, without further empirical or theoretical investigation.

By contrast Dunlop, who also refuted Keynes's conjecture on the basis of statistical observations ($W \overset{+}{\longleftrightarrow} W/P$) while accepting (with qualifications) the positive relationship between employment and money wages ($N \xrightarrow{+} W$), had to admit a positive relationship between real wages and employment ($W/P \overset{+}{\longleftrightarrow} N$). We thus obtain the following diagram, keeping the same causal relationship between wages and employment, but reversing the sign of the correlation (without a definite sense of causality) between employment and real wages:



In their refutation of Keynes's conjecture, the two authors (followed by Keynes [1939] 1973) agree that, among all the reasons that can be set forth against the conjecture, an important one is possibly the unrealistic character of the perfect competition assumption with respect to product markets. Imperfect competition should be introduced in order to modify two of Keynes's original assumptions, increasing marginal cost and constant degree of competition. These modifications are sketched by Keynes himself.

As to the first, "if we start from a level of output very greatly below capacity, so that even the most efficient plant and labor are only partially employed, marginal real cost may be expected to decline with increasing output, or, at the worst, remain constant" (Keynes [1939] 1973, 405). If we take the marginal real cost as approximately constant (and equal to average real cost) up to the point of normal capacity, we get the familiar reverse L-shaped cost curve introduced by Michal Kalecki (1938) in a paper quoted by both Dunlop and Keynes. Going further, and assuming decreasing real marginal costs

in the short period, is of course "possible only with the existence of monopoly or imperfect competition," otherwise "enterprises must close down or maintain such a degree of employment that the marginal cost is higher than the average cost" (Kalecki 1938, 102–3).

As to the second modification of his original assumptions, which consists in admitting a variable degree of competition, Keynes ([1939] 1973, 406) writes:

> There remains the question whether the mistake lies in the approximate identification of marginal cost with price, or rather in the assumption that for output as a whole they bear a more or less proportionate relationship to one another irrespective of the intensity of output. For it may be the case that the practical workings of the laws of imperfect competition in the modern quasi-competitive system are such that, when output increases and money wages rise, prices rise less than in proportion to the increase in marginal money cost.

This position may be taken as one of the fundamental features of the so-called New Keynesian approach to business cycles. Commenting on the "famous criticism raised by Dunlop (1938) and Tarshis (1939) against the theory of aggregate supply of Keynes (1936)," Julio J. Rotemberg and Michael Woodford (1999, 1059) have recently emphasized that "Keynes (1939) recognized the appeal of a hypothesis of countercyclical markup variation as a resolution of the puzzle, which is the interpretation that we propose." Increasing returns have also played a significant role in New Keynesian theory, although not always related to the Dunlop-Tarshis puzzle.[11]

1.2 Harrod's "Law of Diminishing Elasticity of Demand"

Harrod (1936a, 84) presents as one of the main features of the trade cycle "the fact that the commodity price fluctuation has greater amplitude than that of (money) rewards to prime factors." If prime factors are restricted to labor, and since money wages and prices are supposed procyclical, Harrod's stylized fact is equivalent to Keynes's hypothesized procyclicality of money wages and countercyclicality of real wages. It implies that either real marginal costs or markups on money marginal costs are themselves procyclical: "The fulfillment of the marginal condition (marginal revenue = marginal cost) requires that, within the ambit of the cycle, work costs rise and fall with rises and falls in output and/or the ratio of marginal revenues to prices falls and rises with rises and falls in output" (Harrod 1936a, 85).

The novelty with respect to Keynes's initial position is that the first alternative, that of rising marginal costs, is not taken by Harrod as the relevant explanation for the stylized fact. Already in the paper "Doctrines of Imperfect Competition," published two years before, he emphasized the importance of imperfect competition for trade cycle theory, because of its compatibility with decreasing costs: "The key which the doctrines of imperfect competition provide for solving the mystery [concerning movements away from the general equilibrium of output] is that . . . industries may be subject to the law of decreasing costs (in the long and short periods)" (Harrod 1934, 465). Decreasing costs undermine equilibrium stability, with the consequence that cycles in a stationary

[11] See Benhabib and Farmer 1999, 398–407, for an overview of the recent literature on equilibrium indeterminacy, which is typically generated by economies of scale, either external (possibly under perfect competition) or internal (necessarily under imperfect competition). An early example of a model exploiting increasing returns to obtain equilibrium indeterminacy, which explicitly refers to the same passage in Keynes [1939] 1973, 406, is found in Weitzman 1982. As to the role of increasing returns in solving the Dunlop-Tarshis puzzle, it is explicitly mentioned for instance by Mark Weder (2000, 289).

environment do not have to be ascribed to errors in producers' expectations and may on the contrary be approached as an equilibrium phenomenon:

> If, on the other hand, imperfect competition, decreasing costs and the absence of a stable equilibrium in the general level of output as a whole are recognized, the psychological theory becomes a valid explanation of trade cycle phenomena without reference to error at all. There being various levels at which, if industries attain them conjointly, they will be in equilibrium with one another, a depressed mentality leads to the choice of a lower instead of a higher level. The lower level is as rational as the higher one. Provided that a number of producers are depressed and recognize the existence of depression in each other, rational choice demands restriction by each. Nor do they subsequently recognize that their action was erroneous, for they attain an equilibrium at the new level and are under no stimulus to reexpand. (469–70)

This passage is important, because Harrod is defending an equilibrium approach to business cycles, based on a rational expectations hypothesis: "The prolonged persistence of . . . errors is surely an unreasonable hypothesis" (470). This approach relies upon the existence of multiple long-period equilibria, which may result from alternative producers' (correct) expectations. Optimism and pessimism lead respectively to high and low equilibrium outputs, anticipating the idea of coordination failures in the New Keynesian literature (Cooper and John 1988).[12]

It is thus clear that decreasing marginal costs play a major role in Harrod's theoretical approach to the trade cycle. This is reinforced by two empirical observations, first that, within the slump, "it is quite unusual for marginal prime costs to rise until the point of normal capacity is reached" (the same argument as the one used by Kalecki, Dunlop, and Keynes, mentioned above), and then that, "within the course of the boom, plant is rapidly extended," making "the period to which [diminishing returns apply] too short for trade cycle analysis" (Harrod 1936a, 86).

Since decreasing marginal costs lead to a positive relationship between real wages and employment, Harrod's stylized fact (equivalent to Keynes's conjecture) can only subsist if the markup on marginal cost, or the degree of monopoly (Lerner 1934), varies procyclically. The reciprocal of the Lerner index, equal in monopolistic competition to the elasticity of demand, must consequently decrease on the upswing. This is expressed in Harrod's "Law of Diminishing Elasticity of Demand" (stated in Harrod 1936b, 21–22) resulting from the fact that the expected value to a consumer of searching for better opportunities among close substitutes is supposedly a decreasing function of his income.

Harrod's conclusion, however, was not accepted in general.[13] More importantly, two crucial countervailing factors were immediately pointed out by Joan Robinson (1936, 59–60) in her review of Harrod's *Trade Cycle*, namely the variability along the cycle of both the number of active firms (hence of the degree of concentration) and of their incentive to collude, both affecting the degree of monopoly: "The degree of monopoly does not depend only on the imperfection of the market for a commodity, but also on the number of separate units of control engaged in selling it, and, since the fear of loss is more powerful than the hope of gain, the tendency towards restrictive combinations is stronger in a slump than

[12] Early examples of models exhibiting multiple rational expectations equilibria, ordered with respect to employment levels, can be found in Weitzman 1982, already referred to, and Bryant 1983, among others. The latter presents his model as a counterexample showing that it is wrong to take "the tools of rational expectations, and more generally microfoundations" as arguments against Keynes.

[13] See Sumner 1940 for a review of the principal arguments.

in a boom." In section 3, we shall come back to the relationship between real wages and employment, more specifically through the variations of the degree of monopoly along the cycle. For the moment, let us examine more deeply the relationship between employment and money wages, as discussed by Dunlop (1938), a relationship that has often been neglected, in particular by Keynes's commentators.

2 Money Wages along the Cycle

Of the two relationships underlying Keynes's conjecture, Dunlop retains the influence of employment on money wages. But, even if he shares Keynes's view that "money wage rates [should be] regarded as a function of trade-union strength, which in turn is a function of employment" (Dunlop 1938, 431), he concludes that "while changes in employment are more closely associated with changes in wage rates, important deviations remain. There seems to be no simple relation—and especially of a causal nature—adequate to summarize the two movements without very wide margins of error" (432). This conclusion results from a careful empirical inquiry on trade-union behavior in the context of wage bargaining, followed by a thorough discussion of the employer's point of view.

2.1 The Trade-Union Attitude

Dunlop's (1938, 422) objective is "to discover, if possible, certain central tendencies in trade-union wage policy and some indication of the deviation from these tendencies." First he insists, even more than Keynes, that "the trade-union leadership resists money wage reductions—to the point of strike—'whenever possible,' " because such reductions "have the tendency to spread" like an "infection" (to different categories of workers, different firms, different industries, and so on). They also tend to be repeated and are in general difficult to restore when trade improves.

He then considers the "purchasing power" argument often developed by the unions to justify the resistance to wage cuts: "It is most frequently argued that a cut in wage rates reduces 'purchasing power,' and therefore leaves the employer and the community (shopkeepers are frequently mentioned) in just as bad, if not a worse situation" (423). Dunlop, quoting a letter written by an employer to a member of Parliament in 1739, recalls the very long standing of this argument. This is related to what is now called the *income feedback effect* (Hart 1985) or the *Ford effect* (d'Aspremont, Dos Santos Ferreira, and Gérard-Varet 1989), since it was put forward by the U.S. car magnate Henry Ford (1922, 124–25) to justify a policy of high wages:

> I believe in the first place that . . . our own sales depend in a measure upon the wages we pay. If we can distribute high wages, then that money is going to be spent and it will serve to make storekeepers and distributors and manufacturers and workers in other lines more prosperous and their prosperity will be reflected in our sales. Country-wide high wages spell country-wide prosperity, provided, however, the higher wages are paid for higher production.

Conversely, lower wages entail less purchasing power from a given number of employees and thus tend to depress, mainly indirectly, the demand addressed to the employers. The purchasing power argument can thus be used by trade unions both to justify their resistance to wage cuts and to ask for an advance in wage rates. However, Dunlop insists on the asymmetry in trade-union behavior between the "no reductions" policy and the wage-rate advance policy in relation to his statistical findings summarized above.

An aspect of this asymmetry is the importance of the cost-of-living argument for wage-rate advances ("the cost of living has gone up and an advance in wage rates is therefore justified" [Dunlop 1938, 425]), which, reinforced by other arguments, like the purchasing power, the improvement of profits, or the technical changes arguments, entails a rise in real wages in the upswing (although maybe not at the very start of the upswing, since negotiations take some time). As for the no-reductions policy, it should imply a rise in real wages in the first part of a depression "until a phase of the depression is reached when great pressure is characteristically brought to bear by employers against wage rates. Then real wage rates might be expected to fall" (425). And Dunlop concludes this about the cost of living as a trade-union argument: "If to such an exceedingly complex problem in social motivation each person were entitled to one guess, mine would be that the cost of living has been less important than a survey of wage negotiations would indicate, but considerably more important than Mr. Keynes' position would admit" (428).

2.2 The Employer's Point of View

Furthermore, as emphasized by Dunlop, one should also take into account "the employer's point of view" in this negotiation process, both as an employer proper (a demander in the labor market) and as a product competitor (a supplier in the output market) who may be inclined to adopt a stable wage-rate policy in spite of an employment decline. In this respect, Dunlop's "British field work" (Dunlop 1998, 228) appears as an application of the *efficiency wage* hypothesis (Akerlof and Yellen 1986), of which he is an early formulator, with its sociological (Akerlof 1982; Akerlof and Yellen 1990) and labor-turnover foundations (Stiglitz 1974; Salop, 1979): "The employer may judge the decrease in wage rates possible—in view of trade-union strength—to be not worth the loss in 'morale' which would have an adverse effect on output. Wage-earners may be less careful, or may even curtail their rate of effort deliberately" (Dunlop 1938, 428). And: "The extra wages may be regarded as an investment in a more efficient working force for the future, by preserving a group of working-men intact in the present" (428–29).

There are still other factors presented by Dunlop "which may lead employers to adopt a policy of 'more stable' wage rates." Among them are the attempt to avoid destructive strikes, the relief of the downward pressure on wages resulting from the layoff of the least efficient workers, and the use of long-term *wage contracts*: "The existence of wage contracts and agreements which run for a period of years have a tendency to reduce the frequency and amplitude of wage-rate changes" (429). Long-term contracts as a source of wage rigidity again constitute an important element of New Keynesian economics (Akerlof 1969).

Finally, Dunlop considers *strategic* objectives of the employers, concerning their competitors in product markets and involving an advertising effect (a "good" employer attracts more customers) and a contamination effect (lower wages spread and imply lower costs for the competitors too, making them more competitive): "If a considerable proportion of sales are to working-class people, an employer may further advertise that he is a 'good' employer, and thereby actually shift his individual demand curve to the right, at the expense of competitors" (Dunlop 1938, 428). And: "A reduction of wages in one firm may tend to make easier a reduction of prices elsewhere in the industry, as the wage reductions spread" (429).

All these elements of the analysis of the labor market are clearly helpful in understanding wage rigidities, and more generally the fact that the relationship ($N \to W$) between changes in employment and changes in wage rates may not have been so tight as Keynes

assumed.

3 Markups and Prices along the Cycle

Procyclical real wages may result from countercyclical movements not only of marginal costs but also of markups on marginal costs or, equivalently, of degrees of monopoly: "Wage cutting is likely to increase to a certain extent the degree of monopoly because a tendency may exist not to pass it on to the buyer" (Kalecki 1938, 111–12). Also, "in the slump, cartels are created to save profits and this of course increases the degree of monopoly, while they are afterwards dissolved in the boom because of improving prospects of independent activity and the emergence of outsiders" (111). Or as Dunlop (1938, 432–33) stated,

> A number of factors combine to make for an increase in the "degree of monopoly" during the depression and a decrease during the boom. With "rigid prices" in many sectors of the economy, a rise in wage rates during the upswing tends to reduce the "degree of monopoly." It is argued that the liquidation of cartel organizations and the disappearance of fear of retaliation for not following a price leader make for similar results.

We will successively consider in the following subsections these two factors of markup countercyclicality[14] pointed out by Kalecki and Dunlop:[15] rigid prices in the presence of variable wages and countercyclical degrees of collusion.[16]

3.1 Price Rigidity with Wage Variability

The Oxford Economists' Research Group conducted between 1936 and 1939, at the instigation of Harrod, an empirical inquiry into entrepreneurs' behavior, on which is based Robert Hall and Charles Hitch's 1939 paper. Although focusing on business pricing practices and apparently pertaining to the field of industrial economics, the inquiry was connected with the trade cycle,[17] more specifically with "the reciprocal influence of trade fluctuations and firms' behaviour" (Besomi 1998, 549). The principal result of the inquiry consisted in ascribing to entrepreneurs a full-cost pricing policy, namely, the practice of setting the price on the basis of the average cost computed at some customary output, plus a given markup. John Kenneth Galbraith (1936, 471) had already conjectured this result: "No matter with what subtlety economists explore the intricacies of marginal costs, it remains that to the business man it is average costs which are known and understood.

[14] Mark Bils (1987, 854), in one of the first New Keynesian articles to defend the idea of countercyclical markups, concludes: "Marginal cost is very procyclical. . . . The finding of a very countercyclical markup holds across most of the two-digit industries. This evidence is clearly inconsistent with a perfectly competitive view of manufacturing. It is also inconsistent with the view that wage stickiness is an important cause of the business cycle." Bils (1987, 839) refers to Kalecki 1938 for having explained the cyclical behavior of wages and prices by a procyclical elasticity of demand.

[15] Dunlop refers in the present context to Kalecki 1938, but also to other articles that will be brought up in the following, namely Abramovitz 1938, Galbraith 1936, and Tucker 1938 (see Dunlop 1938, 429, 432–33).

[16] We are leaving aside another possible reason for procyclical real wages, stemming from the reversal of Harrod's law of diminishing elasticity of demand: "People with decreased money incomes and increased concern for their economic security are less rather than more responsive to lower prices" (Galbraith 1936, 463).

[17] Roy Harrod occasionally labeled the OERG (of which he was a member, together with Hall and Hitch) "the trade cycle group" (Besomi, 1998, 547).

Moreover they are used as a guide to price policy." Keynes ([1939] 1973, 407) comments that "it is rare for anyone but an economist to suppose that price is predominantly governed by marginal cost."

Full-cost pricing as a mere rule of thumb is in itself a factor of real price rigidity. But other factors lend rationality to that policy or reinforce its consequences. One such factor consists in the fact that "changes in price are frequently very costly, a nuisance to salesmen, and are disliked by merchants and consumers," and that "there are conventional prices to which customers are attached" (Hall and Hitch 1939, 22), so that, as already observed by Galbraith (1936, 470 n. 5), the cost of making a price change is an incentive to holding prices constant: "Dealers [must be] informed of the change [so that the producer] must distribute new price schedules [and] also recast its advertising to acquaint the public with the change. All of these things cost money and all of this expenditure is avoided if prices are allowed to stay where they are." Rufus S. Tucker (1938, 53) makes fundamentally the same remark:

> Manufacturers are compelled to announce in advance what they expect to charge, frequently before they have any product ready for sale. They have to inform their salesmen and dealers and in some cases the buying public. They print price lists and advertisements. Necessarily prices so announced cannot be changed frequently. . . . It has been necessary for them to announce prices and to stick by their announcement, or if they diverted from them to do so secretly.

In other words, to use the terminology which has become standard, producers incur *menu costs* (Mankiw 1985), which can only dissuade them of making minor and frequent price adjustments.

Another factor, possibly still more significant in the context of oligopolistic competition, lies in the conjectures that may reasonably be ascribed to producers: "Although producers do not know what their competitors would do if they cut prices, they fear that they would also cut. [By contrast,] although they do not know what competitors would do if they raised prices, they fear that they would not raise them at all or as much" (Hall and Hitch 1939, 22). The oligopolist's belief that his rivals would not follow price increases but would on the contrary match price decreases makes him face a *kinked demand curve*, "the kink occurring at the point where the price, fixed on the 'full-cost' principle, actually stands" (Hall and Hitch 1939, 22–23).[18] At the same time, Paul M. Sweezy (1939, 568–69) independently introduces a similar "imagined demand curve," with a "corner" at the current price:

> If producer A raises his price, his rival producer B will acquire new customers, [a pleasurable feeling calling for no particular action]. If, on the other hand, A lowers his price, B will lose customers [the natural retaliation being a similar cut]. . . . From the point of view of any particular producer this means simply that if he raises his price he must expect to lose business to his rivals (his demand curve tends to be elastic going up), while if he cuts his price he has no reason to believe he will succeed in taking business away from his rivals (his demand curve tends to be inelastic going down).

[18] After referring to Kalecki (1938) and Keynes ([1939] 1973) for their development of the role of markup variation in the generation of business cycles, Rotemberg and Woodford (1992, 1195 n. 29) mention Hall and Hitch (1939), "who explained countercyclical markups in terms of strategic interactions among oligopolists and decreasing average costs. In these respects their view is a precursor of our own, although their model is entirely static."

Since the marginal revenue curve has a discontinuity at the quantity corresponding to the kink, with the marginal cost curve passing between its two segments, the short-run equilibrium price need not be affected either by a cost shock or by a demand shock (provided, in this case, the firms continue to refer to the same conventional price after the shock). Hence, "prices so fixed have a tendency to be stable. They will be changed if there is a significant change in wage or raw material costs, but not in response to moderate or temporary shifts in demand" (Hall and Hitch 1939, 33). Moreover, as the kink refers to some specific conjectural price-output configuration, the kinked demand model leads to equilibrium indeterminacy, so that we find once again a situation of *coordination failures*: "Generally speaking, there may be any number of price-output combinations which constitute equilibriums in the sense that, ceteris paribus, there is no tendency for the oligopolist to move away from them. But which of these combinations will be actually established in practice depends upon the previous history of the case" (Sweezy 1939, 573). Sweezy's conclusion coincides with Hall and Hitch's (1939, 33) conclusion: "There is usually some element in the prices ruling at any time which can only be explained in the light of the history of the industry."

Besides accounting for price rigidity, the kinked demand model can also incorporate a cyclical component in price behavior. Indeed, the demand elasticity may be differently affected by demand shocks above and below the kink:

> It may be suggested that an increase in demand leading to a fuller use of capacity, more difficulty in getting quick delivery, etc., will make the imagined demand curve less elastic for upward movements in price. For downward movements in price the result is likely to be a more elastic curve, since it may be assumed that rivals are less worried about losses in business and hence less ready to retaliate against a price cut. (Sweezy 1939, 571)

The opposite may be expected in case of a decrease in demand. As a consequence, the gap between the two segments of the marginal revenue curve is supposed to shrink during a boom and widen during a recession. Sweezy concludes that, in the latter case, "the producer will be more anxious than ever to hold his price where it is" (572). More generally, "as far as the cyclical behavior of oligopoly prices is concerned we might expect to find (1) that prices go up easily and openly in time of upswing; (2) that prices resist downward pressure in times of recession and depression; and (3) that list prices become less trustworthy guides to real prices the longer bad times last." (572). The last point refers to the possibility of secret price cutting, which provides a transition to the theme of the variability of the incentive to collude, the second important determinant of countercyclical markups, to which we now turn.

3.2 Collusion Variability

As already mentioned in section 1, Joan Robinson (1936, 59–60) had already pointed out in her argument against Harrod's law that "the tendency towards restrictive combinations is stronger in a slump than in a boom." We found the same idea explaining the observation of a countercyclical degree of monopoly in Kalecki 1938, an idea that was extensively discussed in the same year by Moses Abramovitz (1938). The latter considers the influence of business cycles on the probability that oligopolistic firms in an industry adopt a "common policy," adhering to what would be called nowadays a "best price guarantee" or a "meeting competition clause" (Salop 1986), corresponding (under appropriate demand

sharing) to the collusive choice of output and prices:[19] "If reductions in price are always met by rivals, the output which will maximize profits is that for which marginal cost equals marginal revenue, reckoned on the assumption that price-cuts are accompanied by appropriate reduction of rivals' prices. This definition of marginal revenue makes it the same for a single member of a market as for a unified monopoly" (Abramovitz 1938, 193). However, firms do not always adopt such a common policy, because they are moved by two motives, increasing the size and profitability of the market and increasing their share of it:[20] "Business men are interested not only in exploiting, as well as they can, an established monopoly position within an industry. They are interested, too, in increasing their share of the market" (196). The balance between these two motives depends crucially upon the phase of the cycle:

> When demand is increasing generally, an increased share of the market can be secured at the expense of a relatively small absolute decrease in the sales of rivals; but when demand is stationary or falling, all of one's gains must be at the expense of competitors. It is, moreover, not only more difficult to detach the old customers of a rival than to attract new customers, but rivals are likely to struggle harder to keep what they already have than to secure a proportionate part of an increase of demand. [Consequently,] the stage of the cycle most likely to produce prices appropriate to monopoly is that of recession; while in the later stages of depression, and in revival and prosperity, forces appear to be present which tend to bring prices to the position appropriate to competition. (206)

Since the effect of isolated price cuts on producers' market shares changes along the cycle, determining (as in Sweezy 1939) cyclical variations of the individual demand elasticity, the conjectures about the competitors' more or less cooperative attitude are accordingly influenced by the phase of the cycle:

> The downswing of business seems likely to resolve [the doubt about acting independently of the industry or not] in favor of cooperation, for we may posit with some confidence that the demand curves for the products of individual firms drawn on the assumption that their rivals do not meet price changes will then become more elastic. . . . The incursions which one firm can make into the markets of other firms will therefore become greater, and the likelihood that price-cuts (if made) will not be met by rivals smaller. In the upswing, on the other hand, the demand curves for individual firms become less elastic and our conclusion would be reversed. . . . Then, there is greater likelihood in depression that prices will approximate the monopoly figure than in periods of prosperity. (Abramovitz 1938, 203)

[19] More generally, one may think of other conventional pricing policies and "facilitating devices" contributing to the competitors' incentives to cooperate (that is, reducing their incentives to compete), despite their partly divergent interests. The significant point in the present context is that the enforcement of such devices is not time-independent (either in the short or in the long run): "The devices which industries use to help themselves regulate their competition—such things as trade associations, open-price systems, basing-point systems, production and inventory statistics—are also affected by the passage of time" (Abramovitz 1938, 213).

[20] The idea that firms make price and output decisions under two different constraints, one on their market share, the other on market size, together drawing a kinked demand curve, is used by the present authors (d'Aspremont, Dos Santos Ferreira, and Gérard-Varet 2007) to parameterize the set of oligopolistic equilibria in terms of "competitive toughness."

This portrayed alternation between a fierce competition for market share during prosperity and a propensity to collude during depression, as well as the conjectural behavior built into the kinked demand curve, is peculiar to the analysis of oligopolistic (not merely imperfect) competition. They take us away (and not only by reversing the cyclical pattern) from Harrod's "law of diminishing elasticity of demand" applying to monopolistic competition. In the modern New Keynesian revival of these themes of the late 1930s, imperfect competition of the monopolistic type dominates the literature, but Rotemberg and Saloner (1986) propose a model of price wars during booms very much along the lines drawn in the 1938 Abramovitz paper, to which they explicitly refer.[21] They consider a game of price competition à la Bertrand and rely on repeated games to show that any collusive outcome is sustainable as a (perfect) equilibrium provided that at each step the incentive to deviate is lower than a tacitly accepted credible punishment. The basic insight of their model is that the incentive for a firm to deviate increases with demand, whereas the punishment is independent of its environment.

For the 1930s, Abramovitz's premonitory description of the more or less cooperative attitude of firms along the cycle can be seen as the crest of the imperfect-competition wave in macroeconomics, created by Keynes's conjecture of countercyclical real wages (and procyclical money wages) and by Harrod's related law. Such a wave was to vanish within the decade and to form again only more than four decades later.

4 Concluding Remarks

We examined a set of related contributions on wage and price dynamics along the business cycle, which responded more or less directly to the empirical rejection by Dunlop (1938) and Tarshis (1939) of a supposed stylized fact, namely, the negative correlation between money and real wages. These contributions, which were published during the last two years before the Second World War, constituted a genuine, coherent, research program on the macrodynamics of imperfectly competitive economies that might have been active for more than one decade. Instead, this program quickly withered and died, only to be reconstituted in the 1980s by the so-called New Keynesian economists. Two questions are in order. Why was such a program aborted? Did these contributions serve at least as deferred guidelines for future research?

The answer to the first question lies, to begin with, in the disappearance of business cycle analysis from the forefront of economic theory. The war, the economic reconstruction (principally in Europe), and the active stabilization policy adopted in developed countries smoothed the business cycle for three decades and diverted the attention of economists to other problems to the point where economists, by the end of the 1960s, began to question whether business cycles even existed anymore (Bronfenbrenner 1969). Another reason for the abortion of the research program linking the trade cycle to imperfect competition can be found in the dominant orientations that ruled the development of macroeconomics in the first two postwar decades. An important stream of macroeconomic theorizing was deprived of microfoundations and accordingly disregarded questions of market structure and the behavior of firms or unions. More sophisticated macroeconomic contributions were interested in the relationship between the Keynesian revolution and the Walrasian paradigm, readily accepting the idea that Keynes's theory was compatible with, or was even formulated in terms of, perfect competition.

Consider now the second question, about the actual influence of the prewar literature

[21] See also Rotemberg and Woodford 1992.

we have examined. The "Dunlop-Tarshis observation," often reduced to the "failure of real wages to move countercyclically" (Sargent 1987, 468), first invalidated Keynes's modeling of stochastic effective demand shifts along a fixed, decreasing, labor demand curve and then continued "to play a central role in assessing the empirical plausibility of different business-cycle models" (Christiano and Eichenbaum 1992, 430). These included the real business cycle models of the 1980s, in which productivity shocks translate into shifts of the labor demand curve along a stable labor supply curve, leading to the prediction of a *high* positive correlation between real wages and hours worked. So, the "observation" itself obviously played an important role in the revival of business cycle theory. But did this influence go further? In particular, can we say that the working hypothesis conceived to rationalize the "observation," namely, the imperfectly competitive nature of labor and output markets, was influential? Or, more precisely, did the research program elaborated in the late 1930s guide the development of macrodynamics in the last three decades? The prewar research program undoubtedly anticipated the New Keynesian program. However, Dunlop's empirical results, for instance, are often quoted without any reference to the accompanying theoretical discussion. With the exception of a few contributions pointed out in the present essay, in which the anticipation is acknowledged, the recent revival of the prewar program is possibly of the kind consisting in just rediscovering the same answers to the same questions. So, the guidelines offered by the prewar literature were rich and potentially fruitful, but remained sterile and largely unnoticed. This may be a good reason to revisit them today.

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