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Imperfect competition and the trade cycle:
guidelines from the late thirties

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Abstract

It is the study of the trade cycle during the thirties that made imperfectly competitive output markets a major theme in macroeconomics, principally under the lead of Harrod. Both him and Keynes were referring at the same time to a supposed feature of business cycles, namely the countercyclicality of real wages, which was however going to be very soon contested. Empirical evidence, as well as other more speculative considerations, induced an important flow of theoretical arguments developed by several authors during a very short period, at the eve of the second World War. We propose to examine these aborted guidelines already exhibiting the main ingredients of the *New Keynesian* research programme only developed one half century later: imperfectly competitive goods markets (with costly price adjustment, economies of scale and cyclical behaviour of markups), imperfectly competitive labour markets (with wage negotiations, implicit contracts and efficiency wages), and finally coordination failures.

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1 Introduction

If we place in the *General Theory* (Keynes, 1936) the origin of Macroeconomics proper, that is, the analysis of the economy as a whole on the basis of a general equilibrium model simplified by aggregation, we must admit that imperfect competition is present from the beginning in the history of macroeconomic theory. Indeed, unemployment – the main theme of the *General Theory* – can hardly be approached, except as concerns its frictional component, if the labour market is assumed to be perfectly competitive. Accordingly, even if Keynes does not provide a complete analysis of wage determination, money wages explicitly appear – already in the *Treatise on Money* – as the result of contractual arrangements between entrepreneurs and workers, typically represented by trade unions.[1] Besides, the *General Theory* also assumes imperfect competition in the product markets, although in a discrete and simplified way characterized by a constant degree of competition.[2]

Yet, it is 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 Harrod, who began to write on the trade cycle in 1925 and on imperfect competition in 1927, building a bridge between the two fields in the articles "Doctrines of Imperfect Competition" (Harrod, 1934), and "Imperfect Competition and the Trade Cycle" (Harrod, 1936a) just before the publication in the same year of his essay on the *Trade Cycle* (Harrod, 1936b) (cf. Besomi, 2003). Both Harrod and Keynes were referring at the same time to a supposed feature of business cycles, namely the countercyclicality of real wages, which was however going to be contested two years later by statistical observations, principally collected by Dunlop (1938). 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, at the eve of the second World War, and involving the reciprocal influences of output market power and economic fluctuations. This kind of arguments completely disappeared after the war from the forefront of economic analysis, in both fields of industrial organisation and macroeconomics.

We propose to examine these aborted guidelines from the late thirties, which appear quite significant today because they already exhibit the main ingredients of the *New Keynesian* research programme developed one half century later: imperfectly competitive goods markets (with costly price adjustment, economies of scale and cyclical behaviour of markups on marginal costs), imperfectly competitive labour markets (with wage negotiations, implicit contracts and efficiency wages), and finally coordination failures (cf. Mankiw and Romer, 1991).

Section 2 starts with the arguments for the countercyclicality of real wages,

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[1]Cf. Keynes (1930), 1, pp. 149-153, and (1936), pp. 7-13.

[2]In the published version of the *General Theory*, Keynes "take[s] as *given* [...] the degree of competition" (Keynes, 1936, p. 245, our emphasis), not necessarily the maximal one. His position with respect to such less than perfect competition in the output markets has evolved since the first proof of the book (cf. Keynes, 1973, II, p. 502). Cf. also the comment on 'the first postulate' of the Classical Economics as formulated in the published version (Keynes, 1936, p. 5), and in the first and second proofs (Keynes, 1973, II, pp. 352-353).

as expressed in Keynes' and Harrod's writings, and the evidence that was given later to show that it was a mistaken belief. In section 3, we pursue with the determinants of wage formation as discussed by Dunlop (1938) and examine the influence of employment on money wages. Section 4 will be devoted to the rigidity of output prices and the variability of collusive behaviour by oligopolistic firms along the cycle, which are two important reasons for countercyclical markups and, hence, for the statistical rejection of Keynes' conjecture, and which are also the main themes of several important papers of the late thirties.

2 A contested "stylised fact" in the light of imperfect competition

At the beginning of the *General Theory*, Keynes formulated the conjecture 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 "stylised fact", following Kaldor (1961):

> "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 summarised, the theorist, in my view, should be free to start off with a 'stylised' 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 'stylised' facts, without necessarily committing himself to the historical accuracy, or sufficiency, of the facts or tendencies thus summarised" (Kaldor, 1961, p. 178).

Keynes' conjectural stylised fact would result from two hypothesized relationships between employment and wages: one positive concerning money wages, the other negative concerning real wages. The fact was however soon rejected on the basis of statistical observations, determining a reexamination of these underlying relationships in the light of imperfect competition. We will devote the first subsection to this question.

In the same year, in his paper "Imperfect competition and the trade cycle", Harrod (1936a) also started by enumerating a few stylised facts ("features of the trade cycle [that] are taken for granted as established by wide observation"), namely the procyclicality of three classes of variables: money rewards to prime factors, commodity prices, and profits, in increasing order of amplitude of their fluctuations. These facts imply the stylised fact conjectured by Keynes, as well as the two underlying relationships between employment and wages. Harrod's own justification for this stylised fact provoked an immediate and large discussion, examined in the second subsection.

2.1 Keynes' conjectured correlation of real and money wages

Keynes' 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; labour 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" (Keynes, 1936, pp. 9-10).

This passage is recalled by Keynes (1939) in his reply to two articles providing the statistical inquiry he called for. The first article is by Dunlop who, as a graduate student on a fellowship for a year in Cambridge, examined the question using the British data for the period 1860-1937. His paper, the draft of which was read and commented in a letter by Keynes (see Dunlop, 1998), was published in the *Economic Journal*, September 1938. The second article is by Tarshis, who had the privilege to follow Keynes' lectures during the four years preceding the publication of the *General Theory*. It is a short note based on U.S. monthly data for the period 1932-1938 and published in the *Economic Journal*, March 1939. Both authors are refuting Keynes' conjecture. Dunlop reaches the following conclusion:

> "Increases in wage rates have usualy been associated with increased real wage rates, while decreases in wage rates have equally often been associated wîth a rise or fall in real wage rates" (Dunlop, 1938, p. 421).

Tarshis reaches 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" (Tarshis, 1939, p. 153).

However, 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 relations: one, concerning the product markets, between real wages and output, the other, concerning the labour market, between money wages and employment. Real wages W/P should be decreasing, and money-wages W increasing, when output or employment N is rising:

$$W \quad \overset{\textstyle -}{\longleftarrow \longrightarrow} \quad W/P$$

$$+ \searrow \; \swarrow \; -$$

$$N$$
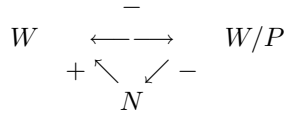
Keynes's argument goes as follows. Money wages are assumed to decrease in response to a decrease in output and employment ("labour being readier to accept wage-cuts when employment is falling off").[3] This is what Keynes calls an *induced* (as opposed to *spontaneous*) change in money wages (Keynes, 1930, 1, p. 151). On the other hand, for such a decrease in output to respond to a decrease in effective demand, and taking into account the assumption of a decreasing short-run marginal product of labour, real wages have to increase ("real wages inevitably rising in the same circumstances on account of the increasing marginal return to a given capital equipment when output is diminished"). Then, at short period equilibrium, we get the conjectured inverse relation between money and real wages.

In all this argument the most important ingredient will appear to be the negative relation between real wages and output. For Keynes, this negative relation should not be viewed as a way to justify the benefit of an expansionary policy stimulating effective demand and pushing prices up. The associated fall in real wages should on the contrary be viewed as a regrettable side effect, not as a sacrifice to be accepted by the working classes in order to increase employment. He only admitted this side effect because it fitted a "belief [...] widely held by British economists up to the last year or two" (Keynes, 1939, p. 394), "the question of the influence on real wages of periods of boom and depression [having] a long history" (*ibid.*, p.395). This belief in the countercyclicality of real wages goes back at least to Marshall's memoranda for the Gold and Silver Commission in 1887, and for the Indian Currency Committee in 1899, and extends to Pigou (in the *Theory of Unemployment*, 1933). However,

> "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, pp. 399-400).

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[3]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, p.301).

Hence, if the negative relation between employment and real wages is to be discarded, one has to move from a closed to an open system, from short to long period or, principally, from perfect to imperfect competition, so as to open the way either to decreasing marginal cost, or to disconnected changes in prices and marginal costs because of a variable degree of competition.

Tarshis comments precisely on the non-realistic character of Keynes' assumption "that increases in output [...] are associated with rising marginal costs, even in the absence of rises in money wages" (Tarshis, 1939, p. 153), as well as of Keynes' assumption of a constant degree of competition. However, after giving evidence of a positive correlation between real hourly wages and money earnings per hour, he concludes in a postscript that "changes in real hourly wages are in general opposite in direction from changes in man-hours of work" (Tarshis, 1939, p. 154). This leaves us with the new following picture of the three relationships, with an implied negative relation between employment and money wages:

$$
W \quad \underset{\longleftarrow \longrightarrow}{\overset{+}{}} \quad W/P
$$
$$
- \searrow \nwarrow \quad \swarrow \ -
$$
$$
N
$$
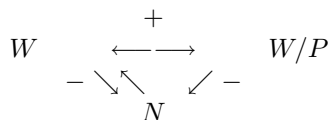
The same kind of agreement-disagreement results from Dunlop's analysis, refuting Keynes' conjecture on the basis of statistical observations, yet accepting (with qualifications) the positive relation between employment and money wages defended by Keynes. He consequently must admit a positive association of real wages with output:

$$
W \quad \underset{\longleftarrow \longrightarrow}{\overset{+}{}} \quad W/P
$$
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+ \searrow \quad \swarrow \nearrow \ +
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N
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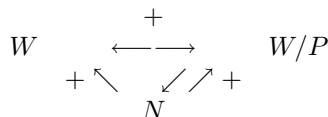
In their refutation of Keynes's conjecture, the two authors thus offer different explanations while agreeing (followed by Keynes, 1939) that, among all the reasons that can be set forth against the conjecture, the main one is possibly the unrealistic character of the perfect competition assumption on the product markets. Imperfect competition should be introduced in order to modify two of Keynes' 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 labour are only partially employed, marginal real cost may be expected to decline with increasing output, or, at the worst, remain constant" (Keynes, 1939, p. 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 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, pp. 102-103).

As to the second modification of his original assumptions, which consists in admitting a variable degree of competition, Keynes 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" (Keynes, 1939, p 406).

Assuming prices to rise "less than in proportion to the increase in marginal money cost" directly contradicts one of the stylised facts put forward by Harrod (1936a), as we will examine now.

2.2   Harrod's "law of diminishing elasticity of demand"

Harrod 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" (Harrod, 1936a, p. 84). If prime factors are restricted to labour, and since money wages and prices are both supposed procyclical, Harrod's stylised fact is equivalent to Keynes' 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, p. 85).

The novelty with respect to Keynes' initial position is that the first alternative, that of rising marginal costs, is not taken by Harrod as the relevant explanation for the stylised 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, p. 465).

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Decreasing costs undermine equilibrium stability, with the consequence that cycles in a stationary 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" (Harrod, 1934, pp. 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" (*ibid.*, p. 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).

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, p. 86).

Since decreasing marginal costs lead to a positive relation between real wages and employment, Harrod's stylised fact (equivalent to the Keynes' 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" (Harrod, 1936b), resulting from the fact that the expected value for a consumer of searching for better opportunities among close substitutes is supposedly a decreasing function of his income.

Harrod's conclusion was however not accepted in general.[4] More importantly, two crucial countervailing factors were immediately pointed out by J. Robinson (1936) in her review of Harrod's essay on the trade cycle (Harrod, 1936b), namely the variability along the cycle of both the number of active

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[4]Cf. Sumner (1940) for a review of the principal arguments.

firms (hence of the degree of concentration) and of their aptitude 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 in a boom" (Robinson, 1936, pp. 59-60).

In section 4, we shall come back in particular to the second of these counter-vailing factors, emphasized by Kalecki (1938), Abramovitz (1938) or Dunlop (1938). But let us now reconsider more deeply the relation $N \rightarrow W$ between employment and money wages, as discussed by Dunlop (1938).

3   Money wages along the cycle

Of the two relations underlying Keynes' conjecture, Dunlop retains the influence of employment on money wages. But, even if he shares Keynes' 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, p. 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 summarise the two movements without very wide margins of error" (Dunlop, 1938, p 432).

This conclusion results from a careful empirical inquiry on trade-union be-haviour in the context of wage bargaining, followed by a thorough discussion of the employer's point of view.

3.1   The trade-union attitude

Dunlop's objective is "to discover, if possible, certain central tendencies in trade-union wage policy *and* some indication of the deviation from these tendencies" (Dunlop, 1938, p. 422). 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" (Dunlop, 1938, p.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 *Ford* or *income feedback effect* (Hart, 1985, d'Aspremont *et al.*, 1989) put forward by Henry Ford 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 property will be reflected in our sales. Country-wide high wages spell country-wide prosperity, provided, however, the higher wages are paid for higher production" (Ford, 1922, pp. 124-5).

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 behaviour 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", p. 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 may be 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" (p. 425). And Dunlop concludes on 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" (Dunlop, 1938, p. 428).

3.2   The employer's point of view

As stressed by Dunlop, one should however take also into account "the employer's point of view" in this negotiation process, both as an employer, that is, as a demander on the labour market, and as a supplier (and a competitor) on the product market, who, as such, may be inclined to adopt a stable wage rate policy in spite of an employment decline. In this respect, Dunlop appears as a precursor of the *efficiency wage* hypothesis, with its sociological (Akerlof, 1982, Akerlof and Yellen, 1990) and labour 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, p. 428).

> "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" (Dunlop, 1938, pp. 428-429).

There are still other factors presented by Dunlop "which may lead employers to adopt a policy of 'more stable' wage rates." Such are the attempt to avoid destructive strikes, the relief of the downward pressure on wages resulting from the layoff of the least efficient workers, or 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" (Dunlop, 1938, p. 429).

This may be seen as an anticipation of the "implicit contract" approach (Azariadis and Stiglitz, 1983).

Finally, Dunlop considers *strategic* objectives of the employers, concerning their competitors in the 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, opening the way to price reductions):

> "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, p. 428).

> "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" (Dunlop, 1938, p. 429).

All these elements of the analysis of the labour market are clearly helpful in understanding wage rigidities, or more generally the fact that the relation $N \to W$ between changes in employment and changes in wage rates may not have been so tight as it was assumed by Keynes. But, in order to explain why real wages may display some procyclicality, that is, in order to reconsider the relation $W/P \to N$, one has to examine further interdependencies between the labour and the output markets, pushing the latter to the front stage.

4   Markups and prices along the cycle

Procyclicality of real wages may be partly due to decreasing marginal costs, as already observed in section 2. We want however to concentrate now on the countercyclicality of markups on marginal costs[5] as the main reason for the statistical rejection of Keynes' conjecture (and, of course, of Harrod's equivalent

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[5]Bils (1987) offers one of the first instances of the New Keynesian approach to this question.

stylised fact). This might simply result from the assumption that demand elasticity varies in the same sense as income (contrary to Harrod's law): "people with decreased money incomes and increased concern for their economic security are less rather than more responsive to lower prices" (Galbraith, 1936, p. 463). Two other reasons for countercyclical markups were however going to play a more important role in the discussion:

> "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 organisations and the disappearance of fear of retaliation for not following a price leader make for similar results" (Dunlop, 1938, pp. 432-433).

We will successively consider these two factors in the following subsections.

4.1 Price rigidities

The rigidity of major industrial prices during the Great Depression was the object of several economic studies (*e.g.*, Galbraith, 1936, Tucker, 1938), the most ambitious of which is certainly the empirical inquiry conducted between 1936 and 1939, at the instigation of Harrod, by the Oxford Economists' Research Group, and culminating in Hall and Hitch (1939) paper (cf. Besomi, 1998). Although focusing on business pricing behaviour and apparently pertaining to the field of industrial economics, the inquiry was connected with the trade cycle, more specifically with the reciprocal influence of economic fluctuations and firms behaviour. The principal result of this empirical 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 mark-up. Galbraith (1936) 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. Moreover they are used as a guide to price policy" (Galbraith, 1936, p. 471).

Also, Keynes wittily comments that "it is rare for anyone but an economist to suppose that price is predominantly governed by marginal cost" (1939, p 407).

Full-cost pricing as a mere rule of thumb is in itself a factor of 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, p. 22). Also, producers incur *menu costs* (Mankiw, 1985) when changing prices, as already observed by Galbraith (1936):

> "Professor Gardiner C. Means has drawn my attention to the cost of making a price change under modern conditions as an incentive to the holding of prices constant. [...]

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> 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" (Galbraith, 1936, p. 470, fn.5).

Tucker (1938) 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" (Tucker, 1938, p. 53).

Another factor, possibly more significant still 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, p. 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, pp. 22-23). At the same time, Sweezy (1939) 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)" (Sweezy, 1939, pp. 568-569).

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, p. 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, p. 573).

Sweezy's conclusion coincides with Hall and Hitch (1939) 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" (p. 33).

Besides accounting for price rigidity, the kinked demand model can also incorporate a cyclical component in price behaviour. 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, p. 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" (p.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" (Sweezy, 1939, p. 572).

The last point refers to the possibility of secret price cutting. Such considerations provide a transition to the variability of the aptitude to collude, the second important determinant of countercyclical markups.

4.2   Collusion variability

As already mentioned, Joan Robinson had already indicated in her argument against Harrod's law that "the tendency towards restrictive combinations is stronger in a slump than in a boom" (Robinson, 1936, pp. 59-60). We find the same idea in Kalecki (1938):

> "[...] 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" (Kalecki, 1938, p.111).

This source of countercyclicality of the degree of monopoly is extensively examined in the same year by Abramovitz (1938). He 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:[6]

> "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, p.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:[7]

> "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" (Abramovitz, 1938, p. 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,

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[6]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, p. 213).

[7]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 d'Aspremont *et al.* (2007) to parameterize the set of oligopolistic equilibria in terms of "competitive toughness".

forces appear to be present which tend to bring prices to the position appropriate to competition" (Abramovitz, 1938, p. 206).

Since the impact 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, p 203).

This portrayed alternation between a fierce competition for market share during prosperity and a propensity to collude during depression, as well as the conjectural behaviour built into the kinked demand curve, are 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 thirties, imperfect competition of the monopolistic type dominates the literature, but we find an echo to Abramovitz' analysis in Rotemberg and Saloner (1986).[8] 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 thirties, Abramovitz's premonitory description of firms more or less cooperative attitude along the cycle can be seen as the crest of the imperfect competition wave in macroeconomics created by Keynes' 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.

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[8]See also Rotemberg and Woodford (1992).

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