

Mark-up Rate Fluctuations in the Business Cycle

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[Abstract]

This paper deals with mark-up rate fluctuations on a firm level, and gives a procyclical explanation of those fluctuations. This is important, for the mark-up pricing is originally a rule taken by the firm. However, a firm level explanation has a limit in dealing with 'strategic' and 'anchor' variables (investment and the money wage rate), and technical progress. More dynamic treatment of these variables will be properly given on a macro level.

1. Introduction

This paper deals with mark-up rate fluctuations on a firm level, and aims at making clear the property of those fluctuations. The idea of mark-up pricing based on the full cost principle stems from Hall and Hitch (1939). The Kalecki's (1938) "degree of monopoly" is not the same as the Hall & Hitch's idea.¹⁾ However, we may consider that the degree of monopoly generally moves in the same direction to the "mark-up rate."

Whether the degree of monopoly (the mark-up rate in our context) fluctuates procyclically or counter cyclically has been a long-pending question since Kalecki (1965) and Harrod (1936).²⁾ Iyoda (1999) and Iyoda and

1) Kalecki (1965, p.18) himself differentiates his theory from the so called full-cost theory, on the grounds that "The degree of monopoly *may*, but need not necessarily, increase as a result of a rise in overheads in relation to prime costs," in the slump and stresses "the emphasis on the influence of prices of other firms."

Key words: mark-up pricing, business cycle, mark-up rate fluctuations.

Matthews (2001) gave a methodological explanation of (procyclical) mark-up rate fluctuations in the whole economy. They explain that an actual markup rate (r) fluctuates procyclically around r^* (a markup rate at the normal operation rate of capacity). Iyoda (2001) presents an empirical research on the USA, Japan and the UK, and concludes that the mark-up rate seems to change procyclically. These methodological and empirical questions were dealt with on a macro level.

It is not difficult to find productivity and the employed labor force as predetermined at the normal operation rate of capacity on a firm level. The mark-up pricing is originally a rule taken by the individual firm. Finding their actual values is comparatively difficult on a macro level, for actual values reflect the industrial structure. The present paper aims at giving an explanation of procyclical mark-up rate fluctuations based on a firm level.

The paper is organized as follows. In the next section, we present our assumptions on which our story starts. Then we give two types of explanations of mark-up rate fluctuations on a firm level in section 3. In section 4, we discuss some matters in the real world, which cause the weaknesses of this treatment. Finally we conclude.

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- 2) Kalecki (1965, p.18) argues that “there is a tendency for the degree of monopoly to rise in the slump, [and] a tendency which is reversed in the boom.” Contrary to this Kalecki’s argument, Harrod (1936, pp. 86-87) argues that the degree of monopoly increases in the boom and falls in the slump, because the elasticity of demand diminishes in the slump and *vice versa* in the boom. Robinson (1951, p. 59) criticizes this Harrod’s explanation. See also Feiwel (1975, pp.107-108) for this argument. Mind that, however, Kalecki seems to suggest a counter cyclical movement in the relative shares of wages and salaries. He considers that “Salaries, because of their ‘overhead’ character, are likely to fall less during the depression and to rise less during the boom than wages. Thus the ‘real’ wage and salary bill, V , can be expected to fluctuate less during the course of the cycle than the ‘real’ gross income of the private sector, Y ” (p.40). See Iyoda (1999, appx. A) for the gist of Kalecki’s price formation (Costs and Prices) and theory of income distribution (Distribution of National Income), both of which are in Kalecki (1965). The first part is a final version excerpted from his earlier chapter in (1943) and the second part was presented in a rather imperfect form in his paper (1938).

2. Assumptions

We start our story with the following assumptions:

- i.* The money wage contract lasts for one term;
- ii.* A price is set by marking up on wages and depreciation at a customary rate, provided that the firm is working at the normal operation rate of capacity, and this price does not change through the term;³⁾
- iii.* The unit costs of labour and capital are decreasing functions of the operation rate of capacity until the full operation rate;
- iv.* The change of demand⁴⁾ is expressed by the change of the operation rate of capacity, and causes the changes of productivity, profits, and employment;
- v.* Reflecting the changes of productivity, profits, and employment, money wages change at the beginning of the next term, then the price and profits will change;
- vi.* The wage contract is normally made in terms of money wages.

At a starting point, the capital stock (asset) is given, and the money wage rate is also given as a historical datum. Based on these given conditions a firm organizes the business and decides a necessary volume of employment at the normal operation of capital. Then, quantity of output (Q) will be determined and the supply price (p) will be given by the mark-up pricing, provided that the firm is working at the normal operation rate of capacity. We obtain employment (L), per capita quantity of out-

3) Mind that our mark-up pricing is not the same with each of their original ideas (Kalecki, Hall & Hitch). For the price rigidity, refer to Lee (1994) for the USA and the UK; Fuchi and Watanabe (2001) for Japan and a cross-country comparison (among G7 countries). After surveying a large number of researches, supplied data and case studies, Lee (pp.315-319) recognizes that the prices of manufactured products remain unchanged for extended periods of time. He mentions that "it can generally be concluded that a significant proportion of industrial and consumer products in a capitalist economy, as indicated in Table 6, have prices which are based on mark-up, normal cost, and target rate of return pricing procedures" (p.319).

4) The change of demand may be caused by various factors: investment, propensity to consume, government expenditure, external trade surplus, *etc.*

put (q), productivity per head (pq), and profits (P).

3. Mark-up rate fluctuations

3.1. Mark-up rate fluctuations

We deal with the property of mark-up rate fluctuations. Writing wages, quantity of output, employment, and depreciation for W , Q , L , and D , respectively, the unit labour cost (w) and the unit capital cost (c) are respectively defined as:

$$(1) \quad w = \frac{W}{Q} = \frac{w_m L}{Q} = \frac{w_m}{q}, \text{ and}$$

$$(2) \quad c = \frac{D}{Q} = \frac{d}{q}$$

where w_m = money wage rate, q = per capita quantity of output, and d = per capita depreciation.

Assumption *ii* is that a firm sets markup pricing based on the normal operation rate of capacity and the price does not change for a certain period. The price, p , is expressed as:

$$(3) \quad p^* = (I + r^*)(w^* + c^*) - c^*$$

where the star (*) means the value at the normal operation rate of capacity. Mind that r^* is expressed in gross terms (but, in the case of net terms, the second term on the right hand side, $-c^*$, is omitted).

The actual price equation at the current operation rate is generally expressed as:

$$(4) \quad p = (I + r)(w + c) - c.$$

If the operation rate is lower than the normal level, the unit costs (of labor and capital) are higher than the normal case, so that

$$w + c > w^* + c^*.$$

This may be plausible if we take into account overhead labor and depreciation costs, because these costs are very likely to change in reverse proportion to the operating rate of capacity.

Assuming the period that the same price continues ($p^* = p$), by putting (3) = (4), we have

$$(I + r^*)(w^* + c^*) - c^* = (I + r)(w + c) - c,$$

then

$$\left(\frac{1+r^*}{1+r}\right) - \left(\frac{c^*-c}{(1+r)(w^*+c^*)}\right) = \left(\frac{w+c}{w^*+c^*}\right).$$

We start from the firm operating at below the normal operation rate. If we assume the second term on the left hand side of above equation is negligible, we have

$$\left(\frac{1+r^*}{1+r}\right) \approx \left(\frac{w+c}{w^*+c^*}\right) > 1,$$

so that we find that an actual markup rate in this case is likely to be less than the normal rate ($r < r^*$).⁵⁾ As the rate of operation increases, the actual markup rate will increase until the full capacity. If an actual operation rate is decreasing from a higher rate than the normal operation rate to the contrary, the reverse course will occur; that is, the actual markup rate will be decreasing.

We explained that the actual mark-up rate procyclically fluctuated around the customary rate. In this case the price setting principle is cost-determined markup, but the actual markup rate is decided by actual variables that reflect the change of demand.

3.2. An alternative explanation of the fluctuations

We here present an alternative explanation of the mark-up rate fluctuations on a firm level. From equation (4) we obtain an actual mark-up rate:

$$(5) \quad r = \frac{p^- w}{w+c}.$$

Replacing w and c with equations (1) and (2), respectively, we have

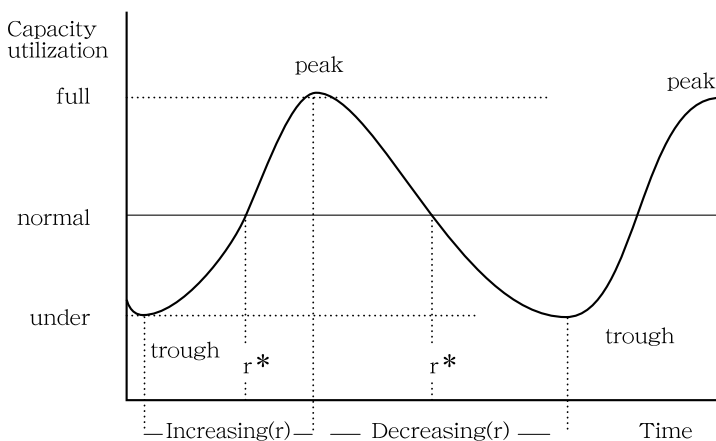
$$(5-1) \quad r = \frac{pq^- w_m}{w_m + d}.$$

We have assumed that money wages and a mark-up price do not change for one term, so that we may consider the following. During the upturn process in the business cycle, the actual mark-up rate will increase, for per capita quantity of output, q , increases and per capita depreciation, d ,

5) We deal with r in gross terms, so equations (3) and (4) include $-c^*$ and $-c$ on the right hand side, respectively. Dealing with r in net terms, these elements ($-c^*$ and $-c$) do not appear, so that this result becomes straightforward.

decreases in equation (5-1); and *vice versa* for the downturn process. Chart 1 shows the relationship between capacity utilization and mark-up rates in the business cycle.

Chart 1 Capacity utilization and mark-up rates in the business cycle



During the business cycle, not only productivity but also employment and profits change. To deal with this question, we need to discuss the change of demand, in particular the change of investment. The question will be properly dealt with in the macro economy. Replacing w and c in equation (4) with unit cost definitions (1) and (2), we have an alternative expression of the price setting equation on a firm level.

$$(4-1) \quad pQ = (1+r)(W+D) - D.$$

Considering the firm as a representative of industry, we can use this form by redefining all these variables as the weighted average in the whole economy. Then this price setting equation is the same as that we used in Iyoda (1999), and Iyoda and Matthews (2001).

4. In the real world

We dealt with mark-up rate fluctuations based on a firm level and explained its procyclical fluctuations. This is important, for the mark-up pricing is originally a rule taken by the firm. Suppose our firm as a representative of industry. The firm's variables can be aggregated as a weighted average in the whole economy, respectively. Then, we obtain total employment, quantity of output, profits, and also obtain the unemployment rate. A similar story to the firm would be applied to the aggregate economy.

We here deal with some real world issues in relation to our explanation on a firm level. First, we have assumed that (assumption *iv*) the operation rate of capacity reflects the change of demand. The demand consists of various ingredients, among which investment will be the most influential factor on the mark-up rate fluctuation. To deal with this matter more clearly, we need to deal with mark-up rate fluctuations on a macro level. In the aggregate economy we will be able to explain that the change of investment has an effect through the change of employment on productivity, profits, and the unemployment rate.

Second, Post Keynesians consider the aggregate level of the money wage as “a historical datum,” and as “the anchor on which the actual level of nominal values in the entire system depends” (see Seccareccia, 2003, p. 383). The *money wage contract* is the base for running a business, particularly under the markup pricing. We need to deal with the determinant of money wages as much as possible. Some economists may consider that it is difficult to deal with endogenous determination of money wages without depending on the marginal productivity (of labour) principle. Without depending on this principle, I consider that this matter may also be dealt with more effectively on a macro level.

Third, in the real world there is technical progress that has a close relationship with investment. To measure the unit cost at the normal operation rate of capacity at the beginning of the term, we need the per capita quantity of output (which reflects technical progress) as well as the money wage rate. These are usually given as exogenous variables at

the firm level. Technical progress is a dynamic process and the determinant of the money wage rate should be dealt with as mentioned above, both of which may be more properly dealt with on a macro level rather than on the micro level.

5. Conclusion

The property of this analysis is that: (a) the mark-up pricing based on the full cost principle is applied; (b) once a price is set, money wages and the price do not change for one term, and (c) reflecting the demand change, other variables (employment, quantity of output, productivity, *the actual mark-up rate*, and profits) change.

We have the following conclusions. First, this paper dealt with mark-up rate fluctuations on a firm level and gave their procyclical explanation in the business cycle in two ways, which was in line with our previous methodological explanation and empirical results on a macro level. This analysis is important, for the mark-up pricing is originally a rule taken on a firm level.

Second, a firm level explanation has a limit in dealing with dynamic and strategic variables, which are investment, technical progress, and the money wage rate. To deal with the determination of these variables for the dynamic explanation, we need an analysis on the macro-level.

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