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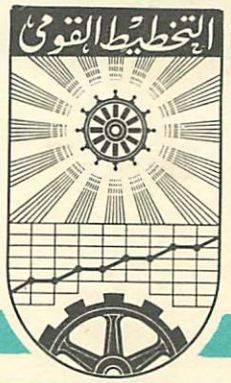

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COST INFLATION

by

Miss H. Kheir El-Dine

Under the Supervision of

Prof. B. Hansen
Dr. A. Hosny

October 1963.

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Economic Planning Group.

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A Training Research Undertaken at INP in partial Fulfilment of the Training Requirement.

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Contents

INTRODUCTION.

I N T R O D U C T I O N

During the last few years, the problem of development and inflation has been given much attention. The most important arguments for a certain degree of inflation as a prerequisite for development are:(1)

1) The full utilization of resources. For the rate of growth to be high, investments must be high, and it is thought that gross national product should be as large as possible - i.e. that no resources are left idle. This is taken to mean that the demand for resources has to be-on average-in excess, because of the practical difficulties of adapting demand and supply to each other in all fields.

2) Capital imports. Development requires import of capital which is achieved according to the classical theory - by an amount of domestic inflation greater than that of the outside world. We should note that inflation results in a deficit in the balance of current payments.

3) Forced Savings. The main idea behind this argument is that prices are perfectly flexible, so that all excess demands are immediately removed through price increases. Now, if investment plans are expanded so that to exceed saving plans, the result would be an excess for factors of production for investment purposes. Thus, factors prices will increase in investment fields, and factors will move from consumer goods industries to capital goods industries ; this shift in the allocation of resources is the basis of higher real savings. Higher factor's income with lower consumer goods production lead to rising consumer prices. Real wages will fall, and there will be unexpected excessive profits in the consumer goods sectors; this provides the basis of increased financial savings .

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(1) "Inflation Problem in Small Countries". by Prof. B. Hansen (lecture III)

Although these arguments make development through excess demand inflation very tempting , yet this policy has been rejected by most developing countries on the basis that:

1) Inflation is accompanied by redistribution of income in favour of profit earners at the expense of wage earners and fixed income recipients. This creates a social unrest that developing countries seek to avoid; particularly because most of them adopt a socialist philosophy.

2) Inflation creates a certain disorganization that leads to a loss of confidence which makes foreign loans difficult to obtain. It might be argued that foreign loans are not essential, since foreign capital may flow inside the country as a result of internal inflation. However, it seems doubtful that capital imports will go to the fields required for development ; on the other hand, a developing country cannot leave its foreign trade free, because free foreign trade exposes the country to fluctuations and foreign influences which may impede its development.

3) The forced-savings argument implies that factors of production are perfectly mobile so that they can move from one industry to another in response to excess demands. However, this mobility is lacking in developing economies where monopolies and market imperfections are prevailing.

4) Finally, developing economies usually plan for development so that, excess demand is no longer necessary to achieve a full utilization of resources; since Planning assumes this function.

Thus, most developing countries try to achieve development without excess demand inflation. However, it may happen that even if a market seems to be in equilibrium; so that at the ruling price excess demand is zero, the price tends to rise. In such cases, other forces than the excess demand in the market concerned, must cause price to change.

These considerations have led to the distinction between, on the one hand, demand-pull or induced inflation, and on the other hand cost-push or autonomous inflation. However, it has been argued that cost-push inflation in any sector of the economy is nothing but a price rise induced by an excess demand in some other sector of the economy.

In the first part of this paper, we shall try to investigate whether cost inflation is always induced by an excess demand.

In the second part, we shall be concerned with the role of costs in the process of price determination and with the forces that push different cost elements up.

Finally, as a conclusion, we shall try to investigate whether the inflationary forces considered are operative in developing economies.

After the examination of the factors responsible for cost inflation, we shall consider three factors in operation - I.e. the process of cost inflation. This will be the subject of the Appendix.

PART I:

Cost Inflation and the Excess Demand.

PART I:

COST INFLATION AND THE EXCESS DEMAND

Is the cost inflation always induced by an autonomous inflation?

Before answering this question, it may be suitable to define the word "inflation" . For the purpose of this paper, it seems helpful to define "inflation" as a time of full employment[1] and rising product prices, as measured by the increase in a broad price index such as the consumer price index. Although there may be inflation without price increases in times when there are price controls, and then inflation becomes "repressed", this definition still has advantages. It is simple and unequivocal, it is in accord with common usage and finally it may apply, when accompanied with suitable adjectives to different types of inflation as "creeping" and galloping inflation, which refer to cases with different rates of price increase.[2]

The question now is : What causes prices to rise?

Wagner writes: "We distinguish nowadays two kinds of inflation according to their origin: demand-induced inflation which is due to an excess of effective demand over supply; and cost-induced inflation which is due to wage increases leading in their turn to inflation of prices if the employers succeed in passing the increase in labor costs on to the consumers.[3]

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(1) Full employment is taken here to mean either full employment of the labor force or full utilization of the productive capacity. We should note that the latter meaning is more applicable to underdeveloped economies where the main bottleneck appears in the capital equipment rather than in labor.

2) "The Wage-Price Issue" by Bowen (ch. 2) and "Cost Inflation and Demand Inflation: a useful Distinction" by Bowen in the Southern Economic Journal (January 1960)

(3) "Wage Policy and Full Employment "by Wagner in the Theory of Wage Determination (ed. by Dunlop) p. 89.

Cost-Push alone is not sufficient to call forth Inflation:

There is a contention that the cost-push inflation is indirectly induced by an excess demand because demand for labor and raw materials is a derived demand, and so, an increase in the demand for final products is reflected in the factor markets as an increase in demand for labor and raw materilas and thus results in higher factor costs which are in turn translated into higher final product prices. This is true, but it is necessary to distinguish between higher costs due to an increase in derived demand and higher cost due to an autonomous factor price increase, i.e. an increase in factor prices not attribute to an excess demand for factors. In the case of labor unions, for instance, autonomous wage increase may take place because the unions try to increase wage rates or because the unions have obtained a stronger monopoly position; another reason may be the distortion of traditional wage- differentials; and finally it may be that the unions expect demand to increase with an increase in money wages, so that employment will never be diminished as a consequence of higher money wages.(4)

Another contention is that there cannot be a cost-push inflation for without an increase in purchasing power and demand, cost increases would lead to unemployment not to inflation . In fact, an increase in effective demand is necessary for a continuing rise in prices. Effective demand should expand to absorb all units produced at the higher price; this expansion is made possible when monetary authorities follow an elastic credit policy. Our conclusion is that an expansion in effective demand is indeed necessary for a continuing price increase, but the first impulse for rising prices is the cost-push.(5)

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(4) "Inflation problems in small countries" by B. Hansen - First Lecture (On the Nature of Inflation)

(5) "Another View of Cost-Push and Demand-Pull Inflation" by Machlup in the Review of Economics and Statistics. (May 1960)

Demand-Pull alone is not Sufficient to lead to Inflation:[6]

Having shown that, in a certain sense, cost-push cannot cause inflation and it involves demand-pull, it may also be contended that under certain assumptions, demand-pull cannot cause inflation and it involves a cost-push. If in the economy, producers, distributors and labor unions take full account of increased cost of production and increased cost of living, but disregard changes in demand, then there cannot be any demand-pull on prices. In such cases, an increased effective demand would lead to unfilled orders and vacancies but would fall to raise Prices and Wages. It is clear that this model does not apply to the competitive areas in the economy, but it does apply to the manufacturing sector where prices are set on a cost-push basis.

The conclusion is that there may be conditions under which effective demand would not pull prices up and it takes a cost-push to lead to price inflation, as well as there may be circumstances under which cost increases would not push prices up, and it takes demand-pull to produce price inflation. We should make here the following distinction proposed by Machlup[6], namely that "an administered cost increase may be "equilibrating" in the sense that it merely absorbs a previously existing excess demand, or it may be "disequilibrating" in the sense that it creates an excess supply that may be prevented or removed only by an expansion of demand".[7]

It is clear then that demand and cost elements are combined in the process of inflation. However, it is essential that sufficient criteria should exist to determine whether we are faced by a demand inflation or by a cost inflation. For that purpose, Machlup makes the distinction between

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(6) "Another View of Cost-Push and Demand-Pull Inflation "by Machlup in the Review of Economics and Statistics (May 1960).

(7) We should note that cost increase induced by an excess demand are "equilibrating" when the system is stable and "disequilibrating" when the system is unstable.

three kinds of demand expansion, namely: autonomous, induced and supportive demand expansions; and three kinds of costs increase, namely: responsive, defensive and aggressive cost increases.

Types of Demand Expansions:

- Autonomous demand inflation would be expansions which are not connected to previous or to expected cost increases.
- Induced expansions of demand are direct consequences of a cost increase through the income side of cost increases.
- Supportive expansions of demand would be those due to monetary or fiscal policy designed to reduce unemployment arising or threatening to arise from cost increases.

Types of Cost Increases:

- Aggressive wage inflation would be an increase in wages which achieves a net increment in the real wage rate and which is induced by an increase in the employer's profits, or an increase in wage rates obtained by other labor groups or which are spontaneous. Aggressive inflation of materials and producers goods prices would be an increase in prices which exceeds the invreased production costs, thus achieving an increased profit rate calculated on the basis of the repalacement cost of the required capacity.

- A defensive wage increase in an increase in wages induced by an increase in the cost of living , this increase being designed to restore real earnings which the group of workers in question has long been enjoying. A defensive increase in prices of producers' goods and of materials leaves real profit rates unchanged, taking account of no more than the increased production cost.

- A responsive wage increase is that which is induced by an excess demand in the particular labor market; i.e. those wage increases which can occur as a result of competitive demand in the absence of any monopoly power. A responsive price increase may take place also in industries producing materials and producers' goods, but it is clear that it cannot occur in an industry with much excess productive capacity.

This classification has some defects: the cases it presents are not mutually exclusive and it implies a cross classification. Demand expansions should be divided into demand expansions connected with previous cost increases and demand expansions, not connected with previous cost increases; the first including both of induced demand expansions and supportive demand expansions, and the latter comprising autonomous demand inflation. In this way, the cases will be mutually exclusive. On the other hand, aggressive and defensive cost increases seem to cover all cases of cost increases, while the responsive cost increases may be considered as a cross classification; in the sense that responsive cost increases may be either aggressive or defensive, e.g. let us consider an expansion of public demand for labor, this expansion of demand calls forth a responsive wage increase which is aggressive too, since it is not due to higher cost of living, and since it achieves an increment of workers' real earnings.

Definitions:

On the basis of the preceding distinctions we may define demand-pull inflation as a case of rising prices due to autonomous expansions of demand, followed by responsive price and wage increases. Cost-push inflation can be defined as a case of rising prices due to agressive increases of wage rates and/or material prices followed by induced and/or supportive demand expansions.

We should note that these two definitions do not cover all cases of inflation; there are other cases of inflation e.g. a fall in productivity is likely to cut down real wages which, in turn, call forth a defensive money wage increase designed to restore worker's real earnings. This defensive wage increase leads either to unemployment - when the government follows an inelastic monetary policy - or to inflation - when the government follows an elastic monetary policy, so that a supportive demand expansion may take place. Thus, a fall in productivity may start an inflationary process.

A distinction which bears a close resemblance to that between cost inflation and demand inflation has been made by Prof. B. Hansen: namely, the distinction between induced and autonomous inflation (8). Induced price increases are those called forth by excess demand in the markets concerned, whreas autonomous price increases are those which could not be explained in terms of the excess demand of the markets concerned. However, the criterion used in distinguishing between induced and autonomous price increases, namely excess demand, involves some troubles. The main trouble is that the concept of excess demand which is clearly defined in a perfectly competitive market as the difference between the quantity demanded and the quantity supplied at a given price, looses its clarity when applied to imperfect markets, because under conditions of imperfect competition, cost and demand schedules are interdependent (9), so that it is difficult to rely on the two schedules to determine excess demand,

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(8) "The Wage-Price Issue" by Bowen, ch. 2, and "Inflation Problems in small countries" by Prof. B. Hansen (First Lecture).

(9) Costs influence the demand for the individual firm's product through the existence of advertising costs. In turn, the demand situation confronting the firm influences the costs through affecting the prices of the factors of production since demand for factors of production is <u>derived</u> demand. When we move to the economy as a whole, this interdependence is more pronounced, for a shift in the cost function is almost certain to induce a shift in the demand function through the income side of cost adjustments. "The Price-Wage Issue" by Bowen, ch. 16.

however, if the demand is interpreted as excess of purchasing plans over sales expectations or the excess of realised sales over sales expectations, the concept may also apply to both perfect and imperfect market-forms.

Empirical Tests:(10)

However it is possible to draw a theoretical distinction between cost-push and demand-pull inflation, it seems impossible to test such a distinction statistically.

A way of testing whether wage-push or demand-pull had initiated the upward price movement, is by looking to see which wages or prices have increased more, or which have increased first. The main defect in these tests is that the choice of a base for the comparison is arbitrary, and hence the conslusions drawn from these tests are equally arbitrary. On the other hand, the rise in productivity normally secures increases in real wages over the years, hence leading to an increase in wage rates relative to consumer prices regardless of whether there is inflation.

Another test is to take the increase in money wage rates at a higher rate than the increase in labor productivity as an indicator of a wgae-push, however, this result can be attained in the case of a demand-pull inflation where excess demand for labor would eventually pull the wage level up. Hence,, this test is inconclusive.

A fourth test is to use the relative shares of profits and wages in the national income. The argument behind this test is that an expansion of demand pulls up product prices; increased profits and profit rates would result untill wage rates are pulled up by the derived demand for labor. Thus an increase in consumer prices associated with increased profit rates,

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(10) "Another View of Cost-Push and Demand-Pull Inflation" by Machlup in the Review of Economics and Statistics. (May 1960).

but with wage rates lagging, would point to the existence of demand-pull inflation? Hence too, the main defect is the arbitrary choice of the base period. On the other hand, the lead of profit rates is not a decisive indicator of a demand-pull it may also occur in connection with a cost-push in which the price setters decide to increase their profit margin, thus planning the leading role.

Finally, it has been argued that demand-pull inflation may be detected by referring to over-employment and payments. The existence of over-employment could be detected by the existence of an excess job vacancies over job applications; and the existence of overtime payments could be detected by means of average hourly eranings increasing faster than the wage rates. However, such indicators do not rule out the contribution of some cost-push to the inflationary process. Thus, these tests can vertify the existence of a demand-pull, however, they cannot exclude the possibility of the existence of the cost-push. Consequently, it appears to be extreemly difficult to test the price increase is due to a cost-push or whether it is due to a demand-pull. Needless to say that the difficulty is multiplied when we try to draw a statistical distinction between different types of cost and demand increases. The conslusion which emerges from the preceding analysis is that the concepts of demand inflation and cost inflation have not yet been defined in a testable way; and thus, this distinction seems to be of little use - if any - for setting an anti-inflationary policy.

Finally, the answer of our first question is that if we define autonomous cost increases as the cost increases not attributable to excess demand, we may assert that there are autonomous cost increases and that they cannot take place within a competitive market. An autonomous cost increase- i.e. which is not demand - induced may yet be induced either by increased employer's profits, or by distortion of wage differentials, or by an increased cost of living; finally, it may be sponteneous in the sense that it is not induced by any economic force .

Having shown that cost inflation is not always demand-induced; we shall now be concerned with the role of costs in the price-setting process and with the forces that push different cost elements up. The leading role in both of the price-setting and the cost-determining processes is usually assigned to monopolistic pricing and to collective bargaining; however, other forces, such as diminishing returns play an equally important role - and in some instances a more important role - in the price and cost determination.

PART II:

Costs and Prices.

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Changes in the general price index are the sum of changes in the individual prices which constitute the index , so that it is possible to begin the analysis of the impact of costs on the overall price increase with micro-economic considerations, then we shall be concerned with the elements which determine the general price level and the general cost level .

Micro-economic Considerations

In this section we shall be concerned with price determination and with the role of costs in the price determination process within the individual firm; then, we shall consider the factors responsible for raising the firm's costs.

Price Determination:(1)

1. Demand-determined prices.

According to this view, price adjustments are determined by the excess demand for the goods, so that:

$$\frac{\Delta P}{P} = k_1 \frac{Xc}{S_c} \qquad (1)$$

where $\Delta P/P$ is the relative change in price, $X_c = D_c - S_c$ is the excess demand for the goods, X_c / S_c is the relative excess demand, k_1 is a coefficient which denotes the price flexibility. This type of price determination usually applies to competitive markets.

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(1) "The Wage-Price Issue" by Bowen . ch. 15
"Cost and Demand Elements in the Inflationary Process" by Pitchford in the Review of Economic Studies (February 1957) pp. 139-148.

2. Cost-Determined Prices.

In this case, "the price which a firm will normally quote for a particular product will equal the estimated average direct costs plus a costing margin" which will tend to cover the indirect costs - including overheads - and provide a normal level of net profits(2). According to this type of price determination, price adjustments conform to changes in costs, so that:

$$\frac{\Delta P}{P} = k_2 \frac{\Delta C}{C} \qquad (2)$$

where $\Delta P/P$ is the relative price change, $\Delta C/C$ is the relative variable cost change, k_2 a coefficient determining the strength of the price reaction to relative variable cost changes.

It is to be noted that, whatever the state of demand, the firm for fear of reducing its profits will not reduce its price relative to costs below a certain point. There is thus a minimum margin of profit which depends on the degree of monopoly; k_2 could be considered as an indicator of this gross profit margin. Changes in the degree of monopoly are thus reflected by changes in k_2. The main factors responsible for increasing degree of monopoly and theory responsible for increasing gross profit margins are:

a) the process of concentration in industry leading to the formation of giant corporations producing a substantial share of output.

b) the development of sales promotion through advertising so that price competition is replaced by competition in advertising compaigns.

c) the increase in the level of overheads in relation to variable costs (e.g. as a result of the introduction of more capital intensive techniques) will result in a decrease of net profits unless the ratio of price to variable costs is permitted to rise.(3)

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(2) "The Pricing of Manufactured Products" by A. Robisnson in the Economic Journal (December 1950) p. 772.

(3) "Theory of Economic Dynamics" by Kalecki, ch. 1

3. Cost-and demand-determined prices.

A firm which determines its prices on a cost-plus basis will be a firm which tends to maintain its long-term competitive position, whereas a firm which changes its prices according to demand fluctuations will maximize short-run profits but may spoil its future market. Perhaps the firms adopt a middle solution by combining both of cost and demand elements in the price-setting process, so that:

$$\frac{\Delta P}{P} = k_1 \frac{Xc}{S_c} + k_2 \frac{\Delta C}{C} \qquad (3)$$

this equation can be reduced to (1) or (2) by putting $k_2 = o$, or $k_1 = o$.

In appraising the impact of cost changes under this type of price determination, it may be convenient to refer to the marginalist analysis which asserts that the optimum output which the firm tends to produce is that which equates the marginal costs and the marginal revenue. We shall begin by considering the probable shape of the marginal cost curve.(4)

The marginal costs can be expected to be fairly constant over a wide range of output rates because entrepreneurs tend to build flexible and divisible plants. Flexibility means specialized fixed factors. Divisibility of plant and equipment means the plant is composed of identical small productive units, so that output could be expanded (or reduced) by using more (or less) of these units at the optimum capacity. Divisibility also means that a plant may be operated at optimum output a few hours per week, or with one or more shifts. However, adding a new shift, or working the existing labor overtime leads to an increase in marginal costs; so that they attain a new higher level where they remain fairly constant for a certain range of output rates. Finally, when the output rate at which the fixed factors of production are fully utilized is reached, so that it is

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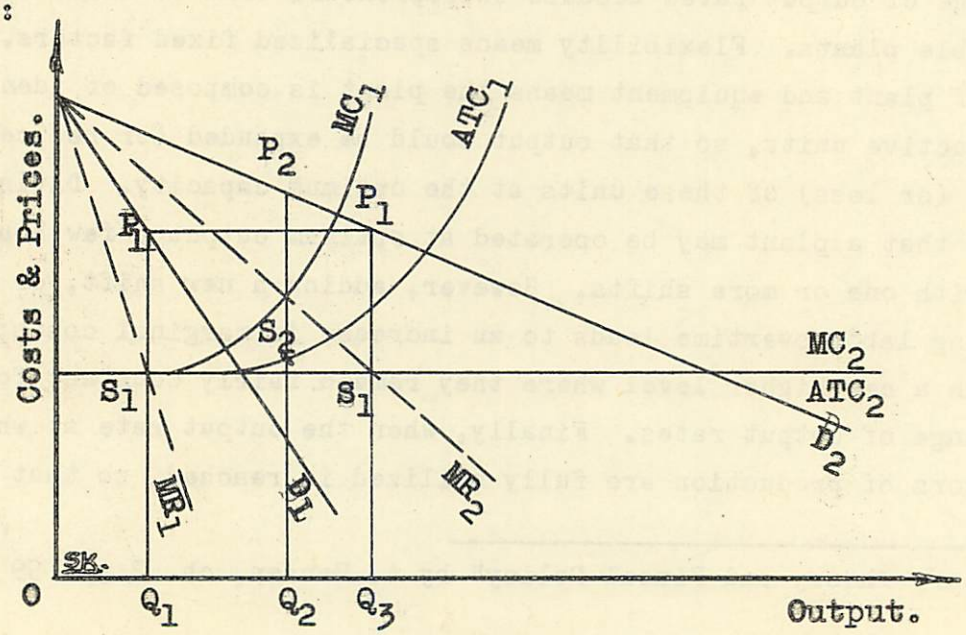
(4) "Monetary Theory and Fiscal Policy" by A. Hansen, ch. 7 pp. 99 - 115.

impossible to increase production by adding more variable factors, the marginal cost curve rise sharply. The movement along the cost curve, due to a change in the scale of operation would thus lead to increased costs and prices.

Demand curve high enough, so that the marginal revenue curve intersects steeply rising marginal cost curve with produce enormous profits, price being much higher than average costs. How, it is clear that, without an expansion in demand, production would not have increased, and prices would have remained stable. But, would prices have increased if costs have remained constant?

To answer this question, it is convenient to use the device of the "standard firm" i.e. a firm in which variations in output, cost and price reflect equivalent variations in the aggregate volume of production and in the general cost and price levels. How, assume that average and marginal costs are constant up to certain scale of production where they begin to rise according to the more intensive of capacity, and that monopolistic competition is prevailing ; the cost and revenue curves will be as follows:



In the figure, at the first demand level D_1, the optimum output oQ_1 will be sold at price Q_1P_1, moderate profits S_1P_1 are realized. When demand increases to D_2, optimum output OQ_2 would be sold at price Q_2P_2 and larger profits S_2P_2 would be realized. However, we should note that, increasing decreasing demand is a necessary condition to increasing prices, but it is not a sufficient one; for suppose that demand increases to D_2, that the demand elasticity does not change[5] and that costs remain constnat (MC_2= average total cost ATC_2), price would have remained stable ($Q_3P_1 = Q_1P_1$) and output would have increased to OQ_3. Hence, increasing marginal costs have raised price from Q_1P_1 to Q_2P_2 and, as a result, demand and output have decreased from OQ_3 to OQ_2. Thus, the effect of a shift in the demand curve on price depends on both of the elasticity of demand and the behavior of marginal costs (whether they are constant or increasing) in the range between the old new rates of output.

The conslusion is that, while an upward shift in the demand function is more likely to increase price (i.e. when market conditions are stable); yet we cannot be sure of that. It is only in the case in which the firm is operating at capacity after the demand increase - i.e. the case in which marginal costs are increasing that we can confident that higher prices will result from the increase in orders.

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(5) To show the necessity of the assumption of unchanged demand elasticity, let us refer to the Amorozo - Robinson relation which relates marginal revenue M R, average revenue A R or price P , and the elasticity of demand E (or more precisely its absolute value): $A R = P = M R. \frac{E}{E-1}$. Remembering that the condition for profit maximization is that marginal cost M C equals M R, the equilibrium proce P° will be : $P° = M C \frac{E}{E-1}$. It is clear that if the elasticity of demand E remains constant, then P° will increase in proportion to the increment in M C. An increase in E will exert a downward pressure on price, and a decrease in E will exert an upward pressure. By constant demand elasticity we mean unchanged demand elasticity at a given price - say , the old price OP_1. It should be noted that unchanged demand elasticity implies that D_1 must be steeper than D_2, since $E = \frac{dQ}{dp} \cdot \frac{P}{Q}$. "The Wage-Price Issue" by Bowen, ch. 14.

Bowen has assumed up the role occupied by cost and demand elements in the price-setting process in three propositions:[6]

"Proposition one: Prices are particularly sensetive to costs , that is, changes in costs are, in general, more likely to inspire some sort of price adjustment than are shifts in demand".

This proposition is based on the consideration that cost data are more available and reliable than demand data, so that it is more convenient to depend on costs for setting the prices. Changes in costs are also more permanent than changes in demand, consequently the appeal for stability is more likely to lead to price adjustments in response to a change in costs than to a demand shift. Changes in costs are often more uniform among the competing firms[7] than are changes in demand, so that a price adjustment in response to a change in costs is not likely to alter the relative position of the firms in the market. Finally, the public tends to consider price adjustments based on changes in costs as more justifiable and acceptable than demand-induced price changes.

"Proposition two : It is much more likely that an increase in costs will lead to an upward price adjustment than that a decrease in costs will inspire a price reduction".

One of the most important considerations is that an increase in costs reduces the firm's profits whereas a decrease in costs raises the profits, so that the firm is usually hostile to changes in price in response to a cost decrease. The existence of uncertainty also supports this proposition; the fact that changes in volume in response to changes in price are uncertain and difficult to predict, leads the firm to pay more attention to the size of its profit margin. Finally, considerations of security also support this proposition; instead of cutting prices now, the firm may prefer

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(6) "The Wage-Price Issue" by Bowen - ch. 15 pp. 293-297.

(7) This applies to monopolistic and competitive competition.

to let its profit margin increase so as to earn more profits for the case it is late forced to cut prices down and thereby decrease its profit margin.

"Proposition three: In the case of shifts in demand, it is much more likely that decreasing demand will provoke a cut than that increasing demand will lead to a price increase".

Social pressure discourages the firm from raising price in response to increasing demand, while it encourages price reductions in response to a decrease in demand. The desire of the firm to maintain its share of the market in the long-run discourages price increases in response to increasing demand. Finally, when demand increases, the firm can make no adjustments to increased orders, and still benefits from such an increase through higher volume of sales, whereas a decrease in demand puts a pressure on the firm to act in order to prevent its profits from declining or turning to losses.

These propositions show that prices are usually more sensetive to cost changes than they are to demand shifts (proposition one) , and that a cost increase is more likely to inspire a price rise than an upward shift in demand whereas a downward shift in demand is more likely to lead to a decline in prices than a decrease in costs (Proposition two and three). In other words, cost increases exert more inflationary pressure on prices than upward demand shifts, whereas cost decreases have less deflationary influence than downward demand shifts.

However, we should note that Bowen has states these propositions without giving any empirical evidence to support them. Thus, we should not take these conclusions for granted and take for the rules of setting prices, rather, we should consider them as expressing the probable effect of cost and demand elements on prices in a certain sector of the economy, namely the manufacturing sector.

Factors Responsible for Cost Increases:

It may be convenient to begin this section by enumerating the components of the variable costs, the fixed costs and the total costs[8].

Variable or, direct costs are composed of:

1. Costs of raw materials,
2. Wages of labor directly engaged in the production process,
3. Costs of the power,
4. Any other cost which could be appropriated to each unit produced.

Fixed Costs are composed of:

1. Depreciation costs,
2. Maintenance and improvement costs,
3. Administrative costs incurred to pay wages and salaries for the basic human element which the firm employs whatever the rate of output it produces,
4. Interest on the total capital invested.

Total costs are the sum of both of the variable and fixed costs.

We can divide our discussion into two parts and distinguish between two general ways in which an increase in costs the individual firm can come about:

1. An increase in costs can result from a movement along the cost curve.
2. An increase in costs can be brought about by an upward shift in the entire cost curve.

We shall consider each of these types of cost increases consecutively.

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(8) "Prices and Costs" by Prof. W. Messiha (in Arabic) pp. 319, 320, 323.

I. Cost increases resulting from a movement along the cost curve.

We have already shown that when the output rate at which fixed factors of production are fully utilized is reached, the marginal cost curve tends to rise sharply, and that the movement along the cost curve due to a change in the scale of operation would thus lead to increased costs and prices[9].

Inflation here would be attributed to the under-capacity of the existing capital equipment[10], in the sense that granted that the factor prices are held constant, the cost structure itself leads to high prices when the firm approaches a state of full utilization of fixed capital. Demand curve high enough so that the marginal revenue curve intersects steeply rising marginal cost curve will produce enormous profits, prices being much higher than average costs. If labor unions try to share these profits by claiming for higher wages, the result would be to raise both of the marginal revenue and the marginal cost curves, leaving profits unchanged, but at a higher price level. The remedy would be to reduce output and employment and hence to move down and back on the cost curves to restore the initial price-cost relation.

A continuing inflationary pressure due to undercapacity of fixed capital provides the inventive to enlarge capacity, because if output was maintained at a high marginal cost, this would indicate a high return to the scarce fixed factor of production - i.e. a high marginal efficiency of capital. This situation calls forth an expansion of investment in capital which would be translated, in the short-run, into an increase of the price of the scarce fixed factor, given the prices of other factors; but in the long-run, capital equipment would expand. Larger fixed capacity

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(9) See pp. 15 - 17.

(10) "Monetary Theory and Fiscal Policy" by A. Hansen, ch. 7

means that total average cost curve is pushed to the right, so that the new higher level of output is again produced at the lowest marginal cost.(11)

It is clear that without an expansion in demand, production would not have increased, and prices would have remained stable. But expanding demand would not have raised prices if costs have not increased.(12) Thus, increasing costs (or diminishing returns) are necessary rising prices.

II. Cost Increases resulting from upward Shifts of the Cost Curve.

Cost curves shift upwards as a result of an increase in the price of one or more of the variable or fixed inputs at a given level of output. An upward shift in the cost curve can thus be attributed to an increase in any of the following elements:

1. Average labor cost,
2. Average depreciation cost and average maintenance cost,
3. Average interest cost,
4. Average tax cost,
5. Average import input cost.

Now, we shall consider the effect of each of these elements on total costs.

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(11) The lowest marginal cost might be equal to, greater or smaller than the old minimum level of marginal cost, according to the existence of constant costs, net internal diseconomies or net internal economies of large scale production.
See, "Cost Curves and Supply Curves" by Viner, in Readings in Price Theory. pp. 210 - 217.

(12) See pp. 15 - 17 .

1. Wages.

It has been asserted that any wage increment that exceeds the rate of productivity increase will lead to a higher average labor cost, which will be translated at least [13], into an equal absolute increase in average variable costs. Moreover, if the increase in average cost is accompanied by an improvement in productivity, it is possible that average capital costs would increase also.[14] Hence, it is probable that the average total cost will move upwards at least as much as the amount of increase in average labor cost.

Now, why do wages increase?

The forces leading to increasing wages differ according to the type of wage determination. Pitchford has made a distinction between:

1. Demand-determined wages: In this case, money wage adjustments are determined by the excess demand for labor, so that:

$$\frac{\Delta W}{W} = k_3 \frac{Xv}{S_w} \qquad (4)$$

where $\Delta W/W$ is the relative change of the money wage rate, X_w/S_w is the relative excess demand for labor, k_3 a certain coefficient which denotes

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(13) "At least" because a smaller absolute increase in average variable costs in response to an increment in average labor costs implies either a fall in non-labor prices as a result of a rise in avergae labor cost, or a reduction in the quantity of non-labor inputs in the unit of output; neither of these alternatives seems likely. "The Wage-Price Issue" by Bowen, ch. 12.

(14) It is sometimes possible for total product per worker to increase thanks to a progress of technology without any increase in capital investment. More often however, some additional investments are required to increase productivity. If such investments were not allowed to earn a return, progress might be stopped and, with higher wages, workers might be laid off. If additional investments are so large that capacity per worker has increased at a higher rate than output per worker, wage rates cannot increase by as much as output per worker without inducing either inflation, or unemployment. Thus, there are cases where wage increases at the same rate as productivity advances lead to inflation.
"Another view of Cost-push Demand-Pull Inflation" by Machlup in the Review of Economics and Statistics (May 1960).

the money wage flexibility. Such a type of wage determination applies to an unorganized labor market with no organizations, neither for labor nor for employers; this market corresponds to a perfect competition market.(15)

2. Cost-determined wages: In this case wages will be determined according to some index of the cost living.

$$\frac{\Delta W}{W} = k_4 \frac{\Delta C_e}{C_e} \qquad (5)$$

will be the form of the wage adjustment, so that the relative wage increase will bear a certain agreed proportion k_4 to the relative change in the cost-of-living. This type of wage determination sets usually a price-wage spiral. Once a price rise has occured, it will lead to claims for higher wages which, if granted, would increase prices, and so on.

There are sometimes arrangements which link wages directly to the cost of living; but they have the disadvantages that any temporary rise in prices caused by exogenous factors (e.g. a crop) sets off a price-wage spiral and leads to a permanent rise in costs.

3. Cost-and demand-determined wages: $k_4 \frac{\Delta C_e}{C_e}$ is a wage adjustment which a producer usually makes in order to prevent his workers from shifting to his competitions; but this adjustment does not affect the producer's demand for additional labor. Thus, a producer is interested in increasing his output, he has to make another adjustment in accord with his excess demand, so that:

$$\frac{\Delta W}{W} = k_3 \frac{X_w}{S_w} + k_4 \frac{\Delta C_e}{C_e} \qquad (6)$$

The rate at which wages tend to be raised is related to both of:

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(15) $X_w = D_w - S_w$ = demand for labor-supply of labor.
"Full Employment and Wage Stability" by Prof. B. Hansen in the Theory of Wage Determination. (ed. by Dunlop).

1. The level of employment in the individual labor market as expressed by the relative excess demand for labor X_w / S_w

2. The cost of living as expressed by the relative change in the cost of living. This factor exerts a greater effect when employment is high than when it is low within the individual labor market.(16)

Other factors, such as comparison between wages and institutional set-up influence also the wage behaviour.

Comparisons between wages reflect psychological, economic, social and political forces which make for the maintenance of existing wage differentials between industries, regions and types of labor. The influence of this factor is stronger in times of rising wages and prices, so that any labor group which does not catch up with the general movement of wages is likely so suffer a relative, or even an absolute decline in real wages. This process of catching up takes its most important form between wages in different industries; however, it also operates inside individual industries; between firms and inside individual firms, between classes of labor and especially between skilled and unskilled labor, and between time rate and piece rate workers.(17)

However, the extent to which wages are affected by the preceding factors depends on institutional conditions prevailing in the labor market. Bowen(18) has made a distinction between the case of uniloteral wage-Setting by the employer and the case of collective bargaining.

1. Unilateral wage-Setting.

There are two necessary conditions for wages to increase:

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(16) "The Great Inflation 1939-1951" by A.J. Bowen, ch. 4 pp. 90-98.

(17) "Wage relationship- The comparative impact of market and power forces by Kerr in the Theory of Wage Determination (ed. by Dunlop) and -"The Problem of Rising Prices" by Fellner. Ch. on the Role of Wages.

(18) "The Price-Wage Issue" by Bowen, ch. 10.

a) There must be some wage pressure which is provided by either the existence of an excess demand for labor, or an increase in the cost of living or an increase in comparable wages -i.e. a distortion of wage differentials.

b) The firm must choose to respond to this wage pressure. This condition will be fulfilled either if it is more profitable for the firm to eliminate this wage pressure, or if the absolute level of the firm's profits is high enough to permit the financing of the wage increase.

The existence of any one of the conditions a) and b) alone is not sufficient by itself to call a wage increase, both of these conditions must act jointly to lead to a wage adjustment. Claims for higher wages depend on wage pressures, but the magnitude of the adjustment or the response to these claims depends on the financial conditions of the firm.

2. Collective Bargaining.

The existence of collective bargaining affects the pressure on the firm to raise wages in two ways:

a) The old pressures for higher wages are transmitted through the union and thus become more formal.

b) New pressures for wage increases appear.

Changes in the cost of living and comparable wages are potential sources of worker discontent. In addition to these "old" pressures union wage demands will be subject to the pressure of the economic position of the employer and his probable reaction to hypothetical wage claims. This factor affects significantly wage pressures as well as the response to these pressures. It should be noted that, even in the absence of pressures from the cost of living or wage comparisons, unions are likely to claim for high wages, if it is thought that the employer will accede to these claims. This source of pressure leads to demand for higher wages based on the arguments that the firm's productivity has increased and that profits are excessive.

The firm's excess demand for labor also plays a role in the case of collective bargaining. A positive excess demand for labor may exert an indirect influence on wage demand by suggesting that the employer may have interest in raising wages and so would not resist claims for higher wages. An excess supply of labor affects more directly the union's wage claim in that workers are not likely to push for a wage increase that might result in a strike if there is widespread unemployment.

The conclusion is that, the union's wage demand is equal to the wage increase necessary either to effect a rise in the cost of living or to match an increment in comparable wages. Widespread unemployment or poor profit prospects within the individual firm may force the union to modify its wage demand downwards. On the other hand, if the union feels that the firm is in a position where it will be more willing to negotiate a larger wage increase than it would be to take a strike, it would modify its wage claims upwards.

The appearance of the union will extent its strongest influence on the relative profitability of acquiescence which is determined by comparing the impact on the firm's profit position of (1) granting the wage increase and of (2) resisting. A strong union can increase the relative profitability of acquiescence by increasing the costs of resisting. The main source of the increase in the costs of resisting wage pressures is the threat of the organized[19] strike. However, we must not expect every wage nogotiation to be decided with reference to the immediate profitability of acquiescence and resistance. An employer may resist more obstinately than economic conditions seem to justify, either to discredit the union, or to protect himself from excessive union claims in the future.

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(19) Provided, of course that organized strike is not prohibited.

2. Depreciation and maintenance costs, Interest costs and Tax costs.

a) Depreciation and maintenance costs:

The rate of depreciation of fixed equipment depends either on the historical capital costs incurred by the firm, or on the replacement costs and on the expected life of capital equipment. However, it is more safe for the firm, especially in times of rising prices, to compute its rate of depreciation on the basis of the replacement cost. Depreciation costs are likely to increase according to a rise in capital goods prices and to a decrease in the expected life of capital equipment.

Rising producers goods prices affect capital costs either by increasing marginal capital costs, i.e. additional costs actually incurred by the firm to enlarge its productive capacity or to replace its depreciated equipment or by increasing replacement costs which the firm expect to incur when its capital equipment will be used up and will have to be replaced.

Decreasing life of capital equipment means a decrease in the period necessary for capital equipment to be used up, and thus it implies that the total capital costs charged per unit of time must rise, so that total average cost curve shifts upward. A decrease in the expected life of fixed equipment is usually attributed to the sustained intensive use of productive capacity.

Maintenance costs also depend on the rate of utilization of the productive capacity, so that it increases with the intensity of utilization of capital equipment.

Now, do depreciation costs affect pricing? if we assume that prices are set by adding a mark-up to the estimated average direct cost, it is doubtful that depreciation costs would affect pricing, since they are not considered as an element of direct costs. However, we may argue

that depreciation costs affect prices through their effect on the costing margin which is assumed to cover indirect costs - including overheads - and provide a normal level of net profits; but this effect has not been observed, and the usual view is that the costing margin changes according to demand fluctuations.

b) Interest costs:

Interest on the total capital invested is considered as an item of costs because it is either an actual cost which the firm incurs if it has borrowed its capital, or an opportunity cost which is equivalent to the income the firm would have earned if it had invested its capital in an alternative field.

Interest is determined in the credit market by the interaction of demand for and supply of credit which are determined by macro-economic factors. However, we can roughly say that the size of the loan is an important determinant of the costs of borrowing. The principle of increasing risks applies here, in the sense that costs of borrowing incurred by the individual firm tend to increase at a higher rate than the size of the loan.

Finally, the same as has been said in connection with the effect of depreciation costs on prices could apply to the effect or interest costs on prices.

c) Tax Costs:

Government action may influence prices through indirect taxes, especially excise duties and customs duties, so that price increases due to higher indirect taxes may be described as "governmentally induced price increases".

The effect of higher excise duties on the price of a certain product depends on both of the elasticities of demand and supply of the

product in question; the higher the elasticity of demand and supply, the weaker will be the effect of higher excise duties on prices, and the stronger will be its effect on the quantity sold, and vice versa.

Higher customs duties are translated into increased import prices, and it may be more convenient to consider customs duties as a part of import prices.

The effect of indirect taxes on prices also depends on the nature of the tax, i.e. whether it is specific or advalorem.

Increasing profit taxes may also affect prices when the firm tries to keep a constant net - absolute or proportional - profit margin . In this case, higher profit taxes will reduce the net profit margin and will probably lead the firm to raise its price to offset this reduction in the profit margin.

3. Import prices:

Import prices, for a given economy, could be considered as determined by foreign economic forces. If import prices are taken to include customs duties, we may add that they are also determined by government action. Finally, changes of exchange rates also affect import prices, but they may be considered as demand-induced, since when the country permits exchange rates to vary, they will change according to change in the relation between demand for and supply of foreign exchange. Imports constitute a significant input in many industries; they are either current inputs, or capital inputs. Thus, increasing import prices affect costs in the domestic costs in the domestic market via two effects:(20)

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(20) "An Analysis of the Inflation in Machinery Prices " by Wilson

1) Current input cost effects: the current inputs can be defined as the flows of imports required for the output of a given product. Increase in current input costs is translated into higher average variable cost, provided that increased import prices do not lead to a substitution of local materials for imported materials.

2) Capital cost effects: the imported capital inputs are the stocks of imported capital goods required for the output of a given product. Whereas a rise of current input cost affects an industry almost immediately, a rise in capital costs (fixed costs) will exert its influence over a long period of time. The rate at which prices adjust to higher capital costs depends on"the rate of growth of demand for the industry's product, the competitive structure of the industry and the average life of capital within the industry"(21) the size of that adjustment depends on the extent to which other factors of production could be substituted to imported capital and on the intensity of impoted capital used in the industry.

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(21) "An Analysis of the Inflation in Machinery Prices" by Wilson

MACRO-ECONOMIC CONSIDERATIONS

The General Price Level:(22)

The type of price determination differs between sectors, as it differs between firms, so that there is no single type of price determination which could be applied to the whole economy. However, we can envisage the factors determining changes in the general price as;

1. The various types of market conditions in different sectors of the economy.
2. Cost conditions(23)
3. Demand conditions
4. Distributional factors, i.e. the way in which cost conditions, demand conditions and types of market conditions are combined in the economy.

Now, we shall develop the first and fourth factors.

1. The various types of market conditions in different sectors of the economy agriculture:

The final product in this sector is homogeneous, the number of independent producers is large and the market is well organized; thus, the market of agricultural products approximates perfect competition. Hence, increases in costs incurred by the farmer cannot influence directly the price of the agricultural products, but they exert an indirect and slow influence through changes in the amount of product offered for sale. Price changes are thus governed by changes in the excess demand or agricultural products. This is due to the conditions of inelastic agricultural supply in short periods, so that an increase in demand causes a diminition of stocks and a consequent increase in price. This initial price increase

(22) "The Wage-Price Issue" by Bowen ch. 16.

(23) We must remember that variable costs for the economy as a whole consist of wage costs and import costs only, since local raw material costs cancel out for the economy as a whole.

is reforced by speculative inventory accumulation.

The government agricultural policy also influences the agricultural prices either fixing them directly, or by altering the supply of agricultural produce through crop restrictions (e.g. cotton in Egypt).

Finally, this type of price formation also applies to extractive industries which have almost the same characteristics as agriculture and where the supply is inelastic in short periods.

Industry: The previous analysis of the price determination on the basis of cost elements and on the basis of both of cost and demand elements usually applies to the industrial sector. In this sector, institutional factors play a significant role in the price-setting process. Demand increase do not influence prices directly; when demand increases, unfilled orders pile up until production is expanded or until increased pressure on the factor markets pulls the factor prices up, so that costs rise and thereby industrial prices rise as well. However, the relative importance of cost and demand elements in the price setting process differs between various industries. It is possible to say, in general - that the further we are from consumers, the more demand elements are effective in the process of price determination (e.g. in steel industries), and the nearer we are from consumers, the more operative are costs elements (e.g. in manufactured consumers' goods, prices become really administered).
This type of price determination also applies to public utilies sector which is characterized by the existence of government control in order to provide the public with goods and services at a price that just covers the costs of production, so that prices vary directly with the costs of production.

Finally, in the distributive sector, distributors tend to increase their prices in proportion to increases in their variable costs which are primarily composed of the prices paid to manufacturers in order to buy goods for resale.

Services: The pricing of services rendered by individuals - lawyers, doctors, domestics - enters in the field of wage determination. Their prices will usually be most sensetive to increases in demand; a cost-plus pricing cannot be applied to this sector.

2. Distributional factors:

The impact of a shift in demand on the general price level depends on the distribution of increases of demand among the various types of markets in the economy-Demand shifts concentrated in the agricultural sector (competitive sector) will lay a greater impact on prices than increasing orders in the industrial sector. Within the industrial sector, increasing demand will lead to a high production rather than to higher prices. However, if the industry is operating at capacity, and if the demand increase seems to be significant and permanent, then prices may be increased . Consequently, the general impact of demand shifts on prices will be less the greater they are concentrated in the industrial sector and the further from full capacity is operating the industrial sector.

The distribution of cost increases among various types of markets also influences the impact of an increase in costs on the general price level. Thus, a cost increase localized in the industrial sector would push up the price level more than an equivalent increase in the cost of producing agricultural products.

The impact of cost increases on prices depends also on their distribution among the various stages of production. Thus, increased costs localized in the production of capital goods, i.e. for from the consumer, will take a longer time to be transmitted to the public - in the form of higher prices - than increased costs in an industry which sells directly to the consumers. On the other hand, the magnitude of the final effect of increased costs on the price level will probably be greater the further from consumers is the stage of production affected, because if the cost increase is an

industry producing intermediary goods or capital goods, the resulting increased price will be transmitted to other subsequent stages of production through raising their current costs or their capital costs, if the increase in costs occurs in the consumers' goods industries, this does not mean that the resulting increased consumers prices cannot be propagated throughout the whole economy. This process may take place through claims for higher wages which may be accorded, cost of living having increased. We shall consider this question more carefully when discussing the price-wage spiral. (See the Appendix).

Another distributional factor resulting from proposition two[24] is the uniformity of the cost increase over the economy; i.e.,a moderate but widespread series of cost increases would lead to a smaller general price increase than a scattered combinayion of significant cost increases and cost reductions.

Finally, combining both of the demand and cost elements together, we may conclude that an increase in costs in an industry faced with a declining demand will have less effect on prices than in an industry with an increasing demand for its product.

Another related point concerns the distribution of cost increases among industries using different profit margins[25]. The increase is price resulting from a given increase in costs depends on whether the industry maintains an absolute level of profits or whether it maintains profits as a percentage of the direct costs it incurs.

This ends our discussion of factors determining increases in the general price level. Now we shall proceed to the examination of factors responsible for raising the general cost level.

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(24) P. 18.

(25) "Income determination in open inflation" by Holzman in the Review of Economics and Statistics (May 1950) p. 152.

The General Cost Level.

,Movements of the general cost level can be regarded as dependent on two main considerations:

1. The same cost-determining factors that explain cost changes within the individual firm.

2. The distribution of these factors among different sectors of the economy. In a sectored economy, an upward movement of the general cost level is not likely to be brought about by a single and comprehensive cost increase; rather, it is likely to begin in certain sectors, industries or firms, and then ripples through the economy in the form of cost and price increases in other sectors, industries and firms. The total magnitude of the increase in the general cost level will thus depend on the size of the initial cost-push and the extent to which this cost-push is transmitted throughout the economy.

Taking changes in the general wage as an example, we should note that knowledge of the aggregate movements of the excess demand for labor and of productivity is not sufficient , and it must be supplemented by distributional informations. Thus, to appraise the impact of a change in excess demand for labor on the wage level, it is necessary to know how this change in excess demand is distributed with respect to other wage-setting factors such as the location of strong unions and of oligopolistic product markets - which determine the extent to which prices may rise in response to higher costs - and the general economic position of various firms and industries. The same set of aggregate conditions can lead to different movements in the wage level according to the distribution of these conditions.(26)

Now, let us consider the relation between wage adjustments and the level of unemployment.

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(26) "The Wage - Price Issue" by Bowen . ch. 11.

There is a conflict of opinion concerning the determinants of wage increases. There are those who believe that wage increases are determined by the pull of excess demand in the labor market and that even if wage increases were brought about by wage negotiations between employers and unions, wages would only rise by the amount that employers would have granted under the pressure of market forces. Whereas there are those who believe that wage increases are the outcome of collective bargaining and that they reflect the pressure for higher wages from the side of the unions.

Phillips[27], adopting the former view, has demonstrated that the rate of increase in money wages on the one hand, and the level of unemployment and the rate of change of unemployment, on the other hand, are strongly correlated;[28] and he has deduced from this correlation that the rise in wages reflects the state of demand for labor.

Kaldor, adopting the latter view, considers the rise in money wages as depending on "the bargaining strength of labor; and bargaining strength in turn, is closely related to the propensity of industry, which determines both the eagerness of labor unions to demand higher wages and the willingness and ability of employers to grant them."[29] That wages depend on "propensity of industry" does not exclude the relation between unemployment and changes of money wages. "It is when investment is high that profits are high, and it is periods of rising total demand and rising productivity that profits are rising. Such periods, in turn, are periods of low unemployment and also periods of falling unemployment". Finally, Kaldor concludes that "If instead relating wage increases to unemployment, and the rate of change of unemployment, Prof. Phillips had related them to the increase in production, or to the increase in profits of the previous year, I am confident that he would have found an even better correlation."[30]

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(27) "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the U.K. -1861-1957" by Phillips in Economica(Nov. 1958).

(28) It is clear that this correlation is negative.

(29) "Economic Growth and the Problem of Inflation-Part II, by Kaldor in Economica (November 1959) p. 293.

(30)The preceding article pp. 293-294.

Another objection to Phillips' view is that the labor market is not homogeneous and market imperfections prevent workers to shift from one part of the market to the other: thus excess demands and excess supplies may coexist in the labor market. Hence, unemployment is not a sufficient indicator of the general state of demand for labor and it has to be supplemented by information about unfilled vacancies. "It is the relation between excess supplies (unemployment) and excess demands (over-employment), and not the unemployment alone which is decissive for the tendency of the money wage to move in an upward direction when organizations agree upon money wages".(31)

However, wage adjustments may be expected to vary inversely with unemployment, because:(32)

1. a high level of employment, is likely to be accompanied by high profits and decreasing price competition in the product market.

2. A high level of employment may contribute to business prosperity by providing higher effective demand.

Phillips' view being defective, can we rely on Kaldor's view and conclude that the wage - push is motivated by the rise in profits which determine the loyer's ability - to-pay" higher wages, and that this process is consistent with a shortage of labor, but there is no direct link between unemployment and wages, the apparent relation between them being due to profits.

The relation between profits and wages has been tested empirically; the results have been rather negative. Lipsey and Steuer conclude from the testing of Kaldor's view "that the U.K. observations in the post-war period are consistent with the unemployment theory, but not with the profits theory. Rather than being able to explain away the observed relation between wages

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(31) "Full Employment and Wage Stability" by Prof. B. Hansen in the Theory of Wage Determination (ed. by Dunlop) PP. 75, 76.

(32) "The Wage-Price Issue" by Bowen, ch. 11 p. 225.

and unemployment by an association between unemployment and the "real" causal factor: profits; (they) found just the reverse: it is possible to explain away almost all of the observed relation between wage changes and profits by means of a correlation between profits and unemployment"[33]

Thus, we may also reject Kaldor's view. Now, what are the determinants of changes of the general wage level? The usual view is that changes of the general wage level are determined by: the excess demand for labor as illustrated by statistics of unemployment and of unfilled vacancies[34], and by changes in the cost of living. We could accept Kaldor's view if we may find a definite relation between profits and prices - as expressed by the cost-of-living index - however, such a relation has not been established.

Finally, although excess utilization of productive capacity, or higher import prices may motivate a cost-push inflation; however, inflation could not go on as a time process without increasing money wages, since the sources of cost-push, other than wage increases, cause a once - and - for-all rise in costs and prices. Wage increases have two aspects: they are an element of costs on the one hand, and they are the main component of income, on the other hand. Hence, rising wages lead to higher costs, as well as they increase demand which, in turn, is favourable to price increases. The main concern of the Appendix is this interaction between wages and prices during the inflationary process.

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(33) "The Relation between Profits and Wage Rates "by R.G. Lipsey and M.D. Steuer in Economica (May 1960) P. 150

(34) "The excess demand for Labor. A Study of conditions in Great Britain 1946-56."

COCLUSIONS AND COMMENTS.

CONCLUSION AND COMMENTS.

The conslusions drawn from the preceding analysis may be summarized as follows:

The general price level increase can be attributed to:[1]

A. Price increases which are induced by the appearance of excess demand in markets approximating the perfect competition requirements.

B. Price increases which occur in the non-perfectly competitive sector of the economy. Such price increases can be subdivided into:

1. Non-profit maximizing price increases which are mainly attributable to governmental action -e.g. price increases due to higher indirect taxes; or which are due to import price increases.

2. Profit maximizing price increases. Here, price adjustments may result from two main factors:

a) Increasing demand.

b) Increasing costs -which may be attributed either to:

i-an increase in derived demand for factors of production, or to

ii-autonomous factor price increases.

Demand inflation may take place within the sectors (A), $\{B,2(a)\}$ and $\{B,2,(d,i)\}$. Whereas cost inflation can only take place in the non-profit maximizing sector (B,1) and in the profit maximizing sector when price increases are due to increasing costs attributable to autonomous factor price increases $\{B,2,(b,ii)\}$.

We have pointed to a type of cost inflation which may be explained by the cost structure itself, provided that the factor prices are held constant. This type of inflation due to undercapacity of capital equipment seems to apply to developing economies which try to combat underdevelopment

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(1) "The Wage-price Issue" by Bowen, ch. 1.

by expanding their production at a rate higher than the rate of expanding productive capacity, so they use more their existing stock of capital, so that diminishing returns take place and lead to price inflation.

Another source of cost inflation in developing economies is provided by increasing import prices. Imports constitute a significant input in many industries in developing economies which depend to a large extent on foreign materials imports ripples through the economy in the form of cost increases leading to higher prices. As has been shown, rising import prices affect either current input costs or capital costs. In a developing country, the current input cost effects are small relatively to capital cost effects, because most imports are composed of capital equipment, raw materials being usually available in the domestic market.

Increasing depreciation and maintenance costs provide a third source of cost inflation in developing economies. This factor results from over-utilization of productive capacity and rising import prices.

Finally, we should note that usually wages are not a source of cost inflation in developing economies. In such economies, only a small part of the labor force is organized and labor[(2)] is an abundant factor. Thus, it is not likely that wages would increase, unless they are raised by governmental order-this may happen either when the cost of living rises considerably so that real wages are drastically cut down or when the government aims at improving wage earners' relative standard of living. However, a price-wage spiral may take place, in a limited scope, through the interaction of professional's income and prices. Professional - such as engineers, doctors, lawyers,... - in developing countries are both scarce and organized; thus they can raise the price of their services regardless changes in demand for them. These professional's wage increases are not likely to spread to unskilled labor, as a consequence of a lack of basis for comparison between professionals income and unskilled labor wages. Thus the price-wage spiral is expected to be of limited scope in developing economies.

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(2) We mean unskilled labor.

APPENDIX:

A Model of the Cost Inflation.

A P P E N D I X :

A MODEL OF THE COST INFLATION.

Having analysed the relation between costs and prices, and the factors responsible for raising costs, we shall now develop the mechanics of inflation under the assumption that price increases are induced by rising costs, not by excess demand.(1)

We shall consider an economy with two sectors, namely industry and agriculture, where there are four types of income recipients: farmers, industrial wage earners, industrial nonwage earners or fixed income recipients and corporations.

Symbols used:

P_{AT}= agricultural prices in any period (t) after the base period t = 1

P_{It}= industrial prices in any period (t) after the base period t = -1

O_A= agricultural output which is not consumed by the agricultural sector and which is assumed fixed.

E= the level of industrial employment which is assumed fixed.

W_t= the money wage rate in any period t.

f= the fixed money income of industrial nonwage earners.

a= the fraction of money income spent by industrial wage and nonwage earners on farm products.

B= the fraction of money income spent by industrial wage and nonwage earners on industrial products.

x= the fraction of money income spent by farmers on industrial product.

n= industrial productivity per worker.

m= the costing margin percentage.

I_t= a general fixed weight price index.

w_1=the weight attached to industrial prices in the price index.

w_2= the weight attached to agricultural prices in the price index.

w_3= the weight given to fixed price elements in the cost of living.

t= time and t = -1 is the initial period.

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(1) "The Mechanics of Inflation" by J. Duesenberry in the Review of Economics and Statistics (May 1950) pp. 144-149.

Prices are determined as follows:[2]

1) Agricultural prices are determined by the interaction of supply and demand in competitive markets, so that, in any period t after the initial period t = 1,

$$a(W_t E + f) = O_A P_{AT}$$

Demand for farm products = supply of farm products.

i.e.

$$P_{AT} = \frac{a(W_t E + f)}{O_A} \qquad (1)$$

2) Industrial prices are determined by adding a percentage costing margin to the average labor cost,[3] so that:

$$P_{It} = \frac{W_t E}{O_I} + M \frac{W_t E}{O_I} = \frac{W_t (1+M) E}{O_I}$$

where O_I is the industrial output. Denoting industrial productivity per worker $(\frac{O_I}{E})$ by Π, then:

$$P_{It} = \frac{W_t (1+M)}{\Pi} \qquad (2')$$

Assume that in the base period t = 1, prices are fixed in both sectors, so that neither farmers receive the competitive price, nor corporations receive their whole mark-up; assume also that prices, in the base period, equal unity for both of the agricultural and industrial products. In the initial period, if industrial prices are below the normal level by a factor $\frac{1}{k}$, the price be :

$$1 = \frac{W(1+M)}{\Pi} \cdot \frac{1}{k} \qquad (2'')$$

where W is the money wage rate in the initial period t = 1.

Dividing (2') by (2''), we get

$$P_{It} = (\frac{W_t}{W}) \; k \qquad (2)$$

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(2) Part II : Costs and Prices.

(3) Raw materials costs should also be included; but for the economy as a whole, local raw materials cancel out, so that raw materials costs are reduced to imported materials costs which we shall disregard.

k appears to be a coefficient which denotes the strength of the price reaction to wage changes[4], and which shows the extent to which the producer may raise his price in response to higher costs.

3) Money wages are determined so as to keep their real value constant, and thus are related to a fixed weight price index:

$$I_t = W_1 P_{It} + W_2 P_{At} + W_3 \qquad (W_1 + W_2 + W_3 = 1)$$

Assuming that money wages respond to prices after a one-period lag, the money wage rate in any period (t), after the initial period will be:

$$W_t = WI_{t-1} = W\,(w_1 P_{I,\,t-1} + w_2 P_{A,\,t-1} + w_3) \qquad (3)$$

The Model:

Inserting (1) and (2) into (3), we get:

$$W_t = W\left(w_1 \frac{W_{t-1}}{W} k + w_2 \frac{a(W_{t-1} E + f)}{O} + w_3\right)$$

or

$$W_t = \left(w_1 k + \frac{w_2 aWE}{O_A}\right) W_{t-1} + W\left(\frac{w_2 a f}{O_A} + w_3\right) \qquad (4)$$

$$W_t = \overline{W} + w_t$$

where $\overline{W}$ is the equilibrium solution of (4) and w_t the deviation from this equilibrium.

Putting $\overline{W} = W_t = W_{t-1} =$ in (4), we get

$$\overline{W} = \frac{\left(\frac{w_2 af}{O_A} + w_3\right)}{1 - w_1 k - \frac{w_2 a W E}{O_A}} \qquad (5)$$

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(4) k is equivalent to k_2 which - as has been pointed out earlier - depends on the degree of monopoly. See p. 14 (Cost-determined Prices).

and the deviation from $\bar{W}$ is :

$$W_t = A \left(w_1 k + \frac{w_2 \, a \, W \, E}{O_A} \right)^t = A \, B^t$$

thus:

$$W_t = \bar{W} + A \, B^t$$

where $\bar{W}$ and $A \, B^t$ are given by (5) and (6) respectively.

The value of A could be computed by putting t = o in the preceding equation, so that:

$$W_o = \bar{W} + A$$

or

$$A = W_o - \bar{W} = W_o$$

i.e. A is the deviation from equilibrium in the period t = o.

From (4), and remembering that $W_{-1} = W$, we have:

$$W_o = \left(w_1 k + \frac{w_2 \, a \, W \, E}{O_A} \right) W + W \left(\frac{w_2 \, a \, f}{O_A} + w_3 \right)$$

or

$$W_o = \left(w_1 k + w_2 \frac{a(W \, E + f)}{O} + w_3 \right) W = W I_{-1} \qquad (7)$$

from (5) and (7), we get :

$$A = W_o - \bar{W} = \frac{W\left(w_1 k + \frac{w_2 \, a \, W \, E}{O_A} \right) \left(1 - w_1 k - \frac{w_2 \, a \, (W \, E + f)}{O_A} - w_3 \right)}{1 - w_1 k - \frac{w_2 \, a \, W \, E}{O_A}}$$

Stability of Equilibrium:

If the equilibrium $\bar{W}$ is to be stable , $\left(w_1 k + \frac{w_2 \, a \, W \, E}{O_A} \right)$ in eqaution (6) should be smaller than unity, so that the deviation from equilibrium W_t will decrease in absolute terms and will tend to zero, as (t) increases, and W_t will thus converge towards $\bar{W}$. But, will W_t start out above or below $\bar{W}$?

We should note that the nominator of A is negative[5], and if the equilibrium is to be stable, $(w_1 k + \frac{w_2 \, a \, W \, E}{O_A})$ 1, so that the dono-minator of (A) will be active and A itself will be negative.

The conclusion is that w_t will be negative and describing in absolute terms (t) increases. Hence, the money wage rate W_t starts out below $\overline{W}$ and increases as it tends to $\overline{W}$, with $(w_1 k + \frac{w_2 \, a \, W^t E}{O_A})^t$ tending to zero.

It is clear that the value of the expression $(w_1 k + w_2 \frac{a \, W \, E}{O_A})$ depends on the weights given to both of the industrial and agricultural prices i.e., w_1 and w_2; it also depends on the degree of monopoly-as reflected by k - and on the proportion between the demand of industrial wage earners for agricultural products, in the initial period, (a W E), and the quantity of agricultural products applied (O_A). Thus, the value of $(w_1 k + w_2 \frac{a \, W \, E}{O_A})$ - and thereby the stability or instability of equilibrium depends on structural considerations (w_1, w_2, k), as it depends on the behaviour of wage earners as regards their consumption of agricultural products (a), and on distributional considerations (the relation between industrial wage earners' income and agricultural production - i.e. $\frac{W \, E}{O_A}$.

Since P_{It} and P_{AT} are linear functions of W_t, they will approach their equilibrium value in the same way as W_t.

Instability of Equilibrium:

If $(w_1 k + \frac{w_2 \, a \, W \, E}{O_A})$ 1, the system will be explosive, for w_t will increase with time, and if the basic equations (1), (2), (3) hold indefinitely, prices and wages will rise indefinitely. However, there are forces which arise to stop this process, or to impede its development.

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(5) Since k 1, $\frac{a(W \, E + f)}{O}$ 1 and $w_1 + w_2 + w_3 = 1$, then $w_1 k + \frac{w_2 a(W \, E + f)}{O_A} + w_3$ 1 and the second expression in the nominator of A will be negative, while both of W and $w_1 k + w_2 \frac{a \, W \, E}{O_A}$ are positive, thus the nominator of A is positive.

Let us consider the effect of this process on demand for industrial products. The industrial wage and nonwage earners' income is $(W_t E + f)$ and the farmers' income in $O_A P_{AT} = a(W_t E + f)$ as has been shown earlier. Total demand for industrial products will be:

$$B(W_t E + f) + x\, a(W_t E + f)$$

or

$$(B + a)W_t E + (B + a)f$$

The industrial price level being $P_{It} = W_t k/W$ - as given by (2) - real demand for industrial products will be:

$$\frac{(B + a)\, W_t E + (B + a)f}{P_{It}} + \frac{(B + a)W\, E}{k} + \frac{(B + a)f\, W}{kW_t}$$

i.e.;

$$\frac{(B + a)\, W\, E}{k} \qquad \frac{(B + a)fW}{k(AB^t + W)}$$

When the system is explosive, the second term will decrease gradually with t, as its denominator (more precisely B^t) increases with t. Thus the real demand for industrial products is continually decreasing . This decrease is due to the fact that as prices and wages rise, the share of profits in national income increases at the expense of the fixed income recipients, so that, the real demand of the latter is continually reduced. Although a fraction of profits is distributed, it is likely, however, that the decreased real demand of fixed income recipients will not be offset by the increased demand of profits earners; the reason is that distributed profits will rise less than in proportion to increasing profits and that the marginal propensity to consume of profit earners is less than that of fixed income recipients.

On the other hand, wage earners' demand oscillates because adjustments lag behind price increases. Wage earners' demand is at a maximum after the wage increase, but as the wage increase is assumed to be instantaneously transmitted to prices, age earners' demand decrease and reaches a minimum just before the next wage increase. When the price increase has been diffused throughout the economy.

Decreasing consumer demand leads thus either to unemployment or to accumulation of stocks, so that either trade unions stop claiming for higher wages, or businessmen fail to raise prices in response to cost increases.

Then, our conclusion is that the price - wage spiral may come to an end:

1) either when the system reaches the equilibrium wage level expresses by equation (5), and the corresponding equilibrium price level

(2) or, if the system is explosive, reduction in real consumers demand leads to unemployment and or to stock accumulation, so that:

a) trade unions refrain from claiming for higher wages.

b) and/ or businessmen fail to raise their prices in response to cost increases.

The conditions of operation of the price-wage spiral implicit in the model are that:(4)

1) It is essential to the working of the process that extra credit or liquid serves should be available both to finance each wage increase and to take finished goods of producers' hands at increased prices.

2) It is necessary that producers and sellers try to pass off cost increases to consumers by raising the prices and that the state of expectations is such that they do not cut down orders, but they accept to see their stocks increased.

3) Finally wage earners should not only attempt to preserve their real incomes by claiming for higher wages as the price index rises, but they should also succeed in raising money wage rates. This condition is implicitely associated with the condition of a high level of employment, because demand for higher wages might fail to raise wages in times of wide-spread unemployment.

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