

makes payment to these factors much in advance of the realisation of the values of output produced after sale of the product. What is left after paying the contractual rewards to the factors employed is the profits of entrepreneur. Thus profits are *non-contractual income* and therefore they may be positive or negative, whereas the contractual income of other factors such as wages, rent and interest are always positive and never negative. It should be further noted that *pure profits* of the entrepreneur are found by subtracting from the gross residual income the *imputed values of rent and interest* on self-owned land and capital employed by the entrepreneur in his own business and also the *imputed wages* for his work of routine management.

CLARK'S DYNAMIC THEORY OF PROFITS

A popular conception of profits is that they arise in a dynamic economy, that is, in an economy where changes are taking place. In a static economy where nothing changes there can be no profits. It was J.B. Clark who first propounded that profits are a dynamic surplus. He argued that in a stationary state where no changes in conditions of demand and supply are occurring, the prices paid to the factors on the basis of their marginal productivity would exhaust the total value product and no profits would accrue to the entrepreneur. Profits result when selling prices of the goods exceed their cost of production. Now, in a competitive long-run equilibrium, price equals average cost of production (including normal profits which are in fact wages for routine supervision and management) and therefore no pure profits are made. Now, if no changes either in the conditions of demand or in the conditions of supply occur, competitive equilibrium will persist and therefore no pure profits will be earned by the entrepreneur.

On the contrary, if due to the changes in either demand or supply, price exceeds cost of production, profits will emerge. If due to these changes, price falls below the cost of production, negative profits, that is, losses will accrue to the entrepreneur. It is evident that changes prevent the long-equilibrium to be achieved and thereby give rise to profits. In other words, profits arise due to *disequilibrium* caused by the changes in demand and supply conditions. Prof. Stigler rightly says, "Firms in a competitive industry may receive profits....because of a state of disequilibrium....these profits can arise even if all entrepreneurs are identical, for disequilibrium can characterise a whole industry. If prices are higher, or costs lower than were anticipated, entrepreneurs will receive a return in excess of the alternative product of their resources. If prices were lower or costs higher than were anticipated, entrepreneurs will receive less than the alternative product of their resources *i.e.*, negative profits. Positive profits may persist for a long time if firms outside the industry are slow to enter the industry and negative profits can persist as long as specialised equipment yields more when used in the industry than when used elsewhere, say as scrap."²

It should be noted that these disequilibrium profits arise from *unanticipated* changes in demand or cost conditions. If the changes could have been foreseen in advance, then suitable adjustments could have been made according to the anticipated changes so that forces of competition would have driven profits to zero.

Now, the question is what changes occur in the economy and give rise to profits. Clark mentioned five changes that occur in a dynamic economy and which give rise to profits. These five changes are:

- (1) changes in the quantity and quality of human wants,
- (2) changes in methods or techniques of production,
- (3) changes in the amount of capital,
- (4) changes in the forms of business organisation, and
- (5) the growth of population.

The above changes are constantly taking place and bring about the divergence between price and cost and thereby give rise to profits, positive or negative. If the demand for a com-

2. G.J. Stigler. *The Theory of Price* (revised edition, 1952), p. 181.

modity increases due to the increase in population or increase in the incomes of the people or due to the increase in consumer's preference for the commodity, the price of the commodity will rise, and if cost remains the same, profits would accrue to the entrepreneurs producing the commodity. On the other hand, cost of production may go down as a result of the adoption of a new technique of production, or as a result of cheapening of the raw material, and if price remains constant or does not fall to the same extent, the profits would emerge.

Innovations and external changes. Apart from the five changes mentioned by Clark, there are other changes also which occur in the economy. All the changes which take place and as a result of which profits arise in a dynamic economy may be classified into two types: (1) *innovations* and (2) *external changes*. Innovations represent changes which are introduced by individual entrepreneurs themselves. The entrepreneur earns large profits from introducing innovations such as a new product, a new and cheaper method of production, a new method of marketing a product, a new way of advertisement. The innovational changes may either reduce cost or increase the demand for the product and thereby bring profits into existence. Those entrepreneurs who introduce successful innovations earn large profits. But as the innovation gets known to other entrepreneurs and they adopt similar other innovations, profits which arise because of a particular innovation tend to disappear. But new innovations are being continuously introduced by the entrepreneurs and profits continue to arise out of them.

External changes refer to those changes which are external to the firms or industries in an economy. These changes affect all firms in an industry or sometimes all industries in the economy. Examples of external changes are breaking out of wars, occurrence of sometimes periods of inflation and rising prices and sometimes business depression and falling prices, changes in the monetary and fiscal policies of government affecting favourably or unfavourably, changes in the technology of production, changes in tastes and preferences of the consumers, changes in income and spending habits of the people, changes in the availability of substitute products, alteration in the legislative and legal environment affecting the industries, and changes in preference between income and leisure. All these changes affect either the cost or demand of the products and give rise to profits, positive or negative as the case may be. For instance, during wars when prices of goods mount up, and costs lag behind, the entrepreneurs make lot of profits. Similarly, when inflation occurs due to the increased demand for goods caused by the rising incomes, increasing population and expansion in the money supply, huge profits accrue to the firms. On the contrary, when period of depression comes due to the fall in effective aggregate demand, firms suffer huge losses and some may even go into liquidation. During periods of depression all prices, rents, wages, and interest tend to fall but because of the non-contractual nature, profits fall sharply and even become negative.

Here the views of Prof. F.H. Knight about dynamic changes giving rise to profits are worth mentioning. According to him, "Dynamic changes give rise to a peculiar form of income only in so far as the changes and their consequences are unpredictable in character...It cannot, then, be the change which is the cause of profits, since if the law of change is known, as in fact is largely the case, no profits can arise. The connection between change and profits is uncertain and always indirect. Change may cause a situation out of which profit will be made if it brings about ignorance of the future...It is not dynamic change, nor any change as such which causes profits, but divergence of actual conditions from those which have been expected and on the basis of which business arrangements have been made. For a satisfactory explanation of profit we seem to be thrown back from the dynamic theory to the *Uncertainty of the Future*."³

As far as unpredictable, unforeseen changes and uncertainty about the future giving rise to profits are concerned, there can be no disagreement with Prof. Knight. But with his assertion that dynamic changes as such are not the cause of profits, one can differ. Against Knight's view it may be pointed out if there is no change there will be no uncertainty about the future and

3. F.H. Knight, *Risk, Uncertainty and Profits*, pp. 37-38.

therefore no profits. Thus the factor of change is fundamental in bringing profits into existence. Professors Stonier and Hague rightly maintain, "in an economy where nothing changes, there can be no profits. There is no uncertainty about the future so there are no risks and no profits."⁴

SCHUMPETER'S INNOVATIONS THEORY OF PROFITS

Successful innovations as important dynamic changes and as source of profit have been, in brief, explained above. But since innovations have been singled out as a very important factor responsible for the occurrence of profits to the entrepreneurs it requires to be dealt with separately. It has been held by Joseph Schumpeter that the main function of the entrepreneur is to introduce innovations in the economy and profits are reward for his performing this function. Now, what is innovation? Innovation, as used by Schumpeter, has a very wide connotation. Any new measure or policy adopted by an entrepreneur to reduce his cost of production or to increase the demand for his product is an innovation. Thus innovations can be divided into two categories.

First type of innovations are those which reduce cost of production, or in other words, which change the production functions. In this first type of innovations are included the introduction of a new machinery, new and cheaper technique or process of production, exploitation of a new source of raw material, a new and better method of organising the firm, etc. *Second type of innovations are those which increase the demand for the product*, or in other words, which change the demand or utility function. In this category are included the introduction of a new product, a new variety or design of the product, a new and superior method of advertisement, discovery of new markets etc. If an innovation proves successful, that is, if it achieves its aim of either reducing the cost of production or increasing the demand for a product, it will give rise to profits. *Profits emerge because due to successful innovations either cost falls below the prevailing price of the product or the entrepreneur is able to sell more and at a better price than before.* It should be noted that profits accrue not to him who conceives innovation, nor to him who finances it but to him who introduces it. Further, whenever any new innovation is contemplated to be introduced, it always calls for a new combination of factors or reallocation of resources.

It is here worth mentioning that *profits caused by a particular innovation are only temporary* and tend to be competed away as others imitate and also adopt it. An innovation ceases to be new or novel, when others also come to know of it and adopt it. When an entrepreneur introduces a new innovation, he is first in a monopoly position because the new innovation is confined to him only. He therefore makes large profits. When after some time others also adopt it in order to get a share, profits will disappear. If the law allows and the entrepreneur is able to get his new innovation e.g., new product patented, then he will continue to earn profits.

But in a competitive economy and without patent laws, the existing competitors or the new firms will soon adopt any successful innovation and as a result profits would be eliminated. But in a competitive and progressive economy the entrepreneurs always continue to produce new innovations and thus profits continue emerging out of them. Thus Prof. Stigler writes, "Unless one can construct a permanent monopoly, such profits as are realised by successful innovations are essentially transitional and will be eliminated by the attempts of other firms to share them. But these profits may exist for a considerable time because of the ignorance of other firms of their existence or because of the time required for the entry of new firms. More important, the successful innovator can continuously seek new disequilibrium profits since the horizon of conceivable innovations is unlimited."⁵

We have seen above that innovations are important source of profits. Obtaining profits is a necessary incentive for the entrepreneurs to conceive and introduce innovations which help the economic development of a country. Since innovations, if successful, yield profits and profits are also the motive to introduce innovations, profits are both the cause and effect of innovations.

4. Stonier and Hague, *A Textbook of Economic Theory*, 2nd edition, p. 327.

5. G.J. Stigler, *op. cit.*, p. 182.

KNIGHT'S UNCERTAINTY THEORY OF PROFITS

An important theory associates profit with risk and uncertainty. According to F.H. Knight, profit is a reward for uncertainty bearing. Even before Knight, F.B. Hawley and A.C. Pigou had pointed out that entrepreneurs earn profits because they have to bear the risks of production. But Knight has greatly developed the theory of profits based on uncertainty. He has distinguished between risk and uncertainty on the one hand and predictable and unpredictable changes on the other. According to him, dynamic changes give rise to profits in so far as changes and their consequences are of unpredictable character. Only those changes whose occurrence cannot be known before hand give rise to profits.

Profits, Unpredictable Changes and Uncertainty

As we have noted above, if there were no changes or if the changes were foreseen and predictable, there would have been no uncertainty about the future and therefore no profits. Profits arise because of the uncertainty of future. If the future conditions could be completely foreknown in the present, then competition would certainly adjust things to the ideal state where all prices would equal costs and profits would not emerge. Thus it is our ignorance about the future and uncertainty of it that give rise to profits. In other words, it is the divergence of actual conditions from those which have been expected and on the basis of which business arrangements have been made that give rise to uncertainty and profits. Prof. A.K Dass Gupta rightly maintains, "uncertainty is thus a permanent feature of economic system. It is one of the limitations of human ingenuity that it cannot unearth the contents of the future. Trained instincts of businessmen coupled with statistical information may go a long way, but in so far as the course of nature (both physical and human) is any thing but rhythmical the future would always remain more or less of mystery."⁶ He further writes, "so long as entrepreneurs start operations with imperfect knowledge about the state of the market and so long as the anticipated marginal product of the hired factors deviated from their actual product, so long a surplus would persist."⁷

We thus see that entrepreneurs have to undertake the work of production under conditions of uncertainty. In advance they have to make estimates of the future conditions regarding demand for the product and other factors which affect price and costs. In view of their estimates and anticipations, they make contract with the suppliers of factors of production in advance at fixed rates of remuneration. They realise the value of the output produced by the hired factors after it has been produced and sold in the market. But a good deal of time is spent in the process of producing and selling the product. It follows, therefore, that a good time gap elapses between the contracts made by the entrepreneur with the factors of production at fixed rates and the realisation of sale proceeds from the output made by them. As mentioned before, these contracts are based upon anticipations about the future conditions. But between the times of contracts and sale of the output many changes may take place which may upset anticipations for good or for worse and thereby give rise to the profits, positive and negative. Now if the conditions prevailing at the time of sale of output could be known or predicted when the entrepreneurs enter into contractual relationships with the factors of production about their rates of remuneration, there would have been no uncertainty and, therefore, no profits. Thus *uncertainty, that is, ignorance about the future conditions of demand and supply, is the cause of profits*. It should be noted that positive profits accrue to those entrepreneurs who make correct estimate of the future or whose anticipations prove to be correct. Those whose anticipations prove to be incorrect will have to suffer losses.

What Causes Uncertainty?

Now, the question is what changes cause uncertainty. As has been explained earlier, there are *two types of changes* which take place and are responsible for conditions of uncertainty.

6. A.K. Dass Gupta, *The Conception of Surplus in Theoretical Economics*, p. 188.

7. *Ibid.*, p. 188.

First type of changes refer to innovations (for example, introduction of a new product or a new cheaper method of production etc.) which are introduced by the entrepreneurs themselves. These innovations not only create uncertainty for the rivals or competitors who are affected by them but they also involve uncertainty for the entrepreneur who introduces them because one cannot be certain whether a particular innovation will be definitely successful. The second type of changes which cause uncertainty are those which are external to the firms and industries. These changes are: (1) changes in tastes and fashions of the people, (2) changes in Government policies and laws especially taxation, wage and labour policies and laws, liberalisation of imports, etc. (3) movements of prices as a result of inflation and depression, (4) changes in income of the people, (5) changes in production technology, (6) competition from the new firms that might enter the industry. All these changes cause uncertainty and bring profits, positive or negative, into existence.

Insurable and Non-insurable Risks

We have seen above that entrepreneurs work under conditions of uncertainty and that they bear uncertainty and earn profits as a reward for that. Here a distinction drawn by F.H. Knight between *insurable* and *non-insurable risk* is worth mentioning. Because of the changes that are continuously occurring in the economy entrepreneur has to face many risks. But all risks do not cause uncertainty and give rise to profits. It is only *non-insurable risks* that involve uncertainty and the entrepreneur earns profits for bearing these non-insurable risks. Now, the question arises as to what kind of risks are insurable and what non-insurable. The entrepreneur faces risks like fire, theft, accident etc. which may cause him huge losses. But these risks of fire, theft, accident etc. can be insured against on payment of a fixed premium. Insurance premium is included in the cost of production. Thus no uncertainty arises due to insurable risks as far as individual entrepreneurs are concerned and therefore they cannot give rise to profits.

Now, only those risks can be insured the probability of whose occurrence can be calculated. Thus an insurance company knows by its calculation on the basis of past statistics that how much percentage of the factories will catch fire in a year. On the basis of this information, it fixes the rate of premium and is able to insure the factories against the risk. But there are risks which cannot be insured and therefore they have to be borne by the entrepreneurs. These non-insurable risks relate to the outcomes of the price-output decisions to be taken by the entrepreneurs. Whether it will pay him to increase output, reduce output and what will be the outcome in terms of profits or losses as a result of his particular output decision. Again, whether it will pay him to lower price or to raise it and when he takes a particular price decision whether he would make profits or losses. Similarly, he has to face risks as a result of his decisions regarding mode of advertisement and outlay to be made on it, product variation etc. For taking all these decisions he has to guess about demand and cost conditions and always there is risk of incurring losses as a result of decisions. No insurance company can insure the entrepreneurs against commercial losses which may emerge out of decisions regarding price, output, product variation and also against the losses which may fall upon the entrepreneurs due to the structural, cyclical and other exogenous changes which take place in the economy. It is, therefore, clear that *it is non-insurable risks that involves uncertainty and give rise to profits*. To quote Knight, "It is 'uncertainty' distinguished from insurable risk that effectively gives rise to the entrepreneurial form of organisation and to the much condemned 'profit' as an income form."⁸

MONOPOLY THEORY OF PROFITS

We have explained above that profits can originate from dynamic changes, innovation, and from making a correct estimate of future under conditions of uncertainty. But monopoly is another

8. F.H. Knight, Social Economic Policy, *Canadian Journal of Economic and Political Science*, (26 Feb., 1960) p. 31.

source of profits. Monopolistic position gives rise to profits both in static and dynamic conditions. Monopolist commands a control over the price of a product and therefore manages to make profits by virtue of his monopoly power. He raises price by restricting his level of output and thereby makes profits. Monopoly is a matter of degree only. Monopoly power is exercised not only by a pure monopolist which produces a product which has no close substitutes but also to somewhat lesser extent by the producers in monopolistic competition and oligopoly. We have seen in our chapters on product pricing that monopoly element is present in various categories of imperfect competition, namely, pure monopoly, monopolistic competition and oligopoly. It is due to this monopoly element in these categories of imperfect competition that demand curve slopes downwards in them. Thus monopoly power is associated with downward-sloping demand curve.

We have seen in our chapters on pricing and output under pure monopoly, monopolistic competition and oligopoly that due to monopoly power and resultant downward-sloping demand curve, firm's equilibrium, that is, equality between marginal revenue and marginal cost, is reached at a price which is higher than marginal cost of production. Further, price so determined is often higher than average cost of production which yields positive profits to the firm enjoying monopoly power to a greater or smaller degree. Owing to the strong restrictions on the entry of new firms, the firms working under pure monopoly and oligopoly continue to make supernormal profits even in the long run. Even under monopolistic competition with a large number of firms, due to product differentiation entry into the industry is not fully free, as was realised by Chamberlin himself. Product differentiation gives a firm a certain degree of monopoly power in setting his own price and no new firms can produce exactly the same product as that of any existing firm under monopolistic competition. With only restricted entry of firms under monopolistic competition, demand curve does not fall in the long run to the tangency position with the average cost curve so that the entrepreneurs working under monopolistic competition also continue to enjoy positive profits by virtue of their monopoly power. Commenting on monopoly as a source of profits. Professor Pen writes, "The real monopolist—the one and only supplier in a branch of industry—is rare, but in many cases a breath of monopoly pervades competition. One brand is not the same as another—economists call that product differentiation, and as a result an element of monopoly power creeps into the market that yields an extra profit for the supplier. He can fix his own price, which is impossible under perfect competition, and perhaps he extends his volume of production a little less than he would otherwise have done. In some cases this limitation of production is an obvious danger; contrived scarcity leads to profit for a small group, and to harm for the public."⁹

As we have discussed in a previous chapter, A.P. Lerner has provided a quantitative measure of the degree of monopoly present in any market situation. Lerner's quantitative measure of the degree of monopoly is based on the fact that whenever monopoly power is present and as a result demand curve is downward sloping, price set by the producer will deviate from marginal cost. Further, this measure of degree of monopoly power is based upon ideal market situation of perfect competition, in which monopoly element is completely absent and, in equilibrium, price is equal to marginal cost. According to Lerner, if p stands for price and m for marginal cost, the difference $p - m$ measures the deviation from perfect competition ideal, or in other words, the extent of monopoly power present in any real market situation. The difference, $p - m$, expressed as a fraction of price p , that is, $\frac{p - m}{p}$ is Lerner's measure of degree of monopoly. Now, it has been assumed by many exponents of monopoly theory of profits, especially M. Kalecki that the greater the degree of monopoly $\frac{p - m}{p}$, the greater the size of profits earned by the entrepreneur or firm. According to M. Kalecki, the degree of monopoly as given by Lerner's measure,

9. Jan Pen. *Income Distribution*, Penguin Books, p. 134.

$\frac{p - m}{p}$ is the most important factor determining the volume of profits; indeed, according to him, it is the only determinant of the level of profits.

It should be noted that the degree of monopoly power of a firm, or in other words, its power to set price above marginal cost of production depends upon the *elasticity of demand curve* facing him. Lerner's measure of degree of monopoly $\frac{p - m}{p}$ is equal to the reciprocal of the price elasticity of demand (*i.e.*, $1/e$). That is, the smaller the elasticity of demand for a product, the greater the degree of monopoly power. But the price elasticity of demand for a firm's product depends on the extent to which its product is different from others; the greater the extent to which its product is differentiated, the less the elasticity of demand and consequently the greater the degree of monopoly.

The second factor on which monopoly power of a firm depends is *its share in the market or the total output of the industry*. The greater its share in the industrial output or market for the product, the greater the extent of monopoly power wielded by a producer. This is because the greater its share in the market or total output of the market, the greater will be his freedom and independence in setting the price. Now, with the monopoly power gained by the extent of distinctiveness of his product and his share in the total output or market, the producer succeeds in setting price above average cost of production and thereby earns supernormal profits for himself.

It is often pointed out that monopoly power possessed by a producer is no guarantee of positive profits. If demand for the product is inadequate and cost of production is high producers working under pure monopoly, monopolistic competition and oligopoly enjoying varying degrees of monopoly power can make losses. In fact, in chapters on price and output under monopoly and monopolistic competition we have shown that producers under pure monopoly and monopolistic competition respectively can make losses in the short run due to unfavourable demand-supply conditions in spite of the monopoly power possessed by them. Thus, according to Professor Bober, "he skates on thin ice who identifies profits with monopoly and monopoly with profits."¹⁰

No doubt there is a good deal of possibility of losses being incurred in the short run by firms under monopolistic competition (when there is a large number of firms), but the possibility of losses in case of pure monopoly and oligopoly should not be exaggerated. Pure monopoly and oligopoly generally go together with big business which is organised on corporate basis. Big corporate firms working under pure monopoly and oligopoly and enjoying a lot of monopoly power do not take the consumer's demand as given but seek to *manipulate* and *create* demand and have enough resources to do so. Through product variation, advertisements and other sales promotion devices, big corporate firms having a good deal of monopoly power, *succeed in shifting the demand curve for their product*. Thus through the devices of advertisement, product variation and other sales promotion activities the big firms with greater monopoly power see to it that the demand curve for their product remains above cost of production yielding them a good deal of profits.

Further, firms with varying degrees of monopoly power not only exploit the consumers by setting a higher price and thereby earn profits but often they are also *monopsonist or oligopsonist in various factor markets*. With their monopsonistic power they also exploit the factors, especially labour and pay them less than their marginal revenue products. By exploiting the hired factors, they increase their share of profits.

Monopoly power of a firm manifests itself its ability to raise price of the product. But if a firm sets a higher price and thereby earns excessive profits, it will attract other firms into the industry and will reduce the monopoly power of the existing firms and eliminate excessive

10. M.M. Bober, *Intermediate Price and Income Theory*.

profits. Therefore, authors such as F. Machlup¹¹, F.H. Hahn¹² and Jean Marchal¹³ have emphasized that in order that the monopoly power be enduring and lasting and therefore firms continue to enjoy monopoly profits, there must be *strong barriers to the entry of firms*. Thus monopoly power and the profits accruing because of that ultimately depends on restrictions on the entry of firms. Control over the supply of an essential raw material, legal restrictions in certain cases such as patent rights, the existence of goodwill enjoyed by the existing firms, reputation of brands and trade names of the products of existing firms, economies of large-scale production and difficulty of organising production on a large scale are some of the important factors that put restrictions on the entry of firms and make possible the earning of the monopoly profits by the existing firms enjoying a degree of monopoly power.

Critical Evaluation of Monopoly Theory of Profits

It is certainly true that monopoly is good source of profits. Theories of imperfect competition and monopolistic competition by Joan Robinson and Chamberlin involving downward-sloping demand curve with its implication of price-setting power made a significant contribution not only to price theory as such but also to profit theory. But Kalecki's assertion that monopoly is the *only source or determinant* of profits is not right. Dynamic changes, innovations by the entrepreneurs themselves, and uncertainty are also the important causes of profits and in any adequate explanation of profits these things can hardly be neglected. Further, there is no any contradiction between uncertainty and monopoly theories of profits as has been wrongly considered so by Kalecki. In fact, as has been asserted by F.H. Hahn¹⁴, market imperfections in monopolistic competition and oligopoly increase uncertainty and further that this uncertainty makes the entry of new firms more difficult. Thus the *theory which attributes profits to monopoly power only supplements the uncertainty theory of profits rather than replace it*.

Kalecki's concept of the degree of monopoly $\frac{(p - m)}{p}$ and profits resting on it has been criticised. For instance, measure of the degree of monopoly $\frac{(p - m)}{p}$ is zero under perfect competition, since price (p) is equal to marginal cost (m) under it. It implies that under perfect competition with zero degree of monopoly the share of profits (*i.e.*, of capital) will be zero and the share of labour will be 100% which is obviously unrealistic and ridiculous. To quote Pen, "unfortunately upon closer examination the Kaleckian theory proves disappointing. We have a presentiment of this when we examine what happens under perfect competition, *i.e.*, a neo-classical world. Then the formula produces odd results : the degree of the monopoly is zero, and the share of labour is 100%. But nevertheless capital remains scarce and productive—it is important that it would receive no remuneration. Now, of course, it may be argued that Kalecki's theory was not designed for such a world but all the same it ought to be able to embrace this borderline case as well."

It should be noted that much of the criticisms against monopoly theory of profits is against Kalecki's measures of degree of monopoly and its association with profits. That monopoly is an important cause and source of profits cannot be denied. Kalecki particularly used *macro* degree of monopoly and explained with it the distributive shares of profits and wages in national income.

11. Fritz Machlup, Competition, Pilopoly and Profit, *Economica*, Vol. XI, 1942.

12. F.H. Hahn, A Note on Profit and Uncertainty, *Economica*, Vol. XIV, 1947.

13. Jean Marchal, The Construction of a New Theory of Profits, *American Economic Review*, Vol.XLI, 1954.

14. *Op. cit.*, p. 291.

QUESTIONS FOR REVIEW

1. Profits arise due to innovations and entrepreneurs are rewarded for introducing innovations. Discuss
2. Profit is the reward for making innovations. Do you consider this as an adequate explanation of profits ?
3. Profit is defined as a functional reward to the entrepreneur.
4. Explain why profits are zero in a competitive economy.
5. "In a purely competitive static economy economic profits are eliminated" Discuss.

OR

"There can be no profits in the stationary state" Discuss

6. Profits are a dynamic surplus. Discuss.
7. Profits are a reward for uncertainty bearing.
8. "Profits may come to exist as a result of monopolopoly or monopsony, as a reward for innovation, as a reward for making a correct estimate of uncertain factors either particular to the industry or general to the economy as a whole" Discuss.
9. What is the role of profit in a free market economy ? Is there a conflict between profit earning and social welfare ?
10. Distinguish between risk and uncertainty. What causes uncertainty in an economy ? Critically examine the view that entrepreneurs is rewarded in the form of profits for bearing uncertainty.
11. "Monopoly is the important source of profits". Discuss.
12. "The greater the degree of monopoly power, the greater the profits" Explain how the degree of monopoly power measured and what factors determine monopoly profits.
13. "Monopoly power and the profits that accrue due to it ultimately depend on the barriers to the entry of new firms in an industry" Discuss.

National Income : Concepts and Measurement

In the previous some chapters we have explained how wages of labour, rent on land, interest on capital and profits of enterprise are determined. The sum of wages, interest, rent and profits is called national income. It is also called *national dividend*. In this chapter we shall explain the various concepts of national income, how is it measured and how far increases in national income indicate increase in welfare of the community. We will also explain the flow of money income and under what conditions it continues unabated.

National Income : Meaning

The labour and capital of a country acting on its natural resources produce annually a certain amount of goods and services. This is called national income of a country. National income of a country can be defined as *the total market value of all final goods and services produced in the economy in a year*. Two things must be noted in regard to this meaning of national income. First, it measures the market value of annual output. In other words, national income is a *monetary measure*. This is because there is no other way of adding up the different sorts of goods and services except with their money prices. But in order to know accurately the changes in physical output, the figure for national income is adjusted for price changes. Secondly, for calculating national income accurately all goods and services produced in any given year *must be counted only once*, and not more than once. Most of the goods go through a series of production stages before reaching a market. As a result, parts or components of many goods are bought and sold many times. Hence, in order to avoid counting several times the parts of goods that are sold and resold, national income only includes the market value of all *final goods* and services and ignores the transactions involving *intermediate goods*.

The above way of explaining national income is only one way of interpreting it. In fact, the concept of national income has three interpretations. It represents a total value of production (as explained above), it represents a receipts total, and it represents an expenditure total. It is an obvious fact that every expenditure is at the same time a receipt. In other words, amount spent is equal to amount received. But as goods and services are valued at their market prices, we have three-fold identity, namely, that the value received equals the value paid equals the value of goods and services produced and sold.

To explain the above idea let us take an economy where there are only two agents: households and firms. Firms are required to produce goods. To produce them, they require services of factors of production. Factors of production are paid rewards for their contribution to the production of goods. Thus incomes of these factors arise in the course of production. The sales value of net production must equal the sum total of payments made by the firms to the factors of production in the form of wages, rents, interest and profits. These incomes in turn become the sources of expenditure. Thus income flows from the firms to the households in exchange for productive services. This income again returns to the firms when expenditure is made by the households on goods and services produced by them.

From above it follows that :

National Income = National Product = National Expenditure.

Thus, there are three measures of national income of a country:

- (a) the sum of values of all final goods and services produced;
- (b) the sum of all incomes, in cash and kind, accruing to factors of production in a year; and
- (c) the sum of consumers' expenditure, net investment expenditure and government expenditure on goods and services.

Sum of all incomes, sum of values of all final production, and sum of all expenditures will be the same, but the significance of each arises from the fact that they reflect the three basic activities of the nation's economy, viz., production, distribution and expenditure.

CIRCULAR FLOW OF INCOME

The modern economy is a monetary economy. In the modern economy, money is used in the process of exchange. Money has facilitated the process of exchange and has removed the difficulties of the barter system. Thus money acts as a medium of exchange. The households supply the economic resources or factors to the productive firms and receive in return the payments in terms of money. The households use the money income so obtained to buy goods and services they want. The productive firms sell goods and services for money and use the money so received to pay the households for their supply of economic resources. Thus labour gets wages, capital gets interest, land gets rent and enterprise obtains profit—all in terms of money.

It is thus clear that in the monetary economy, there will be flows of money corresponding to the flows of economic resources and the flows of goods and services. But each money flow is in opposite direction to the real flow. The flows of money corresponding to real flows of resource, goods and services have been shown in Fig. 33.1. In the upper loop of this figure,

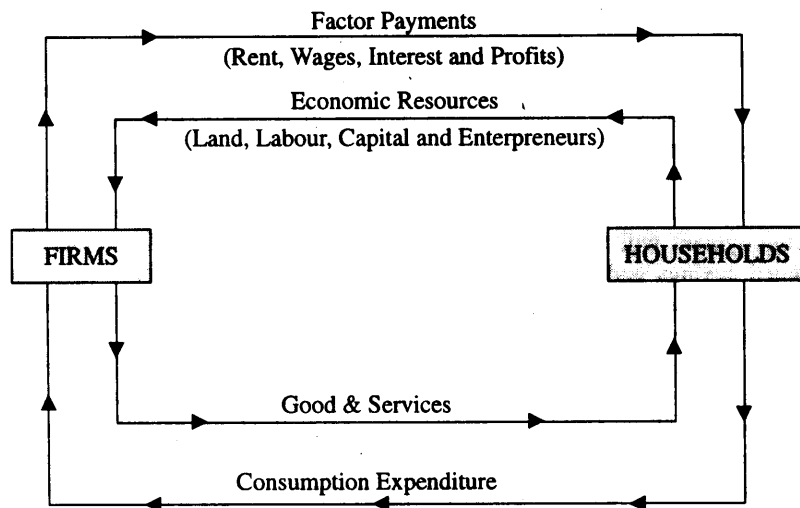


Fig. 33.1. Circular Flow of Income

the resources such as land, labour, capital and entrepreneurial ability flow from households to productive firms as indicated by the arrow mark. In opposite direction to this, money flows from firms to the households as factor payments such as wages, rent, interest and profits. In the lower half of the figure, money flows from households to firms as consumption expenditure made by the households on the goods and services produced by the firms, while the flow of goods and services is in opposite direction from productive firms to households. Thus we see that money flows from productive firms to households as factor payments and then it flows

from households to firms. Thus there is, in fact, a *circular flow of money or income*. This flow of money will continue indefinitely week by week and year by year. This is how the economy functions. It may, however, be pointed out that this flow of money income will not always remain the same in volume. In other words, the flow of money income will not always continue at a steady level. In years of depression, the circular flow of money income will contract, *i.e.*, will become lesser in volume, and in years of prosperity it will expand, *i.e.*, will also become greater in volume. This is so because the flow of money is a measure of national income and will, therefore, change with changes in the national income. In years of depression, when national income is low, the volume of the flow of money will be small and in years of prosperity, when the level of national income is quite high the flow of money will therefore be large.

The above picture of the flow of money income is very much simplified. In order to make our analysis simple and to explain the central issue involved, we have taken many assumptions. In the first place, we have assumed that neither the households save from their incomes, nor the firms save from their profits. We have further assumed that the government does not play any part in the national economy. In other words, the government does not receive any money from the people by way of taxes, nor does the government spend any money on the goods and services of the firms or on the resources and services of the households. Thirdly, we have also assumed that the economy neither imports goods and services nor exports anything. In other words, in our above analysis we have not taken into account the role of foreign trade. In fact, we have explained above the flow of money income that occurs in the functioning of a closed economy with no savings and no role of government.

Now the question arises what is the condition for the flow of money income to continue at a steady level so that it makes possible the production and subsequent flow of a given volume at goods and services at constant prices. To explain this we have to introduce saving and investment in the analysis of circular flow of income. Saving a part of income means it is *not spent* on consumer goods and services. In other words, *saving is withdrawal of some money from the income flow*. On the other hand, investment means some money is spent on buying new capital goods to expand production capacity. In other words, *investment is injection of some money in the circular flow of income*. For the circular flow of income to continue unabated the withdrawal of money from the income stream by way of saving must equal injection of money by way of investment expenditure. Therefore, planned savings must be equal to planned investment if the economy is to run a smooth course. Now, what will happen if planned investment expenditure falls short of the planned savings? As a result of fall in planned investment, income, output and employment will fall and therefore the flow of money will contract. If the equality between planned savings and planned investment is disturbed by increase in savings, then the immediate effect will be that the stocks of goods lying in the shelves of the shops will increase (as some of the goods will not be sold due to the fall in consumption, *i.e.*, increase in savings). Owing to the deficiency of demand for goods and the accumulation of stocks in the shops, prices will tend to fall. Further, as a result of accumulation of stocks, retailers will place small orders with the wholesalers. Consequently, smaller amount of goods will be produced. Fewer capital goods like machinery will be needed, with the result that fixed investment will tend to fall which will in turn bring down the level of income, output and employment. Prices will also fall. Thus the ultimate effect of either the fall in planned investment or the increase in planned savings is the same, *viz.*, the fall in income, output, employment and prices with the result that the flow of money will contract.

On the other hand, if the equality between planned saving and planned investment is disturbed by the increase in investment demand, the result will be increase in income, output and employment. Consequently, the flow of money income will expand.

It is thus clear from the above analysis that the *flow of money income will continue at a steady level only when the condition of equality between planned savings and investment is*

satisfied. Because in a free enterprise capitalist economy, investment is made by enterprises and savings are mostly done by households and, for different reasons, there is no guarantee that planned investment will be equal to planned savings and thus fluctuations in income, output and employment are inevitable. As a result, circular flow of income does not continue at a steady level in a free market economy unless certain corrective and preventive steps are taken by the government to maintain stability in the economy.

NATIONAL INCOME AND NATIONAL PRODUCT

The sum of all incomes of the people of a country is called national income. This national income is greatly related to the social product. In fact they are the names of one and the same thing. The incomes which the different people of the society get are obtained by them for their contribution of labour, land, capital and entrepreneurial services to the national production. Hence the income which the labourers get are wages for the productive services which labourers lend to the various firms which undertake the work of production. Similarly, the owners of land get income as rent because of their contribution of land to the productive firms; the capitalists get interest for lending their money capital to the entrepreneurs for undertaking any work of production or business. The entrepreneurs get profits for starting and organising the work of production and bearing risk and uncertainty involved in it. It is thus clear that the different individuals of a country obtain their income either as wages of their labour, or as interest on their money capital, or as rent for their land, or as profits for their enterprise. The total income obtained as wages, rent, interest and profits is the national income of that country.

Various households obtain their income from the productive firms or businesses which utilise their labour, land, capital and other services for the production of goods and services. The incomes earned by the various households and individuals from the work of production are in fact costs of production of the goods produced. The total value of all goods produced by various productive firms or businesses in a year is known as national product. Therefore, the national product of a country can be estimated by multiplying the total output of goods and service with their market prices.

Hence the total national product in terms of rupees or value which is produced by various productive firms in a year, will be distributed among the various productive factors which have contributed to its production. Therefore, out of this social production (in value terms) wages will be paid to those households which have sold their labour to the productive firms. Out of this total value of the national product, land-owners would get rent for the contribution of the services of land and capitalists would get interest for lending money capital to the productive firms. After the payment of wages, rent, interest, what is left is the profits of the entrepreneurs who set up productive firms, organise their work and bear risk and uncertainty and because of these services they get profits. It is thus clear the national product (value of total output of a country) is distributed among wages, rents, interests and profits. As we have stated above, the sum of total wages, total interests, total rents and total profits is national income. Hence national product (value of the total output) will be equal to the national income. We, therefore, conclude that the value of National product is equal to wages plus interest plus rent plus profits, and the wages plus rent plus interest plus profits are equal to the national income. The national product thus equals national income.

The above conclusion can be expressed in the form of the following equation:

$$\text{National Income} = \left\{ \begin{array}{l} \text{Wages} \\ + \\ \text{Rent} \\ + \\ \text{Interest} \\ + \\ \text{Profits} \end{array} \right\} = \text{National Product}$$

From the above analysis it is evident that national income and national product are one and the same thing. Professor J.R. Hicks rightly writes, "*The value of the net social product of the community and the sum of the incomes of its members are exactly equal. The net social product and the social income are one and the same thing.*"¹

CONCEPTS OF NATIONAL INCOME

There are various concepts of national income which we study below one by one.

Gross National Product (GNP)

This is the basic national accounting measure of the total output or aggregate supply of goods and services. *Gross National Product is defined as the total market value of all final goods and services produced in a year.* Two things must be noted in regard to gross national product. (First, it measures the market value of annual output.) In other words GNP is a *monetary measure*. There is no other way of adding up the different sorts of goods and services produced in a year except in terms of their money prices. But in order to know accurately the changes in physical output, the figure for gross national product is adjusted for price changes.

(Secondly, for calculating gross national product accurately, all goods and services produced in any given year must be counted once, and not more than once. Most of the goods go through a series of production stages before reaching a market. As a result, parts or components of many goods are bought and sold many times. Hence to avoid counting several times the parts of goods that are sold and resold, gross national product includes the market value of only final goods and ignores transactions involving intermediate goods.)

What do we mean by *final goods*? Final goods are those goods which are purchased for final use and not for resale or further processing. Intermediate goods, on the other hand are those goods which are purchased for further processing or for resale. The sale of intermediate goods is excluded from gross national product. Why? Because the value of final goods includes the value of all intermediate goods used in their production. The inclusion of intermediate goods would involve double counting and will therefore give an exaggerated estimate of gross national product. An example will clarify this point. Suppose in our economy only two things are being produced, raw cotton worth Rs. 100 and cotton cloth worth Rs. 200. Now what will be the measure of gross national product? For finding it, if we add up the sales value of cloth and cotton, there is clearly an element of double counting in the sense that we have added the value of cotton *twice*—one as the sales value of cotton and secondly when we added to it the value of cloth. Actually, the value of cloth includes also the value of cotton which having been accounted for already should not be added second time.

(**Gross Domestic Product (GDP).** Another important concept of national income is gross domestic product (GDP). Gross domestic product is the money value of all final goods and resources produced by normal *residents as well as non-residents* in the *domestic territory of a country*. The difference between gross domestic product (GDP) and gross national product (GNP) at market prices arises due to the existence of '*net factor income from abroad*'. Gross domestic product does not include net factor income from abroad, whereas gross national product includes it. Therefore,

$$\begin{aligned} \text{Gross Domestic Product (at market prices) or } GDP_{MP} &= GNP_{MP} - \text{Net factor income from abroad} \\ \text{or} \quad GNP_{MP} &= GDP_{MP} + \text{Net Factor Income from Abroad} \end{aligned}$$

Now, what does net factor income from abroad stand for? The sum of factor incomes such as wages and salaries (*i.e.*, compensation of employees), rent, interest and profits generated within the domestic territory of a country in a year is called domestic factor income. It includes factor incomes generated both by residents and non-residents working in the domestic territory of a country. For example, non-residents (*i.e.*, foreigners) work in the domestic territory of India and earn wages

¹ J.R. Hicks, *The Social Framework*.

and salary. Thus, foreign individuals and companies from the USA, Great Britain and other countries have acquired property such as factories, offices, buildings, places and have also acquired financial assets such as bonds and shares of Indian companies. This generates incomes in the form of rent and interest to them. In addition to this, foreign residents—individuals and companies—have set up industrial plants and factories producing goods and services from which they earn profits.

On the other hand, Indians go abroad and work in the territories of other countries and earn wages and salaries. Likewise, some Indian individuals and corporate companies have acquired assets such as buildings, factories, commercial space and have also invested in bonds, bank deposits of foreign countries and thus receive rent and interest. Some Indian companies have set up factories abroad and earn profits.

Now, the *net factor income from abroad* is the difference between factor income received from abroad by normal residents of India for rendering factor services in other countries and the factor incomes paid to the foreign residents for factor services rendered by them in the domestic territory of India.

Net factor income earned from abroad have the following three components:

1. *Net* compensation of employees.
2. *Net* income from property *i.e.*, rent, interest and income from entrepreneurship (that is, profits and dividends).
3. *Net* retained earnings of the resident companies working in foreign countries.

(Note that '*Net*' in the above means the difference between the relevant income of normal residents earned from abroad and the same type of incomes paid to non-residents working in the domestic territory of a country.)

Net National Product (NNP) or National Income at Market Prices

The second important concept of national income is that of net national product (NNP). In the production of gross national product of a year, we consume or use up some fixed capital *i.e.*, equipment, machinery, etc. The capital goods, like machinery, wear out or fall in value as a result of its consumption or use in the production process. This consumption of fixed capital or fall in the value of fixed capital due to wear and tear is called *depreciation*. When charges for depreciation are deducted from the gross national product we get net national product. Clearly, it means the *market value of all final goods and services* after providing for depreciation. Therefore, it is also called '*national income at market prices*'. Therefore,

$$\left. \begin{array}{l} \text{Net National Product} \\ \text{or} \\ \text{National Income at} \\ \text{Market Prices} \end{array} \right\} = \text{Gross National Product} - \text{Depreciation}$$

National Income (NI) or National Income at Factor Cost (NNP_{FC})

National Income at factor cost which is also simply called *national income* means the sum of all incomes earned by resource suppliers for their contribution of land, labour, capital and entrepreneurial ability which go into the year's net production. In other words, national income (or national income at factor cost) shows how much it costs society in terms of economic resources to produce net output. It is really the national income at factor cost for which we use the term National Income. (The difference between national income (or national income at factor cost) and net national product (national income at market prices) arises from the fact that *indirect taxes* and *subsidies* cause market prices of output to be different from the factor incomes resulting from it.) Suppose for instance, a metre of mill cloth sold for Rs. 200 includes Rs. 25 on account of the excise and the sales tax. In this case while the market price of the cloth is Rs. 200 a metre, the factors engaged in its production and distribution would receive Rs. 175 a metre. The value of cloth at factor cost would thus be equal to its value at market price less the indirect taxes on it. On the other hand, a subsidy causes the market price to be less than

the factor cost. Suppose handloom cloth is subsidized at the rate of Rs. 10 per metre and it sells at Rs. 90 per metre. Then while the consumer pays Rs. 90 per metre, the factors engaged in the production and distribution of such cloth will receive Rs. 100 per metre (Rs. 90 + 10 = Rs. 100). The value of handloom cloth at factor cost would thus be equal to its market price plus the subsidies paid on it. It follows, therefore, that the national income (or national income at factor cost) is equal to net national product *minus* indirect taxes plus subsidies.

$$\left. \begin{array}{l} \text{National Income} \\ \text{or} \\ \text{National Income at} \\ \text{Factor Cost} \end{array} \right\} = \text{Net National Product (National Income at Market prices)} - \text{Indirect Taxes + Subsidies.}$$

Net of indirect taxes and subsidies is called *Net Indirect Taxes*. Therefore,
 National Income = Net National Product – Net Indirect Taxes

Personal Income (PI)

Personal Income is the sum of all incomes *actually received* by all individuals or households during a given year. National income, that is, total incomes earned and personal income, that is, total incomes received must be different because some incomes which are earned such as social security contributions, corporate income taxes and undistributed corporate profits are not actually received by households, and conversely, some incomes which are received like transfer payments are not currently earned (examples of transfer payments are old-age pensions, unemployment compensation, relief payments, interest payments on the public debt, etc.). Obviously, in moving from national income as an indicator of income earned to personal income as an indicator of income actually received, we must subtract from national income those three types of income which are earned but not received and add those incomes which are received but currently not earned. Therefore,

Personal Income = National Income – Social Security Contributions – Corporate Income Taxes – Undistributed Corporate Profits + Transfer Payments.

Disposable Income (DI)

Even whole of the incomes which are actually received by the people are not available to them for consumption. This is because governments levy some personal taxes such as income tax, personal property taxes. Therefore, after a part of personal income is paid to government in the form of *personal taxes* like income tax, personal property taxes, etc., what remains of personal income is called *disposable income*. Therefore,

Disposable Income = Personal Income – Personal Taxes.

Disposable Income can either be consumed or saved. Hence,

Disposable Income = Consumption + Saving.

MEASUREMENT OF NATIONAL INCOME

Since factor *incomes* arise from the production of goods and services, and since incomes are spent on goods and services produced, three alternative methods of measuring national income are possible.

Value Added Method. This is also called *output method* or *production method*. In this method the contribution of each enterprise to the generation of flow of goods and services is measured. Under this method, the economy is divided into different industrial sectors such as agriculture, fishing, mining, construction, manufacturing, trade and commerce, transport, communication and other services. Then, the net value added at factor cost (NVA_{FC}) by each productive enterprise as well as by each industry or sector is estimated. Measuring net value added at factor cost (NVA_{FC}) by each industry requires first to find out the value of output. Value of output of an enterprise is found out by multiplying the physical output with market prices of the goods produced.

In order to arrive at the *net value added at factor cost by an enterprise* we have to subtract the following from the value of output of an enterprise:

1. Intermediate consumption
2. Consumption of fixed capital (*i.e.*, depreciation)
3. Net indirect taxes.

Summing up the net values added at factor cost (NVA_{FC}) by all productive enterprises of an industry or sector gives us the net value added at factor cost of each industry or sector. We then add up net values added at factor cost by all industries or sectors to get *net domestic product at factor cost* (NDP_{FC}). Lastly, to the net domestic product we add the *net factor income from abroad* to get *net national product at factor cost* (NNP_{FC}) which is called *national income*. Thus,

$$NI \text{ or } NNP_{FC} = NDP_{FC} + \text{Net factor income from abroad}$$

This method of calculating national income can be used where there exists a *census of production* for the year. In many countries, the data of production of only important industries are known. Hence this method is employed alongwith other methods to arrive at the national income. The one great advantage of this method is that it reveals the relative importance of the different sectors of the economy by showing their respective contributions to the national income.

Precautions: The following precautions should be taken while measuring national income of a country through value added method:

1. *Imputed rent values* of self-occupied houses should be included in the value of output.
2. Sale and purchase of *second-hand goods* should not be included in measuring value of output of a year because their values were counted in the year of output of the year of their production. Of course, commission or brokerage earned in their sale and purchase has to be included because this is a new service rendered in the current year.
3. *Value of Production for self-consumption* should be counted while measuring national income. In this method, the production for self consumption should be valued at the prevailing market prices.
4. *Value of Services of housewives* should not be included because it is not easy to find out correctly the value of these services.
5. Value of intermediate goods *should not* be counted while measuring value added because this will amount to double counting.

2. Income Method

This method approaches national income from distribution side. In other words, this method measures national income at the phase of distribution and appears as income paid and or received by individuals of the country. Thus, under this method, *national income is obtained by summing up of the incomes of all individuals of a country*. Individuals earn income by contributing their own services and the services of their property such as land and capital to the national production. Therefore, national income is calculated by adding up the rent of land, wages and salaries of employees, interest on capital, profits of entrepreneurs (including undistributed corporate profits) and incomes of self-employed people. This method of estimating national income has the great advantage of indicating the distribution of national income among different income groups such as landlords, owners of capital, workers, entrepreneurs. Measurement of national income through income method involves the following main steps:

1. Like the value added method, the first step in income method is also to *identify* the productive enterprises and then *classify* them into various industrial sectors such as agriculture, fishing, forestry, manufacturing, transport, trade and commerce, banking, etc.

2. The second step is to classify *the factor payments*. The factor payments are classified into the following groups:

1. *Compensation of employees* which includes wages and salaries, employers' contribution to social security schemes.

2. *Rent and also royalty*, if any.
3. *Interest*.
4. *Profits*: Profits are divided into three sub-groups:
 - (i) Dividends
 - (ii) Undistributed profits
 - (iii) Corporate income tax
5. *Mixed income of the self-employed*: In India as in other developing countries there is fifth category of factor income which is termed as *mixed income of self-employed*. In India a good number of people are engaged in household industries, in family farms and other unorganised enterprises. Because of self-employment nature of the business it is difficult to separate wages for the work done by the self-employed from the surplus or profits made by them. Therefore, the incomes earned by them are mix of wages, rent, interest and profit and are, therefore, called *mixed income of the self-employed*.

3. The third step is to *measure factor payments*. Income paid out by each enterprise can be estimated by gathering information about the number of units of each factor employed and the income paid out to each unit of every factor. Price paid out to each factor multiplied by the number of units of each factor employed would give us the factor's income.

4. The *adding up of factor payments* by all enterprises belonging to an industrial sector would give us the incomes paid out to various factors by a *particular* industrial sector.

5. By summing up the incomes paid out by *all industrial sectors* we will obtain *domestic factor income* which is also called *net domestic product at factor cost* (NDP_{FC}).

6. Finally, by adding *net factor income earned from abroad* to domestic factor income or NDP_{FC} we get *net national product at factor cost* (NNP_{FC}) which is also called *national income*.

Income approach to measurement of national income is shown through bar diagrams in Table 33.1.

Table 33.1. Income Approach to National Income

| | | | Net Indirect Taxes |
|-------------------------------|-------------------------------|-------------------------------------|-------------------------------------|
| | <i>Net Income from abroad</i> | <i>Consumption of Fixed Capital</i> | <i>Consumption of Fixed Capital</i> |
| <i>Dividends</i> | } → Profits | Dividends | Profits |
| Undistributed Profit | | Undistributed Profits | |
| Corporate Income Tax | | Corporate Income Tax | |
| Interest | Interest | Interest | Interest |
| Rent | Rent | Rent | Rent |
| Mixed Income of Self-employed | Mixed Income of Self-employed | Mixed Income of Self-employed | Mixed Income of Self-employed |
| Compensation of Employees | Compensation of Employees | Compensation of Employees | Compensation of Employees |
| NDP_{FC} | NNP_{FC} | GDP_{FC} | GDP_{MP} |

Precautions: While estimating national income through income method the following precautions should be taken:

1. *Transfer payments* should not be included in estimating national income through this method..

2. *Imputed rent* of self-occupied houses should be included in national income as these houses provide services to those who occupy them.

3. *Illegal money* such as *hawala money*, *money earned through smuggling* should not be included.

4. *Windfall gains* such as prizes won, lotteries should not be included.

5. *Corporate profit tax* (that is, tax on income of the companies) should not be separately included as it has already been included as a part of profits.

6. *Death duties, gift tax, wealth tax, tax on lotteries, etc.*, are paid from past savings or wealth and not from current income. Therefore, they should not be treated as a part of national income of a year.

7. The receipts from the *sale of second-hand goods* should not be treated as a part of national income. This is because the sale of second-hand goods does not create new flows goods and services in the current year.

8. Income equal to the *value of production used for self-consumption* should be estimated and included in the measure of national income.

Expenditure Method

Expenditure method arrives at national income by adding up all expenditures made on goods and services during a year. Income can be spent either on consumer goods or capital goods. Again, expenditure can be made by private individuals and households or by government and business enterprises. Further, people of foreign countries spend on the goods and services which a country exports to them. Similarly, people of a countries spend on imports of goods and services from other countries. We add up the following types of expenditure by households, government and by productive enterprises to obtain national income.

1. Expenditure on consumer goods and services by individuals and households. This is called *final private consumption expenditure*, and is denoted by C .
2. Government's expenditure on goods and services to satisfy collective wants. This is called *government's final consumption expenditure*, and is denoted by G .
3. The expenditure by productive enterprises on capital goods and inventories or stocks. This is called *gross domestic capital formation*, or gross domestic investment and is denoted by I or GDCF. Gross domestic capital formation is divided into two parts:
 - (i) Gross fixed capital formation
 - (ii) Addition to the stocks or inventories of goods
4. The expenditure made by foreigners on goods and services of a country exported to other countries which are called exports and are denoted by X . We deduct from exports (X) the expenditure by people, enterprises and government of a country on imports (M) of goods and services from other countries. That is, we have to estimate net exports (that is, exports – imports) or $(X - M)$.

Thus, we add up the above four types of expenditure to get final expenditure on *gross domestic product at market prices* (GDP_{MP}). Thus,

GDP_{MP} = Private final consumption expenditure + Government's final consumption expenditure + Gross domestic capital formation + Exports – Imports or

$$\begin{aligned} GDP_{MP} &= C + G + I + (X - M) \\ &= C + G + I + X_n \end{aligned}$$

On deducting consumption of fixed capital (*i.e.*, depreciation) from gross domestic product at market prices (GDP_{MP}) we get *net domestic product at market prices* (NDP_{MP}).

In this method, we then *subtract net indirect taxes* (that is, indirect taxes – subsidies) to arrive at net domestic product at factor cost (NDP_{FC}),

Lastly, we add 'net factor income from abroad' to obtain *net national product at factor cost* (NNP_{FC}), which is called *national income*. Thus,

$$NNP_{FC} = GDP_{MP} - \text{Consumption of Fixed capital} - \text{Net Indirect taxes} \\ + \text{Net Factor Income From Abroad.}$$

Expenditure approach to national income is shown through bar diagram in Table. 33.2.

Table 33.2. Expenditure Approach to National Income Concepts

| Gross Domestic Capital Formation | Less Depreciation | | | Net Income from abroad |
|---------------------------------------|---------------------------------------|---------------------------------------|-------------------------|---------------------------------------|
| | Net Domestic Capital Formation | Net Domestic Capital Formation | Less Net Indirect Taxes | Net Domestic Capital Formation |
| Govt. Final Consumption Expenditure | Govt. Final Consumption Expenditure | Govt. Final Consumption Expenditure | } NDP_{FC} | Govt. Final Consumption Expenditure |
| Private Final Consumption Expenditure | Private Final Consumption Expenditure | Private Final Consumption Expenditure | | Private Final Consumption Expenditure |
| Net Exports (X - M) | Net Exports (X - M) | Net Exports (X - M) | | Net Exports (X - M) |
| | | | | |

$GDP_{MP} \longrightarrow NDP_{MP} \longrightarrow NDP_{FC} \longrightarrow NNP_{MP}$

(Note: To any concept of the domestic product, if we add 'Net Income from Abroad' we will get corresponding National Product)

Precautions: While estimating Gross Domestic Product through expenditure method or measuring final expenditure on Gross National Product, the following precautions should be taken:

1. *Second-hand goods:* The expenditure made on second-hand goods should not be included because this does not contribute to the current year production of goods and services.
2. *Purchase of shares and bonds.* Expenditure on purchase of old shares and bonds from other people and from business enterprises should not be included while estimating Gross Domestic Product through expenditure method. This is because bonds and shares are mere financial claims and do not represent expenditure on currently produced goods and services.
3. *Expenditure of transfer payments* by government such as unemployment benefits, old-age pension should also not be included because no goods or productive services are produced in exchange by the recipients of these payments.
4. *Expenditure on intermediate goods* such as fertilisers and seeds by the farmers wool, cotton and yarn by manufacturers of garments should also be excluded. This is because we have to avoid double counting. Therefore, for estimating Gross Domestic Product we have to include only *expenditure on final goods and services*.

Difficulties in the Measurement of National Income

There are many difficulties in measuring national income of a country accurately. The difficulties involved are both conceptual and statistical in nature. Some of these difficulties or problems involved in the measurement of national income are enumerated below.

1. **Treatment of non-monetary transactions.** The first problem relates to the *treatment of non-monetary transactions* such as the services of housewives to the members of their families and farm output consumed at home. On this point, the general agreement is to *exclude the services of housewives while to include the value of farm output consumed at home in the estimate of national income*. This, however, gives rise to certain anomalies. For example, if a

man employs a maid-servant for household work, payment to her will appear as a positive item in national income. If the next day the man were to marry the maid-servant, she would be performing the same services as before but without payments. In this event the value of national income would go down though the real amount of goods and services performed remains the same as before.

2. Treatment of Government Activities in national income accounts. The second difficulty arises with regard to the treatment of the government in national income accounts. On this point the general viewpoint is that as regards the administrative functions of the government like justice, administration and defence are concerned they should be treated as giving rise to final consumption of such services by the community as a whole so that contribution of general government activities will be equal to the amount of wages and salaries paid by the government. As regards capital formation by the government, this is treated as par with capital formation by private enterprises.

3. Treatment of income generated by foreign firms. The third major problem arises with regard to the treatment of income arising out of activities of the foreign firms in a country. Should their income form a part of the national income of the country in which they are located or should it belong to the national income of the country owning the firms? On this point, the IMF viewpoint which is generally accepted is that production and income arising from a foreign enterprise should be ascribed to the country in which production takes place. However, profits earned by foreign companies are credited to the parent country.

Difficulties of Measurement in Developing Countries

In developing countries like India, we face some special difficulties in estimating national income. Some of these difficulties are given below:

1. A great difficulty in estimating national income in the developing countries like India arises because of the *prevalence of non-monetised transactions in such countries* so that a considerable part of the output does not come into the market at all. Agriculture still being largely in the nature of subsistence farming in these countries, a major part of output is consumed at the farm itself. The national statistician, therefore, has to face the problem of finding a suitable measure of value for this part of national output.

2. Because of illiteracy in the developing countries most producers have no idea of the quantity and value of their output and do not follow the practice of keeping regular accounts. This makes the task of getting reliable information from a large number of petty producers all the more difficult.

3. Because of underdevelopment, *occupational specialisation is still incomplete*, so that there is a lack of differentiation in economic functioning. An individual may receive income partly from farm ownership, partly from manual work in industry in the slack season, etc. This makes the task of estimating national income very difficult.

4. Another difficulty in measuring national income in the developing countries arises because *production, both agricultural and industrial, is unorganised* and scattered in these countries. This does not admit of easy calculation. In India, agriculture, cottage industries and indigenous banking are some of the production sectors which are unorganised and scattered. An assessment of output produced by self-employed agriculturists, small producers and owners of household enterprises in the unorganised sectors requires an element of guess work which makes the figure for national income unreliable.

5. The greatest difficulty in the measurement of national income in the developing countries is *general lack of adequate statistical data*. Inadequacy, non-availability and unreliability of statistics is a great handicap in measuring national income in these countries. As stated above, statistical information regarding agriculture and allied occupations, and household enterprises is not available. Even the statistical information regarding the enterprises in the organised sector

is sketchy and unreliable. There is no accurate information available regarding consumption, investment expenditure and savings of either rural or urban population.

NATIONAL INCOME AND ECONOMIC WELFARE

National income, or GNP, as explained in the last chapter, measures the value of aggregate output of goods and services produced in a year. Since goods and services satisfy the wants of the people, national income or GNP has often been used as a measure of satisfaction or economic welfare of the people. The greater the magnitude of national income, the greater the level of economic welfare. Besides, economic progress or what is now generally called economic growth has been measured in terms of increase in national income (that is, increase in GNP or NNP) in terms of total or per capita income. In recent years doubts have been expressed about the validity of national income or gross national product (GNP) as a measure and index of economic welfare.

It has been asserted by several modern economists that national income as it is usually defined is not a satisfactory measure of economic welfare. According to them, in order to obtain a true measure of economic welfare, some adjustments both in the form of additions and subtractions have to be made in the aggregate of national income. National income, as it is usually conceived and measured, includes some things that do not increase welfare of the people. Therefore, such things ought to be excluded in order to get a true measure of economic welfare. This true measure of economic welfare is now often called "*Net Economic Welfare*" or simply *NEW*. On the other hand, the usual concept of national income excludes some goods and services which increase satisfaction of the people and therefore ought to be included in any good index of Net Economic Welfare.

As regards the things that ought to be added to obtain the index of Net Economic Welfare (*NEW*), the first important thing is the *value of satisfaction that people derive from leisure*. The usual concept of national income (or GNP) does not attach any significance to the amount of leisure people enjoy. However, the individuals derive satisfaction not only from the consumption of goods and services but also from leisure they have. Therefore, for constructing any index of net economic welfare, the value of leisure which the people enjoy must also be included. For example, if the average working hours are reduced, this is likely to reduce national production or national income but may raise welfare of the people by enabling them to enjoy more leisure.

The other important items that ought to be added to obtain a true measure of welfare are the *non-marketed personal services* (that is, the personal services which are not sold and purchased in the market) which also greatly raise the satisfaction and welfare of the people. For instance, services rendered by the housewives to the family members greatly add to their welfare but they are not recorded in national income accounting. Likewise, personal services rendered by the individuals to themselves such as gardening, painting one's own house significantly raise their welfare but do not get registered in the national income or GNP. Hence in order to get any true index of economic welfare, the value of non-market activities such as personal services which increase welfare ought to be incorporated.

As regards the items that have to be deducted from the national income, mention may be made of those harmful effects which result from increase in output. As is well known, the production of modern industries pollutes the environment such as polluting air, water and calmness which significantly reduce welfare of the people. Though modern industrialization has greatly increased national income of the countries but by causing *air pollution, water pollution and noise* has tended to reduce the welfare of the people. Therefore, for preparing a measure of net welfare, negative values ought to be assigned to the *environment pollution* that results from the production of goods and services. The various forms of pollution of environment have often been referred to as *costs of economic growth*, which like other costs, have to be deducted to obtain the index of net economic welfare.

Apart from environment pollution, certain other deductions on account of wasteful and non-productive expenditure such as Government expenditure on police and law courts so as to maintain law and order and on defence to protect the country from external aggression. These have been called "*regrettable costs*", because economists consider them regrettable necessities

expenditure on which does not lead to increase in welfare of the people. Hence expenditure on them should be excluded from GNP to arrive at the measure of net economic welfare.

To sum up, the relation between national income (GNP) and Net Economic Welfare (NEW) can be represented as follows:

Real GNP
 – Depreciation
 + Value of leisure
 + Value of non-market activities (*i.e.*, services of housewives and personal services)
 – Environment pollution
 – Regrettable costs
 = Net Economic Welfare

But it is worth-mentioning that even the measure of Net Economic Welfare (NEW) as defined above does not truly indicate the welfare enjoyed by the people. There are other things which play a significant role in determining welfare of a nation and which do not get registered in national income or in Net Economic Welfare. Thus, *composition of national output* as between wage goods and luxuries and also the *distribution of goods between individuals* determine welfare to a great extent. If with the increase in total national income and per capita income, the rich are getting richer and the poor getting poorer, then this growth in national income and per capita income cannot be said to promote welfare. Professor Hicks rightly remarks, “the national income only measure the total volume of goods and services at the disposal of the community during the year; it can tell us nothing, for example, about the way in which the national income is divided up between rich and poor.”²

Further national income and per capita income are also not true measures of welfare because they do not consider the *composition of output*. A country’s national income and per capita income may be very high but the well-being of the people may be very low because the national output consist of a larger quantity of war material. This is a very important factor because it is well known fact that various countries are spending quite a large part of national budgets on the manufacture of war materials and the greater the expenditure on the defence forces, the smaller will be the actual well-being of the people, given the size of national and per capita income.

Similarly, the well-being of the people also depends upon the *relative proportions of wage-goods (necessities) and luxuries* in the composition of national product. It may be noted that in a country if luxuries are being produced in relatively greater quantities than the wage-goods, then in that case while the few rich will be rolling in luxuries, the poor will be deprived of even sufficient quantities of necessities of life. Likewise, national and per capita income do not accurately reflect *improvements in the quality of products*. This is a shortcoming because improvements in the quality of products affect the economic welfare of the people as much as the increase in quantities of goods.

Lastly, the increase in national income does not truly indicate the increase in welfare of the people because it does not take into account how the national income is being produced and how the increase in it has been brought about. If increase in national income has been brought about by making workers work longer hours which impair their health and efficiency, then this increase in national income will not promote welfare but will adversely affect it. Similarly, if the increase in national income has been obtained by introducing labour-saving machinery throwing out a large number of workers out of employment, this growth in national income which increases unemployment and therefore cannot lead to the increase in social welfare.

² J.R. Hicks, *Social Framework*, p. 186.

QUESTIONS FOR REVIEW

1. Define national income. Explain the different methods of measuring national income.
2. What is national income? How is national income measured by value added product method?
3. Explain different concepts relating to National Income.
4. Distinguish between the following concepts of national income
 - (1) Gross Domestic Product (GDP) and Gross National Product (GNP)
 - (2) Net National Income at Market Prices (NNP) and Net National Income at Factor Cost (NNP_{FC})
 - (3) Personal Income and Disposable Income
 - (4) Gross National Product and Net National Product.
5. What are the *difficulties* involved in estimating national income in developing countries.
or
What problems arise in the estimation of National Income in India.
6. Explain different methods of measuring national income. What are their limitations?
7. Explain how an increase in national income does not necessarily mean an increase in welfare of the people.
9. Which of the following statements are correct and which are incorrect? Give reasons in brief for your answer.
 - (1) The share of agricultural sector in India's national income has shown a declining trend.
 - (2) GNP is the money value of all goods and services produced in an economy.
 - (3) Gross National Product (GNP) at market prices is the same as GNP at factor cost.
 - (4) The welfare of people increases with an increase in GNP.
 - (5) National income and National Wealth are the same.
 - (6) Increase in national income does not mean increase in welfare of people.
 - (7) National income is money value of only goods produced during a period of one year.
 - (8) National income and per capita income do not reflect the real economic growth.
10. Is growth in national income is a true index of welfare of a society.
11. What are the components of national income from the view points of expenditure approach.
12. Explain the circular flow of money income. How do different phases of it help us in measuring national income in three different ways ?
13. Distinguish between net Domestic Product at Factor cost (NDP_{FC}) and Gross Domestic Product at market prices measured through income approach ?
14. In an economy without Government, show that the value of net national product of the community and the sum of the income of its members are exactly equal. The net value product and the social income are one and the same they" (J.R. Hicks)

PART VI
Capital Budgeting

- **Capital Budgeting: Analysis of Investments Projects**
- **Cost of Capital**

Capital Budgeting : Analysis of Investment Projects

Introduction

Most of the principles of managerial economics discussed so far focus on the analysis of short-run decision making problems of a business firm. For example, deciding about how much price of a product should be fixed, how much quantity of output should be produced so as to maximise profits and similarly how much labour or any other factor be used to minimise cost for a given level of output, or maximise output for a given level of cost are all important short-run decision making problems. In this chapter, however, we will be concerned with the analysis of decisions which have long-run implications for a firm. What new fixed assets, plant and capital equipment be acquired or built up so as to increase the value of the firm and its long-run profitability? Should old capital equipment be replaced by new one embodying the latest technology; should new product be launched to broaden the product line; should a rival firm be taken over to eliminate the competition and expand its outlets. All of these and other similar decisions require long-term investment analysis.

The decisions regarding the above mentioned issues are of crucial importance for determining the long-run profitability of a firm. It should be noted that *the basic objective of a firm is to make those decisions that will increase the value of a firm*. By the value of a firm we mean present value of all future profits or *net cash flows* accruing to the firm. To increase the value of a firm, decisions regarding long-term investment or what is also *capital expenditure* must be made. In this chapter we will first describe issues and problems involved in capital budgeting, that is, analysis of long-term investment projects. Secondly, we will critically examine the various criteria which have been proposed for evaluating capital projects as to whether or not they should be selected for investment. Thirdly, we will explain the choice of investment projects from the various alternative projects.

Capital Budgeting : Meaning

Capital budgeting which is also known as *long-term investment analysis* is the process of planning for investment expenditure in capital projects. Capital or investment projects are those returns (or cash flows) from which are expected to continue beyond one year in future (that is, for several future years). *Expenditure on such capital projects which yield returns beyond one year is called capital expenditure*. Thus, a capital expenditure (or what is also called long-term investment) is defined as an outlay that is expected to generate a stream of future cash flows that accrue to a firm beyond one year. The important examples of capital projects are investment in new factories, machinery, automobiles, trucks, expenditure on research and development, expenditure on advertising campaigns are capital projects as returns from them accrue beyond one year.

Importance of Capital Budgeting

The importance of capital budgeting, that is, planning long-term capital expenditure is that capital expenditure has a long-term effect on the performance of an enterprise. Capital expenditure affects long-term profitability and leads to the increase in the value of a firm. It indicates

such things as what expansion in productive capacity of the firm will take place, what type of products will be produced, what new markets will be entered, where the new plant will be located, what type of technology will be used? It is thus clear that capital budgeting should be carefully done because capital expenditure is both very costly to make and difficult to reverse without incurring heavy costs.

Uncertainty and Capital Expenditure

It is worth mentioning that capital expenditure or long-term investment involves a good deal of uncertainty about its outcome. Since what *state of nature* (i.e., business conditions) will be prevailing in the future is highly uncertain, the outcome of alternative courses of action cannot be known with certainty. Therefore, in making decisions under conditions of uncertainty *expected values* of each alternative outcome is incorporated into the analysis. Expected values are the weighted averages of the values of all possible outcomes multiplied by the probability of the value of each possible outcome. Under conditions of uncertainty measures of risk based on expected values and other techniques are used to make decisions. Thus, decision making is of particular importance for evaluating alternative investment projects under conditions of uncertainty. However, it may be noted that in our analysis we assume that for planning capital expenditure, that is, capital budgeting a manager works under conditions of *certainty* and possesses full and adequate information about prices, revenue and costs that will be prevailing in future. Therefore, he is in a position to calculate the net cash flows from alternative projects. Decision making under conditions of uncertainty will be studied in a separate chapter.

Classification of Capital Projects

It is useful to classify various capital projects for which long-run investment analysis is needed.

1. *Replacement.* The existing machinery and other capital equipment is worn out by its continuous use for production over a number of years. Therefore, there is a need for its replacement by new machinery and capital equipment. Capital budgeting is required to plan for its replacement.
2. *Cost Reduction.* Some capital projects are undertaken to reduce unit cost of production. Among such capital projects are included the installation of new and *more efficient machinery and equipment* for outdated (i.e. obsolete) equipment and machinery so that unit cost of production is reduced. Note that it is *new* equipment and machinery in which improved technology is embodied makes cost reduction possible.
3. *Output Expansion.* Investment in new capital projects is needed for expansion of productive capacity in response to the increased demand for a firm's *traditional products in the existing markets.*
4. *Expansion by Developing New Products and/or Markets.* Capital expenditure is required for the development of new products in response to changes in tastes of consumers and/or for entering new markets. Note that entering new markets will require additional staff or opening new outlets.
5. *Government Regulation.* There are some investment projects which are required to meet government regulation. Such investment projects include projects for pollution control, projects for health and safety regulation of the government and other legal rules and regulations.

In general, decisions regarding capital expenditure for replacement of worn-out equipment is not difficult to make because the firm is already quite familiar with the nature of existing equipment, its productivity, the operating and maintenance costs required for it. Moreover, the firm knows when it is to be replaced. However, capital expenditure for the reduction of cost by installing *new* machinery and equipment and the output expansion of traditional products are relatively more complex and difficult. Therefore, they require careful and detailed analysis of evaluating the capital projects concerning them and the decisions regarding them are taken by

higher level management. But investment projects for producing *new products* and entering *new markets* are very complex and most challenging as they involve a greater degree of risk. However, it may be noted that the projects for production of new products and entering new markets are relatively more important as they are financially highly rewarding in the long run. This is because a firm's established product tends to become outdated over a period of time which lowers its profitability. Similarly, gaining entry into new products or opening new outlets are also more important as traditional markets of a firm soon get shrunked. It is clear from above that ideas and proposals for undertaking new investment projects are crucial for profitability of a firm in the long run and even for its survival in the future. In well-managed firms, all employees are provided with incentives so that they should give new ideas about investment but in highly dynamic firms there is a separate division or department known as '*Research and Development (R & D) Department*' which is entrusted with the task of providing proposals for new investment projects. This department is managed by experts in product management, marketing research, industrial engineering etc. and they interact with other departments to discuss proposals for investment in new products, gaining entry into new markets, adoption of new technology for the production of a product. They also discuss strategies to be adopted for the purpose.

For proper capital budgeting, that is, planning for long-term investment there is a need for co-ordination of the operations of the major departments or divisions of a firm. Capital budgeting requires information on sales or demand for the product, costs of production, effects of advertising, and the availability of funds for investment. Therefore, all management divisions of the firm are necessarily involved in it and contribute to the capital budgeting process. Since capital budgeting is crucial for long-run profitability and survival of firm, it is reviewed and guided on continuous basis by *top* management of a firm.

Capital projects are generally very costly and require huge amount of investment funds to finance the capital projects which are taken by the firms from external sources. Further, as mentioned above, it is not easy to reverse the capital projects once the investment is undertaken in them. Thus, if once a cement manufacturing plant has been set up, it is difficult to dismantle it or sell it if market conditions do not sustain any more capacity in cement production. Thus, capital budgeting decision sets the direction or course of a firm for several years to come and if the project does not succeed the firm has to bear heavy losses. The decision regarding price of a product, the amount of advertising may be easily reversed or necessary correction may be made but if decision-making regarding capital projects is not properly done, then the very existence of a firm is threatened.

Steps in Capital Budgeting

If a firm invests in a capital project whose present value is greater than its initial cost, the value of the firm will increase. This increase in the value of the firm as a result of successful capital budgeting will contribute to its future growth. As a result, if capital budgeting by a firm, that is, its planning for long-term investment is more successful in increasing the value of the firm, its future growth rate will be higher which will ensure better profitability of the firm and its share prices. Thus, capital budgeting must be done very carefully so as to achieve the basic objective of the firm, namely, *maximisation of its value* and hence maximisation of its rate of growth. The following six steps are involved in the capital budgeting process.

1. **Determining the cost of the project.** The first step in the budgeting process is to determine the cost of the project, that is, how much cost or capital expenditure will be incurred in undertaking the proposed investment project. This will depend on the prices of new equipment, the quantity of new equipment required (and if it is an imported equipment, the cost of the project will also depend on the foreign exchange rate, custom duties, if any), and expenses on its installation have to be considered for making an estimate of the cost of a project.

2. **Estimating cash flows.** The second step in the budgeting process is to estimate cash

flows associated with an investment project. Cash flows generated by an investment project depends on the series of incremental *cash inflows* and *cash outflows* that occur over time when the project is operational. *Cash inflows of a project are incremental revenues generated by the project by over a number of years of its operation and cash outflows are incremental costs incurred over a number of years when the project remains operational.* The incremental net cash flows generated by a project are the difference between incremental cash inflows and cash outflows *with and without the project.* How the net cash flows from a project are estimated will be explained below at length.

3. Measuring riskiness of estimated cash flows. Since cash flows of investment projects occur in future, varying degrees of risk or uncertainty exist about the values of these flows in the future. The expected values of these flows under conditions of uncertainty can be obtained if the firm has the information about probability distribution of these flows. The estimation of cash flows under varying degrees of risk and uncertainty will be explained in a separate chapter. For now, we assume that a manager has adequate information to estimate cash flows with certainty for deciding whether or not to go in for an investment project.

4. Determining the appropriate discount rate. The fourth step in the capital budgeting process is to determine the appropriate discount rate (*i.e.*, the cost of capital) at which future cash flows are to be discounted to obtain the present value of the cash flows in the future. Generally, *opportunity cost of funds* is the appropriate cost of capital. The opportunity cost of funds is the market rate of interest which is used for the purpose of discounting estimates of future cash flows.

5. Finding present value of future cash flows. Fifthly, present value of future cash flows are obtained by actually discounting them at the selected discount rate representing the opportunity cost of capital (in many cases, market rate of interest represents the opportunity cost of capital or funds used for investment). It may be noted that present values of both cash inflows and cash outflows during the period of operation of the project and on that basis the estimates of *net cash flows* are made.

6. Comparing present value of cash flows with the cost of the project. Finally, the present value of the estimated net cash flows of a project are compared with the *initial cost of the project* (*i.e.*, initial investment expenditure incurred on the project). If the present value of an investment project exceeds the cost of a project, the project will add to the value of the firm and therefore should be accepted. On the contrary, if the present value of the project is less than the cost of the project it should be rejected.

ESTIMATION OF CASH FLOWS

In the analysis of investment projects, the most important but a very difficult step is the estimation of cash flows generated by a capital project that occur during the life of the project. For projecting cash flows many variables are to be considered and therefore many departments and individuals in the firm are to be consulted. For example, estimates of sales of a product in the future years and its likely price are normally decided by the marketing department of the firm. Note that the managers running marketing department of a firm makes its estimates of future sales and price of the product on the basis of price elasticity of demand and its effect on sales, the state of the economy, trends in tastes of consumers and competitors reaction. It may however be mentioned that *future is highly uncertain.* Therefore, it is very difficult to make accurate future estimates of incremental revenues (*i.e.*, cash inflows) and incremental costs (*i.e.*, cost outflows) associated with a project.

For preparing correct estimates of cash flows some rules or principles should be followed. We discuss below some important rules or principles that should be followed for estimating accurate estimates of cash flows generated by a project in future.

1. First, in estimation of cash flows, it is *net reduction in cost and/or net increment in revenue* associated with a project that should be considered. As stated above, certain capital

projects are of cost reducing types. For example, if a proposed project is to replace a machine by a more efficient machine that requires less labour to produce a product the cash flows generated by this new machine should be viewed as *net reduction in operating cost* over a number of years in future. Secondly, a machine project may involve the production of a new product which is of higher quality and, therefore, can be sold at a higher price. The cash flows generated by such machines will be in the form of *net addition to revenue* in the coming years. Further, some projects are of both cost-reducing and revenue-increasing types. For example, a project which involves modernisation and expansion of a plant and equipment embodying superior technology will reduce cost per unit and will also increase productive capacity leading to a higher rate of production and therefore net addition to revenue of the firm. Therefore, in this case, for estimating cash flows the reduction in cost and net increment in revenue in each future year should be taken into account. It needs to be emphasised that both the reduction in cost or increase in revenue generated by a project should be made on the *incremental basis*. This means that cost reduction or revenue expansion due to a project must represent the difference between the cash-flow streams to the firm with and without undertaking of the project.

2. Another important principle for making proper estimates of future cash flows is that *introduction of bias in preparing them* should be avoided. Some members of managerial staff develop vested interests in undertaking some particular projects and, therefore, they tend to overestimate the cash inflows and underestimate the costs, that is, cash outflows. This introduces bias in the estimates of cash flows. Therefore, for obtaining unbiased estimates it is desirable that these are reviewed by some outside experts or the individuals managing finance division of the firm.

3. Thirdly, cash flows should be estimated on an *after tax basis*. Further, it is important to note that in estimating cash flows of a project, *depreciation should be included* in the incremental revenue accruing over a number of years to the firm as a result of the operation of the project. This is because depreciation is not a *cash expenditure* of the firm. However, since in income tax laws depreciation is allowed as a cost and reduces net taxable income of the firm on which profit or income tax is levied, therefore, while estimating cash flows after taxes, depreciation is first deducted for determining net taxable income, and then it is added to income after payment of tax to obtain *cash flows after tax* associated with a particular capital project.

4. The next important rule followed in the estimation of cash flows is that *indirect effects* of the project, both of revenue-increasing or cost-reducing types should be included in them. For instance, if a division of the firm is planning to undertake investment in a project that will affect the revenue or costs of other divisions, then these external effects should be included in the estimates of cash flows associated with that investment project.

5. Fifthly, *sunk costs* should not be considered for evaluating an investment project. A *sunk cost is an outlay that has already been made and cannot be recovered*. Whether a project should be accepted or rejected, sunk cost has to be borne. Therefore, sunk costs are not taken into account while evaluating capital projects.

6. Another important principle followed in estimating cash flows generated by a project is that *the value of resources used in a capital project should be measured in terms of opportunity costs* for the firm. Opportunity cost is the value of a resource in its next best alternative use. In the analysis of the investment projects, opportunity costs of resources used for a project are the cash flows that these resources would generate if they are not used in the proposed project.

For a typical investment project an investment is made in year 0, generates a stream of yearly net cash flows over a life span of the project. The net investment in a project is defined as the initial net cash outlay on it in year 0. It consists of a cost of acquiring the new asset plus installation expenses and tax effects.

Estimating Cash Flows of a Project : An Illustration

It will be useful to give an illustration of estimating cash flows of a project. Let us assume

that the proposed project is to install a new machinery which produces a particular product. The engineering department forecasts input-output relationship which tells us which and how much various inputs will be required to produce a given rate of output. The purchase and marketing divisions will predict the costs of inputs and prices of output which will enable them to calculate expected incremental revenues generated by the project and incremental costs of production to be incurred each year in future.

Let us assume that the purchase and installation of machinery requires initial investment of Rs. 150 thousands and has a life span of five years. Cash flows each year beginning with the year 1999 are given in Table 34.1. In row 1 of this table gross sales of output produced by the machinery (which represents cash inflows in terms of revenues) in each of the five year period are shown. In the second row operating cost of output produced each year is shown that depends, apart from input-output relationship, on the prices of inputs used. The operating costs of production represents the cash outflows each year. Then, in row 3 depreciation of machinery is given. It is assumed that the firm follows a *straight line method* of depreciation which means a constant percentage each year over the life span of the machinery. It is assumed that machinery depreciates at the rate of 20 per cent per annum. The initial investment outlay on machinery being Rs. 150 thousand, depreciation each year amounts to $\text{Rs. } 150 \times 20\% = \text{Rs. } 30$ thousand each year.

The fourth row shows net profits after allowing for cost of output and depreciation. Thus, in the first year of operation whereas sales revenue is Rs. 120 thousand, cost of output and depreciation amount to $\text{Rs. } 100 + 30 = 130$ thousands. This gives us a negative profits of Rs. 10 (thousands) in the year 1999. Similarly, profits or income of the firm before tax is calculated for the next four years. Further, for the sake of simplification it is assumed that the rate of profits or income tax is 50 per cent. Since in the year 1999 there are negative profits or losses, tax on profits will be zero. But in the subsequent years when net profits are positive, 50 per cent of them are paid as profit or income tax. In the sixth row of the table profits or income after tax are given. It is important to understand again that in row 7 we have shown depreciation which has been now added to net profit after tax to obtain net cash flows in row 8. As explained above, depreciation is not a *cash expense* (i.e., cash outflow) but it is exempted from income

Table 34.1: Estimation of Cash Flows of a Project

| | (Figures in Rs. thousands) | | | | |
|---|----------------------------|------|------|------|------|
| | 1999 | 2000 | 2001 | 2002 | 2003 |
| 1. Gross Sales (or cash influxes) (i.e. Revenue) | 120 | 200 | 240 | 280 | 320 |
| 2. Less : Operating Costs of Production | 100 | 130 | 160 | 210 | 260 |
| 3. Less: Depreciation | 30 | 30 | 30 | 30 | 30 |
| 4. Net Profit (i.e. income before tax) | (-)10 | 40 | 50 | 40 | 30 |
| 5. Less: Income or Profit Tax | 0 | 20 | 25 | 20 | 15 |
| 6. Net Profit after Tax | (-) 10 | 20 | 25 | 20 | 15 |
| 7. Plus: Depreciation | 30 | 30 | 30 | 30 | 30 |
| 8. Net Cash Flow after Tax | 20 | 50 | 55 | 50 | 45 |

or profit tax. Therefore, for calculating income tax we have deducted it from gross income or sales revenue. But since it is not cost outflow, we have to add it to net income after tax. Note that it is net cash flow, shown in row 8, which is available each year for payment of dividend to shareholders and interest on borrowed capital and for ploughing back into investment