

THE TEACHING OF ECONOMICS IN SENIOR HIGH SCHOOLS IN GHANA, A DISCUSSION FOR THE INCLUSION OF THREE (3) ADDITIONAL FACTORS OF PRODUCTION.

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ABSTRACT

This paper sheds some reflections on the concept of 'production' and the factors or prerequisites which must exist before production can be carried out, albeit successfully.

It argues for the inclusion of three additional factors (of production) which is aimed at not only enrichment of the basic school economics curriculum but would also provide holistic knowledge which would predispose students to appreciate the relevant and contemporary environmental factors which are indeed needed to fully understand and undertake any viable economic activity.

As a product of the O'level, A' level and university courses in economics, I feel startled that the 'Factors of Production' which I was first taught and read from books, authored by Samuelson, Hanson and others (accomplished writers of Economics during their time) over two decades ago, continues to be what is being taught today as it was being taught back then. This paper discusses the 'Factors of Production' as are outlined in the Economics syllabus (the emphasis is on senior high schools), and goes further to argue for the inclusion of (i) Money/Liquidity, (ii) Modern Technology(IT) and (iii) Market as the three additional factors without which 'production' today would be ineffective and counterproductive.

INTRODUCTION

Economists regard human beings as dynamic creatures. They believe that 'man' is never idle. And this is so because while he lives, he must sustain his survival through some activity. Man's wants are unlimited. Here, the economist assumes that every man is rational: either as a producer or as a consumer. Typically, a rational producer aims at making maximum return for their efforts/investments while a rational consumer seeks to obtain maximum satisfaction from their consumption. Economists use the concept of 'model' to simplify and represent real world events. A one character producer model in which the producer is also the consumer may be possible, although not practicable for our application (As in the case of Robinson Crusoe). In essence, economics always assumes a model in which one person gives something (source) and the other receives or consumes. In general, economists describe the conscious effort employed to satisfy a need on mutually acceptable terms as 'Economic Activity'.

Theoretical Foundations: In words of Wicksell, "By an economic activity is meant every systematic endeavor to satisfy a material need." According to Dr V.K.R.V Rao, "Economic activity is the activity which is concerned with the production, exchange, and distribution of all goods which possess utility, are scarce in quantity and can be the subject of exchange." In the words of Leftwich, "The key elements of economic activity are (i) Human wants (ii) Resources, and (iii) Techniques of production."

Modern economic theorists spearheaded by Prof. Boulding agree that economic activities are these which are concerned with production, distribution, exchange, and consumption. The main objective of these activities is to acquire wealth. Such activities alone are called economic activities which conform to the laws of the land. Illegal activities are such as drug trafficking and money laundering are not economic.

- **Production:** ordinarily, the term production is used to mean making of material goods. For example, when a person makes soap or produces sachet water, we will say that soap or sachet water has been produced. But from the point of view of economics, what turns out as soap did not exist all by itself as soap. Rather, the producer has created utility out of goods like palm oil, caustic soda, water, heat and so on to obtain a needed product called soap. Similarly, water existed separately from all other forms of rubber. But when the rubber (whether synthetic or

latex) is processed it becomes usable for packaging water. Marshall has said, "Man does not create material goods, he only creates utility". Scientists also maintain "matter can neither be created nor destroyed". Thus, in economics the term production refers to the creation of utility or value as in the example of making soap or producing sachet water; and all other goods and services. Utility in production is found not only in material goods but in services also. The services of a lecturer, doctor, solicitor, and transporter satisfy own wants. Each of these persons has added utility to themselves which makes them able to produce the services others demand. Hence, in economics, production refers to that activity by which utility or value is created in the form of goods or services. Production of goods and all kinds of services related to them (*aids to production*) such as storage, transportation, advertisement, retailing or wholesaling is called *production* in economics.

For sometime it was held that land and labor were the main factors of production. Then capital was added to these as 'man-made' factor of production. And then entrepreneurship was added to become the fourth factor of production. According to economists, the four factors of production are land, labor, capital, and entrepreneurship.

Land. Land is the factor of production which is available to mankind as a free gift of nature. It includes not only soil but also all other goods provided by nature which include forests, minerals, vegetation, water bodies and so on. Land is also called natural resource. In the words of Marshall, "By land is meant not merely the upper surface of land but all of the materials and spaces(s) which nature gives freely for man's aid in land and water, air, light and heat."

Labor. Labor is the human factor of production. It includes all these mental and physical activities of man which are undertaken to earn wealth. The services of the carpenter, blacksmith, teacher, doctor, cleaner, and typist are all forms of labor. In the words of Thomas, "Labor connotes human efforts of body or mind, undertaken in expectation a reward."

Capital. Capital is that man-made material source of production which is used for more production. Machines, tools, factory premises, vehicles, power are called capital. In the words of Chapman, "Capital is wealth that yields income or aids in production of income or it intends to do so."

Entrepreneur. Ownership of entrepreneurship quality is called entrepreneur. They take economic decisions and undertake risks. An entrepreneur mobilizes the other factors to production like, labour, and capital, he initiates production and all risks are borne by him and him alone.

- **Distribution:** Distribution refers to that economic activity which is concerned with the distribution of all the goods and services made in a given time among the co-operating factors of production. In the words of Chapman, "The economics of distribution accounts for the sharing of wealth produced by a community among the factors which have been active in its production. Distribution can be considered to be of two types:
 - i. Personal Distribution: It refers to the distribution of production among different persons. It relates to the size of income of a person and not its sources. The main problem of person distribution in a capitalist economy is of inequality of the distribution of income and wealth.
 - ii. Functional Distribution: It refers to the distribution of income among different factors of production viz, land, labour, capital and entrepreneur according to their functions. It relates to different sources of income, i.e. rent, wages, interest and profit. In other words it relates to the problem of factor pricing.
- **Exchange** – Exchange refers to that economic activity which is concerned with voluntary, legal and mutual transfer of economic goods or wealth between two parties.

In the words of Prof J.K. Mehta, "The word exchange signifies an act of giving a thing that one has and getting another that one does not have." As an economic activity, exchange refers to that transaction which has the following three elements:

- i. Transfer of wealth: Under the process of exchange goods are always transferred through the market from one person another.
- ii. Voluntary transfer of wealth: Only that activity will be called exchange activity wherein economic goods are exchanged voluntarily and without any coercion.
- iii. Legal transfer of wealth: Transfer of wealth must be legal. Illegal transfer is not exchange. In short, legal and mutual activity of voluntary transfer of wealth between two parties is called exchange. The term exchange is used in place of monetary exchange and barter in place of exchange of goods of goods. Money exchange takes place in the market. Different goods are

bought and sold in the market at a given price. Price is determined in the market through business between buyers and sellers. This activity is called *price determination*.

Consumption: Consumption is the end point of an economic activity. Here, final packages of a conscious effort are delivered to its intended users. In essence, the concept of demand and cardinal utility implies consumption.

- **FACTOR PRICING**

In order to carry on production, factors of production viz, land, labour, capital and entrepreneur are needed. Whatever is produced with their help and co-operation is distributed among the factors in the form of wages to labour, interest to landlord, rent to capital and profit to the entrepreneur. The price that is paid for the services of these factors is called factor pricing. The theory of factor pricing is concerned with the determination of prices of different factors. In other words, theory of factor pricing studies how rent, wages, interest and profit are determined.

And so, the senior secondary school economics curriculum treats the factors of production as being four (4). It however discusses each factor in terms of its meaning, types, importance, characteristics, advantages, disadvantages and the like.

Indeed, all the factors of production named above were not nominated based on whimsical considerations. Economic theorists were careful to give detailed explanations to justify each of the four factors. Perhaps, they thought, all other ancillary materials and or activities are aids to production.

However, the four factors may be considered in the context of '**What are most needed or relevant to exist before production can be successful?**' Before entrepreneurship was added, Labor, for example, was defined as 'all human effort whether mental and physical (as well as skilled and unskilled) used in production. Here, entrepreneurship was embedded in labour. **Capital** has been defined as 'all man made factors used in production.' Here some examples of capital used as a factor of production which may be quoted, and correctly so by students include premises, cars, equipments, gadgets and cash. The key capital items mentioned are fixed capital, variable capital and social overhead capital. **Land** has been defined as factor of production which consists of the land surface, the sea and air. These are the factors, as argued, which chiefly facilitated production. Therefore, a typical sachet water producing firm may require an Entrepreneur, who may also be described as the CEO; Land, may be four plots of surface space; Labor, who may be those workers who would be responsible for applying their human physical and mental effort to coordinate the process; and capital, which may include water filter, premises, electricity, purification chemicals, packaging machines, carpentry materials and so on.

Here, Entrepreneurship + Capital + Labor + Land = Production.

In the more technical breadth, it is argued, the four factors obtain their relevance in production as a result of their rewards. The reward of Land is rent, Labor's reward is wages, Capital gets interest and finally the reward of the Entrepreneur is called profit. Here, functional distribution may provide some explanation. It deals with the distribution of national income among the four factors called land, labor, capital and entrepreneurship for their services. It mainly deals with the sources of income such as rent, wages interest and profit. The theories of functional income distribution are categorized into two:

1. Micro Theory and Distribution (Theory of Factor Pricing). Micro theory of distribution studies the determination of the rewards of the factors of production working in an industry. In this way the theory of factor pricing shows how the different factors of production share the cake of total production. Simple speaking, the theory of factor pricing shows how the rent of land, wages of laborers, interest of capital and the profits of the entrepreneurs are determined at the level of a firm and of an industry.

ii. Macro Theory of Distribution: Under macro theories of distribution we study how the national income is distributed among the factors of production. For example, suppose Ghana's National Income today is GH¢40 Billion. From it, 20 billion are given to labors, 10 billion to capitals, 5 billion as rent to land, and 5 billion to entrepreneurs as profits. This type of study of distribution is called Macro Distribution. Macro Distribution studies two things: (a) How are the relative shares of each of the four factors of production determined? (b) What is the effect of economic development on the relative shares of different factors of production? The various macro theories are classical theory, Keynesian theory and Marxian theory.

Factor pricing under micro theory: The theory of factor pricing deals with determination of the remuneration of the factors of production for their contribution in the process of production.

Need for a separate theory of factor pricing?

The theory of factor pricing deals with determination of the remuneration of the factors of production for their contribution in the process of production. The shares of the factors are incomes. It is the price paid for their services. The share is determined by the forces of demand and supply. Prices of various commodities are also determined by their demand and supply. Hence the question arises as to why factor pricing is not studied in the theory of general pricing. Some economists say that no separate theory is needed for the general pricing. Some writers say that no separate theory is needed for the determination of the rewards of factors. But some economists think that that is a wrong and hasty conclusion. The demand for and supply of factors of production are very different from those of goods. Therefore, the same theories cannot be applied to the pricing of commodities and of factors.

There are various reasons for having separate theories of factors pricing:

1. Distinct Demand. The demand for factors of production is different from the demand for goods in two ways:
 - Derived Demand. The demand for goods is direct demand. On the contrary, the demand for factors is derived or indirect. We directly need and demand goods like milk, food, cloth etc. The consumer takes into consideration the marginal utility of goods while purchasing the goods. But the demand for factors is not for their own sake. They are demanded only because they can produce something. Hence the factors are demanded for because their productivity. For example, if we demand a 'tailor' for sewing a shirt, it is very clear that we demand the sewing work of the tailor and not the tailor himself. Hence factors' demand is derived or indirect. Their demand is affected by their productivity, while the demand for goods depends upon marginal utility.
 - Joint Demand. The demand for factors and goods differs in another way also. The demand for factors is joint demand, because production is possible only with the assistance of all the factors. No single factor can do anything. The joint nature of the demand for factors leads to their interdependence in pricing.
2. Difference in Supply. The supply of goods also differs from the supply of factors in the following two ways:
 - Cost of Production. The supply of a firm's output has a deep relation with the cost of production. The costs of production of goods can be estimated while the cost of supply of the factors cannot be estimated. Relation between Price and Supply. Factor pricing is different from the pricing of goods in another way also. When the market price increases, generally the supply of goods also increases. But quite often the relationship between the price and supply of factors is inverse. It is said that there is a backward bending supply curve of labour. It means that when wages increase, labour supply is reduced in some cases.

From the above discussion, we come to the conclusion that although supply and demand analysis is applied here, a separate theory is essential for factor pricing.

Basically two micro theories have been given for the determination of factor prices. These theories are:

1. Marginal Productivity theory
2. Modern Theory

MARGINAL PRODUCTIVITY THEORY OF FACTOR PRICING

Marginal Productivity Theory is a bold attempt to explain the determination of the rewards of various factors of production. It is the work of many writers each improving, amending and modifying the ideas of the other. David Ricardo was the first to use their theory for the determination of 'Rent' of Land. Then Muntford Longfield, in 1830, applied the theory for the determination of 'interest' and 'wages'. But the theory was fully developed and finalized by Jevons, Wicksteed, Walras, and Clark towards the end of 19th century.

Statement of the Theory: According to J.B. Clark, "Under static conditions, every factor including the entrepreneur would get remuneration equal to its marginal product."

According to Prof. Mark Blaug, "The Marginal Productivity Theory contends that at equilibrium each productive agent will be rewarded in accordance with its marginal productivity."

Meanings of Marginal Productivity: The demand for the factors of production is derived demand. It is created by the firms as producers. Factors are demanded because they help in the process of production. Hence factors are demanded for their productivity i.e., for the contribution they make to the production process. Now we can say that the demand for the factors of production depends on their productivity. Higher the productivity of a factor, greater will be its price. Different

concepts have been used in this connection. In order to understand the theory, the various concepts of marginal productivity should be grasped at first (May be described as the production function).

1. Marginal Physical productivity (MPP). Marginal Physical Productivity refers to the addition made to the total physical product by employing one more unit of a factor, the quantity of other factors remaining constant. For example, if four workers produce 20 metres of cloth and when five workers are employed they produce, say 25 metres. The addition made to the total production cloth is $25 - 20 = 5$ meters by the employment of one more worker ($5 - 4 = 1$) is what we call Marginal Physical Productivity.

2. Marginal Value Product (MVP). When we multiply our products price by MPP of the factor we get its MVP = 5×10 (price) = 50 Cedis.

3. Marginal Revenue Productivity (MRP). Marginal Revenue Productivity is the addition made to total revenue of the producer by employment an additional unit of a factor, quantity of other factors remaining constant. For example: If 10 workers produce clothe worth Ghs. 1000 and 11 workers make cloth worth Ghs. 1100, then MRP of the 11th worker is Rs. $1100 - 1000 = 100$.

$$\text{MRP} = \text{MPP} \times \text{MR}$$

Under Perfect Competition, Price = Average Revenue. AR and Marginal Revenue (MR) are equal to each other. So MRP and MVP are one and the same thing. But in case of Imperfect Competition, MR is always less than Price of AR. In this situation, MVP and MRP will not be equal. Since MR is less than AR, MRP will be less than MVP.

4. Average Revenue Productivity (ARP). Average Revenue Productivity is the average revenue per unit of a factor of production. If total revenue productivity of a factor of production is divided by total factor units used, we get average revenue productivity.

The factor of production called entrepreneurship was delinked from labour. Here, the over-riding argument was that entrepreneurship possesses a unique quality and characteristic which ought to be highlighted based on its own merit. Entrepreneurship is the source of employment of all other factors-including labor. In other words, the nature and type of labor employed was a function of and depended on entrepreneurship. Here, I argue that it is possible to have a one-man entrepreneur without any other person (labour) employed- (Refer Ghana's Population and Housing Census 2010). Meaning that production can still be carried out in the absence of one or even two of the traditional factors. Also, I argue that Money/Equity can be separated from capital. This is because capital is any physical investment used to facilitate the conversion process of raw materials into finished products which (itself) has a longer lifespan as a factor of production. Here the acquisition of any capital material is dependent on the availability of money/equity.

We know that production is the result of combined efforts of four factors of production. The value of production is distributed among four factors of production. Land, labour, 'capital' and entrepreneur get reward for their services. Reward for land is called rent and labour gets wages. Similarly capital gets reward for its services. Its reward is termed as interest.

Therefore, interest is the reward for capital. But how can interest on capital remain an appropriate income of the owner of capital from lending it. But the word capital may contain very vast and vague connotations. For example, capital may be described as fixed capital, variable capital, social capital and so on. For this discussion, I would say that by capital is meant the whole of fixed as well as variable capital used for producing anything. But interest is not the income of these two types of capital. That part of capital which is used for lending purposes, which I would call money / or equity, is called capital – earning interest. So we can say that interest is the income obtained from that part of capital which is used for lending. It is the price/value/benefit paid by the borrower of money to its lender.

After having considered the theoretical basis for the justification of the four factors of production, one may ask whether those four factors alone are still relevant and sufficient to undertake production in our world (environment) today. My answer is no! Three other factors are indispensable to ensure successful production today. They are **money/equity, (information) technology** and **market**.

1. **Money/Equity.** I posit that money/equity is indispensable for production and should be given space as factor of production. Money can be defined as anything or object of intrinsic value which is recognized and generally accepted and used within a community as a medium of exchange for goods and services and for the settlement of debt. It is essentially a token or an intermediary.

Example, Cowry shells or gold dust of which all other goods are valued. It makes indirect exchange possible. Equity: In simple parlance, equity is funds meant to support investment/production. It may be the entrepreneurs own cash in the form of savings, or it may be funds borrowed from the 'market'. In this context, money and/or equity may be interchangeable to refer to the medium which the entrepreneur uses as a medium of exchange to secure the other factors and process of production.

As we have learnt all along, money/equity is capital. Some example of capital items for a firm (production) may include premises, power/electricity, money, machines, vehicle and so on. But how can money be capital and machines, premises, motor vehicles and other physical assets remain regarded as capital too? What is the relationship between money capital and the other forms of 'physical' capital? Are interest paid by/on premises, or motor vehicles etc too?

A simple answer is as follows: We know that people can keep their money in three forms: (i) in banks, (ii) in bonds, securities and debentures, (iii) in cash. Keeping money in cash may be desirable over the two other ways of keeping money. Money in cash can be used at anytime. We can buy with it anything we need and desire. But when we deposit our money in banks or, say, when we lend it to someone, we have to wait for our money. During this period we cannot purchase anything with the learnt money. In other words, we have to part with our 'cash' money when we lend it. In other to benefit (obtain utility) from this parting, we get a price which is called interest. In other words, interest is a form of incentive given by the borrower to the lender to make him part with his cash money. Interest has been defined by economists in different ways. Prof. Carver in his book 'Principles of Political Economy' said, "Interest is the income which goes to the owner of capital." According to Seligman, "Interest is the return from the fund of capital". Mayers defined interest as "the price for the use of loanable funds" Lord J.M. Keynes observed, "Interest is a reward for parting with liquidity for a specified period." Here, it is striking that although each definition connotes 'money' or 'equity' as the dominant concept for earning interest, the theorists stop short of using the term 'money or equity' interest. Herein is the case being made that 'interest' as a derived benefit on investment can only be obtained on 'money or equity'.

Some economists attempt to make a distinction between net interest and gross interest to try to argue out that there could be interest on physical capital items as well as interest on money which is also capital.

Net interest: Net interest is the payment made purely for the use of capital. Marshall defined net interest as the 'earning of capital simply as the reward of waiting'. According to Chapman, "Net interest is payment for the loan of capital, when no risk, no inconvenience (apart from the involved in saving) and no work is entailed on the lender". As a result of the wide structure of interest rates, economists find it convenient to talk about "the" rate of interest. By that they mean the theoretical pure interest rate on a riskless loan. This risk is best approximated by the interest rate on negotiable government securities.

Gross Interest: Gross interest include some charges other than the net interest. Besides the price for the use of capital, gross interest also includes reward for risk of lending money, return for inconvenience etc. So we can say that when a person lends their money, they charge interest from the borrower. This interest includes the price for parting with cash money, reward for risk undertaken in lending, payment for inconveniences and so on. Therefore gross interest is the whole thing while net interest is part of it.

Here, again, one may observe that there is no distinctive argument made that apart from cash money, interest connotes other man-made physical assets used in the form of capital. Again, if we would call a spade by its rightful name, we would note that the concept of 'interest' is a function of material cash money.

To charge interest on capital and also charge Depreciation on capital simply amounts to double counting. Why Depreciation and then Interest?

The point has been made above that 'capital' may be a broad and vast concept. For the sake of this discussion, 'capital' refers to fixed assets and variable assets. Fixed assets can be defined as those assets of material values that are of long life, are held to be used in the business, and are not primarily for resale or for conversion into cash. Fixed assets have a limited number of years of useful life. Motors vans, machines, buildings and fixtures, for instance, do not last forever. When a fixed asset (capital) is bought

and later put out of use by the firm, that part of the cost that is recovered on disposal/ or during the period of its lifespan is called **depreciation**.

Depreciation therefore is actually the gradual payment or reclaim of amount invested to use up capital over its lifespan. Provision for depreciation (suffered) will therefore have to be made in the books periodically, in order that the net profits may be correctly obtained after charging all the expenses for depreciation over the period. One can say then, that the whole purpose of charging depreciation is to secure the replacement of capital in order to ensure an unbroken process of production. In this context, if depreciation is set aside (from income realized from production) on capital items such as fixtures, motor vehicles, premises etc, how can such items also provide interest to the entrepreneur? In other words could depreciation and interest be charged or obtained on a capital item (fixed asset) simultaneously and still reflect a true value of profit for the entrepreneur? I submit that such charges would amount to 'double counting' on capital. That may be a reason why 'profits' to the economist may be different from what the accountant may consider as 'profits'. Let depreciation be the reward on capital (physical assets) while interest be charged on the factor of production called Money/Equity.

Money/Equity like all other factors is derived demand. It is said that the factors of production are needed not merely to be consumed directly but because they aid the production of final goods and services. The demand for goods and services is direct demand. On the contrary, the demand for factors is derived demand. On the contrary, the demand for factors is derived or indirect. A consumer directly demand goods like tooth paste, bottled water, pen, flask etc. the consumer takes into consideration the marginal utility of goods while purchasing the goods. But the demands for factors are not for their own sake. They are demanded only because they can produce something. Hence, the factors are demanded for their productivity. For example, if I demand a 'tailor' for sewing a shirt, it is clear that I demand the sewing work of the tailor and not the tailor himself. Therefore, money/equity, like all other factors of production, is needed not for itself but because of its ability to generate rewards or income obtained on final outcome. Here, interest is 'reward' for the entrepreneur which is also his/her profit. On the other hand, if our same entrepreneur procures 'capital' items such as machines, premises, and the rest, depreciation would be made or set aside 'after exchange'.

What about Foreign Direct Investment?

Foreign investment in the syllabus has been treated as "capital" I argue that foreign investment will remain as foreign investment because it may come in any form of factor of production whether as entrepreneur, or labour (Chinese road builders), or capital (bulldozer, generators), new IT gadgets, as well as money/equity

2. Technology (A factor of production)

I argue that "Technology" is an indispensable factor of production in today's environment which must be emphasized all through the academic curriculum; not least within the senior high school economics syllabus. Technology finds its justification as an aid to every economic activity. Its impact in today's business processes and outcomes is incontestable and staggering.

There is a variety of definitions of what technology is all about and it is said that none is universally accepted. One of the basic disagreements is where 'technology' begins and ends and the extent to which it can be separated from any surrounding social, political and organizational context in which it operates. For example, Orlikowski writes about the scope (what is defined as comprising technology itself) and the role of technology.

Types and Characteristics of Technology

What do we mean by the word 'technology' in today's context? According to Blosch and Preech? The concept of technology should be interpreted broadly to include both:

- The physical aspects of machines, equipment, processes and work layout (machine technology) involved in the transformation or conversation process; and
- The actual methods, systems and procedures involved (knowledge technology) in carrying out the work of the organization and transforming or converting inputs into outputs.

By the physical side of technology we are mainly referring to microelectronics and microprocessors, information and communications technologies (ICTS) based on advances in telecommunication, which

can be applied in manufacturing processes, information sharing and processing, service provision and in products themselves. These main forms or applications may be summarized as follows:

- Manufacturing/engineering/design technology- sometimes referred to as 'advanced manufacturing technology (AMT) or 'computer – aided engineering' (CAE).
- Technology used for information capture, storage, transmission, analysis and retrieval. It may be linked to AMT / CAE or may be used separately in information sharing and dissemination in administrative and managerial functions across a variety of organisations and in teleworking and telecommuting.
- Technology employed in the provision of services to customers, clients, patients, etc. in service sector applications.
- Technology as a product itself.

Manuel Castells, in a number of works, notably the three – volume magnum opus *The Information Age: Economy, Society and Culture*, originally published in 1996, offers an extensive and detailed analysis of societal, economic, cultural and organizational change in the contemporary era that tries to explain recent developments in a broader 'Post – modern' context.

According to Castells, the new economy emerged in the last quarter of the 20th century across the world, defined by its three key and intertwined features: it is (i) informational (ii) global (iii) networked. It is "informational" because in the sense that there is a fundamental dependence upon the generation, processing, and application of knowledge – based information; 'global' because the core activities of production, consumption and circulation, as well as their components (capital, labour, raw materials, information, technology , markets) are organized on a global scale and networked because economic activity takes place through a global network of interaction between a variety of business networks. The emergence and development of new forms of technology made all this possible: "This new economy emerged... Because the information technology revolution provided the indispensable material basis for its creation".

The 'network society'

The 'material foundation' of the network society consists of the following:

1. Information is the raw material. Technologies act on information rather than information acting on technology, as in previous technological revolutions.
2. Pervasiveness of effects of new technologies. Because information is an integral part of all human activity, all processes of our individual and collective existence are directly shaped (although certainly not determined) by the new technological medium.
3. Networking logic. Using the new ICTs, the network can now be implemented in all kinds of process and organisations.
4. The flexibility of IT. This mainly concerns the configuration and reconfiguration of organisations and institutions through IT. This 'reprogramming' of the material basis of the organization through ICT can be liberating.
5. The convergence of specific technologies into an integrated system. Old, separate technological trajectories become literally indistinguishable. Thus, micro-electronics, telecommunications, opto-electronics, and computers are all now integrated into information systems.

Example of technologies and technology applications

Advanced Manufacturing Technology

Computer numerical control machine tools (CNC)

Robotics

Computer-aided design / drafting (CAD)

Flexible manufacturing systems (FMS)

Computer-integrated manufacturing (CIM)

Computer-aided production planning and inventory control systems

Materials requirements planning (MRPi)

Manufacturing resource planning (MRPii)

Information Technology

Word processing/personal computers

Intelligent knowledge-based systems

Mainframe, mini, micro computers- used in a stand-alone mode or networked (LAN, WAN, WWW etc.)

Teleconferencing

Video conferencing

Teleworking/telecommuting

Service Provision

Automatic Teller Machines (ATMs)

Electronic Funds Transfer (EFTs)

Electronic Data Interchange (EDIs)

Electronic Point – of – scale (Epos)

Tele text

Patient monitoring systems.

Products

Pocket calculators

Electronic games

Digital watches

Sources: Adapted from Preece, D.A, Organization and Technical Change: Strategy, Objective and Involvement, Routledge (ITBP (1995) P.3

Proof of results

In 1999, Andy Grove, Charman of Intel said, 'in five years time all companies will be internet companies or wont be companies at all". It is believed that the internet is the most transforming invention in human history! Its capacity has changed the transactions are done. This goes deep into the processes and culture of enterprises and far beyond buying and selling. It offers many opportunities for business to grow in sales and reduce costs. According to the American City Business Journal, small businesses that use the Internet grew 46 percent faster than those which did not (Howard, 2002). For example, these days, customers can quickly check product availability, brand, pricing, distribution, place an order and pay electronically all by a click.

In the book 'Marketing Management' (Russell S. Winer, Pearson International Edition) under the topic 'The increased adoption of information technology) it is quoted that in the years 2001, companies in the United States spent the staggering sum of \$800 billion on information and communications technology. Japan (\$400 billion) and German (\$150 billion) were next.

In addition, nearly 100 percent of the sales moving through grocery stores in the United States are recorded by electronic scanner.

Today, considerable amounts of money continues to be poured into transaction – based information systems (TBISs) and electronic data interchange (EDI), the more general term for the electronic exchange of information. These systems take all the information available in a transaction through point – of – sale (POS) terminals and make it available to all the entities in the distribution channel for better decision making.

3. Market (A factor of Production)

Referring from the definitions of economic activity as discussed by Wicksell, Rao, Leftwitch, and Boulding above, one can easily recognize that sometimes, in economics the term production and economic activity may be used interchangeably. Prof. Boulding agrees that economic activities are those which are concerned with production, distribution, exchange and consumption. In other words, economic activity is not complete without exchange and consumption. If production is indispensable for exchange and consumption to occur, why then don't we study or consider the

concept of 'market' as being an important factor in production. In essence, exchange and consumption actually refer to 'market'. Market, in economics, may be defined as the place where buyers and sellers meet to do business. Here, the word of 'market' is a suitable. From an economic standpoint, no entrepreneur will ever think about production without considering to whom, for whom, where and how to produce. In fact, to remain sustainable and pay rent, wages, interest, depreciation, or plough-back (invest) depend on the amount of goods and services consumers will procure through the exchange mechanism. Almost every topic of economics makes references to the market. It is however, striking that 'Market' is left out as a factor of production. For example, Demand discusses individual and market demand. (One individual consumer/buyer is still a market although there would normally be more than single-individual market). Cardinal utility deals with demand and consumer satisfaction. The laws of production itself, cost analysis, market structures (monopoly, oligopoly, perfect competitive markets etc), international trade with its comparative cost theories, national income, and so on all points to the 'market' and yet that important factor has been given only a benign role in production.

Economics is one of the most practical and rewarding subjects; not least, on the senior high school curriculum. But too often the subject is taught dryly, and very traditionally having rigid concepts. I ask, 'How often do teachers consider the important role of technology as they discuss, say Static efficiency, Distribution efficiency or Dynamic efficiency? Or , how often do our teachers discuss the possible initiating factors of modern technology (call it IT) on the concept 'Demand' or 'Elasticities of Demand? Demand has a time dimension. In times past, people from the four corners of Ghana or elsewhere needed to congregate physically to transact business for maize at particular times of the year but that 'physical meeting' may no longer be necessary today because of modern technology.

Economics is a human centered subject and since technology has made a significantly tremendous impact on 'all spheres of man's life; it will be in the right stead to introduce it as a factor of production.

The issue of calculation of National Income (at Factor Cost) traditional approach. It is the sum total of all payments made to the factors of production. The sum total of goods and services in a year is produced by the cooperation of the factors of production and as such their money value is also distributed among the factors of production. These payments take the form of wages, rent, interest and profits. Thus the chief constituents of national income at factor cost are as follows:

- i. All wages, salaries and supplementary incomes earned by employees against productive services rendered, plus (ii) interest paid to private individuals plus (iii) net rents of all individuals; including imputed payments like the rents of self-occupied houses, plus
- ii. Net profits of all kinds of business, including the income of individual business like farmers, professional men like lawyers, footballers, net earnings of joint stock companies comprising dividend payment, undistributed profits and corporate taxes. Minus.
- iii. Transfer payments .i.e. Those income payments for which not productive service is made in return such as social security payments (e.g unemployment benefits, old age pensions et).

Don't money liquidity, IT and/or market play any role in the determination of national income? I posit, they do. The national income measurement at factor cost must be considered holistically.

All cash money with the financial institutions (savings/equity), all new IT equipments and gadgets purchased over the year, all depreciation charged on fixed assets (capital) and the potential size of the market must be considered for determining the national income at factor cost.

Money, Technology (IT) and Markets are not entirely new terminologies to the economist. However, my submission is that they have not been incorporated into the economic syllabus for senior high school in a way which makes it relevant and enhances learning outcomes.

At the senior high level, students would not be expected to design any new 'curves' as such. Like the concept of 'externalities' and/or the matter of 'social responsibility' which guides a multi-national factory to be mindful of social dimensions, those concepts would actually equip students with holistic knowledge.

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