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ECONOMIC BASE THEORY OF URBAN GROWTH: A REVIEW

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**ECONOMIC BASE THEORY OF
URBAN GROWTH : A REVIEW**

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

" Over the past four decades, the number of people living in India has more than doubled - From 350 million in 1947 to nearly 800 million today. During the same period, our urban population has been growing almost twice as fast, and has in fact quadrupled from 50 million in 1947 to over 200 million in 1988. In next thirteen years, i.e. by 2001, it is expected to reach 350 million " (*)

Urbanisation and urbanism is an inseparable aspect and experience of daily life for every city dweller. We all are beneficiaries of delights of city life and at the same time are helpless victims of unplanned and uncontrolled urbanisation. Proliferation of slums and shanty settlements, congestion on roads, overcrowding in Central cities, are all the manifestations of unchecked city growth. No doubt that the process of urbanisation, which as Mills and Becker (1986) put it, occurs, "because of massive shift of labour and capital from predominantly rural to predominantly urban activities in the course of economic development", (1) is an indication as well as a resultant of the overall process of an advance of economy. But unplanned, uncontrolled and uneven urbanisation in many parts of the Third World has caused an alarming concern among the administrators, city planners, environmentalists and academicians.

(*) Report of the National Commission on Urbanisation Vol.I August 1988. P = 1.

The designing of appropriate and effective remedial urban development policies call for an indepth understanding of the factors which cause and govern the process and pattern of urbanisation. A detailed analysis of various inter-relations among economic, demographic, social and political factors whose simultaneous interactions exert their combined influences on the growth of an urban area, is a necessary prerequisite for effective policy formulation and implementation. The present study makes an attempt to review one of the basic theoretical formulations of urban growth viz. the Economic Base Framework. Before we highlight the basic postulates of this theoretical framework, it would be appropriate to have a better perspective of the much broader discipline of Regional Science on the background.

A revival of interest in Regional Science, as a special field of study and research, began in late '40s and early '50s. Regional Science is essentially an interdisciplinary, umbrella concept. As Prof. Miernyk (1976) defines it, " Regional Science is the study of those social, economic, political and behavioural phenomena which have a spatial dimension", (2) and hence it crosses over the boundaries of several disciplines such as Economics, Sociology, Geography, Anthropology, Ecology, Politics and so on. The contribution of these various sciences to this much broader area of analysis has been neatly identified and presented in an article by Prof. Morris E. Garnsey (1956) (3).

As described by Prof. Garnsey, economics has contributed in several ways to Regional Science. As he states it, " many of the relevant conventional methods of Economics are being

consolidated into a new generalised type of theory of Industrial Location particularly applicable to regional analysis ". (Garnsey 1956).⁽⁴⁾ Besides this he proclaims that the general economic theory has contributed several tools, concepts and methods of interregional and international trade to the development of a branch of regional economic analysis which devotes itself to the study of comparative regional analysis of income levels, commodity flows and balances of interregional transactions. This is the arena of what we call now "Regional Economics". Studies in the field of regional economics gathered momentum in mid '50s. According to Prof. Meyer⁽⁵⁾ who wrote a survey article on regional economics in the 1963, volume of American Economic Review, the sub-discipline of Regional Economics primarily comprises of the following aspect of analysis.

1. The Location theory ;
2. The interregional and international Multiplier analysis; ^(*)
3. Leontief's interindustry input output analysis; and
4. Mathematical programming.

Urban economics, as a separate field of research became strengthened in early 1960s. As Goldstein and Moses (1973)⁽⁷⁾ point out in a survey article, a large amount of literature has grown up in the field of urban economics which can broadly be classified into the following branches viz.

1. Studies of composition, growth and spatial form of urban areas; and

(*) In another survey article on Regional Economics, by Richardson (1978)⁽⁶⁾ the Economic Base framework and the Multiplier analysis is described as the "Oldest and simplest" forecasting model in regional economics.

2. Analysis of problems of urban areas such as congestion, growth and spatial form of urban areas; and employment and so on.

As Goldstein and Moses describe, "Most approaches to urban growth are demand-driven and are exercises in comparative statics rather than dynamics". (Goldstein & Moses 1973)⁽⁸⁾. The two main demand driven urban growth theoretical frameworks are:

1. The Central Place theory developed by Christaller; and
2. The Economic Base theory. (1964)⁽⁹⁾

The model developed by Borts and Stein views urban growth from the supply side This was later on modified by R.F.Muth .

The scanning of the literature on urban growth reveals that, the Economic Base Framework which emerged in its most organised form for the first time in mid 1920s, has been extensively studied, reviewed, modified and tested empirically over the period of last 65 to 70 years. The theory has been in continuous light for all these years. It has been reviewed and updated from time to time in concurrence with the changing realities of urban growth in the Developed as well as Developing nations. On account of this, it was thought that a review of emergence and subsequent developments of the basic tenets of the theory would be of help in understanding and analysing the process of urban growth. Incidentally, the theory was applied and tested in the case of Pune recently; and the study has been published in February 1991.

The present study has been devoted to the review of the Economic Base theory of urban growth. The growth of an urban area, according to this framework, is triggered off by the

establishment and growth of "Export" or "Basic" activities of the region. The 'Export' or 'Base' activities are defined to be those which primarily cater to the outside, non-local markets. These activities earn a net inflow of money/wealth for the community, which provides the necessary impetus for the growth of the web of local activities. Therefore, the theory postulates that the initial or original change/disturbance in the 'Basic' sector of the region exerts a 'Multiple' impact on the entire urban area. Thus the concept of 'Multiplier' is an integral part of the Economic Base theory. The Multipliers are mainly of two types viz. the Employment Multiplier and the Income Multiplier. As data regarding employment is generally easily available at the sub-national level, most of the Base studies use employment as a unit of Base.

The thesis contains in all six chapters including Introductory and Concluding chapters. The present chapter is followed by a Chapter which provides an overview of the urbanization process. (Chapter 1). This chapter consists of in all four sections. The first section deals with the basic concepts and definitions of various terminologies. The second section presents an elaborate account of the emergence and growth of cities. Section three presents a global view of the urbanisation process. The last section i.e. section 4 reviews the urbanization experience of India. Chapter 2 provides a concise account of some of the main theoretical formulations of urban growth. Chapter 3 is devoted to the presentation and discussion of the fundamental tenets of the Economic Base framework. This chapter is divided into three sections. The first section is devoted to the understanding of the basic postulates of the Economic Base theory.

The second section summarises the discussion about the choice of various units of and suitability of Base identification and measurement. The last section of the chapter reviews the main techniques of Base measurement. The subsequent chapter (chapter 4) discusses the concept of Employment Multiplier. As majority of the Base studies use employment as a unit of Base due to its easy availability and the policy implications that the unit has as far as Urban and Town Planning is concerned, the discussion is primarily about the theoretical concept and the empirical usage of the Employment Multipliers. This, of course, does not undermine the importance and utility of Income Multipliers, but the focus has been set on the Employment unit of Base.

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CHAPTER: I :

URBANIZATION: AN OVERVIEW:

1.1 BASIC CONCEPTS & DEFINITIONS:

Urbanisation is an indication as well as a resultant of the overall process of economic development. A proportion of Country's total population residing in urban areas at a point of time is an emblematic feature of the process of economic development. Economic advancement is characterized by several structural changes in the economy. These are reflected in the changing contributions of the three main sectors of the economy viz. agriculture, manufacturing and services, to the Gross Domestic Product (GDP), as well as in the sectoral shift of the productive resources; mainly capital and labour.

It is an established and an accepted proposition that a close link exists between the levels of economic development and urbanisation and that the pace and pattern of the former shapes the course of the latter. As Rakesh Mohan states, "It is found that as income increases, urbanisation proceeds slowly in the initial stages, accelerates (in the stage of countries which are now known as middle income countries) and again slows down at very high levels of income". (Mohan R: 1984) ⁽¹⁾.

In the initial stages of economic development the pastoral activities are predominant. The level of per capita income is low. Agriculture being the prominent source of livelihood, a large chunk of labour force is engaged in the primary activities. Food items account for a substantial proportion of the household expenditure. As income rises, the proportion of the increased income spent on food items gradually declines. In the initial stages of economic advancement, when the rate of growth of expenditure on non-food items is slow, the rise in demand for these goods is also slow.

But as the proportion of increased income spent on non-food items continues to rise, the demand for such items increases too. This initiates the process of sectoral transformation of labour and other factors of production from the agricultural sector to the non-agricultural sector.

This sectoral shift of productive resources has a geographical dimension also. Agriculture is primarily located in rural areas while the main non-agricultural activities viz. industry and services are situated in urban areas. At higher levels of income, as the demand for non-food items increases, the demand for labour and other inputs required for the production of these goods increases in the urban areas. The migration of labour from rural areas to growing urban centres accelerates with the increase in demand for non-food items, and consequently ... urbanization gets accentuated.

Once we postulate that the process of economic development is characterized by the sectoral shift of the productive resources which further entails a geographical movement between two areas viz. "Rural" and "Urban", it is pertinent at this juncture to define the two related terms "Urban" and "Urbanization". When we observe that, the non-agricultural activities concentrate in urban areas and the growth of these sectors accentuates the process of migration from rural areas to urban areas, we have to tackle a closely related issue of why these non-agricultural activities are located in the urban areas.

1.1.1 ATTRIBUTES OF AN 'URBAN' AREA:

The demarcation of geographical regions as 'Rural' and 'Urban', as well as the classification of population as 'Rural Population' and 'urban population', is by no means an easy task, but rather it is a complicated issue. As

Hauser puts it, "Although urban population is widely understood to include the population resident in cities, the definition of urban is, nevertheless, a complex matter.

The delineation of areas as 'urban' or 'rural' is often related to administrative, political, historical or cultural considerations as well as demographic criteria'.

(Hauser P.M. 1966)⁽²⁾. It is, therefore almost impossible to have unique definition of the term 'Urban' universally applicable at all times. Not only that the definition of an 'urban' area varies greatly from country to country, it undergoes changes over the period of time in the case of a single country too.

The several criteria that are generally used to differentiate between an urban locality and a rural area could be broadly classified on quantitative and qualitative basis^(*)

The most widely used quantitative measures of differentiation are ; (i) A certain minimum population (ii) Density of the population; and (iii) The importance of non-agricultural activities in a region.

The qualitative attributes of urban life emerge primarily out of a specific economic-demographic-social milieu of an urban area. This milieu is nurtured on a distinct and definite size and type of economic activities and relationships among them which further determine the demographic features -of that area too. The word "Urbanism" is in fact a post-

(*) The qualitative criteria or attributes refer to all those characteristic features associated with urban way of life i.e. urbanism. This encompasses a whole gamut of attitudes, behavioural patterns, institutions, the nature of interpersonal contacts, the forms of organisation, the legal system, the role of the market mechanism, the modes of transport and communication and so on.

facto description of the urban way of life which has its roots in the type of economic and commercial activities which generally concentrate in urban areas. So it is the quantitative measures of differentiation which reflect the distinctly different economic and the resulting demographic features and foundations of an area labelled as 'Urban', are widely used for demarcation and comparison purposes across space and time.

The importance of quantitative measures of differentiation has been expounded by Prof. Rakesh Mohan in a systematic fashion (Mohan R: 1984). He states, "Conceptually, disregarding details and practical problems characteristically encountered in the classification of urban areas by census authorities, the essence of urban areas lies in (i) the size of settlements, (ii) the density of these settlements, and (iii) the predominance of non-agricultural activities"⁽³⁾. The predominance of non-agricultural activities is actually a consequence of factors such as size and density of a settlement⁽⁴⁾. The emergence of an urban centre then appears to be an outcome of the simultaneous existence and interplay of all these three factors.

Population concentration of certain minimum size is a necessary pre-requisite for the location of some manufacturing and other activities which require a 'threshold size of market' below which the production of that particular good or service is not feasible economically (Schreiber et.al, 1971)⁽⁵⁾. In such activities demand which is sufficient for profitable production exists, when the market is above the

threshold size. As the size of the market expands, over and above the threshold, the enterprises enjoy the economies of scale. Agriculture is a land intensive activity. This makes difficult the concentration of people engaged in agriculture at one place. On the other hand, the non-agricultural activities use land as one of the inputs in the process of production. These activities require land as a mere site to conduct an activity. As Rakesh Mohan puts it, 'This is another way of saying that the elasticity of substitution between land and non-land inputs in agriculture is limited, while in industry and services it is high. As a result, industry and service activities tend to be capital intensive and are therefore, concentrated in space which leads to concentration of human population as well' (Mohan R 1984) (6).

This interplay of these three factors viz. size of the population, density and the predominance of non-agricultural activities is somewhat like this: In a virgin land (i.e. an area having certain amount of population concentration but devoid of non-agricultural activities) a manufacturing firm is set up. Selection of an area for the location of a firm would depend upon the locational decisions of the firm. The entire branch of economics viz. The Economics of Location deals with this aspect of location of economic activities at a particular point over the space. As Thomlinson (1969) (7) suggests, the centralization of manufacturing and/or service activities at a particular location may be on account of one or more of the following factors:

- i) Proximity to market: Especially those industries which enjoy economies of scale and therefore require certain threshold size of the market. This also includes firms producing bulky and perishable products.
- ii) Proximity to raw materials.
- iii) Proximity to Power.
- iv) Proximity to skilled man power.
- v) Availability of efficient transportation network.
- vi) Natural advantages as good climate, abundant water supply and land.
- vii) Availability of investible resources like capital and so on.

The establishment of a manufacturing firm/s gives an initial impetus to further concentration. This is specially so in the case of industries exhibiting economies of scale. As Rakesh Mohan (1984) ⁽⁸⁾ puts it, "The existence of industries exhibiting scale economies implies plants of certain optimal sizes, which induces concentration". The employment and income generated by these newly established activities give rise to further rounds of economic activities. This chain could be described as follows:

- a) Employees of these units and their families require certain consumer goods and services. Emergence of this demand attracts firms and individuals who cater to this demand.
- b) The large manufacturing units require several ancillary manufacturing services. This gives rise to the agglomeration of several ancillary units around the larger parent units. These backward linkages become stronger over the time and further accentuate the local concentration.

- c) Enlarged population and activity canvas then requires certain specialised services such as banking, finance, marketing, insurance, consultancy, printing and so on.
- d) The pre-existence of such agglomeration economies attract further private as well as public investment in the forms of creation of new production capacities and development of civic infrastructure. This gives birth to the next spiral of concentration. The complementary manufacturing and service units which supply their inputs and services to the manufacturing firms and population find it profitable to locate near such plants to minimise the transportation costs. Competition for the available space induces the optimal utilisation of every piece of land. This leads to the rise in the density of the region. So, it is a simultaneous interaction of all these forces which gives a location the face of an 'urban' centre. As Rakesh Mohan describes it, "Hence, it is the combined operation of scale economies, agglomeration economies, the existence of transport costs, and the comparatively higher non land - land substitution elasticities in industry and services which make their location desirable in urban areas" (Mohan R:1984)⁽⁹⁾

1.1.2

URBANIZATION:

The foregoing analysis highlights the fact that, the demographic process of population concentration is fundamental in the emergence of an 'urban' centre. The other two characteristic features namely density and primacy of non-agricultural activities emanate from this basic characteristic feature of Population concentration of certain minimum size. Logically, it then follows that, the process of urbanisation is that process which results in the emergence

and growth of population concentration. One of the most unambiguous and comprehensive definitions of Urbanization is provided by Hope Tisdale Eldridge (1956)⁽¹⁰⁾. According to him "Urbanization is a process of population concentration. It proceeds in two ways. The multiplication of points of concentration and the increase in the size of individual concentrations".

As Hauser (1966)⁽¹¹⁾ postulates, the term "Urban Population" is widely understood to include the population resident in "cities". The formation of cities is an integral part of the process of urbanization. In fact, Hope Tisdale Eldridge proclaims, "Consistent with the definition of urbanization, cities may be defined as points of concentration" (Hope Tisdale Eldridge: 1956)⁽¹²⁾. It becomes clear from his discussion that urban centres are the points of population concentration, while concentrations beyond certain level are designated as cities. He states, "There is no need at this juncture to fix lower limits to the size and density which qualify a concentration as a city. There is no clear-cut level of concentration at which a city suddenly springs into being. It is convenient from time to time arbitrarily to name certain levels beyond which concentrations are designated as cities. This is necessary in analysing data and identifying characteristics of various size groups, but it does not alter the validity of the original concept" (Hope Tisdale Eldridge 1956)⁽¹³⁾.

1.2 EMERGENCE AND GROWTH OF CITIES:

The emergence and growth of cities is an important manifestation of the process of urbanization. Hope Tisdale Eldridge (1956)⁽¹⁴⁾, in fact claims that "Just as long as cities grow in

size or multiply in number, urbanization is taking place". The view that urbanisation is "the societal process that creates the dynamic system that we call a city" (Hirsch W: 1973) (15), is shared by authors like Eric Lampard also. He states "Under a demographic formulation, cities are viewed as points of population concentration, they are the product or outcome of urbanization. Thus urbanization is a societal process that necessarily precedes and accompanies the formation of cities". (Lampard E.E. 1966) (16).

Urbanization is a dynamic phenomena. Being a concomitant of the process of overall economic development, the factors and the forces which shape the pattern of development at different levels, have a close bearing on the associated levels of urbanization and the forces which govern its pattern. The process of economic development is characterized by important structural changes. The process of urbanization too, receives an impetus for growth from the development of several sectors closely associated with different levels of economic development. Even though the factors which shape the pattern of urbanization at its different levels undergo a change which is concurrent with overall economic development, there are certain basic factors which are necessary for urbanization at all levels. As Hope Tisdale Eldridge (1956) (17) puts it, "Two conditions appear to be necessary for urbanization. One is people and the other is technology. Population increase and surplus feed the process; technology gives it form and focus. All three of them, population increase, technology and urbanization, work along together. The whole thing is a spiral arrangement whereby technology produces production surplus and encourages population increase, population surplus and increase encourage further technology, and the upshot is urbanisation" -

Eric Lampard (1966) ⁽¹⁸⁾ while calling technology as a 'cultural' variable, introduces one more 'Social' variable namely the organization. Cities being the result of urbanization, the same four factors are instrumental in the formation and growth of them. While explaining this, Hauser (1966) ⁽¹⁹⁾ states, "It seems clear that the emergence and development of the city was necessarily a function of four factors; (1) the size of the total Population; (2) the control of natural environment; (3) technological development, and (4) developments in social organisation".

1.2.1 HISTORICAL ACCOUNT OF CITY GROWTH:

One of the comprehensive accounts of the historical growth of urban centres and the emergence and development of early cities is found in an article by Kingly Davis titled, "The origin and growth of urbanisation in the world" (Davis K: 1959) ⁽²⁰⁾. Cities are the points of population concentration. An urge for permanent settlement is basic to this phenomena. Therefore transition from hunting and fishing to agriculture, which occurred in the Neolithic Age was the first major landmark in the history of the formulation and organisation of human Settlements. Several technological innovations, which began some 8 to 10 thousand years ago were associated with this Neolithic culture. But these were not adequate to give rise to larger settlements which could be classified as towns. While describing this transition, Davis states, " Even though the Neolithic Population was more densely settled than the purely hunting or food gathering peoples, it was nevertheless chiefly engaged in an occupation - agriculture - which requires a large amount of land per person. The Neolithic Population density was therefore not a matter of town concentration but rather

a matter of tiny villages scattered over the land" (Davis K: 1959) (21). The historical account of the process of urbanization presented by Davis reveals that certain inventions like the Ox-drawn plough, the wheeled cart, irrigation, the sailboat, and such other, which appeared during 6000 and 4000 B.C. facilitated a more intensive and a more productive use of the Neolithic elements. When these improved techniques were put to use in regions with favourable natural - climatic conditions, as Davis puts it, "The result was a sufficiently productive economy to make possible the sine qua non of urban existence, the concentration in one place of people who do not grow their own food" (Davis K:1959) (22).

This highlights the role of technology, which Eric Lampard calls a 'Cultural' variable in the process of growth of urbanization. The 'Social' variable of organisation, again to use Lampard's terminology, also plays a vital role in this process. Commenting on this aspect and explaining the vital role of social organisation in the process, Davis states, "The rise of towns and cities therefore required, in addition to highly favourable agricultural conditions, a form of social organisation in which certain strata could appropriate for themselves part of the produce grown by the cultivators. Such strata - religious and governing officials, traders and artisans - could live in towns, because their power over goods did not depend on their presence on the land as such. They could thus realise the advantages of town living, which gave them additional power over the cultivators". (Davis K:1959) (23).

Population concentration, which could be termed as first 'cities' appeared sometime between 6000 to 5000 B.C. These

larger agglomerations seemed to have given rise to certain superior inventions, both technological and social organisational, which facilitated the emergence of, what Davis describes as 'true' cities in Egypt, Mesopotamia and India (Davis K: 1959) (24). The incidence and advancement of the early urbanisation and the size of the cities was greatly determined by the then prevailing technology of agricultural production, transport and other political limitations. While highlighting this fact Davis writes, "Agriculture was so cumbersome, static, and labour intensive that it took many cultivators to support one man in the city. The technology of transport was as labour - intensive as that of agriculture long - distance transport was reserved largely for goods which had high value and small bulk - i.e. goods for the elite - which could not maintain a large urban population. The size of the early cities was therefore limited -by the amount of food, fibres and other bulky materials that could be obtained from the immediate hinterland by labour intensive methods ... " (Davis K:1959) (25). The pace and pattern of technological development shapes the overall course of economic development. Different levels of economic development are associated with various stages of technological advancement. It is a spiral process. Certain level of technological knowhow designs the process of development in near future and the attainment of an higher level of economic development sows the seeds of further advancement of technology. Different stages of urbanization and the changing forms of the cities too, depict the same process. The evolution of a region from small village community to

a gigantic metropoly and the intermediate stages of settlement are closely associated with a staged development of technology in agriculture, industry, transport and communication at the successive levels of economic development. N.S.B. Gras, has outlined the relationship between economic development and settlement or habitation patterns in his analysis of evolutionary process. He delineates five stages as: (i) the collectional economy, (ii) the cultural-nomadic economy; (iii) the settled village economy; (iv) the town economy; and (v) the metropolitan economy (Gras N.S.B: 1926) (26) .

1.2.2 THE EVOLUTION OF MODERN CITY:

The early settled village economy of small groups was the outcome of the invention of the art of cultivation. Agriculture was the dominant way of making a living. Further advancements in the techniques of agricultural production which raised the productivity of land and labour, produced larger surplus which could feed even a larger number of persons who were engaged in other non-agricultural activities. Further proliferation of crafts, artisans and petty traders and manufacturers was necessarily a function of the larger size of agricultural surplus which was made possible by technological innovations in agriculture.

The development of still larger agglomerations in terms of population size and the geographical spread was a function of further advanced and efficient technology. Evolution of larger concentrations required a different organisational set up. This was necessary for managing newer and more complex social, functional and economic interrelations within the agglomeration and between the hinterland and the aggro-

meration. Diversity of occupations gave rise to specialisation. Coordination and integration of such a plathora of heterogenous activities required still efficient forms of social, legal and political institutions.

The emergence of larger towns and cities was an outcome of technological developments both in the agricultural and non-agricultural sectors. A critical factor which played a vital role in the enhancement of productivity was the increasing use of non-human sources of energy in the production process. The invention of a machine, was powered first by water or wind, then by steam and now by fuels and electricity. Expanded activities, scales of production, specialisation was paralled by concomitant evolutions in the social and economic institutions of government and markets. Technologically improved and efficient means of transport and communication further facilitated the development of local, regional, national and international markets.

The speedy development and expansion of the non-agricultural sectors and especially industries, marks a further stage of overall economic development. Industrialisation is then a coterminus of economic development. The industrial revolution of the 18th century which first emerged in Great Britain added a new dimension to the overall process of urbanisation. Industrialisation and the growth of certain urban centres due to the centralisation of industries at those points, gave an altogether a different look and form to the cities of the late 18th and early 19th century. The industrial city of the 18th and the 19th century was qualitatively different in several aspects as compared to the pre-industrial city.

The developmental phase of urbanisation prior to the industrial revolution is termed as "classic urbanization" by Eric Lampard. According to him ... "The most ubiquitous form of specialisation for a city was at all times in its historically definitive role as a general central place. The larger a system's population area, the more numerous the central places it would require" (Lampard E:1966) (27). Under this system the 'Centrality' of a place would depend upon the variety of the services that it would provide to its service area or the hinterland. The existence of such services, their diversity and number determined the hierarchy of settlements in the entire system. As Lampard puts it, "Only the largest, wealthiest, and most 'Central' agglomeration would normally serve the entire system with the whole range of highly specialised goods and services, whereas the least specialised items were available locally through the system on the basis of comparative accessibility or competition" (Lampard E: 1966) (28). The emergence of cities of different sizes and the hierarchy among them was on the agrarian background. Cities performed the function of collection and distribution of farm and non-farm products. Those services which required certain "Threshold" demand for their production would be located in the cities. So, basically the City's primary function was to serve as a "service centre" for its hinterland. The scope for diversification and specialisation was limited. While describing the nature of cities under classic urban system, Lampard remarks, "This notably 'Static' order of classic urban systems - from antiquity through the medieval efflorescences of China,

Europe and Africa into early modern times - was rooted in the constraints of a largely undifferentiated agrarian base. Apart from relatively minor flows of interregional trade and tribute, productive activity remained local and unspecialised" (Lampard E: 1966) (29).

The industrial city of the 18th century was a qualitatively new and a distinct phenomena. It was a product of advancement in agricultural productivity and acceleration in the development of industrial technology. The advent of machine and the increasing use of non-human sources of energy namely power, fuels, coal etc. changed the process of production. Production was no more a simple process. Factory was an outcome of the process. This marked the separation of the place of work from the place of residence. The factory and the changing work culture gave rise to improved forms of organisation and management. The industrial city was no more a 'service' centre of its hinterland. It was a centre of sophisticated industrial activity characterized by economies of scale, and having national markets. Increasing Complexity of the production process and the high rate of technological development fostered specialisation. Greater specialisation and larger division of labour made the entire production process highly interdependent. Rapid growth of the industrial activity fostered the growth of specialised services such as finance, consultancy, banking, insurance, communication and so on. The industrial city then was a dynamic complex phenomena. It was distinctly different from the pre-industrial city in all respects.

1.2.3 THE "METROPOLITAN" CITY:

The "Metropolitan City" of the 20th century is an outcome of an extensive application of science to industry and the advent of automobile. The modern development of mechanised transport and means of instant long-distance communications gave the modern metropolitan city an altogether a new imprint. The emergence of a metropolity owes its existence to several forces as:

- i) Migration: As the process of centralisation of manufacturing and commercial activity in the Central city began, the expanded job market attracted hoards of job seekers from the surrounding region, thereby increasing the density in the Central city. High congestion and the co-existence of residential complexes and commercial/industrial dwellings would invariably lower the operational efficiency of the system.
- ii) Expansion and Spread of Activities: Due to congestion in the Central industrial - residential - commercial belt, the large, growing manufacturing firms encounter severe restrictions on their physical expansion from the local authorities. These firms then prefer to either relocate or open a new branch on the fringe of the Central town. Efficient transportation network facilitates such an outward movement. Increase in the volume of activities in the Central city leads to the appreciation of the land values. This further accentuates the tendency of outward movement on the part of business and manufacturing enterprises to exploit cheap land and labour on the outskirts of the Central city. Increasing prices of land, and especially the prices of land for residential purposes,

provide an incentive to both low and middle income earners to shift their residence to nearby suburban areas. This tendency is strong, provided that there exists an efficient, easy and economic transportation network between the Central city and the suburban areas. Interaction of all such and other factors precede the emergence and growth of a modern metropolis.

1.3 URBANISATION: A GLOBAL VIEW:

Urbanisation has now become a global phenomena. It is projected that by 2025 A.D., 62.5 percent of the total world population would reside in urban areas ⁽³⁰⁾. At all times the level and/or Degree of Urbanisation (i.e. the proportion of population living in urban areas) in the more developed regions of the world has been higher than the less developed regions.

It is projected that the Developed regions would attain the level of urbanisation as high as 85 percent by 2025 A.D. The trend of world urbanisation however shades light on few important differences in the urbanization experience of the Developed and the Developing regions. The less developed regions are rapidly becoming urban. In 1970 25.2 percent of the population in these countries was living in urban areas. In the span of mere 55 years i.e. by 2025 A.D., this proportion is projected to be around 58 percent. But still this level is well below the projected level of urbanisation that the more developed regions would attain by that time. As against this the rate of urbanisation i.e. the rate of growth of the proportion urban for the entire group of less developed regions is significantly higher than that of the more developed regions. This is clear from table 1.1(a) and 1.1(b). Even though the fact that these Developing countries had a smaller urban

base historically in a way inflates the growth rates, the crux of the matter does not change much.

Table 1.1(a): Proportion of population living in urban areas by major regions: 1970 - 2025 (percentage).

Region:	Proportion of Urban Population.								
	1970	1975	1980	1985	1990	1995	2000	2010	2025
1. World Total	36.9	38.3	39.9	41.6	43.6	45.8	48.2	53.8	62.5
2. More developed regions	66.4	68.7	70.6	72.4	74.2	76.0	77.8	81.2	85.4
3. Less developed regions	25.2	27.1	29.4	31.7	34.4	37.3	40.4	47.3	57.7

Table 1.1 (b): Rate of Urbanisation by Major Regions, 1970-2025 (Annual Percentage Change).

Region:	Rate of Urbanisation.							
	1970-75.	1975-80.	1980-85.	1985-90.	1990-95.	1995-2000.	2000-2010.	2010-2025.
1. World Total	0.72	0.81	0.84	0.93	0.98	1.03	1.10	1.00
2. More developed regions.	0.69	0.53	0.50	0.49	0.48	0.46	0.43	0.34
3. Less developed regions.	1.43	1.58	1.56	1.61	1.62	1.60	1.59	1.32

Source: Compiled from the United Nations' Population Studies, No.93, 1983 Monitoring Report, Volume I PP. 182 - 183.

The rate of urbanisation in the Developing regions is quite high as compared to the Developed nations. But they are not devastatingly high per se. In fact, from Table 1;1(b), we can see that the projections for the period after 1995 depict a consistently declining trend in this rate from 1.62 per cent in 1990-95 to 1.32 per cent in 2010-2025 A.D. But this is not all. The urbanisation pro-

cess in the Developing countries is characterised by an interesting phenomena that, even though the rate of urbanisation is not significantly high, the rate of growth of Urban Populations is substantially high in these countries. This becomes clear from Table 1.2.

Table 1.2: Average Annual Growth Rate of Urban Population by Major Regions.

Region:	Annual Growth Rate (Percentage).							
	1970	1975	1980	1985	1990	1995	2000	2010
	-75.	-80.	-85.	-90.	-95.	2000	2010	2025
1. World Total	2.7	2.6	2.5	2.5	2.6	2.5	2.4	2.0
2. More Developed Regions.	1.6	1.3	1.1	1.1	1.0	1.0	0.8	0.7
3. Less Developed Regions.	3.9	3.7	3.6	3.5	3.5	3.4	3.1	2.5

While pinpointing this peculiarity of the urbanisation process in the Third World, the United Nations Monitoring Report of 1983 remarks, "The more detailed data for the various world regions show that some of them, such as large parts of Africa and South Asia, which still present low levels of urbanisation, will face a dramatic growth of their urban population". (31).

1.4 URBANISATION: THE INDIAN EXPERIENCE:

The discussion in the earlier section, then implies that in the Developing nations of the Third World, the spread of the incidence of urbanisation is not even over space and over urban settlements of different sizes. The process of urbanisation is taking place in a polarized manner. The growth is concentrated in few size classes of urban centres. The Monitoring Report of 1983 makes a very pertinent observation in this regard stating that "Urbanisation of the world population has continued at a very rapid

pace, with an increasingly marked trend in the developing countries towards concentration in very large metropolises" (32). This peculiarity of the urbanisation process has several ramifications as far as the overall developmental process of the Developing countries is concerned. While highlighting this issue, the report makes a succinct remark as, "Even a moderate rate of urbanisation can, nevertheless, have negative consequences for individual cities if urban growth is concentrated in one or in a few urban places. In fact, many developing countries are characterised by a strong concentration of urban population growth in a primate city, which is usually substantially larger than the next smaller cities. Such a concentration of the urban population not only produce enormous problems for the primate city but tends to perpetuate the regional disparities in social and economic opportunities of which it is a reflection, and it is widely viewed as a major obstacle to development" (33).

1.4.1 URBANISATION PROCESS IN INDIA:

The urbanisation process in India is in conformity with the peculiar characteristic features of the urbanisation process in the Developing nations of the Third World. The Indian Census (1987) defines and declares a settlement to be an 'urban' if it -has a municipality, corporation, cantonment board or notified town area committee, etc. Other places are also termed as 'Urban' if they have (a) a minimum population of 5,000, (b) at least 75 percent of male working population engaged in non-agricultural pursuits; and (c) a density of population of at least 400 persons per square kilometer" (34). This means that there are two types of urban areas; as those having some type of statutorily notified area agency and those other which satisfy the demographic and economic criteria mentioned

above. The second type of urban units are generally termed as 'Census Towns' (35).

There were in all 4029 urban units or towns in India as per the 1981 census. These include 80 towns in Assam where the census enumeration could not take place due to disturbed conditions. The Census Monograph referred here therefore does not include these 80 towns in the analysis. So the number of urban units, according to the 1981 census, for operational purposes is 3949. India depicts a steady growth in the degree of urbanisation which is generally measured in terms of absolute or relative number of people living in urban areas. This is presented in Table 1.3.

Table : 1.3: Degree of Urbanisation: India (*)
1951 - 81.

Year:	Per cent urban population.
1951	17.59
1961	18.24
1971	20.21
1981	23.70

(*) Excludes Assam.

Source: Urban Growth in India 1951-81: A Statistical Analysis: Census Monograph No. 1 - P = 7.

Over the period of last 30 years, as the number of towns has gone up from 3036 in 1951 to 3949 in 1981, the average population size of an urban unit also has almost doubled during the same period. This is shown in Table 1.4.

Table : 1.4: Urban Units, their population and average size of an urban unit.

Year:	No. of Units:	Urban Population	Average size of an urban Unit.
1951	3036	6,20,98,878	20,454
1961	2647	7,81,55,315	29,526
1971	3054	10,78,24,755	35,306
1981	3949	15,76,80,171	39,929

Source: Urban Growth in India 1951-81,
A Statistical Analysis: Census
Monograph No.1 - P = 3.

1.4.2 UNEVEN INCIDENCE OF URBANISATION:

The imbalance in the incidence of urbanisation is visible at two levels viz. at national and at regional level.

At the National level the tempo of urbanisation is concentrated in a few States. The 9 States listed in Table 1.5 accounted for almost 80 per cent of the urban population of India in 1981. But this was largely on account of the fact that, almost 76% of the country's total population was residing in these nine States.

Table: 1.5: Degree of urbanisation and the urban population of 9 highly urbanised States of India: 1981.

State:	Urban Popula- tion 1981 (Nos).	% of Urban popu- lation to total population of the State.	% of urban population to total urban population of India.
1. Maharashtra	2,19,93,594	35.03	13.95
2. Tamil Nadu	1,59,51,875	32.95	10.15
3. Gujarat	1,06,01,653	31.10	6.72
4. Karnataka	1,07,29,606	28.89	6.79
5. West Bengal	1,44,46,721	26.46	9.13
6. Andhra Pra- desh.	1,24,87,576	23.32	7.93
7. Madhya Pra- desh.	1,05,86,459	20.29	6.72
8. Uttar Pra- desh.	1,98,99,115	17.95	12.62
9. Bihar	87,18,990	12.47	5.52
TOTAL:	12,54,15,589		79.52

Source: 1. Report of the National Commission on Urbanisation Vol. 2 - Aug. 1988 - P = 9.
2. Urban Growth in India 1951 - 1981
A Statistical Analysis, Census Monograph No.1
P = 38.

At the State level too, the process of urbanisation is centralised at few centres. This is visible from the fact that, in some States, even though the rate of urbanisation (i.e. the rate of growth of proportion urban or the rate of growth of level of urbanisation) is not that high, the rate of

growth of urban population is quite significant. This is vividly seen in the case of larger States like Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar and Andhra Pradesh. Despite the fact that these five States have a large rural population and rural settlements, 43 per cent of the total urban centres are located in these States. All the five States have experienced very high growth rates of urban population during the decade 1971-81 without much significant changes in their levels of urbanisation (see Table 1.6). Incidentally, a high rate of overall population growth was one of the important factors contributing to speedy urbanisation in the case of these States. While pointing out this fact, the National Commission on Urbanisation remarks, "It may be noted that the overall rate of population growth in Uttar Pradesh, Bihar, Madhya Pradesh and Andhra Pradesh is high and the sheer increase in the number of people in these States itself generates urbanisation"⁽³⁶⁾.

Table: 1.6: Level of urbanisation and Decadal, annual growth rates of Urban Population of Five Large States of India.

State:	Level of Urbanisation (%).			Decadal Urban Growth rate(%).		Annual Growth Rate (%) (Simple).	
	1961	1971	1981.	1961-71	1971-81	1961-71	1971-81.
1. Uttar Pradesh	12.85	14.02	17.95	30.4	61.1	3.04	6.11.
2. Rajasthan.	16.28	17.63	21.04	38.3	59.2	3.83	5.92
3. Madhya Pradesh	14.29	16.29	20.29	46.4	56.5	4.64	5.52
4. Bihar	08.43	10.00	12.47	43.6	55.2	4.36	5.52
5. Andhra Pradesh	17.44	19.31	23.32	66.2	49.0	6.62	4.90

Source: Urban Growth in India: 1951 - 81.

A Statistical Analysis . Census Monograph No.1

PP = 38,39,47.

Among the areas designated as urban, the phenomena of urban population growth is again concentrated in urban areas of certain size. The data compiled by the National Commission on Urbanisation reveals that, among the six size classes of the towns, the class I towns with a population of 1,00,000 and above, which are designated as "cities" in the Indian Census are swelling. Both, at the National as well as at the State level, the class 1 towns account for the largest chunk of the urban population. The corresponding statistics is presented in Table:1.7.

Table: 1.7: Distribution of Urban population into different sizes of Towns (1981).

State:	Urban Population 1981.	Percentage of Urban population in towns belonging to size class. **					
		I	II	III	IV	V	VI
India	15,97,27,357 *	60.5	11.5	14.3	9.5	3.6	0.5
1. Andhra Pradesh	1,24,87,576	53.8	16.2	20.8	7.4	1.7	0.1
2. Bihar	87,18,990	54.2	14.4	19.2	10.0	2.0	0.2
3. Gujarat	1,06,01,653	58.0	14.5	13.3	10.2	3.7	9.2
4. Haryana	28,27,387	56.7	10.8	14.8	11.6	5.8	0.3
5. Jammu & Kashmir	12,60,403	65.8	0.0	11.7	6.1	10.9	5.5
6. Karnataka	1,07,29,606	58.7	6.4	17.7	13.7	2.9	0.6
7. Madhya Pradesh	1,05,86,459	46.8	18.0	12.2	15.1	7.7	0.1
8. Kerala	47,71,275	53.1	9.5	31.9	4.8	0.7	0.0
9. Maharashtra	2,19,93,594	75.3	5.9	11.0	6.1	1.5	0.2
10. Orissa	31,10,287	41.6	12.8	21.8	17.0	6.3	0.4
11. Punjab	46,47,757	46.4	14.4	20.2	11.3	6.5	1.2

Table: 1.7: contd

12. Rajas- than	72,10,508	46.8	10.0	21.9	18.6	2.6	0.1
13. Tamil Nadu	1,59,51,875	62.2	16.0	12.5	7.4	1.8	0.1
14. Uttar Prade- sh.	1,98,99,115	51.4	12.4	12.6	13.5	8.6	1.4
15. West Ben- gal.	1,44,46,721	77.0	10.7	7.5	3.6	1.0	0.2

Source: Compiled from the Report of the National Commi-
ssion on Urbanisation Vol. 2 - P = 20.

* Including projected population of Assam.

** Class I towns have population more than 1,00,000.

Class II	50,000 - 99,999
Class III	20,000 to 49,999
Class IV	10,000 to 19,999
Class V	5,000 to 9,999
Class VI	Less than 5,000.

As the statistics presented in Table 1.8 reveals, the ten-
dency of the urban population to concentrate in cities has
strengthened over the years.

Table: 1.8: Percentage share of cities '(Class I towns)'
in Urban Population 1961, 1971, 1981.

India*/State:	Percentage share of cities in Urban Popula- tion in -		
	1961	1971	1981
1. Andhra Pradesh	43.2	48.4	53.8
2. Bihar	39.4	45.4	54.2
3. Gujarat	44.4	49.0	58.0
4. Haryana	08.1	12.8	56.7
5. Jammu & Kash- mir.	67.4	68.5	65.8

Table: 1.8: contd

6. Karnataka	39.7	51.1	58.7
7. Kerala	27.0	42.3	53.1
8. Madhya Pradesh	39.1	45.1	46.8
9. Maharashtra	65.8	70.8	75.3
10. Orissa	13.2	38.3	41.6
11. Punjab	38.6	40.6	46.4
12. Rajasthan	38.5	41.9	46.8
13. Tamil Nadu	47.5	57.7	62.2
14. Uttar Pradesh	54.4	57.1	51.4
15. West Bengal	72.1	71.0	77.0
* INDIA	48.4	55.8	60.5

=====

* Excluding Assam.

Source: Compiled from the Report of the National
Commission on Urbanisation, Vol.2 - P = 21.

This particular pattern of Indian Settlement Structure has been described as "top heavy" by Rakesh Mohan (37). According to him, the growth of urbanisation in India over the years was mostly due to enlargement of existing towns at all levels and not mainly because of addition of new towns. The lack of addition of towns at the bottom end, according to him, is primarily due to the sluggish growth of agriculture in many regions of the country. While stating this clearly, Prof. Mohan observes, " To the extent that urbanisation is related to economic development and the distribution of lower settlements is well explained by Central Place Theory, the dearth of new urban settlements must be related to the relatively slow growth of agriculture in many regions of the country, coupled with the fact that settled cultivation has existed in India for a very long time". (38).

1.4.3 MIGRATION:

Besides the higher rate of natural increase, migration of population from rural areas to larger cities in search of employment is an important factor contributing to the process of concentration of population in large and growing urban centres. In the States like Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, Orissa, Bihar and Rajasthan where the rural sector is prominent, and in general in a country like India, where large urban settlements coexist vis-a-vis large rural settlements and further where the non-agricultural employment opportunities are concentrated in few larger urban centres, one would expect the migratory flows to be heading towards large cities from the rural areas. But interestingly enough, the data on migration streams compiled by the National Commission on Urbanisation throws light on a distinct tendency of urban to urban migration especially in the States having a broad urban sector. The two types of migration flows and their respective magnitudes are presented in Tables 1.9 (a) and 1.9 (b). In the highly urbanised States of Maharashtra, Tamil Nadu and West Bengal, and in the industrially developed States like Gujarat, Karnataka the extent of urban to urban migration supercedes the tempo of rural to urban migration. This indicates the tendency on the part of the migrants to move to large towns and cities in search of a better job opening. In the technical terms these are "active" migrants. On the other hand, predominantly rural States of Uttar Pradesh, Bihar and Rajasthan, the rural to urban type of migratory flows are predominant. All the "Push" factors instrumental in the rural

areas which cause the exodus of rural dwellers, can be said to be associated with these migratory streams.

Table: 1.9 (a): Migration Streams: 1971 - 81.

States:	Rural Urban mi- grants in ..('000).	Urban-Urban migrants in ('000).
1. Maharashtra	145	313
2. Tamil Nadu	148	271
3. West Bengal	71	217
4. Uttar Pradesh	1,170	688
5. Bihar	464	217
6. Rajasthan	240	184
7. Karnataka	199	232
8. Gujarat	152	162
9. Andhra Pradesh	172	184
10. Madhya Pradesh	162	179

Source: Report of the National Commission on Urbanisation Vol. 2 - Aug. 1988 - P = 4.

Table: 1.9 (b): India:- Rural-Urban and Urban-Urban migrants among Internal Migrants: 1971 and 1981.

Types of Migrants:	<u>Migrants in Million.</u>	
	1971	1981.
1. Rural - Urban	23.95	34.20
2. Urban - Urban	13.98	21.83
TOTAL:	37.93	56.03

Source: Report of the National Commission on Urbanisation Volume 2, Aug. 1988 - P = 17

(NOTE: It can be seen from the table that during the decade 1971 and 1981, the absolute number of rural to urban migrants went up by 41.8 per cent. On the other hand, during the same period the absolute number of urban to urban migrants registered a marked increase of 56.15 per cent.)

The foregone discussion reveals that Urbanisation process in India presents a mixed picture as far as the incidence and growth of urbanisation is concerned. While commenting on the overall pattern of urbanisation in the country, the National Commission on Urbanisation states, "Thus urban India is a mixed bag: We have 'high urban' (in the Indian Context) States like Maharashtra, Tamil Nadu and West Bengal, dominated by cities like Bombay, Madras and Calcutta, and 'low urban' States like Uttar Pradesh, Madhya Pradesh and Andhra Pradesh with a large agricultural sector but nevertheless having a large urban population by virtue of their large total population" (39).

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CHAPTER: II :
URBAN GROWTH: NETWORK OF THEORIES

2.1 INTRODUCTION:

The process of urbanization is associated with the transformation of productive resources , (viz. labour and capital mainly) as well as the overall socio-economic environment of a "Rural" economy into an "Urban" economy. As a matter of fact, we use the terms "rural" and "urban" in order to distinguish between two types of "regions", which are qualitatively different from each other in several aspects such as the size of the population, the density of population, the occupational structure, the pattern of factoral payments, the diversity and heterogeneity of the economic and commercial activities, the degree of specialisation and interdependence and so on. But in essence, what we are dealing with is, a process of "Regional Change".

The phenomenon of change has two aspects:

- a) The factors associated with the process of change; and
- b) The process of change per se.

A change into any system is caused by certain factor/s which could be internal or external to the system. As Prof. Hirsch puts it, "At a broad level of aggregation, the causes of urban change can be thought of as originating primarily within the urban area or outside the area". (Hirsch: 1973) ⁽¹⁾. Now depending upon the place of origin of the cause of change, three perspectives on urban change could be thought of viz:

- i) External
- ii) Internal
- iii) Mixed i.e. External and internal.

The three types of theoretical frameworks which attempt to explain the process of urban change by using each one of the above three perspectives are as follows:

- a) External: The Central Place Theory and the Economic or Export Base Theory.
- b) Internal: The Resource Base Theory.
- c) Mixed: Theories using the Input-Output framework.

The phenomena of urban change can also be viewed from Demand and Supply analysis. The basic stimulus for the growth may be from the demand side or from the supply side. In this type of categorization the Central Place theory and the Economic Base theory fall under the demand category. The Resource Base theory falls under the supply category; while both of these approaches can be integrated in the Input-Output framework.

While the threefold categorization of the phenomenon of urban growth is given above it is the External/Demand based framework that seems to be the dominant one in explaining urban growth. The literature on urban growth mainly pertains to this framework. In the following we concentrate our attention on this framework.

2.2 NETWORK OF THEORIES:

The second half of the present century observed a marked upsurge in the literature concerning the phenomenon of urban growth. The Central Place Theory developed by Walter Christaller deals primarily with the emergence and geographical distribution of towns of different sizes and their number. The emphasis of the Economic Base theory is on the growth of an individual urban area. A concise account of these two theories is presented below. A brief note on other theoretical frameworks

dealing with the growth aspect of urban areas is also given in the following pages.

2.2.1 THE CENTRAL PLACE THEORY:

As Goldstein and Moses (1973) observe "Most approaches to urban growth are demand-driven and are exercises in comparative statics rather than dynamics. Models on Central Place theory argue that a city grows to meet the demand of its hinterland region". (2). Basically, the Central Place theory deals with the emergence and spatial distribution of towns i.e. the Central Places of various sizes. But its focus per se is not on the growth of an individual Central Place. Still, we find some discussion about the factors which influence the growth of an individual Central Place in a book by W.Christaller. (3) According to him the factors affecting the development of a Central Place are:

1. Geographical/spatial distribution of the population in the hinterland: Besides this other factors like the costs of transportation between the Central Place and the hinterland or the service area; the opportunity cost of time spent in travelling; availability of transportation facilities, are also instrumental in determining the growth of the Central Place.
2. The size, density and the structure of the population in the complementary region: Since the demand for goods and services, which are produced at the Central Place, by the hinterland is crucial to the growth of a Central Place, the factors such as the net incomes of the inhabitants of the service area, the income distribution among the people residing in different

regions or sections of the service area are of crucial importance for the growth of the Central Place.

3. The natural endowments of the Central Place: The supply conditions as well as the prices of the goods or/and services produced and/or supplied from the Centre, would also determine the growth pattern of that Central Place^(*). The towns or the Central Places, the growth of which is explained by the Central Place theory of W.Christaller, have a lot of similarity with what Lampard (1966)⁽⁴⁾ calls as the "Classic Urbanisation". The primary function of these Central Places was to serve their hinterlands or what Christaller calls them as their "Service areas", with those services which can be produced only centrally. These towns emerged and developed on the agrarian background. With the exception of the discussion of few factors which influence the development of an individual Central Place, the primary focus of the theory is on explaining the emergence and spatial distribution of towns or Central Places of different sizes and other factors which determine and establish an hierarchy among Central Places of different sizes. The theory mainly deals with the first part of the Hope Tisdale Eldridge's definition of the process of urbanization⁽⁵⁾ i.e. it deals with the 'multiplication of points of concentration', and that too on an agrarian background. Expressing a similar view, Goldstein and Moses (1973) state, "Central Place theory was developed by

(*) While Christaller includes the supply factors also in the Central Place theory, in our view its role is secondary to the Demand factors.

Christaller to explain the size, number and spatial distribution of towns, but not their growth" (6).

2.2.2. THE ECONOMIC BASE THEORY:

The other prominent demand driven theory of urban growth is the Export Base or Economic Base theory, which emphasizes the role of external demand for the goods and services of an urban area in shaping the growth pattern of that urban centre. A lot of primacy is conferred on to all those activities of the area, which primarily cater to the external demand. The theory proposes a classification of the region's activities into two classes; as (i) all those activities which primarily cater to the markets located outside the geographical boundaries of the region and, (ii) the activities which cater to the region's local population. The exporting activities are considered to be the 'prime movers' of the local i.e. region's economy. These are collectively termed as the activities forming the 'Economic Base' of the region. The growth and development of the region's Local activity sector is a function of the development of the 'Export' sector. Being the main sources of income and employment, the exporting activities are denoted as 'Basic' activities, while the local activities which emerge out of the impetus provided by these 'Basic' activities are termed as 'Non-Basic' activities. It is proposed that an initial change in the 'Basic' activities, exert a 'Multiple' impact on the local economy. While explaining the main logic inherent in the Economic or Export Base framework, Werner Hirsch (1975) states, "The economic process implicit in the underlying export-base frame

work is that sales to buyers outside the area generate labour and business earnings, some of which are spent on additional purchases of locally produced goods and services and thereby generate still more employment, income and production within the area. This process can be summarized in the form of a functional relationship called a 'multiplier' that relates the level of the urban area's total activity to its export activity." (7).

2.2.3

THE STAGES THEORY OF URBAN GROWTH:

A very similar theoretical framework is provided by Wilbur Thompson (1965) (8) which too uses the primacy of the 'Export Sector' as the central theme. His analysis postulates that the process of urban growth passes through five stages. These are as follows:

- i) Stage of Export Specialization: In this stage the local economy is the 'lengthened shadow' of a single dominant industry or even a single firm (which is of course export oriented).
- ii) Stage of the Export Complex: The local sector expands via production linkages by 'adding local suppliers and/or consumers of intermediate products'.
- iii) Stage of Economic Maturation: The local sector expands to such an extent that it starts replacing the 'imports' of both, manufacturing and services.
- iv) Stage of Regional Metropolis: In this particular stage, the local economy becomes, "a mode connecting and controlling neighbouring cities..." In this particular phase the export of services becomes a major economic

activity of the region .(*)

- v) Stage of Technical Professional Virtuosity: The location achieves national eminence in some specialised skill or economic function. (Even though the configuration of the 'export sector' activities undergo a change, and gradually the local sector too acquires importance at various stages, the basic idea of the framework is analogous to that of the Economic Base Theory.)

2.2.4 BORTS AND STEIN MODEL OF URBAN GROWTH:

As cited by Goldstein and Moses (1973) ⁽¹⁰⁾, G.H.Borts and J.L.Stein (1964) have devised a supply dominated model of urban growth ⁽¹¹⁾. The formation of this model is a part of their much broader study which attempted to develop and test a theory of inter-state difference in the manufacturing employment in the United States. The authors postulate that, the growth of employment in different states, is a function of two factors viz.(i) the existence of a large pool of labour in the non-manufacturing sector and (ii) the extent of net migration. But as Goldstein and Moses (1973) ⁽¹²⁾ point out, as the model did not deal with the simultaneity of migration and employment growth, the results of the model were "questionable". Prof. R.F.Muth, made an attempt to take a cognizance of this simultaneity of migration and employment growth in his model by using the simultaneous equation estimation technique. (**)

(*) In an article entitled "Location Theory and Regional Economic Growth" Prof. Douglass C.North also gives a reference of the typical sequence of stages through which regions move in the course of their development, as postulated by the Theory of Regional Economic Growth (9). According to this theory, the final stage of regional growth is attained when the region specialises in tertiary industries which are primarily "Export" oriented.

Ref. ? ← (**) As the original text of the model developed by Prof. Muth could not be obtained, we are relied upon the details of it provided by Goldstein & Moses in their article.

These two models emphasize the role of migration in urban growth. As per them the region grows due to the simultaneity of migration and employment growth. But, then it seems that, these models treat the pre-existence of demand factors giving rise to growth of area's employment and the resulting migration, implicitly. The Economic Base theory, on the other hand, explains the causality and the actual process of employment generation in an urban area, which in the subsequent time periods attracts capital and labour from outside locations.

2.2.5 THE 'LAYER' THEORY OF URBANIZATION:

In the earlier sections we made an attempt to enlist the various theoretical formulations dealing with the phenomenon of urban growth. We learn from Prof. Rakesh Mohan (1984) that Koichi Mera (*) has made an attempt to synthesize the different theoretical frameworks in his "Layer" theory of urbanization (14). The demand for non-food goods and services by the agricultural sector gives rise to the emergence and development of lower order urban settlements. This is Mera's first layer. A similar explanation of the establishment and growth of towns, which function as service centres, is forwarded by Christaller's "Central Place Theory". The establishment of large manufacturing and service units shape the growth pattern of larger cities and metropolises. These large enterprises which are mostly "export"oriented (i.e. exporting/selling their goods in non-local markets mainly) units have their own multipliers which determine the resulting urban population of that particular location. These are the second and third layers of the Koichi Mera's Layer theory.

Reb. 1 (*) We could not obtain the original piece of work of Koichi Mera.

2.3 "LAYER" THEORY AND INDIAN URBANIZATION:

Rakesh Mohan (1984) then examines whether the process of Indian Urbanization fits into the Layer Theory postulated by Koichi Mera. With the use of appropriate statistical tools and Census data Prof. Mohan has tried to theoretize the Indian urbanization experience. He concludes that "The distribution between large, medium and small towns is therefore determined by the distribution of various economic activities. The number and distribution of small towns is particularly linked tightly with the level and distribution of agricultural activity. The hierarchy of economies of scale found in the manufacture of different products, along with the agglomeration economies as revealed by manufacturing employment multipliers, presumably, then determines the hierarchy of the size of settlements. Layers of urbanisation are cumulatively added on by the different basic activities". (14)

It then becomes clear from the foregoing discussion that, the growth of smaller towns which is closely related to the development of the agricultural activity in the surrounding areas, can be explained by the Central Place Theory. The growth and development of large, modern industrial - commercial cities, which have the inertia of growth inbuilt in their structure and functioning, has little relationship with the agricultural activity in the hinterland. These big cities, where large chunk of the urban population in the Third World, is concentrated are the centres of industrial-and-commercial activities. It is the 'Economic Base' theory which explains the growth of the large cities most aptly. The following chapters present a detailed review and discussion of the main aspects of the Economic Base framework.

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14. Ibid. P = 51.

CHAPTER: III :THE ECONOMIC BASE FRAMEWORK:

" Intensified urbanisation throughout many parts of the modern world has brought city planners and social scientists to a greater realisation of the need for a more complete understanding of the economic forces which represent the foundation of urban growth and change. The concept of the urban economic base is one of the cornerstones of the planner's economic understanding ".

- Richard B. Andrews (*) -

3.1 INTRODUCTION:

The formation and growth of cities is a complex phenomena. The expansion of activities in terms of variety and volume, thereby, creating more job opportunities and increasing the amount of income and employment generated at that location, carve out the path of future expansion of that urban area. Increasing agricultural production, expansion of transportation and communication network, growing manufacturing and trading activity and several such factors which exert their simultaneous influence, give rise to a system of cities which are highly specialised and closely interrelated. In such a system of interdependent locations, the growth of a city and its hinterland is closely interrelated. A city & its surrounding regions function in the framework of regional specialisation & spatial division of labour. Under these cir-

(*) Andrews, R.B. "Mechanics of the Urban Economic Base: The concept of Base Ratios" in "The Techniques of Urban Economic Analysis" edited by Ralph W. Pfouts, Chandler-Davis Publishing Company, 1960, P = 140.

cumstances, the external demand for the goods and services, manufactured in the city, from the surrounding regions, play a significant role in shaping the pattern of development of the city. The "Export or Economic Base" framework of urban growth emphasises the primacy of external demand in shaping the growth of an urban area. This particular framework is founded on the idea of dichotomising the region's economic activities into two sectors viz "Base" and "Service". The "Base" activities earn a net inflow of money for the region and thereby form the backbone of that urban area. The growth of the "Service" activities is functionally related to the growth and expansion of the "Base". Section 2 contains a concise account of the origin and evolution of the theory. The future growth of a region, according to this framework, could be projected with the help of 'Base-ratio/s'. For this the accuracy in the identification and estimation of the 'Base' is of utmost importance. The exercise of Base estimation consists of two important aspects viz. the Unit of Base and the Method/s of Base estimation. A brief review of literature concerning the choice and suitability of different units of Base, their virtues and weaknesses, is presented in Section 3. The last section of the Chapter contains a concise account of various techniques of Base measurement, which are broadly classified into two categories viz. Indirect methods of Base measurement and Direct techniques of Base measurement.

3.2 EVOLUTION OF THE THEORY

The Economic Base theory of urban growth came into existence sometimes in late 1920s. A systematic and exhaustive -

account of the origin, evolution and development of the Economic Base is presented by Prof. Richard B. Andrews in series of articles under the broad title "Mechanics of the Urban Economic Base" which appeared in the journal LAND ECONOMICS during May 1953 and February 1956 (*).

3.2.1 MAIN CONCEPTS AND DEFINITIONS:

The theory bifurcates the total economic activities of an urban area into two sectors according to their market orientations. As Prof. Pfouts puts it, "This theory may be characterised briefly by saying that it divides urban economic activity into two categories; exporting industry that brings money in the community from the outside world and non-exporting industries whose goods and services are sold within the community" (Pfouts: 1960) (1).

While giving a concise definition of the Economic Base concept, Prof. Andrews states, ".... the economic base refers to those activities of an urban community which export goods and services to points outside the economic confines of the community or which market their goods and services to persons who come from outside the community's economic boundaries" (2). But nowhere in the article, the author defines the term "economic boundaries or confines". Even though he gives the hint that the "economic boundaries" are definitely different from the geographical boundaries of the region, he does not specify whether the term -

(*) The same articles have been reprinted in a book entitled "The Techniques of Urban Economic Analysis" edited by Ralph W. Pfouts, Chandler - Davis Publishing Company, New Jersey, 1960.

"economic confines" imply administrative - jurisdictional and/or fiscal boundaries of the region. While describing the other counterpart of the Base, Prof. Andrews writes, "That economic section of the community which the base directly supports is often referred to as "service activity". Service activities include enterprises whose principal function is that of providing for the needs of persons within the community's economic limits. They are also distinguished from the base in the fact that they are, Principally, importers, or, if they do not import, do not export their finished goods or services" (3).

The theory postulates that the exporting activities are the prime movers of the region's economy. These enterprises provide the initial impetus for growth. As Prof. Pfouts puts it, "It is also contended in discussions of the theory that the exporting or basic industries provide the sources of urban growth; they are "City building" industries" (4). The literature reveals that the exporting activities which form the Base of the urban region are described with a varied nomenclature such as, "Export", "Base", "Primary", "Town-builders", "Basic", "External", "Urban growth", "Supporting" and so on. The terminologies used to denote the non-exporting or local activities are, "Service", "Local", "Non-Basic", "Auxillary", "Secondary", "Internal", "Town fillers" and so on.

The fundamental postulate of the Economic Base theory and the primacy of the exports in stimulating the growth could well be compared and equated to the familiar circular flow.

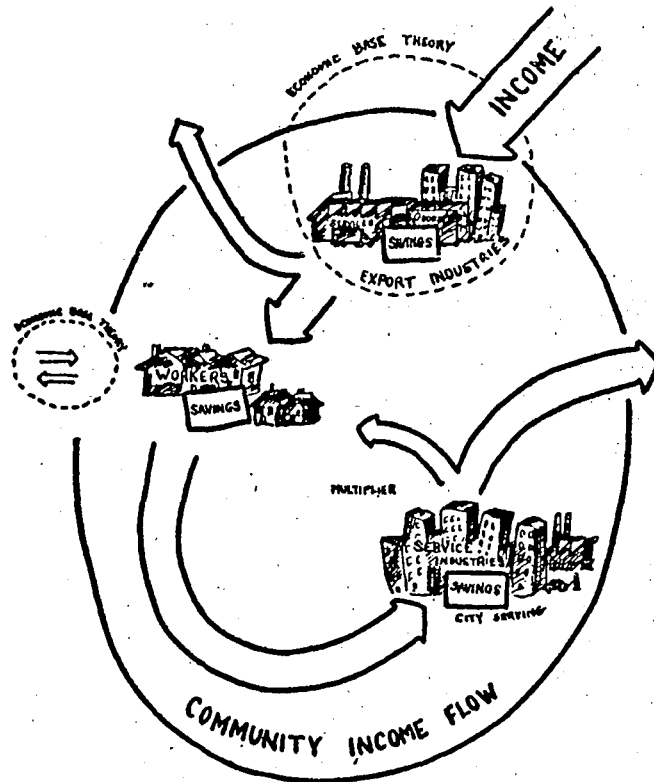
of income model of macroeconomic analysis. (See figure: I)

In the circular flow model, the "Exports" are considered to be an "injection" into the economy. Theoretically, an injection is, "an addition to the income of domestic firms that does not arise from the expenditure of domestic households or an addition to the income of domestic households that does not arise from the spending of domestic firms" (Lipsev, R.G.: 1979) (5). In the case of an urban area too, as Prof. Andrews puts it, "From a trade-flow viewpoint these base enterprises through their export function earn a dollar inflow for the community from the surrounding region, the nation at large, and even from other nations" (6). So in the framework of the Economic Base concept, these Export enterprises which are "income earners" of the community determine the economic health of that urban region. Describing this important role of the Base Enterprises, Prof. Andrews states, "In yet another sense the base activities can be considered the wage earners of the community family. Without them, or if they decline in earning power, the economic health of the community suffers accordingly" (7).

The export earnings, and the activities which earn them, therefore, assume a pivotal role in the growth of that locality. Recognising the significance of Export enterprises and their earnings, Prof. C.M.Tiebout describes these activities to be the "prime mover of the local economy". (Tiebout: Dec.1962)⁽⁸⁾

The income earned by the Base enterprises and their employees, when spent locally, create demand for several goods and services in the region. This demand warrants investment in these "Local" enterprises which cater to the needs of the

EXPORT EARNINGS AS AN "INJECTION"
IN AN URBAN AREA'S INCOME FLOW:



Source: Pfouts, R.W. and Curtis, E.T.: "Limitations of the Economic Base Analysis" in Pfouts, R.W. (ed.) "The Techniques of Urban Economic Analysis", Chandler - Davis Publishing Company, New Jersey, 1960, P =319.

Base enterprises and their employees. This is how several local enterprises (termed as "Non-Basic") come into existence following the establishment and growth of the Base enterprises. The "Base" activities support these "Local enterprises" (*).

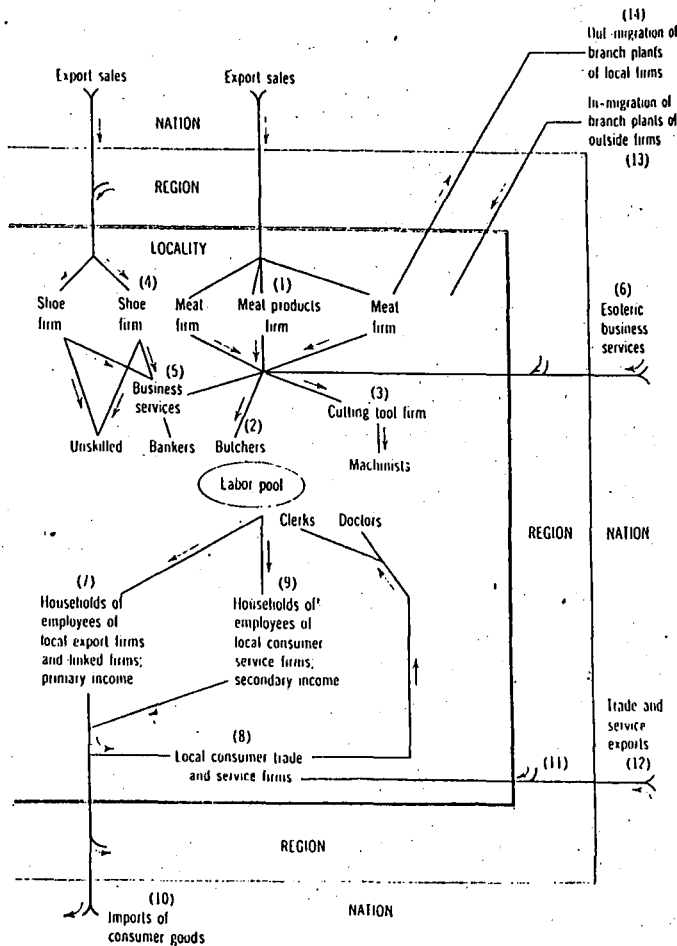
3.2.2 MECHANICS OF GROWTH:

The export earnings introduce an "injection" in the region's circular flow and disturb the equilibrium. The total gamut of activities which comes into existence due to the local spendings of Base enterprises and their employees could broadly be listed as follows - (also see Figure-2).

- a) All those firms and other enterprises which cater to the manufacturing needs of the Base enterprises, e.g. spare parts, semi-finished and fabricated items and so on.
- b) Activities providing the required manufacturing services like repairs, maintenance, servicing and so on to Base activities as well as enterprises which are classified as (a) above.
- c) Enterprises and activities which cater to other service needs of Base enterprises as well as enterprises of type (a) and (b). These are like transportation, communication, insurance, banking, consultancy, Research and Development institutions, laboratories etc.
- d) Firms and enterprises engaged in the manufacturing of commodities of daily use demanded by the local population like household utensils, garments, stationery, food -

(*) An elaborate and a lucid description of this process is given by Prof. C.M. Tiebout (Tiebout, Dec. 1962) (9)

A SCHEMATIC PRESENTATION OF THE EMERGENCE AND GROWTH OF LOCAL ACTIVITIES FOLLOWING THE DEVELOPMENT OF BASE ENTERPRISES.



NOTE: The three firms producing Meat Products are the "Export or Base", enterprises. All other activities are " Non-Basic," in nature.

SOURCE: Thompson, W.R. "Urban Economic Growth and Development in a National System of Cities", in Hauser, P.M. and Schnore, L.F. (ed.) "The Study of Urbanisation", John Wiley and Sons, Inc., New York, 2nd Edition, 1966, P = 436.

articles, bakeries and other consumables.

e) Other service enterprises providing services such as retail trade, hotels, hospitals, entertainment, travel, laundries to the local population.

All such and several other activities which fall in the local sector are supported by the Base. The local activity sector, is, therefore, closely related and dependent on the Export sector. Any changes in the Base have repercussions on the local sector. Describing this relationship and the nature of interdependence, Prof. Andrews remarks "The dependency of service activity upon base activity is evident in the fact that employment and profitability in service activities is highly sensitive to changes in the base, rising and falling with it" (10). Through the successive rounds of interaction between the Base and the Local sector, the initial change in the Export sector exhibits a "Multiple" impact on the region's economy. This is how the mechanics of a region's growth operates. (*)

(*) While, Tiebout (1962) (11) explains the process of growth with the help of an hypothetical example of a 'Minetown', Prof. Douglass C. North cites a real example of the Pacific Northwest region whose development, according to him "from the beginning was dependent on its success in producing exportable commodities" (12). With an additional concrete empirical evidence of several new regions in America, which developed around one or two exportable commodities, Prof. North unhesitatingly proclaims that a region's growth "is closely tied to the success of its exports and may take place either as a result of the improved position of existing exports relative to competing areas or as a result of the development of new exports" (13) In the same article we find an illuminating discussion of how a fine blending of some other related theoretical frameworks like the Location Theory and the Theory of Comparative Cost Advantage have helped the emergence of Economic Base Concept as an independent and a coherent theory of urban growth.

Primarily the impact of the export earnings is felt, and, passed on to the local economy via two levers viz. income and employment. The local income and employment expands in several successive rounds originating from the initial impetus provided by the Base. The process could elaborately be described as follows:

- A. The first round of income expansion in the region comes via the export earnings of the Base enterprises.
- B. A part of these earnings is distributed in the form of wages and salaries to the employees of these Base enterprises.
- C. A part of the income of Base enterprises is spent on the local purchases of raw materials, semi-finished products, spare parts and such other inputs required for the manufacturing of final goods and services to be exported. Initially, when the local activity sector is yet to emerge, the exporting industries are forced to rely on the imports of these items from the outside regions. These imports then represent the leakages through which the region's money flows out.
- D. The employees of the Base enterprises who receive their incomes then spend it on the purchases of goods and services of their daily requirements, which are produced locally.

These demands from the Base enterprises as well as their employees provide the necessary impetus to the emergence and growth of further local activities which are required for catering to the various needs of the local population. This is how further rounds of employment and income are created and the urban area grows.

3.2.3 SOURCES OF EXPORT EARNINGS:

The foregoing discussion reveals that the money earned by the Base enterprises, which we describe as "Export earnings" play a pivotal role in the development of the local sector and consequently the growth of that particular urban area. The sale of goods and services produced by the Basic activities of the area, outside the boundaries of that particular region represent one of the major sources of export earnings. But this is not all. Prof. C.L. Leven classifies export activities into five broad categories. (Leven C.L. 1958) ⁽¹⁴⁾. While defining exports, which he terms as "Export Production", he clubs together all those activities which are engaged in the production of commodities which are:

- i) shipped directly outside the area,
- ii) sold to other producers within the area for further processing before being shipped directly out of the area,
- iii) sold to installations of non-local government located within the area,
- iv) sold to non-residents who come into the area to purchase them,
- v) sold to persons residing in institutions within the area.

Among the five categories of exports listed above, the activities in categories (ii), (iv) and (v) need further elaboration as these activity groups add a further dimension to the concept of "Export or Base" enterprises. This dimension assumes a lot of significance in the process of segregation and Base estimation.

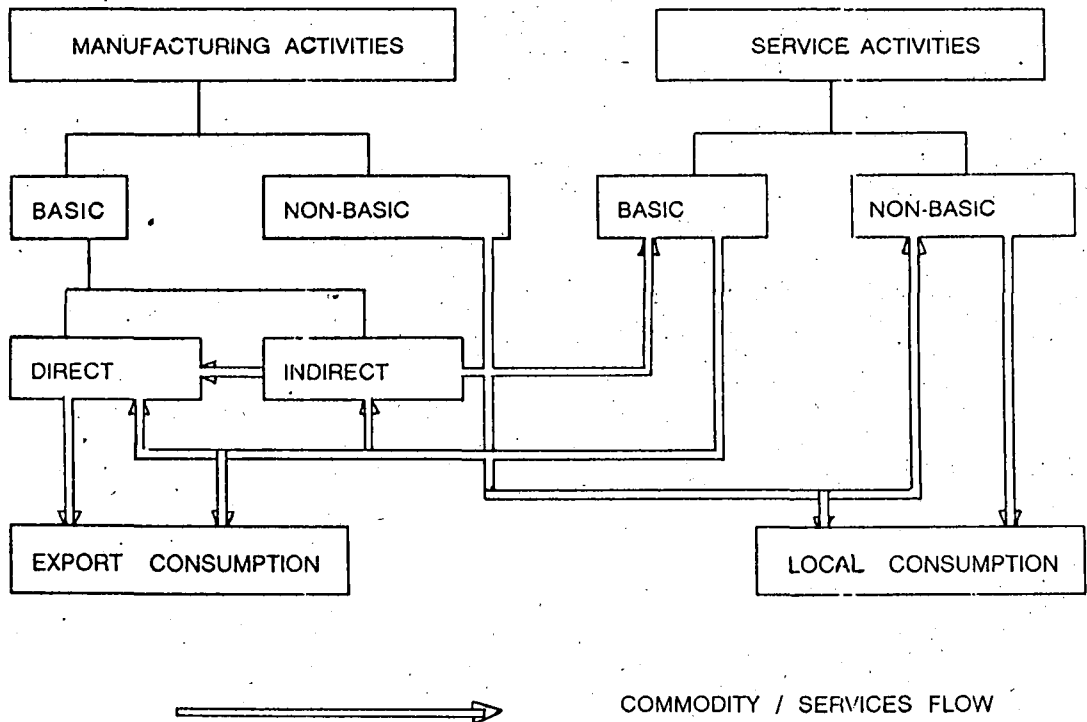
3.2.4 DIRECT AND INDIRECT "EXPORT" ACTIVITIES:

As stated earlier, all those activities in the region, which cater to the production and service requirements of the area's Base enterprises are the part of the "Local" activity sector. These activities are described as "linked" activities (Tiebout: Dec.1962)⁽¹⁵⁾; (Isard: 1960)⁽¹⁶⁾. These enterprises provide spare parts, semi finished components, semi assembled items and other inputs which are purchased and processed further by the Base enterprises for using them in the production of the final good which is sold in the outside markets (i.e. Export production category (ii) as postulated by Prof. Leven).

At this juncture, the theory introduces a further bifurcation in the 'Export Sector'. The final good which is shipped out directly, is termed as a "Direct Export", and the respective enterprise is classified as a "Direct Export Activity". While, a new term is now coined to describe the export linked activities which are classified under the name of 'Indirect Export Activities'. So, the initial broad export sector is now further broken into two sectors viz. 'Direct Exports' and 'Indirect Exports'. The demand for latter is a derived demand which ultimately depends upon the demand for the final goods and services which are exported to outside regions i.e. the Direct Exports. (See Chart: 1).

An exact and a complete identification and segregation of all the linked activities is a highly complicated task, and more so in the larger urban areas. The complexity of the exercise increases as the size of the urban region as well as the number and diversity of the Base activities increases.

FUNCTIONAL DICHOTOMY AND INTERSECTORAL
LINKAGES AMONG ECONOMIC ACTIVITIES OF
AN URBAN AREA:



SOURCE: Adapted from, Kulkarni, A.P., " Employment Multiplier in Pune: Industrial and Employment Growth of an Indian City since 1950, Centre of Studies in Social Sciences, Pune, February, 1991, P = 10.

It is also intimately related to the rate of technological development in the Basic sector.

3.2.5 IDENTIFICATION OF OTHER TYPES OF BASE ACTIVITIES:

As we have seen, the non-local sales of the region's goods and services is one of the important ways in which an urban area can earn net earnings from the outside world, but there are other sources also through which a region can enjoy an inflow of money. The two major sources of money inflow for an urban area are:

- 1.a: Purchases of the area's goods and services within the boundaries of the area by non-residents e.g. tourists (Category (4) of C.L. Leven's "export production" given above).
- 1.b: Purchases of the region's goods and services by customers who are temporary residents of the area and get money from outside sources e.g. students residing in University hostels and getting money from their parents. (Export production category (5) as given by Prof. C.L. Leven).
2. All those residents of the area who receive money from non-local sources in one or more of the following ways such as:
 - 2.1 Pensions and other transfer payments,
 - 2.2 Rental income from non-local property,
 - 2.3 Dividends and interests, and;
 - 2.4 Remittances from abroad.

While Prof. Tiebout describes these as "less obvious" items of "Private" exports, (Tiebout: Dec.1962) ⁽¹⁷⁾, according to Prof. Andrews such items pose, what he describes them as "Special Problems of Base Identification" ⁽¹⁸⁾. Even though

in the case of Universities, the bifurcation of their activities into two components could be done on the basis of the ratio of local students to "External or Foreign" students, the impact on the local economy of the money spent by these students remains unidentified to a large extent. The same technical difficulty persists in the case of tourists' expenditures and the purchases made by non-local residents. The complexity of the identification procedure gets aggravated with the size of the area. Prof. Andrews makes a reference to another important section of export activities, which consists of all those residents of the region, who are employed in enterprises located outside the boundaries of the locality. So, the income that they earn is, therefore, available for "Local purchases" within the region, and hence represents another form of "Export earnings" as the residents "export" their labour services to non-local regions/enterprises.

As Prof. Andrews suggests, the total number of such commuters could well be estimated by various methods such as counting the monthly commutation tickets, or via the Industry pay-roll data which would have the record of the location of the employees' residence or the Tax records which would be helpful in identifying the place of the employment and so on. But this exercise again suffers from the technical difficulty of the lack of necessary tools to make the provision for the "negative allowance". One has to make the required adjustments in the region's Base estimations to take an account of all those commuters who come from other regions, for jobs located in the region and take the money

away in the form of their wages and salaries ⁽¹⁹⁾. All such activities pose several such technical and conceptual issues, which have yet not found any completely satisfactory and implementable solution.

3.2.6 THE CONCEPT OF BASE AND CITY PLANNING:

The functional dependence of the "Local or Service" activity sector on the "Export or Base" sector assumes a lot of significance in the city planning process. As the changes in the Basic sector bring about computable changes in the Non-Basic sector of an urban area, the future volume of the Non-Basic Sector could well be projected once we are able to estimate future Basic activity. It is then of vital importance that the area's Base (current as well as future) is estimated accurately, so that adequate civic and urban amenities could be planned for the expanded future canvas of total (Basic and Non-Basic) activities. The estimation procedure involves two things viz. (i) the choice of the Unit of Base; and (ii) the actual method of Base estimation. The following two sections deal with these two aspects of Base estimation respectively.

3.3 THE CHOICE OF THE UNIT OF BASE:

The literature concerning the choice and suitability of different units of Base is quite substantial in volume and rich in contents. Several scholars such as Andrews (1954) ⁽²⁰⁾, Tiebout (Dec.1962) ⁽²¹⁾, Leven (1954) ⁽²²⁾ and (1956) ⁽²³⁾ and Isard (1960) ⁽²⁴⁾ have devoted their attention ^{to} this important facet of the theory.

3.3.1 SOME MAIN UNITS OF THE BASE:

Some of the main units of Base measurement which have often been cited and discussed in the literature are:

1. Jobs i.e. Employment.
2. Pay Rolls.
3. Value Added
4. Value of Production
5. Physical production.
6. Income and expenditure Accounts.
7. Income
8. Sales.

As Prof. Andrews observes, the units like Value of Production and Physical Production 'have not found great favour' among those who were involved in conducting actual base studies (25)

The main reason for this is that both these units fail to take a due account of those activities of the Base which produce non-physical output. In addition to this, the Value of Production unit requires an additional adjustment while making any inference, of that of price movement. But both these units have a virtue of rendering a valuable qualitative information regarding manufacturing activities of the Base - like impact of technology on labour productivity, capacity utilisation and so on. These elements assume a lot of significance in the long run analysis of the impact of increased productivity, profitability; on the growth of the area especially when these factors further attract newer manufacturing and other activities to that area.

Net inflow and outflow of money into the area and its circulation represent all the monetary transactions of the area. When this Income and Expenditure Accounts data is supplemented by other units such as employment, this would provide a complete understanding of intra urban structural and money

linkages and channels through which any external stimulus is transmitted to the various sectors of the urban area's economy. But such a study, inclusive of all types of Measurements, is almost impossible for very large cities and metropolitan areas for want of time, money and data availability.

3.3.2 'VALUE ADDED' AS A UNIT OF BASE:

Among other units of measure, Value added and Employment are the two units which have often been used in empirical studies. Prof. C.L. Leven had used value added as a unit of measurement in the study of Sioux City. The distinguishing factor which classifies the urban area's total activities either as "Export or Basic" or "Local or Non-Basic" is the location of the sales of the products of these activities. So, total Value of Sales, as a unit of measure, has also been suggested in the literature. But, sales as a unit of Base suffers from the common problem of double counting. The particular unit 'value added' avoids the problem of double counting. So, while commenting on the suitability of this particular unit of measure, Prof. Leven remarks "By subtracting the value of these inputs from total export sales, a more pertinent measure of export earnings can be obtained, namely, value added by manufacture of goods and services sold outside the area"⁽²⁶⁾.

Prof. Leven proposes that, "Value added in the area", which he defines as the sum total of value added of the directly exporting activities plus the value added generated in each of the vertically integrated production activities, is an "entirely adequate measure of the size of the base and its components"⁽²⁷⁾. This is similar to the parallel concepts of 'Direct Basic Employment' and 'Indirect Basic Employment',

when employment is used as the unit of Basic measurement which collectively form the total "Export" employment. Since Base activities are by definition those activities which earn a net money inflow for the community the value added by the export activities appropriately catches the true meaning of the term 'Base'. As value added by an industry is distributed as factor payments within the area, total Value added also gives a measure of income in a community. (28). While highlighting the same aspect, Prof. Leven writes, "The sum of the value added in each of the various stages of production will account for all of the earnings arising from each particular basic activity" (29) Even though Prof. Leven describes the 'value added in the area' as an 'entirely adequate measure' he is fully aware of some of the main limitations of this unit. According to him, the requisite adjustments those will have to be carried out if value added has to be used as a unit of Base are -

- 1) Adjustments for unearned incomes like transfer payments, and
- ii) Adjustments for the difference between interest and dividend payments for -
 - a) Payments made by area firms to individuals outside the area, and
 - b) Payments made by firms outside the area to individuals within the area.

Recognising the fact that direct information pertaining to this adjustment will be practically difficult to obtain in most of the cases, Prof. Leven presumes that, "Fortunately these items tend to offset each other" (30). Besides these,

necessary adjustments are also required in the face of price fluctuations.

3.3.3 'EMPLOYMENT' AS A UNIT OF BASE:

Among all the units discussed so far, 'Employment' is by far the most commonly used unit of Base measurement. Some of the main advantages that this unit possesses are - (31)

1. The employment or the job unit is a universally experienced thing.
2. Employment in a general sense is one of the major concerns of any economic system; and,
3. Information regarding this unit is generally easily available at the regional level.

Among the three factors listed above, the last, i.e. relatively easy availability of data, is the most important factor for its choice as a unit of Base measurement in several studies.

The availability of data, at the sub-national/regional level is the major constraint encountered by the planners conducting the Economic Base study. Even if units like Income and Value added are conceptually most appropriate and accurate as far as the central idea of the Economic Base is concerned, the relevant data regarding these aspects is not always easily available. While commenting on the suitability of employment as the unit of Base measurement vis-a-vis Income and Value added Prof. Mattila and Prof. Thompson observe, " However, in passing, it might be mentioned that the best theoretical alternatives to employment as indices of economic activity are empirically impracticable. Data on income generated, classified by industrial origin, is unattainable

at less than the State level of areal subdivision. Firm value added data is available on a local basis but it generally measures the productive contribution of local labour and 'foreign' capital, whereas, what is needed is a measure of Local value added, i.e., the productive contribution of local labour and local capital, if any ... However, the use of employment data does not pose as serious a problem in the study of the large metropolitan area, where more refined techniques add so little to accuracy that the additional cost in time and money is usually unjustified" (32). Even though employment is the most commonly used unit of measurement, in the Base studies, as Prof. Andrews puts it, it is, 'not a device of perfection' (33). Some of the main shortcomings of this measure are -

1. This unit of measure does not reflect productivity (especially labour productivity) and wage differentials among different Base activities. These factors assume a lot of significance as far as the local impact of the changes in the Base activities are concerned. Technological progress may enhance the labour productivity over a period of time. Then as pointed out by Prof. Andrews "A rise in productivity may, moreover, be associated with an increase in the rate and total wage assigned to the individual job" (34). Higher exports, higher net earnings from the rest of the world, and then higher wages exert a multiple impact on the local economy's income and employment. Prof. Andrews observes succinctly, "Specifically, higher wage rates, over time work, greater productivity, and heavier profits in the base would lead to heavier spending for service acti-

-vities and the necessity for expansion of service activities simply to handle the increased physical production moving out of the community" (35). Prof. Isard describes the similar phenomena as an 'income induced' Local Employment Generation (Isard: 1960) (36). Employment as a unit of measure fails to reflect these crucial factors.

2. Another difficulty is encountered while taking a due cognizance of either part-time employment and/or seasonal employment. In recent years, this factor assumes a lot of significance when a general tendency is observed on the part of the large enterprises to hire-in the services of 'Contract labour' as and when need arises. Enterprises resort to this option basically on two accounts - (i) rising labour costs in the organised labour market; and, (ii)... increasing strengths of Trade Unions.

In this case one has to adopt measures like taking into account the "Average" employment of the Base enterprises and so on. In the case of a part-time job or over-time as Prof. Tiebout suggests, the unit employment will then have to be adjusted appropriately by defining it in a more neutral term such as "hours worked" (37).

3. Employment, when used as a unit of measure again fails to reflect the local income and employment impacts of earnings of factors of production other than labour (Leven: 1954) (38).

The conceptual shortcoming of the employment unit of measure, of not reflecting the inter-industry wage differentials, could well be taken care of if "Pay rolls", instead of job, is employed as a unit of Base measurement (39). But like

other units of Base, such as, Sales, Value of production, Value added, this measure is also prone to price fluctuations. Even this factor could well be overcome by using an appropriate price deflator. ^{But again,} ~~... individual retail price index~~ ^{may not be} available for many cities.

3.3.4 PAY-ROLL AS A UNIT OF BASE:

Total pay rolls as a unit of measure does reflect wage differentials among various Base activities. But again it fails to reflect the local impact of other non-labour earnings. The payroll as a unit of Base measurement has still further a serious shortcoming. The total payroll of a particular Basic activity does not per se say anything about the actual number of jobs created by that particular enterprise. Prof. Andrews succinctly points out this crucial issue by saying that, "For can the planner properly say that ten positions in the community each paying \$ 50,000 are the economic equivalent of one hundred \$ 5,000 positions?"⁽⁴⁰⁾. The actual number of jobs created, and the resulting distribution of income, has important planning and conceptual implications such as -

1. The number of job opportunities in an area is an indicator of economic opportunity. Further, it is in a way a measure of the future population that is to be supported. As far as the planning exercise to provide primary urban amenities for projected population is concerned, employment as a unit has concrete planning relevance.
2. The distribution of the total payroll of a Basic enterprise among its employees has a close relevance to the demand for various types of local goods and services,

which in turn would shape the pattern of local investment, employment and income⁽⁴¹⁾.

3.3.5 SIMULTANEOUS USE OF DIFFERENT UNITS OF BASE:

The foregoing discussion reveals that there is no single "ideal" unit of Base measurement as such, which can find a universal applicability regardless of location, time and purpose. As a solution to this problem, scholars like Prof. Leven and Prof. Andrews advocate a simultaneous use of more than one unit of measurement in studying the urban Economic Base. The thread of argument common to both of them is that, the main task of Base identification and delineation of total activities as "Basic" and "Non-Basic" should be carried out with one single unit of measure. Several other units should then be employed to gain a further understanding of the urban economy's structural relationships. Prof. Leven who advocates the use of value added for Base measurement opines that once value added is chosen as a unit of measurement, other measures, such as employment and payrolls, can provide valuable supplementary information about the qualitative nature of the Base⁽⁴²⁾.

If one adheres to the view expressed by Prof. Andrews that one unit should be employed for the purposes of Base identification and other units should subsequently be employed to understand the structure of the urban economy better, the task of screening becomes relatively easy. Even though the foregoing discussion has elaborately dwelled upon the virtues and shortcomings of several alternative units of Base, such as sales, income, value added, payrolls, employment and so on, it can be argued that the three units of measurement viz.

sales, employment and value added, even though suffer from technical difficulties, have conceptual advantages. The classification of the area's activities into "Base" and "Service" primarily depends upon the market orientation of the activities. From this point of view, ... Sales unit of the measure has an inherent advantage of identifying and classifying a particular activity as either 'Basic' or 'Non-Basic'. The only crucial question that remains then to be answered is where to draw the demarcation line regarding the level of sales within the area and outside the area in order to qualify the enterprise as either "Base" or a "Service". The ratio of 'Export or Non-Local Sales' to 'Local Sales' would automatically assign a degree of 'Basicness' to a particular activity.

As is generally done in actual Base studies, ratio of Non-local Sales to Local sales is then applied to either the actual value added or/and employment of the area's enterprises. This practice brings about an interesting theoretical issue. As far as the definition of the 'Base' activities is concerned, (those activities which earn money inflow for the urban area/region under consideration, from rest of the world) ^{i.e.} both the units, 'value added' and/or 'income' are the most appropriate units which catch and convey the precise meaning and the central idea of the 'Base' concept. But if one looks at the Base studies as an analytical tool of planning, then 'employment' seems to be a unit having an edge over other units. As stated earlier, employment is in a way an indirect measure of the total population that would be residing in that particular urban area. The city and town planners

are primarily interested in estimating the future projected population as they have to make the requisite provisions for housing, drinking water, drainage, sanitation and other such facilities.

So, the measures like value added and/or income contain in them the central theoretical idea of the 'Base' concept. While, as far as Base studies are looked at as a tool of planning, the employment unit of measure has an inherent and distinct advantage over other units of measurement. Hence the employment unit of Base measurement is considered to be most suitable for conducting the actual Base studies.

After reviewing the merits and demerits of some of the main units of Base measurement, now we proceed to the other important aspect of Base estimation procedure i.e. the methods of Base estimation. The following section is devoted to the discussion and review of main techniques of Base measurement.

METHODS OF BASE MEASUREMENT:

The selection of the measurement technique and the precision of the Base estimation exercise have significant bearing on Planning implications. The emergence and growth of the Non-Basic activities and their employment are functionally related to the development of the Base. As the actual size and growth of the Non-Basic employment is closely related to the employment in the Base, accuracy in the estimation of Basic employment presumes

a lot of significance. Because, it is ultimately the Base, which determines the future population of the region.

The methods of Base measurement are broadly classified into two categories viz. (i) Direct Techniques of Base Measurement; and (ii) Indirect Techniques of Base Measurement. The direct technique of Measurement, as the name suggests, involves the direct measurement of the commodity and money flows in the urban area and the surveys of the consumers and firms of the region. As the direct techniques of estimation are costly and time consuming, generally planners and researchers take recourse to relatively quick, easy and inexpensive indirect techniques of the Base measurement.

3.4.1 INDIRECT TECHNIQUES OF BASE MEASUREMENT:

There are in all three main indirect techniques of Base measurement. These are as follows -

- i) The Assumption Approach,
- ii) The Location Quotient Approach, and
- iii) The Minimum Requirement Approach.

As Prof. Tiebout puts it, "Most indirect measures use employment as a unit." (Tiebout: 1962)⁽⁴³⁾. We will briefly study these three techniques one by one.

3.4.1.1. The Assumption Approach:

Among all the indirect techniques of measurement, the most crudest and the simplest is the 'Assumption Approach'. This approach involves an arbitrary classification of area's activities into Base & Service components

which is based on certain assumptions which are usually intuitional. As Prof. Tiebout observes, "An arbitrary assumption is made as to what is export and what is local employment. The usual assumption is that all manufacturing and agriculture is export and the rest is local.

This has been done, and it is attractive because of its simplicity" (Tiebout: Dec.1962) (44). But this intuitional technique of bifurcation suffers from several serious shortcomings. Several manufacturing units of the area such as Bakeries, Printing, Brick manufacturing are primarily 'Local' in character. Under such a generalised classification, such manufacturing units would erroneously be classified as 'Basic'. Same is the case with certain services. Service units such as branch offices of National Insurance Companies, Banks, State Government Offices, Universities, Big Hospitals, which have a large 'Export or Base' component in them, would be classified as 'Local' sector units. In the initial years of the development of the Base concept, this approach was used. But with the development of more refined techniques, it was not much used in empirical studies in the subsequent years.

3.4.1.2. The Location Quotient Approach:

One of the most widely used indirect techniques in empirical Base studies is the 'Location Quotient' (LQ) technique of Base measurement. As Prof. Mattila and Thompson put it this "aggregative - comparative - inferential" macro-cosmic method, "essentially rely on inferences drawn from a comparison of national and local patterns

of economic activity" (Mattila and Thompson: Aug.1955) (45).
 A thorough & exhaustive analytical presentation of the basic concept of the Location Quotient is provided by Prof. J.M.Mattila and W.R.Thompson. It seems that the concept of Location Quotient as an 'Index of Local Specialisation' was first devised by Prof. P.Sargent Florence in 1939. The index which is most commonly used to identify the Base component of an urban area is a simple ratio of an industry's share of local employment relative to the industry's share of the national employment, or alternatively, a locality's share of industry employment relative to the locality's share of national employment. The concept presented in the form of a mathematical formulation is as follows -

$\frac{e(i)/e(t)}{E(i)/E(t)}$	Industry's share of local employment, relative to the industry's share of national employment.
-------------------------------	--

OR

$\frac{e(i)/E(i)}{e(t)/E(t)}$	Locality's share of industry employment relative to the locality's share of national employment
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where $e(i)$ = Local (i.e. the "subject" economy's) employment in industry (i) .

$E(i)$ = Total national (i.e. the "Benchmark" economy) employment industry (i)

$e(t)$ = Total employment of the local region.

$E(t)$ = Total national employment.

The classification of the regional activities is based on values of these quotients. If the value of the index is

equal to one then that particular urban area employs equal proportion of its total work-force in a particular activity as that of the nation; and therefore, the area neither exports nor imports that particular commodity. In other words, when the value of the index is equal to unity, the area is self-sufficient as far as the production of that particular commodity is concerned. The index value above unity (which indicates a locality's labour force specialisation in that particular economic activity), implies that the region is producing that particular commodity/service in excess of its own internal need; and therefore exports the "surplus" production to other regions. On the other hand, the value of the index below unity indicates that the region under consideration even fails to meet its own internal demand with internal production. Therefore, the region has to 'import' that particular commodity from the other regions. Here in the entire analysis underlies the assumption of equal labour Productivities in the two economies; viz. Subject and Benchmark.

So the numerical size of the quotient/index, in the first instance, is an indication of the industry specialisation of the region's labour force. Even if we assume average or more productivity per worker for the region under consideration i.e. the 'subject' economy, it implies that, the production of that locality is more specialised in that particular good or service. But how would then one has to reach a conclusion that the extra or the surplus production, over and above, the local needs

is necessarily exported out of the region ? The logical transition from the locality's production specialisation to the exportation of this 'surplus' production requires that the above assumption be supplemented by the further assumption that the per capita consumption of locality is equal to that of the nation on the average. An illuminating elaboration of the various assumptions associated with Location Quotients (LQ) and their implications are discussed by David Greytak (Greytak: 1969) (46) (*). So, ultimately, the Location Quotient or the Index of Local Specialisation is an indicative measure of the locality's labour force specialisation. With the assumption of equality of per capita consumption in the 'subject economy' and the 'benchmark economy' i.e. the nation, the index could be used to infer about the market orientation of the region's product. While pointing out this, state Prof. Mattila and Thompson/succintly "Strictly interpreted, the index of Local Specialisation is really a measure of labour force specialisation per se, and only by successively more tenuous inferences may it be extended to the role of an index of product specialisation and, ultimately, product-market orientation of local industry" (Mattila & Thompson, 1955) (48).

A. Assumptions underlying the construction of Location Quotient.

In the derivation of the Index of Local specialisation

(*). Prof. Mattila and Thompson recognise the observable possibility of the region's per capita consumption deviating from the national average on account of the factors such as differences in the income levels and its distribution, the taste patterns and the relative price structure (47).

and the Index of surplus workers, Prof. Mattila and Prof. Thompson have made a reference to the two underlying assumptions viz. (1) the productivity of workers in the region being studied is equal to the productivity of workers in the 'benchmark economy' i.e. the nation; and (2) the per capita consumption of the commodities is same in the two regional economies, being compared (49). While elaborating on the assumption of identical pattern of consumption, Prof. Leven observes, "Moreover, similarity of consumption is assumed not only for consumer goods, but also for capital goods and even for intermediate raw materials. In treating all areas as having the same consumption of raw material consumption it goes a long way toward assuming away the other half of the problem by implying equivalent production functions everywhere" (Leven: 1956) (50).

While commenting on the assumption that the proportion of local activity for local use is equal to that of the 'benchmark economy', Prof. Greytak remarks, "The implication of this assumption is that the propensity to consume and the average income (or some combination of the two) are equal in the two economies. In addition, community preference patterns for individual consumer commodities must be the same in the two areas" - (Greytak: 1969) (51).

One of the assumptions implicit in the construction of Location quotients is that, the 'benchmark economy', which is in general the nation, is closed economy. The word

"closed" in this context means no gross exports or imports of any kind. While pointing out the widely prevalent incorrect interpretation of the term "closed economy" Prof. Isserman writes, ".... implicit in this approach is the assumption that there are not net exports (i.e. exports minus imports), either positive or negative, by any industry in the nation. Since a region with, for example, 10 percent of the nation's total employment is assumed to consume 10 percent of the nation's production of each industry, the entire nation must be assumed to consume an amount exactly equal to the nation's entire production. (This assumption is often stated incorrectly as the nation's economy must be closed, which implies no gross exports or imports of any commodity" (Isserman: 1977) (52).

B. Index of Surplus workers:

The value of more than unity of the index, notionally implies that the region's labour force is specialised in the production of that particular good or service, and that with the assumption of average or more labour productivity and equal per capita consumption (as that of the benchmark economy), we infer that the 'surplus' production is exported to the outside territories. Since by our definition, that part of the labour force engaged in catering to the outside world, forms the part of the Economic Base of the region, the 'surplus workers' i.e. those associated with the production of 'surplus' which is sold outside the region, are the 'Export' or 'Basic' workers. Prof. Mattila and Thompson further provide a device to estimate directly

the 'surplus' workers in each of the region's activities. This particular index is termed as the 'Index of Surplus workers'.

The index of 'surplus' workers which directly measures the absolute number of 'surplus workers' is the "difference between actual local industry employment and the locality's prorata share of national industry employment" (Mattila & Thompson: 1955) (53). Using the mathematical notation used earlier, the Index of Surplus workers could be given as:

$$S = e(i) - \frac{e(t)}{E(t)} \times E(i)$$

i.e. actual employment in industry (i) in the "Subject economy" minus its prorata employment.

Where -

S = The absolute number of 'surplus' workers in industry (i).

e(i) = Number of workers employed in the industry (i) in the 'subject economy'.

E(i) = Number of workers employed in the industry (i) in the 'benchmark economy' i.e. the nation.

E(t) = Total employment in the 'benchmark economy'.

e(t) = Total employment in the 'subject economy'.

As, the authors argue, theoretically the value of 'S' would lie between the two limits of:

$$(-) \frac{e(t)}{E(t)} \times E(i) \leq S < e(i)$$

i.e. at one extreme the locality's employment in industry (i) is zero, while at the other extreme, the entire employment of the region in industry (i) is "Export Employment".

C. Dual concepts of Basicness:

Prof. Mattila and Thompson have at this juncture, introduced an interesting as well as important distinction in the concept of basicness. These dual concepts of basicness are named as (i) The degree of industry basicness; and (ii) the degree of Local basicness. The former concept exhibits the extent to which the industry itself is "Basic" or "Export" industry by nature; while the latter denotes the extent to which the industry is "Basic" or vital to its locality. In order to get a better idea of these closely related concepts, let us take an hypothetical example.

City 'A' (i.e. the 'Subject' economy)	Nation (i.e. the 'benchmark economy).
$e(i) = 20$	$E(i) = 50$
$e(j) = 40$	$E(j) = 200$
$e(t) = 100$	$E(t) = 1000$

Where:

$e(i)$	=	employment in industry 'i' in City A
$e(j)$	=	employment in Industry 'j' in City A
$E(i) = E(j)$	=	employment in industries 'i' & 'j' respectively in the 'benchmark' economy.
$e(t)$	=	Total employment of the City A
$E(t)$	=	Total employment of the 'benchmark' economy.

Now, let us calculate both, the Index of Local specialisation, and, the Index of Surplus workers for the two industries 'i' and 'j' of the region A.

Location Quotient (LQ)
for industry 'i' = LQ_i

$$\begin{aligned} LQ(i) &= \frac{e(i)/e(t)}{E(i)/E(t)} \\ &= \frac{20/100}{50/1000} \\ &= 4 \end{aligned}$$

Location Quotient (LQ)
for industry 'j' = LQ_j

$$\begin{aligned} LQ(j) &= \frac{e(j)/e(t)}{E(j)/E(t)} \\ &= \frac{40/100}{200/1000} \\ &= 2 \end{aligned}$$

i.e. $LQ(i) > LQ(j)$

So, the city A appears to be more specialised in the production of commodity 'i' than 'j'. Now, let us look at the 'S' values i.e. the size of the absolute number of surplus workers in the two industries.

S_i = Surplus workers in
industry 'i'

S_j = Surplus workers in
industry 'j'.

$$S_i = e(i) - \frac{E(i)}{E(t)} (x) e(t)$$

$$S_j = e(j) - \frac{E(j)}{E(t)} (x) e(t)$$

$$S_i = 20 - (50 / 1000) x 100$$

$$S_j = 40 - (200 / 1000) x 100$$

$$S_i = 20 - (5)$$

$$S_j = 40 - 20$$

$$S_i = 15$$

$$S_j = 20$$

i.e. $S_i < S_j$

Therefore, it appears that, even though the City A appears to be more specialised in the production of industry 'i', the industry 'j' has a larger absolute size of surplus workers. This means that, the industry 'j' numerically contributes more to the city's Economic Base, which is measured in terms of the number of Export workers.

Now, let us look at the proportion of surplus workers to total workers in the respective industries of the City.

$$\text{i.e. } \frac{S}{e(i)} = \frac{15}{20} = 75\% \quad \& \quad \frac{S}{e(j)} = \frac{20}{40} = 50\%$$

Here according to the authors, the industry 'i' with a greater proportion of 'surplus' workers "exhibits the greater degree of industry basicness" i.e. the degree to which the industry itself is a "Basic" or "Export" industry while, the industry 'j' with a greater number of 'surplus' workers "exhibits the greater degree of local basicness", i.e. the degree to which the industry is 'basic' (vital) to its locality. (Mattila & Thompson:1955) (54).

The Local sector of an urban area expands due to the successive rounds of spendings of the employees of the Base sector. So, naturally, the actual absolute number of surplus workers in various Base activities of an urban area assume a lot of significance. While exploring this issue, the authors write, "Since an absolute measure of the number of surplus workers automatically reflects relative industry size, the index of surplus workers is a better measure of the net income generating capacity of a local industry and, therefore, it would seem that this index exhibits a clear advantage over the index of local specialisation as a measure of the 'basicness' of an industry to its locality. In that it is this latter concept of 'basicness' that is usually at issue in the typical urban base study, investigators would do well to place primary reliance on the index of surplus workers" (Mattila & Thompson: Aug. 1955) (55). Even though a vital distinction has been introduced between basicness according to industry (i.e. a larger proportion of surplus workers to region's total industry employment) and basicness according to locality (i.e. a

larger absolute size of the surplus workers) and it has been argued that, it is the index of surplus workers which is more relevant in the Economic Base studies, one has to give a due consideration to couple of issues which have a close bearing on the implication of the index. The local impact of the 'Base' in terms of employment and income, operates through two distinct levers.

a) The growth of a particular Base enterprise (in terms of employment and/or income) gives rise to the generation of secondary rounds of employment and income in the local economy via the process of ancillarization. The development of these ancillaries, both manufacturing and services, depends on several factors such as

- i) the nature of the final product being manufactured by the parent Base enterprises
- ii) the type of technology of production of the parent Base unit.
- iii) the policy of the government and the labour laws.
- iv) the nature of the labour market i.e. the relative shares of organised and unorganised labour markets in the locality.
- v) Overall industrial and commercial infrastructure existing at that location at that point of time.

In such case then, the absolute number of surplus workers of a locality's enterprise/s is not that vital a issue; but the secondary employment and income generation

impacts would depend upon the local manufacturing and service linkages of the Base enterprises.

- b) The second channel of local employment and income generation is via Keynesian income multiplier effect i.e. through the spendings of the employees of the Base enterprises. In such a case, the factors like average income level, the income elasticities of demand and the tastes of employees, become relevant factors in the determination of total income level generated in the locality. This fact could be explained with the help of simple arithmetic. Consider an hypothetical region A. There are two enterprises 'i' and 'j': Now let us visualise two scenarios.

Case: A :

Industry 'i'		Industry 'j'
Number of surplus workers	SL _i = 200	SL _j = 200
The average income of these surplus workers.	Ay _i = Rs1000	Ay _j = Rs 500/-
Total income generated & available for local spending		
Ty _i = Rs. 1000 x 200	= Rs 2,00,000	Ty _j = 200x500=100000

Case: B :

Industry 'i'		Industry 'j'
Number of surplus workers	SL _i = 200	SL _j = 500
The average income of these surplus workers.	Ay _i = Rs 4,000	Ay _j = Rs 1,200/-
Total income generated & available for local spending.	Ty _i = Rs8,00,000	Ty _j = Rs 6,00,000.

In the above examples, in the former case (Case:A) even though the absolute number of surplus workers in the two industries of the region is same, the level of average income in two industries is different. Naturally, the tastes patterns and the propensities to consume of the two groups of surplus workers would be different. Their different elasticities of demand, tastes would give rise to a different pattern of investment and production in the local sector. Obviously, the employment generation potential and pattern would be different. (i.e. employment associated with the new investment which would be fostered by the new demand created by the surplus employees of Base enterprises). In the second Case, (Case:B), even though the industry 'j' has a larger absolute number of surplus workers, the total income available for local spending is more in the case of industry 'i', as the average income of employees of industry 'i' is significantly higher than that of 'j'. These differences in the absolute number of surplus workers and their average incomes in the two industries would have differential impacts on the local sector. So, it turns out that the mere absolute size of the surplus workers is not the only determining factor.

The generation of local income and the broadening of the local activity canvas would further depend upon whether the Base employees spend their income on locally manufactured goods or imported commodities. In the early stage of the region's development, when the local activity sector is in its infancy, the residents of the area would rely to a greater extent upon importation of goods

and services from other areas. But as the local activities start growing with the expansion of the Base enterprises, the proportion of income spent on local purchases, would rise, which, in turn foster further investment in the local activity sector. So, this tendency in itself would depend upon the overall level of economic development of the area.

D. Relaxation of the assumption of Equal Average Income:

In 1975, Prof. Wolfgang Mayer and Prof. Saul Pleeter, constructed a two region and three commodity general equilibrium trade model to demonstrate that "the common assumption that average income of each region must be the same is inconsistent". While describing such a stringent assumption as "unnecessary" the authors further argue that even allowing for differences in average income the Location Quotient is still a correct indication of an industry's trade orientation as long as there are no differences in tastes and in production techniques". (Mayer and Pleeter: 1975) ⁽⁵⁶⁾. The basic premise of the argument is, in a nutshell, as follows:

If the resource endowments or the endowment ratio of a particular region is different than the whole economy, (or the 'benchmark' economy) there will be differences in the fraction of the labour employed in the given industry as well as in per worker earnings. This, then implies that whenever the value of the Location Quotient is other than unity, the average income of the people

living in these regions must be different from that of the national average. In this situation, the assumption of equal average incomes among regions and between a particular region i.e. the 'subject economy' and the 'benchmark economy' is irrelevant. The authors argue that, "Whenever the location quotient of a given industry is not equal to one, average income of the people living in this region must be different from that of the national average. Therefore, it is not possible to work with location quotients and at the same time assume that average income differences between regions are zero. This assumption is inconsistent". (Mayer & Pleeter: 1975) (57).

While maintaining the assumption of similar taste patterns in the 'subject' economy and the nation (i.e. the 'benchmark' economy), the authors draw attention to a very important factor which was missing in the literature developed earlier. The differences in tastes for the given commodity will no doubt affect its exports, but, the authors proclaim, that even, "differences in tastes for local, non-traded, commodities affect the trade orientation of traded, goods as well. A change in demand for a non-traded good can be satisfied only through a corresponding adjustment in local production of this commodity, since exports or imports are by definition excluded. But with a given stock of factor resources the production adjustment of one industry will also affect production of all other industries. Hence, difference in tastes for non-traded commodities have an impact on exports of a traded good through the supply

side". (Mayer & Pleeter: 1975) (58).

E. Location Quotients for Tertiary Activities.

We have seen that the Economic Base of an urban area consists of enterprises which primarily cater to the 'external' demand. The enterprises are of both the types viz. manufacturing and services. As seen so far, the literature on estimation of Location Quotients for the manufacturing industries is quite rich and diversified. But relatively little seems to have been done about the Localisation Coefficient for service enterprises. (*) Prof. S.R.Keil and Prof. R.S.Mack made an attempt to devise a tool which "identifies those service sector industries that are actual or potential exporters". (Keil & Mack: 1986) (59). According to these scholars, "..... it is the variance in location quotients across regions that gives rise to the possibility of using this methodology to identify exports and imports for a particular region" (Keil & Mack: 1986) (60). But as per the observations of both the authors, the variance in the Location Quotients for service industries across regions is not high enough to warrant any inference about exports or imports of that service from that particular region. This has led to, as they state, "The general designation of service industries as non-basic

(*) Here the term 'Service enterprises' implies all those economic activities which are classified as "Tertiary" sector activities, in the conventional economic analysis. This should not be confused with the 'service' activities of the Economic Base theory, which represent the counterpart of the Base concept.

is partly explained by the fact that the service sector location quotients vary substantially less than manufacturing quotients" (Keil and Mack: 1986)⁽⁶¹⁾. So, while explaining the difficulty in using this technique for the identification of export enterprises in the service sector, the authors state, "The primary problem in identifying exportable services is finding those service industries that have a high variance in location quotients when this variance is measured across an appropriate set of regions" (Keil & Mack: 1986)⁽⁶²⁾.

In order to develop a methodology to identify export services, the authors hypothesize a situation in which a large economy consists of several regions having varying degrees of urbanized sub-regions or areas. There would, definitely be some services which are purely of residential or local nature and are consumed locally. The Location Quotient for such industries would be exact or near unity, regardless of the region selected. Now, the authors propose that even if the rural areas are Sliced-Off the estimated Location Quotients for such services in the urban sub-regions would not be affected. There are certain agglomerative services which agglomerate in urban areas, but, serve both the regions i.e. the surrounding rural hinterland and other urban centers. At this juncture, the authors argue, the inclusion or exclusion of these hinterlands in the Base analysis would ultimately decide the nature of the service as whether Local or Export, which will be reflected in the value of the Location Quotient. They observe, "If these hinterlands are included in the base, agglomerative services will have

elevated location quotients that are not necessarily indicative of exports. Service sector industries that are potential free-standing exporters can be identified at low cost by examining what happens to both location quotients and their variances across urban areas when the rural hinterlands are dropped from the base. If a particular urban area's location quotient from the i^{th} service industry remains above one after dropping the rural areas from the base, then that urban area is likely to be exporting that service to other urban areas" (Keil and Mack, 1986) (63).

In order to prove this point, a new version of Location Quotient has been devised which does not include the rural area of the Base region. The new Location Quotient, then looks like somewhat as given below:

$$LQ_{iu} = \frac{e(i)u/e(o)u}{(E(i)o - e(i)r/E(o)o - e(o)r)}$$

where:

- LQ_{iu} = Location Quotient of the i^{th} industry for the u^{th} urban area (included in the Base) net of the rural hinterland/region.
- e_{iu} = Employment in the i^{th} industry in the u^{th} urban area of the Base.
- e_{ou} = Total employment of the u^{th} urban region.
- E_{io} = Total employment of the i^{th} industry in the Base region.
- e_{ir} = Employment in the i^{th} industry in the r^{th} rural area which has been omitted from the Base.
- E_{oo} = Total employment of the Base region.

$e(o)r$ = Total employment of r^{th} rural area being omitted from the Base.

The Location Quotient for the i^{th} industry in a purely urbanised region ($LQiu$) would be slightly different from the one whose Base region consists of some rural areas. The difference would be $\Delta LQiu$. This is represented as:

$$\Delta LQiu = LQiu - LQiu.$$

$$\Delta LQiu = \frac{e(i)u/e(o)u}{E(i)o/E(o)o} (-) \frac{e(i)u/e(o)u}{(E(i)o - e(i)r)/(E(o)o - e(o)r)}$$

when $\Delta LQiu = 0$, then

$$\frac{e(i)u/e(o)u}{E(i)o/E(o)o} (-) \frac{e(i)u/e(o)u}{(E(i)o - e(i)r)/(E(o)o - e(o)r)}$$

i.e., the authors proclaim "Shedding the rural areas from the base leaves a base that is essentially urban. Therefore, the separate urban entities are now being compared against a base which is more homogenous" (Keil & Mack: 1986) (64).

The methodology devised to identify the export potential of service enterprises by Prof. Keil and Mack is a distinct improvement in the methodology of the construction of Location Quotient. But the exercise as a whole appears to be adopting a particular definition or criterion for identification of "Exports". According to the conventional framework of the Economic Base theory, any sales beyond the geographical boundaries of a given region or an urban area are considered as "Exports". If, the geographical unit of the urban area that is being studied is a "City", any sales outside the boundaries of the city are export sales. This may include the imme-

-diate rural hinterland, the other comparable city and/or the entire outside area. But, on the other hand, if the geographical unit of the urban area which is being chosen for study is a "Metropolitan" area which is composed of one or more central cities, other urban centres and several semi-urban and rural areas, then according to the authors, the service enterprises which agglomerate in urban areas and serve the surrounding hinterland and other urban areas will have an elevated Location Quotient. They further argue, that, these elevated quotients "are not necessarily indicative of exports" (65). While defining the objective of the article, the authors proclaim that the methodology devised by them is useful for ".... identifying those service industries that export beyond the corresponding rural hinterland of the urban place in which they are located to cities of similar sizes" (66). The classification of activities as either "export" or "local" always has a specific reference to the geographical area chosen for the Economic Base study. As we change the unit of the area from city to a metropol, several activities classified earlier as 'exports' now become "residential". But this phenomenon is inherent in the Economic Base studies. In the present article "export - Sales" are defined to be sales from a urban area or a city, strictly to other urban areas or cities, of similar sizes. This is a further specification that has been introduced to the term "export" as has been used conventionally in the Base Studies.

F. Limitations of the Location Quotient Technique.

The foregoing discussion so far, was devoted to the understanding of the theoretical contents of the technique. Here it is intended to look at the performance of the technique, when applied in actual empirical Base studies.

As the construction of the Location Quotients requires little data, which is mostly available and could easily be compiled from the secondary sources quickly and inexpensively, it is the most widely used indirect measure of export employment in actual Base studies. Even though it is the most popular and commonly used technique, it does have some serious shortcomings, both technical and conceptual.

The major limitations of the technique, are the stringent assumptions made regarding the structural parameters like consumption, production patterns, the pattern of tastes, the levels and distribution of the income in the two economies, i.e. the urban region under study and the 'benchmark' economy and the assumption of complete product homogeneity within each industry in two areas. The conceptual shortcomings associated with these restrictive assumptions in themselves, make the empirical applicability of this technique difficult. Prof. C.L. Leven, makes a succinct but a blunt remark in this context, saying that, "In my opinion the shortcomings of this technique render it useless as a quantitative measure of basic activity in an area" (Leven: 1956) (67).

We will consider some of the main shortcomings of this particular technique one by one.

i) Differences in the structural Parameters of the two areas:

Prof. J.M.Mattila and W.P.Thompson (1955), who provided an exhaustive theoretical account of the technique and suggested the conceptual bifurcation between the Index of Local Labour Force specialisation and the Index of Surplus workers, had recognised the fallacy of the inference drawn about the exportation and importation of a commodity by looking at the values of the Location Quotients, without having a recourse to the underlying structural variations in the two regional economies. They were aware that, the value of coefficient greater than one for any commodity need not necessarily imply exportation of that commodity from that particular region and vice-versa. If the consumption pattern is more favourably tilted in the consumption of a particular commodity than the average per capita consumption in the 'benchmark' economy, or if the regional economy is diversified to a lesser extent and characterised with lower wage rates and lower labour productivity, the index value above unity, in such a case, may not necessarily imply exportation of that industry's product from that region. Similarly, if the labour productivity is considerably higher than the national average and/or if the per capita consumption of that particular good is much lower than the national average, it is possible, that even though the numerical

value of the quotient is less than unity, the region may be an exporter of that particular commodity.

(Mattila & Thompson: 1955) ⁽⁶⁸⁾.

ii) Downward bias of the Technique.

The technique suffers from another shortcoming which is of a technical nature. The basic assumption of the approach is that, the proportion of local activity for local use is equal to that of the 'benchmark economy', which is generally the nation at large. Here, the regional ratios are compared with that of the national average ratio. The use of an average ratio in themselves introduce a downward bias in the estimation of the Basic or Export activity of the region. Even though Prof. David Greytak, cited this as a serious shortcoming in application in 1969 (Greytak, D: 1969) ⁽⁶⁹⁾, Prof. Mattila and Thompson, had recognised it, way back, in 1955 and had provided an 'Adjusted' form of the Index of Local Specialisation to rectify, at least partially, this downward bias. (Mattila & Thompson: 1955) ⁽⁷⁰⁾.

The adjusted form of the Index of Local specialisation is given below:

$$LQ_i^A = \frac{e(i)/e(t)}{E(i)-e(i)/E(t)-e(t)}$$

where,

LQ_i^A = Adjusted Location Quotient for industry 'i'. (other notations carry similar meaning as given earlier).

The rationale for this adjustment, as provided by the authors is, "The national ("benchmark") quanti-

ties are adjusted by subtracting the local economy from the national economy to eliminate the "Overlap", (Mattila & Thompson: 1955) (71). The subtraction is necessary to prevent the downward bias in the case of specialised industries. While explaining the impact of this adjustment on the value of the Location Quotients, the authors write, "When the unadjusted index is equal to one, the adjusted index will also equal one because the numerator and the denominator of the denominator of the index are each proportionately reduced. If the unadjusted index is greater than one, the adjusted index will be the larger because the numerator of the denominator will be reduced more (proportionately) than the denominator of the denominator of the index. Similarly, if the unadjusted index is less than one, the adjusted index will be the smaller" (Mattila & Thompson: 1955) (72).

Prof. David Greytak (1969) further argues that, the correction introduced by Mattila and Thompson, of eliminating the 'subject' economy from the 'Benchmark' economy to avoid the overlap, only 'partially' corrects the downward bias (73). The downward bias in the estimate gets corrected only in those cases in which the 'local' ratio is greater than the 'benchmark' ratio. Prof. Greytak further proclaims that, this downward bias and even the adjusted form of the quotient have repercussions on the 'export estimates' of the region (74).

The correction introduced by Mattila and Thompson,

does alter the values of the quotients, but unlike Prof. Greytak's criticism, it does not alter the "export estimates". Even though the quotients are sensitive to the overlap of the regions, and the correction to this as suggested by Mattila and Thompson, at least partially rectifies the bias, these theoretical intricacies does not have much empirical significance in the practical usage of the technique. This is so on account of the following factors:

- a) The technique of Location Quotient consists of two related concepts of Index of local specialisation and the Index of surplus workers. The former is an index of region's labour force specialisation, while the latter gives an estimate of the region's actual "Surplus or Export" workers. The corrective adjustment only alters the numerical value of the Index of Local Specialisation which plays only a limited role of an indicator of the locality's labour force specialisation, which is totally different from the Index of surplus workers. So, as argued by Prof. Greytak, the adjustment procedure only alters the numerical value of the Index of Local specialisation and not the estimates of export employment.
- b) The downward tendency of the ratio is not universal. Even after the correction technique is employed, in the case of only those economic activities which have an unadjusted quotient

below unity, the numerical value of the quotient gets reduced further. For those economic activities which have an unadjusted quotient equal to unity, the adjusted quotient too equals unity. While, in the case of activities having an unadjusted quotient above unity, the adjusted quotient gets inflated further.

- c) The Index of Local specialisation is used for on a priori classification of locality's activities in the two sectors. Only the activities/enterprises having quotient value above unity are relevant and important as far as the dichotomization exercise is concerned. The adjustment procedure technique does not alter the nature and therefore the classification of the activities. The activities which have the unadjusted quotient value below one continue to be non-exporting activities. As the Location Quotient technique is employed to identify and estimate the Base enterprises of the region, what happens to the value of the quotient for activities once classified as non-exporting is of no relevance in the actual exercise.
- d) The adjustment procedure affects only the Index of Local specialisation and not the Index of surplus workers. It is the latter which has a close bearing on the value of Base ratio/s and subsequently on the size of the Employment Multiplier (EM) so, what happens to the value of

Index of Local Specialisation, which performs only a classificatory function, does not matter at all as far as the construction of EM and the projection exercise is concerned.

Another study by Prof. Roger Leigh, too, confirms the downward bias in the estimations of export employment by using Location Quotients, when compared with the estimates arrived at by applying the outside region sales proportions to the total employment of the 'respective industries'. (*) He used the data used by Prof. P.D. McGovern in his paper, which provided a comprehensive description of the industrial economy of metropolitan Vancouver, British Columbia. While he compiled the other part of the data from the Canadian Census of Industry. The data regarding Vancouver metropolitan area contained information about the market destination of the products of several important manufacturing industries of the Vancouver area. From this data, it was possible to calculate the proportion of each industry's sales that were made outside the local metropolitan area. Prof. Leigh compared the Export employment estimates arrived at by the application of the Export sales proportions to the respective industry's total employment and the estimates made with the use of Location Quotients. The findings presented by him in a tabular

(*) This particular technique of direct estimation is discussed in details in the following sub-section, which has been devoted to the discussion of the Direct technique of Base measurement.

form reveals that, the total export employment estimates arrived at with the use of Location Quotients technique could cover only 57 per cent of the Export employment actually estimated by applying the outside the region sales proportions. So, the extent of underestimation due to the usage of an indirect method was found to be significant (Leigh: R: 1970) (75).

The findings of his study show that, the Location Quotients always underestimated the Basic employment as against the estimates based on non-local proportion of sales, even in individual industry groups also. Not only that, but the relationship between the numerical value of the Location Quotients and the percentage of sales outside the Vancouver Area did not reveal any stable and consistent relationship and behavioural pattern as proposed by the technique. The size/or the numerical value of the Location Quotient and the market orientation of the industry's products depicted an appropriate relationship with each other, as postulated by the technique, only in certain ranges of the values of the Location Quotients. High Location Quotients i.e. above three, were found to be associated with industries having 75 percent of the total sales outside the Vancouver urban area. But in the case of 12 middle to low ranking industries, where the Location Quotients ranged between 0.27 to 1.68, the outside market shares varied between 12 to 84 percent. While in the case of industries with Location Quotients below unity, the outside market sales shares were between 35 percent and 84 percent. While referring to this, Prof. Leigh observes, "there

is no support here for the idea that such low location quotient industries are exclusively city serving, making no contribution to the urban economic base" (Leigh, R: 1970) (76).

With such a mixed picture emerging out of the empirical analysis, Prof. Leigh concludes, " In short, high location quotients seem to successfully identify industries with large proportions of sales made outside the urban area that undoubtedly are important components of the urban economic base. But the majority of industries have low to medium location quotients, while their out-of-town sales proportions cluster in the 30 percent to 60 percent range in a manner unrelated to the magnitude of the location quotient, and this does not permit clear identification of the basic-non basic status of the industry from the location quotient alone. Even where location quotients are below unity, out-of-town sales proportions can be significant and industries can claim to be part of the urban economic base. This suggests that, in the identification of urban base components from location quotients, we should be most suspicious of the apparent meaning of the lower quotients" (Leigh, R:1970) (77). Ultimately, even though Prof. Leigh warrants that the utility of this technique must heavily be qualified, he discards the technique by describing the estimates of the basic-non-basic employment

ratio arrived at by using this tool as "misleading" (*).

iii) Sensitivity of the LQs to the level of Aggregation:

We have seen so far, that the Location Quotients underestimate the volume of Export employment when compared with the other direct estimates. The inherent tendency to underestimate the volume of Export employment continues to prevail also due to, as Prof. C.M.Tiebout describes it, the "Problem of Product Mix" (Tiebout:1962) (78)

One of the assumptions underlying the construction and use of the Location Quotients, is that, the products manufactured in the two regional economies are completely homogenous. But in reality it rarely happens so. Even though, the products of a particular industry, when classified at a broader level of aggregation, appear to be 'Export' items from a particular region, it is very likely, that, in practice other brands of the same product are imported in the same region. Elaborating on this finer issue, Prof. Isserman comments that a region may both export and import the same good because of brand preferences. To the extent that a region imports products from a category which it also exports, the location quotient will under estimate exports, thereby overesti-

(*) The tendency to underestimate the Export employment in this particular case primarily arises due to the fact, that in actual and direct area studies, the vertical production linkages of Base enterprises can be traced out to a much finer level. This then makes the estimation of "Indirect-Export" employment associated with "Direct-Basic" enterprises, relatively more thorough and complete. With the use of Location Quotients, this is not always possible and guaranteed. So, when compared, with the direct technique of Base measurement, the Location Quotients tend to give a lower estimate of "Export" employment, on account of the underestimation of "Indirect-Export" employment mostly. (Total "Export" employment consists of both the 'Direct' as well as 'Indirect' export employment)

-mating the multiplier" (Isserman: 1977) (79). Prof. C.M. Tiebout, too, discusses the same point at length (*). (Tiebout: 1962) (80).

This sensitivity of the Export estimates to the level of disaggregation, even though was cited by Prof. C.M. Tiebout in 1962, was pointed out by Prof. C.L. Leven, way back in 1956. He writes, "Besides these conceptual shortcomings the use of localisation coefficients is particularly susceptible to the deficiencies of the Standard Industrial Classification. Its method of calculation inevitably assumes complete product homogeneity within each category. Thus, the proportion of "exports" to "local" activity in any area would depend on the particular breakdown used to compute the coefficients" (Leven: 1956) (81).

(*) In the case of commodities/enterprises of the Base region, where the problem of Product Mix exists, the tendency of the LQ technique to underestimate the "actual" Export employment associated with those enterprises can be explained with the help of the fundamental tenets of the International Trade Theory. All the imports of goods and services of the region have to be paid for by exporting the goods and services of the region. In the case of those activities, where the problem of Product Mix exists, the Location Quotient technique fails to take an account of those workers who are engaged in the production of those goods and services, which have to be exported in order to pay for the imports of a particular brand of the same commodity, which is classified as an "Export" activity/commodity at a broader level of aggregation. The 'total' or 'gross' export employment of the region, therefore, is then underestimated to the extent of those many workers, who are "Export" workers by nature.

At this juncture, then Prof. Isserman casts, what he describes as "considerable doubt" on the three empirical studies that we have cited and quoted so far as an evidence of the inaccuracy of the Location Quotients in the estimation of Export employment. These are the three studies conducted by Tiebout (1962), Greytak (1969) and Leigh (1970). He further argues that, had these studies used the Standard Industrial Classification data at a still lower level of aggregation, their findings would have been different. So, while supporting the use of Location Quotients and providing a rationale for its use, Prof. Isserman makes a pointed remark that ".... the commonly cited "evidence" of the inaccuracy of the location quotient approach is itself questionable because of the level of aggregation at which the "tests" were carried out" (Isserman:1977) (82)

In order to improve the accuracy of the Export employment estimates by using the Location Quotients approach, Prof. Isserman suggests two operational modifications. Those are:

1. Disaggregation of the data base; and
2. An a priori specification of certain sectors as exogenous.

He then argues that, both these modifications to the LQs improved the estimates of Export employment and reflected themselves in the values of Multipliers, which were more or less closely comparable with the Multiplier estimates arrived at by using other techniques like Input-Output (Isserman:1977) (83).

Prof. Isserman further suggests several procedural modifications to this technique so as to take an account of the underlying rigid assumptions and to make the Export estimates more accurate as well as at the same time to make the tool more realistic (Isserman: 1977) ⁽⁸⁴⁾. Obviously, the testing of these suggestions would call for a still more empirical data which may not be available or could not be generated easily and inexpensively all the time at all places.

Besides these modifications, Prof. Isserman suggests an important conceptual modification of selecting a "non arbitrary value other than one as an indication of export activity" (Isserman: 1977) ⁽⁸⁵⁾. In essence he is advocating a selection of, what he describes as, an "optimal" Location Quotient of value less than one, to represent the region's self sufficiency. He proposes that, "A comparison between location quotient multipliers and survey based multipliers for areas where the latter exist, or a comparison between location quotient estimates of exports and available export data could determine the nature and severity of the bias of the location quotient multiplier. If the bias is consistently toward over-estimation, as expected, it would be possible to select an "optimal" location quotient, less than one, representing self sufficiency. That optimal level would be selected to minimise estimation errors; it would be empirically, rather than theoretically, defined".... However, such fine tuning of the location quotient requires sufficient benchmark data both to define self-sufficiency levels & to test their accuracy" (Isserman: 1977) ⁽⁸⁶⁾.

The discussion so far centered around the conceptual and technical shortcomings of the technique of Location Quotients. Scholars like Prof. A.M. Isserman advocate the use of this technique with certain modifications which, as he argues, enhances the accuracy of the Export employment estimates. But Prof. C.L. Leven at one place points out a fundamental methodological as well as an ideological shortcoming of this technique, which even challenges the relevance and utility of such a tool in the regional studies. Prof. Leven asserts, "All too frequently attempts to implement these studies empirically rely on assumptions of the universal applicability of structural ratios. It is important to keep in mind that the entire purpose of individual area studies is to uncover regional variation. With this end in mind, the practice of quantitatively describing the structure of an individual area by making use of techniques which assume that the area's structure is much like that of all other areas seems largely self-defeating". (Leven: 1956) (87).

iv) Advantages of the LQs in actual empirical Base Studies.

Despite several conceptual and technical limitations of the concept, the tool of Location Quotients, still continues to be the most widely used indirect measure of Base identification and estimation. Its main advantages are that, it firstly takes care of both direct and indirect exports and secondly, it is an inexpensive way, both time and moneywise, of estimating region's exports. It is, therefore advisable to supplement the estimates of Export employment arrived at by using the Location Quotient technique, with the Export employment estimates carried out with the use of other direct and/or indirect techniques. Prof. Isserman, in fact, goes a step ahead in this regard

and proposes that because of the tendency of this technique to underestimate, the estimates of export employment given by the other techniques should be used when they are larger than the estimates given by Location Quotients. (88).

3.4.1.3 Minimum Requirements Technique of Base Measurement.

The Minimum Requirements technique is yet another important technique of Base measurement which has been used in empirical Base studies quite often. This particular method of Base estimation, which is a slight variant on the Location Quotient was applied to a group of cities in the United States by Edward L. Ullman and Michel F. Dacey (1960) (89) (*).

This particular method of classifying the total employment of an urban area into the two components viz. Base and Service, as Prof. Ullman and Dacey describe, "yields a quantitative statement which closely approximates the minimum percentage of a labour force required in various sectors of its economy to maintain the viability of an

(*). Even though a complete statement of the concept and the results of its application to a group of American cities appeared in the 1960 Volume of the Papers and Proceedings of the Regional Science Association, it appears that Ullman and Dacey conceived this technique sometimes in the early 1950s. Because in the text of the article a reference of two studies have been given, which appeared in late '50s and had used the similar concepts. One of these was by Prof. Gunnar Alexandersson, published in 1956, and the other was by Prof. Irving Mossissett which was published in 1958. (Ullman: Dacey: 1960) (90). But as Ullman and Dacey put it, to their 'sorrow' they found a mention of three Dutch scholars viz. Klassen, Torman and Koyck, in the article by Prof. Alexandersson, who had used the same technique in 1949 for the first time.

urban area" (Ullman & Dacey: 1960)⁽⁹¹⁾. This minimum approximates the employment needed for satisfying the local needs. If any urban area happens to employ workers in a particular activity which are in excess of this minimum that area is said to be having an "excess employment". While establishing the correspondence of this method of urban labour force classification with the dichotomy of the standard Economic Base framework, the authors write, "The minimum requirement closely approximates the service or internal needs of a city, and the excess employment approximates the export or basic employment". (Ullman & Dacey: 1960)⁽⁹²⁾. This technique was then used to compute the figures of internal employment for a group of U.S. cities.

Ullman and Dacey (1960) applied this particular technique to a group of American cities. There were in all six size classes of the cities. The lowest size class contained cities having population between 2500 to 3,000, while the biggest size class consisted of the cities having population above 10,00,000. Each city size group except the last, (i.e. city population equal to or more than 10,00,000) contained a sample of 38 cities which were selected randomly. Only the biggest size class was composed of the sample of 14 cities having population equal to or above 10,00,000. For all these cities, the percentage of the labour force employed in each of 14 census categories was calculated. In order to arrive at the Minimum Employment Requirements associated with population of a city for the 14 industry

groups, the technique of Linear Regression was employed. The Linear Regression equations were constructed with the minimum Employment Requirement in percentages as a Dependent variable; and the population of the city as an Independent variable. (93)

These were all independent cities. The suburbs were not considered in the estimation as they were having a "different structure". It was found that, the aggregate minimum employment in various sectors of the economy that was necessary to maintain the viability of that particular city was closely related to the size of the city. While stating this, the authors write, "Perhaps the most interesting finding, therefore, is the variation in the minimum requirement in relation to the size of the city.

... This finding is consistent with theory, since the larger the city the larger the number of specialities that can be supported and the more self contained the city can be". (Ullman and Dacey: 1960) (94).

Ullman and Dacey, further compared the estimates of Export and Local employment components arrived at by using the Minimum Requirements technique with the Basic and Non-Basic employment estimates arrived at by using direct and more close and intensive area accounting systems in other studies, and confirmed that a close, if not exact, correspondence existed in both the estimates. Hence Ullman and Dacey opine that, "These few comparisons are not conclusive evidence of the correctness of the minimum requirements

method, because of limitation in number, different methods of classification and/or different dates, as well as possible error in the other estimates. Nevertheless they do appear to confirm that the main function measured by the minimum method is the local component and its remainder, export activity, and that the measure is reasonably reliable".

(Ullman & Dacey: 1960) ⁽⁹⁵⁾.

a) Assumptions and Limitations of the Minimum Requirements

Technique:

This particular technique also rests upon the same set of assumptions regarding the equality of tastes, income levels and the distribution of income, per capita consumption, labour productivities and so on, among different urban areas, as that in the case of Location Quotient technique. Prof. Pratt (1968) ⁽⁹⁶⁾, argues that, as the same set of assumptions as that of Location Quotient technique is required in order to "produce valid results", the Location Quotient technique would identify the Base and the Service components of an urban area more correctly as it uses "average" proportions, rather than "minimum" proportions for the apportionment exercise. Prof. Pratt further argues that, the Minimum Requirements technique is even "more vulnerable to the problem of aggregation than is the location quotient or index of surplus workers" (Pratt: 1968) ⁽⁹⁷⁾.

Besides these shortcomings, Prof. Pratt comes out with a more fundamental paradox inherent in the Minimum Requirements technique, which is of a conceptual nature. According to this technique, the smallest percentage of

employment in a given category of an economic activity is considered to be the minimum required percentage of employment that a city of a certain population should have for its self-sufficient and viable existence. All other cities in that population size group, which have employment proportions in that particular category of economic activity, over and above the minimum percentage, are considered to be self sufficient and exporting the "surplus" production. In this case, Pratt argues that, this technique leads to a situation in which, "each city exports and none imports". So ultimately Prof. Pratt opines that, the device of Minimum Requirements is, 'not superior' in any way to that of the technique of Location Quotient (Pratt: 1968) (98).

But , in an empirical study which was undertaken by David Greytak (1969) to evaluate and compare the magnitude and source of error associated with various indirect techniques of Export employment estimation, the Minimum Requirements technique was found to be better as against the Location Quotient technique. As measured by the Root Mean Square error, Prof. Greytak observed that "the errors of estimation associated with the minimum requirements techniques were smaller than those of the location quotient techniques". (Greytak: 1969) (99).

b) Suitability of Minimum Requirements Technique for Developing Countries:

Researchers like C.L.Moore (1975), H.Brodsky and D.Sarfaty (1977) too advocate the use of Minimum Requirements tech-

nique in empirical Base studies. Moore (1975) prefers this particular technique for the three main virtues that it possesses, which are very important in actual Base Studies. According to him, the Minimum Requirements technique is (i) Inexpensive, (ii) quick to construct; and (iii) reasonably accurate (Moore 1975) (100).

Harold Brodsky and David Sarfaty (1977), further argue that as an indirect technique of Base measurement, the Minimum Requirements technique has "several advantages over the location quotient, particularly when applied in a developing country". (Brodsky and Sarfaty: 1977) (101). They have used this particular technique for measuring the Economic Base of Nicaragua. Both of them advocate the use of this technique vis-a-vis the Location Quotient technique, particularly in the case of Developing countries for the following reasons. (102).

- i) In the case of larger countries, as that of United States, which are more or less self sufficient and hence, as the proportion of International Trade relative to the total economy is small, the national employment in any industrial category can be used as an approximate measure of national consumption of that particular industry's products. But in the case of a Developing small country, where the International Trade is of "Overshadowing significance", the Location Quotient derived from the national employment, then would have to be adjusted accordingly. The Minimum Requirements technique does not need any such special adjustment for foreign trade.

- ii) The Minimum Requirement technique measures "Gross" rather than "Net" Basic activity.
- iii) This particular technique uses an aggregate industrial classification and hence the required data could be generated quickly, easily and inexpensively.

3.4.1.4. Homer Hoyt Technique of Base Measurement.

Another method of estimating Base indirectly was devised by Prof. Homer Hoyt in 1960s. The basic accounting principal of inter-regional trade that, "In the long run, however, the value of exports is equal to the value of imports or vice-versa" is fundamental to this exercise undertaken by Prof. Hoyt. While describing the basic ideology behind this method, he writes, "The value of the food and manufactured products delivered to a city represents the amount that must be paid for by exports in one form or another. So it occurred to me that it would be easier, in the case of many urban communities, to measure the wholesale value of goods shipped from outside the urban region to its borders than to calculate the exact value of the products of all industries and services that are exported" (Hoyt:1961) (103).

With several assumptions and generalisations Prof. Hoyt carried out this exercise for two metropolitan areas - Detroit and Washington, D.C. with the use of secondary data. He estimated the Basic to Non-basic ratios in dollar terms, and then compared these with the Basic to Non-basic ratios estimated with employment as a unit. Even though, both the ratios did not match exactly, they did not differ widely either.

The estimation of total volume of exports indirectly via estimating the volume of region's imports is the main feature of this method proposed by Prof. Hoyt. Except this, the method earns similar results, when the estimates of Basic and Non-Basic activities are done with any unit of measurement other than employment. Prof. Hoyt clearly states, "The foregoing calculations do not show the number of basic workers employed in any County but the dollar volume in the form of wages, rents, interest and profits necessary to pay for the imports". (Hoyt:1961)¹⁰⁴

In this method Prof. Hoyt uses income as the unit of measurement. We have discussed the utility of 'employment' as a unit of measurement in Base studies in the earlier section. The limitations associated with 'income' as a unit of measure are then relevant here too. Further, the method requires data regarding retail sales by type of stores at the city or a metropolitan area level, which may not be available everywhere easily. A still detailed critique of this method has been provided by Prof. John Murdock in the 1962 Vol. of Land Economics. (Murdock, J: 1962) (105).

We have discussed the main Indirect techniques of Base measurement so far. Now, what follows is a brief account of the Direct Techniques of Base estimation.

3.4.1 Direct Techniques of Base Measurement:

Prof. C.M. Tiebout (1962)⁽¹⁰⁶⁾ classifies the Direct methods of Base measurements broadly in the following two groups.

- a) Direct measurement of commodity and money flows from various sources of data:

This particular method is similar to the one

suggested by Prof. Hoyt. We have presented a brief account of the exercise in the previous section. The only difference in the version suggested by Prof. Tiebout is that, the study primarily focuses its attention on the region's transportation industry. As the data compiled so would automatically be regarding both the physical volume of the goods transported, as well as, their value, this would give a detail account of all the goods and services exported from the region by all the modes of transportation. Prof. Hoyt, on the other hand relies on the retail sales data of the region. But as Prof. Tiebout himself admits, this method requires a lot of data. Further, there are several flows of money and funds which are not related to the exchange of goods and services. Taking into consideration all these factors, researchers often opt for the other alternative of Sample Surveys of consumers and firms. Tiebout (1962)⁽¹⁰⁷⁾ also has expressed his preference for Survey method.

b) Surveys of Consumers and Firms:

While expressing a clear preference for a direct method of Base measurement like field surveys by using questionnaires and personal interviews, one of the staunch critiques of indirect measurement techniques Prof. C.L. Leven states unhesitantly, "Essentially the only way to find out who exports from an area and what products they export is simply to ask the firms in the area. This obviously involves a lot more work than the application of some generalised formula. Nevertheless, I do not believe

that there is an easy shortcut". (Leven: 1956) (108). Prof. Leven compared the Export employment estimates based upon the Location Coefficients and the sample surveys. After examining the difference in the estimates, he concludes, "The differences are quite striking and are certainly not systematic. I hope these comparisons drive home the message that, the only way to find out how much firms 'export' is to ask them" (Leven:1956) (109). A similar view has been expressed by Greytak (1969) (110).

In an article, "Mechanics of the Urban Economic Base; Historical Development of the Base Concept", Prof. R.B. Andrews makes a reference to a study undertaken by Prof. John Alexander, in which he had used the technique of direct survey for segregating the Basic and Non-Basic components of the community's total work force. Prof. Andrews writes, "A very recent contribution in the field of technique has been made by Prof. John Alexander. He has devised a system of base and service activity identification which works through a questionnaire issued to individual enterprises of the community. Their reported proportions of export activity are then applied (particularly in the case of retail establishments) to their total employment figure in order that it can be broken down into its base and service components" (111).

Because of the more direct approach of the field surveys, and since the data that is generated out of such field work is relatively fresh, this technique of direct estimation is preferred to other indirect methods. But, these surveys are rather costly, both in terms of time and money. Prof. Andrews describes them as "The questio-

-naire approach is simple in concept but often complex in execution". Instead of using any other indirect technique of Base measurement which relies more on generalisations and uses some average ratios, the direct field surveys are always preferable for their accuracy and inherent ability to uncover the structural and sectoral interrelations of the urban area. But resources, both time and finance, may not always permit such an exhaustive and a complete survey. While pointing out this, Prof. Roger Leigh states, "Perhaps the best kind of economic base study is one that surveys every industrial and commercial enterprise in a defined urban area and identifies the locus of their sales and incomes. However, such surveys are obviously difficult and expensive to carry out, especially for a large city" (Leigh:1970) (112). Brodsky and Sarfaty (1977) (113), have suggested a solution to this problem. In their view, "Critical sectors of an urban economy may be surveyed while other sectors are separated into basic and non-basic components by allocative procedures". Researchers like Prof. Tiebout (1962) and R.B.Andrews have also discussed the short-cut techniques to the complete survey methods and other important issues associated with it (114).

3.5 Utility of the Base Estimates:

We have reviewed the Indirect as well as the Direct techniques of Base measurement till now. The choice of any particular technique in an actual empirical Base study would depend upon factors like scope and objective of the study, the availability of relevant data, and, the resources (both,

time as well as money) those are at the disposal of the researcher/planner. The estimation of an area's Base and the subsequent bifurcation of region's total employment in its two components viz. Base and Service, is then used further to derive and construct the two main tools viz. Base ratio/s and the Employment Multiplier (EM) which are used in the actual process of projection and urban Planning. The derivation of these two tools of planning and projection is the subject matter of the next chapter.

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CHAPTER - IV:CONCEPT AND USE OF EMPLOYMENT MULTIPLIER:

In the previous chapter we discussed the various methods of measurement of the Base. From the Base, the Base ratio/s can be devised which is an analytical tool for projection of the future employment and population that have a bearing on the urban growth. The other important tool of projection is the Employment Multiplier (EM) which is an extension of the Base ratio. In this chapter we discuss the derivation and use of the Base ratio/s and the Employment Multiplier (EM). The size and the dynamics of these two tools have an important bearing on the predictive power of the Economic Base theory.

4.1 Base Ratios and the Exercise of Population Projection:

The Economic Base concept as a tool of forecasting was used for the first time by Prof. Hoyt for the Federal Housing Administration in 1936. (*) In this exercise, this concept was used for projecting the total future population of a particular city or an urban area with the use of a ratio named as the "Basic-to-Non-Basic Employment Ratio". While commenting on the role of this analytical tool in the Base studies, Prof. Leven remarks, "The notion of the economic base, essentially borrowed from the New York Regional Study of 1928, reduced the problem of estimating total future population to estimating future,-

(*) An elaborate account of the early development of the Economic Base concept and its use in the actual empirical exercises of city planning and population projections, has been provided by Homer Hoyt in an article entitled "Homer Hoyt on Development of Economic Base Concept". (Hoyt: 1954) (1). This article has been followed by an extensive Bibliography on the Economic Base.

"town building" employment, with an assumed fixed ratio of "town filling", to "town building" employment and a fixed number of inhabitants per employed worker" (Leven: 1964) (2).

The actual exercise of projection, as conceived by Prof. Hoyt involved the following steps (3).

1. Enlisting the major sources of employment and income in the urban area under consideration.
2. Ascertaining the number of 'urban growth' or 'Basic' employees in each industry or trade.
3. The total number of "Basic" employees in each of the major activities would then be subtracted from the actual number of employees employed in these enterprises. The result would give us an estimate of 'Non-Basic' or 'Service' employees in these activities.
4. Estimation of the ratio between Basic and Non-Basic employment.
5. Calculation of the ratio of total employment to the total population of the urban area.
6. Projection of the size of the future "Basic" employment. This could be done either by,
 - a) taking into account the past trends in various types of Basic employments; and/or
 - b) direct survey and interviews with the area's Base activities, their officers and so on.
7. The estimation of future total employment from Basic to Non-Basic ratio (or with the help of a 'Multiplier', which is a logical extension of the same ratio).
8. Estimation of the future population of the urban area with the help of the ratio of total employment to total

population.

Then the three Base ratios viz. (i) Total population to total employment; (ii) Total employment to total Basic employment; and, (iii) Non-Basic employment to Basic employment assume a key role in the process of estimation of population. The last of the three ratios i.e. the ratio of Non-Basic employment to the Basic employment, further gives us the other tool of Employment Multiplier. The derivation of the Employment Multiplier and the relation of it to the Base ratio is presented in the following passages.

4.2 Base Ratio and Employment Multiplier (EM).

The primacy of the Basic (or Base) activities is fundamental to the Economic Base theory. The rise in demand for the region's exports leads to an increase in the employment of the Base enterprises. As the employment creation in the Basic sector rises, the income of the persons engaged in the Base activities also rises. These workers and their dependents spend this money on the goods and services of their daily use. This is how income and employment are generated in the other local sectors of the region's economy. So, the initial change in the Basic sector is said to have a 'MULTIPLE' impact on the region's economy. The functional relationship implicit among the three main variables of the region viz. (i) total Basic employment, (ii) total Non-Basic employment; and (iii) total population is as follows :

$$EN_{(A)} = B \cdot EB_{(A)} \dots\dots\dots(1)$$

i.e. the Non-Basic employment (EN) of the region A is some multiple (B) of the region's Basic employment (EB).

$$TE_{(A)} = M \cdot EB_{(A)} \dots\dots\dots(2)$$

i.e. total employment (TE) of the region A is some multiple (M) of the region's Basic employment (EB), and

$$TP_{(A)} = D \cdot TE_{(A)} \dots\dots\dots (3)$$

i.e. Total population (TP) of the region A is some multiple (D) of the region's total employment (TE).

The mathematical formulation of the above mentioned functional relationship is presented below in the form of linear equations.

$$TE_{(A)} = EB_{(A)} + EN_{(A)} \dots\dots\dots (4)$$

Since, $EN_{(A)} = B \cdot EB_{(A)}$.

$$TE_{(A)} = EB_{(A)} + B \cdot EB_{(A)} \dots\dots\dots (5)$$

$$TE_{(A)} = EB_{(A)} (1 + B) \dots\dots\dots (6)$$

$$TE_{(A)} = M \cdot EB_{(A)} \dots\dots\dots (7)$$

Where $M = (1 + B)$ is called as the "EMPLOYMENT MULTIPLIER". This M is defined as:

$$M = \text{Employment Multiplier} = \frac{TE_{(A)}}{EB_{(A)}} \dots\dots (8)$$

as $TE_{(A)} = EB_{(A)} + EN_{(A)}$

$$M = \frac{EB_{(A)} + EN_{(A)}}{EB_{(A)}} \dots\dots\dots (9)$$

$$M = 1 + \frac{EN_{(A)}}{EB_{(A)}} \dots\dots\dots (10)$$

Comparing equation (10) and equation (6) it gets confirmed that

$$B = \frac{EN_{(A)}}{EB_{(A)}} \text{ which is in fact given by}$$

$$\text{equation (3) i.e. } EN_{(A)} = B \cdot EB_{(A)}$$

$$TE_{(A)} = M \times EB_{(A)}$$

$$TE_{(A)} = EB_{(A)} \left(1 + \frac{EN_{(A)}}{EB_{(A)}} \right) \dots \dots (11)$$

In the above equation, the ratio of area's total Non-Basic employment to total Basic employment $\left[\frac{EN_{(A)}}{EB_{(A)}} \right]$ is the 'Base Ratio' mentioned above. The ratio indicates the number of people employed in the region's Non-Basic sectors for every person employed in the Base. The Base ratio of 1:2 would imply that, .. every one person in the region's Base, supports, two persons in the Local sector. On the similar lines, the relationship between the Base ratio and the Base Multiplier could be described as follows:

According to equation (7) above:

$$M = 1 + B$$

further as per equation (3)

$$B = \frac{EN_{(A)}}{EB_{(A)}}$$

so,

$$M = 1 + \frac{EN_{(A)}}{EB_{(A)}}$$

i.e. when the Base ratio is 1:2, the value of the Employment Multiplier is 3. This is so because,

$$M = 1 + \frac{(2)}{(1)}$$

$$\therefore M = 1 + 2$$

$$\therefore M = 3.$$

So, when we say that the Employment Multiplier for a particular region is say 6, what it implies is, that, every

one employee in the Basic sector, supports additional 5 employees in the Non-Basic sector of the region's economy. In the static analysis, the concepts of Base ratios and/or Employment Multiplier explain the structure of the region's employment. So, the size of the average aggregate regional Multiplier at a point of time does not say much about either the nature of sectoral linkages or the relative importance of different sectors in the region's growth. The construction of disaggregated multipliers would then cast some light upon the relative responsiveness and importance of various Non-Basic sectors vis-a-vis the region's Base in the total employment creation.

4.3 Kahn's Conception of a "Multiplier".

The concept of Employment Multiplier, is primarily used as a tool of projection in the Economic Base framework. The idea and derivation of multipliers, both employment, as well as income, is an adaptation and application of the concept of 'Multiplier' in the general economic theory to the regional analysis. As stated by Wright (1956) in a review article which traces the early genesis of the multiplier theory, the "origin of the term as an economic concept is difficult to discover". (Wright: 1956) ⁽⁴⁾. But as we learn from him, the origin of this concept is attributed to Prof. R.F.Kahn.

The reading of Prof. Kahn's original piece of writing reveals that, even though Prof. Kahn spells out the basic idea of the tool and the mechanics of its functioning in its most crudest form, the particular term 'Multiplier' was not coined by him. This article of Prof. Kahn's appeared in the Economic Journal of June 1931. This is one of the early years of the great depression of 1930s. In this

article, Prof. Kahn argues out a case for Public works, by calling an attention of the readers to the "beneficial repercussions" of the home investment. (Kahn: 1931) (5). In this regard he states, "The argument will apply to the effects of any net increase in the rate of home investment.

The increased employment that is required in connection actually with the increased investment will be described as the 'primary' employment. It includes 'indirect' employment that is set up in the production and transport of the raw materials required for making the new investment. To meet the increased expenditure of wages and profits that is associated with the primary employment, the production of consumption-goods is increased. Here again wages and profits are increased, and the effect will be passed on, though with diminished intensity. And so on adinfinitum. The total employment that is set up in this way in the production of consumption-goods will be termed the 'secondary' employment. The ratio of secondary to primary employment is a measure of these "beneficial repercussions", that are so often referred to". (Kahn:1931) (6)

Now one can see the direct concurrence between the ideas behind the construction and derivation of the Employment Multipliers in the Economic Base framework today, and the same formulation presented by Prof. Kahn in different words. The increased employment associated with the increased investment, both Direct and Indirect, which Kahn collectively describes as "Primary" employment, is later on described as "Direct Basic" and "Indirect-Basic" in

the nomenclature employed by the Economic Base framework today. The total employment that is set up in the production of goods for consumption, which Kahn classifies to be "secondary employment" is now termed as " Non-Basic or Service" employment. The ratio of secondary to primary employment, which Kahn calls as the "measure of beneficial repercussions" is what is now defined as the "Base ratio", i.e. the ratio of Non-basic to Basic employment. The Multiplier is a modified version of this Base ratio as described in the beginning.

A large amount of literature (both empirical and theoretical) is available regarding the usage of this tool in the regional analysis. A fine summary of some of the main empirical studies and conceptual advancements in this area have been presented in some of the review articles written by scholars such as, Lane (1966)⁽⁷⁾, Williamson (1975)⁽⁸⁾, McNulty (1977)⁽⁹⁾, Gerking and Isserman (1981)⁽¹⁰⁾, and Bender and Parcels (1983)⁽¹¹⁾. A brief summary and review of some of these has been presented in the following section.

4.4 Stability of the Base Ratio and the EM.

The Economic Base framework and the Base ratios were summoned to project the future population of the region by Prof. Homer Hoyt. The future population of the region would be estimated from the projected total employment of the region. This process could be explained with the use of the functional relationship described above.

$$TP(t^*) = D(.) TE(t^*) \dots \dots \dots (12)$$

$$TE(t^*) = M_{(t1)} \times EB(t^*) \dots \dots \dots (13)$$

Where (t*) represents some future time period/year for which

the projection is undertaken.

In fact $TE_{(t^*)}$ represents the changed total employment. In effect the changed employment figure is arrived at by the following formula.

$$TE_{(t^*)} = M_{(t_1)} (x) EB_{(t^*)} \dots \dots \dots 14.$$

According to equation (12) the projected population $TP_{(t^*)}$ is arrived at by multiplying the projected Basic employment $EB_{(t^*)}$ of time period (t^*) by the Employment Multiplier of the current year $M_{(t_1)}$.

The entire predictive ability of the Economic Base framework and its use as a forecasting tool is primarily, therefore, based on two fundamental hypotheses.

1. The Non-Basic employment of the region is directly dependent upon the region's Basic employment; and,
2. The nature of this dependence is reasonably stable over the years.

So, in essence the presumed stability of the Base ratio has a fundamental bearing on the stability of the Employment Multiplier.

In the earlier usage of the Base ratio in the planning and projection exercises, it was presumed that the stability of the Base ratio, and therefore the stability of the Employment Multiplier, has spatial as well as temporal parameters. Not only that, but Prof. Hoyt had made an additional simplifying assumption that the ratio of Basic to Non-Basic workers is 1:1, while he was carrying out the population projections for the Federal Housing Authority. But later on, Hoyt himself asserted that, "It seems to me that the ratio between

basic and service employment not only varies between urban regions but that it will change in the same region over a period of time... " (Hoyt:1954) ⁽¹²⁾. A brief account of some of the main factors which cause changes in the Base ratio and thus in the EM is presented below.

4.5 Factors affecting the Base Ratio/s.

We shall first discuss some of the main factors which can cause variation in the Base ratio among various regions at a point of time.

4.5.1 Factors affecting the Base ratio Across regions at a point of Time:

The Base ratio across various regions could be different at a point of time on account of one or more of the following factors:

- i) The size of the area.
- ii) The population of the area.
- iii) The level of income and its distribution in the area.
- iv) The tastes pattern, consumption habits, income elasticities, and propensities to consume various commodities, of the inhabitants of the region.
- v) The extent of diversification of the Base.
- vi) The level and nature of technology of the Base enterprises.
- vii) The wage levels of Base employees.
- viii) The overall stage of economic development of different regions.
- ix) The existence of economies of agglomeration and economies of scale which again depend upon (viii).
- x) Technique used in the estimation of Base:

As proved by Gerking and Isserman (1981)⁽¹³⁾ as well as by Isserman⁽¹⁴⁾ the methods used for estimating the size of the region's Base is one of the important factors which cause a variation in the Base to Service ratio & thus the value of EM.

4.5.2 Factors affecting the Base ratio of an urban area over a period of time:

The factors which cause change in the Base ratio and thus in the value of EM in the case of a particular region over a period of time, could broadly be classified into two categories according to their source of emergence, such as:

A. Factors originating out of qualitative as well as quantitative changes in the Base of the region:

Some of the factors which come under this category are:

1) The expansion of the Base of a region: This can happen in either of the following ways:

- a) Expansion of the existing Base enterprises.
- b) Addition of newer enterprises both; manufacturing and service to the region's Base.

The addition to the Base of a region, again, can take place in either of the following manners:

b1) The establishment of an altogether new unit, either manufacturing or service, catering primarily to the external demand.

b2) Evolution of an existing unit from the status of a Non-Basic locally oriented unit to an export oriented Basic enterprise.

ii) The nature of expansion of the Base: As we have seen the income generated by Base enterprises which is available for local spendings, provide the primary boost to the expansion of Non-Basic local activities. The

wages and salaries received by the Base employees is one of the most important constituents of the Base - Local intersectoral circular flow. The size of the total purchasing power generated hitherto by the Base is governed by two factors viz: the size of the direct employment of the Base enterprises; and the size of the wage bill of the Base employees.

These two factors exhibit differential impact on the process of growth of an urban area at its various stages of development.

It has been observed that the rate of growth of organized sector employment in the large cities and metropolis of the Developing Countries has slowed down. The firms in the organized sector are trying to restrict the size of their direct employment on account of one or more of the following factors:

- a) Rising labour costs in the organised labour market of the cities.
- b) Strong Trade unionism and the likelihood of labour disputes.
- c) The emergence and existence of economies of agglomeration, which enable the larger firms to farm out some of their less sophisticated operations to other local small scale units.
- d) The policy of the Government, which in many cases put restrictions on the physical expansion of larger units in the large cities and metropolitan areas.

Due to such and several other reasons the tendency to promote ancillarisation by restricting own employment is becoming stronger on the part of larger organised sector units. But

at the same time the productivity of these large units is growing, and subsequently their pay scales are being revised every year. As a consequence the other part of this growth, viz. the total wage bill comes to play an important role in the development of the local activity sector. This precisely is the second type of Multiplier as discussed by Prof. Isard (Isard: 1960) ⁽¹⁵⁾. So for a particular industrial unit, the Base ratio may change over the years depending upon the nature and the phase of development of that unit.

iii) The level of technology and the nature of final products manufactured by the Base enterprises: These factors also have a discernable impact on the size of the Base ratio via the potential for the development of linked activities.

iv) The overall policy of the Base enterprises: The policies of the Basic Units regarding expansion, diversification, ancillarization, modernization and so on also affect the growth of ancillary units which in turn affect the Base ratio.

B. Other factors having no direct concurrence to the changes in the Base.

The factors which do not have a close and direct correspondence to the changes in the Base, but which still affect the Base ratio and EM are:

- a) The stage of overall economic development of the region: This has a bearing on the establishment of newer units, the potential for the development of economies of urbanisation and so on.
- b) Government policy: Especially the policies regarding licensing, incentives, taxation, (both personal and

corporate) location and so, also affect the Base ratio.

c) Income distribution of the region.

d) Other non-export sources of income for the region:

As we know the export earnings of the Base enterprises is one of the sources of external earnings for a region. The sources other than this which bring money into the region's economy such as pensions, rents, interest, dividends, remittances and changes therein too, have an important influence on the development of local activities and therefore on the size of the Employment Multiplier.

4.6 EM and the Lags in the realisation of its Full Impact

A vast amount of literature, both theoretical and empirical, is available about the Economic Base theory and the concept of Employment Multiplier. The estimates of the Employment Multiplier and/or the Base ratio is generally arrived at by using either of the following methods:

- A. The use of linear regression technique with either total employment or Non-Basic employment as a dependent variable and the Basic employment as the independent variable.
- B. Construction of the ratio directly by estimating the region's total Basic employment either with direct method or indirect methods, and then subtracting it from the region's total employment to arrive at the estimate of the Non-Basic employment of the region.

Several studies which have tested the Economic Base theory have some common features such as:

estimation

- 1) Most studies have used Linear Least Squares/technique.

ii) Some version of the Location Quotient technique has been used for the purpose of bifurcation of region's total employment into its two components viz. Basic and Non-basic.

iii) Mostly employment has been used as the unit of Base. The choice of unit as well as the technique of Base measurement, has been influenced to a large extent by the considerations of data availability.

As we have seen so far, the factors which bring about changes in the Base ratio and thereby alter the size of the EM are multifaceted. Some of them have a close bearing on the changes in the Base, while others are overall, general economic factors. Changes in the region's economy come into being as a response to the initial disturbance introduced by the Base enterprises. Regional change is a cumulative process. This has given rise to a closely related controversy regarding the extent of time lag or timing of the full impact of the initial change in the Export sector on the Local economy. In other words the issue is, how much time does it take for the multiplier impact of the initial change to be realised fully? The relevant literature addresses this issue in the form of a question as to whether the Economic Base framework and the EM analysis is a theory of short run regional income/employment determination or is it a theory of long run regional growth?

The literature that is available about this important issue is rather vague and inconclusive. The Economic Base theory has been applied and tested empirically at several places since 1940s, but as Prof. McNulty observes (McNulty: 1977) (16),

a relatively less attention has been paid to this important issue of the duration of the lag in the response of the Non-basic sector to the initial changes in the Basic sector. In an article, published in November 1981, Prof. S.D. Gerking and Prof. Andrew Isserman have attempted to resolve some of the disagreements by taking a review of all the earlier studies, with a special emphasis on three studies. These three studies are the one conducted by Prof. Sasaki in 1963⁽¹⁷⁾, Moody and Puffer in 1970⁽¹⁸⁾ and by Prof. McNulty in 1977. Regarding the treatment of the question of time lag of impact in some of the earlier studies, Gerking & Isserman categorically observe that, numerous regression studies such as those conducted by, Hildebrand and Mace (1950)⁽¹⁹⁾ Gerald Thompson (1959)⁽²⁰⁾ and Weiss and Gooding (1968)⁽²¹⁾, "do not consider the question of lags explicitly". Not only this, but they state, that these studies "examine the relationship between basic and non-basic activity in the same time period" (Gerking & Isserman: 1981)⁽²²⁾.

There is no general agreement or a consensus among the scholars regarding the usefulness of the concept of Employment Multiplier, whether as a tool of short run regional Employment and income determination or an equipment of explaining long term regional economic development. The three review articles written by researchers like Prof. Lane in 1966, Prof. Williamson in 1975 and Prof. Gerking and Isserman in 1981, reinforce the conventional shortrun orientation of the Economic Base study.

Despite the fact that most of the empirical studies emphasize the short-run orientation of the theory, this could not be

accepted as an undisputed verdict against the usefulness of the theory as a tool for explaining the long-term regional development. This is so because all these studies differ from each other in several important aspects such as:

- i) Even though most of the studies have used employment as the unit of Base, the studies conducted by
 Prof. Ghali (1973)⁽²³⁾ and Prof. James McNulty (1977), use income as a unit of Base measurement.
- ii) The technique of Base measurement is not uniform in all the studies.
- iii) Even though mostly linear least squares estimation technique has been used, the definitions and the constituents of dependent variable and independent variable are again not uniform in all the studies.
- iv) All the studies have not incorporated the notion of lag consciously in their analysis.

The two empirical studies conducted by Moody and Puffer (1970) and the other by McNulty (1977) assert that the Economic Base theory can very well explain the long run development of the region. Not only this, but Prof. McNulty strongly proposes, that, "the economic base theory of regional growth was found to fit the facts very well in the long run, but to provide a very poor explanation of short-run regional economic development". (McNulty: 1977)⁽²⁴⁾. While showing that this conclusion of Prof. McNulty is invalid, Gerking and Isserman remark, " the research design actually does not test for the existence of a lagged impact of basic activity on non-basic activity, so that conclusion is invalid". (Gerking and Isserman: 1981)⁽²⁵⁾. They further

argue that there is a methodological flaw in the construction of the test. In order to test the hypothesis that the changes in the Basic activity affect Non-Basic activity after four years, the changes in the Non-Basic activity in a particular period will have to be regressed upon the changes in the Basic activity in the earlier four years of that period. But, Prof. McNulty regressed the changes in the Non-Basic activity in a particular period of time on the changes in the Basic activity during the same time period.

In a study conducted by Moody and Puffer in 1970, they found out that the full multiplier effect, "would not be felt for several decades" (Moody and Puffer: 1970) ⁽²⁶⁾. This observation is in dire contrast to the study conducted by Prof. Sasaki in 1963, which concluded that, the multiplier effect of a change in Export employment would be felt almost within a period of a year. Gerking and Isserman argue that, these diametrically opposite conclusions of the two studies could be attributed to either of the following factors:

- 1) Differences in the selection of dependent variables in the two studies: Prof. Sasaki used region's total employment as a dependent variable, while Moody and Puffer, used the Non-Basic employment as a dependent variable. Since Basic employment is a part of the total employment, which is a dependent variable, Prof. Gerking and Isserman argue that the lag length estimates would be shorter than when Non-Basic employment is the dependent variable. So, as they state, "This factor then could contribute to making Sasaki lag length estimates shorter than those found by Moody and Puffer" (Gerking & Isserman:1981) ⁽²⁷⁾.

ii) The techniques used for estimating the Basic employment:

Prof. Moody and Puffer relied upon the assumptions method of bifurcation of region's total employment into Basic and Non-Basic components. While, Prof. Sasaki used the actual outside region sales proportions of Hawaii's enterprises to ascertain their Basic employment. Commenting on this distinction as a potential source of difference in the findings, Prof. Gerking and Isserman state, "the different bifurcation methods used by Moody and Puffer and by Sasaki may have contributed to their conflicting estimates of the timing of impacts as, the assignment method of bifurcation may tend to produce larger lag estimates than methods such as the location quotient and minimum requirement method" (Gerking - Isserman:1981) (28).

The actual timing of impact would depend upon several factors such as:

1. The region's productive capacity vis-a-vis its demand.
2. The composition of the Basic enterprises and the changes therein
3. The direction and magnitude of changes in the Basic activity.
4. The responsiveness of migration and labour force participation to employment opportunities and wage changes in the region.
5. The institutional infrastructure of the region and so on.

Therefore, a still modified basket of analytical tools is needed to accommodate all such factors mentioned above to assess the exact length of time lag.

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C O N C L U S I O N :

In the earlier chapters we have examined in details the fundamental tenets of the Economic Base theory, the choice and suitability of different units of Base identification, the techniques of measurement and the problems of projection and the stability of Base ratio. The major works having bearing on this area have been reviewed. In the foregoing we have examined how the Economic Base theory has evolved. We do not propose to repeat in the form of a summary here. A review of the literature shows that the concepts have been well developed and the implications of different assumptions have been thoroughly analysed. There were a number of empirical studies based on this theory in the Western countries. We have not reviewed these empirical studies partly for reason of space but mainly due to the reason that the nature and effect of structural parameters who have a sensitive effect on Multipliers is different in Developing countries from that of the Developed countries. Hardly there is any work in the Indian Context. The only study that is available is that of A.P.Kulkarni for the city of Pune.

The focus of the study was on the exploration of the manufacturing linkages between the large Export Oriented (Basic) manufacturing units of Pune and their manufacturing ancillaries. In all 11 large Basic units were selected from different sectors such as Automobiles, Chemicals and Engineering and with the direct sample survey method the Employment Multipliers were estimated for each of the 11 large, Basic Units.

The study postulates that, even though the role of Base enterprises is crucial in the expansion of local activity sector,

the growth and actual size of employment in some sections of Local enterprises bears no direct relation with the size of employment in the Basic sector. The actual employment and its growth in Non-Basic local units (both manufacturing as well as services) is determined by factors such as population, tastes and habits of residents of the area and the amount of income earned and spent locally by the employees of the Base enterprises. (*)

While this is a pioneering study the impact of Employment on Income and its consequential impacts have not been explored. Even then this is of help for policy makers in projecting the population growth and provision of urban infrastructure.

The theory, if empirically applied to different regions, the nature of the growth pattern of the Indian Urban centres can be understood. This has important policy implications for urban planning.

(*) A much more elaborate exploration of this important issue is contained in Czernanski (1964) (1) and Kulkarni (1991) (2).

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