WORKING PAPER NO. 159

ROLE OF SERVICES IN THE GROWTH PROCESS: A SURVEY

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MARCH 2005

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Foreword

It is observed that since 1990s service sector has emerged as the fastest growing sector in most of the economies, be it developed or developing. The growing share of services in global output, employment and international transactions has brought to the forefront the issue of the role played by services in the growth process of developing countries. In this context, the paper undertakes a selective review of literature that discusses the growth of service sector in developing countries. The relationship between manufacturing and service sector is also explored along with the reasons for slower productivity growth in services as compared to goods. The problems in measurement of productivity in services are discussed along with the issue of productivity paradox.

The paper is useful for researchers, academicians and policy makers who are interested in the inter-sectoral linkages in the growth process and the issues involving productivity in services.

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March 2005

1. Introduction[*]

The rapidly rising share of services in production and employment in most economies has evoked interest in the issue of de-industrialisation and the emerging service economy. One of the important issues of interest is the role played by the service sector in the growth process of developing countries. The issue has assumed even greater importance in view of increasing international transactions in services and the growing liberalisation of services in developing countries. On one hand, a forceful case is made of the services becoming the major driving force of economic growth, on the other hand, some have argued that decline in manufacturing and the corresponding shift to services is unsupportable in the long run as services depend critically on manufacturing for their demand.

Closely associated with the issue of role of services in growth process of developing economies, is the issue of low productivity in services as compared to goods. It has long been argued that productivity growth in services is slower than that in manufacturing sector. Different explanations have been put forward for it including the argument that many service are subject to diminishing returns and because of their labour-intensive nature, service-sector activities cannot be made more efficient through capital accumulation, innovation, or economies of scale.

 In this context, the paper undertakes a selective review of literature and addresses the critical issues of growth of service sector and implications of lower productivity in services. For this purpose, it reviews the studies which discuss the factors which have led to growth of service sector and critically analysis the changing relationship between manufacturing and service sectors in the growth process of developing countries. It also discusses the problems associated with measurement of productivity in services and highlights areas of further research.

The paper is structured as follows: section 2 of the paper reviews studies that attempt to conceptualise services. Section 3 reviews both theoretical and empirical studies that examine and estimate contribution of services to growth. Section 4 reviews literature on productivity in services and examines the problems associated with measurement in productivity of services. Section 5 concludes the study.

2. How to Conceptualise Services?

There exists an inconclusive debate on conceptualisation of services which began with the classical economists who characterised services as products of labour that perish at the moment the labour is performed, giving services an air of intangibility and transitoriness. Both of these apparent characteristics have loomed from the background ever since, and have caused great confusion later on when neo-classical economists, forced for reasons of internal consistency of their theories, saw themselves faced with the issue of how to interpret services. We provide a selective review of studies that define and categorise services, either based on the use of services or for facilitating international transactions in services.

The earliest attempt to define services was made by Hill (1977) who argues that "goods and services belong in different logical categories." He focussed on the fact that producers cannot accumulate a stock or inventory of services, stressing that services must be consumed as they are produced unlike goods that can be produced and then stored. This makes it essential for the user and the provider of the service to *interact*. But subsequent to this conceptualisation there have been many studies that have noted the restrictiveness of Hills's definition (e.g., Hindley and Smith 1984, Sampson and Snape 1985, Sapir 1985, Bhagwati 1984, King 1987). Melvin (1989) points out that Hill's definition simply relates to *contact* services and that there exists a range of services which do permit a separation of the location of production and consumption in space as well as time, so that service trade may take place either at the factor or at the product level.

Bhagwati (1984) argues that services can be divided into two categories; first, those that necessarily require the physical proximity of the user and the provider; and second, those that do not essentially require this though it may be useful. Services that require <u>essential physical proximity</u> have been further categorised into three groups that are:

a) Mobile provider and immobile user, e.g., shifting labour to the construction site in other country.

b) Mobile user and immobile provider, e.g., hospital services

c) Mobile user and mobile provider, e.g., lectures, haircuts, etc.

However, it has been argued that services for which <u>physical proximity is inessential, i.e.,</u> the long distance services, are on a rise due to technical progress that makes it possible to provide services without physical proximity (Bhagwati 1985). Services like banking and insurance fall under this category. But it has also been argued that physical proximity between provider and user of the service does lead to greater efficiency. However, unlike in the case of goods where factor mobility and trade are distinct phenomena, in the case of services the distinction vanishes as factor mobility and trade in services are two integral aspects of service transaction [Bhagwati (1987)].

But, Stern and Hoekman (1988) point out that services can be: (1) complementary to trade in goods; (2) substitute for trade in goods; (3) unrelated to goods. All these characteristics have implications for how trade can occur. Their intangibility and non-storability implies that in order to become tradable, services have to be applied to, or embodied in objects, or information flow, or persons. Thus, for trade to occur, the means of transporting the services often have to be able/permitted to cross national frontiers. This makes international transaction in services more complex conceptually than international transactions in goods.

Most of the economists have categorised international transaction in services into three groups;

a) cross-border or separated trade analogous to trade in goods;

b) transactions that require the movement of the producer to the location of the demander (demander-located services); and

c) transactions that imply the movement of the consumer to the location of the provider (provider-located services) (Sampson and Snape 1985, Stern and Hoekman 1987).

These typologies help in assessing the role played by technology on tradability of services. Trade may or may not be technically feasible depending on the type of service. To the extent that it is feasible there may be different avenues available to the firms. These include trade in "service-intensive" goods; "separated services" i.e., embodiment in cross-border information flows; and movement of provider or demander.

However, the evolution of trade and investment in services between different countries will depend on various factors [Hoekman and Stern (1993)]. These include differences in per capita incomes, variations in factor endowments, distances from the markets, technology and technological gaps, the degree to which capital, labour and demanders are mobile, government policies, and firm strategies. Though these factors also affect tradability of goods but what differentiate the two is that services have different avenues of trade as discussed above. Therefore technological and regulatory considerations that determine the relative costs associated with alternative ways of providing services become more important for services vis-à-vis goods. For example, the "right to establish" becomes an important policy issue for services since restrictions on factor inflows will be sufficient to hinge on service transactions without the need for restrictive border measures on trade. This also raises important question relating to labour mobility and immigration which has led to the notion of "right of presence" or " right of market access" as softer versions of "right to establish".

For the purpose of classifying international transaction in services the most commonly used classification is provided by Sampson and Snape (1985) and modified by Sapir and Winter (1994). This classification is based on the constraints on the physical location of producer and consumer in realising the transaction.

1. Services transactions without movement of both the receiver and the producer of service.
2. Services transactions for which the consumer travels across borders to the immobile provider.
3. Service transactions that are accomplished by the temporary movement of factors of production across national borders while the receiver of the service does not move.
4. Service transactions by means of permanent local establishment via a foreign affiliate of a firm originating from a different country.

This classification has been adopted by World Trade Organisation (WTO) established April 1994 under the General agreement on Trade in Services (GATS). The Agreement applies to four "modes of supply"

<u>Mode 1</u>: cross-border supply of service (i.e., not requiring the physical movement of supplier or customer)

<u>Mode 2</u>: Provision implying movement of the consumer to the location of the supplier;

<u>Mode 3</u>: services sold in the territory of a Member by (legal) entities that have established a presence there but originate in the territory of another Member; and

<u>Mode 4</u>: provision of services requiring the temporary movement of natural persons.

This classification

Apart from the functional classification of services, to facilitate international transactions, services have also been defined and categorised using different characteristics and uses of services. Hirsch (1989) argues that to arrive at a functional definition of services the question posed should be "why is the service demanded?" An answer to this would be: service is acquired to serve any of the following goals:

a) instant benefits (e.g., travel, entertainment, haircuts, etc)

b) enhancement of user's consumption benefit capacity by reducing the cost-benefit ratio per product transaction (e.g., transport, communications, financial services, insurance, etc)

c) enhancement of user's productive capacity by reducing the cost-benefit ratio per unit of output (e.g., transport, training, business services, medical services, etc)

Based on this definition of services, alternate groupings of services have been done, these are:

(i)   "Intermediate" versus "final demand" services: This classification scheme comes directly from the input-output matrix structure, where "intermediate" production refers to output sold to other domestic firms or agencies.

(ii)   "Producer" versus "consumer" versus "government services": This classification scheme is also based on the end customer and was originally developed to underscore that at least half of all service sector production is sold to other firms (i.e., "producer services").

(iii)   "Market" versus "non-market services" This classification scheme is popular in Europe and differentiates between services paid for directly by a customer (industry or private household) and those paid for indirectly through taxes. As a wide range of formerly monopoly services become privatised, the distinction has become quite blurred.

Alternatively, many studies adopt a broader and simpler definition of services that help in distinguishing services from goods. One such broad definition of services is:'services form a diverse group of economic activities not directly associated with the manufacture of goods, mining or agriculture. They typically involve the provision of human value added in the form of labour, advice, managerial skill, entertainment, training, intermediation and the like'.

Thus, studies have put forward alternative definitions and classification schemes. However, the basic characteristics of services on which most of the classifications are based are: *non-transferability and non-storability.* Other associated characteristics of services that need to be noted are *services are heterogeneous and flexible in production* and *imperfect competition* is highly relevant for services. This implies that consumer

preferences for variety can be easily met; also because of simultaneity in production and absorption, services can be regarded as heterogeneous products.

Conceptualisation of services therefore depends on the purpose of the study. It is found that the categorisation of services broadly used in the current literature on international transaction of services primarily follows GATS classification scheme while the literature related to role of services in economic growth and productivity in services follow use-based categorisation of services. Alternatively, United Nations has also developed the Central Product Classification (CPC) for identification of services. This classification is based on products and identifies more than 600 service products. The CPC classification is now used as reference for the identification of services under GATS and also to describe the services components in the balance of payments as recommended in the IMF's Balance of Payments Manual (IMF 1993).

3. Role of Services in the Growth Process

Studies have theoretically argued and empirically estimated the link between performance of service sector and growth of the economy. In this context, one of the conceptual issues that have been discussed in the literature is the role played by services in the growth process. It has been argued that as economic growth proceeds service sector grows. But along with the growth of service sector, growth in manufacturing sector also takes place and the two-way spillover effect induces growth in the economy. There therefore exists a causal relationship between economic growth and growth in the service sector.

3.1   What Explains Growth in Service Sector

The classical economists from Adam Smith to Karl Marx were interested in services as distinct from goods for the purpose of defining productive labour. Following Verdoorn's

Law[1], Kaldor (1966) argued that there will be a negative relation between labour productivity growth in the economy as a whole and the rate of growth of employment in the non-manufacturing sector because most activity outside the manufacturing sector particularly in land-based activities such as agriculture and many service activities is subject to diminishing returns.

But along with the notion of services being generally unprogressive, it has often been emphasised by authors like Fisher (1935), Clark (1940), Kuznets (1957), Chenery (1960) and Fuch (1980) that with growth structural changes take place in an economy. These studies have noted and documented the positive association between growth and share of services in the industrial-distribution of the labour force based on Petty's Law which states that in the course of economic growth there will be a shift of population from agriculture to manufactures and from manufactures to services

The various explanations that have been put forward to explain the increasing share of services in GDP, investment and employment in the process of growth can be categorised as demand side factors and supply side factors. Demand side factors lead to higher demand for services as growth proceeds while supply side factors improve the supply of services.

A. *Demand-Side Factors*

1. high-income elasticity of demand for final product services, and
2. structural changes, which make contracting out services more efficient than producing them in the firm or household.

B. *Supply-Side Factors: Trade Liberalisation and Reforms*

1   increased trade;
2   higher foreign direct investments in services; and
3   improved technology

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[1] growth of productivity in manufacturing is an endogenous result of the growth of output

A. Demand-Side Factors

1. High-Income Elasticity of Demand for Final Product Services

The high-income elasticity of demand for final product services implies that at any relative price of services the quantity absorbed of services rises more than the quantity absorbed of commodities as real per capita income increases. This explanation for increasing share of services in the growth process has been tested by many empirical studies (e.g., Kravis et al 1983) and theoretical studies, which include Balassa (1964), Samuelson (1964) and Bhagwati (1984, 1985).

However, we find that the hypothesis that 'demand for services is income-elastic' tended to find support in early empirical work in the 1980s but in the 1990s studies with better methodologies and better international data find results contrary to this. For example, Falvey and Gemmell (1996) use dis-aggregated data set covering sixty countries in 1980 and re-estimate income elasticity of demand for services. They reject the above hypothesis for overall services though confirm it for different types of services.

2. Structural Changes

Along with the notion of services being generally unprogressive there are arguments about structural changes that take place with growth in the economy[2]. Browne (1986) argues that with increasing monetisation of the economy, a major chunk of household activities is outsourced from the market. The measured growth of national income is, therefore biased upward since such shifts in production do not result in a corresponding increase in total output of the combined household and market sectors.

Further, in contrast to a post-industrial society, Gershuny (1978) has advocated a self-service economy, wherein self-service activities with the help of consumer durables are visualised to replace the purchased consumer services. The increased use of consumer durables is expected to enhance the demand for intermediate services such as servicing

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[2] See Fisher (1935), Kuznets (1957) and Fuchs (1980)

and repair of household equipment. Wirtz (2001) adds that the emergence of broad-based prosperous middle class along with ageing population has further boosted the Gershuny effect in Asia.

While emphasis in the service literature has been placed on final expenditure patterns and prices, some of the most striking aspects of service sector growth relates instead to the relationship of services to the production structure of economies, particularly its relationship to manufacturing. Greenfield (1966), Katouzian (1970) and Francois (1990) argue that demand for producer services in total intermediate demand by manufacturing firms grow with development. This expansion is linked to growth in round-about production and the associated conversion of local markets into national markets. With technological progress and development, services become even more crucial to co-ordinate production processes; to create and absorb new innovations and to increase the benefit-extracting capacity in production and consumption. All these lead to higher use of services in the growth process.

The increasing role of services in the growth process has been further explained by Francois (1990). He argues that increased expenditure on producer services enhances the efficiency of production by allowing a higher level of specialisation in production. Given the overhead nature of this type of producer services, a larger market triggers more intermediate demand for services, because higher specialisation has become more profitable. Such a large market may result from technological progress. Besides the profitability incentive, larger markets also provide a competitiveness incentive, which prompts additional investment in producer services to increase efficiency.

Alternatively, Bhagwati (1984) in his seminal work, has put forward different ways in which technical and structural changes define a continuous process during which services splinter-off-goods and goods-splinter-off services. He argues that services, which splinter off from goods are technically progressive and possibly capital-intensive, but services that are left after goods-from-services splintering process are mostly technically unprogressive and labour intensive.

The reason for expecting these services to be technically progressive is the fact that these services arise due to specialisation, which reflects economies of scale. Being a part of dynamic process of change in the economic system they are not technically stagnant. Also, it has been pointed out that since the source of growth of these services reflects specialisation of activities outside firms they are independent of any demand influence. But in case the goods splinter-off from services as for example when gramophone was invented, the musical services left behind was unprogressive and technically stagnant. But most of the empirical studies e.g., Francois and Reinert (1996) that test whether the rise in services sector is due to real change in the structure of production or splintering effect (as argued by Bhagwati) find that much of this rise can be attributed to the real structural change rather than outsourcing or splintering.

Pilat (2000) find that with increasing complexities of modern industrial organisations, manufacturing activities have become more and more service intensive both upstream (e.g., design and R&D) and downstream (e.g., marketing and advertising). He also argues that the competitive advantage of firms now depends more on providing specialised services like financing and after-sales facilities than on production. This is reflective of increased demand for intermediate specialised services.

With respect to the developing economies, the rise in service inputs into manufacturing has been confirmed by a number of empirical studies e.g., Park (1989), Park and Chan (1989), Uno (1989). But very few studies have empirically estimated the extent of increase in the use of services in manufacturing sector. Gordon and Gupta (2004) measure the increasing usage of services in other sectors through changes in the input-output coefficients. The matrices for different years show that the use of services sector input to industry increased by about 40 percent between 1979-80 to 1993-94 in the Indian economy.

Alternatively, the increased usage of services by manufacturing sector has been estimated by Banga and Goldar (2004) for 1980s and 1990s. For this purpose, they empirically estimate the contribution of services as an input to manufacturing (organized) output

growth in Indian manufacturing using the KLEMS (capital- labor-energy-materials-services) production function. They use panel data for 148 three-digit level industries for 18 years, 1980-81 to 1997-98, and estimate the production function, which has services used by the industry as one of the inputs[3]. The results of the analysis bring out that the growing use of services has a significant favorable effect on growth of output in Indian manufacturing in the 1990s, The coefficient of services is found to be positive and statistically significant. The contribution of service input to output growth in manufacturing was about one per cent in the 1980s, and it increased to about 25 per cent in the 1990s.

B. Supply Side Factors : *Trade Liberalisation and Reforms*

Along with demand side factors, there are also some supply side factors that lead to higher use of services as growth takes place in an economy. Three supply side factors identified are increased trade, higher FDI and improved technology that leads to higher supply of services.

The two main distinguishing features of trade liberalisation of services vis-à-vis goods are a) "imports" of services must be locally produced and b) liberalisation of services leads to enhanced competition, which is both domestic and foreign. Greater foreign factor and increased competition together imply a large scale of activity, and hence greater scope for generating the special-growth enhancing effects. In fact, if foreign participation merely substitutes for domestic factors and the sector does not expand, i.e., the degree of competition remains the same, then there cannot be a positive growth impact on account of scale effect. On the other hand, even without scale effects and even if services sector does not possess endogenous growth attributes, the import of foreign factors that characterises services sector liberalisation could still have positive effects because they are likely to bring with them the source of endogenous growth, namely, technology.

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[3] These services are mainly: transport services, storage and warehousing, communication services, trade (wholesale and retail), banking & insurance, hotels and restaurants and other professional services like legal, accountancy, etc.

The existing empirical literature that link trade liberalization and growth primarily focuses on the financial sector. Francois and Schuknecht (1999) find a strong positive relationship between financial sector competition and its growth. Mattoo et al (2001) finds relatively strong and robust econometric evidence for the financial sector (and less strong but nevertheless statistically significant evidence for telecommunications sector) that openness to trade in services influences long run growth performance of the sector.

Other studies that estimate impact of trade on growth of services include Gordon and Gupta (2004) and Banga and Goldar (2004). Gordon and Gupta (2004) estimate panel data regressions for trade, hotels, rail transport, transport by other means, storage, communications, insurance and other services for the period 1970-2000. Using sector-specific liberalisation dummies they find that sectors that were open for FDI, external trade, or private ownership, etc. were the ones which experienced faster growth. Alternatively, Banga and Goldar (2004) use multiple regression analysis and show that trade reforms carried out in the 1990s explain to a large extent the rapid growth of use of services in manufacturing. Lower tariff (adjusted for changes in real effective exchange rate) and lower non-tariff barriers (in terms of import coverage ratio) were also found to have led to an increase in the usage of services in manufacturing sector.

Along with trade liberalisation, improved technology has also led to higher use of services. Electronics, information and communications technologies have now made services available even when the producers and consumers do not interact. Information technology (IT) in particular has led to manifolds increase in the use of services. Moreover, service technologies have now allowed much more responsiveness to fluctuating or individualised demand patterns. The issue that 'even though service sector has been a voracious consumer of technological investments it still has lower productivity as compared to goods' will be examined later.

3.2   *The Inter-Relationship between Manufacturing and Service Sector*

Much of the literature on inter-sectoral growth has been limited to agriculture and the industrial sectors, both in developed as well as developing economies. The research on the service and manufacturing sectors has been somewhat limited. While expansion of service sector has benefited manufacturing sector in a number of ways and more and more of manufacturing activities are now splintering off, we find that the benefits have not flowed one way. Clemes et al (2003) empirically estimate the two-way effect of growth of service sector and growth of manufacturing sector for five ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, and Thailand) and find the two-way effect to be exist.

The increase in the growth of service sector has also triggered a growth in demand for a variety of manufactured goods such as computers, cell phones, digital scanners and optical linkages. The close connection between the service and manufacturing sectors is therefore likely to have spillover effects in each of these sectors. Hansen (1993) maintains that the technological progress in general provides a greater potential for service specialization and that add-on services constitute an increasing share of the value of new products: "… approximately two-thirds of the value-added in the computer market", he writes, "consists of software and maintenance service-add-ons that tend to be provided by firms in the service sector rather than in manufacturing.

Glasmeier & Howland (1994) conclude that a vast amount of research suggests that services, as inputs to other industries, enhance productivity and that their presence in the region stimulates the competitiveness of other industries in it. Producer services, for instance, facilitate manufacturing firms adaption of skills, products and processes to changes in the market. They also help to reduce organizational, managerial and informational barriers to adjustment, (Marshall *et al*, 1987). Similar ideas can be found in Porter (1990) and his so-called "diamond- model", in which the success of an industry is partly dependent on the existence of related and supporting industries.

In this regard, Banga and Goldar (2004) estimate the impact of higher use of services input on productivity growth of manufacturing sector. They construct a multilateral total factor productivity index for 41 major industry groups for the period 1980-81 to 1999-00. Regressing the total factor productivity index on a set of explanatory variables including the ratio of services input to employment, the study finds a positive relationship between use of services input and industrial productivity. Their results show that the increase in use of services in manufacturing in the 1990s favorably affects productivity in the manufacturing sector.

From the above studies we can conclude that increased use of services has come about due to structural changes in production process and higher availability of specialised services. Higher use of services has in turn led to greater specialisation and improved productivity in the manufacturing sector. The dual spillover effects of growth in manufacturing and service sectors therefore put an economy on a higher growth trajectory.

4. Productivity in Services

It has often been argued in the literature that services are less productive than goods. Many explanations for this have been put forward, but the explanation mostly used is the mis-measurement of productivity in services. To gain insights into this issue we review select studies that discuss the issue of lower productivity in services and those that discuss measurement of productivity in services.

4.1   Why is Productivity in Services lower than Productivity in Goods?

Following Kaldor (1966), who emphasised that labour in non-manufacturing sector is less productive, many studies have attempted to examine the lagging service sector productivity. Studies have argued that services are relatively much cheaper in the relative price structure of a typical poor country as compared to a rich country (e.g., Balassa 1964, Samuelson 1964, Kravis et al 1982). Bhagwati (1984) formulates a general

equilibrium model to show this. The inter-spatial and inter-temporal empirical work, based on exchange-rate conversions, suggest that poor-country per-capita spending on services is smaller relative to rich-country. They ascribe this tendency to differential productivity ratios.

Baumol (1967) points out that productivity improvements in services are harder to achieve than in goods producing industries. The unbalanced growth models by Baumol and Fuchs (1968) helped in popularising the notion that because of their labour-intensive nature, service-sector activities cannot be made more efficient through capital accumulation, innovation, or economies of scale. However, some of the studies argue that in the creation of new ways of satisfying wants, technological changes are as important in service sectors (such as health care) as in commodity sectors, but when it comes to cost reduction for existing products or services, technological change is more frequent and more powerful in its effects in the commodity sector. Therefore, productivity of service sector relative to productivity of commodity sector may vary inversely with income level of the country [e.g. Kuznets (1955), (1966) and Chenery and Syrquin (1975), Bhagwati (1984), Kravis et al (1983)]. In other words, between poor and rich countries the productivity differential in services is found to be lower than that in commodities.

But lower productivity in services compared to goods would imply that the shift of the economy towards larger service sector might lead to reduction in the national rate of productivity improvement. However, these notions have led to alternative arguments for lower productivity in services. Two important arguments put forward are: (a) greater investment has been done in new technology in service sector and this may take time to lead to productivity enhancement and (b) low productivity of services is a product of mis-measurement of output in services since an increasing portion of output is not captured in the basic statistics.

The relationship between investment in new technology, mainly information technology (IT) and productivity has been widely discussed but little understood. The huge increase in computerisation overtime especially in the 1970s and 1980s decades roughly coincides

with the productivity slowdown that began in the early 1970s. It has also been widely reported that most of the productivity slowdown is concentrated in the service sector. This "productivity paradox" has led to a big debate and a corresponding stream of literature.

Research on impact of IT usually starts with the basic assumption that computers enhance productivity. However, the available evidence is mixed. Siegel and Griliches (1992), Brynjolfsson and Hitt (1996), Litchtenberg (1995), Lehr and Lichtenberg (1999) and Gera, Gu and Lee (1999) find a positive and significant relationship between computerisation and productivity. However, others e.g., Roach (1991), Landauer (1995), Gordon (1996) and Wolf (1999) find IT has not influenced productivity while some find a negative impact of IT on productivity.

The impact of IT on productivity of services is an important issue since over 80% of IT investments are in services. One of the first studies on impact of IT was by Cron and Sobol (1983,) which looked at a sample of wholesalers and found that, on an average, impact of IT was not significant. Strassmann (1990) also concludes that, "there is no relationship between spending on computers, profits and productivity". Roach (1991) supports the dismal performance of IT in the service sector. However, Roach argues that the long-learning period associated with the new technology reduces the visible benefits from these investments. Moreover, these investments show higher productivity only if they are widely used. Many a times, the new technology is used along with the old technology leading to slow down of productivity.

This argument has been supported by many studies that estimate impact of IT on productivity of different types of services. Parsons et al (1990) estimate a production function for banking services in Canada and find that the overall impact of IT on multifactor productivity was quite low between 1974 and 1987. However, they speculate that it has positioned the industry for greater growth in the future. Similar conclusions are reached by Franke (1987), who finds that IT is associated with a sharp drop in capital productivity and stagnation in labour productivity, but remains optimistic about the future

potential of IT, citing the long time lags associated with previous "technological transformations" such as the conversion to steam power.

Thus, explanations for productivity paradox based on service sector's relatively greater investment in new technology at best account for lagging growth. Some studies have also attributed slower productivity in services to lack of competition in the service sector (Fingleton 1995). A higher level of regulation in services, including foreign investment controls and less exposure to foreign trade, is found to be an important reason for lower competition in services.

We now look at the second argument put forward for lower productivity in services, i.e., lower productivity in services is simply a result of mis-measurement of both output and input and consequently productivity in services. We now examine the problems in measuring productivity in services.

4.2   Problems in Measuring Services Productivity

A key problem in measuring productivity relates to obtaining <u>a suitable measure of output of services</u> over time. Griliches (1994) points out that some of the services whose productivity growth rates in the 1947-1973 era were as high or higher than productivity growth in manufacturing industries have experienced a much lower productivity growth since 1973. Additionally, productivity slowdown has been particularly intense in services where output is hard to measure-- for example health services has the largest labor productivity slowdown in service and both banking and health services have large multifactor productivity slowdowns. This points to the possible problem of mis-measurement since in both health and banking services it is very hard to define and measure output.

The problems pointed out in the literature that lead to mis-measurement are:
(a) Market prices are not available for publicly provided services;

(b) It is difficult to identify precisely what constitutes the service activity in a particular industry and to account correctly for the quality changes in services and this is further complicated due to inappropriate defltors that are not able to distinguish quality improvements;

(c) The "quantity" of services is difficult to capture, as it often represents a process by which a user (consumer) or the user's good is changed (Hill 1977);

(d) Compared to goods many services are characterised by a greater degree of heterogeneity (even uniqueness) so it is difficult to aggregate them;

(e) Poor quality of data on services further complicates the problems.

We now examine the problems of measurement of output and inputs separately.

Output Measurement:

In case of a sector providing one type of service, output is merely a count of units of this service, however defined. This assumes that there is homogeneity in the services being counted. However in the more usual case of a sector providing a number of heterogeneous services, the various units must be expressed in some common basis for aggregation. In measures of an output per unit of labour input, this basis is in terms of the base year labour input requirements for different types of services. In this way, the output measures for developing labour productivity measures differ from the more traditional production measures, which are based on total price or value-added weighting of the components.

Further, when there are quality changes within a service, adjustments must be made in the output measure to account for the fact that the services are no longer the same homogenous unit. Ideally, then, output measures should incorporate data on the number of services provided differentiated by unit labour requirements and in sufficient detail to account for quality differentials. However, such data are generally not available. As a result, approximations based on alternative approaches utilising various assumptions are used.

Wolf (1999) suggests use of indirect indicators of productivity growth in service sector by examining changes in the input mix so as to avoid using service output measures or price deflators. One of the approaches suggested is based on changes in direct input-output coefficients, i.e., use inter-industry coefficients and the capital-labour and material-labour ratios as indices of productivity growth. The second approach suggested is to consider changes in the occupational composition of employment within service sectors. This would indicate changes in the cognitive skill level of the workforce in an industry.

Alternatively, in the absence of quantitative information on the units or amount of services, the approach used is to remove the change in price from the change in value (reflecting both price and quantity) of the volume of services. This approach is tantamount to weighting the quantities of services provided with price weights. Insofar as price relationship among the various component of services are similar to unit labour requirements or unit labour costs relationships, this measure approximates the desired measure. Also, since it is generally easier to measure price change for services defined with detailed specifications, this approach is most generally used when adequate quantity information is not available [Kendrick (1988)].

However, this approach requires price data in sufficient detail to represent adequately the price trends of services included in the change in value of services. Otherwise, price movements of the covered areas are implicitly imputed to the uncovered areas. But since the relationship among the price movements of similar services is stronger than the relationship among quantity changes of various services, this alternative has greater viability than imputing quantity changes of covered areas to those of uncovered areas. Nevertheless, the use of price deflators still requires ideally that adjustments for quality change be made.

Labour Input

To estimate productivity measure that relates output to the corresponding labor involved in the production or services-generating process, it is important to have data on the hours

worked differentiated by all persons involved in the production process. In addition, the hours should refer to hours worked differentiated by types of employees in the particular industries. Unfortunately, the data available generally have serious gaps and do not meet these requirements.

In many cases, the available data assumes that workers, supervisory and non-supervisory, are homogenous with respect to skill. However, a highly skilled worker can provide more labour services per hour than a less skilled worker. When skill differences are ignored, increases in skill levels are measured as productivity increases. As a result, shifts from less skilled to more skilled labour because of increased education or experience are not reflected as increases in the measure of labour input [Marko (1988)].

To address this problem, studies have usually taken the position that the relative wage or income level differentials associated with specific worker characteristics reflect marginal productivity of these attributes. Generally, the included characteristics are the number of years of schooling, age, sex and possibly industry and occupation (Gollop and Jorgenson 1980). Weighting the quantity of labour (measured in hours or employees), classified by these characteristics of the work force by relative wage or income differentials results in an aggregate measure of labour input intended to reflect the composition of the work force. However, this procedure also has problems. For example, workers with similar characteristics have different earnings in different occupations and industries. Also the earnings might differ not due to skill differential but due to differences in cost of living or degree of unionisation, i.e., factors unrelated to productivity. Skill-adjusted labour input measures therefore have to be developed.

Productivity Measurement:

Productivity growth in most of the services is either estimated using labour productivity estimates, i.e., output measured per unit of labour employed or by constructing multifactor productivity indices. Calculations of multifactor productivity take into account capital inputs as well as employment and hours worked. Many studies find that the multifactor productivity data are broadly consistent with the labour productivity

numbers, (e.g., Maclean 1997), but multifactor productivity indices are considered to be superior as they relate to total factor productivity (Worthington 1999).

Most of the studies in the current literature use Data Envelopment Analysis (DEA) approach to measure productivity in different services sector. This approach is preferred as it enables the disaggregation of TFP into scale economies, technical change and pure efficiency change. Apart from the above problems in the measurement of output and labour input, it is also recognised that there is no overall theme to measurement problems in different services. Each appears to be a special case, with specific measurement problems unique to the services measured.

5. Conclusion and Policy Implications

In the context of rising share of services in total output and employment in the global economy, the paper undertakes a selective review of studies with respect to some of the conceptual issues regarding the role of services in the growth process of developing countries. The paper identifies the factors that lead to higher use of services in the growth process of developing countries, viz. higher income elasticity of demand for services, structural changes and trade liberalisation along with other reforms and improved technology.

The relationship between service sector and manufacturing sector in the growth process is discussed. It is emphasised that the process of growth is accompanied by dual spill over effects, i.e., growth in manufacturing sector improves growth in service sector since it creates additional demand for services, which arises due to structural changes that makes contracting out cheaper and more efficient for manufacturing sector's growth. Service sector, in turn, leads to higher growth in manufacturing sector since it to leads to higher demand for new products and brings about improvement in productivity of manufacturing sector.

Further, the issue of lower productivity in services as compared to goods is discussed in detail and the problems in measuring productivity of services are highlighted. The paper also discusses the issue of productivity paradox. In short, the current literature is found to emphasise that 'service economy' is structurally different from the previous era of 'mass industrial production'. But, it is crucial to note that this change does not necessarily imply that services have become more important in final consumption. Rather, services have become ever more crucial to co-ordinate and control production processes of differentiated consumer products that are subject to economies of scale. Increased expenditure on producer services also enhances the efficiency of production by allowing for higher level of specialisation in production. The literature therefore points out that services are becoming more and more crucial in the growth process of an economy.

Certain stylised facts that emerge from the literature[4] about relationship of services with income growth are:

a) The proportion of labour force employed in agriculture declines and that in manufacturing and services rises with per capita GDP;

b) prices of services and real per capita GDP are positively associated;

c) Labor productivity in services relative to that in commodities is likely to be lower in rich countries than in poor countries; and

d) The share of services in expenditures rises with per capita income if the conversion is done at the exchange rate but remains constant across if conversion is done at the purchasing power parity.

The decline in manufacturing and the corresponding shift to services was widely held to be unsupportable in the long run since services depend critically on manufacturing for their existence. But such well-entrenched arguments have now come under increasing scrutiny. Rather than services following and supporting manufacturing, manufacturing is seen as flowing to those countries and areas where the service infrastructure is efficient and well developed (OECD 2000).

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[4] and also theoretically explained by Panagariya (1988)

One of the important policy implications that can be derived from the above review is, research indicates that economic growth is closely linked to growth in service sector. An important aspect of services is the ability to generate sizable external economies or diseconomies that are not reflected in the price signals. Therefore the price of services tend to differ substantially from social costs associated with them. Also, closely linked with the problem of externalities is the problem of linkages, both backward and forward, with the rest of the economy and with its growth rate. Inefficiencies in services tend to exert a multiplying effect on the economy as a whole and efficiency in providing services can make a considerable difference to the sectoral growth rates. It is therefore very important for an economy to provide services as efficiently as possible and this may require not only increasing investments in services but also continuously improving on them through improved technology and more knowledge.

However, seldom has careful planning and development taken place in this sector. It is observed that many of the developing countries that are undertaking domestic reforms in their service sector and liberalising services do not have a well integrated policy for services and in many cases reforms are undertaken in an ad-hoc manner. But keeping in mind the importance of services in the growth process, it is essential to have a well-defined service policy in line with agriculture and industrial pollicies. Reforms in services should therefore be an outcome of well-integrated policy for services and should be undertaken in sequential manner maintaining the balance between growth of different services and between manufacturing and service sectors. Developing countries should therefore concentrate more on the growth and development of their service sector, which can be an important step towards overall growth of the economy.

5.1   Areas of Further Research

Though a vast literature has emerged on services, it can still be said that this literature concentrates on only few aspects of services and there exists a vast scope to explore further many different aspects of services. In particular, we find that there is an ever-growing literature on trade in services, but studies on contribution of services to growth

and productivity in services are limited. A wide range of theoretical and empirical challenges exists in these areas. We attempt to identify few such areas, where future research is much needed.

1. The extant literature does not provide a single encompassing definition of services but does highlight many characteristics that could form the basis for a universal definition. Attempts to define service output follow two basic approaches, the first emphasises the nature of service output, particularly its intangibility and frequent impermanence. The second approach focuses on the method of production defining service output, as the residual not accounted for by agriculture, mining or manufacturing activity. Both approaches leave much to be desired. The first is overly restrictive excluding those activities, which result in material goods, e.g., construction, while the residual approach fail to specify unique characteristics of services. These problems are compounded by the heterogeneity of services. Much research is therefore needed in this area.

2. In view of the technological advances that have taken place in the last few decades, there is now a need to take a fresh look at the characteristics of services highlighted in the literature. For example, 'non-tradability' of services is now becoming less and less important with advancement in information technology while heterogeneity of services is what needs to be given explicit attention, as services become more and more customer-specific. Further research is required to arrive at some economic-definition of services rather than frameworks for classifying services.

3. There is a dire need for further research on productivity in services. In particular, to develop improved methods of estimating outputs and inputs of services. A promising line of research could be to examine productivity differentials between service and non-service sectors and formulate theoretical and analytical frameworks to find possible explanations for the existing differentials and ways for making the convergence occur.

4. Low productivity in services indicates that with the growth in service sector the impact on employment can be substantial. However, research on implications of liberalisation of services on labour markets is almost non-existent.

5. Another direction of research can be to identify determinants of productivity and growth in services and estimate the implications on welfare and growth of the economy.

6. Limited empirical research exists in the area of services. What remains the biggest hurdle in future research in services is the <u>lack of reliable, timely and easily interpretable data</u>. The data that is more widely available do not currently encompass all forms of services. What is required is data on services at a more disaggregated level which is consistent with value-added and employment data and is comparable across time and across countries. Efforts should therefore be made to develop a suitable database for furthering empirical research in this field.

7. There is a dire need to formulate an <u>Index of Services</u> in order to have a coherent policy on services. Appropriate measures to estimate output in services need to be identified and by attaching suitable weights to disaggregated services, index for services can be formulated. Given the heterogeneity of services, formulation of separate indices can also be considered.

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