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**Revisiting the Service-led Growth in India –  
Trends and Determinants of India's Service sector productivity**

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**Abstract**

Understanding the drivers of economic growth is hugely beneficial for low income countries like India as it is directly related to improving the living standards of its population. Often productivity improvements in manufacturing industries are considered as one of the major sources of growth. This idea is analogous to the traditional structural transformation hypothesis that as a country develops resources move from primary to manufacturing and subsequently to services (see Kuznets, 1966). The experience in India, however, seems to suggest that the country has been pioneering a stage of development that defies the conventionally hypothesized structural transformation. Indian economy has been witnessing a service-driven growth, particularly since 1990s, though it still remains in the category of low-income emerging countries. While the share of services in India's GDP has risen over much of the post- independence period, there was a marked acceleration in the trend since the early 1990s. Similarly, the relative Importance of services sector in employment generation has also increased substantially. Moreover, the export share of services has been large and increasing in recent years (Eichengreen and Gupta, 2012). The economic reforms of the 1990s paving the way for trade liberalization along with major policy changes in domestic business environment may have helped the emergence of service sector as a key player in India's growth story. Traditionally, services have been a regulated activity. This was particularly true in areas of banking, insurance and telecommunication, which are among the sectors that witnessed massive improvement in the post-reform period. Further, this sector has evolved as a prominent sector in terms of contribution to national and state incomes, trade flows, FDI and employment.

The emergence of services as the most dynamic sector of the Indian economy has in many ways been a revolution. The most visible and well-known dimension of the take-off in services has been in software and information technology (IT)-enabled services (including call centers, software design, and business process outsourcing), which to some extent also help increase innovation capabilities in the sector (Lema et al, 2012). However, growth in services in India has been much more broad-based than IT (Gordon and Gupta, 2004). There have been many studies looking into India's service-driven economy (Eichengreen and Gupta 2009, 2010), and its sluggish manufacturing. While studies on structural transformation suggest that the observed structural transformation in India has been growth enhancing (McMillan and Rodrik, 2011; Bosworth and Collins, 2008; Vries et al, 2012), evidence on services sector suggest that the observed growth surge is mainly due to higher productivity growth in this sector (Verma, 2012). However, there has hardly been any attempt to explain the observed momentum in the service economy in detail, particularly by looking into how productive the sector is and what are the factors that drive the productivity in this sector. This paper attempts to revisits the "Services led Growth" hypothesis for the Indian economy by undertaking detailed analysis of the service industries in terms of labor productivity and multi factor productivity growth. An attempt is made to explore the factors that drive productivity performances in the service sector. Yet another aspect that has been overlooked in the literature is the complementarities between service sector growth and manufacturing performance, which calls for understanding why

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productivity improvement in the manufacturing sector continues to be slow and low. The examination of the above issues constitutes the core of our paper.

In order to understand the empirics of India's growth performance, we undertake a growth accounting exercise based on the KLEMS production function due to Jorgenson, Gollop and Fraumeni (1987). The gross output production function incorporating Capital (K), Labor (L), Energy (E), Material (M) and Services (S) as inputs allows us to evaluate the relative significance of multi factor productivity growth *vis a vis* input accumulation in accounting for output growth. Using the newly created comprehensive INDIA KLEMS data set for the Indian economy for the period 1980-2010, we compute productivity trends for the service sector. We analyze sources of labor productivity in 9 sub-sectors of the service economy – trade, hotels and restaurant, transport and storage, post and telecommunication, financial services, public administration, education, health and other services. These 9 sectors are further re-classified into market services and non-market services, within which we also examine ICT intensive and non-ICT service segments separately. Our measure of productivity is based on the gross output approach at industry level as it accurately reflects the contribution of intermediate inputs.

The paper makes a number of contributions to the existing literature. First, in contrast to previous productivity studies in the Indian context, we use more rigorous measures of factor inputs, which will have important consequences for productivity analysis (see OECD, 2010, Productivity manual). Both labor and capital inputs are measured as Tornqvist indices of different types of workers and asset types. Labor input, which is inclusive of self-employment, is measured using five education categories of employment, with the growth of each category being weighted by its relevant cost share. In the case of capital input, previous studies have used a measure of capital stock, often making no adjustment for depreciation. Such an approach ignores the importance of heterogeneity in capital asset due to the existence of multiple vintages and various asset types. In our measurement, we use a measure of capital services using 3 different asset types, asset-specific depreciation rates and an external rate of return (see Diewert, 2001; Schreyer, 2004). Our second contribution is in providing a detailed sectoral perspective on India's service sector. Since there is substantial heterogeneity within service sector, and the contribution of different segments of the sector to aggregate service sector growth is substantially different, we examine the productivity dynamics in service sector at detailed industry level using a carefully developed time series data from INDIA KLEMS project. Our detailed focus on several sectors also helps in understanding the respective position of market services as against non-market based services, and ICT using and producing services as against non-ICT services in the overall service sector performance in India. Thirdly, at industry level we use a gross output production function, which includes contribution of intermediate inputs in the production accounts, which also helps us examine the industry origins of aggregate service sector productivity growth using Domar aggregation. Fourth and more importantly, our study makes an attempt to relate the observed trends in service sector productivity to possible determinants. In particular, we consider skill intensity of workforce, labor market regulations, availability of infrastructure, capital intensity and other measures connected with technology. Finally, the study also makes an attempt to understand the complementarities between service sector growth and manufacturing performance in India.

The paper is structured as follows. Following the introduction, section 2 provides an overview of service sector in India with a focus on value added, employment and policy framework. Trends in labor productivity and the sources of labor productivity – factor accumulation and multifactor productivity - are documented and analyzed in section 3. Section 4 makes an attempt to relate the observed productivity trends in service sector and its sub-industries to possible determinants. In section 5, the complementarities between manufacturing and services industries are examined and why productivity improvements in manufacturing appear to be low will be analyzed. The final section concludes the paper.

## References

- Bosworth, B, and S M. Collins.(2008). "Accounting for Growth: Comparing China and India." *Journal of Economic Perspectives*, 22(1): 45–66
- Diewert, E (2001), "Measuring the price and quantity as capital services under alternative assumptions", Discussion Paper 01-24, Department of Economics, The University of British Columbia
- Eichengreen, B and P Gupta (2009), "Two Waves of Service Sector Growth": Working Paper 14968, National Bureau of Economic Research, May 2009
- Eichengreen, B and P Gupta (2010), "The Service Sector as India's Road to Economic Growth": Working Paper 249, Indian Council for Research on International Economic Relations, New Delhi, April 2010.
- Eichengreen, B and P Gupta (2012), "Export of Services: Indian Experience in Perspective": Working Paper 2012-13, National Institute of Public Finance and Policy, New Delhi, March 2012
- Fraumeni B. M and D. W. Jorgenson (1980), "The role of capital in U.S. economic growth, 1948–76": in Von Furstenberg, G. M (eds.), *Capital, Efficiency and Growth*, Cambridge, Ballinger.
- Gordon, J and P Gupta (2004), "Understanding India's Service Revolution": IMF working Paper, Asia and Pacific Department, September 2004.
- Jorgenson, D. W., F. M. Gollop and B.M. Fraumeni (1987), "Productivity and U.S. Economic Growth", Cambridge, Mass., Harvard University Press.
- Kuznets S (1966), "Modern Economic Growth", Yale University Press, New Haven
- Lema, Rasmus, RuyQuadros and Hubert Schmitz (2012): "Climbing to the top? Reorganising global value chains and building innovation capabilities in Brazil and India", mimeo, July 2012, available at: <http://ssrn.com/abstract=2153987>
- McMillan M S and D Rodrik ( 2011), "Globalization, Structural Change and Productivity", NBER Working Papers 17143, National Bureau of Economic Research, Inc.
- Schreyer, P (2004), "Measuring multi-factor productivity when rates of return are exogenous," Paper presented at the SSHRC International Conference on Index Number Theory and the Measurement of Prices and Productivity, Vancouver, 30th June – 3rd July 2004.
- Verma R (2012) "Can Total Factor Productivity Explain Value Added Growth in Services?" *Journal of Development Economics*, Volume 99, Issue 1, September 2012
- Vries, D E, A.A. Erumban, M. P. Timmer, I. Voskoboynikov and H. Wu (2012), "Deconstructing the BRICs: Structural Transformation and Aggregate Productivity Growth", *Journal of Comparative Economics*