

The Impact of the New Generation Mobile Apps on Services Sector



Rajarethinam Emmanuel, S.N. Sugumar, S. Chandrachud, S. Jansirani, S. Thangamayan

Abstract: A General Vehicle Technology such as Computer Applications and Internet Penetration affects all sectors of Economy. Previous studies have quantified the extent of growth in GDP that occurs due to a given growth level in internet subscriptions. However, the immediate impact of mobile app usage is naturally on services sector growth rather than the overall GDP. Since September 2016, when Reliance Jio unleashed a data price war, the app-based services sector saw a phenomenal growth. Taking this well-known fact into account, this paper constructs a regression model between mobile internet subscription and the growth of services sector in six states of India for the period 2014-18. The study also enquires if the spurt of mobile data usage since the year 2017 has resulted in a corresponding growth on services sector GSDP in the target states. Although there exists an extremely strong correlation between the growth of wireless internet subscriptions and the growth of services sector in the target states, the spurt in data usage since 2017 hasn't resulted in a corresponding spurt in the growth of services sector. The study explores the implications of such results obtained through regression analysis between mobile internet and the growth in services sector GSDP.

Key Words: Mobile App, 5G network, Services Sector, Telecom Infrastructure

I. INTRODUCTION

Thanks to Mobile internet and cloud technology, service-delivery has become the new engine of growth. With 420 million 4G connections in India, Startups and Unicorns compete with each other to line up their virtual platforms and door-step services at the simple touch of the customers' hand-device. Everything-as-a-service [XaaS]¹ is no longer a dream but an engulfing movement.

The data price war unleashed by the launch of Reliance Jio since September 2016 has boosted the revenues of App-based businesses across all economic sectors including the Agri-tech ones. Even as this new phase of economy is gaining traction, the 5G network with its 20 times faster connectivity is on a big-bang roll-out.²

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* Correspondence Author

Dr. Rajarethinam Emmanuel*, Asst. Prof. , Department of Economics, Vels Institute of Science, Technology and Advanced Studies, Chennai, India.

Dr. S.N. Sugumar, Professor and Head of Department, Economics, Vels Institute of Science, Technology and Advanced Studies, Chennai.

Dr. S. Chandrachud, Economist, currently serves as Professor in the Department of Economics, VISTAS, Chennai, India.

Dr. S. Jansirani, Professor, Department of Economics, Vels Institute of Science, Technology and Advanced Studies, Chennai, India.

Dr. S. Thangamayan, Asst. Prof. , Department of Economics, Vels Institute of Science, Technology and Advanced Studies, Chennai, India.

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It's not only the delivery of grocery, vegetables, high-tech food or other FMCG items purchased on the internet, the Home-appliances, vehicles and even agricultural marketing and machines entail their own module of virtual platforms, door-step resolution, and profitable sharing of resources.

Specialized services like Diagnosis, Optometric, Facials, Electrical and Plumbing have also developed their homecare versions utilizing the latest technologies in communication and computing. From the customers' perspective, the apps are the modern gateways of economic choices.

At this juncture, a multiple regression study relating growth of mobile internet with the growth of services sector is of paramount importance. Moreover, it's only when Reliance Jio unleashed a data price war, the app-based services sector saw a phenomenal growth. Taking this well-known fact into account, this paper seeks to quantify the impact of mobile internet subscription on the growth of services sector, excluding banking and financial services, in six states of India for the period 2014-2018. The states having tier-1 cities: Maharashtra, Karnataka, Tamilnadu, Undivided Andhra Pradesh, West Bengal and Delhi have been taken up for this study, as the door-step service delivery economy for the country is still in its early stages and we want to enquire if the spurt of mobile internet data usage pertaining to the year 2017 has resulted in a corresponding growth on services sector GSDP in the target states.

II. REVIEW OF LITERATURE

The New Generation Service sector took off as an essential component of the E-commerce development over the last decade. E-commerce, however, just can't happen without the arrangement for door-step delivery.

As per the report of India Brand Equity Foundation released in February 2019, "The Indian e-commerce industry has been on an upward growth trajectory and is expected to surpass the US to become the second largest e-commerce market in the world by 2034. The number of internet users in India is expected to increase from 560.01 million as of September 2018 to 829 million by 2021. Internet penetration in rural India is expected to grow as high as 45 per cent by 2021 compared to the current rate of 18 per cent."³

The high-light of this report is that the e-commerce retail logistics market in India is estimated at US\$ 1.35 billion for the year 2018 and is expected to grow at a 36 per cent CAGR over the next five years. "A young demographic profile, rising internet penetration and relative better economic performance are the key drivers of this sector"³

A more-focused study on Internet-based services conducted by ICRIER⁴ analysed the growth trajectories of 16 mobile app companies like Urbanclap, MakeMyTrip, Practo and Paytm.

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As per this study, Internet's contribution to the country's GDP was at 5.6 per cent in 2015-16 and is estimated to grow to nearly 16 per cent (Rs 36 lakh crore) by 2020. Making a further classification, the report finds that the internet-based apps will contribute about half of this amount (Rs. 18 lakh crore) by 2020.⁴

An eye-ball-raising article of Times of India, appearing in February 2019, "Online Food-delivery Wars are moving from India to Bharat" has reported that Zomato has spread its presence to more than 165 cities and towns, increasing from just 15 in July 2018. Swiggy expanded from 30 cities in October 2018 to 100 by March 2019. Foodpanda is also available in 100 cities. Uber Eats has started its operations in more than 40 cities.⁵ The crucial point to note is that with the entry of Reliance Jio in late 2016, food delivery service has prospered thanks to the cheap internet connectivity of smart-phones.

We also learn from the website Digital Vidya that BigBasket turned out to be a huge success, only when it joined hands with neighbourhood grocery stores to deliver goods. With 2000 service-delivery executives, BigBasket now processes nearly 20,000 orders a day. Again we see that the success formula of digital economy is one of popularizing a brand name and a mobile app; but the final leg of connectivity can only happen through engaging with local vendors and the local youth for service delivery.⁶

Tracxn.com is a portal of information for startups across the world. Under the agri-tech category, the portal has a brief description on 345 Agritech startups in India. Ninjacart, for one, sources staples, fresh fruits and vegetables, directly from farmers and delivers it to kirana stores and supermarkets. The startup, based in Bangalore, has received \$48 million from Accel Partners, Syngenta Ventures, Neoplux and 13 other investors.⁷

With its mobile based support system, Reuters Market Light (RML) based in Mumbai offers knowledge on best farming practices, procurement, supply and pricing strategy to 1.3 million farmers across 17 states. Founded in the year 2007, the startup has received \$13 million from venture capitalists.⁷

Eruvaka Technologies offers integrated sensors, mobile connectivity and decision tools for affordable aquaculture monitoring in the vicinities of Vijayawada. Its diagnostic equipment measures in real time the water parameters that are crucial for shrimp growth and survival. The data gets uploaded to the cloud and the farmer gets real-time alerts for quality drops and they also receive analytics to adjust the feed based on water quality data. The startup has received \$7 million from Omnivore Partners and Nutreco.⁷

Khethinext is a mobile app that enables procurement of farm inputs at lower cost and to facilitate selling of produce at higher margins. The startup founded in Hyderabad in 2017 has raised funds of \$ 5 million.⁷

Nasscom has stated that Agritech in India is growing at 25 percent year-on-year and the sector hosts more than 450 startups that have received \$428 million funding in the first six months of 2019.⁸ "More than 50 per cent of agri-tech startups offer supply chain solutions like market linkage, better access to inputs etc."⁹

In a case study of Ola Vs Uber market share, it is claimed that Ola has 6 lakh vehicles on its internet platforms and it serves in 110 cities in India. With 6000 core employees, it renders transport service partnering with 6 lakh drivers. It has also launched food and grocery delivery. Uber that

started three years later, has captured 35-40% of market share through competitive pricing. Uber has 3,50,000 vehicles on its platform, which implies an equal number of drivers have found their livelihood through this international web-based taxi service.¹⁰

Be it the glamorous service startups of the urban classes or the just evolving agri-techs of rural India, all of them would be impacted to varying degrees when 5G technology rolls out. Hence we need to capture the fast developments taking place in the services sector under the new price wars unleashed in mobile internet data in order to estimate the possible impact under the emerging 5G network.

III. OBJECTIVES

1. To examine the linear relationship between mobile internet subscription and services sector GSDP for the period 2014-17 in six states of India having tier 1 cities.
2. To examine the impact of the spurt in mobile internet data usage for the year 2017 on the services sector GSDP in the target states.
3. To examine if the new development of app-driven-service-delivery startups have made any significant contribution to the services sector GSDP in the target states.

IV. METHODOLOGY

As per the report of ICRIER, a 10% increase in India's mobile internet usage would result in an average 1.3% increase in India's GDP. (IANS Feeds, 2017)

However, this is an extremely broad correlation and we can further narrow it down and explore the relation between mobile internet subscription and the growth of services sector, in particular. In this study, as we focus on the last mile connectivity extended via the new generation apps, we have made a comparative study of the impact of mobile internet subscription and data usage on the growth of services sector in states where the app-based startup services have become popular. RBI statistical handbook presents state-wise sectoral GSDP data. The services sector is generally given in two broad categories: 1) banking and financial services and 2) the rest of the services that include trade, hotel, essential utility, broadcasting, telecom and transport. Since the app-based door-step services are part and parcel of the second category items, we would consider only the data given in this category of the RBI handbook.

The telecom ministry releases the state wise internet subscription data for every year. The Handbook for the year 2017 also presents the growth in the average monthly data usage for each subscriber across India starting from the year 2014 onwards.

Based on the data of these two significant government sources, two types of analysis can be made. (1) We can quantify the relationship between the growth of mobile internet subscription and the growth of services sector GSDP from 2014-17 by making a regression analysis. (2) We can also verify if the sudden spurt in data usage pertaining to the year 2017 has resulted in an equal proportion of growth in the services sector. As the app-driven service-delivery sector started mushrooming from 2017 onwards,

if an equal proportion of growth in the services sector in the year 2017 is found to be the case, it can indeed be attributed to the spurt in the app-driven service-delivery sector. On the contrary, if we do not find a commensurate spurt in the services sector GSDP from 2017 onwards, we can only conclude that the variation in data usage predicts predominantly the conventional services sector growth and the contribution of app-driven services is yet to become a significant factor.

Table I: Wireless subscriptions in Six States (Figures in millions)

State	2014	2015	2016	2017	2018
Andhra	15.7	20.06	22.72	29.4	35.2
Delhi	14.6	17.28	19.15	25.1	29.3
Karnataka	13.8	18.3	20.7	24.9	30.1
Maharashtra	37.42	37.1	42.0	52.3	58.9
TN	18.25	21.9	25.7	29.1	37.1
WB	8.6	11.0	13.0	16.2	19.0

Data from Telecom Bulletin 2018 (Telecommunications Dept.)

Table II: Data Usage per subscriber per month (Figures in MBs)

Year	GSM Data usage per subscriber per month(MBs)
2014	53.94
2015	89.06
2016	133.87
2017	1006.00
2018	2447.00

Data from Telecom Bulletin 2018 (Telecommunications Dept.)

Table – III : GSDP for services sector excluding banking and financial services in Six States (Figures in billions)

State	2014-15	2015-16	2016-17	2017-18
Andhra	4,194	4,659	5,101	5,627
Delhi	3,200	3,497	3,746	4,018
Karnataka	4,226	4,749	5,123	5,668
Maharashtra	7,480	8,079	8,856	9,711
TN	4,506	4,681	4,897	5,217
WB	2,936	3,125	3,334	3,643

Data from RBI Statistical Handbook

V. RESULTS

From the multiple regression analysis, the following results emerged.

- ❖ A 10% increase in wireless internet subscription is correlated with 4.21% increase in services sector GSDP in the six target states for the study period 2014-18
- ❖ For Maharashtra, a 10% increase in wireless internet subscription in the study period is correlated with as high as 6.45% increase in services sector GSDP.

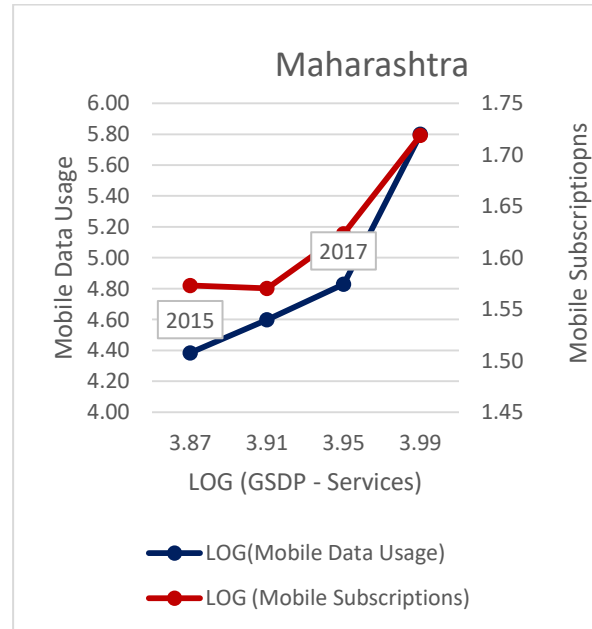


Figure 1

- ❖ For Karnataka, a 10% increase in wireless internet subscription in the study period is correlated with 4.87% increase in services sector GSDP.

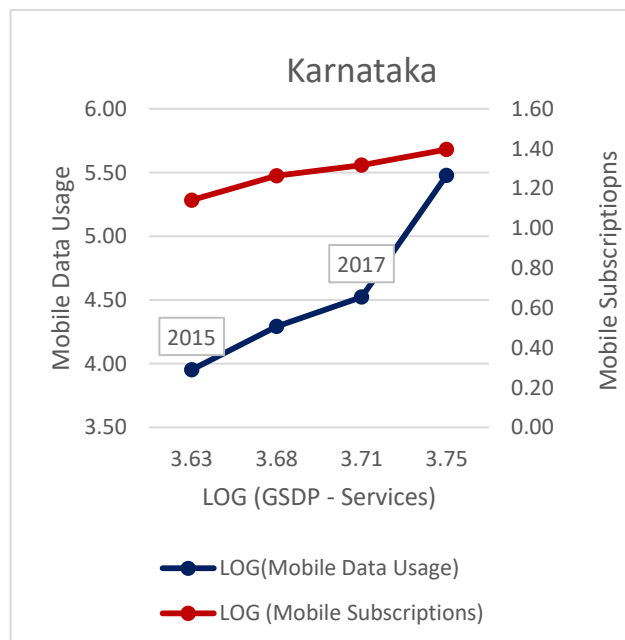


Figure 2

- ❖ For Tamilnadu, a 10% increase in wireless internet subscription in the study period is correlated with 2.94% increase in services sector GSDP.



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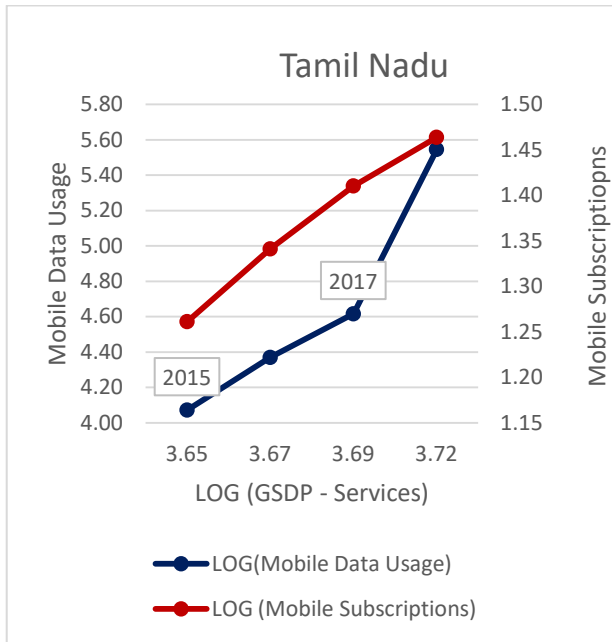


Figure 3

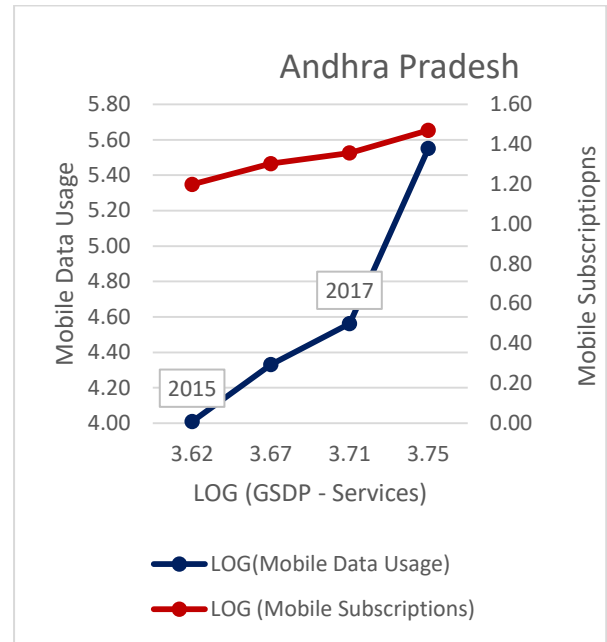


Figure 5

❖ For Delhi, a 10% increase in wireless internet subscription in the study period is correlated with 4.08% increase services sector GSDP.

❖ For West Bengal, a 10% increase in wireless internet subscription in the study period is correlated with 3.28% increase in services sector GSDP.

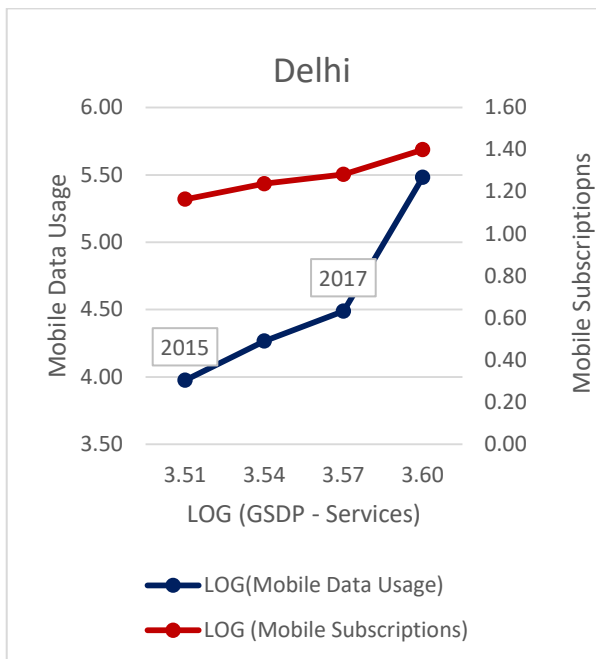


Figure 4

❖ For the undivided Andhra a 10% increase in wireless internet subscription in the study period is correlated with 4.68% increase in services sector GSDP.

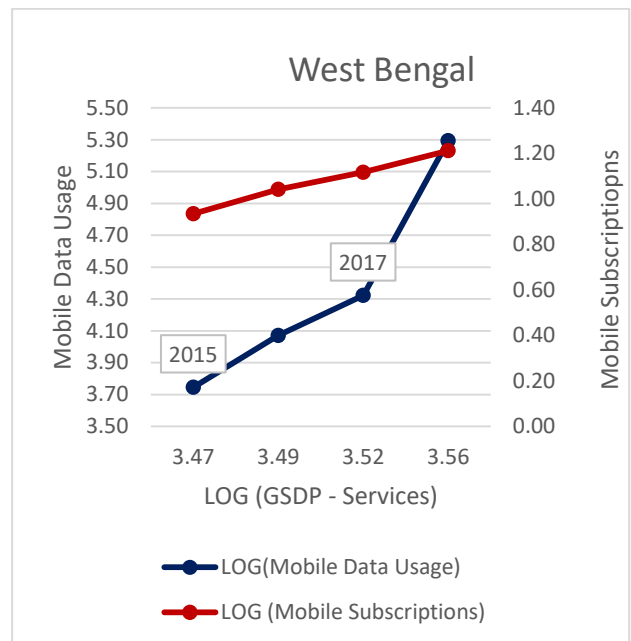


Figure 6

❖ However, the spurt in data usage in the year 2017 has not resulted in a commensurate growth in the services sector GSDP. In other words, the trend break observed in data usage since the year 2017, has not resulted in a trend break for services sector growth as such. This implies that the variation in data usage predicts conventional services sector and the impact on app-driven services is yet to become significant. The app-driven-service-delivery sector is still in its nascent stage and it has not yet become an integral part of each and every service industry listed under the services sector.

VI. DISCUSSION

The ICRIER study⁴ predicts 1.3% growth in GDP for a 10% growth in mobile internet traffic. The report came out in the year 2017 and it has not considered the impact of the spurt in data usage since 2016, the year Reliance Jio entered the scene. In fact, the average mobile data usage per user suddenly increased from 133.87 MB per month to 1006 MB per month in the year 2017¹¹. This is a huge jump and so far there is no study to examine the correlation between this new development in data usage and its immediate possible impact on the services sector.

From our analysis, we have found that the impact of mobile internet subscription on services sector GSDP is 3.2 times stronger than the one indicated by the ICRIER study⁴ between mobile data usage and GDP. This implies that the hypothesis of our study has been verified. The growth of mobile subscription and data usage do have a much larger impact on the growth of services sector than GDP taken as a whole. This is evident from the basic result of this study, i.e. a 10% increase in mobile internet subscription results in 4.21% increase in the services sector GSDP as opposed to the mere 1.3% increase in GDP reported by the ICRIER study⁴

We have arrived at this much stronger result by taking services sector GSDP as the dependent variable and mobile internet subscription as the independent variable for the period 2014-18 for six different states through a regression analysis.

The regression equation was arrived at under the formula:

$$\text{Log GSDP}_{it} = \alpha + \beta \text{Log (Wireless Internet Subscription)}_{it} + D_i + \epsilon \tag{1}$$

Where i goes across 6 states of India and t runs from 2014-15 to 2017-18

Log GSDP_{it} is the logarithmic value of constant state domestic product for services sector excluding banking and financial services for the ith state in the year t. Data for this variable has been extracted from the RBI website.

Log (Wireless Internet Subscription)_{it} is the logarithmic value of wireless internet subscription for the ith state in the year t. Data for this variable has been extracted from Telecom Bulletin 2018 of the Telecom Department of India.

D_i are 6 state dummies

α and ε are the Constant and Error terms respectively.

β has been found to be 4.3. Translation: 10% of increase in mobile internet subscription has resulted in 4.3% increase in GSDP of services sector excluding banking and financial services of the six target states in the given period.

Table – IV & V : Summary Output of Regression with Mobile Subscription as the independent variable and services sector GSDP as the dependent variable

Regression Statistics	
Multiple R	0.994299889
R Square	0.988632269
Adjusted R Square	0.925796599
Standard Error	0.017531534
Observations	24

	Coefficients	Standard Error	T Stat	P Value
Intercept	3.110243	0.044169	70.41746	2.07 E - 22
Log Wireless subscription	0.433247	0.032752	13.22797	2.24E-10

The statistical significance of the independent variable was validated by checking the p-value of regression. This value works out to be less than 0.01, suggesting that this is a significant predictor variable.

R square value is as high as 98% and Adjusted R square value is 93%. This strong correlation implies that much of the variation in services sector GSDP can be explained by the variation in mobile subscription in the respective states.

This result, however, does not yet tell us if the spurt in mobile data usage since the year 2017 has contributed to a corresponding growth in services sector GSDP. What we still can't infer is whether this spurt in data usage that has contributed to the revenue of the app-based services delivery start-ups has made a sizeable impact on GSDP as such. This is a very recent development in services sector and its contribution to GSDP has probably not yet turned out to be of huge significance. To examine this we undertook yet another regression analysis with data usage as the independent variable and services sector GSDP as the dependent variable.

Table – VI: Summary Output of Regression with Data Usage as the independent variable and services sector GSDP as the dependent variable

Regression Statistics	
Multiple R	0.504317
R Square	0.254336
Adjusted R Square	0.220442
Standard Error	0.124815
Observations	24

The summary output of regression for data usage reveals that there's no meaningful correlation between the sudden upsurge in data usage and its impact on services sector growth for the study period. The variation in data usage from 2014 to 2018 can only explain about 25% of variation in services sector GSDP of the same period. That's indeed a highly insignificant correlation.

Indeed, the regression line obtained by taking data usage as the independent variable has a sharp twist at the year 2017 for all states under study, suggesting that the correlation breaks at this point.

However, the spurt in mobile data usage for the year 2017 comes out very clearly from the trend break noticeable in the state-wise graphs given above.

In other words, the trend break observed in data usage since the year 2017 has not resulted in a commensurate growth in services sector GSDP. This could be attributed to any one of the following scenarios:

1. The spurt in data usage implies spurt in consumption in video, games, social apps and educational content a lot more than the usage of app-based economic services.

2. The trend break observed in mobile internet data usage might result in an equivalent trend break in the growth of services sector only after a gap of one or two years. The possible explanation for this result is that the growth of app-based-service-delivery has just begun to make its impact on the high middle-income populations of the urban sector and it hasn't yet penetrated down to the lower middle classes and the rural sectors.

VII. CONCLUSION

The major objective of the study was to quantify the relation between the growth of mobile internet subscription and the growth of services sector GSDP. It has been found that the impact of mobile internet subscription on services sector GSDP in six states is 3.2 times stronger than the overall impact on GDP as given in the ICRIER study⁴. It has also been found that the app-based service delivery sector is still in its early stages and the spurt in data usage for the year 2017 has not resulted in a commensurate growth in the services sector GSDP of the six states. However, the investments in agri-tech startups for the year 2017 have already begun to see some remarkable growth¹². Combined with this positive signal and the 10 times faster data transfer expected under the 5G network, the new technology to be introduced in the later part of this year, one could expect that the spurt in data consumption will also lead to a corresponding spurt in services sector GSDP. India has all the potentials to grow into an app-based service economy in the coming decade.

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AUTHORS PROFILE



Dr. Rajarethinam Emmanuel has undertaken rigorous research over a period of 32 years on the Science of Consciousness and the natural connections between physics, biology, mind, society and religion. His Inter-disciplinary Doctoral Thesis in Philosophy and Economics was entitled: *An Integral View of Nature, Mind, Economy and Society to Foster Individual Evolution*. Besides publishing a number of research articles in Scopus indexed journals, he has also authored five books: 1. *Evolution Beyond Man*, 2. *Science of Consciousness*, 3. *Roots of Evolution* 4. *Untrained Multitude* and 5. *Parinaamap Paarvayil Manam - A collection of Poems in Tamil on the topic Mind*. He is currently employed as Asst. Prof. at the Department of Economics, Vels Institute of Science, Technology and Advanced Studies, Chennai – 117.



Dr. S.N. Sugumar is Professor and Head of Department, Economics, at Vels Institute of Science, Technology and Advanced Studies, Chennai. Previously he was the Head of the Department at RKM Vivekanda College, Mylapore. He has 33 years of teaching experience and has presented a number of research papers on HRD and Development issues in Regional, National and International conferences. He is the recipient of prestigious awards, such as Bharat Seva Ratan Gold Medal, AASIRIYAR CHEMMAL and Best Teacher Award.



Dr. Chandrachud Sivaramakrishnan, Economist, currently serves as Professor in the Department of Economics, VISTAS, VELS Institute of Science, Technology and Advanced Studies, Chennai, India. His research area is in Mathematical Economics, Business Economics, Health Economics and International Economics. He has published 57 research papers and also published 2 books. He started an economics lab called WISE Lab - world Institute for Scientific Economics Lab. Scopus Author ID – 57195615646 Orcid Author ID- 0000-0002-5635-5172 Researcher ID - G1767-2017. He was the best outgoing student from Madras Christian college during 1995-97 batch and he has been awarded on teachers day, 2017 for his Ph.D., work and received the longest service award from VISTAS with cash award in 2018.



Dr. Jansirani is serving as Professor in Department of Economics, VISTAS, Chennai. She has 18 years of teaching experience and has guided 5 Ph. D scholars and 6 M.Phil candidates. She was the senate member of the University of Madras. She has organized several symposiums and seminars for M.B.A students. She has presented 10 research papers at National and International Conferences; published 20 Research Papers and has participated in many International Conferences and seminars. She can be reached at ranjansi1972@gmail.com



Dr. S. Thangamayan was honoured with the "Best Social Scientist" Medal in 2019 by the Indian Academic Researchers Association. He is currently employed as Assistant Professor, Department of Economics, VELS Institute of Science, Technology and Advanced Studies, Chennai. He obtained his Post Graduate Degree from Arul Anandar College Madurai in 2010. He was awarded Ph.D by Madurai Kamaraj University in 2016 for his thesis "An Economic Analysis of Growth and Pattern of Public Expenditure in Tamilnadu". He has published 48 research papers on the topics of Fiscal Economics, Health Economics and Indian Economy. .

