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RESEARCH ARTICLE

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GROWTH DRIVERS AND CATCH-UP EFFECT IN THE BRICS NATIONS- IMPLICATIONS FOR INDIA

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ABSTRACT

Comparisons between the growth rates of countries have been controversial due to the existence of the convergence effect. Convergence theory propounds that less developed countries are able to catch-up to their developed counter-parts when catered to the catch-up effect. Previous research has focused on convergence rather than comparative analysis focusing more on developed nations. This research extends the body of knowledge by focusing on BRICS nations with policy implications for India thus, tackling the question of how to compare nations when their initial stages of development are different. The growth rates of these economies were analysed by benchmarking it with the United States to understand the extent of catch up effect and the extent to which they need to grow to reach the same level as the United States. The study showed that US exceeds China in terms of growth by ~0.5 times, India by ~2 times, Brazil by ~8 times, Russia by ~7 times and South Africa by ~36 times. This paper also throws light on several areas of improvement in social sector (health and education) and economic sectors (agriculture, industries and services) which can spur economic growth in India and help it to catch up to the more developed economies.

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INTRODUCTION

The Problem of Growth Comparison: A major contribution of the Keynesian school was the Harrod-Domar model- one of the preliminary models analyzing economic growth. The model postulated that economic growth depended on the policies to increase investment through increase in savings and using it for technological advances. However the assumptions that growth would be sufficient to maintain full employment, along with the constancy of savings rate and marginal returns to capital garnered heavy criticism. The Solow Swan Model, developed in a neo-classical framework, was an extension of this addressing several of its shortcomings. The Solow Swan model was devised by Robert Solow and Trevor Swan in 1956. It stated that economic growth theories were dependent on three major factors: Labor, capital and technology. The model stated that an economy might have limited amounts of both labor and capital but technology on the other hand could contribute to growth endlessly. The growth that is attained by an economy is measured by the production function. One of the major implications of the Solow model is that it predicts convergence between economies which are in different stages of economic growth. A lesser developed country over the period of time will be thus able to attain the same steady rate of growth as a developed country even though it started from way behind if it is able to attain the same capital labor ratio and savings rate as a

developed country. This convergence or catch up effect as this is more commonly known has many examples in recent history. The high levels of growth rates attained by Japan in the 1960's as it recovered from the damage of World War II or the high growth rates achieved by the Asian Tigers in the 1990's were examples where a lesser developed country was able to achieve higher growth rates because of increased level of capital and absorption of new technology. The reasons for this catch up effect though can be several. Similar to what is propounded in the Solow model, technological efficiency was one of the prime reasons that economies like Japan and South Korea were able to flourish. In the case of China availability of cheap labor helped in achieving faster growth. Another common trait that is seen in almost all such fast growing economies was the presence of a stable political environment. Pakistan for example however could not grow at the same pace as their counterparts as it was shrouded in political instability. The development of social capital, economic infrastructure and in some cases the endowment of natural resources (Oil in the Middle-east economies being a prime example) have been pivotal in helping these economies attain fast paced growth. Accelerated economic growth is thus a result of multiple factors working in tandem. Given this background, how can one compare economies has been a question that has puzzled economists over the years. The acronym BRIC (Brazil, Russia, India and China) was originally coined in the year 2001 to highlight this fast paced growth that was being attained in the respective countries. All these economies with the exception of China had undergone structural changes in their

economies over the past decade with Russia going through significant political changes as well due to the disintegration of the Soviet Union. The four countries started to meet as a group in 2006 and in 2010 South Africa was inducted into this group post which it came to be known as BRICS. These economies together form the engines of economic growth in the recent years with ~42% of the population residing in it and accounting for 1/4th of the global GDP.

II. Review of Related Literature

The Keynesian and Neo-Classical growth models have resulted in the birth of the convergence theory. Convergence theory postulates that less developed economies can grow at a faster rate than their developed counterparts and are of two categories – absolute and conditional convergence (Dornbusch et al, 2001). The former stems from the proposals of the Solow and the Harrod-Domar models which establish that poorer countries would be able to achieve the same growth rate as richer countries, including the convergence of per capita income. The implication of this is largely due to returns to capital being slower as well as the ability to replicate technology for poorer countries. Evidence in support of the absolute convergence is far and few. Baumol (1986) used Madison's data to test the absolute convergence theory in 16 countries for the period of 1870 to 1979. The countries showed remarkable growth in productivity, gross domestic product per capita and exports. However the limitations of his study include sampling bias through errors in data measures as well as the longer time horizon. To address the first point, Delong (1988) added 7 more countries from Baulmol's convergence clubs to analyze convergence theories and found no evidence. To the second, a longer time frame resulted in normalizing for any adverse socio-political and economic factors that can affect growth rates. In this context, Parente and Prescott (1993) analyzed 103 countries between the years of 1960 to 1985 and found that there was divergence upto 18.5% year upon year amongst the countries. However, when grouped into clubs, they found countries with high incomes showing signs of convergence, but when compared to Asian economies, there is significant disparity. Another support to the absolute convergence theory comes from Barro and Sala-i-Martin (1990) who studied the data of US states since 1840. However, they found that convergence happens only if certain assumptions on technology and preferences like a high capital share co-efficient are applied. Mankiw et al (1992) used an augmented Solow Model represented by including human capital along with physical capital. Their results showed absolute convergence holding only if population and capital accumulation was held constant.

Criticism of the absolute convergence theory stems from the unrealistic assumptions of same savings rate, technological change and demographic growth across economies. This implies that countries converge to one another irrespective of their initial conditions. Countries differ in one or many aspects of these. Conditional convergence refers to the growth rates of countries converging conditional upon other factors remaining constant. This theory garners more support. Romer (1986) found that there are three elements required to maintain long run growth- externalities from knowledge, decreasing returns to knowledge to ensure consumptions and constant utility functions, increasing returns for output. His endogenous growth model shows little support for the convergence theory as knowledge has dependency on capital which is available in richer countries. Lucas (1988) took a different approach using human capital in place of technology to find no evidence for absolute convergence but rather for club convergence. Club convergence is a phenomenon wherein countries that are identical in nature would converge with each other. Other research found evidence for local conditional convergence where they grouped countries with similar initial conditions with varied income distributions. (Durlauf, 1996, Quah, 1996). Others find parallels using demographic factors and market imperfections leading to club convergence (Barro and Becker, 1989, Galor and Zeira, 1993). Abramovitz (1986) studied how Europe converged with US from the years of 1948-72 and found that Europe succeeded by importing capital through technology from US. The

returns to capital was diminishing in the case of US but was on an upward trend for Europe enabling the latter to converge. Therefore this implies that countries that have the social capability to emulate the technology and capital of other countries succeed in catching up. This means that there are more factors at play than mere technology or the capital thereof- technology diffusion is largely then dependent on rate of investment, education, efficiency of absorbing technology and mobility of resources. Most literature of technology diffusion stems from follower countries being able to effectively emulate leader countries, further accelerated by R&D (Skonhofs, 1995, Benhabib and Spiegel, 2005, Keller, 2004). A brief overview of the related literature shows how scattered the convergence debate really is. Primary research has been focused on identifying if countries are converging instead of how countries can be compared. Our focus in this paper takes a corollary view of the convergence theory by identifying how can countries be compared efficiently and what is the ideal rate a country has to grow by to effectively catch up to a reference state. Aforementioned literature also falls short in considering newly liberated countries but rather focuses on more OECD centric nations to understand the convergence theory. On that note, our paper extends the body of literature by studying convergence and country growth comparisons from the BRICS point of view. BRICS refer to economies that are growing at a fast pace to reach the ranks of its developed counterparts. Our study explores how true this is by throwing light on how far they have reached and how far they have to go.

III. Methodology and Analysis

Given the vast expanse of literature on the convergence debate, the premise of this research is how countries can be compared given differences in their initial state of development. Often, direct comparisons of these metrics are deemed inconclusive due to unaccounted external conditions. For instance, based on Table 1. It might seem like China is at a higher economic status than the US with an average of 7.8% GDP as compared to the 2.3%. In fact, it might appear like the US is one of the least developed nations going by this logic! However, when these are anchored to their initial stages of development which is historically different for all countries, only then can meaningful comparisons and policies be derived. In the example in the aforementioned sentence, the US has an aggregate output of \$19.49 Trillion as compared to China which has \$12.01 Trillion a measured by official exchange rate (CIA Factbook, 2017). To substantiate, China is ahead of US in Agriculture and Industry sector, largely due to cheaper labour force. Agriculture Output of United States is only 17.58% of China and 77.58% for Industry sector. However, services sector of US is more than double of China. To make comparisons meaningful it is imperative to account for the catch-up effect. In order to do so, catch-up adjusted economic growth can be analysed.

$$rij = ri/aij$$

Where,

rij = Adjusted economic growth of the developing nation

ri = Growth rate of the developed country in this case the United States

aij = Proportional offset of catch-up effect

Proportional offset of the catch-up effect is simply the proportional change in the growth rate of developed economy in comparison to that of the developing nation and is defined as-

$$aij = yi/yj$$

To compute what is the acceleration of real growth (GDP) in the developed nation as compared to the developing nation, the actual economic growth of the developed country is divided by the adjusted economic growth of the developing country-

$$bij = (ri/ rij) aij$$

The previous paragraphs threw light on how comparisons between countries by taking absolute economic growth do not make sense. In

Table 1. GDP at constant Prices for BRICS Nations and US

Country Name	2010	2011	2012	2013	2014	2015	2016	2017	2018	Avg GDP Growth
Brazil	7.5	4.0	1.9	3.0	0.5	-3.5	-3.3	1.1	1.1	1.4
China	10.6	9.6	7.9	7.8	7.3	6.9	6.7	6.8	6.6	7.8
India	8.5	5.2	5.5	6.4	7.4	8.0	8.2	7.2	6.8	7.0
Russia	4.5	4.3	3.7	1.8	0.7	-2.3	0.3	1.6	2.3	1.9
South Africa	3.0	3.3	2.2	2.5	1.8	1.2	0.4	1.4	0.8	1.9
United States	2.6	1.6	2.2	1.8	2.5	2.9	1.6	2.2	2.9	2.3

Source- World Bank

Table 2. Economic Growth and Development using GDP @ Constant Prices

Countries (A)	Avg GDP (B)	GDP @ 2018 (C)	ri/rj (D)	Aij (E)	rij (F)	rij/ri (G)	Bij (H)
Brazil	2.24	23,09,659	0.97	7.73	0.29	0.13	7.99
China	9.00	1,07,97,222	3.89	1.65	5.44	2.35	0.42
India	6.71	28,41,580	2.90	6.28	1.07	0.46	2.17
Russia	3.47	17,22,191	1.50	10.37	0.33	0.14	6.92
South Africa	2.65	4,29,511	1.14	41.57	0.06	0.03	36.35
United States	2.31	1,78,56,477	1.00	1.00	2.31	1.00	1.00

Source- Authors' Calculations

Column	Schema and Key
A	Countries present in BRICS
B	Average Economic Growth for period of 1998-2018
C	Real GDP (\$) at constant prices for 2018 in million
D	Ratio of actual average economic growth in a given state to that of USA
E	Proportion of catch-up effect (ratio of USA real GDP to that of a given state):
F	Hypothetical economic growth
G	Ratio of a given state's hypothetical average economic growth to USA actual average economic growth:
H	Ratio of actual USA average economic growth to a given state's hypothetical average economic growth:

Table 3. Economic Growth and Development using PCI @ Constant Prices

Countries (A)	Avg PCI (B)	PCI @ 2018 (C)	ri/rj (D)	Aij (E)	rij (F)	rij/ri (G)	Bij (H)
Brazil	1.15	11,026	0.80	4.95	0.23	0.16	6.17
China	8.36	7,753	5.85	7.04	1.19	0.83	1.20
India	5.20	2,101	3.64	25.98	0.20	0.14	7.14
Russia	3.51	11,729	2.46	4.65	0.75	0.53	1.89
South Africa	1.21	7,434	0.85	7.34	0.17	0.12	8.66
United States	1.43	54,579	1.00	1.00	1.43	1.00	1.00

Source- Authors' Calculations

Table 4. Education Metrics of BRICS Nations

Country	Literacy Rate	Pupil Teacher Tertiary ratio	Education Expenditure as % of GDP
Brazil	93	19	16.2
Russia	100	10	11
India	74	25	14.2
China	97	19	12.6
South Africa	87	23	18.9
United States	99	12	13.4

Source: World Bank

Table 5. Health Infrastructure Metrics Across BRICS Nations

Country	Infant Mortality Rate	Hospital Beds Density (per 1000)	Life Expectancy at birth	Health Expenditure as % of GDP
Brazil	12.8	2	75.1	9.47
Russia	6.1	8	71.9	5.34
India	30	1	68.8	3.53
China	7.4	4	76.4	5.15
South Africa	12.8	3	63.6	8.11
United States	5.6	2	78.8	17.06

Source: Statista (2018)

Table 6. Infrastructural Indicators of BRICS Nations

Country	% Population Acces to Electricity	Logistics Performance Index	Electricity Power Consumption (Kwh)	Energy Use (Kg)	% Population using Internet	Phone Subscriptions per 100
Brazil	100	2.93	2,620	1,496	70	99
Russia	100	2.78	6,603	4,943	81	157
India	95	2.91	805	637	34	87
China	100	3.75	3,927	2,237	54	116
South Africa	91	3.19	4,198	2,695	56	160

Source: World Bank

order to calculate the catch-up effect and obtain the GDP figures of countries, World Bank data was used for GDP data at constant prices (2010) along with the Per-capita Income. The sample covered a period of 20 years from 1998-2018. These years were chosen as all countries started to get liberalised around this time and were well within their expansionary phases. The Table 2 highlights and enables comparative analysis to be made when accounting for the catch-up effect. When comparing China and the United States, it seemed like China was ahead of United States (9% vs 2.3%), despite the fact that US is one of the most developed nations and the GDP thereof is ~36% higher or ~\$7 trillion higher than China. However taking a closer look after accounting for the catch-up effect, one can see that China's growth is actually 5.44% growth in US. Thus the appropriate ratio of measuring the actual economic growth of China to that of the US is 2.35. Therefore though China in absolute terms seems higher, once adjusting for factors like the catch-up effect, the US exceeds China in terms of growth by ~0.5 times. Likewise, the US exceeds India by ~2 times, Brazil by ~8 times, Russia by ~7 times and South Africa by ~36 times. A similar exercise has been done for PCI at constant prices (2010) and are presented in Table 3. The US exceeds Brazil by 6.17 times, China by 1.2 times, India by 7 times, Russia by 2 times and South Africa by 8 times. However without accounting for the catch-up effect the similar issue of misinterpretation arises with China and India dominating.

IV. Policy Implications

The Sen-Bhagwati debate showcases the interdependency of growth vs development with Sen is of the opinion that focus should be on social development, Bhagwati advocating for faster economic growth. However given the interdependencies of the two, it is paramount that social welfare bodies consider both aspects for achieving convergence. Some of the common tools enlisted are:

1. Education: Growth literature points at three different aspects through which education impacts economic growth. Firstly, education increases the human capital inherent in the labor force which increases productivity in the augmented neo-classical growth theories (Mankiw et al, 1992). Education also increases the innovative capacity of the economy and facilitates diffusion of knowledge and implementing new technology (Lucas, 1988, Romer, 1990, Nelson and Phelps, 1966; Benhabib and Spiegel, 1994). Sala-i-Martin et al (2004) shows that primary schooling turns out to be the most influential factor on growth in GDP per capita from 1960-1996 out of 67 explanatory variables on a sample of 88 countries.

A look at the Table 4 shows that India has not been performing well in the field of education when benchmarked with its peers in BRICS. Although there have been several policies to elevate the educational levels in India there still are many aspects that need improvement

1. Finland had been in the limelight in the field of educational achievement in the last decade. It came to the forefront when Programme for International Student Assessment (PISA), a standardized test given to 15-year-olds in more than 40 global venues, revealed Finnish youth to be the best young readers in the world attributed to small pupil teacher ratio (Hancock, 2011). Nearly 30 percent of Finland's children receive some kind of special help during their first nine years of school. As seen in the Table 4 the ratio is highest in India leading to higher drop-outs due to lack of interest. Increasing the quality and quantity of teachers available would help in improving the effectiveness of the education system.
2. The Finnish educational system avoids rankings and comparisons between students, schools or regions. They are also publicly funded implying a good shot at getting the same quality education regardless of where the student resides (Hancock, 2011). In India however, the average monthly expenditure on education for a middle-class rural family was Rs. 31 while in an urban area was Rs. 125 in

2011, this manifests in the quality of education. Reducing the divide in terms of rural and urban areas and making quality education affordable would help improving the quality of life and opportunities available to large sections of the society (Mint, 2016).

3. Kerala has a special place among Indian states for its achievements in the field of education- the National Literacy Mission declared total literacy in the whole state of Kerala in 1991. Jeffrey (1987) states that historically the female literacy in the provinces of Kerala has been high. Another thing that has contributed to the success is the state's involvement in the educational expenditure. About 37 percent of the state's annual budget goes to education. There's an elementary school within two miles of every settlement (Raman, 2005). This is much higher than the national expenditure on education. Improving the educational levels of women (literacy rate of women is 64%) and having more state expenditure in education would be steps in the right direction.

2. Health- Good health enables one to achieve their potential and enables the society to develop and grow as health has both intrinsic and an instrumental value. The links between a good health infrastructure and economic growth are several. Firstly, it enables enhancement of labor productivity. Second, in children it allows for lower absenteeism in schools thereby increasing future productivity. Thirdly, it allows for different use of financial resources that would be used for treatment of health issue, thereby at times allowing for recreational and educational activities. Several studies have attributed to this. Weil (2007) found that a 10% increase in adult survival rate lead to a 7% increase in productivity. Bloom, Canning and Sevilla (2004) found that good health measured by life expectancy has a high impact on aggregate output in the countries listed in the Penn World Table. Similar evidence for Latin American countries showed high Granger causality between probability of survival and income. The study also showed old age improvements can lead to a substantial increase in income (Mayer, 2001). There are two implications to this, one is that with better health infrastructure for the elderly, the dependency of them towards the younger population reduces, second, the cases of early retirement also reduces. Similar support was found in studies carried out on lower income countries such as Burundi, Ivory Coast, India, Nigeria etc (Bhargava et al, 2001). A look at the Table 5, which showcases select health indicators of the BRICS countries shows how poorly India does in the health space.

In India, access to health care facilities is marred by caste, gender and economic divide (Subramanian et al, 2006; Patil et al, 2002, Baru et al, 2010). To account for these disparities, several policies have been taken from both a state and central level.

1. Studies found that health care disparities and inaccessibility is exacerbated by lack of health care financing and provisioning (Gilson et al 2007; Mackintosh 2001). Therefore to enable a better health infrastructure, a higher percentage of GDP should be allocated for health infrastructure.
2. The health situation in India is exaggerated by the unequal distribution with expensive and unregulated private parties as well as the underfunded government facilities. Given that 70% of India's population concentration is in the rural areas, it is imperative that better access be granted. In fact, in 2012, out of pocket costs for medical facilities pushed 38 million people in India into poverty (Selvaraj et al, 2018). To better this, universal health coverage should be provided. As of today, the Rashtriya Swasthya Bima Yojana (RSBY), Universal Health Insurance Scheme (UHS) and the Ayushman Bharat Scheme are the primary drivers for insurance coverage for the marginalised sector. However, the issues of out-patient facilities not being covered which account for 65% of the out of pocket expenditure (Ravi et al, 2016), slow settlement of claims, low coverage have

resulted in poor enrolment rates whereby 40% of the BPL population are still not insured.

- Capacity building in terms of training institutions, teaching assistantships, health camps, health education and awareness building forums will reduce the gap in terms of health infrastructure. In addition to this, patient welfare must be put forward. Nordic countries have managed to achieve high health infrastructure by virtue of a local administration, equal access as well as variable pay what you can systems are in place. Other aspects such as markets having little influence over healthcare, reforms to cut down wait time between surgeries, as well as compensations due to errors committed by medical practitioners (Patient Injury Law) have yielded better results.

3. Industries and Agriculture: Industries and Agriculture employs close to 2/3rd of India's working population with agriculture employing 43% of the population. Looking at the contribution to the GDP tells a different picture. Service sector is responsible for close to half of the total GDP whereas agricultural sector contributes to only 14.6%. China on the other hand has close to 40% of the GDP coming from the industrial sector. Given the interdependence between the two sectors, improvement in both these sectors would have a multiplier effect on the economy as a whole. Some of the aspects are mentioned below-

- China's growth from a relatively poor country in the 1970s to the second largest economy as of 2020 is to a large extent the result of an active and targeted industrial policy making (Overdiek et al, 2020). One of the major targets of the policy makers was to transform the country from the factory of the world to the research laboratory of the world. India's high economic growth rate in the late 1990's to the mid 2010's was to a large extent driven by the service sector. During this time, the growth of the manufacturing sector was less than the average GDP growth rate. In a country with a huge working population, the growth of the industrial sector is paramount to ensure sustainable living opportunities. To keep up the high levels of growth rate, India has to invest large resources in increasing the efficiency of the industrial sector by fostering innovation.
- In the competitive industrial performance index (CIP) compiled by UNIDO for the year 2009, India was placed 42nd out of the 118 countries. Economic survey of 2012-13 stated that from the long-term point of view, low level of R & D and inadequate availability of skilled man-power would adversely affect the competitiveness and manufacturing growth in India. In such a scenario, technology can play a crucial role in terms of increasing growth, reducing costs of operations, enhancing user productivity and building a sustainable competitive advantage (Kanda R, 2015). Having a competitive import policy also helps in making organizations more technologically efficient. Investing 2-3% of GNP in R&D, improving the industry-academia interaction and protecting intellectual property would help in giving the industrial sector a much-needed impetus.
- One of the major problems plaguing the country's agriculture is the low levels of productivity. The yield rate for rice is 2.4 tonnes per hectare, which is way behind China (4.7) and Brazil (3.6) (Raghavan, S 2014). The yield rate for wheat is better with a yield of 315 million tonnes per hectare but still lower than China (4.9) and South Africa (3.4). One of the first things that have to be done in this regard is to ensure proper irrigation facilities. Increasing the awareness of farmers to new techniques and availability of credit in the rural areas through co-operatives credit societies will ensure that farmers are able to afford the latest technology.
- The success of green revolution in India in terms of increasing the overall agricultural productivity during the 1970's came at a great cost to the environment. About 60%

of the geographical area in Punjab, India is reportedly facing soil degradation due to Green Revolution technology (Srivastava, P et al, 2015). Conservation agriculture and Organic Farming are sustainable way of enhancing integrity of natural resources with simultaneous improvement in productivity and reduced energy requirement (Abrol and Sangar, 2006; Sharma et al, 2011; Pimental et al., 2005).

4. Economic Infrastructure- The correlation of economic infrastructure and economic growth is less direct but nonetheless significant. The accessibility to power, telecommunications, transport and other development infrastructure enhances the capital stock of an economy driving economic growth through economies of scale, market connectivity as well as reduction in price volatility thereby creating economic opportunities. A prominent example of this is that the construction activities especially railroads coincided with the rapid economic growth in Japan, United States and Western Europe (Banerjee et al., 2012). Perez and Wilson (2012) segregated infrastructure into tangible and intangible. The former represented by communications, power and transport and latter deemed as soft infrastructure comprising of health, education and other ancillary sectors. Studies by the African Development Bank show that 16-35% of costs incurred by corporates are for energy and transportation requirements; this is because due to lack of basic infrastructure the corporates have to invest in energy backups, private transportation etc. A similar story pans out for Uganda where firms did not receive power for over 89 days on average in a given year and hence had to invest in power backups. An increase in public investment for infrastructural development is said to have a spur private investment as seen in Chile (Albala-Bertrand and Mamatzakis, 2004). Mitsui (2004) found that improvement of highways in Vietnam spurred economic growth and employment. Transport facilities are considered to be important drivers of economic growth and development either directly or indirectly. Banister and Berechman (2000) showed that transportation spurs economic growth by time and cost savings, interlinkages to market as well as the spatial redistribution of economic activities. It also allows for the ability of firms to source raw materials from more distant markets enabling local production, attracts greater FDI and labour productivity (Gunasekera et al., 2008, Hong, 2007, Krugman, 1991). Keeler and Ying (1988) showed that constructions of interstate highways was capable to reduce the costs of transporting goods and services by 6-9 million \$ per year. Chandra and Thomson (2000) found that county's that had an interstate highway had a rise in its earnings by 3-10% as compared to the ones without one. Telecom industries also play a pivotal role by diffusing information at a low cost, reducing transaction costs and increasing outputs from firms. Furthermore, they allow for cross border exchange of goods and service by simulating consumer demand (Roller and Waverman, 2001, Leff, 1984). In support of this, Sridhar and Sridhar (2009) found that public investment in telecommunications leads to 16% growth in the national output. Evidence in India and Pakistan have shown that increases in telecom leads to a 1-2% increase in GDP in the post telecom reform periods, though it is suspected that the increase in GDP would be much more now owing to more users, inexpensive equipment and better coverage (Narayana, 2011, Hashim et al, 2009). Table 6 where India lies in the infrastructural arena-

While it is obvious that India is not doing the worst, it is necessary that the quality of the infrastructure can be developed further. The Prime Minister's vision of a USD 5 trillion economy by 2024-2025 implies a 9% growth rate in GDP for the next 5 years. This can be met with a significant investment in infrastructural development. For this GOI has set up the National Investment and Infrastructure Fund onboarding foreign investors, additionally, Rs. 100 trillion has been announced for railways, irrigation, education, health and power. However there are still challenges that remain:

- Lack of private investment mainly due long gestation periods and unprofitability adds financial burden to the government. To address this- lucrative offers, private public partnerships, tariff policies and scaling up investment

through guarantees will help crowd investment (Bielenberg, 2016).

2. Maintenance of infrastructure is also paramount- Civic bodies should constantly upgrade airports and ports, quality of highways should also be made better and better amenities must be provided (Mishra et al, 2013).
3. Land acquisition and leasing have complicated and delayed several projects. Through the enactment of the Land Acquisition and Rehabilitation & Resettlement Act, GOI sought to resolve disputes relating to land acquisition and pay up to 4 times the market price. However bureaucratic protocols and approvals have made this process slow and ineffective. To address this, better follow up agencies must be actioned along with setting up of time lines within which approvals have to be passed (Agrawal, 2015).

The aforementioned points highlight how economic growth and development have to work in tandem with one another for countries to achieve higher outcome and better standards of living. Of course, finer details also matter for eg, confidence of public on the political system, the corruption in the society, safety, ease of doing business and environmental wellness. These holistically enable citizens to achieve higher standards of living thereby being productive in their own spheres. The notion of being able to do and to be is the corner-stone of Amartya Sen's work on the developmental frontier. The capabilities approach anchors of the ability for people to feel safe, learn and grow thereby fostering better outcomes for generations to come.

V. Conclusion

Economic growth has always been one of the key areas of discussions among policymakers and academicians alike over the past few decades. It thus becomes important to understand more about metrics like GDP to prevent misinterpretations. As seen in this paper catch up effect helps in understanding growth differences among different countries by benchmarking it with a highly developed country. India has done tremendous work over the past few decades but the data shows that there is still a long way to go before it can rub its shoulders with the other developed countries. As pointed out there are several areas of improvement in social sector (health and education) and in the different economic sectors (agriculture, industries and services) that can help spur India to higher levels of growth. The New Education Policy that was recently passed in the parliament is definitely a step towards that direction. The focus on vocational training, increasing public investment to 6%, entry of high quality foreign institutions and a focus on a multi-disciplinary approach is commendable. Increasing the competency of the local industries by focusing on 'vocal for local' also has the potential for being a catalyst to economic growth. Devising such ideas are though not enough, successful implementation of them is what really makes the difference. Implementation of such ideas in the various sectors would surely help India reach a higher and more equitable level of development.

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