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India Vision 2050

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Abstract

This paper presents a Vision of a developed India in 2050. Two objectives drive this vision. One is fast catch-up growth that closes the gap with countries which were at the same stage of development as India in the 1960s & 1970s but have moved ahead since then. An understanding and utilization of global & domestic trends is critical to fast growth, which can be used by Indian government and its people to leapfrog to a better life. The second is equality of opportunity for every Indian citizen based on personal motivation & inherent capabilities. Equal access to quality education, skills, public goods, social and governance services is critical to both these objectives. Provision of social services to 1.6 billion Indians, at the quality available to 1.3 billion citizens of the Developed countries, is only possible in 30 years through comprehensive use of digital systems like e-governance, e-learning, tele-medicine, and artificial intelligence. We envision a Hybrid architecture which marries India's vast human resources to a pervasive digital infrastructure to accelerate structural transformation and inclusive growth. Government will ensure the provision of hard & soft infrastructure to every habitation in India, develop a policy structure that creates competitive markets in which private entrepreneurs can innovate and thrive, and a welfare system that protects the weak & vulnerable while giving ample scope for civil society to provide a multiplicity of non-marketable services. The key policy & institutional reforms required are also discussed.

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1. Introduction

India is a heavily populated country with relatively low per capita GDP. This combination makes us the fifth largest economy in the World. The key to India's future is the development and exploitation of our comparative advantage, to eliminate the per capita GDP gap with the Upper middle income countries and to reduce the gap with the high income countries. The economic reforms under way and the economic & institutional reforms on the agenda for the next few years, will sustain growth of per capita GDP at 6% to 7% during the decade of 2020s, to make India the third largest economy in the World by 2035. India will also become the most heavily populated country in a few years. The challenge is to broaden and deepen these reforms to transform the quality of our human resources, to take advantage of the new trends in global polity and economy, so fast growth is sustained for three decades.

The next section lays out a vision of equality which is the foundation of fast inclusive growth in a free, open, plural democracy. The subsequent section examines the demographic, digitization, and de-carbonization trends, which will determine India's global comparative advantage. The following sections outline the macro-economic & structural evolution of the Indian economy over the next 30 years and a future knowledge economy. We then delve into the Hybrid, digital-physical systems that are critical to translating the vision into a reality. This is followed by a sketch of key elements of the Green economy and a Geopolitical vision for India in the World of 2050. Section 9 presents a policy vision of reforms needed to accelerate and sustain fast growth for three decades.

2. Equality of Opportunity

India's constitution is based on the philosophy that all citizens are equal under the constitution, under the laws enacted under its umbrella and the governance and administrative institutions which implement these laws. The original vision as best explained by Ambedkar, has been distorted by political purpose and expediency. Further the administrative reality of how the constitution and laws are implemented remains too far from the vision. We envision an India in 2050 in which the original vision of human equality embodied in the fundamental structure of the constitution is restored, the laws reflect the fundamental right to equality and the Governance institutions are reformed to reduce the gap between the laws and their implementation.

Indian society is more unequal today, than the framers of the constitution envisaged or imagined it would be 70 years after its promulgation. Reservation for Scheduled Castes and Scheduled Tribes, which was made for 10 years, with the expectation that it would be enough to eliminate handicaps & restore equality, has been extended for 70 yrs, with limited success. Part of the success in reducing inherited discrimination, is attributable to facelessness of the market economy and the anonymity of urban life. The founders could never have envisaged that instead of reservation being eliminated a few decades after independence, it would be extended further to OBCs after 40 years, with further demands for expansion arising after 60 years. Political discourse and contestation have also hampered the elimination of discrimination based on religion by each religious group. We envisage an India in 2050, where residual discrimination is reduced to, or below, the level prevailing in other large plural democracies like the USA.

India was one of the first democracies to enshrine full gender equality in the constitution but has failed to translate it into societal norms and rules. We envision an India in which women working from villages, small towns and urban homes provide more than half the high skill labour force of India. We envision an India in which women's labour force participation rate is in the highest quartile and the wage differential is in the lowest quintile. An OECD study (2015) suggests that gender parity in labour force participation and wages, can raise India's GDP growth rate by 1.5% to 2.4%.

Social mobility is an economic imperative, as full use of the productive potential of the population, benefits not just the individual, but increases the total productivity of the economy. We envision an India in which there is equality of economic opportunity for all citizens, independent of the class, caste, religion or ethnic origins of the parents, or the gender of their child. This requires an education system that provides basic education and job skills of highest quality to all, and higher education and skills to each according to her capabilities & talents (IQ, EQ, SQ), interests & motivation, tempered by the need to promote public (viz personal) interest.¹ Learning to learn, the scientific method, and ability to question assumptions buried in our psyche, is an important function of good education. To the extent that humanities are designed to produce this result, they can be as valuable as STEM (science, technology, engineering, and mathematics) in promoting innovation. Education must inculcate Gandhian

¹ IQ = intelligence quotient, EQ = emotional quotient, SQ = social quotient.

notions of social, civic, and national responsibility, in contrast to Stalinist-Maoist notions of, “ends justify the means.”

Equality of opportunity requires a competitive market economy, in which natural monopolies are rationally identified and professionally regulated, and the adverse effect of asymmetric information on equality of opportunity is corrected. Society has at times to create monopoly rights because it is in the public interest to do so, such as in the grant of patents, or with respect to investment & production of strategic defence technology. This must be done with due consideration of the public benefits and costs.

Socio economic equality also requires access to Public Goods and equal quality of public goods, as inequality in the provision of “Public goods” by the Government is a source of inequality. “Public health” and “Public health education” are classic Public goods for which Government bears full responsibility.² Communicable disease is the best example of the Public good referred to as “Public health”, and vaccination, vector control, sewage, sanitation, clean drinking water, and public education are the means of controlling it. Control of pollution (air, water, land) is also closely related to Public health. Provision of good quality “Public health” services to all is a foundational pillar for equality of opportunity.³ We envision an India in which health insurance covers 100% of residents for all testing, & treatments (including minor surgery), with major surgery, chronic disease and curable cancers covered by the govt tertiary health system.⁴

We envision an India in which all have equal access to high quality drinking water, clean air, and land unpolluted by chemicals of all kinds, where all have access to the same urban facilities and environment from large metros to small towns and habitations as they do in advanced countries. We envision an India in which equality of opportunity is achieved in fact and is visible; The poor, the middle class and the rich, the urban dweller and the rural villager,

² On par with roads & highways, judicial system, internal security & police, and defense. For examples of “Private goods” see next footnote.

³ “Public health,” needs to be distinguished from “individual health” issues like pneumonia, heart problems, cancer, kidney & other organ diseases and failures. For these diseases, society & polity have the choice of different health systems (UK, Canada, Europe, USA), or a private-public partnership version, suited to our tax capability and demands on tax resources.

⁴ This requires having State Primary, secondary and tertiary health centers which provide health services which are credible to patients and insurance companies. Telemedicine will make universal personal health insurance feasible.

are virtually indistinguishable in public parks, metro rail (a quasi-public good), airports, and footpaths & roads.

We envision a social security system which functions seamlessly from the poorest to the richest. from those who need transfers to those who pay taxes. A net income transfer system which implements the saying, “from each according to her capability to each according to her need,” without compromising the incentives for work and honest deceleration of income. A system which ensures that every citizen is part of it and is treated neither like a supplicant at one end, or a potential criminal at the other.

We envision an India in the World, which is equal to any in the World, which is the third most powerful, which deters totalitarian aggressors, and provides a voice to the low income & lower middle-income countries in international forums & organizations. India has always provided high quality Aid and assistance to other developing countries, and as its income rises it will be able to step up this assistance.

Though we are the fifth largest economy, there is a big gap, between the income & “quality of life” of the average Indian citizens, and those of upper middle- & high-income countries. We envision an India in 2050, in which this gap is closed, so that Indian metros and the people walking there look as well off as in any city of America, Europe or Asia. It will be an India, where NRIs and PIOs are eager to come back and settle in and to send their children to study and work in. Along the way India will become the third largest economy by 2035, a potential great power, half-way to becoming a potential super-power by 2050.⁵

Fast, inclusive, green growth is necessary condition, for this vision to be achieved. Inclusive growth generates private income for all, but also generates government revenues, which are critical for providing the public & quasi-public goods and safety net needed to achieve the vision.

⁵ We measure power with VIPP index of economic power and define a Great power as one with VIPP > 40% of the strongest economic power and super power as one with VIPP > 80% of the strongest economic power. India is projected to meet this technical criterion of Potential Great power by 2030, and Potential Superpower by 2050.

3. Global Trends

3.1 Demography

Demographic change is the most important driver of changes in global comparative advantage. India has been unable to utilize its demographic dividend as well as the countries of East & South East Asia have since 1960s. The working age population of most of the high-income countries (HICs) and many of the upper middle-income countries (UMIC) is in decline, while India's is rising. The global share of working age population, for the largest developed countries like USA, Japan, Germany will decline by 4% to 6% points, while India's share will increase by 4% points by 2050. The share of Europe in working age population will decline by 3.25% points, with Russia, Italy, France UK all losing share. Even more important, China, which is India's direct competitor in terms of factor endowments will lose a significant 6.7% of its share in global work force by 2030, providing an opportunity to attract labour intensive production from China to India.

The trend in de-globalization which started with the global financial crisis, accelerated with a recognition of the monopoly of China over global manufacturing supply chains (2018-19), and the disruption of supply chains during the Pandemic (2020), add to the relative advantage of India as a location for diversification out of China.

The current advantage in labour intensive production will, however, be eroded over the next 10-15 years by the expansion of labour force in Africa. So, India's comparative advantage will shift to semi-skilled labour-intensive manufacturing and services, over the next 30 years. The low ratio of educated and skilled labour in total labour force of India, in 2020 provides an opportunity to raise India's share to double digits by 2035.

The global share of skilled labour force will decline along with the share in total labour force, for the countries mentioned earlier. In addition, the Republic of Korea, Brazil, rest of N & S. America's share of educated and skilled labour force will also decline. R&D by MNCs in Emerging economies has increased significantly over the last few decades, with Israel, India and China being the key beneficiaries of this diversification. The discovery of massive leakage of advanced technology from all the developed countries to China over the last 20-30 years adds to the attractiveness of diversifying manufacturing value chains into India. This particularly attractive for value chains involving software elements, given that India is already an attractive destination for R&D in software solutions.

The comparative dis-advantage faced by India in terms of economies of scale and scope, is being partly addressed by the new Product Linked Incentive (PLI) scheme, but more will have to be done with respect to other bottleneck and high-tech education & skilling. Online education & training processes and expert systems are the only way of delivering quality education and skills to the large population of India in the short time available.

A third aspect of demography is the aging of the population. Except for the countries in which total and working age population is rising, the share of aged population will rise, China's aged population will double in 30 years, from 12% in 2020 to 24% in 2050. Even India's aged population will double over this period but remain a little more than half that of China's in per cent of total. Age related health care, drugs & pharmaceuticals and medical equipment will expand rapidly. India can become a major provider of *hybrid health services* (online & offline), medicines, and medical equipment to the World. Training of technicians, nurses, physical & mental health therapist and an army of niche skills like speech therapist, will be necessary.

Because of the Pandemic, Public Health & public health education issues will take centre stage in the next five years. But India is well placed to become the Pharmacy of the World by 2035. Govt must provide professional regulation of the entire process of drug research, discovery, testing, approval, and post-production pricing, to minimize regulatory costs and maximize the public health benefits.

3.2 Digitization

Two other global trends are especially important for India of 2050. Digitization and Green economy. The Developed countries and China have been digitizing at a much faster rate than India. Important steps taken by the Government to develop digital infrastructure, like Aadhar, UPI and financial & health stacks, need to be broadened & accelerated. The Pandemic has given a great impetus to digitization worldwide and in India; Remote work and work from home, and Global demand-supply of over the wire services and export of services, will grow swiftly over the next decades. With a supportive environment provided by Govt to Tech entrepreneurs, India can and must close the gap, and benefit from the new possibilities like work from home and work from anywhere which have opened.

Digital provision of human and social services will be critical to delivering high quality education, skills, health, and government services to a population which is more than the continents of Europe and North America combined. The trends in Artificial intelligence, machine learning and expert systems will complement the process. Hybrid models will be

developed in India to optimise the balance between the benefits of direct human contact & socialization and better quality of information & knowledge provided digitally by a few to many.

The “work from home (WFH)” trend offers a way to work around the social discrimination faced by women in working outside the home, especially in rural areas. The work from anywhere (WFA) trends, provides an opportunity to close the existing and emerging skill shortages in India and the World. India must urgently utilise the unused potential of highly educated women who are confined to their homes or limited to small hometowns, with few job prospects for the highly educated.

3.3 Climate Change

Climate change and green economy trends are also accelerating. With India taking a proactive stance on Solar power and electric vehicles, we are well placed to participate in a whole range of new activities opened by the trend towards a greener economy. Unlike EU, Japan, and USA, we face a greater problem of hot weather & evaporation. The need for cooling and refrigeration is extremely high in summer. Urban planning and housing design must minimize the costs of climate moderation to the economy. Climate change is also leading to freak weather conditions, which must be anticipated and built into the design of rural and urban habitation. An optimal combination of incentives for generating better design of systems and disincentives for environmental degradation will emerge.

3.4 Comparative Advantage

India’s comparative advantage will shift from labour-intensive and semi-skill intensive manufacturing during the 2020s, to semi-skilled manufacturing and skilled services during the 2030s. As the working population of the Developed countries and Emerging economies declines, their share of semi-skilled and skilled labour force reduces, the cost of skilled labour will increase relative to the cost of capital. These countries’ comparative advantage will therefore shift to high-tech capital-intensive products like robotics, automated machines & automated production lines, artificial intelligence (AI), and machine learning systems. India need not ape these countries with respect to automation but can use AI and machine learning to enhance the quality of its skilled labour force and magnify its reach & effectiveness (up-scaling). This will give India a potentially unique competitive advantage between the countries

with rapidly expanding labour force in Africa & West Asia and declining labour force in Americas, Europe & E & S.E. Asia.⁶

India's comparative advantage is envisioned to shift to Innovation, in the 2040s. This requires Innovative entrepreneurs and associated skills for translating innovations into marketable products & services. The institutions needed to generate an environment that promotes innovation on the frontiers, have a long gestation period. India must accelerate the creation of such institutions and create the required comparative advantage within 25 years.⁷

4. Economy: Growth & structure

4.1 Indian Economy

Sustained fast growth in per capita GDP over three decades, averaging 6.5% per annum (about 1% point faster in first decade, slower in last), is possible, given appropriate policy and institutional reforms. Reforms of product markets (goods & services), factor markets (capital, labour, land, and management), natural resource exploration production and marketing, social services (education, health, govt services) and Public sector monopolies & monopsonies (defence), are at various stages of implementation. Some of these reforms (financial sector, labour, electricity distribution, defence production, corporate tax) have already been undertaken but may need to be refined, over time.

Micro, small & medium enterprises (MSMEs) constitute 85-90 percent of the India's producers and start-ups and tech entrepreneurs to power India in the 21st century, will arise among them. Ease of regulatory compliance is more valuable in cost and time for MSMEs than for Companies. Goods and services tax (GST) simplification, and rationalization of the Direct tax code are critical to providing a level playing field to MSMEs. Customs duty simplification is needed both to level the playing field for MSMEs but also as part of an industrial policy for facilitating the growth of global supply chains in India.

Legal reforms, Welfare reforms and reforms of the transfer-subsidy system are pending. Further reforms will also be necessary to transform the structure of the economy, leapfrog over known weaknesses and address new bottlenecks that arise with growth.

⁶ Including China

⁷⁷ Catch-up growth requires institutions for imitation and adaptation of technology, which is widely available in the advanced countries, and takes a country from low income to middle income. The move from middle income to high income requires institutions which promote the generation and implementation of innovation at the frontiers of technology.

Poverty rate as defined in Lower middle-income countries, will be eliminated by 2035, through a net income transfer system integrated with personal income taxes. 100% coverage of Aadhar number will ensure that neither a single person (man, women, or child) is left behind, nor a single income earner fails to pay his/her due share of taxes. Poverty as defined in upper middle-income countries will be eliminated in India, by 2050, through a combination of higher per capita GDP and a more efficient tax-transfer system.

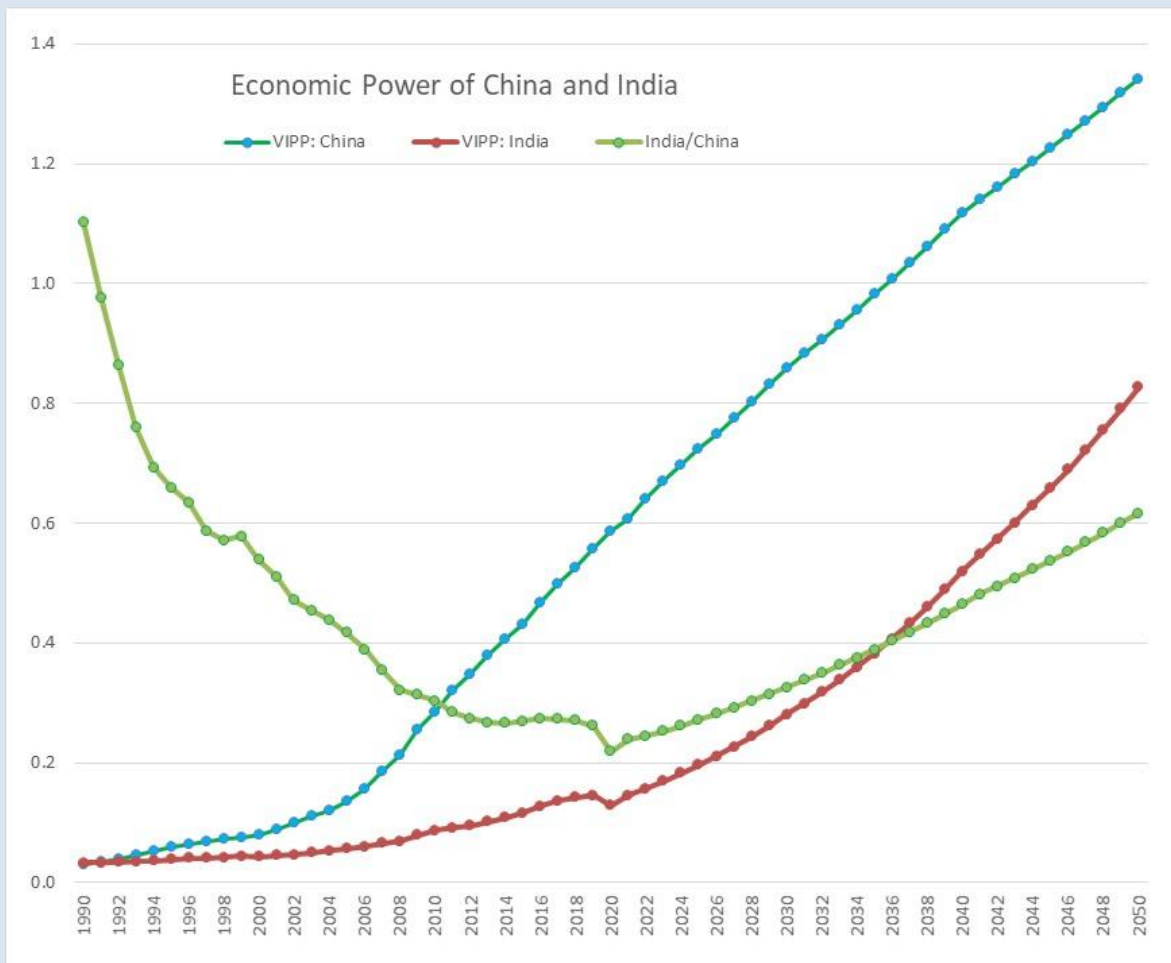
4.2 India in World Economy

If India undertakes the required policy and institutional reforms, it is projected by us to have a Per capita GDP approximately 65% of China's and 33% of USA by 2050.⁸ India's economic power, as measured by the VIPP index will be >60% of China's and >80% of USA's (figure 1).⁹

⁸ Citigroup and Price Waterhouse predicted India would become the largest or second largest economy by 2050. Our projections are more conservative, assuming a compound annual growth of per capita GDP of 5.8% for India, 4% for China and 1.7% for USA. If China grows faster than projected, India will have to accelerate policy and institutional reforms to maintain the same pace of catch-up.

⁹ VIPP = Virmani Index of Power potential; It measures a country's economic power relative to that of the USA. Economic power is geometric average of an economies real relative size and a measure of general technological prowess(per capita GDP relative to USA). VIP = Virmani index of (overall) power, is a geometrically weighted average of VIPP and military power. As the April 2021 revision of World Bank WDI is delayed, these projections will have to be updated when the international data for 2020, the pandemic year becomes available.

Figure 1: Global Economic Power of India & China as measured by VIPP



Note: VIPP = Virmani Index of potential power, measures a country’s economic power relative to that of the strongest power (USA). India/China = India’s VIPP (VIPP: India) as % of China’s VIPP (VIPP: China).

India will be the third largest Military power with the third largest military-industrial complex and a sizable R&D hub. The general standard of living will increase from about 15% of EU average to about half of EU average by 2050 (figure 2) and be comparable to the average income levels in current day Spain and Italy, which are classified as a high-income country (HICs).¹⁰

Having already become the third largest economy by 2035, India will be among the top three drivers of global growth (with USA, EU), because of its direct effect on rest-of-world demand

¹⁰ Spain has 32 rank in Per Capita GDP and 25th rank in Human Development. The rankings will change in 30 years, with India improving from its current ranking of 132.

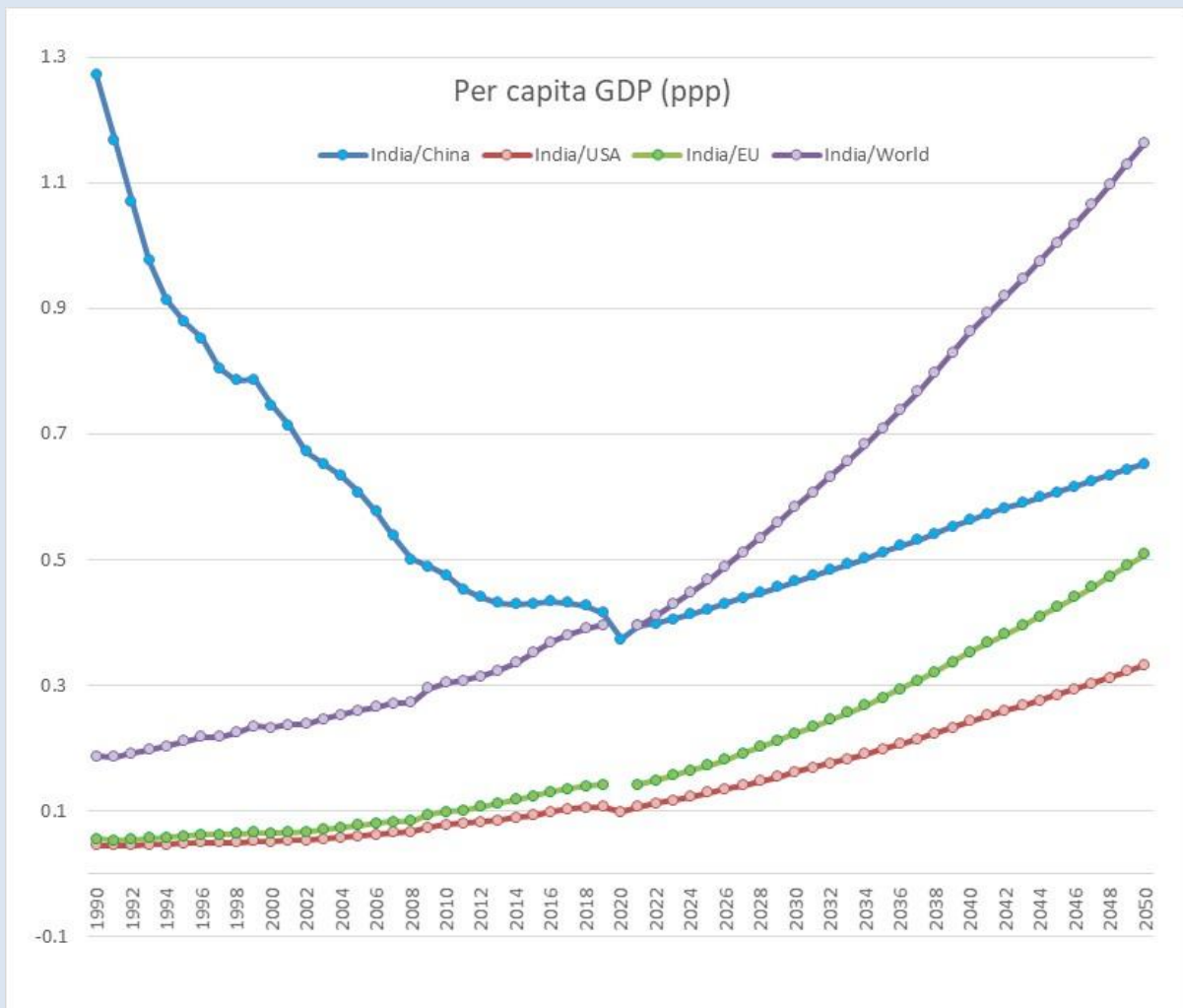
through net imports of goods & services from the rest of the World.¹¹ It will also be the second largest capital market in the world, after the USA, attracting larger amounts of capital than any other country, because of high investment levels reflected in the current account deficit.

India will become the Middle and Back office of the World and the largest provider of online, managerial (industry, agriculture), professional (fin tech, data analytics, advisory) & social services (health, education), by utilizing its demographic dividend, as educated, young workforce declines in rest of Eurasia. It can also become a manpower supplier to the world for economic activities which require physical presence of technical & professional personnel at the site, like surgery, physiotherapy, nursing, house construction & repair. India will innovate *hybrid services*, where a worker with purely physical capability works under a personal supervisor, who guides, monitors, and inspects the work in real time.

Whether India enters the ranks of the top three manufacturing goods producers in the world depends on the degree to which India and the free market, open democracies adopt a dualistic trade policy; First prong is a policy of strict reciprocity and symmetry with respect to totalitarian, non-transparent States which use asymmetric trade, technology & FDI policies to monopolise the production and export of manufactured goods. Second prong is a conventional free trade and investment policy with the Rest of the World.

¹¹ Reflected in the absolute value of the current account deficit. Note that a driver of growth for the rest of the World, is measured by the elasticity of ROW GDP because of an autonomous change in country GDP. It is different from arithmetical contribution to World growth, which is just the ratio of the increase in country GDP as ratio of increase in World GDP.

Figure 2: India's Per Capita GDP (at PPP) compared to China, USA, EU, World



Note: India/China = India's per capita GDP divided by China's per capita GDP. Similarly, India/USA (India/EU, India/World) is Ratio of India's per capita GDP to USA's (EU, World).

4.2.1 Connectivity & Trade

Development of a global manufacturing hub in India will be greatly facilitated and accelerated by supply chain diversification by the QUAD, EU, UK, Canada, Republic of Korea, and Taiwan. Trade and FDI are intimately linked; Half the World's merchandise trade takes place within MNCs, through their internal supply chains. The share has been on an uptrend for decades, till the setback received from the Global Financial crisis. The share will likely start rising again after the pandemic is behind us. As most of the World's MNCs are still headquartered in USA, European Union (+UK) and Japan, a plurilateral free trade agreement (FTA) between these economies and India will benefit all of them. Such an FTA can help reduce dependence on totalitarian countries, which have used asymmetric policies to create monopolies, and are not shy of using this dependence for geoeconomics & geopolitical coercion.

The Trans Asian highway and the Trans Asian railway, from Vietnam through India to West Asia, will have come to pass. These were envisaged by Asian countries and endorsed by ESCAP decades ago, but will finally come to pass, by 2035. India's North East will lie at a cross-roads of East West traffic, with important Southern roads and rail lines through Bangladesh and Myanmar to Thailand and Malaysia. Afghanistan could become another logistics hub with North-South rail line from Chabahar through Afghanistan and Central Asia to Russia. Greater connectivity will also facilitate the participation of all South Asian countries India's growth.

India will become a hub for the Indian Ocean region, with a web of shipping services, air lines and internet cables linking all the countries on the shores of the Indian Ocean and the Gulf and the islands of the Indian Ocean. India's role in the Indo-Pacific will expand, to provide more options to South East Asia and West Asia. India could curate a, "Gondwana Common Market (GCM), with members from South Asia, Indian Ocean island nations, East Africa, and West Asia. By 2050 this organization will have special market arrangements with ASEAN and GCC.

4.2.2 International Finance

We envision an India in 2035 with a fiscal surplus, open capital account, double AA rating and a currency (Rupee) which is fully convertible and part of IMF special drawing rights (SDR) list. India's large and rising international reserves, increasing trade diversification & rising role of the Rupee in neighbourhood, and the third largest capital market in the free world, will make this a natural outcome.¹²

An Indian rating agency will diversify out of India, to cover all developing and emerging market economies. This could be with the equity participation of rating agencies of large, free market democracies, or as joint venture with them. GOI will facilitate this process!

An international financial centre like pre-2020 Hong Kong, Singapore or London can only be developed if the quality of life is comparable to that in these centres. If the social freedom and quality of life available in these centres cannot be provided in GIFT city, a new centre will have to be developed elsewhere.

By 2050 India in co-operation with other free market, open democracies like, EU, will have an international payment and settlement system managed jointly by these economies/countries.

¹² These are necessary and sufficient conditions for inclusion in SDR as a fully convertible currency.

4.3 Structural Transformation

4.3.1 Agriculture & Rural labour

One of the unique negative aspects of Indian economy is the failure to follow the conventional economic development pattern seen in history. A shift in employment from Agriculture into Industry, with a corresponding decline of Agriculture value added in total GDP. 50% of labour force remains in Agriculture, though Value Added has declined to 20% of GDP.¹³ Labour productivity in Agriculture is therefore 40% of average and seasonal underemployment remains a substantial problem.¹⁴ Female labour force participation is low, even lower than in urban areas, because social constraints and prejudice is much more constraining in rural areas.

Among the reasons for the lack of structural change has been the continuation of controls on all aspects of agriculture (inputs, land, farm management, output sale), which have stifled innovation and diversification. Subsidy policies have encouraged over-use of ground water, electricity and polluting fertilizer, and under-use of farm waste (& consequent open burning). Reforms have started, but must be taken to logical conclusion, to create a structurally transformed rural economy by 2050. These reforms must be complemented by upgrading of public goods infrastructure like roads, R&D, agricultural extension, 24x7 electricity, telecom cables, digital data connectivity, water supply grid, drainage, and ground water recharge systems for sustainable agriculture. Transformation of the rural economy is critical to eliminating poverty.

4.3.2 Infrastructure

India will have national multimodal transport and logistics system matching the best in Asia, in terms of costs and transit & turn-around time. Roads/highways, ports, airports, waterways, rail lines will be upgraded to HIC standards and quality. There will be one or two deep water ports which take the largest container ships. Electricity generation, distribution and transmission operations will be optimized by intelligent systems, which are fully isolated from foreign Cyber-attacks. Railway lines and signalling systems, gas and oil pipelines, electric goods will be run on a goods principle for open access to all suppliers for running train services,

¹³ 2/3rd of population remains dependent on agriculture.

¹⁴ Peak labor demand occurs in sowing season and a lower peak during harvesting, though this peak has reduced due to mechanization. There is disguised unemployment or underemployment, during most of the growing season.

transporting oil & gas and electric power, respectively. Power generation will depend increasingly on nuclear fuel, solar & wind, and hydrogen fuel.

Universal Broadband connectivity is critical to fast productivity growth, given that rate of return in digital infrastructure is even higher than in roads and highways. The objective of a national backbone, of fibre-optic land lines for web/internet connectivity to all blocks & taluks/tehsils, is a sound one. Mobile/digital network for 99% geographical coverage including India's coastal Exclusive Economic Zone will be achieved. We envisage a telecom and 6G infrastructure that is thoroughly firewalled from hostile & unfriendly countries and international mafia operators.

A national water grid will supply piped drinking water to every urban and rural household. Every village & town will have a modern sewage and solid waste collection system, connected to a national processing, recycling and hazardous waste disposal system. These measures will wipe out environmental enteropathy, which is the main cause of child malnutrition in India.

4.3.3 Manufacturing

Modernization and diversification of Agriculture will have to be complemented by faster growth of semi-skilled labour-intensive manufacturing. This requires a massive improvement in the quality of basic education and job skilling of rural youth. The scale of Indian manufacturing is exceptionally low compared to that of China. Labour reforms coupled with the PLI scheme has started the process of raising manufacture of consumer goods to minimum efficient scale (MES). The next stage in this process is the setting up of special industrial estates, with good quality infrastructure, to incentive backward integration. For instance, common facilities for processing of chemical waste, would reduce costs of regulatory compliance for chemical industry. The third stage is the growth of specialized industrial towns, with overlapping input suppliers, common set of input services and labour skills, so that backward linkage can extend to common training facilities and eventually to R&D. Such towns have the added advantage of facilitating economies of scope and forward linkages to international markets, by building reputation and facilitating branding.

A reformed and simplified GST, Customs tariff structure and direct tax code are critical compliments to a successful industrial policy. Digitalization and integration of the relevant tax systems with foreign exchange management and credit flows, facilitates exports by reducing the cost of developing & servicing international markets.

On the demand side, the global diversification of Supply chains to reduce risks of disruption and over-dependence on supplies from one country, provides a once in a generation opportunity for India. A dual trade policy, which differentiates between imports from controlled, non-transparent high risk and hostile countries and the rest of the world, is critical at this stage. This must be reflected in our Export-Import policy and customs duty structure and tariff rates, as well as in our approach to free trade agreements, preferential trade agreements and plurilateral agreements such as Regional comprehensive economic partnership (RCEP) and comprehensive and progressive agreement for trans-pacific partnership (CPTPP).

The benefits of globalization can be maximized, and costs minimized, if the group of free market, open, transparent, democracies (QUAD+EU+UK) jointly adopt a dualistic trade & investment policy framework.¹⁵ As the trade risk is largely confined to merchandise trade, a traditional free trade agreement (FTA), with zero tariffs on manufactured goods, subject to 70-80 of value addition being within the set of FTA countries, is an ideal which can be achieved in this decade. Given our comparative advantage in labour intensive and semi-skilled labour-intensive goods, an FTA with the set of labour scarce countries is more beneficial to us than an FTA which includes China and other highly populated Asian countries.¹⁶

Value chain diversification can also be achieved if the focus is on goods, services and technology related to the manufacturing sector, as Intellectual Property agreements will be easier for services which complement manufacturing than for unrelated services, such as movies, books. Art. An agreement on Patents and intellectual property is not harmful to us if the Developed countries are willing to compromise on the duration of patents and the number of generations to which they can be applied.¹⁷

4.3.4 Services

Modern Services are likely to play a much more important role in the structural transformation of the rural economy than is the case historically. Two issues need to be addressed to accelerate the process. One is the provision of the job skills needed in agriculture

¹⁵ QUAD = Group consisting of USA, Japan, India, Australia.

¹⁶ Note that this is quite different from RCEP which includes a country that has monopolized the export of many manufactured goods through asymmetric trade, technology, investment, and economic policies. It is also different from TPPP whose primary objective is to impose asymmetric IP agreements, which favor wealth countries at the expense of poor countries under the guise of “High Quality agreements.”

¹⁷ Long duration, and multilevel/multigenerational patents favor wealthy, net exporters of IP, while shorter, more limited agreements favor poorer, net importers of IP.

and the rural service sector and the other is the social constraints on females working outside the home. These can only be built on a foundation of good basic education. Public institution must, promulgate standards for the 5000-6000 globally defined technical skills. Then in co-operation with the private sector, a comprehensive system of certification and skilling must be created. The digital and online service revolution can be used to leapfrog the provision of quality education & training in job skills in rural areas and to provide the infrastructure for females to work from home.

The Pandemic has been a big shock to domestic and international travel and tourism. The shock will be overcome in the next few years. India's tourism market is very poorly developed and consequently has great unexploited potential. Medical, religious, and natural resource tourism has great potential in different regions of India, given the great geographical, human, cultural and religious diversity. Given the almost virgin territory, due attention must be paid to developing environmentally sustainable, green tourism.

5. Knowledge Economy

The key to India's knowledge economy will be innovation and entrepreneurship, for which the foundation is already being laid by the stand-up India, start-up India initiative of the Govt of India, which giving a central role to tech start-ups and new entrepreneurs in generating employment. Innovation is envisioned not just at the frontiers of (manufacturing) technology, but in the trenches of the under-developed economy; Innovation by "rural entrepreneurs" to transform agriculture, rural manufacturing & services, and by "social entrepreneurs" to scale up to a market of 1.6 billion people without diluting quality. Innovation in hybrid physical-digital systems, that balance the social value of human interaction and the cost effectiveness of web-based services. The foundation of innovative entrepreneurship is good education the ability to learn, think, question, find solutions & take risks.¹⁸ The second pillar is a competitive economy in which lobbies of established oligopolies, cannot collude with the political establishment, to stop creative destruction of their profits by the innovators¹⁹ Public policy, regulations and institutions must provide the correct incentives.

The higher education and research system reform initiated recently is only the first step. The entire superstructure will have to be re-engineered. Further reform of Government research

¹⁸ In contrast to credentialism, directed at getting a job based on a degree or school certificate.

¹⁹ Philippe Aghion et al have provided research-based advice in their book, "Creative Destruction."

institutions, including the agricultural research system under the State Govts, is critical to meeting the needs of the knowledge economy. The Strategic & Defence R&D system needs to be reformed by setting up a Defence R&D Commission patterned on the successful Space commission. Such a commission would identify and develop futuristic technologies from basic research, training of high-level professors/teachers, to developing prototypes and helping productionize them. This would include pure defence systems like hypersonic vehicles, satellite defence systems & high-powered lasers, to dual use items like semi-conductors, robots, autonomous vehicles, Artificial intelligence, machine learning, expert systems & cyber tools.

The global learning of Indian research systems and Indian University STEM department needs to be strengthened, by connecting them to research carried out in the universities and research labs and incorporated in new start-ups, of the developed countries.

The medical and drug research system needs to be overhauled to restore the private development of new and modified, drugs and their testing and trials. Public – Private partnership will be essential to develop new medical technologies.

Agricultural research and extension, basic education and mass skilling is critical to transforming the rural economy, where more than 2/3rd of the population lives, and half the work force is employed and eliminating poverty and malnutrition. Training in logical analysis and the scientific method, coupled with access to information & knowledge available in India and the world, along with appropriate incentives for local start-ups/innovation to solve local problems, will help transform this economy.

Drugs, pharmaceuticals, and medical equipment sector is the only manufacturing sector still subject to price controls. The spate of reforms during the 1990s and early 2000s was reversed since then and even new ones added. Given the enormous possibilities of new medical and pharmaceutical discoveries during the next 30 years, the entire regulatory system from R&D, drug testing & trials, production and marketing needs to be modernized into a professional *Food and Drugs Administration*.

5.1 Education

Quality of education and job skills for the entire population is critical to achieving “Equality of opportunity” for the poor & discriminated groups. Scaling up of social services to meet the needs of the World’s most populist country, while improving quality from current low levels, is an enormous challenge. Universal digital connectivity and digitization of the economy and

population, provides an opportunity for simultaneously expanding access while improving the quality of social services (Education, health, welfare, urban services, govt/public services).

In the information age, much of the new economy is related to the digital world. Among these will be the future systems of education and imparting skills. Innovations in Tele-education and the development of hybrid digital-physical systems will play an important role. Three-level delivery system Design (courses at every class/level, all languages)), Implementation & continuing services (including experiments, training, testing, counselling), local (language) helpers. Public health education, Social, civic & moral responsibility. Educating the educators and training the trainers is critical to the quality of education and skilling.²⁰

5.2 Knowledge Stack

To facilitate the creation of a Knowledge economy in the information age, the Government will create a multi-dimensional knowledge exchange, with several sub-stacks such as for R&D, education, and skilling. The knowledge stack will have a digital library, a library of patents and a library of indigenous knowledge. The R&D sub-stack will have a provision for listing and accessing all published Indian research and for digital publication of reviewed and unreviewed Indian research articles. This system will also bring together all the higher education and research resources of the government(s). It will also have a knowledge exchange with provision for both free exchange among academia, think tanks and researchers and for marketing of priced knowledge services.

The second dimension will be a public education sub-stack, which will bring together the tele-education, e-learning, and e-skilling efforts of central and State governments.²¹ At the base of this stack will be a central government system for the education of educators and training the trainers. The next layer will be State Govt layers for schooling and skilling, which connect to and provides access to every State Government Primary school, Secondary school, college, and training centre in the State. The top layer will contain all the NGOs, private companies, educators, and trainers providing goods and services for e-learning.

6. Hybrid Digital Economy

We envisage India is one of the foremost digital economies in the World by 2050. India's large population, provide an opportunity to pioneer the development of *hybrid online-offline systems*

²⁰ Citizens, old or young, men or women, will have Foundational Literacy and Numeracy (FLN).

²¹ ISRO's experience in tele-education can be used to build a comprehensive education stack.

for Social services, government services, finance, and business services. Social entrepreneurs will play a key role in delivering quality services to the rural areas, on digital platforms built on government developed infrastructure.

Regulatory systems & regulators for Digital economy: Data Privacy, data security, safety from (sexual) predators, hate speech/incitement to violence/murder/mas murder, information warfare (countries, non-state ideologues), global mafias/drug cartels; The economics of digital economy has features, not seen in Goods and services, or even in the financial economy, such as economies of scope, network externalities and psychological control & information warfare. Regulatory rules must ensure against these dangers and the development of sectoral oligopolies and service monopolies.

Public goods infrastructure for digital economy: Bharat Net (fibre optic system connecting every village of India) will play a critical role in equality of opportunity and inclusive growth. Private mobile footprint will soon cover 99% of land and exclusive economic zone and provide digital data services to mobile workers & consumers outside their habitation and fixed workplaces. The government will develop the soft infra based on open architecture (like India stack, Fin Stack, UPI, Health Stack, Knowledge stack), to provide a level playing field to millions of Indian tech entrepreneurs.

There must be a Public information centre in every village in this country, connected through a fibre optic backbone reaching every district in the country, so that every citizen has web-based access to National and international information bases, data, and knowledge bases. These centres will provide universal digital access to government services and health & education services on a fair and equitable basis. They will also provide connectivity to business and individuals on a commercial basis.

6.1 Governance

We envision India in 2050 in which the memories of the license-quota-permit raj of the 1960s and 1970s have been wiped clean. A bureaucracy, which was once notorious, obstructionist and worse, among the large countries, has replaced Singapore as a model of uncorruptible, efficient and helpful bureaucracy. The tax bureaucracy, which was once considered the worst among the bad will run the simplest, most rational system in the world, in which few need help from their CA or lawyer, to file tax returns. The direct tax code will have been reduced from a tome to a 20-page paper, which will be studied and emulated. The GST will be so simple efficient, that it will be studied in management courses in US ivy league

colleges. The customs tariff will be a uniform tariff of 5% among the lowest in the World. Even agriculture will have become so efficient, that it will not need special protection in the form of QRs and higher tariff rates. India will be among the top 10 in terms of Ease of Regulatory compliance, Ease of doing business and ease of living.

6.1.1 Government Stack

A comprehensive digitization of all rules & regulations, forms compliance procedures will greatly facilitate this process. This will integrate compliance and eliminate duplicate filing of the same information to different levels of government and different departments of government and different regulators. Random post-filing audit of regulations. Incentive compatible, integrated tax-welfare system (NIT). Digitization of laws, judicial services, judgements, arrest, prosecution and conviction data bases, prison population is an important element of institutional reform. The digitization of governance will have to be complemented by modern management, processes re-engineering, development of technical capabilities & acquisition of new equipment,²² covering; (a) Laws, Courts, Judiciary, (b) Policing, Investigation, Prosecution. (c) Prisons.

6.2 Welfare Stack

There are 250 to 350 different State & Central Govt programs at the district level, designed to help the poor and needy in different ways for different problems, yet many do not get the benefit of even one program while many others get away with multiple undeserved benefits. A *Welfare Stack* would put all these programs on a digital platform where everyone can see what these programs are and for who! An Aadhar ID linked, virtual Integrated Smart Card (VISC), layered on top of the base, would show the eligibility of each person for all the programs in the Stack.²³

The third layer would be the creation of a *Direct cash transfer* system (*DCT*), which can deliver cash in the hands (mobile wallet) of any citizen hurt by an epidemic, natural or manmade disaster as soon as those affected by the disaster have been identified.

²² E.g., DNA labs, finger printing, recording of statements.

²³ Including free schooling and health services provided in State govt primary, secondary & tertiary health centers and primary and secondary schools. To ensure the security of the Aadhar number and the uniqueness of the VISC/Welfare Identification number of the person, it will be linked to the Aadhar number in the data base.

The fourth layer would be an incentive compatible, *Net income transfer* system (*NIT*) integrated with the personal income tax system in which adults with an income below a certain threshold, receive a payment based on how far they are below this threshold. Such a *negative income tax* could start at an income of 1 lakh with 10% and increase to 20% below Rs 75,000 and 30% below 50,000.²⁴ The Aadhar provides a unique identifier to bring all adult citizens into this integrated NIT system, though a PAN/WIN (welfare identification number) could be used in public domain to protect safety & security of Aadhar.

6.3 Public Health Stack

India will pioneer the development of a Health Stack and a Public Health Stack. A health stack is a unique innovation for public private cooperation, in which government funds the design and development of a public good infrastructure for digital health, on which the whole range of health, medicine and medical equipment can over lay their products and services. Telemedicine will play a central role in providing quality health services to India's huge population. This will include,

- (a) Direct to Patient diagnosis & medicine delivery,
- (b) Knowledge resources for public & private doctors/clinics/hospitals,
- (c) Direct to patient (DTP) diagnostic & prescription services and delivery of medicines.
- (d) Hybrid Primary health centres (pathology, X-Ray, ultrasound), Secondary Health Centres (CT, minor surgery), Tertiary Health Centres (MRI, major surgery, rare disease).

The Pandemic has also alerted us to the need for a *Public health Stack*, which will mirror the health stack or be a specialized sub-set of it, focusing on Public health issues. The Epidemics Act of 1987 also needs review and overhaul to deal with future epidemics. The disaster management act is more suited to disasters which cause physical damage to humans and property.

6.4 Community Interface & Social Stack

Social Media is playing an increasing role in shaping society in terms of both short-term socio-political discourse and expression of conflict and in terms of long term mental and social

²⁴ Like the income tax, the income transfer would be individual, not household/family based. Eventually there could be a bonus payment for up to two minor children, added to the mothers' net income transfer.

development. India democratic society must not only regulate this medium but also provide the infrastructure for a healthy positively directed alternative to a commercial, profit driven media. We envision an Indian developed, multicultural, multilingual, multireligious, gender neutral and child safe Social Stack, based on the best of Indian community and family values. A social media or community media stack, which uses Aadhar ID based system for secure online interaction as well as Hybrid social spaces where social groups can meet offline.²⁵ Private sector can use the SM stack to build layers of social media and physical spaces for different age groups (minors, youths, adults, aged) and interests (intellectual, emotional, social, spiritual/moral, physical, mental).

6.5 Digital Regulation

The economics of digital regulations has revealed four important elements relevant for regulation of the digital economy. (1) Economies and Scale and scope are much deeper and broader than in the bricks and mortar economy. (2) Network externalities are unique to telecommunication systems and the digital economy. (3) Data is a unique natural resource, (4) Algorithms can give the illusion of being neutral and more objective than human beings, but can be as much if not more biased, while being undetectable. These four elements raise the possibility of multi-product, multi-service monopolies, stretching over multiple countries. Independent professional regulation is critical to ensuring competitive markets, without stifling innovation.

6.6 Business & Finance

6.6.1 Digital Employment Exchange

Informal labour markets work through personal contacts and connections. A modern economy requires a better matching of job requirements with education and skills of potential labour force. Private intermediaries are good at matching upper-level jobs to skilled personnel. There are a range of jobs where a digital employment exchange is a necessary condition for equality of opportunity, particularly for tribal, Dalits and other social groups, who are not part of legacy networks.

Such groups are particularly handicapped if they are subject to oppressive social traditions in villages and rural areas. Social constraints have worked even more strongly against female employment as rural women have withdrawn from labour force as family income increases.

²⁵ Non-resident foreigners, who are ineligible for Aadhar could be issued a unique ID number (UIDg) based on a recognized passport or other recognized international document.

Even educated and trained urban women have low labour force participation rates compared to urban males. Propagation & proliferation of the “work from home” digital economy can help them get around discriminatory social norms, practices & biases facilitating their entry into the labour force. It will also improve the incentive of discriminated groups to acquire job skills, digitally. Training/skilling will be key to Increasing long term labour force participation rates (LFPR) of rural groups. A digital employment exchange will help gain access. Further reform of labour laws, rules, and procedures to facilitate work from home will also be necessary.

6.6.2 Universal Financial Interface or Fin stack

We envision an India as a leading provider of FinTech, including Mobile wallets, mobile accounts, deposit & loans, Insurance & pensions, Financial & wealth management services, Investment advisory. Regulations must balance the need to stimulate innovation and protecting the interests of less informed savers. Publicly driven innovations like *Universal Financial Interface* (UFI) and *Financial stack*, will accelerate innovation by promoting competition.

6.6.3 Digital Market Interface or Market stack

The central govt has created a marketplace for purchase of goods and services by Central and State Govts and their subsidiary organization and Public Sector Enterprises. It could expand and extend these digital markets to create a Universal Market Interface (UMI) or Market stack for e-commerce. The EGOM could an upper level on top of the market stack, built on the foundation of a UMI. Such a platform can be viewed as public goods infrastructure (open access, neutral), on which MSMEs, farmers and service providers from the remotest corners of the country can market their products competitively. Geographically branded products will be supplied to nation & world.

Another sub-set of the digital marketplace would be a marketplace for social services, including online management & business services (Front, Middle and Back office), Professional services (fintech, architecture, data analytics), Social services (health/medical, education/skilling, welfare) and technical services.

7. Green Economy

We envision a green economy in 2050, in which economic development during the next thirty years, creates energy efficient, carbon neutral and low environmental polluting designs for everything. We also envision the Developed countries training, financing a generation of Indian youth to create environmentally efficient designs and to implement through thousands of start-

ups. These start-ups will not only implement these designs in India, but also propagate them to the rest of the world.

The “throw away” consumer economy that developed with mass consumption will gradually move back to one in which consumer product design is more modular. Products will have sub-systems which can be replaced when they become technologically obsolete and those which will continue to be used because they are very carbon intensive or energy intensive to produce & replace. The repair and maintenance services which play an especially important role in poor countries but have virtually dis-appeared from the rich countries, will make a comeback. India will become a leader in modular green product design, and they will attain economies of scale and scope, in India’s vast rural market.

The primary incentive for promoting a low carbon, less polluting economy will be a new Carbon Tax, separate from the three core taxes (income tax, GST and customs tariffs) which will replace the excises on petrol, diesel and other polluting substance.²⁶ Conceptually this will provide the funding for promoting de-carbonization, pollution reduction and energy efficiency programs, as well as rural digital connectivity, which will help substitute physical movement (transport) with digital interaction. An independent professional environmental protection agency will be set up to calculate the carbon content and polluting load of different goods, based on which the tax will be imposed.

7.1 Transport

Mass transit systems, Electric Vehicles (EVs), Substitution of physical transport by online transaction, service delivery; business (work from home, work from anywhere in country/world), personal services, such as social media (SM), entertainment, digital shopping & ordering, government, education, health. Innovation in production, storage and use of hydrogen will bring down the cost of using it in industry & transport in which grid electricity cannot be used.

7.2 Energy

The capital cost of renewable energy (Solar, Wind, sea wave) is now about half that of fossil fuel plants, which in turn is about half of nuclear plants, The variable cost of renewables is of course a fraction of fossil fuels and nuclear, but it requires large storage, to even out the daily and seasonal fluctuations in availability of sunshine, wind & waves, so the delivered cost is

²⁶ Once the carbon tax is imposed, normal GST will include petrol and diesel at the single standard GST rate applicable to 75-85% of goods and services.

higher, but still cheaper than fossil fuel plants. Further, decentralized production and use of solar energy in villages and remote hamlets, will reduce electricity transmission and distribution losses. Solar industry, including repair and maintenance services will become an important industry in the sunny, water stressed rural areas of India, having poor land quality.

7.3 Urbanization

Urban land-use, design of work, residence, social activity; Urban gardens & greenery. “Natural Cities” to accommodate structural migration from rural areas to urban agglomerations. Semi-urban areas & small towns located on, or near rivers, will be transformed into Natural cities of 1.5 to 2 million population.

7.4 Housing

Design of mass housing, offices and factories and the construction industry has developed and propagated from an era in which there was little consideration for local climate or geography. As India is virtually at the start of the journey for mass housing and commerce, it can pioneer design based on local materials and climate/weather conditions, married to modern technology such as Solar roof tops, smart sensors & energy controls.

7.5 Recycling

Recycling of Water, sewage, physical waste; national grids for each. Cleaning of all rivers and water way (including those on which “Natural cities” can be built), to make them suitable for drawing drinking water. Chemical units generating polluting liquid waste to be in estates, where norms can be strictly enforced, and common water treatment facilities set up for efficient processing. Waste collection, processing, and recycling will become a significant industry, with e-markets for different types of waste. Consumer durables design will return to an era when it was repairable and re-usable.

7.6 Environmental Regulation

Environmental regulation has been heavily politicized and tied up in legal wrangling. A professional *Environmental Protection Agency* needs to be set up which collects data, tests hypothesis, and provides scientific analysis of benefits and costs of different regulatory choices. The mandate of this agency must be carefully defined. This will help ensure that administrative and judicial decisions are based on professional advice rather than speculation and motivated public campaigns.

7.7 Green Stack

India will build a Green Stack, on which all element of the green economy will be featured including markets for green designs, green products, and green services. Alternatively, it could be a sub-stack within the knowledge stack.

8. India as Third Pole

In economic there is the concept of “Duopoly with competitive fringe”, in which the two firms in the duopoly jointly set prices and competitive fringe are pure price takers, with no market power. We envisage a World in 2050 that can be described in 2035, as “*Bipolar World with Multipolar Rim*” and in 2050, as “*Tripolar World with Multipolar Rim.*”

In contrast to economic competition, there are four separate dimensions of inter-country competition: Geoeconomics, Technology, Military and Geopolitics. We envisage the World in 2035 will be a geopolitical version of this concept, with USA & China constituting the bipolarity which dominates other competitors in all four domains, and the “multipolar rim” consisting of 5-6 countries, having a high rank and influence in one or more domains. For instance, Japan, Germany, India, UK, France will be among the 6 largest economies; India, UK, France, and Russia are nuclear powers. Russia’s economy & general technological base is much weaker than that of Japan, Germany, UK, and France, but it has a large legacy/reservoir of defence technology.

8.1 Defence & Deterrence

India’s technological base and defence technology base is envisioned to rise rapidly over the next 15 years, to establish multilevel deterrence against aggression and foreign terrorism. The levels include border encroachment/acquisition and terrorist infiltration(L1), limited war in border region (L2), Deterrence of Restricted (military bases in border States) war (L3), Deterrence of Conventional war (L4), and Nuclear deterrence (L5). We envision a defence capital budget which will rise above 1% of GDP to make this financially feasible, a Defence R&D commission which will develop strategic technology (AI) and new weapons systems and a reformed higher defence management structure which will mould and organise human resources and weapons into cost-effective deterrence at each level. Remaining obstacles to private production, marketing and export of dual use products and defence systems will also need to be eliminated.

8.2 Bipolar World with Multipolar Rim

A “Bipolar World” with a Multipolar Rim will emerge by 2035. It will resemble the Bipolar post-war World to some degree, but most closely with respect to technology because of “technological decoupling.”. The multipolar rim will include Japan, UK, France, Russia, Germany, and India. The EU can also become an important member of the competitive Rim, because of geoeconomics strength and authority over economic, trade and technology policies of member States. It must, however, resolve the contradiction arising from the independent geo-strategic and geo-political role of France, Germany, and other large members of EU. Other large economies like Republic of Korea, Canada, Australia, and Taiwan will also play a role in technology and investment.

8.3 Tripolar World with Multipolar Rim

We envisage the emergence of a “Tripolar World with Multipolar Rim”, by 2050. India is projected to catch-up with China, by closing the per capita GDP gap that opened during the 30-year period, 1992-2021 (figure 1 & 2). Economic growth will generate the revenues needed to close the Strategic technology gap. One reason for the huge gap is the “open arms, closed eyes policy,” adopted by the developed countries towards the Peoples Republic of China, during 1980-2010. These countries can now play an important role in helping India close the technology gap, through equally generous partnerships.

Considerable progress will be made in developing an Indian private military industrial complex by 2035. Cooperation with free market economies with a large private defence sector like France, Israel, UK, and USA will play a key role. Development and production of “dual use technologies”, needed for the civilian and defence sectors, need to be jointly planned and coordinated to maximize Atman-Nirbhar. By 2050 India will have full-fledged private military industrial system which partners with the private military industrial US companies, on a near equal footing. India’s defence public-sector will continue to partner with country like Russia with much of defence production in its Public sector.

The efficiency and comprehensiveness of technological and digital firewalls and extent of economic decoupling, between, (a) The Peoples Republic of China & its allies & partners, and (b) The USA & its allies and partners, will determine whether USA or China is more powerful (economy, military, technological) in 2050. China has grown much faster than any expert predicted, because none understood the nature and import of the asymmetric, economic, trade, technology, and investment policies it adopted. These non-transparent policies allowed PRC to extract rents from rest of the world and thus contributed about 1/3rd of the growth during 1980-

2010. These rents can be eliminated by technological decoupling and the creation of viable competition for PRC's export monopolies through supply chain diversification. India can catch up faster, if the labour-intensive supply chains and human skill intensive value chains, are incentivized to move to India by the USA & its developed allies.

8.4 Diplomacy

India's National interest is being clearly defined and its National security and economic growth goals more clearly integrated into Indian Diplomacy. This will continue to improve and be better translated into foreign policy and actions. Every country has multiple goals, some of which translate into actions over time and geography that appear inconsistent or even contradictory. Values are important for India, but its preferable to pursue them quietly and persistently outside the media glare, then to hypocritically criticize enemies and adversaries, while tacitly condoning more serious violations of values by allies. National interest must take precedence, but philosophical values should not be abandoned or forgotten.

The role of the QUAD in Indian Geopolitics and Geo-economics is envisioned to rise during this decade, plateau in next decade, and decline in the third. With Africa and Middle East's share of world population rising, the importance of Indian Ocean will increase rapidly during the next decade. India's historical ties and legacy must be enhanced and developed to promote peaceful development of this expanded IOR region.

India cannot match PRC's financial advantage in geo-economics and geo-politics. We must use one critical advantage which we have. The Chinese communist party has wiped out Islam from PRC and committed genocide against the Uyghur. In contrast, India is among the handful of countries in which the percent of Muslims in total population has risen decade after decade for 70 years. This argument can and must be used when we go head-to-head with China in the 50 Muslim countries (including Indonesia, Malaysia, Bangladesh, Pakistan, Afghanistan, Nigeria). The narrative must also be addressed to Muslim populations in Christian countries.²⁷

9. Policy Vision

Accelerating economic growth and sustaining it for three decades is the key to achieving the vision presented above. Faster growth is the source of higher revenues, which will fund the development of hard and soft infrastructure by the Government and provide the resources to

²⁷ The pendulum of religious division in India has moved from the far left to the right, but we envision it settling back to the center in a decade.

create a Welfare system that takes care of the less advantaged. A competitive market economy in which monopoly infrastructure segments, and services characterised by asymmetric information or moral hazard, are rationally regulated, is a necessary condition for sustained fast growth. Government provision of public goods and an environment for competitive entrepreneurship and innovation will help sustain growth.

9.1 Controls, Regulations & Regulators

During the first 30 years of independence India developed a jungle of controls, restrictions, regulations, and procedure, which came to be known as the licence, permit quota Raj. There has been considerable de-control and liberalization since the 1980s, but its residue still exists in every law, rule, regulation, and procedure, relating to every subject and policy domain. The control mentality is deeply embedded in the public mind, and it will require Herculean dedication and effort to root it out. This must be complemented by economically rational regulations and well qualified, independent, professional regulators.

A modernised Indian economy requires 21st century regulations and regulatory systems, run by technically qualified professional regulators.²⁸ These relate to public goods infrastructure, financial markets (SEBI) and fiduciary financial institutions (RBI), social services like Education and Health (FDA) characterised by asymmetric information & moral hazard, and specific subjects affecting public safety (pollution-EPA, fire hazards, mines) & security.²⁹ Government must keep deepening and broadening the recent reforms in Education, Medical education and Science, to develop better regulators for these complex sectors.

Infrastructure unbundling is required to separate competitive parts like electricity production or running train service, and those like electricity distribution & transmission, docks, runways & rail lines & signalling systems, which need regulation. Production and intra-city electricity distribution is still monopolised by State electricity boards and must be made competitive. So, must passenger and cargo train services and cargo handling, fuel supply and other services at ports, airports & railway stations. Within the non-competitive parts, areas like intra-city electricity & piped gas distributions, must be subject to benchmark competition, and inter-city

²⁸ Not bureaucrats and politicians who are clueless about academic economics, market reality, entrepreneurial risk taking and complexity of managerial decision making. Regulations need to be commented and criticized by such professionals as well as consumers/users/buyers before they are promulgated.

²⁹ As proposed in earlier section, we must set up technically proficient, Food and Drugs Administration (FDA), an Environmental Protection agency (EPA) and Center for Disease Control (CDC), modeled on US and/or EU institutions. For good school regulators we could look to Scandinavia and other European countries.

transmission lines (electricity, pipelines, rail lines, fibre-optic cables), must be run on public carrier principle with regulated open access. Turnaround time for cargo at ports, airports, and stations of the dedicated freight corridors is reduced to that in competitor countries.

Financial markets, both domestic and international, need regulation to rationally balance the benefits of innovation and the risks of macro instability & crisis. Much of the interest differential between India and global financial markets, is due to the relative lack of competition, and higher fiscal deficits. Fiduciary financial institutions need to be regulated to protect mass of investors/depositors without destroying financial incentives & efficiency.

The internet and web-based services, such as e-commerce and social media, are new areas whose economics and social impact is still not fully understood. There is an opportunity for India to pioneer rational, socially beneficial, regulations based on emerging knowledge.

9.2 Taxation

Corporate taxes have been reformed and plans for ease of tax filing and compliance have been initiated but much remains to be done. The Goods and services tax was a landmark constitutional change. But too much of the legacy laws, rules, and procedures that it was supposed to replace crept into the new law, rules, and rates. Massive simplification of the rules and procedures can be achieved if three-fourths ($3/4^{\text{th}}$) of goods and services are subject to a uniform 15% rate, one-tenth to one-eighth (10-15%) are exempt (0%) food, medicines & medical services and education services, to ensure equity.³⁰ Revenue neutrality requires that cars, tobacco & products and luxury hotels, be subject to a higher rate of 25%.³¹ If Cess is extended it must be restricted to a few product categories like tobacco & products, betel nut & luxury cars, otherwise they are undistinguishable from multiple GST rates.

The Income tax Act (1961) contains 23 chapters, 298 sections and fourteen schedules in 90 pages. Further complexity arises from numerous sub-sections & sub-sub sections accumulated over 60 years of clarifications and amendments of the Act. There are 129 income tax rules,

³⁰ Only exports must be zero rated, other wise the GST system rapidly increases in complexity. The uniform ate structure will also remove the discrimination against man made and artificial fibers, fabrics and cloth which has stopped India from becoming a major exporter of garments made from no-cotton and mixed fabrics.

³¹ With this rate structure, 99% of MSMEs can use an excel spread sheet to store daily/weekly/ monthly & file returns; Total value of inputs bought from each supplier and total value of output sold to each buyer would have to be separated by 15% and 25%. Monitoring becomes equally easy as a single sheet can represent (GSTN) rows of sellers and columns of buyers, with each cell representing total value of items bought during month/quarter/year (at 15%), with another sheet for those who sell and buy items at 25%.

with several sub-rules and three appendices, contained in 47 pages. The complexity embedded in the Direct tax Acts, gives rise to massive litigation (1.37 lakh cases under litigation in March 2017), with 85% by the direct taxes department, and repeated unsuccessful appeals, having a success rate of 30%. A new Direct tax code, incorporating economic logic, global best practice and simplicity of language has been devised. It consists of 16 chapters, 285 sections and eighteen schedules contained in 254 pages (including 16-page table of contents). It is essential for reducing the time and financial costs of compliance for MSMEs and dramatically reducing the litigation choking Indian courts.

As per Team lease data, there are 54 Central acts, 945 compliances and 254 filings/intimations related to taxation and finance.³² The Indian tax bureaucracy is notorious among free market, open democracies with the worst reputation among potential FDI investors. It fares very badly relative to our competitor countries. Simplification laws and rate structure will make it much easier to digitize compliance and monitoring systems and run them smoothly and efficiently to the benefit of both taxpayers and govt's tax revenue collection.

9.3 Ease of Regulatory Compliance: Labour

Reform of the labour code must be taken to its logical conclusion by eliminating controls and improving Ease of Regulatory Compliance (EoRC). This requires reducing and integrating as many rules and regulations as possible, and simplifying compliance procedures, through digital filing, private certification, and random audit system.³³ This process must also proceed progressively from Central regulations to Union Territories (UT) regulations with many elements of State regulations, to State regulations.³⁴

There are also 23,655 central compliances and 1,893 filings/intimations on subjects other than labour, taxation, and finance, which need to be dramatically slashed. This should be followed by making a model regulations to replace 35,289 State compliances and 687 intimations. The Central government can test and demonstrate the model State rules by applying them in Union territories.

³² There are also 62 State acts, 2339 compliances and 736 filings/intimations, which must be addressed.

³³ Details of legal changes at <https://prsindia.org/billtrack/overview-of-labour-law-reforms>. Team lease study estimates that there were 937 compliances and 135 filings and intimations under the central labor laws. These should be reduced by 90%.

³⁴ As per Team lease study, States have 423 labor-related Acts, 31,605 compliances and 2,913 related filings. Most of these could be collapsed into the four central labor codes and their compliances.

9.4 Capital Markets

Capital costs are too high in India, relative to its competitor countries and to global financial markets. The competitor countries of Asia have been famous for low corporate tax rates and fiscal surplus. We have reduced corporate tax rates to competitive levels and must eliminate fiscal deficits by 2035. The announced policy of privatization of (all but four) Public sector banks and several Govt General Insurance companies, and reduction of govt equity holding in LIC needs implementation over next five years. For the four large Public sector banks remaining under Govt control, the Bank Nationalization Act needs to be replaced by the Companies Act, to improve their management & regulation. These policies will increase competition and help reduce interest differential. Phased introduction of more risk management products and decontrol of investment in them by banks, will improve depth. Dollar denominated bond markets need to be created to compete with ECB. Bond markets, commodity markets, foreign exchange markets needs and markets for risk management products are currently either very short term or lack depth. These need to be opened to foreign investment. These measures will reduce interest differential and pave the way for complete capital account convertibility by 2035.

9.5 Supply Chain Policy

India needs a Global Supply chain policy to meet the challenges and opportunities thrown up by post-financial crises (2008) de-globalization and post-Pandemic (COVID) opportunities: All established exporters must be seamlessly linked digitally to GST, customs, designated bank, and RBI, so that foreign exchange payments/receipts, exports and import, export linked credit, GST set-off/refund, import tariff set-off are recorded instantaneously and available/visible to all. This can ensure complete zero rating of exports & 8-hour GST offset, and full credit provision for export production at international interest rates.

The import tariffs critical to both MNC supply chains and domestic MSMEs are those on raw materials, components, parts, intermediate goods, and sub-systems. A single uniform ad-valorem tariff rate of 10% on all minerals, oils, manufactured goods will lead to rationalization and increased competitiveness.³⁵ The rate can be gradually reduced to 5%.

Around 10% of manufactured goods can have higher rates for a limited duration, to promote import substitution of goods monopolised by China. The extra protection must be linked to

³⁵ Textile sector has dozens of specific rates which are of source of complexity and corruption, and which provide a disincentive to honest, genuine exporters of textiles. Raw cotton, silk and other plant materials used in industry should also have the same rate, but this may need to be phased in slowly as they currently have much higher rates.

attainment of minimum efficient scale under the production linked incentive (PLI) scheme, so that such plants get a window of three years to iron out glitches in their new plants and improve their procurement & marketing systems, to match higher production.

Ad hoc changes in agricultural import-export controls, quantity restrictions (QRs), import tariffs and export duties, increase the risk of developing production for export markets and import substitution of niche products. We need a transparent, virtually automatic system of import tariffs and export duties, linked to the difference between international and domestic prices. Controls and QRs must be replaced by such a system to reduce policy and regulatory risk for farmers and Agri-entrepreneurs and promote export of agriculture and allied products.

9.6 Urban Development

Urbanization and Urban development will be one of the drivers of growth in the next few decades. The Sewage and drainage systems of all cities and towns will need to be modernised and a system of underground conduits built in cities, to carry utilities such as electricity, piped gas, and fibre optics cables. Mass transit systems will have to be built in cities and large towns. Despite the Nagar palika Act, the planning, development and running of cities is highly fragmented among State government agencies and multiple city administration Modernization and development of cities and towns requires a single political-administrative authority, with all elements of town planning & policy, and town specific taxation (e.g., land & real estate) & expenditure under this authority. The Nagar palika and Panchayati Raj Acts must be amended to ensure this.

9.7 Land & Real Estate

Efficient land and real estate markets require accurate records of land ownership. The lack of such records limits the contribution that real estate can play in raising personal income and GDP growth. The digital India Land Records modernization program can play an important role in modernization of the industry, along with Cadastral surveys. Urban land-use planning must be modernised to provide greater flexibility in land use change, institutional structures for participation of all stake holders and speedier procedures for change in land use. Rules, procedures and systems for renting, leasing, sale and purchase of land and real estate must be made smoother and corruption free. India's Ease of Doing indicators have improved in every sub-category except those related to real estate regulations, procedures, and speed of litigation, largely because it is a State subject. Central government can take the initiative in creating and implementing model legislation & systems and implementing them in Union territories and Special export zones under its control.

Rural land markets remain the most legally controlled in the World. An owner of farmland cannot lease degraded land to a company for farming. A farmer cannot lease his land for setting up an industry, shop, office, or apartment building, without going through endless bureaucratic hoops. Over the next 10 years, the sale, purchase, lease, and rental of rural land must be decontrolled. Land use rules and procedures must be greatly simplified to allow quick conversion of land from use for agriculture, to residential, commercial, or industrial purpose and back. A land pooling law is critical for equitable sharing of benefits and cost of building infrastructure and industrial estates which are critical to structural transformation. Panchayats must be empowered to build village (“Rurban”) infrastructure through public-private partnership and to levy charges to recover operational costs.

9.8 Water & Irrigation

Groundwater resources are low and depleting fast in North-West India (Gujrat, Rajasthan, Haryana, Punjab).³⁶ Many areas of the Deccan plateau between the Western and eastern ghats are water stressed. Water use by industry, commerce and water intensive crops like sugar, rice and wheat must be charged to reflect its scarcity value in water stressed regions of the country. The funds generated can be used for water harvesting, restoration of water bodies, and recharge of ground water.

9.9 Criminal Justice System

An efficient market economy is built on the rule of law. Citizens require an environment secure and safe from criminals to innovate and take entrepreneurial risk. The abysmal 10-15% conviction rate for heinous crimes (murder, rape & kidnapping) can only be improved substantially by comprehensive, end to end reform of the criminal justice system. This requires reform of laws, rules and procedures, police & prosecution reform, judicial reform, reform of courts and prison management systems and of the political system to minimise the possibility of criminals becoming legislators or ministers.

10. Summary and Conclusion

This paper outlines a vision of a developed free market economy, an open, plural democracy, in which every citizen is assured of equality of opportunity and provided the support to develop her full potential to the benefit all. The paper analyses the demographic, digital and greening

³⁶ Map <https://www.wri.org/insights/nasa-satellite-data-help-show-where-groundwater-and-where-it-isnt> , “Long-term groundwater variation in North-West India from satellite gravity measurement,” Cheng, Li, Zhang & Ni, May 2014, <https://www.sciencedirect.com/science/article/pii/S0921818114000526> .

trends in the global economy and society to trace a path for India's comparative advantage, over the next 30 years. It then sketches out an economic vision in terms of average income of the citizens and puts in the perspective of the World economy. The geopolitical & strategic implications of this growth are addressed towards the end of the paper.

Structural transformation of the economy entails a reduction of the labour force engaged in agriculture from half to 15-20% of total labour force. The rest will be employed more productively in rural services and industry located in currently rural areas. With less underemployment and greater labour productivity in Agriculture will improve, leading to increased demand for rural services & industrial products. Its important to ensure that a substantial share of this increased demand is met by service providers and production located in rural geographies. Physical & digital connectivity, availability quality education and skills, and the freedom to use land for non-agricultural purpose, will play a critical role in this transformation.

We envision a key role for the digital eco-system in upgrading human resources, structural change, and the transformation of the Indian economy from a lower middle income one to a high income one. The digital economy will have two elements, one a digital of architecture of a dozen stacks and sub-stacks and second a modular, multi-layered system of telemedicine, and e-learning, tele-education & e-skilling' The stacks include a knowledge stack with four sub-stacks focused on education, rural & agricultural information, R&D and marketing of high-tech skills, a Health stack with a sub-stack focused on Public health, a Welfare Stack, and a Social media stack, along with the broader and deeper fin-stacks and e-market stacks. The stacks are designed to promote competition in the digital economy, by providing a level platform, with transparent, fair and credible rules to new entrepreneurs & MSMEs. The stacks will be accessible to every resident of India through a national fibre optic cable network which reaches every block, tehsil & taluk. The telemedicine and e-education systems are envisioned as hybrid ones that leverage the scalability of web delivery with personal human touch critical for motivation and social learning. They will also combine government and private service providers to complement the strengths and supplement the weakness of each. The architecture is envisioned to empower citizens, promote structural transformation of the labour force, and drive inclusive growth.

The green economy's role is envisioned to grow over time in urbanization, housing, and transport and to contribute to greening of growth. A green sub-stack will be built to support the propagation of green designs, services, goods, and systems.

Policies and programs causally related to these issues such as welfare reform, are also discussed. These include the creation of a macroeconomic, and sectoral environment in which private initiative can thrive and take the entire economy and society forward. The last chapter brings together the policy and institutional reforms essential for accelerating growth and sustaining fast growth for three decades.

The paper estimates that the India-China per capita gap has bottomed out in 2020-21 and the gap will start to close from 2021-22. With India's population likely to be as large as China's, the relative rates of growth of per capita income will determine how fast the gap will close. If the free open market democracies, reject the asymmetric economic, trade, technology and FDI policies of the Peoples Republic of China and diversify their Supply chains out of the PRC and into India and other free open market democracies, they can collectively reduce the risk of disruption and exploitation. This will allow India to reform faster, and to transform its economy more comprehensively, to create a better, more equal economy and society for its 1.64 billion citizens by 2050. It will also be in a better position to provide more support and help to the low income and lower middle-income countries.

11. Postscript (2022)

What is the implication of all this for the Rest of the World? How will India's rise to third rank in the comity of nations benefit the World? These implications can be summarised as follows:

11.1 Diversification of Manufactured Imports

In their quest for just in time efficiency, and cost reduction, the votaries of globalisation, forgot the basic lesson of portfolio diversification and industrial structure (monopoly). The implications become apparent during the pandemic. With the result that China, the "Factory of the World's", share of world exports (2020) of textiles is 47%, Electronic data processing & office equipment is 40%, Telecommunication equipment is 33% and clothing is 32%. Within the rest of manufacturing (machinery, transport equipment, chemicals, miscellaneous) it has equally high shares of many exports. Diversification of merchandise trade is now accepted by the votaries of globalization, and countries like Vietnam, Thailand, India and Mexico have already benefited from the fall in China's share of imports since January 2018.³⁷ In the long-term India is the only country with the labour, land, skills and size, which can provide an alternative for sustained, substantive, diversification of manufactured exports over the next few decades It will therefore play a critical role in de-risking US, EU & UK value chains..

³⁷ According to a Morgan Stanly study (march 2023) , between January 2018 and October 2022, China's share of US imports has declined by -4.32%, with gain accruing to Vietnam(+2.07%), Thailand (+0.57%), India(+0.55%), Mexico(+0.33%) and Malaysia(+0.14%).Indonesia is attracting natural resource(minerals) related investment, while Mexico benefits from closeness to US market, Vietnam & Thailand from closeness to Chinese suppliers. Malaysia was among the first countries in Asia to attract US MNCs.

11.2 Contribution to global demand

India, UK & USA have had a balance of trade deficit, which adds to World demand for goods and services, while China, Germany and KSA had surplus on trade account since the 1990s. The former set add to the demand in the Rest of the World, while the latter have a depressing effect on world demand. Since the Global financial crisis (2008) the global balance has shifted from excess demand to excess supply. India's contribution to Global demand will grow with its economy.

11.3 Supply of semi-skilled & skilled labour

Given the shift in global demography, India will become a major supplier of semi-skilled labour to the developed countries in the next 10-15 years, and a major supplier of skilled labour to the middle & high-income countries in the next 20-25 years.

11.4 Unbundling & Globalization of Services

Global demographic changes and the ageing of population in many high income (HIC) and upper middle-income countries (UMIC), will add to the momentum generated by the Pandemic to the Work from Home & work from anywhere movement. India will become the Service Centre to the World, including for R&D and business services. India's share of World business service exports is currently about 2.1%. Even if this quadruples by 2050, it will only be 8.4% of World business services exports. India may, however, have a larger share of new online service exports, like medical services and Government services, given the projected aging & decline of working age population in many HICs & UMICs. As India's share of total service exports is about 4.2%, a quadrupling of total share would be 17% in 2050.

11.5 Digital Economy

USA is the pioneer in the development of digital companies, while the European Union has led the development of futuristic regulations for the digital economy. India has pioneered the development of Digital Public goods and Quasi-public goods and services. India also has the additional advantage of a growing semi-skilled and skilled digital work force, which will power the global digital economy, both through online availability and GVCs and R&D centres in India.

11.6 Voice of Global South

Between half to two-thirds of countries are small in terms of population or GDP, and do not have a voice in multilateral Global governance institutions (Global South). India with its millennial history of trade relations, solidarity with de-colonization movements and economic co-operation with developing countries, and the largest democracy with no history of colonialism or neo-colonialism, will be in the best position to represent these countries in the global governance system.

11.7 Security Provider in IOR

The Indian Ocean region (IOR) stretches from Gulf of Iran, Suez canal and Africa in the West, to Malacca Straits, Indonesia and Australia on the East, and India in the North to Antarctic in the South. India is best positioned to act as a "net security provider" in the region and to ensure

equal rights of access to all, within and outside this region. India's democratic political system will be reflected in its foreign policy, furthering the spiritual philosophy of one planet, one world, one family, one future.

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