EGROW

Foundation for Economic Growth and Welfare

Draft Project report on

India Vision 2036-37 – A Macro econometric Approach

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1. *Growth* - Prof. Surender Kumar, DSE
2. *Growth* - Prof. D. Maiti, DSE, Sh. Naveen Kumar, DSE, Dr. Debajit Jha, OP Jindal University and Soumyadipta Sarkar, Gallagher Re
3. *Agriculture* - Prof. Raka Saxena and Prof. S.J Balaji, NIAP-ICAR and Prof. Ashok Vishandass, Egrow Foundation
4. *Industry* - Prof. Suresh Babu, IIT-M
5. *Fiscal* - Prof. Gayithri and Dr. Ramanjini, ISEC Bangalore
6. *Defence* - Lt. Gen P S Rajeshwar (Retd)
7. *Urbanisation* - Prof. Amitabh Kundu, JNU and P.C Mohanan, former member of National Statistical Commission
8. *Public Enterprises* - Prof. Ramesh G., IIM-B

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India Vision 2036-37 – A Macro econometric Approach - Draft[2]

I. Introduction

India would be completing 90 years of independence in 2036-37. In its journey in the last 75 years, from gaining independence in 1947 to 2022, India's growth path has followed an interesting pattern. The country had followed a mixed ideology for the first few decades under centralized planning and by 1991, decided to undertake significant reforms and open the domestic market to global economy. Since 1991, reforms in the financial and external sector as well as in industrial policy have yielded positive results. Consequently, with increased opportunities and competition, the growth rate increased substantially as well as the investment rate. The economy is robust and withstood the onslaught of the Asian crisis and the global financial crisis.[3] The second-generation reforms in agriculture sector and labour market are being initiated which are also expected to lead India into a higher growth trajectory.

This study aims to scientifically attempt a gaze into the upcoming 15 years of India's growth trajectory. In the past, since the Second Five Year Plan, India has been making projections for growth rates, based on certain econometric models. These were generally short-term models, making projections for 5 years, and examining the demand and supply side of the economy, taking into account select sectors and variables. The long run growth projections have generally not been attempted in policy making, both domestic and globally. To make long term projections, India would probably need to examine the growth theory, considering labour, capital and technology.

The objectives of the current study are:

i. To develop scenarios for making projections of various macro-economic indicators,
ii. To make projections of key sector-wise and aggregate economic indicators for years up to 2036-37, and
iii. To project the Indian Economy in 2036-37.

[2] The authors would like to acknowledge the comments and observations in the webinar held on March 8 and 9, 2022 with the officials of NITI. The comments received from NITI on the earlier draft have helped immensely in improving the contents of the revised study.

[3] Reddy (1998) and GOI (2011)

This exercise of projections for the next 15 years was attempted in the following manner - select subject matter experts were invited to offer their analysis in areas of real sector (agriculture and industry), fiscal, urbanization, demography, public enterprises and growth projections for the overall economy; and in-house analysis, mainly using linear projections, was attempted in the EGROW Foundation for the external sector and few other sectors.

The study is organised in 11 sections starting with the introduction followed by Section II, which presents a brief explanation about the methodology used in the study. The specific studies by experts have been consolidated in this report starting from the real sector, which is presented in Section III, covering overall growth in select parameters for agriculture, industry, health, education and demographics. Fiscal sector is covered in Section IV, which covers revenue receipts, expenditure and liabilities. The issue of fiscal council is also covered in this section. Section V covers the external sector including merchandise trade, services exports, preferential trade agreements, current account balance, foreign exchange reserves and internationalisation of the Rupee followed by Section VI, which covers financial sector and includes banking and non-banking financial services. Section VII incorporates the defence sector and covers the geostrategic environment, defence budget, defence capability development, R&D and indigenous defence industry, and strategy and policy. Urbanisation is discussed in Section VIII, public sector in Section IX and tourism in section X. Finally in Section XI, a conclusion is presented followed by the Annexures. Review of Literature has been presented in Annexure XII.11.

II. Research Methodology

The study is aimed at making projections for the year 2036-37 under different scenarios based on data for 1990-91 to 2019-20.[4] For the aggregate Report, three scenarios have been considered – Baseline, Aspirational and Pessimistic. In view of the long duration of forecasts, various methodologies were examined from the existing literature for projections of macroeconomic variables.

Furthermore, taking into account the long-term growth drivers of various sectors and projection of other variables, analysis of various macro econometric models of the Indian economy was attempted by subject matter experts using a combination of the methodologies, where choice

[4] The year 2020-21 was excluded because of covid.

of specific methodology was guided by availability of data and the statistical attributes. Following is the list of special papers written by subject matter experts (Table II.1).

Table II.1: Special Papers written for EGROW Foundation for the report

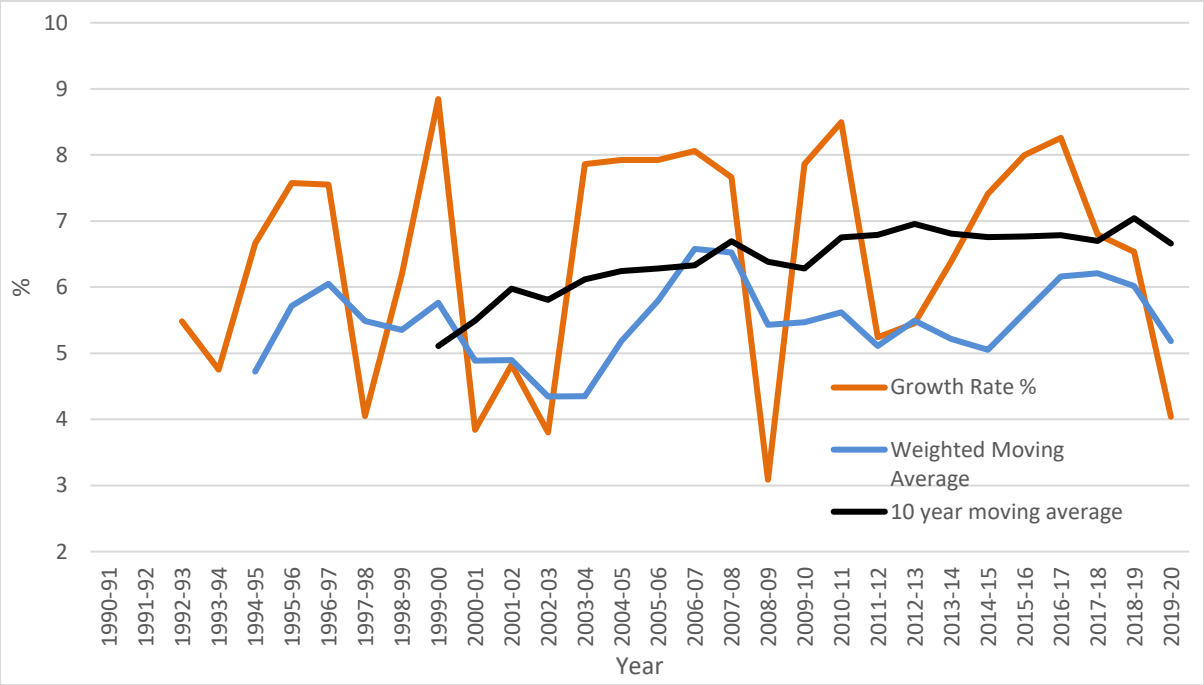
S.no.	Sector	Title of the Study	Author	Methodology
1	Economic Growth	Economic growth in India: Retrospect and Prospect	Prof. Surender Kumar, DSE	Jorgenson et al. (2002) model
2	Economic Growth	Post-COVID Recovery and Long Run Forecasting Indian GDP with Factor-augmented Error Correction Model (FECM)	Prof. D. Maiti, DSE; Naveen Kumar, DS; Dr. Debajit Jha, OP Jindal University and Soumyadipta Sarkar, Gallagher Re	Dynamic Factor Model (DFM) and Factor-augmented Error Correction Model (FECM)
3	Agriculture	Growth Trajectory of Indian Agriculture-Forecasting Key Variables	Prof. Raka Saxena and Prof. S.J Balaji, NIAP-ICAR and Prof. Ashok Vishandass, Egrow Foundation	SEM, ARIMA, SARIMA, and Machine Learning Models.
4	Industry	Industrial growth in India-Future Trends	Prof. Suresh Babu, IIT-M	Growth Based Scenarios
5	Fiscal	India's Fiscal Performance and Future Outlook	Prof. Gayithri and Dr. Ramanjini, ISEC Bangalore	Additive Holt-Winters Model
6	Defence	Defence budget and its role in economy - A forecast till 2036-37	Lt. Gen. P S Rajeshwar (Retd)	Growth Based Scenarios
7	Urbanisation	Projecting Urban Population: Methodological issues and the Macro Scenario in 2036	Prof. Amitabh Kundu, JNU and P.C Mohanan, former member of National Statistical Commission	Urban Rural Growth Differential Based Projection
8	Public Sector	Future Trajectory for Public Sector Undertakings.	Prof. Ramesh G., IIM-B	Qualitative

Special papers were also commissioned for the external sector, health and financial sector but the authors chose to withdraw, at last minute, mentioning that such long-term projections were difficult to make in their area of expertise.

In addition to the invited concept papers prepared by subject matter experts, projections were also attempted in the EGROW Foundation (consolidated paper, placed at Annexure XII.9). The methodology was as follows – Various methodologies were considered initially, e.g., normal averages, weighted moving averages - with more weight assigned to recent years, and moving averages (Graph II.1). Furthermore, moving averages of 5, 10 and 15 years (Baseline) followed by best performing 5, 10 and 15 years (Aspirational) and least performing 5, 10 and 15 years

(Pessimistic) was considered. Finally, after examining various growth rates for different variables, it was decided to consider linear projections until 2036-37 based on 10- years moving average growth rate. Thus, projections have been attempted under three scenarios. In the first scenario, Baseline, average of 10-years moving average has been computed from the annual growth rates recorded during 1990-91 to 2019-20. In the second scenario, Aspirational, average of the best registered 10-years growth rates has been considered. In the third scenario, averages of lowest registered 10-years growth rates have been considered.

Graph II.1: Various methodologies considered before settling on 10-year moving average - GDP growth rates at constant market prices being presented as an illustration (2011-12 Base)



Source: Computed by the Author

II.1 Variables projected – list of select indicators

The variables used as inputs as projected in the study are listed in Table II.2.

Table II.2: Sector-wise list of some variables used in the study

S.no.	Sector	Variables used
1	Economic Growth	GDP at constant and current prices, GDP per capita, Sector-wise GDP, Savings and investments as a percentage of GDP and international experience of India with other countries. Variables for labour input growth rate: Labour quantity (employment) growth rate and labour quality growth rate. Variables for capital input growth rate: capital stock growth rate, capital composition growth rate and total factor productivity (TFP) growth rate.
2	Agriculture	Agriculture percentage contribution of GDP, GCF- Public Sector, GCF- Private Sector, Agriculture workforce, institutional credit and fertilizer subsidy.
3	Industry	IIP - General, Manufacturing and Mining and Quarrying. IIP - Use based Classification (Basic goods, Capital goods, Consumer goods, Consumer Durables, Consumer Non-durables, and Intermediate Goods). Informal sector has been excluded due to the unavailability of data and complexities involved with data collection of unregistered manufacturers.
4	Fiscal	Revenue deficit, revenue expenditure, revenue receipts, tax to GDP, liabilities, gross fiscal deficit to GDP.
5	Defence	Defence budget projections
6	Urbanisation	Urban Population Share in Total Population, Share of Population by Size Class of Towns.
7	Public Sector	Number of Enterprises
8	External sector	Merchandise Exports to GDP, Merchandise Imports to GDP, Trade Balance to GDP, Net Non-Factor Services exports to GDP, Invisibles Receipts to GDP, Invisible Payments to GDP, Net Invisibles (Invisible Balance) to GDP , Current Account Balance to GDP and Foreign Exchange Reserves.

Further, a series of webinars were conducted between May and December 2021, attempting to understand various aspects of the economy in the next 25 years, by subject matter experts, who were not engaged in drafting the concept papers for EGROW Foundation (Table II.3).[5]

[5] The proceedings of these seminars are available on the website of EGROW Foundation.

Table II.3: Organised webinars on various aspects of the economy by EGROW Foundation

Subject	Experts	Organization / Designation
Economic Growth	Dr. Bibek Debroy	Chairman, Economic Advisory Council of the PM
	Dr. Aruna Sharma	IAS (Retd.)
	Gautam Chikermane	Vice-President, Observer Research Foundation
	Dr. Ejaz Ghani	Former Economic Advisor, World Bank, Washington DC
Agriculture	Prof. Seema Bathla	Jawaharlal Nehru University, Delhi
MSMEs	Prof. Bala Subrahmanya	IISc Bangalore
	Prof. Rajendra K. Sinha	Chairperson, Centre of Excellence in Banking, Jagdish Sheth School of Management, Bangalore
Health	Prof. Dileep Malvalankar	Director, Indian Institute of Public Health, Gandhi Nagar
	Prof. Gopal Naik	IIM Bangalore
	Dr. K.R. Antony	Independent monitor, Ministry Health and Family Welfare
	Dr. Faujdar Ram	Director, IIPS, Bombay
Education	Prof. Gopal Naik	IIM Bangalore
Urbanization	Prof. Geetam Tiwari	IIT Delhi
	Dr. O.P. Agarwal	IAS (Retd.), CEO, World Resource Institute, India
Geopolitics	Amb (Retd.) Shivshankar Menon	Former National Security Advisor, India
	Shri Avtar Singh Bhasin	Director (Retd.), Ministry of External Affairs
	Brig. (Retd.) L.C. Patnaik	Indian Army
	Amb (Retd.) Vivek Katju	IFS (Retd.)
	Brig (Retd.) Arun Sahgal	Director, Forum for Strategic Initiative
	Amb. (Retd.) Gautam Mukhopadhaya	IFS (Retd.)
	Prof. Sachin Chaturvedi	Director General, RIS
	Amb (Retd.) Rajiv Sikri	Former Foreign Secretary
	Amb (Retd.) Kanwal Sibal	Former Foreign Secretary

III. Real Sector- GDP related parameters

India was the fifth largest economy in the World in 2021. The key to India's future is economic development aimed at increasing employment, efficient use of limited financial resources and

reducing poverty and income inequalities. Virmani (2021) argued that the economic reforms are under way and the economic and institutional reforms are on the agenda for the next few years to make India the third largest economy in the World by 2035. 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 (Virmani, 2021).

Kumar (2022; subject matter expert) analysed the growth of the Indian economy using Jorgenson et al (2012) model. Annual input data[6] was used for the period 1990 to 2019 and HP filter was used on historical time series data to understand the trajectory of economic growth and separate trend from cyclical and irregular components. Further, the projection period was segregated into 2020-2030 and 2031-2037 and growth accounting framework was used for growth projections, i.e., GDP growth was decomposed into growth rate of labour productivity and growth rate of employment where labour productivity was dependent on capital intensity, labour quality and total factor productivity (TFP). Some assumptions[7] were made on capital stock per unit of labour, labour quality and TFP based on analysis of previous trends. It was projected that during 2022-2030 and 2031-2037, labour productivity will grow annually at 6.3 percent and 5.9 per cent respectively and as a result, GDP will grow annually at 7.7 per cent and 6.8 per cent respectively, under the Baseline scenario. In an Optimistic scenario, labour productivity was projected to grow annually at 7.6 per cent and 7.1 per cent in 2022-2030 and 2031-2037 respectively resulting in GDP annual growth rates projections of 9.4 per cent and

[6] Variables for labour input growth rate: Labour quantity (employment) growth rate and labour quality growth rate, variables for capital input growth rate: capital stock growth rate, capital composition growth rate and total factor productivity (TFP) growth rate.

[7] Assumptions: A). *Business-as-Usual* - In the coming quarter century, relative factor income shares will remain constant. Labour income share will be 51.0 per cent and capital income share will be 49.0 per cent. Capital intensity will grow at an average rate of 8.0 per cent in 2022-30, 7.5 per cent per annum in 2031-37, and 7.0 per cent in 2038-47. Labour quality will grow at an annual rate of 1.0 per cent and annual rate is expected to decline to about 0.7 per cent by 2047. TFP will grow at an annual rate of 1.9, 1.7 and 1.5 per cent for periods 2022-30, 2031-37 and 2038-47 respectively. Employment rate will grow at an annual rate of 1.0 per cent in 2022-2030. B). *Optimistic* - Capital intensity will grow at an annual rate of 9.5 per cent in 2022-30 and then decline to 9.0 and 8.5 per cent in 2031-37 and 2038-47, respectively. TFP will grow at an annual rate of 2.3 per cent during 2022-30 and then at an annual growth rate of 2.1 per cent and 1.9 per cent for 2031-37 and 2038-47, respectively. Labour quality will grow at an annual rate of 1.2 per cent during the first 15 years and then at 1.0 per cent to 2047. C). *Pessimistic* - Capital intensity will grow at 7.0 per cent per annum in 2022-30, and 6.5 per cent and 6.0 per cent annually during the periods 2031-37 and 2038-47, respectively. TFP will grow at an annual rate of 6.0 per cent from 2022-30, and then decline to 1.5 per cent and 1.4 per cent for the period ending 2037 and 2047, respectively. Labour quality will grow at an annual rate of 0.8 per cent for the first 15 years of projection, and 0.6 per cent for the remaining years. Factor income share and employment growth will have common values across all scenarios.

8.9 per cent respectively. Under Pessimistic scenario, GDP projections showed the annual growth rate of 6.6 per cent and 6.0 per cent during 2022-2030 and 2031-2037, respectively.[8]

Maiti (2022; subject matter expert) indicated that Indian GDP annual growth rate is expected to range between 4.0 per cent to 8.0 per cent in the long run during 2021-22 to 2035-36. Dynamic Factor Model (DFM) and Factor- augmented Error Correction Model (FECM) were used.[9] The model found 3 major dynamic factors that captured 80.0 per cent of the variations of 56 quarterly variables of the Indian economy. These major factors were found using dynamic factor analysis. The Factor 1 was mainly driven by variation in variables such as finished steel production, broad money, bank credit, cash in circulation, cargo handled at ports, exchange rate, M3, non-food credit and tourist arrival, while Factor 2 had high influence of foreign exchange turnover purchase, import, CPI Industrial workers, rainfall, sale of commercial vehicles etc. Factor 3 extracted variations from BSE, IIP Manufacturing, Gas production and Car sales. In the Error Correction Model, 4 exogenous variables were also considered apart from 3 factors mentioned above; they were Cash Reserve Ratio (CRR), public expenditure on completed projects out of GDP, the price of crude oil, and all India average temperature.[10] The projections were done for a period from 2022 to 2035, and after execution of the model, it was found that Factor 1 and 3 contributed to the GDP growth favourably, but Factor 2's contribution to GDP growth had a negative relationship that was not statistically significant. Out of the exogenous variables, the rise of CRR and temperature was found to have an adverse effect on the GDP growth, while the public expenditure on the completed project out of GDP had a

[8] Factor income shares: The income share of capital input has been increasing and labour input income share has been decreasing since the early 1990s. At the outset of economic reforms, the income share of capital input has been about 27.0 per cent. It has increased to 48.4 per cent by 2019. The income share of ICT capital has been hovering between 3.0 to 4.0 per cent and it has been 3.4 per cent in 2019. Subject matter experts assumed that in the coming quarter-century the relative factor income shares will remain constant, i.e., the factor income share of capital will not exceed 50.0 per cent in the coming years. In particular, it is assumed that the labour income share will be 51.0 per cent and capital income share will be 49.0 per cent out of that 4.0 per cent will be the income share of ICT-capital. This assumption is consistent with the factor income shares observed in middle- and high-income countries (The figures on factor income shares are based on the data from The Conference Board Total Economy Database). In South Korea, the income share of capital has been similar to that in India in the early 1990s and has also been observing an increasing trend and it was 39.0 per cent in 2018. Similarly, capital income share has increased from 34.0 per cent to 39.0 per cent during this period in China. It has never exceeded 47.0 per cent in the last thirty years in Japan. Capital factor income share in the USA has hovered around 35.0-36.0 per cent in the last thirty years. It is also worth noting that ICT-capital share remained around 3.5 to 5.0 per cent in all these countries from 1990 to 2019.

[9] All variables were run through a stationarity test, then DFM was used to extract the significant factors contributing to GDP growth, which were then taken into FECM for establishing a long- run relationship between GDP and the obtained significant factors, FECM was also used to project the annual growth rate of GDP.

[10] CRR captures monetary policy; Public expenditure on completed projects out of GDP is taken as a proxy of expansionary fiscal policy; Price of crude oil captures external shocks; and Temperature captures climate change.

positive effect on GDP growth. That is higher investment in government projects boosts GDP. However, it was observed that the rise of temperature and the crude oil price adversely affect economic growth. Therefore, considering a rise in government's investment, crude oil prices and temperature, the annual growth rate would be limited to 4.0 percent to 8.0 percent in the long run during 2022-35.

Singh (2022) observed the growth trend from 1990-91 to 2019-20 and based on that projection scenarios have been formed for the period 2020-2037. The study indicated that GDP at constant prices is expected to grow annually at 6.5 per cent, 8.1 percent and 4.0 per cent under Baseline, Aspirational, and Pessimistic scenarios respectively. GDP per capita will grow annually at 4.3 percent, 5.1 per cent and 3.4 per cent under Baseline, Aspirational, and Pessimistic scenarios respectively.[11] GDP per capita projections for the year 2036-37 would be Rs. 2.7 lakh under Baseline, Rs. 3.6 lakh under an aspirational scenario and Rs. 1.9 Lakh under Pessimistic Scenario.[12] In 2036-37, based on linear trend, gross savings to GDP will be at 48.0 per cent, 57.0 per cent and 28.0 per cent under Baseline, Aspirational, and Pessimistic scenarios respectively. Similarly, Total Investments to GDP will be at 51.0[13] per cent, 60.0 per cent and 28.0 per cent under Baseline, Aspirational, and Pessimistic scenarios respectively.[14] In view of the covid pandemic, growth rate has declined substantially, following a sharp dip in savings and investment rate. Therefore, it can be concluded that while the linear projections based on the data from 1990-2020 show a higher savings and investment, the actuals may be benign and continue to be in the recent range of 30.0 to 33.0 per cent, given the weak recovery (domestic and global) and fear of new variants of covid as well as the impact of Russia-Ukraine war.

[11] Results based on data smoothening exercise - moving averages used.

[12] Results based on study by Jatav (2022), estimated population projection is at 151.7 crore for the year 2036-37. A detailed discussion is presented in Annexure XII.9.

[13] The linear projections were yielding unrealistic estimates. Therefore, in the estimation exercise, in the Baseline scenario, savings and investments were truncated at 48.0 per cent and 51.0 per cent maintaining a CAD of 3.0 per cent. The ratios 48.0 and 51.0 per cent are high compared to the current savings and investment pattern, ranging between 33.0 and 36.0 per cent and 36.0 and 39.0 per cent respectively. In the case of China, savings and investment were in the range of 45.0 to 51.0 per cent for nearly two decades. In view of the rapid growth in India, it can be assumed that India's savings/investment rate can rise to 48.0 to 51.0 per cent.

[14] The calculations show the same rate of 28.0 per cent for Savings and Investments in a pessimistic scenario. This implies nil CAD which may not be an optimal policy for an emerging country like India. In India, CAD is expected to supplement domestic savings for growth purposes. A detailed discussion is presented in Section V.1.

International experience has also been analysed and average growth rates of GDP per capita (USD PPP)[15] from 1990-91 to 2019-20 shows that India and Singapore are similar at 6.5 per cent while, Russia and Thailand's were at 6.3 per cent and Malaysia at 6.0 per cent.

India will be among the top three drivers of global growth (with USA, EU) and become the third largest economy by 2035, because of its direct effect on rest-of-world demand through net imports of goods and services from the rest of the World (Virmani, 2021).

Finally, the results of the various studies have been summarised under the three scenarios. Under each scenario, the median of the findings has been considered for uniformity (Table III.1).

Table III.1 Growth Rates computed by various studies

(per cent)

GDP Growth Rates			
	Baseline	Aspirational	Pessimistic
Virmani (2021)	6.0-7.0		
Maiti (2022)	4.0-8.0		
Singh (2022)	6.5	8.1	4.0
Kumar (2022)	6.8-7.7	8.9-9.4	6.0-6.6
Median	**6.8**	**8.9**	**6.0**

Source: Annexure XII.1, XII.2, XII.9 and XII.10

III.1 Sector-wise Composition of GDP

III.1.1 Agriculture

Saxena, Balaji and Vishandass (2022; subject matter experts) indicated that under the Baseline scenario, the agriculture sector might grow annually at the rate of 2.7 per cent to 2.9 per cent during 2021-2037. However, under an Aspirational scenario it would be around 4.0 per cent. ML and SARIMA models were used to analyse various variables like Agricultural contribution in GDP growth, GCF- Public Sector, GCF- Private Sector, Agriculture workforce, institutional credit and fertilizer subsidy and its potential impact on Agriculture and allied GDP growth (per cent per annum). Quarterly agricultural GDP data series for the period 1996-2017 was used as *training dataset*[16] before estimating the projections for the period 2017-2021. Then, the actual

[15] Due to the data availability constraints and to make international experience comparable, USD PPP is used.

[16] Training data is a large dataset that is used in machine learning models which teach machine learning algorithms to find relationships, develop understanding, make decisions and predictions, and evaluate their confidence from the training dataset they are given. The better the training data is, the better the model performs.

data series for the same period was treated as the *test set* to test the closeness of estimated forecast with the actual data with least errors. With the given rates of public and private capital growth, it was predicted that the agriculture sector can grow by a maximum of 4.0 per cent a year during 2021-2037. To note, the private investment at present contributes more than 80.0 per cent of total agricultural capital and the estimated model assumes its GDP multiplier value is roughly 4 times that of the public sector capital. Hence, it has been presumed that the private capital growth shall be at a maximum of 5.0 per cent and would need substantial efforts – conducive policy support from the Government, inclusivity from the financial sector and a shift towards lending credit for capital assets, and a preference on investment over the short-run on-farm expenses from the farm households. Even in the least-growth scenario, the public investment growth shall fall not less than 5.0 per cent, and the private investment would still grow 3.5 per cent following the Government's efforts to promote farm mechanization, improve on-farm post-harvest infrastructure through the Agri-Infrastructure Fund, and its efforts to inculcate entrepreneurship among the farm households through the Farmer Producer Organizations (FPOs). The policies aimed to accelerate productivity need to have a systems approach. Agricultural diversification to high-value commodities will be a significant factor for higher agricultural growth. Further, immense potential exists in terms of expanding agro-processing and building efficient value chains from production clusters to the terminal markets; efforts need to be made to induce private investment in logistics and distribution (Annexure XII.3).

Singh (2022) indicated that the annual growth of the agriculture sector would be at 3.2 per cent, 3.7 per cent and 2.7 per cent under Baseline, Aspirational and Pessimistic scenarios respectively at constant market prices. International trends have also been analysed with a selected basket of countries which includes Advanced and Emerging economies.[17] An international trend and cross-country comparisons have shown a declining trend in the agriculture sector all over the world and India is more than 50 years behind advanced countries in terms of percentage distribution of sectoral GDP. China and Russia were at the same place during 1990-1995 where India is at 2019-20. Similarly, Indonesia, Malaysia, Thailand, Philippines and Turkey were at the same place during 1985-1995, where India is at 2019-20. Consequently, using time trend regression analysis, the study observed that the "Agriculture,

[17] Advanced Economies - Canada, France, Germany, Italy, Japan, Singapore and Spain; and Emerging economies – Brazil, China, Indonesia, Malaysia, Mexico, Philippines, Russia, South Africa, Thailand, Turkey and Poland.

hunting, forestry, fishing" sector as a percentage contribution of gross value added will be 10.0 per cent in the year 2036-37 (Annexure XII.9).

Virmani (2021) observed the reasons for the lack of structural change which were the continuation of controls on all aspects of agriculture (inputs, land, farm management, output sale), that have stifled innovation and diversification. Subsidy policies have encouraged overuse of groundwater, electricity and polluting fertilizer, and under-use of farm waste (and consequent open burning). Reforms have started, but transformation of the rural economy is critical to eliminating poverty to create a structurally transformed rural economy. One of the unique negative aspects of the 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. 50.0 per cent of the labour force remains in Agriculture, though Value Added has declined to 20.0 per cent of GDP. Labour productivity in Agriculture is therefore 40.0 per cent of average in 2021 and seasonal underemployment remains a substantial problem.

The results of the various studies have been summarized under the three scenarios. Under each scenario, the median of the findings has been considered for uniformity. (Table III.2).

Table III.2 Growth Rates observed by various studies

(per cent)

Agriculture Growth Rates			
	Baseline	Aspirational	Pessimistic
Saxena, Balaji and Vishandass (2022)	2.9	4.0	2.7
Singh (2022)	3.2	3.6*	2.7*
Median	**3.1**	**3.8**	**2.7**

*Results based on data smoothening exercise - moving averages used. If smoothening exercise is not attempted, then the growth rate for the aspirational scenario is 7.1 and for pessimistic scenario is -1.0 per cent. In view of the absurdities of the data, projections based on linear model, data smoothening was attempted. In lieu of data smoothening, the projections are close to those made by the subject matter expert.
Source: Annexure XII.3 and XII.9

III.1.2 Industry

The scale of Indian manufacturing is exceptionally low compared to that of China. 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 (Virmani, 2021).

Babu (2022; subject matter expert) observed the annual growth-based trend for the period 1989-2020 and projected variables related to the index of IIP at an aggregate level and use-based classification level of disaggregation for the period 2020-2036 using growth-based scenarios. The available IIP data has been spliced to arrive at a consistent series with 2011-12 weights and has been used to project industrial output in the future. Furthermore, separate sections have been included for projections using the Annual Survey of Industries (ASI) data, Linear Regression Forecasting Method, KLEMS Value Added data and Hodrick–Prescott filter (HP filter). The linear trend growth rate for IIP general is calculated at 3.7 per cent and by 2036-37, IIP would stand at 221.9. Similarly, IIP manufacturing would stand at 226.1 and IIP Mining would stand at 144.3. Under use-based classification, basic goods would be at 200.9, capital goods would stand at 137.3, consumer goods would be at 248.9, consumer durables would be at 179.2, consumer non-durables would be at 273.3 and intermediate goods would stand at 270.0. Projections using HP filtered series concluded that the real manufacturing output will stand at Rs. 3.3 lakh crore under Baseline, Rs. 19.1 lakh crore under Aspirational and Rs. 0.5 lakh crore under Pessimistic scenario in 2036-37. Aspirational and Pessimistic projections are too wide due to the linear modelling technique used in the projections. The probability is very low in the extreme case, and expected to get lower, in the years ahead. Therefore, Baseline projections may be considered as a realistic view. (Annexure XII.4).

III.2 Demography

Virmani (2021) observed that since 1960, demographic change is the most important driver of changes in global comparative advantage. India has been unable to utilize its demographic dividend while countries of East and Southeast Asia have taken the advantage. The working age population of most of the high-income countries (HICs) and many of the upper middle-income countries (UMIC) is declining, while India's is rising. China, which is India's direct competitor in terms of factor endowments, will lose a significant 6.7 per cent of its share in the global workforce by 2030, providing an opportunity for India to attract labour intensive production. The trend in de-globalization which started with the global financial crisis, accelerated with recognition of the monopoly of China over global manufacturing supply

chains (2018-19),[18] and the disruption of supply chains during the pandemic has added to the relative advantage of India as a location for diversification out of China. The low ratio of educated and skilled labour in the total labour force of India, in the year 2020, provides an opportunity to raise India's share to double digits in the next 15 years as India's comparative advantage will shift to semi-skilled labour-intensive manufacturing and services. 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 bottlenecks and high-tech education and skilling (Virmani, 2021). Because of the Pandemic, public health and 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. Government must provide professional regulation of the entire process of drug research, discovery, testing, approval, and post-production pricing, to minimise regulatory costs and maximise the public health benefits (Virmani, 2021).

III.3 Education

It is important to focus on an Education Policy to develop skills for providing employment, improving the quality of human capital for greater economic growth. Education especially for women is also important from the point of view of a successful population policy to delay onset of marriage and child birth thereby reducing the rate of population growth of the country. Despite the improvement in the gross enrolment ratio for classes I-XII between 1990-91 to 2019-20,[19] It is important to focus on the quality of education. In empirical work, the quantity of education was found to have a lower impact on economic growth than the impact of quality of education.[20] The National Education Policy 2020 aims to cover many propositions such as increasing enrolments, improving quality, digitization and technological integration, vocationalisation to teacher development and from improved physical infrastructure to all, to safer, inclusive, economically rewarding and socially relevant education. This is consistent

[18] Virmani (2021)

[19] The Gross Enrolment Ratio for classes I-V has increased from 83.3 percent in 1990-91 to 102.74 percent in 2019-20. The Gross Enrolment Ratio for classes VI-VIII increased from 66.7 percent in 1990-91 to 89.7 percent in 2019-20. The Gross Enrolment Ratio for classes I-VIII increased from 78.6 percent in 1990-91 to 97.8 percent in 2019-20. The Gross Enrolment Ratio for classes IX-XII increased from 19.3 percent in 1990-91 to 68.1 percent in 2015-16 – Source: EPWDB, Statistics on School Education (2011-12) and Education Statistics at a Glance (2018) and UDISE+ (online).

[20] Barro (2013)

with the recognition of the early years in developing cognitive and socioemotional skills.[21] National Education Policy 2020 has recognized the importance of teacher performance and hence focuses on strengthening teacher effectiveness through a combination of improvement in teacher skills, reducing extraneous demands on their time and through rewarding performance. A robust merit-based structure of tenure, promotion and salary structure was also suggested. The National Education Policy also recognizes the importance of changing school organisation and school management.

The National Education Policy 2020 has recommended investing in larger school complexes and also recognizes the importance of school management, emphasising the need for customised school development plans for anchoring a process of continuous school improvement. The disruption in education due to public schools being closed due to the Covid-19 pandemic from 2020 can have an adverse impact on learning outcomes.[22] Education Technology can be used as it can lead to a reduction in digital divide, increase student engagement and provide personalised instruction.[23] The need for a practically relevant curriculum in terms of skill development to increase employment leveraging the demographic dividend brings out the importance of vocational education. In the case of Brazil, it was brought out that the students who completed technical vocational education at the upper secondary level earned a greater hourly wage compared to those that completed only regular secondary education. The need to meet the various propositions of the National Education Policy 2020 required an increase in public expenditure. The National Education Policy 2020 aimed to achieve an increase in public expenditure to 6.0 per cent in GDP at the earliest[24] from the share

[21] Muralidharan and Singh (2021)

[22] Hanushek and Woessmann (2020) projected the impact of the learning losses on growth through assessing the effect on the economy of skills entering the labour market. This study has accounted for the impact on the economy of a less skilful workforce. Learning losses due to school closures could be portrayed as a loss of cognitive skills for students enrolled in Classes I-XII. The learning losses were presented as school year equivalents using the rule of thumb that three years of schooling is equivalent to a one standard deviation of test scores. The projections undertaken for G-20 countries cover learning losses ranging from a one-third year of schooling and for two-third year of schooling given further disruption due to Covid 19 pandemic. The projection has been undertaken for 80 years corresponding to the life expectancy of someone born in 2020.The present value of lost GDP is based on the difference in GDP for 80 years with lower achieving labour force due to learning losses from 1/3rd or 2/3rd years compared to future GDP without learning loss. The future losses in GDP were discounted to the present using a 3 percent discount rate. In the case of India, the impact of a loss of 1/3rd year of learning would be USD 6,368 bn and for a loss of 2/3rd year of learning would be USD 12,552 bn. The GDP of India in 2019 was USD 9,229 bn, as mentioned in the study.

[23] Muralidharan and Singh (2021)

[24] NEP - GOI (2020)

of public expenditure on education in GDP being around 4.4 per cent in 2019-20.[25] For realising the various provisions in the implementation of the NEP 2020 it is important to go beyond the 6.0 per cent target level which is possible by adopting the mixed approach of sudden big push and gradualism in increasing public expenditure on education.[26]

III.4 Health

The Economic Survey 2021-22, GOI noted that COVID-19 pandemic has resulted in an increase in healthcare spending from 1.8 per cent to 2.1 per cent of GDP in 2021-22. The National Health Policy (2017) envisioned health expenditure by government to GDP ratio to reach 2.5 per cent by 2025. Based on analysis of development and human capital requirements, and international experiences, public health expenditure should reach at least 5.0 to 7.0 per cent of GDP by 2036.[27]

Moving towards this broader objective, primary health care services should shift from selective to assured comprehensive care. Secondary and tertiary health segments should move from input oriented to output-based purchasing.[28] Focus in infrastructure and human resource development should shift from normative to targeted approach to reach underserved areas (National Health Policy, 2017). Expansion in public health facilities like primary health centres, health and wellness centres, sub-health centres and application of telemedicine could be undertaken to increase accessibility of healthcare facilities to vulnerable sections like tribals, scheduled castes, and other marginal sections of society.

Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (ABPMJAY)[29] and Pradhan Mantri Bhartiya Janaushadhi Yojana (PMBJY)[30] are steps in the right direction to reduce out-of-pocket health expenditure which is estimated at 60 per cent of total health expenditure in 2020,[31] and

[25] Table No 4 Public Expenditure on Education as percentage of GDP from 2000-01 to 2019-20 in Analysis of Budgeted Expenditure on Education (2017-18 to 2019-20)
[26] Khare and Dubey (2021)
[27] Based on discussions with Prof. Sundararaman, former Executive Director, National Health Systems Resource Centre, New Delhi
[28] Output based purchasing implies that procurement must be based on results on the functioning of equipment, their usefulness and health outcomes. The strategy is recommended based on the vision of National Health Policy, 2017.
[29] Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (PMJAY), is the largest government health protection scheme in the world, entitling 500 million Indians to an annual health protection coverage of approximately US$ 7,100.
[30] Making quality medicines available at affordable prices for all, particularly the poor and disadvantaged, through exclusive outlets "Jan Aushadhi Medical Store", so as to reduce out of pocket expenses in healthcare.
[31] Economic Survey (GoI, 2020-21)

focus should shift to effective implementation and maintaining quality standards. Global Burden of Disease Health Financing Collaborator Network (2017) estimated that by 2040, out-of-pocket health expenditure may fall to 54.3 per cent of total health expenditure in India.

Mainstreaming of the AYUSH system will make healthcare more cost effective. The next few decades would witness an increased push towards standardisation, quality control, development of infrastructure and research facilities of the AYUSH system of medicine. Digital tools would be used for generation and sharing of information about AYUSH services and AYUSH practitioners. Integrated courses for Indian System of Medicine, Modern Science and Ayurgenomics will increase acceptability, and accessibility of these knowledge systems to people.

Increased specialist services can be provided through telemedicine to remote areas as it is not possible to position specialists at the primary or sub-health centre level (Chand, 2022). NASSCOM (2021) estimated that data and Artificial Intelligence (AI) have the potential to add USD 25-30 billion to India's GDP by 2025. AI will prove to be transformational in reducing costs through accelerated drug development, early disease detection, targeted preventive care and personalised health education. It is expected to improve accessibility by enabling remote consultations, monitoring of chronic conditions and virtual patient assistance, and enhance the quality of treatment through personalised and precision treatment (NASSCOM, 2021). Innovations in healthcare are likely to receive a boost through collaboration between technology providers, healthcare start-ups and academic institutions. National Digital Health Mission and Public Health Stack being developed is more likely to enable data-based healthcare service and policy making in the coming years.

The doctor-population ratio in India is 1:1456[32] as against the WHO recommendation of 1:1000. In order to attain the minimum prescribed threshold, India needs to improve affordability and capacity for medical training in India. The National Health Policy (GOI, 2017) envisaged bridging regional disparities in distribution of medical colleges, nursing institutions and AIIMS, along with periodic review and standardisation of fee structure of clinical training in private sector medical colleges. It also aimed at strengthening existing medical colleges and converting district hospitals to new medical colleges to increase the number of doctors and specialists. National Health Policy (GOI, 2017) recommended national

[32] Economic Survey (GoI, 2019-20). Population estimated to be 1.35 billion.

knowledge networks to be used for tele-education, tele-CME, tele-consultations and access to digital libraries, along with review of entrance examinations to achieve quality and quantity of medical practitioners in India.

The private sector will not only impart quality healthcare services but also enable India to achieve self-sufficiency in drugs and medical equipment as envisioned under 'Aatmanirbhar Bharat Abhiyan'. Private sector can be incentivized through preferential treatment in collaboration for CGHS empanelment and in strategic purchase of equipment and non-financial incentives like recognition and skill upgradation. Private sector will also play a crucial role in infrastructure support like laboratories, hospitals, and medical schools to inaccessible and rural areas (National Health Policy, GOI, 2017).

Life cycle approach to healthcare[33] based on nudging for behavioural change and preventive and curative medical intervention should be followed. Focus on institutional births, vaccination, and regular health check-ups and preventive medical care needs to be strengthened. Rajan, Sarma and Mishra (2003) projected India's elderly population (60+ years of age) to grow from 133.32 million in 2021 to 236 million in 2041 and from 9.9 per cent to 14.5 per cent of population during the same period. Economic survey, GOI, 2018 projected the population of elderly to reach 239.4 million in 2041, which would constitute around 15.9 per cent of the entire population at that time. This raises an urgent need to upgrade health infrastructure to cater to the health needs of older people. For instance, since 71 per cent[34] of the elderly residing in rural areas, geriatric health care services should be mandatorily made a part of the primary health care services (Ingle and Nath, 2008).

SDG 3.4 aims at reducing premature mortality from non-communicable diseases (NCDs) by one third. Institute for Health Metrics and Evaluation (2017) [35]projected a fall in death rate due

[33] It focuses on early medical intervention in all stages of life. Key stages in people's lives have particular relevance for their health. The life-course approach is about recognizing the importance of these stages, and WHO/Europe addresses them in four programmes: Maternal and new-born health, Child and adolescent health, Sexual and reproductive health, and Healthy ageing (Health at key stages of life – the life-course approach to public health, WHO)

[34] Census of India, 2011

[35] Progress on 41 out of 50 SDG indicators was estimated as an increase in the number of indicators from 37 in GBD 2016. The projections were generated till 2030 using data for 195 countries from the period of 1990-2017.The projections to 2030 were generated using forecasting methods which produced reference forecasts and alternative health scenarios for life expectancy, all-cause mortality and cause-specific mortality. The modelling framework was designed to account for relationships between risk factors and other independent drivers of health outcomes, thus capturing causal pathways of health change shown in randomised controlled

to NCDs among populations aged 30-70 years from 494 deaths per 100000 people in 2017 to 393 deaths per 10000 people by 2030. While deaths per 100000 may fall, in the view of an increase in population, the total number of deaths in the country may see a rise. Stunting in children below five years of age in India to fall from 39.3 per cent in 2017 to 27.6 per cent in 2030. Maternal mortality rate (MMR) will decrease from 160.1 per 100000 live births in 2017 to 129 per 100000 live births in 2030. Neonatal mortality rate was expected to decrease from 19.3 per 1000 live births to 14.7 per 1000 live births in 2030.

It is necessary to ensure that the health facilities function efficiently and have the requisite manpower, medicines and diagnostic services. Professional councils require a broad-based membership of doctors, patients and society. In order to harness the potential of technology, uniform measures and standards for collection of data can be established. Moreover, improved coordination between different departments and healthcare bodies is required since improvement in health outcomes cannot be an exclusive function of any single department/ ministry.

IV Fiscal Sector

The overall gross fiscal deficit (GFD) situation is guided by the trends in revenue deficit which had a considerable reduction in the initial years of the FRBM; however, the fiscal stimulus announced during the global recession loosened the fiscal consolidation targets. The period between 2014-15 and 2019-20 was also marked by other important factors such as the demonetization and the launch of major indirect tax reform, Goods and Services Tax (GST), that impacted revenue yield of the governments (Gayithri and Ramanjini, 2022, Annexure XII.5; subject matter experts). The share of revenue deficit (RD) in the total GFD is high in the case of the Central Government, causing concerns over the quality of deficits.

trials and cohort studies. Projections for independent drivers were generated through calculating annual change in each location and year from 1990 to 2017 in logit or natural-log space and computing weighted annualised rates of change. If the weights were closer to zero, annual rates of change over time were more equally weighted across years; if weights were closer to higher values, and recent years would be more heavily weighted than were the earlier years. These weights were selected through out-of-sample predictive validity tests.

For further details regarding the methodology refer to GBD 2017 SDG Collaborators. (2018). " Measuring progress from 1990 to 2017 and projecting attainment to 2030 of the health-related Sustainable Development Goals for 195 countries and territories: a systematic analysis for the Global Burden of Disease Study."

Gayithri and Ramanjini (2022) had projected select fiscal indicators, based on data on fiscal trends since 1991, using Additive Holt-Winters forecasting model, which smoothes level, trend and seasonal factors in time series data. The robustness of this model was well depicted through encouraging results of multiple goodness of fit measures. The study indicated that total combined receipts and total combined expenditure may rise to Rs 425.7 lakh crore, and Rs 479.4 lakh crore in 2036-37 from current levels of Rs 57.8 lakh crore and Rs 58.7 lakh crore, respectively.

Gayithri and Ramanjini (2022) also estimated that revenue expenditure (REx) as a per cent of GDP will more than double from 23.3 per cent in 2019-20 to 50.5 per cent in 2036-37. The share of REx in the total expenditure, which is already disproportionately large, will increase further from 80.7 per cent in 2019-20 to 93.0 per cent in 2036-37, indicating a further decrease in quality of expenditure. Growth in the share of revenue receipts (RR) is of much smaller order, increasing from 20.5 per cent in 2019-20 to 37.5 per cent of GDP in 2036-37. As a result, the RD to GDP ratio for Centre and states combined was projected to reach 11.1 per cent in 2036-37 from 3.1 per cent in 2019-20. The gross fiscal deficit (GFD) was projected to increase from 6.9 per cent of GDP in 2019-20 to 15.5 per cent in 2036-37. RD and GFD are high as the REx has historically depicted a much sharper increase than the RR which calls for immediate corrective measures. They are likely to be further adversely affected given the current global issues such as the Ukraine war, global oil price hike etc. Such projections call for the urgent need of a defined path for fiscal correction in post-covid economy. Along with budgeting fiscal prudence, Gayithri and Ramanjini (2022) further recommended that focus must also be placed on improving expenditure efficiency, beneficiary targeting and shifting from incremental budgeting to an effective outcome-based budgeting.

The Fiscal Responsibility and Budget Management (FRBM) Review Committee (Chairman: NK Singh, 2017) set up by the Government of India, envisioned that the RD of the central government would decline steadily by 0.25 per cent each year to reach 0.8 per cent of GDP by 2022-23. Therefore, Singh (2022) considered an alternate scenario, where a glide path was assumed for RD, for Centre, states and combined, to reach net zero in the medium term, assumed in this study to be achieved by 2027-28, and to be maintained at that level in subsequent years.[36] This is in line with the golden rule of public finance that the balance on the

[36] As per the FRBM Act, 2003, RD was projected to be Nil by March 31, 2008 and later extended to March 31, 2009. The emphasis on Nil RD was also stressed by the 13th Finance Commission (GoI) and the Report on the Committee on Fuller Capital Account Convertibility (2006).

revenue account should preferably be in surplus, but never in deficit.[37] Backward calculations were then conducted to estimate the required REx and RR, in Baseline, Aspirational and Pessimistic scenarios (Annexure XII.9).

The central government REx and RR to GDP ratios were projected forward. The projections show that each of the two variables - REx and RR would rise to 11.6 per cent of GDP, respectively, by FY 2036-37 (since RD was assumed to be net zero) under the Baseline conditions. Under Aspirational conditions, both REx and RR to GDP ratios were estimated to reach 14.6 per cent each by FY 2036-37. Under Pessimistic conditions of GDP, REx and RR to GDP ratios were projected at 8.7 per cent each by FY 2036-37.

The combined REx and RR to GDP ratios were projected to reach 25.4 per cent each by FY 2036-37 under the Baseline conditions. Under Aspirational conditions, both REx and RR to GDP ratios were projected at 33.3 percent each, by FY 2036-37. Under Pessimistic conditions of GDP, REx and RR to GDP ratios, were estimated to reach 25.3 per cent each by FY 2036-37. Singh (2022) observed that in the case of the Central government, GFD to GDP ratio had been between 5.0 to 5.9 per cent for 10 years for the period 1990-2020. The centre and state combined GFD to GDP ratio had been between 6.0 to 6.9 per cent for 13 years. Thus, GFD to GDP ratio for central and combined governments was expected to remain at 3.0 per cent and between 5-6 per cent, respectively, in 2036-37 as well. Since, RD will be zero, the entire GFD will be on account of investment in capital goods, which will help to improve the investment capital output ratio (ICOR) of the country.

IV.1 Taxes

The combined gross tax to GDP ratio, continuing with the backward estimation of the fiscal parameters, was projected to reach 19.6 per cent in Baseline scenario, 26.6 per cent in Aspirational scenario, and 15.9 per cent in Pessimistic scenario in 2036-37, from 17.4 per cent in 2019-20 (Singh, 2022). Majority of the tax revenues, more than 60.0 per cent of it, will be sourced from indirect taxes.

[37] Singh (2022) does not assume surplus, as the domestic economy is recovering and tax receipts cannot rise significantly, but in contrast government expenditure will continue to rise. Hence, in such a grim situation maintaining a NIL RD would also require significant effort on part of Centre and state governments.

The trend of Tax to GDP ratio in India has followed an interesting trajectory. In general, it has maintained the range of 13.3 – 17.9 percent. The international tax to GDP experience reveals that in most emerging Asian economies like the Philippines, Thailand, Malaysia, Indonesia, and Singapore as well as Mexico, the ratio is significantly higher. India has the lowest tax to GDP ratio among BRICS countries. Most advanced economies like Poland, Japan, Canada, France, Germany and Italy have tax to GDP ratio of more than 35 percent.[38]

Virmani (2021) assumes continuous growth-oriented reforms in tax domains and continuous simplification of tax reforms. While GST has been a landmark step towards simplification of the indirect tax regime, it continues to suffer from legacy issues of the previous tax regime. A substantial simplification of rules and procedures can be achieved if three-fourths of goods and services be subjected to a uniform 15.0 per cent rate, one-tenth to one-eighth such as food, medicines and medical services and education services be exempted to ensure equity, while taxes on sin and luxury goods be adjusted to ensure revenue neutrality (Virmani 2021). The direct tax regime also continues to be plagued with complex tax laws, chapters, sections and subsections, which lead to confusions and litigations.[39] A much-simplified new Direct tax Code must necessarily be implemented in letter and spirit to ensure time reduction and costs of compliance for businesses, especially MSMEs.

IV.2 Liabilities

Liabilities of the Government, Centre and States combined, as percentage to GDP has ranged between 65.5 as per cent of GDP in 1996-97 to 85.8 per cent in 2003-04, with the central government accounting for a much larger share. Gayithri and Ramanjini (2022) projected combined liabilities burden to GDP ratio to increase to 128.3 per cent in 2036-37 from the current level of 73.7 per cent (2019-20). These projections are in consonance with an alternate Pessimistic scenario considered by Singh (2022), where liabilities were assumed to grow linearly at rate of highest 10-year average growth rates while GDP would grow at the average of lowest 10 years growth rates. The liabilities were projected to reach 122.9 per cent of GDP in this scenario.

Singh (2022) also considered a Baseline scenario, where liabilities grow linearly at the average of 10-year moving average growth rates. Under Baseline scenario, liabilities were expected to

[38] International Centre for Tax and Development (2021)

[39] The Income Tax Act (1961) contains 23 chapters, 298 sections and 14 schedules in 90 pages, apart from numerous sub-sections, sub-sub sections, rules and clarifications accumulated over the last 60 years.

decrease marginally to 71.9 percent of GDP in 2036-37.[40] In the Aspirational scenario, where liabilities were assumed to grow linearly at the lowest rate while GDP was assumed to grow at the highest rate, the liabilities turned out to be significantly lower at 45.5 percent of GDP.

A summary of the fiscal situation in 2036-37 as projected by two studies has been provided in Table IV.1 below.

Table IV.1 Summary of Select Combined Fiscal Parameters to GDP ratios

(per cent)

Parameters	2019-20 (Actuals)	2036-37 (Projected)			
		Gayithri and Ramanjini (2022)	Singh (2022)		
			Baseline	Aspirational	Pessimistic
Revenue Receipts	22.9	37.5	25.4	33.3	25.3
Revenue Expenditure	25.2	50.5	25.4	33.3	25.3
Revenue Deficit	3.1	11.1	0.0	0.0	0.0
Gross fiscal Deficit	6.9	15.5	5 to 6	_	_
Liabilities	73.7	128.3	71.9	45.5	122.9

Source: RBI Handbook of Statistics and Annexure XII.5 and XII.9

IV.3 Fiscal Council

The need for a fiscal council (FC) to conduct an annual independent and public review of Fiscal Responsibility and Budget Management (FRBM) compliance, including a review of the fiscal impact of policy decisions on the FRBM roadmap, was highlighted in 13, 14 and 15 Finance Commission Reports, as well as in FRBM Review Committee Report of 2017 (Chairman: N.K Singh). It is identified by above mentioned committee reports that there are institutional gaps in the production, collation, coordination and publication of fiscal data, as well as in independently reviewing fiscal projections and the medium-term budgetary framework across levels of government. An FC can bridge this gap and improve the quality of fiscal data and assist in calibrating a sustainable policy by making an objective and scientific analysis of fiscal policy, which can ensure greater transparency and accountability in fiscal policy. Such a council can also guide the government on policy cost of new measures with significant fiscal

[40] The combined liabilities had deteriorated during 1991 and 1997 due to the BOP crisis and Asian Crisis.

implications, which would reduce fiscal risk. Therefore, it is expected that by 2036 India will have a FC at Centre to strengthen and improve FRBM, so that all the issues regarding the fiscal trajectory of the country are addressed adequately.

V. External Sector

This section examines India's current account balance, merchandise trade, services export, preferential trade agreements, foreign exchange reserves and internationalisation of Rupee.[41]

V.1 India's Current Account Balance

The sustainability of the current account deficit (CAD) indicates the ability of the economy to finance its current account gap on an on-going basis of the normal capital flows. The sustainability of CAD could be considered on the basis of the international trade perspective and that of the national accounts. The international trade perspective is where the CAD reflected the trade balance and the balance on invisibles while the national accounts perspective indicated that the current account was identical to the domestic savings-investment gap. The national accounts perspective indicated that if the domestic investment exceeds savings, then the country would have to import capital (borrow from abroad), this would lead to a higher CAD. A CAD that indicates excess of investment over savings could indicate a productive and growing economy. Goyal (2012) had considered the sustainability of the CAD in terms of net external liabilities relative to size of the economy. The level of CAD that could be financed on a continuous basis without creating any pressure on the economy is considered as the sustainable level.

Rangarajan and Mishra (2013) had assessed the CAD sustainability using an external sustainability approach developed by the International Monetary Fund (IMF). This approach relied on the intertemporal budget constraint which requires present value of trade surplus to be sufficient for the payment of the country's external liabilities. This constraint could be satisfied through ensuring that the size of net foreign assets was stable relative to the size of the economy. The accumulation of the net foreign assets would depend on the net financial flows. The above two studies brought out that CAD relative to GDP would be sustainable at

[41] The projections are based on Singh (2022) considering two scenarios: the Baseline Scenario (the methodology of which is explained in Annexure XII.9) and the Alternative Scenario that has considered Backward Calculation based on the sustainable level of current account deficit. The trend of similar emerging economies has also been considered in Singh (2022). This note is based on the Alternative Scenario and the trend of similar emerging economies

2.3 per cent to 2.8 per cent. The Report of Committee on Fuller Capital Account Convertibility (Chairman: S.S Tarapore) set up in 2006 concluded that it is important to accelerate the growth of current receipts which reduce the need to access international financial markets and increases the ability to be able to record a higher CAD, thereby achieving a higher economic growth without facing a financing constraint. A rising current receipts to GDP ratio would enable higher CAD that would enable a higher investment ratio (RBI, 2006). It was brought out that a CAD/GDP ratio of 3.0 per cent could be financed comfortably; hence this was the sustainable level of CAD/GDP.[42] The national accounts perspective on the sustainability of the current account indicated that if the domestic investment exceeds domestic savings, then the country would have to import capital (borrow from abroad) and this would lead to a higher CAD. A CAD indicating excess of investment over savings could indicate a productive and growing economy.

In the analysis that follows, a scenario is presented that is based on backward calculation in computing other components of current account on the assumption that the CAD/GDP is at 3.0 percent by 2046-47 following a glide path, with CAD/GDP at 2.1 percent by 2029-30 and at 2.5 per cent by 2036-37.[43]

V.2 Merchandise Trade

Considering that the CAD/GDP ratio rises to 2.5 per cent by 2036-37, the merchandise exports would rise to 14.1 per cent of GDP in 2036-37 increasing from 11.2 per cent in 2019-20. The trends of similar emerging economies were also analysed which brought out that the share of merchandise exports in GDP would rise reaching a maximum share of 30-40 per cent of GDP. Countries with higher quality of export product, as indicated by the skill and technology level of the exports and higher level of institutional quality, human capital and better financial markets would benefit from trade integration and economic policies.[44] It is important for India

[42] RBI (2006)

[43] The alternate scenario appeared to be more realistic than the baseline scenario which obtained a surplus of 13.8 percent of GDP on current account, which is an unrealistically large current account surplus, given that this level of surplus has not been attained in earlier years, and is not preferred in an emerging economy like India, especially if the economy is not resource rich.

[44] Basu and Das (2011)

to diversify its exports as at a lower level of per capita income it is beneficial to diversify exports and once a higher level of per capita income is attained, India would benefit from specialisation of exports after having pursued diversification of exports.[45]

India's pattern of specialisation has been contrary to that of Heckscher Ohlin Model as brought out by rise in share of capital-intensive goods in exports between 2000-2015 and decline in the share of the unskilled labour-intensive goods during these years[46] and a decline in the revealed comparative advantage of India's traditional exports such as precious stones, spices, cotton, tea, jewellery, and leather.[47]

India's participation in vertically integrated global supply chains production could take place through introducing flexibility in the labour market, investment in physical infrastructure, reduction of administrative costs on business and in removing market distortions.[48] Digitization can impact the export intensity directly or can have an indirect impact through firm level characteristics such as productivity and research and development. Digital Technologies such as Robotics, AI need to be promoted to give India's manufacturing exports a competitive edge.[49]

When the CAD/GDP ratio is 2.5 per cent in 2036-37 the merchandise imports would account for 24.0 per cent of GDP increasing from 16.6 per cent in 2019-20. The analysis of the trends of similar emerging economies brought out that merchandise imports share in GDP would rise to a maximum of 30-40 per cent. The importance of imports in boosting exports indicated that industrial and external sector policies should not excessively emphasise exports and harm imports. Macroeconomic policy should aim for broader industrial and economic performance instead of export led growth strategy through exchange rate management.[50]

V.3 Services Exports

The share of services exports in GDP rose from 1.4 per cent in 1990-91 to 7.4 per cent in 2019-20. The share of services exports in total exports rose from 19.8 percent in 1990-91 to 40.0 percent in 2019-20. In following with the trends of similarly placed emerging economies,

[45] Hesse (2008)
[46] Veeramani and Aerath (2020)
[47] Banga and Banga (2020)
[48] Veeramani and Aerath (2020)
[49] Banga and Banga (2020)
[50] Bhanumurthy and Sharma (2013)

India's export share of services could increase to a level between 11.0 per cent to 15.0 percent of GDP. Factors such as economic development, access to foreign technology, spillovers from merchandise exports along with policy initiatives such as trade reforms, and the liberalisation of domestic industrial policy have led to the growth of the services sector.[51]

Traditional services exports were determined by factors such as world demand, exchange rate, manufacturing exports and infrastructure. India needs to focus on supply side factors such as development of human capital, infrastructure, and financial sector. Trade liberalisation, financial liberalisation and allowing greater FDI in areas such as health, education and financial sectors are important for achieving sustained growth in services exports.[52]

The Report of the Task Force on Artificial Intelligence (June, 2018) observed that AI intervention in the modern services sector, especially computer and information services, consisted of the information technology component and the automation component. AI based technologies could have a negative impact on the BPO, Back-offices and the sales and marketing jobs. The low skilled jobs such as market research analyst, data entry operators, software test engineers, system engineers, customer service executives in this sector would experience a decline due to AI intervention. However, AI intervention would lead to the creation of new jobs such as data scientists, natural language processing specialists, AI Research scientists, and user experience designers.[53] This brings out the need for reskilling the workforce to adapt to the changing environment. The specific areas needed for reskilling include natural language processing, neural networks, data analytics, and pattern recognition and data analysis tools.[54]

V.4 Preferential Trade Agreements

The conclusion of the preferential trade agreement (PTA) between India and other countries led to the growth in trade with other member countries.[55] The increase in imports between India and the member countries was greater than the increase in exports. This could be due to the fact that India's tariffs were higher than that of the other member countries hence the effective reduction on tariff for partner countries was greater resulting in greater imports. Preferential

[51] Eichengreen and Gupta (2012)
[52] Sahoo, Dash and Mishra (2013)
[53] GOI (2018)
[54] GOI (2018)
[55] RBI (2019)

trade agreements had a positive impact in terms of increasing the imports of the capital goods and industrial supplies which can enhance the productive capacity of the country.[56]

The rise of the cumulative number of PTA's since the 1990s was followed by a change in the content of the preferential trade agreements. PTA's earlier focussed on the border measures such as tariffs, export taxes. However, over time, PTA's have expanded to focus on behind the border measures such as trade remedies like countervailing measures, anti-dumping duties and subsidies and intellectual property rights and standards. PTA's focussing not only on tariffs and exports taxes but also on countervailing measures, anti-dumping duties, subsidies and intellectual property rights and standards leads to greater trade creation and lesser trade diversion from a more efficient exporter to a less efficient one due to formation of the trade agreement. These agreements also led to an increased trade with countries that were not members of a particular trade agreement.[57] These agreements also led to an increase in vertical FDI as firms would relocate their business operations from one country to another.[58] However, the positive impact on vertical FDI depended on regulatory provisions which improved the contractibility of the inputs provided by the foreign suppliers.[59] In the years ahead, given the geo-political situation, number of PTA's are expected to increase, which should lead to higher trade volumes.

V.5 Foreign Exchange Reserves

Several international crises led to a number of interventions by the RBI in the foreign exchange market to minimise the volatility and impact on the Indian financial sector. The long-term motives for holding foreign exchange reserves were precautionary and insurance against unforeseen external shocks. The short-term objectives consisted of correcting monetary disequilibrium characterised by excess money supply or demand above what can be explained by the standard determinants, buffers against external payment gaps and the potential use of reserves for countering volatility in cross-border capital flows.[60]

[56] RBI (2019)
[57] Mattoo, Mulabdic, and Ruta (2017)
[58] Osnago, Rocha and Ruta (2017)
[59] Osnago, Rocha and Ruta (2015)
[60] Das and Nath (2014 and 2015)

Reserve adequacy can be assessed through measures such as import cover, ratio of reserves to short term external debt, and ratio of reserves to broad money. Traditionally, the level at which reserves were considered adequate was when reserves can sustain imports for three months. However, after the Asian crisis – 1997/98, the universally accepted norm was altered. The revised indicator was the ratio of reserves to short term external debt which measures potential demand for repayments related to a country's short term external currency borrowing. The Greenspan-Guidotti rule of 1999 suggested 100.0 percent coverage of outstanding short term external debt with a residual maturity of one year. Another indicator, ratio of reserves to broad money, is relevant for countries with financially developed markets and an open capital account. The benchmark for reserve adequacy according to this indicator was that reserves should be equal or more than 20.0 percent of broad money.[61]

Earlier, the High-Level Committee on Balance of Payments, (Chairman: C Rangarajan, 1993) recommended that the RBI should target a level of reserves taking into account the liabilities arising for debt servicing, in addition to the imports of three months.[62] The Committee on Capital Account Convertibility (Chairman: S. S. Tarapore, 1997) suggested that to open up to capital account convertibility, India should achieve the following targets for reserve's policy - reserves should cover at least six months of imports; reserves should cover at least three months of imports along with 50.0 percent of debt service payments and one month's exports and imports to take into account possibilities of leads and lags. The Committee also recommended that the short-term debt and portfolio stock should not be more than 60 percent and the ratio of net foreign exchange assets to currency ratio should be maintained around 70.0 per cent and should be prescribed by law to be not less than 40 percent.[63] India's import cover increased from 2.5 months in 1991 to 9.6 months in 2019.

The comparison of India's share of reserves as a percentage of broad money reveals an upward trend from 1991 to 2020 for emerging economies such as Brazil, South Africa, Thailand, Mexico, Poland and Philippines.

Das and Nath (2014 and 2015) assessed the adequacy of India's foreign exchange reserves. Three approaches were used to assess reserve adequacy for India considering- two measures which were used to compare India with a set of comparator countries, an econometric

[61] Arslan and Cantu (2019)
[62] Patnaik (2003)
[63] RBI (1997)

estimation of the reserves demand function and lastly, an intertemporal welfare maximisation model to examine whether actual reserve levels were consistent with the optimum levels against some set of potential risks to the economy. India's reserve levels were within the band of 2 standard deviations of the predictions from the estimated reserve demand equation. The inter-temporal welfare maximisation model based on Jeanne and Ranciere (2011) and Jeanne and Ranciere (2009) suggested that actual foreign exchange reserves were higher in India to cover the Lehman type shock and the external sector shock of the extreme stress scenario. India was observed to have adequate current reserve levels. Consequently, in recent years, India has built reserves amounting to 17.38 months of imports in 2020-21 from the reserves amounting to 8.88 months of imports in 2014-15. This trend is expected to strengthen with changing geo-political circumstances.

V.6 Internationalisation of the Rupee

Indian Rupee has a negligible role as an international currency across both the official and private sectors. There is a greater likelihood of the Indian policymakers moving towards internationalisation of the Rupee in the medium term. India has already achieved full current account convertibility but not capital account convertibility. It is anticipated that India would gradually progress with Internationalisation of India Rupee given that the path of exchange control and capital account liberalisation would continue.[64]

VI. Financial Sector

The analysis in this Section is restricted to banking and non- banking sectors.

VI.1 Banking

The central government has been considering privatisation of public sector banks (PSBs).[65] The idea of reducing government control in the banking sector is likely to persist in the coming decades. Public confidence in private sector banks is also increasing. In December 2021, deposit and credit growth of private banks grew by 15.0 per cent and 13.1 per cent respectively, as against 6.9 and 4.7 per cent in PSBs.[66] These signals indicate that in the coming years, the

[64] Kumar and Patnaik (2018)

[65] The New policy on Public Sector Enterprises of 2021 classified banking as a strategic sector and hinted towards its consolidation.

[66] Quarterly statistics on deposits and credit of scheduled commercial banks.

role of PSBs in the banking sector is likely to decrease, while that of private sector banks is likely to increase. However, given the social role played by PSBs[67] they may not wane away completely in the next 15 years. The recent exercise of the Government has resulted in 12 PSBs from 21 banks in March 2018. The consolidation of PSBs, and increasing use of technology could result in higher digitisation in the banking industry, more internet banking and less dependence on brick- mortar branches.

The Jan Dhan - Aadhar - Mobile (JAM trinity) has enabled India to make significant progress in financial inclusion. As of March 2, 2022, the Jan Dhan accounts have surpassed 44.0 crore. This implies a 6.8 per cent increase from 41.9 crore accounts as on March 3, 2021.[68] Of all the accounts under Jan Dhan Yojana, 14.0 per cent accounts are inoperative,[69] mainly in states like Manipur and Goa. Thus, while accessibility to account has increased, the coming years will see efforts towards making people habitual of banking and availing its services. Payment Banks and Small Finance Banks, proficient in financial technology, can be expected to enable India to complete the remaining gap on financial inclusion by 2036.

VI.1.1 Fintech and banking

The shift in payment preference towards digital methods in the last 10 years is evidenced by the fact that the volume of paper clearing,[70] which comprised 60.0 per cent of total retail payments in FY 2010-11, shrunk to 3.0 per cent in FY 2019-20 (RBI, 2021). The report of the High-level committee on Deepening of Digital Payments (Chairman: Nandan Nilekani, 2019),[71] pointed out that while the number of digital payments per capita had risen ten-fold from 2.4 in March 2014 to 22.4 in March 2019, India is still behind many other nations in digital payments per capita (96.7 for China and 148.5 for Brazil). However, the young demography of India is expected to accept internet banking more easily than others.

Virmani (2021) estimated that with investments in public infrastructure for digital economy like Bharat Net, private mobile footprint in India will soon cover 99.0 per cent of land and exclusive economic zones. This will give further boost to digital financial services.

[67] Majority of Jan-Dhan accounts are opened by PSBs. They offer financial services in unbanked areas.
[68] PMJDY Progress Report.
[69] An account is inoperative if there is no transaction in it for over two years.
[70] Paper clearing consists of cheque truncation system, Magnetic Ink Character Recognition (MICR) clearing and non-MICR clearing.
[71] RBI (2019)

IMF (2021) highlighted the increasing need for banks to catch up on digital frontiers with financial technology and big tech firms to ensure banks' long-term competitiveness, and for financial stability and inclusion in the economy. Citi (2019) estimated that the fusion of technology, AI and big data could cut banks' operational cost by 30.0 per cent to 50.0 per cent mainly due to fewer branches and employees, but revenues would also decline for all banks by 10–30 per cent due to enhanced competition and transparency. Distributed Ledger Technology (DLT) can be optimised for data sharing and bank's back-office operations. Cloud computing allows the sharing of on-demand computer processing resources in a way that promotes efficiencies and economies of scale. Banks may also partner with other vendors and platforms to develop their product range. One of India's largest banks launched its integrated digital banking platform in 2017 where, along with conventional banking services such as account opening and fund transfers, it also offers various non-financial services such as e-commerce, EdTech solutions, online travel services and even caters to the farming needs of customers by enabling the purchase of agricultural equipment and fertilizers (PwC, 2021). In coming years, this model is likely to become common for domestic banks in India to follow.

Fintech will also lead to the rise of digital banks/challenger banks or "neobanks" in India.[72] Given the existing open banking, universal digital identity framework and the account aggregator framework recently revised by the RBI in October 2021,[73] India already has a competitive edge in promoting digital banks and enabling its access. Basel Committee on Banking Supervision (BIS, 2017) envisioned different scenarios that can possibly describe the impact of technology and neobanks on incumbent banks in the coming years. In the first scenario, incumbent banks modernise and digitise themselves to retain their customer base. In the second scenario, banks get completely replaced by neo banks. Rise of banks such as Atom Bank and Monzo Bank in the United Kingdom can serve as an example for this scenario. In the third scenario, the financial services sector becomes increasingly fragmented with incumbent banks carving out a niche service to survive, or develop joint ventures. Fourth is a relegated bank scenario, where incumbent banks become commoditized service providers and cede the direct customer relationship to other fintech and big tech companies. The fifth scenario was described as a disintermediated banking future, where banks have become irrelevant as

[72] Bank of International Settlements (2020) defined digital banks as deposit-taking institutions that are members of a deposit insurance scheme that deliver banking services primarily through electronic channels instead of physical branches.

[73] Initially introduced in September 2016, revisions were conducted in Nov 2017, Feb 2018, Nov 2019 and finally in Oct 2021.

customers interact directly with individual financial services providers, for instance, using DLT. The emergence of P2P lending platforms presents an example of this possibility. However, the actual banking future is more likely to be a blend of the above possibilities.

McKinsey (2021) stressed that in the coming digital era, incumbent banks will have to resolve the weakness of inherent weak core technology systems and replace the fragmented data reserves with a more centralised data backbone to make best use of analytics and AI. Liu (2021) raised the possibility of concentration of few players in the banking sector in the coming decades, since digital transformation requires large initial investment, which could be unaffordable or unprofitable for smaller banks.

VI.2 Non-Banking Financial Companies

Traditionally, India has had a bank-dominated financial sector. There were, in earlier times, small family run businesses for deposit acceptance and lending activities. Since then, these businesses evolved into Non-Banking Financial Companies (NBFCs) which grew tremendously over the years in size, form, and complexity, with some of the NBFCs operating as conglomerates having business interests spread to sectors like insurance, broking, mutual fund and real estate. [74]

However, the default on obligations by Infrastructure Leasing and Financial Services in 2018 prompted a revisit to the regulatory framework for NBFCs in India.[75] Rao (2020) described different changes in regulation that were undertaken since this event. Liquidity risk management framework for NBFCs with asset size above Rs. 100 crore was introduced and Financial Technology (FinTech) based product delivery were regulated to create a conducive environment in FinTech based NBFCs.[76]

The International Finance Corporation (2018) report on Micro, Small and Medium Enterprises (MSMEs) in India estimated that there is a credit gap of Rs 2.58 lakh crore in the MSME sector.[77] It is expected that this large gap between the demand and supply in the MSME lending market will be addressed by 2036 with the help of FinTech. In this regard, the RBI has set up a Regulatory Sandbox where FinTech firms, MSMEs, Banks and NBFCs can onboard and test

[74] Gandhi (2014)

[75] Infrastructure Leasing and Financial Services defaulted on several of its obligations in 2018, causing a severe liquidity shortage in NBFCs for next few years.

[76] Rao (2020).

[77] International Finance Corporation (2018)

innovative technologies that can improve the MSME lending. The outcome of this exercise can be deployed to bridge the credit gap existing between MSMEs and the NBFCs. The other issue that pertains to this sector is lack of formalisation of MSMEs and the ensuing difficulty for banks to assess credit worthiness. To overcome this bottleneck, Account Aggregators will be employed, who will collect, store, and share the data of customers and speed up the process of checking credit worthiness.[78] This will ensure that risk involved in NBFC lending is reduced by 2036.

Ensuring good corporate governance in NBFCs is vital to long term sustainability of these companies. The current mechanism within the Reserve Bank focuses on the above objective for companies seeking registration, there is a need to extend similar rigour of due diligence whenever there is a change in ownership/ control in an existing NBFC. Further, a bigger role, higher penetration in priority sectors and more prudent practices are expected from NBFCs in the period 2022 to 2036.

VII. Defence

VII.1 Geostrategic Environment

Future geostrategic environment of India and emerging threat from neighbouring countries is a distinct likelihood of crisis or even a conflict any time in the next decade up to 2036-37. Three scenarios may occur. First, conflict with China. Second, conflict with Pakistan and third, a 2-front war. Pakistan's continuous hostility towards India has often manifested through its abetment to cross border terrorism in J&K. Its support to the Taliban in Afghanistan has added to its strategic depth. China's belligerent attitude towards India, its power play in global leadership and influence, combined with economic, diplomatic and military support to the Pakistan and enhanced long-term presence in other neighbouring countries of South Asia, through huge economic loans, construction projects, labour, digital infrastructure support and building long term influence is a disadvantage to India (Rajeshwar, 2022). The recent episode of disturbance in Sri Lanka can raise doubts about the economic model of support provided by China: increased responsibility of India in the neighbourhood could have fiscal implications.

[78] An Account Aggregator provides data to a customer or Financial Information User from a Financial Information Provider based on the user's explicit electronic/digital Consent. No financial information of the user is retrieved, shared or transferred by the Account Aggregator without the explicit consent of the user.

VII.2 India's Defence Budget

Rajeshwar (2022; subject matter expert) observed that India is the world's third largest spender on defence, consequently, spending USD 72.9 billion in 2020. In contrast, China spent USD 252 billion and Pakistan spent USD 10.4 billion in 2020. However, India's defence budget has been declining over a period in terms of percentage of GDP over the last decade. There has been a steady debate in the strategic community over the gap between the projections made by the Ministry of Defence and budgetary allocations to it over the past years. This has resulted in delayed payments for committed liabilities or extended duration of overhaul and refit of weapon systems. Capital and revenue expenditure is not in synergy. Enhancements of Government salaries and pensions have added to the revenue expenditure substantially. Also, the military modernization rate of the neighbouring countries is rising at a swift pace. China plans to achieve complete military modernisation by 2035 and transform its military into a world class military by the end of 2049.[79] China also plans to be the world leader in AI by 2030. China's estimated expenditure on AI was USD 2 to USD 8.4 billion in 2018.[80] However, India's effort on AI is limited to establishment of a Defence Artificial Intelligence Council in 2019 and USD 13 million budget allocations for the next five years for AI innovation. Thus, there is an urgent need for scaling up on development of AI systems for armed forces. An augmented support model is recommended with aspirational budget growth rates of 9.9 per cent and baseline 7.7 per cent (Annexure XII.6).

VII.3 Defence Capability development

The concern is the vintage equipment in our armed forces. 68.0 per cent of our equipment is in the vintage category. Similarly, Indian Air Force has only 30 fighter squadrons against its sanctioned 42 at present. Likewise, the Navy cut down its plans from 200 warship forces down to 175. Further, acquisitions of weapon systems over a decade from indigenous and foreign sources indicate our long-term dependencies which call for necessary action (Rajeshwar, 2022, p.16).

VII.4 Indigenous defence industry and R&D

Defence Acquisition procedure 2020 aims to simplify procedures, ensure ease of doing business, reduce timelines of acquisition, rationalise trials and testing, and promote indigenous

[79] Office of the Secretary of Defence, "Military and security developments involving the People's Republic of China", Executive Summary.

[80] CSET issue brief, "Chinese Public AI R&D Spending: Provisional Findings", (2019)

defence manufacturing. It will boost domestic industry and Make in India initiative. The Defence Minister approved imposing restrictions on import of 108 military weapons and systems. Apart from the dedicated efforts of Defence Research and Development Organisation, Ordnance Factory Board and Defence Public Sector Undertakings, nearly 8,643 MSMEs are currently working for the defence sector. A key issue in the indigenous defence initiatives has been the substantial import content in the manufacturing of major equipment. The increased allocation for the domestic defence industry will surely spur us on to Aatmanirbhar Bharat, contingent upon the vigour and earnestness of the private sector. The key to successful indigenisation will lie in progressively reducing the substantial import content, while sourcing of non-available essential defence technologies and urgent procurements continue, when and where necessary. It would be fair to allow about 5-7 years to carve out a much more indigenous defence industry in line with modern combat requirements of the armed forces. Indigenous AI technology-based innovation must be the key focus area in the future. Apart from becoming self-reliant in our defence needs, defence exports are also a priority.

VII.5 Strategy and Policy

The strategic and 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 to productionize them. A defence R&D Commission would be an advantage which will develop strategic technology and new weapon systems and a reformed higher defence management structure. This would include pure defence systems like hypersonic vehicles, satellite defence systems and high-powered lasers, to dual use items like semiconductors, robots, autonomous vehicles, AI, machine learning, expert systems and cyber tools. Obstacles to private production, marketing and export of dual use products and defence systems will also need to be eliminated (Virmani, 2021).

VIII. Urbanisation

Urbanization involves an increase in the size of settlements, their transformation into a denser living environment and changes in economic activity away from agriculture.[81] It is through this process, towns and cities are formed and become larger as more people begin living and working in urban centres. However, Registrar General of India (RGI) categorises a settlement

[81] Kundu and Mohanan (2022)

into urban centres depending on the characteristics of the population in the defined administrative domain.[82]

In India, the exercise of population projection is done by the Technical Group on Population Projection for various government bodies, whose report is brought out by RGI. Their latest projection of urban population was released in 2020. In this report, Urban Rural Growth Differential (URGD) was used to project urban population. URGD is the difference between the rates at which rural and urban populations expand in each decade. RGI (2020) assumed that URGD remained the same throughout the projection period of 2011 to 2036. URGD was kept at 1.60 in their 2020 projection. Through this method, RGI in 2020 projected the urban population to reach 39.0 per cent of the total population by 2036.[83]

The United Nations Population Division (UNPD), the pioneers of URGD based methods for urban population projection, uses it in a much more robust manner as it considers the dynamic changes in country specific information and their implication in the perspective of urbanisation. The UNPD model considers URGD and the ratio of urban to total population. This model also decreases the weightage given to URGD Estimated, while simultaneously increasing the weightage of URGD Actual.[84] The UNPD World Urbanisation Prospects (WUP) in 2018 projected the urban population to reach 43.2 per cent of the total population by 2035.

The differences in the projected values can be attributed to the fact that RGI used state level data for their projections, while UNPD made projections on national level data. It should also be noted that RGI kept URGD at 1.60 throughout the projection period, whereas UNPD projected URGD to rise from 1.81 to 2.54.

Kundu and Mohanan (2022; subject matter expert) utilised above findings to attain three scenarios for urbanisation projections based on GDP growth rates. When the baseline scenario of 6.5 per cent of GDP growth was considered, then UNPD suggested 1.81 URGD was taken for projections.[85] In this scenario the urban population was estimated to be 64.0 crore, which would constitute 42.0 per cent of total population in 2036. The share of urban population in

82 Broad categories are Statutory Towns that were declared urban centres by the State/UT or Census Towns that were declared urban centres by the Directorate of Census Operation based on specific demographic characteristics.

83 This section closely follows the research paper by Kundu and Mohanan (2022).

84 URGD Estimated is obtained through the regression equation of URGD and ratio of urban to total population; and URGD Actual is the URGD observed in the latest years of forecast.

85 URGD of 1.81 was used by UNPD in the 2011-21 forecast.

total population was 31.1 per cent in 2011. When GDP growth rate of 7.1 per cent was considered, which was the Aspirational scenario, URGD rates were projected to be the same as those used by UNPD for World Urbanization Prospects (WUP) 2018 projections.[86] In this scenario, urban population was estimated to be 69.0 crore in 2036, which would be 44.0 per cent of total population in 2036. For the case of pessimistic GDP growth of 6.3 per cent, the constant URGD of 1.61 was used on RGI projected population, which projected 2036 urban population to be 60.9 crore, around 40.0 per cent of total population (Table VII.1).[87] The baseline scenario of 42.0 per cent emerged as the most likely scenario, given the rising trend of per capita income in India.

Table VII.1 Summary of Project of Urban Population

Parameter	2036		
	Baseline	Aspirational	Pessimistic
Urban Population (crore)	64.0	69.0	60.9
Urban Population Share in Total Population (per cent)	42.0	44.0	40.0

Source: Kundu and Mohanan (2022)

Kundu and Mohanan (2022; subject matter expert) also projected the share of population for six size classes of towns that are obtained from RGI. RGI's Annual Exponential Growth Rates of Urban Population for six size classes of 2001-11 was applied to the population of these six size classes of towns. In 2036, the percentage share in small towns (Class I) was projected to reach 70.9 per cent of total urban population. It was also estimated that urban population percentage share will be 5.5 per cent in Class II, 8.0 per cent in Class III, 5.2 per cent in Class IV, 8.4 per cent in Class V and 1.9 per cent in Class VI towns (Table VII.2).[88]

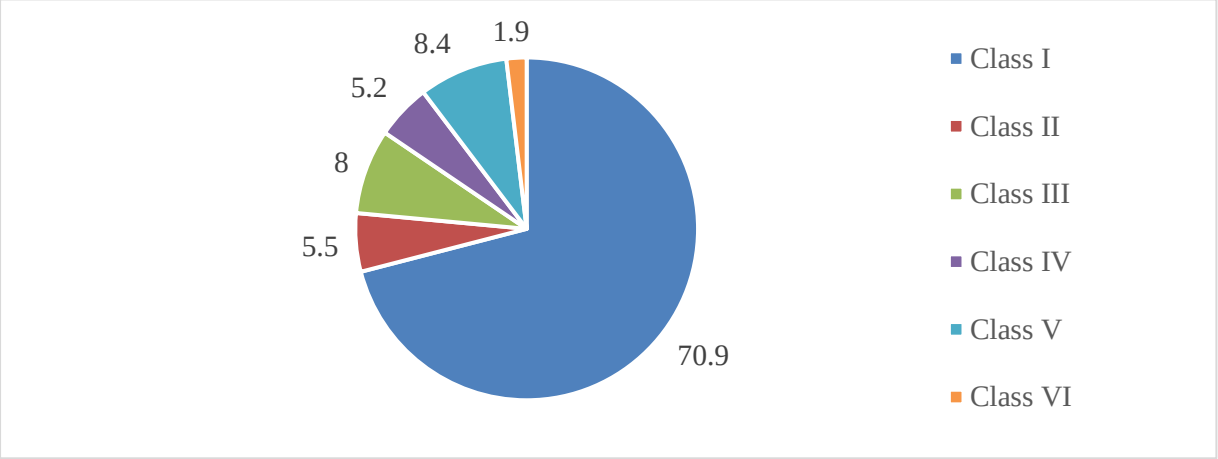
[86] URGD was assumed to increase to 2.23, 2.54 and 2.50 in successive decades from 1.81 in 2011-21.

[87] URGD of 1.61 was used by RGI in the 2001-11 forecast.

[88] Class- I-Population of 100,000 and Above, Class - II - Population of 50,000 to 99,999, Class -III - Population of 20,000 to 49,999, Class - IV - Population of 10,000 to 19,999, Class - V- Population of 5,000 to 9,999 and Class - VI - Population of less than 5,000.

Table VII.2 Projected Share of Population by size class of towns

(per cent)



Source: Kundu and Mohanan (2022)

Kundu and Mohanan (2022; subject matter expert) observed that in-migration to existing cities and towns is not increasing significantly in India, rather the geographical expansion of cities and reclassification of domains account for most of the urban population growth. However, there is a trend of steady decline in population engaged in agricultural workforce and increase in land area used for non-agricultural purposes, which indicate that the landscape is slowly becoming urban in several states. By the year 2036, a significant decline in people engaged in the agricultural workforce is expected. It is also expected that by 2036, with increased digitisation of information and modernisation of the process of collecting data, the deficiencies in surveying, such as lack of timely classification of the urban centres, will be addressed, resulting in a high rate of urban growth.

Virmani (2021) anticipated that the government will promote sectoral diversification in rural areas and recognize many towns to meet the dream of a distributed model of urbanisation. It also envisioned that there will be "Natural Cities" to accommodate structural migration from rural areas to urban agglomerations. Semi-urban areas and small towns located on, or near rivers, will be transformed into 'Natural Cities' of 1.5 to 2.0 million population.

IX. Public Sector Undertakings

Public Sector Undertakings (PSU) played a pivotal role in transforming India, to its current heights. From Industrial Policy 1956, the public sector underwent large-scale expansion. This expansionary trend was reversed in 1991 with the Industrial Policy of 1991. There was a policy shift towards disinvestment and reform, and disinvestment of Air India is one such major achievement in recent times. Moreover, as per new government notification on Public Sector Enterprises, the Central Public Sector Enterprises (CPSEs) will be divided into Strategic and Non-Strategic Sector. CPSEs in the Strategic Sector/ Non- Strategic Sector will be taken up for privatisation, merger, subsidiarisation with another CPSE or for closure. As per the notification only a bare minimum presence of CPSEs in the Strategic Sector is to be maintained.[89] According to Public Enterprises Survey 2019-20, out of 255 CPSEs there were 84 loss-making CPSEs which reported aggregate loss of Rs. 44,817 crore.[90] As on March 31, 2020 there were 188 CPSEs with an accumulated loss of Rs. 1.74 lakh crore.[91] Financing of these losses through the budget, crowd out some of the expenditures that could have been alternatively used to other developmental projects or activities.

Ramesh (2022; subject matter expert) observed that the public sector will have to undergo numerous changes from 2022 to 2036 to reform and eventually get privatised. Changes will be reflected mainly in the form of disinvestment, partial disinvestment, improving key enterprises, improving corporate governance structure and adding new CPSEs that have high profitability. Ideally it is expected that the government should not own more than 20.0 per cent share of the product market in any of the sectors and these CPSEs should be more sustainable and should not seek dependency on the government. Regarding criticism that there is lack of delegation and external control, which discourages development of decision-making culture, a reform to address these issues and improve the efficiency of the CPSEs is expected to take place in near future. The profitable CPSEs which are non-essential services like tourism, engineering, construction, trading and consumer products can be sold off without compromise with strategic interest or loss of control.

[89] Ramesh (2022)
[90] Government of India (2021)
[91] Comptroller and Auditor General of India (2021)

Virmani (2021) asserts that in strategic sectors like banking, insurance, telecom, petroleum, power, etc., it is expected that the government will reduce its presence to one large unit, while selling or merging smaller units.

X. Tourism

Tourism can prove crucial for powering the economy, ensuring inclusive growth and enhancing soft power for India. India Tourism Statistics (2021) noted that the number of foreign tourist arrivals in India were on a rising trend before COVID pandemic of 2020. Foreign tourist arrivals increased from 0.2 crore to 1.1 crore between 1990 and 2019 while domestic tourism visits increased from around 6.0 crore to approximately 232.0 crore in 1990-2019. In 2019, foreign exchange earnings from tourism stood at USD 30 billion. The report of the Working Group on Tourism (Government of India, 2011), travel and tourism sector are estimated to create 78 jobs per million rupees of investment compared to 45 jobs in the manufacturing sector for similar investment. Yet, tourism potential in India remains largely untapped. India accounted for a mere 1.2 per cent share in international tourist arrivals and ranked 23rd globally for the same in 2019.

UN (2011) envisioned international tourism to grow by 5.3 per cent annually for the period 2020-30. It expected the region to receive 0.4 crore international tourists annually, and hold a share of 2.0 per cent in international tourist arrivals. Invest India (2020) expects travel and tourism to contribute USD 512 billion to GDP by 2028, and record an annual growth rate of 10.3 per cent between 2019 and 2028. It also expected international tourist arrivals to reach 3.1 crore by 2028. By 2029, tourism was expected to account for 5.3 crore jobs.

Nangia-Andersen (2021) projected India's tourism sector to grow at 6.7 per cent annually to reach Rs. 35.0 trillion (USD 488 Billion) by 2029, and account for 9.2 per cent of the GDP. McKinsey (2020), stressing on the potential of high value tourism, estimated that 32 tourism circuits with high-quality infrastructure and services could attract 5 crore foreign tourists by 2030, which can generate USD 100 billion in spending to boost local economies and create higher-earning opportunities for 0.5 crore low- and medium-skill service sector workers.

Medical tourism is one of the emerging segments in the tourism sector. 6.4 per cent of all foreign arrivals in India in 2019 were for medical and healthcare purposes. The main contributor for the burgeoning medical tourism sector is the lower costs of tertiary healthcare and relatively high quality of medical treatment in India in comparison to other countries. For

instance, a heart bypass surgery in India costs as low as USD 7,900, which is lowest among major destinations for medical tourism like Thailand, Malaysia, Singapore, Turkey and South Korea (NITI, 2021).

Sankhae et al. (2020) highlighted the potential for India to double its healthcare spending to 6.4 per cent of GDP in the coming decade, by leveraging public-private-partnership models and doubling public investment from about 28.0 per cent to 56.0 per cent to boost medical tourism further. As COVID crisis brought forth the vulnerability of healthcare systems across the world, including India, this idea weighs more than ever before. Singh (2017) recommended incentivizing and developing clusters of hospitals to facilitate access to foreign tourists based on the Visakhapatnam model.[92] Productivity can be enhanced through new business models, leveraging telemedicine, home healthcare and revamping medical education. As recommended by NITI Aayog (2021), scope of medical tourism can be expanded further to develop India into a hub for spiritual and wellness tourism, as the country has much to offer in Ayurveda and Yoga.

There is an increasing focus on spiritual tourism. With its long history and rich philosophy, there is increasing scope for India to attract people looking to elevate their physical, mental and emotional energies by pursuing the spiritual path. Better connectivity and security to traditional spiritual centres and place of origin of different religions holds the key for such segments in the coming years.

Looking towards 2036, niche segments like eco-tourism and heritage tourism should also be tapped to its full potential. India has the 10th largest area under forest cover, 37 World Heritage sites, 10 biogeographic zones, 80 national parks and 441 sanctuaries. Virmani (2021) argued that given the almost virgin territory, due attention must be paid to environmentally sustainable, green tourism. A strategy towards developing sustainable and green tourism must be based on two core ideas - maintaining the ecosystem and poverty alleviation. This will lead to 'pro-poor tourism' which is essentially about redistribution of resources and opportunities and not just the creation of a new tourism product (Planning Commission, 2013). Singh (2017) called for promoting 'responsible tourism' based on the Kerala model of 'green tourism' to be replicated in all states.

[92] In small towns like Vishakhapatnam, clusters of hospitals, similar to export processing zones or industry clusters, have been opened to encourage medical tourism (Singh, 2017)

Singh (2017) argued for increased focus on rural tourism and agri-tourism, since the majority of the population reside in rural areas. Lessons can be drawn from Gujarat's 'Rural Tourism Infrastructure Development' and implementation can be undertaken at national level. While the attraction of India as a tourist destination is beyond doubt, in the coming years, focus must be laid on facilitating and smoothening access and experience. Visa approvals, insurance services and other processes for medical tourists could be simplified and rationalised. Thailand, for example, has allowed 90-day visa-free stays to residents of certain countries.

Availability of good infrastructure, maintenance of law and order, and user-friendly basic amenities are another essential requirement for promoting tourism. Progress on these indicators requires not only strong political will and capacity at local level, but also close federal cooperation between Centre and states. Given the role of multi-sectoral factors like aviation, transport, skill development, hotel infrastructure, environment and others, in the development of the tourism sector, inter-sectoral coordination is also crucial for the success of any strategy. Thus, in the coming years, focus must be laid on promoting vertical and horizontal coordination. States and union territories' must also think about branding their tourist destinations carefully to ensure it is perceived as authentic by tourists, building upon the success of the 'Incredible India' campaign (Planning Commission, 2013).

XI. Conclusion

An attempt has been made, scientifically through econometric techniques, to envision India in 2036-37. The empirical projections and qualitative aspects were considered in this study to project the future trajectory of the Indian economy. In this regard, analysis was done for select economic parameters such as GDP, taxes, deficits, debt, CAD, exports, imports, and urbanisation. The discussion also covered issues like education, health, tourism, demographics, and financial sector (banking and non-banking financial sector).

From the study conducted to project growth of GDP at constant prices in the period from 2022 to 2036, it is concluded, based on most projections, that annual growth rate of GDP is expected at 6.8 per cent, 8.9 per cent and 6.0 per cent under Baseline, Aspirational and Pessimistic scenarios, respectively. While looking at sector-wise composition of GDP, studies concluded with a view that agriculture sector growth rate would be around 3.1 per cent, 3.8 per cent and 2.7 per cent under Baseline, Aspirational and Pessimistic scenarios respectively. In the study, it was also observed that the "Agriculture, hunting, forestry, fishing" sector as a percentage contribution of GVA will be 10.0 per cent in the year 2036-37.

A brief summary of growth rates is presented in Table XI.1.

Table XI.1 Growth rates computed

(per cent)

GDP growth rates			
	Baseline	Aspirational	Pessimistic
Median of studies	6.8	8.9	6.0
Agriculture Growth Rates			
Median of studies	3.1	3.8	2.7
Industry Growth Rates			
IIP General	5.7	7.6	2.4
IIP Manufacturing	6.1	8.3	2.2
IIP Mining and Quarrying	2.8	3.7	1.3

The Covid-19 pandemic has brought health to the centre-stage of policy making. It is expected that public health expenditure will rise 5.0 to 7.0 per cent of GDP by 2036. Inclusivity, affordability and accessibility will remain the central pillars of health policy with increased effort towards mainstreaming of the AYUSH system of medicine. Technology and AI in health are expected to add USD 25-30 billion to India's GDP by 2025 and will be instrumental in reducing costs and enhancing quality. Moreover, health education must be reformed in order to fulfil the demand and supply of health workers and doctors in India. India is also well placed to become the pharmacy of the World by 2035.

In Education, NEP (2020) recognized the importance of improving the quality of education. It recognized the importance of teacher performance and changing school management, as school inputs do not contribute to learning outcomes on their own. However, they can contribute along with teacher motivation and school motivation. NEP has also focused on the importance of vocational education, developing skills and leveraging the demographic dividend of India.

In the fiscal sector, the GFD should logically range between 5.0 to 6.0 per cent of GDP and the golden rule of Revenue account of preferably surplus or alternatively nil revenue deficit should be pursued. On the assumption that RD would be Nil by 2027-28, projections have been attempted. The tax to GDP ratio is expected to increase to 19.6 per cent from the 30-year average of 15.5 per cent (1990-91 to 2019-20). RR to GDP is projected to increase to 25.4 per cent, while REx would match the receipts to achieve nil RD. The liabilities of the Centre are projected to decline while combined of the Centre and state are expected to be flat at around

71.9 per cent of GDP in Baseline scenario, which seems more reasonable among the three scenarios considered (Table XI.2).

Table XI.2 Summary of Projections for Parameters of Fiscal sector - 2037*

(per cent)

Parameters	2036-37
Fiscal Deficit to GDP (Combined)	5.0-6.0
Fiscal Deficit to GDP (Centre)	3
Revenue Deficit to GDP (Combined)	0
Revenue Deficit to GDP (Centre)	0
Revenue Receipts to GDP (Combined)	25.4
Revenue Receipts to GDP (Centre)	11.6
Revenue Expenditure to GDP (Combined)	25.4
Revenue Expenditure to GDP (Centre)	11.6
Tax to GDP (Combined)	19.6
Tax to GDP (Centre)	12.2
Liabilities to GDP (Combined)	71.9
Liabilities to GDP (Centre)	45.1

*In the projections, backward computation for all parameters, except gross fiscal deficit and liabilities to GDP, was done by fixing RD to GDP at 0.00 per cent in 2027-28, and the following years.

In view of the future trajectory of the external sector, the current account deficit would range around 2.5 per cent of GDP in 2036-37 given that India as an emerging country would need external resources to supplement its domestic savings. This level of CAD is sustainable for India. The merchandise exports could rise to 14.1 per cent of GDP from 11.2 per cent in 2019-20 while merchandise imports could increase to 24.0 per cent of GDP from 16.6 per cent. Digital technologies need to provide a competitive edge to India's manufacturing exports. The importance of imports in boosting exports brings out that a macroeconomic policy should aim for broader industrial and economic performance instead of a simple export-led growth strategy. It is also important for India to focus on supply side factors such as development of human capital, infrastructure and financial sector for boosting services exports. Trade liberalisation, financial liberalisation and allowing greater FDI in areas such as health, education and financial sectors are important for sustained growth in services exports. It is important for trade agreements to focus not only on the tariffs but also on issues such as intellectual property rights and standards, anti-dumping duties, countervailing measures to

increase trade between member and non-member countries, and increase the flow of FDI (Table XI.3).

Table XI.3 Summary of Projections for Parameters of External sector - 2037

(per cent)

Parameters	2036-37
Merchandise Exports to GDP	14.1
Merchandise Imports to GDP	24.0
Trade Balance to GDP	-9.9
Net Invisibles to GDP	7.4
Current Account Deficit to GDP	2.5

It can be concluded that the PSBs will continue operating with lower market share in 2036 while the share of the private sector banks would increase significantly. FinTech is expected to play an important role in achieving this by 2036. Apart from FinTech, NBFCs will also play a crucial role in reaching out to financially excluded sections, especially the micro segment of MSME's during the period 2022 to 2036.

Defence sector in India is expected to have an increased budget allocation, to upgrade defence capabilities and infrastructure to counter the scenario of a 2-front war and to safeguard the country from external threats given the geopolitical situation. By 2036, AI will have a significant role to play in defence, and more effort to increase R&D in defence is expected to increase, given the emerging geopolitical situation.

The studies show 42.0 per cent of the population will be in urban centres, out of which 70.9 per cent is expected to be in small or class I towns (Table XI.4). Therefore, policies must be framed to improve and diversify the composition of urban centres.

Table XI.4 Summary of Project of Urban Population

Parameter	2036
Urban Population (crore)	64.0
Urban Population Share in Total Population (per cent)	42.0

Source: Kundu and Mohanan (2022)

The Central government through privatisation and disinvestment is attempting to reduce the share of public enterprises and their presence is recommended to be reduced further to encourage more private enterprises to enter the market.

To address the issue of employment, an important sector with substantial potential is tourism which is expected to improve considerably by 2036-37. India's effort of Swachh Bharat, improvement in infrastructure, maintenance of law and order, and user-friendly basic amenities, can improve the number of tourists in India considerably. Also, the focus must shift to developing niche and relatively unexplored segments like medical, green and spiritual tourism.

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XII. Annexures

XII.1 Economic growth in India: Retrospect and Prospect - Prof. Surender Kumar, DSE

XII.2 Post-COVID Recovery and Long Run Forecasting Indian GDP with Factor-augmented Error Correction Model (FECM) - Prof. D. Maiti, DSE; Naveen Kumar, DSE; Dr. Debajit Jha, OP Jindal University and Soumyadipta Sarkar, Gallagher Re

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