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GENDER AND DEVELOPMENT

The Indian Economic Journal

One of the Oldest and fully Refereed Journal

The Journal, an organ of the Indian Economic Association aims at promoting scientific studies in Economic Theory, Growth and Structural change; Inequality and poverty; Employment and Labour market discrimination; Monetary Policy in India; Productivity and growth in the Inian Manufacturing; Trade and openness; Agriculture and Food Markets in India; Gender and Development and special session on Odisha Economy.

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Editor's Message

Dear Readers,

I am truly honored to edit the special issues of the Indian Economic Journal.

Indian Economy is 75 years' old. During this period, the economy has not only grown, but has diversified the production base with implications for employment and output. Indian economy has been working with a globalized world for more than three decades now. The issue of social safety and the distribution of the benefits of growth to the bottom layers of the income, wealth distribution have evoked interest in contemporary discussions of the Indian economy. An assessment of the successes and challenges faced by the economy is an important task before professional economists and the present conference is dedicated to this task.

The main theme of the 106th Annual Conference of the Indian Economic Association is focused on " Indian Economy @ 75 and @ G20: Approaches to Atmanirbhar Bharat" . Two major milestones have been picked up to visualize the deviations from the targets and the revisions in strategies over the year. The first one is the completion of 75 years of the working of the Indian economy , and second is India's receiving the Chairmanship of the Group of 20 nations in the world.

The major sectors and areas in which the economy has progressed and faced new challenges over the period are chosen for in-depth analysis during the conference. The sub themes are 1. Growth and Structural Change; 2. Inequality and Poverty; 3. Employment and Labour market Discrimination; 4. Monetary Policy in India; 5. Productivity and Growth in the Indian Manufacturing; 6. Trade and Openness; 7.Agriculture and Food Markets in India 8. Gender and Development and Special session on the Odisha Economy

The Indian Economic Journal (IEJ) is an important organ of the Indian Economic Association (IEA) that provides support and services to professionals and researchers both in India and overseas. For over a century the IEA has been one of the largest and the oldest body of teachers, researchers, academicians, and policy makers drawn from the background of Economics and affiliate discipline. Founded in 1917, the IEA is a, "not-for-profit, non-political, and scholarly" voluntary professional

association with membership open to those who fulfil the eligibility criteria laid by the constitution of IEA. Through regular outreach programs like, “Conferences, Courses, Publications and Seminars” IEA disseminates information among scholars to increase their understanding of economics. Both IEJ and IEA work in tandem encouraging members to share their research work findings and contribute scholarly articles in Annual Conferences and for publishing in special editions of the IEJ by maintaining relevance of the journal.

My special thanks and gratitude to our Patron Dr Prof. Achyuta Samanta, Patron, IEA. Hon’ble Member of Parliament. Founder, Kalinga Institute of Industrial Technology (KIIT University), Founder, Kalinga Institute of Social Sciences (KISS) Founder, Art of Giving for organizing this historic 106th Annual Conference at KIIT University during 27-29th December 2023. This special issue is being released at the 106th Annual Conference of the Indian Economic Association. My special thanks to Association President, Dr Tapan Kumar Shandilya for his valuable contribution for the growth of the Indian Economic Association.

The Indian Economic Journal was founded by Prof. C.N. Vakil and Prof. R Balakrishna in 1953 and has over the years become a coveted internationally acclaimed journal in Economics due to high ethical and quality standards maintained by successive editors. The IEJ is at present included in the ‘Abstract Services’ of the American Economic Association through their Journal of Economic Literature. I take the opportunity to acknowledge the contributions of Prof. Sukhadeo Thorat in transforming Conference Volumes of IEA into special editions of Indian Economic Journal and Dr. Anil Kumar Thakur, Chief Convener of IEA for taking efforts to sustain the quality and ratings of IEJ along with the Managing Editor of IEA, Prof. Sudhanshu Bhushan. I take this opportunity to thank all the secretaries for taking this to greater heights.

I would like to thank all the authors, and co-authors for their scholarly article contributions for the 106h Annual Conference. I also express my deepest gratitude to editorial team that is fully engaged and committed to the success of these outstanding volumes. I also thank all the authors, reviewers and the editorial support team, especially the services extended by Dr. Kumari Manisha, Dr. Nameirakpam Taibangnganbi, Dr. M. Dillip Anand, Dr. M. Abdul Jamal, Dr Pragathi Krishan and Dr S. Narayanan in bringing out the special issues of IEJ in scheduled time. Last but not the least, my sincere thanks to Mr. A. Aashik Ahamed and Mr. A. Mohideen, TAMCOS Ltd. Chennai and his team our print service provider for their neat execution and timely delivery of print collaterals.

Ravindra K. Brahme

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"The Role of Financial Inclusion in Promoting Economic Growth in Emerging Economies"

Deepti Taneja

Abstract

This review paper examines the role of financial inclusion in driving economic growth in emerging economies, with a focus on the transformative impact of digital financial services. Financial inclusion - providing accessible financial services to underrepresented populations - enables economic participation by expanding access to savings, credit, and insurance. The study analyses recent literature on the socioeconomic benefits of financial inclusion, including poverty reduction, income stability, and improved social mobility. Advances in digital technology, particularly mobile banking and other fintech solutions means that clients in often hard to reach geographies have been well catered for in recent years. However, the existing policies of financial inclusion have proven effective in several emerging markets, but barriers like the financial literacy and some regulatory impediments exist. It is clear from this paper that there is the need to encourage policy renovation to foster sustainable financial landscape and therefore recommend a focus on the application of newer technologies such as Artificial Intelligence and block chain in improving financial access.

Keywords: Financial inclusion, Economic Growth, Emerging Economies, socioeconomic.

Introduction

Access to financial services forms the core of development plans in the emerging markets where large sections of the population are still barred from mainstream banking. In the context of the emerging markets, characterized by poverty, a lack of infrastructure, and low financial literacy as barriers to people's and businesses' economic engagement, financial inclusion, or the ability of consumers and businesses to access low-cost, "basic financial products and services such as savings accounts, credit, insurance, and payment systems is essential" (Demirguc-Kunt et al., 2018). The idea that people and businesses are unable to save, invest or otherwise manage risks keeps poverty cycles and income gaps going (Beck et al., 2007).

In recent years, this subject of financial inclusion has come to be embraced as the model of development on economic, social, and poverty front. Research also shows that financial inclusion has the potential of increasing efficiency, equity in income and social mobility (Burgess and Pande, 2005). Crossing the ubiquity frontier in emerging economy where millions lack or under-banked, financial inclusion is instrumental not only for economic growth, but firmly established as social justice instrument that eliminates inequality (Klapper et al., 2016).

The progresses in ICT especially mobile money further reduced the threshold of financial exclusion (Mbiti & Weil 2016). Technological tools such as mobile money services, the creation of digital banking platforms and the use of fintech solutions has seen millions of people in areas with restricted physical branches gain access to services (Suri & Jack, 2016). This paper provides an overview of the existing literature regarding the effects of financial access on economic development particularly for emerging markets' and incorporating e-finance. Through theoretical frameworks, empirical studies, and case studies, this review highlights the effects of financial inclusion on poverty reduction, income stability, and economic growth.

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Objective

1. To explore the impact of financial inclusion on economic growth in emerging economies.
2. To analyse the role of digital financial technologies such as mobile banking and fintech in expanding financial services to underserved populations and promoting sustainable economic development.

Literature Review

Zhang et al., (2022) also examined digital financial inclusion by working on 28 emerging economies with regards to mobile money, internet connection, and GDP growth. They observed that digital financial services for consumers enhance economic growth particularly in LMI countries, that mobile banking encourages entrepreneurialism and policy actions advocating for digital networks and fintech. In a current research, Mwangi and Atieno (2021) examined the effects of inclusive finance for social mobility and poverty alleviation in SSA region. Based on survey data from six countries they noted that financial access enhance engagement in income generating activities and provide economic buffers.

They pointed to skills, including financial literacy or lack of identification, as constraints and recommend focused actions by the government to eliminate constraints. In their paper published in the Journal of Business Research, Sharma, et al., (2020) studied the regulation of financial, inclusion and fintech emerging economy. The following works compared Southeast Asia and Latin America and realized that while they push financial inclusiveness, they expose another set of risks like data privacy and fraud. They preached the "sandbox" regulatory model in an attempt to fight for innovation while protecting the consumers. Mbiti and Weil (2020) investigated the influence of mobile money for women social & economic development in Kenya. This study discovered that services in the savings, payments, and business sectors by comprising of mobile money services including "M-Pesa" enhanced the economic empowerment for female across the society, demonstrating that the use of financial services plays a central role in enhancing economic procurement for gender parity. The study by Kumar and Luthra (2020) looked into the impact of financial literacy on proper financial inclusion for the Southeast Asia region. They proved that financial literacy improves the usage of digital financial services and credit products and suggested that financial literacy must be integrated into digital finance strategies and interventions for optimal growth impact. This is anchored on economic theory regarding growth and development where financial inclusion is seen as ability of common people to participate in the economy proactively. Demirguc-Kunt, & levine (2007) prove that financial services lower the levels of poverty due to small business, saving and investment tools and risk management via insurance. As for financial services tailoring appropriately to clients' needs, they also promote capital formation, hence income stability. A survey confirmed the impact of financial inclusion on economic development and hence debt colonization. For instance, Burgess and Pande (2005) establish that the expansion of rural branches in India had a direct impact of reducing poverty level by a recognised rate. Observations from African countries also show that mobile banking services play the role of enhancing economic growth by expanding secure and easy banking services in the remote areas (Suri & Jack, 2016). Ihese studies suggest that small increment in financial liberalization can elicit large effects on growth most significantly in an area of low financial development. Mobile money is seen a phenomenon in the provision of financial services for the financially excluded. Companies such as M-Pesa; a mobile based money transfer service and payment system in Kenya has served the unbanked population by enabling transaction without the need for a bank account as in traditional financial mobile money services like. Mbiti & Weil (2016) warn about the fact that transaction costs are reduced with the help of mobile Banking which also has a direct impact on the rate of savings and the economy and poverty levels in emerging economy. Nonetheless, several constraints hinder the effectiveness of financial inclusion The advantages of financial inclusion are numerous However, the following areas present challenges to FI.

They include infrastructural developments, regulatory constraints, and inadequate financial enablement. These authors also mention that while digital services provide the solutions, the fact remains that people are not fully financially literate and also develop limited trust in those institutions. Besides, the legal environment in some countries may be vulnerable, which will be dangerous to both service providers and those who use the services of those providers. The policy measures for attaining financial inclusion have taken differences forms in different countries. “India’s Pradhan Mantri Jan Dhan Yojana (PMJDY)”, initiated in 2014, also created an agenda for increasing people’s access to financial freedom while offering lowest-cost goods. By 2021, it had opened over 400 million bank accounts, providing a large unbanked population with formal financial access (Reserve Bank of India, 2021). Kenya’s regulatory support for mobile banking has similarly driven widespread financial inclusion, especially in rural areas.

Theoretical Framework of the study

Figure 1: Theoretical Framework

Methodology

The methodology in this review paper essentials of a comprehensive review of the literature centre on the nature of the link between “financial inclusion and economic growth in emerging economies”. In this paper, the authors review assumptions of prior research, theoretical concepts, and case studies that examine the economic benefits of financial access and particularly digital technologies of mobile banking and fintech. Sources are academic journal articles, research reports, and reviews from different emerging economies. Such an approach allows analysing the impact of finance on economic development, reducing poverty, fostering income stability due to the inclusion of financial services through improved digital technologies, as well as reveal the problems arising from the limitation of financial literacy and evolving regulations. The methodology also includes comparing different approaches to regulation and various policy measures in order to evaluate the efficiency of the chosen measures for creating the conditions for effective financial inclusion.

Findings

Figure 2: Key findings of the study

1. The literature proves again and again that financial inclusion enhances the economic development in the following way; increased credit facilities, growth of small and medium enterprises, and income generation. Those countries that have invested on the subject of CFI like Kenya and India have reported significant improvements on poverty elimination and economic growth.
2. Mobile money and other online banking have played a crucial role of enhancing financial inclusion at the right time. This is evident through shifts as seen in the effect mobile banking services have brought in sub- Saharan countries where there many branches and facilities are scarce. These technologies bring down transaction costs and give people convenient and cheap financial tools in far-flung and marginalised communities.
3. The main difficulties established are financial rationality and rules and regulations. However, it possible to mention that one of the significant challenges, which hinder the financial inclusiveness of rural population, is absence of literacy on the basic financial products, while digital banking platforms are already available. Similar to similar global markets, legal frameworks for fraud protection, user privacy, and consumer protection must also be malleable to fit the technologically innovative environment.
4. The governments of emerging economies through implemented policies have improved efforts to increase financial inclusion. The India's PMJDY policy and Kenya's backing of mobile financial services are two great examples of the right approach on how policy and technology can help in fostering financial inclusion.

Conclusion

A major reason why financial inclusion is seen as relevant for economic development in developing world countries is, importantly, driving financial inclusion means that underbanked persons can improve their living standards and uplift themselves from poverty through attaining basic financial solutions. As it was said, the active usage of digital financial services especially in the developing countries with a weak base of the centralized formal financial system has boosted these results even more. However, issues such as financial education/training as well as regulatory constraints are dynamic policy issues that need constant policy formulation and implementation focused approaches. These initiatives are beneficial for emerging economies if they further develop their frameworks for supporting IFS effectively at the same time.

Recommendation

Future research directions for the study should focus on the more comprehensive research of the possible socio-economic consequences of the especially the role of the technology in digital financial inclusion across various population categories in emerging countries. More studies could be conducted

to understand how newer innovations like blockchain and artificial intelligence could help in improving the provision of financial services, and their part in making the processes more transparent and secure within FINS. Another potential direction relates to the analysis of cross-effects of financial inclusion measures on such important factors as gender equity, social status, and financial security in the absence of which maintaining financial literacy remains an issue in some areas.

Limitation

This research mainly relies on the published literature, which lacks dynamic and up-to-date documentation to capture the rapid development of digital financial inclusion technology. Moreover, although the review covers several emerging economies, generalization cannot be made over the global production network because of differences in regulating environment, infrastructure, and socio-economic conditions. Secrecy in informal financial transactions in the rural market and the recent onset of fintech in some economies also peg the study back.

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Inclusive Growth of India @75: Pillars and Prospects

Dinesh Kumar Gupta

Abstract:

Inclusive growth in India is an endeavour by the government for persons with developmental/intellectual disabilities in India. Its aim is to spread awareness to facilitate inclusion. A broad term, Inclusion, can mean different things for different people. For example, it means policies that include different economic Strata of society, it means gender equality, non-exclusion on the basis of religion, caste or creed and full participation of persons with disabilities in the society and place of work. In this research paper, the current status of inclusive growth in India and the economic growth process is analysed to show the lack of inclusivity in the country. Along with this, this paper identifies the pillars and various economic and social dimensions of inclusive growth and suggests policy measures. This paper provides evidence to show that inter- and intra-regional income inequalities are increasing along with India's economic growth and that poverty levels are much higher than previously estimated. Governments are trying to reduce it. It is also important that government and industry continue to deliver critical broadband infrastructure and all necessary services to accelerate the development potential of villages and towns. The government has made efforts at many levels for inclusive growth so that India's growth is not only continuous but also inclusive so that the benefits of development can be distributed equally to all sections of society.

Keywords: *Economic growth, Inclusive Growth, Inequalities, Equity, Inequality*

Introduction:

Inclusive growth refers to economic growth that creates employment opportunities and works towards reducing poverty. This means the poor classes have access to essential health and education services. This includes providing equal opportunity and empowering people through education and skill development. It also involves a development process that is environment-friendly, aimed at good governance and helps in building a gender-sensitive society. According to the OECD (Organization for Economic Co-operation and Development), inclusive growth is economic growth that is fairly distributed throughout society and creates opportunities for all. In other words, development creates new economic opportunities and ensures equitable access to such opportunities for all sections of society. Thus, inclusive growth refers to a situation where higher growth rates of GDP per capita are reflected in a situation where inequality of income and wealth is reduced. Inclusive growth focuses on providing basic amenities to all sections of the population, i.e. housing, food, drinking water, education, and health as well as generating means of livelihood to live a dignified life. At the same time, it is necessary to take care of environmental protection for inclusive development, because the development process on harm to the environment can neither be called sustainable nor inclusive.

In any country, the rapid sustained pace of poverty reduction requires inclusive growth. But to make this growth sustainable in the long term, it needs to be broad-based across all sectors. This definition of inclusive growth emphasizes the importance of both comprehensive and intensive growth. A rapid pace of growth and employment can be achieved through extensive development, which requires expanding the number of resources required. This definition shows the direct relationship between macroeconomic and microeconomic dimensions of growth. The macroeconomic dimension is consistent with the vast literature, which relies on Solow-Swann-balanced growth models

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(Solow, 1956; Swann, 1956) and generally considers the empirical redistribution of labour experienced by rapidly growing economies. The reallocation process, often called "structural change," has been documented by researchers such as Kuznets (1957) and Chenery (1960), but this literature ignores the Kaldor properties related to balanced growth. A more recent paper by Kongsamut, Rebelo, and Xie (2001) brings together these two strands of the literature by putting forward a theoretical model consistent with balanced growth and the dynamics of sectoral labour reallocation. Inclusive growth focuses on economic growth**,** which is a necessary and crucial condition for poverty reduction. It adopts a long-term perspective and is concerned both with the **pace** and **pattern** of growth. High pace of growth is important, but how growth is generated is critical for growth **sustainability** and for accelerating employment creation and poverty reduction.

Objectives of the Study:

1. Through this research paper, we have tried to find the concept of inclusive growth and its impact on the lower sections of society.

2. To study the measures and pillars of inclusive growth.

3. It has also tried to find the goal of rapid inclusive growth in India that can be achieved in the current and future.

4. To study what efforts have been made by the Government of India in this direction.

Research Methodology:

The research Design in the presented paper is descriptive and based on published secondary data on India's inclusive growth indicators. In this paper, we have used the Government of India and foreign institutions' published data, and from that, an attempt has been made to find conclusions and prospects of inclusive growth in India.

Initiatives of the Government for Inclusive Growth:

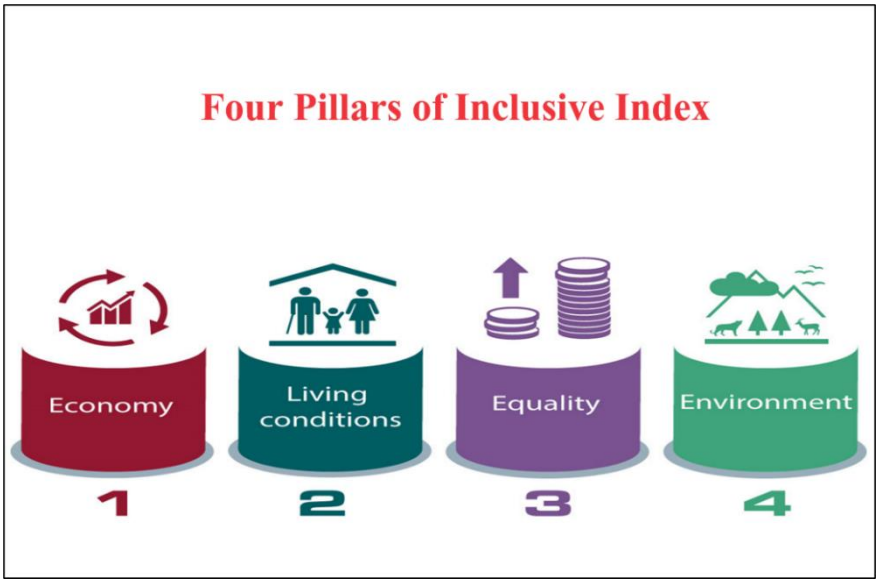
The concept of inclusive growth was first introduced by the government in the 11th Five-Year Plan. This scheme talks about improving the quality of life of people for all sections of society and providing them with equality of opportunities. The 12th Five Year Plan (2012-17) completely focused on inclusive growth and its theme was 'Rapid, Inclusive and Sustainable Growth'. In this plan, special emphasis was given to poverty, health, education and providing livelihood opportunities so that the growth rate of 8% prescribed in the plan could be achieved. Also, many schemes were started by the government to achieve inclusive growth like Deendayal Antyodaya Yojana, Integrated Child Development Programme, Mid-Day Meal, MNREGA, Sarva Shiksha Abhiyan etc. Many efforts were made to accelerate inclusive growth through financial inclusion schemes like mobile banking, Pradhan Mantri Jan Dhan Yojana, Pradhan Mantri Mudra Yojana, Senior Pension Insurance etc. Important schemes like Start-up India, Support to Training and Employment Program for Women, Mahila Entrepreneurship Forum and Pradhan Mantri Kaushal Vikas Yojana, Pradhan Mantri Krishi Irrigation Scheme, Pradhan Mantri Fasal Bima Yojana and National Food Security Mission have been implemented in this direction.

Table-1: Performance Indicators of Inclusive Growth:

Pillars	Performance Indicators
Growth and Development	High growth rate GDP (Per capita) Higher Labor Productivity Employment generation Healthy Life Expectancy
Inclusion	Median Household Income Income Gini Poverty Rate Wealth Gini
Intergenerational Equity and Sustainability	Adjusted Net Savings Dependency Ratio Public Debt (as a share of GDP) Carbon Intensity of GDP

UNCTAD's new Inclusive Growth Index shows countries' performance across four pillars: economy, living conditions, equality and environment.

Figure-1: Pillars of Inclusive Index



Source: https://unctad.org/

Economic performance:

From the 1960s to the end of the 1970s, India's economic growth rate averaged about 3.5% per year. In the 1980s, growth rates averaged about 5.5%. In the late 1980s, India's fiscal deficit increased significantly. India's balance of payments crisis in 1990–1991, after that, Indian policymakers initiated a number of measures aimed at reducing the role of the government in the economy. The industrial licensing system was largely abolished. A financial liberalization policy was also adopted. The Indian rupee was made convertible on the current account and the dual exchange rate system was abolished.

All this, found result in positive accelerated economic growth, although reported inequality in growth rates, and economic reforms were immediately implemented.

Table 2: India GDP Growth Rate - Historical Data

Year	GDP Growth (%)	Year	GDP Growth (%)
2021	8.68	1996	7.55
2020	**-6.60**	1995	7.57
2019	3.74	1994	6.66
2018	6.45	1993	4.75
2017	6.80	1992	5.48
2016	8.26	1991	1.06
2015	8.00	1970	5.16
2011	5.24	1966	**-0.06**
2001	4.82	1965	**-2.64**
2000	3.84	1964	7.45
1998	6.18	1962	2.93
1997	4.05	1961	3.72

Source: World Bank, Macrotrends (Online)

Figure 2: GDP Growth Rate of India

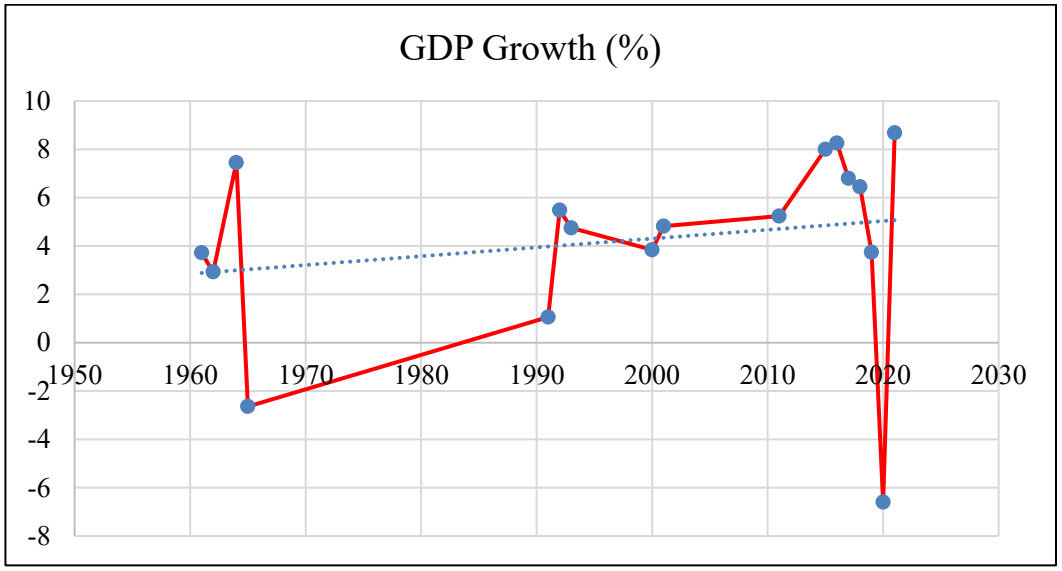
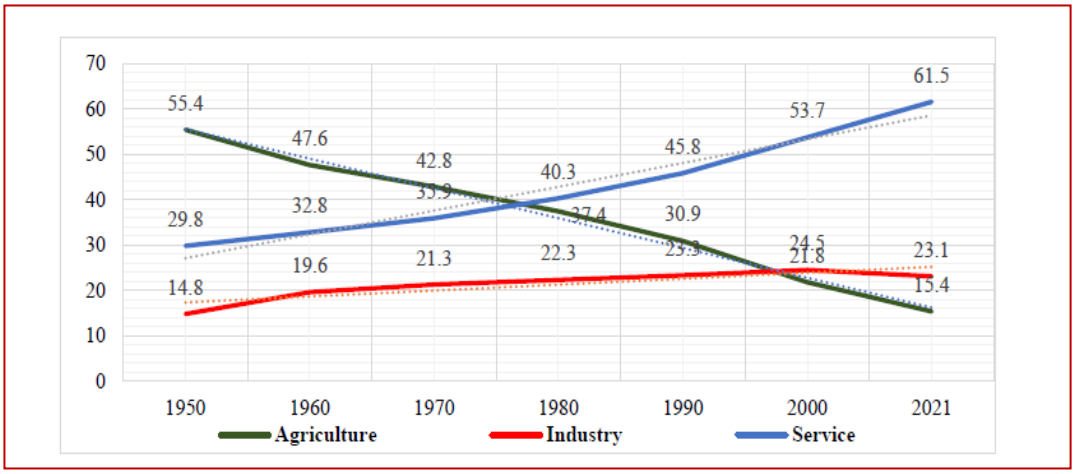


Figure 3: Sectoral Composition of Gross Domestic Product (%)



Source: Economic Survey (various years), Ministry of Finance, Govt. of India.

The average annual growth rate in the 1990s was only around 5.6 %. The growth rate increased to about 7 % in the new millennium and continued at about the same level until 2008. In the six years since the global recession of 2008–2009, growth rates have averaged about 7.5 %, largely due to massive fiscal stimulus. It decreased during Covid 19 but currently, it has increased slightly.

Table 3: Growth across various sectors of the Indian Economy

Sr. No.	Sector of the Economy	Growth Rate at Basic Prices 2022-23
1	Agriculture and Allied Activities	3.5%
2	Industrial Sector	4.1%
3	Services	9.1%

Source: Economic Survey 2022-23

NITI Aayog's Strategy for New India @75 As Inclusive Growth:

NITI Aayog's Strategy for New India @75 has the following objectives for inclusive growth:

- To have a rapid growth, which reaches 9-10% by 2022-23, which is inclusive, clean, sustained and formalized.
- To Leverage technology for inclusive, sustainable and participatory development by 2022-23.
- To have an inclusive development in the cities to ensure that urban poor and slum dwellers including recent migrants can avail city services.
- To make schools more inclusive by addressing the barriers related to the physical environment (e.g.

accessible toilets), admission procedures as well as curriculum design.

- To make higher education more inclusive for the most vulnerable groups.
- To provide quality ambulatory services for an inclusive package of diagnostic, curative, rehabilitative and palliative care, close to the people.
- To prepare an inclusive policy framework with citizens at the center

Current scenario of Inclusive growth of India:

The advance GDP estimates for the year 2022-23 is around 7% and GDP growth of 6.0-6.8 per cent is expected in 2023-24, depending on the trajectory of economic and political developments globally. The optimistic growth forecasts stem from a number of positives like the rebound of private consumption, higher Capital Expenditure (Capex), near-universal vaccination coverage, return of migrant workers to work in construction sites, the strengthening of the balance sheets of the corporates and well-capitalized public sector banks for credit supply including others. Further support to economic growth comes from the expansion of public digital platforms and path-breaking measures such as PM GatiShakti, the National Logistics Policy, and the Production-Linked Incentive schemes to boost manufacturing output. India remained an outlier among major economies, with an expansionary composite Purchasing Managers' Index (PMI) reading in December 2022.

Ten Priorities by 2030:

Aspirations across 10 Priorities for Sustainable, Inclusive Growth			
Sector/themes	**Drivers**	**From (2022)**	**To (2030)**
Agriculture	Exports ($Bn)	$50Bn	$100 Bn
Manufacturing	High value exports in prioritized value chains	$140bn	$400bn
Consumer Tech	E-retail transactors (#)	160 Mn	770 Mn
IT / ITES	Workforce trained in digital skills (%)	25-30%	100%
Financial services	MSME Formal Credit Lending (%)	<40%	>80%
Healthcare	Medical Doctors per 10,000 pop.	7-8	20
Infrastructure and Logistics	Logistics Costs (% of GDP)	13-14%	8-10%
Emerging energy	Share of RE Generation capacity	155GW	500GW
Water	Households with Tap Water Connections	50%	100%
Education	Higher education Gross enrolment ratio	27%	40-50%

Source: Achieving sustainable, inclusive growth, A roadmap for India. December 2022

Conclusion:

By this research paper, we found that economic development and inclusive growth are continuing in the Indian economy. In the last few years, the growth rate of GDP has been 7 to 8% annually. The post-reform policy period has seen an increase in inequalities between some sectors of society and rural-urban areas, but we found there has also been a decline in social inequality in many areas. There is a need for broad-based and inclusive development for the benefit of all sections of the society. The Indian economy has changed a lot in the last 60 years. Tremendous structural change is likely in the next 40 years. Government efforts will empower vulnerable and marginalized populations through inclusive growth, improve livelihoods and help in skill development for women.

An attempt has been made here to list some important initiatives which will ease the path of inclusive growth -

1. To create opportunities for quality education and secure a future for the weaker section of the society.

2. Create opportunities for good and decent jobs and secure livelihoods.

3. Support inclusive and sustainable business practices.

4. To promote better government policies, fair with accountable public institutions.

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Tax Smoothing Behaviour in India in the Post Reform Period

Shruti Priya

Abstract

The government incurs different kinds of expenditure in the process of discharge of its various functions. These expenditure may be permanent or temporary in nature and are financed by either taxes or incurring public debt. Taxes usually carry the burden of distorting effects in the economy. Thus, public debt is preferred to finance expenditure unless it is permanent in nature. Tax smoothing is the phenomenon representing a situation where the tax rates do not fluctuate on year on year basis except for the case when a change of permanent nature occurs in government expenditure in the economy. The present paper examines the tax smoothing behaviour in India in the post reform period. The study makes use of unit root, auto-regression and Vector Autoregressive framework to ascertain the case for tax smoothing in India.

Key words: Tax smoothing, government expenditure, unit root, auto-regression, Vector Autoregressive framework

Introduction

The government incurs different types of expenditure for the systematic running of the country and requires finance to undertake different types of programmes in the fulfilment of its responsibilities of a welfare state. Public revenue is an important source of finance to the government to enable it to discharge its duties. There are different sources of public revenue. These are tax revenue as well as non tax revenues. The taxes carry the burden of distortionary effect with them. Hence non tax revenue is preferred as a source to finance public expenditure until it is permanent in nature.

Tax smoothing is an important tool of fiscal policy. The concept was first developed by Barro (1979). Theoretically the tax smoothing hypothesis means that the tax rates remain unchanged unless propelled by a shock. Such a shock refers to changes in public expenditure. Public expenditure can be permanent as well as temporary in nature. The tax rate in the economy is determined by permanent government expenditure. Any change in permanent government expenditure is borne by changes in tax rate. However, any change in government spending which is temporary in nature must be financed by changes in deficits and debt. This is because a change in tax rates brings tax distortions along with it. Thus, the government relies less on altering tax rates. Thus, tax rates change only to meet changes in government spending which is permanent in nature.

The present paper explores the tax smoothing behaviour in context of India during the post liberalisation period. The study makes use of variables like tax rates, public expenditure and growth rate using the techniques of unit root, auto-regression and Vector Autoregression (VAR) to evaluate the tax smoothing hypothesis. The paper is divided into five sections. Section I presents the review of literature and conceptual framework. Section II deals with data and methodology used in the study. Further Section III presents descriptive statistics. The results and discussions of the study have been presented in section IV and section V presents the conclusion.

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Section I

Review of Literature

What is Tax Smoothing?

It has been propounded by Beatrice (2017) that tax smoothing as a concept means minimizing the distortions associated with taxation. Given the concept of balanced budget constraint, it means that planned tax rate overtime will be constant. Thus, the theory of tax smoothing also points to the larger fact that any temporary deviation of expenditure is financed through a debt and hence forms the basis of public debt management.

Tax Smoothing Cases

There is no dearth of literature confirming tax behaviour by different economies at different times. It has been found in an empirical study by Barro (1979 and 1981) that there are evidences in favour of tax smoothing in the United States of America. Similar results have been found in case of Australia for the period 1949/1950-1984/1985 by Kingston and Layton (1986).

In one of the studies by Bohn (1991) it has been seen that for post war data in US there are evidences of tax smoothing. Similar results of tax smoothing have been found by Ghosh (1995) in case of US and Canada for the period 1961-1988

In a pioneering study by Huang and Lin (1993) evidences have been put forth explaining the optimal tax behaviour. It has been explained that optimal tax rate is determined by permanent changes in public expenditure and it is public debt that is affected by temporary change in public expenditure. In the same study the hypothesis of tax smoothing has been rejected for data for the period 1929-1988 but has been accepted for the post 1947 period. This is due to difference in statistical properties of the two different samples.

Following this line of thought, Huang and Lin (1993) employ US data for the 1929-1988 period and are able to reject the tax smoothing hypothesis for the full sample, but they are unable to reject it for the post1947 period. They suggest that the rejection of the hypothesis should be attributed to difference in statistical properties of different samples and conclude that the tax smoothing hypothesis provides a good approximation to the tax rates in the post-1947 period. Similarly Strazicich (2002) has discovered for industrialized countries for the period 1955-1988 that changes in tax rate are unpredictable, which implies the existence of tax smoothing hypothesis in these countries.

Lloyd-Ellis et al (2005) have developed a tax smoothing model with stochastic interest rates and concluded that behaviour of debt/GDP ratios for the US in 1980s is consistent with the idea of tax smoothing. However, Lloyd-Ellis et al (2005) also argue that a departure from optimal tax smoothing behaviour takes place during the late 1990s. Adler (2006) tests the tax smoothing hypothesis for Swedish data between 1952-1999 and fails to reject the tax smoothing hypothesis for the full period but rejects it for the period of 1970-1996. Adler (2006) has claimed that although it is statistically rejected, visual evidence still supports a tax smoothing and concludes that the tax smoothing model provides a useful benchmark. Recently, Jayawickrama and Abeysinghe (2013) have found evidence for a weak form of tax smoothing using annual data for Australia, Canada, Italy, the Netherlands, the UK and the US. Similarly Karaka et al (2014) have found in case of Turkey for the period from 1923 to 2011 that the tax rate series display non-stationarity, thus extending support to tax smoothing.

However, there are cases which provide evidences against tax smoothing as well. Malley et al (2002) have found that in a general equilibrium framework the policy of keeping tax rate constant overtime to minimize the distorting impact of tax on growth is followed as reflected in a panel study involving 22 OECD countries for the period 1970-1996. Olekalns (1997) has argued that there are evidences against the tax smoothing hypothesis and argues that in case of optimal provision of public goods and countercyclical policies the distortionary effect of tax is something given lesser weight and tolerated.

In one of the studies by Sahasakul (1986) it has been found that there are other variables apart from permanent government spending and an initial public debt which go into the determination of the marginal tax rate. These are temporary defence purchases, the general price level and trend. This means that there is not uniform taxation over time.

Tax Smoothing Hypothesis: A Mathematical Derivation

Two ways to ascertain tax smoothing hypothesis have been discussed here. The concept of tax smoothing has been borrowed from Barro(1979). The model as developed by Barro (1979) is based on the principle of equating the present value of government expenditure and debt with the present value of taxes.

$$\sum_1^\infty \frac{G_t}{(1+r)^t} + b_0 = \sum_1^\infty \frac{\tau_t}{(1+r)^t} \quad \text{.....(1)}$$

Where,

G_t = public expenditure net of interest payments on public debt at time period t

τ_t = real tax revenue obtained in time period t.

r = the real rate of interest assuming constant prices.

The above framework allows for the determination of present value of taxation as well as the time pattern of taxes.

However the collection of taxes involves costs which are also referred to as 'dead weight loss'. The present value of the costs of taxation depends on the type of tax and timing of taxes. The present value of given costs is given by:

$$Z = \sum_1^\infty \tau_t f(\frac{\tau_t}{Y_t})/(1+r)^t \quad \text{....(2)}$$

Where

Z= total collection costs of taxes

t = 1,2,3...∞

Y_t = Real income or taxable resources

The model does not take into consideration the composition of taxes rather focuses on its timings. In each time period the government has a set of planned series of expenditure to be met out of real income, a real rate of interest and an initial stock of debt.

The solution of optimization here involves minimizing equation 2 by taking equation 1 as a constraint. This means that the government needs to choose the tax rates, τ_t, in each time period so as to minimize the dead weight loss subject to equation 1. The first order condition here requires that the marginal cost for raising tax must be the same in all periods. This constancy of tax to income ratio is the main

proposition of tax smoothing hypothesis. This leads to empirical implication of the model that the tax rates follow a random walk as tax rates are unpredictable.

The model explores the tax smoothing hypothesis by testing the unpredictability of changes in tax rates. This suggests that tax rates do not follow a pattern and are not affected by changes in public expenditure or growth rate of GDP. The method goes beyond using unit root test and employs autoregressive tests for lagged values of tax rates as well as Vector Autoregressive model to test if public expenditure and GDP growth rate affect the tax rates Kurniawan (2011). The model takes the following form:

$$T_t = a + b_1 W_{t-1} + \cdots + b_p W_{t-p} + u_t \quad \ldots(3)$$

Where,

W_{it}= vector of endogenous variables

u_t = vector of residual

Section II

Data and Methodology

The present paper examines the tax smoothing behaviour in the context of India since the implementation of the New Economic Policy in 1991. The tax smoothing hypothesis postulates that it is not the tax rate rather the deficits that vary in as the government expenditure changes until the changes are permanent in nature. Accordingly the variables used in the study are tax rate in India (T), public expenditure rate of the government of India (Z) and rate of growth of real Gross Domestic Product (g). The tax rate (T), as used in the study, has been calculated by taking the real tax revenue as a ratio of real GDP. For this the tax revenue comprising of both direct and indirect taxes of the government exclusive of the payments made to state governments out of the revenue collected has been taken. The public expenditure rate (Z) has been calculated by taking real public expenditure as a ratio of real GDP where public expenditure includes all the expenditure of the government. Only the real values of all the variables have been taken by deflating it with Wholesale Price Index with base 2004-05. The growth rate of real GDP (g) has been calculated with base 2004-05. The methodology used has largely been borrowed from the work of Kurniwan (2011) and Beatrice (2017).

Empirical Strategy

The empirically testable tax smoothing hypothesis has been presented as mathematical derivation in section II above. The earlier works analyse the tax smoothing hypothesis by considering the response of primary surplus/deficit to changes in government debt, temporary government expenditure and business cycle indicator Bohn (1990). The criterion based on tax rate was developed by Barro (1979) which entails the constancy of tax rates at all times unless public expenditure of permanent nature occurs in the economy. In the present paper the methodology based on constancy of tax rates has been used to assess the tax smoothing behaviour. The autoregressive analysis has been run in two steps. In the first step the values of tax rates have been regressed against its own lagged values (an autoregressive model) and the relation is explored to examine the impact of lagged values on current rates. If the lagged values do not have an impact on the current rate it means that the rates are not determined by past values and hence are independently determined and do not exhibit a pattern. This is in accordance with the tax smoothing behaviour. In the next step a Vector Autoregressive Model (VAR) has been constructed using tax rate as regressand and public expenditure rate and GDP growth rate as regressors to check if other variables have an influence on tax rate. As per the tax smoothing behaviour other variables do not have an impact on tax rates. Before running the autoregressive models the variables have been tested for stationarity using the Augmented Dickey Fuller Test. In fact a test for unit root

suffices for exploring if a pattern exists in tax rates. Unit root test checks if time series is non-stationary, that is, possesses a unit root. Before examining the results of unit root test the paper presents some descriptive statistics of the variables.

Section III

Descriptive Statistics

Descriptive statistics for the data series are displayed in table 1 below.

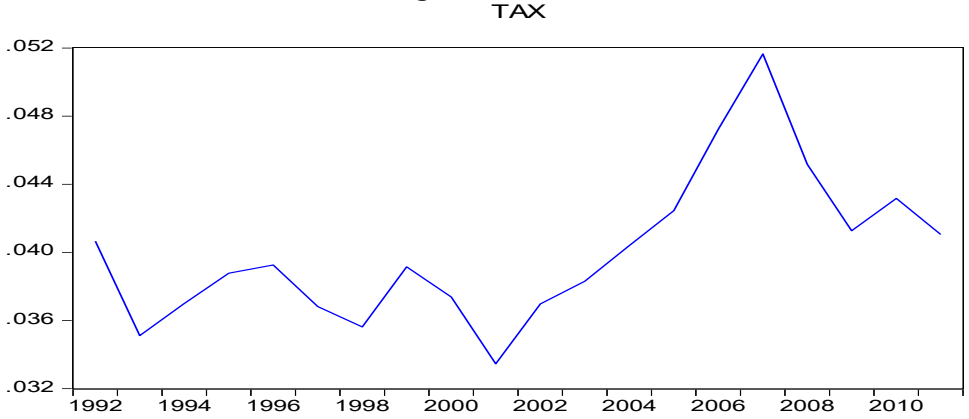
Table 1: Descriptive statistics

Descriptive statistics	Tax Rate	Public Expenditure Rate	Growth Rate
Mean	0.040041	0.0889	6.97
Median	0.039205	0.0897	6.88
Maximum	0.051651	0.0965	9.56
Minimum	0.033449	0.0784	3.87
Standard Deviation	0.004358	0.005	1.77

Source: Author's own calculation from RBI data.

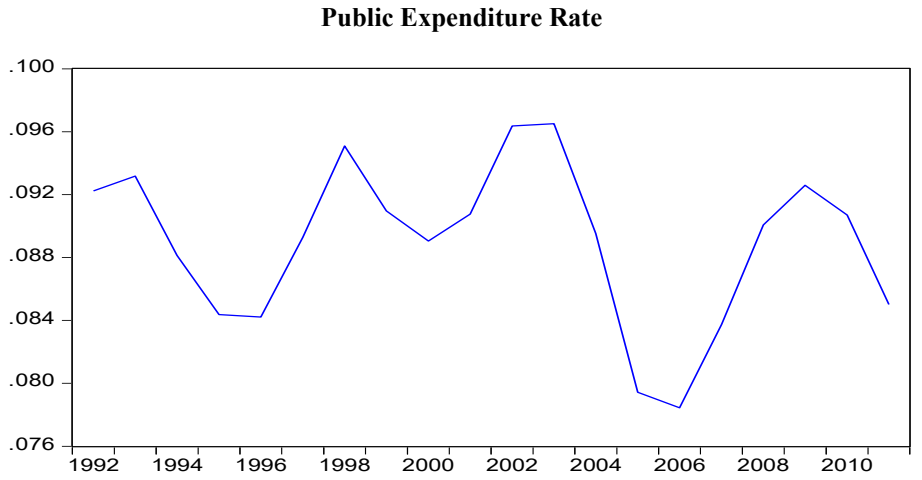
Figures 1 to 3 below present the trend in the behaviour of the variables used in the study. As can be seen the tax rates have fluctuated around lower rates till early 2000s and increased sharply thereafter reaching the peak level in 2006 and declined gradually further. Similarly the public expenditure also remained fairly stable till 2004 after which it witnessed a sharp decline and further increased after 2006. The trend rate of GDP growth rate narrates the success story of the nation. It can be derived from the graphical analysis of the trend rates of tax rates and public expenditure rates that movements in tax rates have not been in consonance with movement in public expenditure. The tax rate has not risen in the period after 2006 when the public expenditure has shown an upward trend. This confirms the tax smoothing hypothesis that the expenditure has not been met by taxes. This suggests that the government has resorted to other methods to finance its expenditure.

Figure 1: Trend in tax rate



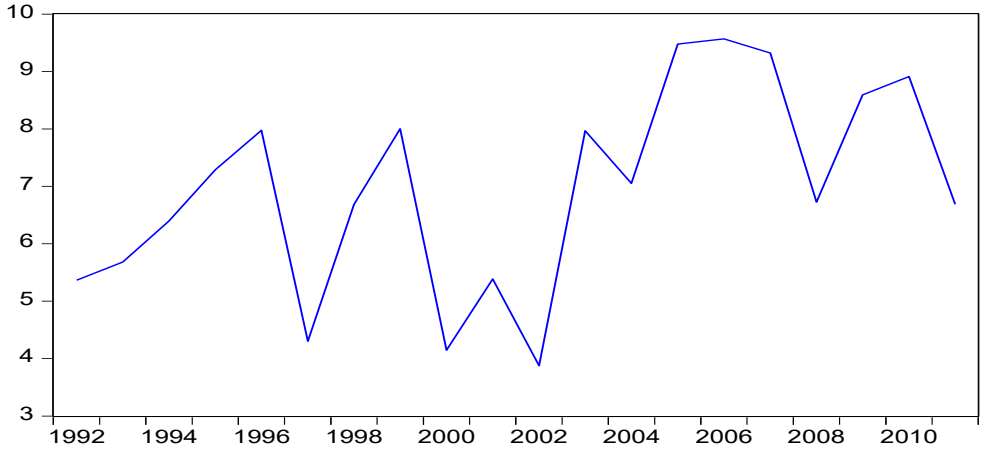
Source: Author's own calculation from RBI data

Figure 2: Trends in public expenditure as a percentage of GDP



Source: Author's own calculation from RBI data

Figure 3: Trends in GDP growth rate between 1992 and 2011



Source: Author's own calculation from RBI data

Section IV

Result and Discussion

The test of stationarity of the individual series has been conducted using the Augmented Dickey Fuller Test. The model assumes that all the variables are a random walk with drift and linear trend. The null hypothesis is that there is a unit root. The results of the Augmented Dickey Fuller Test have been presented in the table 2 below.

The results show that tax rate series has got unit root in level form and becomes stationary after taking the first difference. This means that the series is not mean reverting. The rate of public expenditure is stationary in the level form. Again the GDP growth rate is also not stationary in the level form rather is integrated of order two.

Table 2: Test of Stationarity

Variable	Test Equation Type	Order of Integration	ADF Test Statistics*
Tax Rate (T)	Intercept and trend	1	-4.197082
Public Expenditure Rate (Z)	Intercept and trend	0	-5.449565
Growth rate (g)	Intercept and trend	2	-3.029970
GVAR	Intercept and trend	2	-4.076120

Source: Author's own calculation from RBI data.

*at 5 percent level of significance.

In order to asses if the lagged values of tax rates affect the current rate, an autoregression has been run taking the lagged values of the tax rate as independent variable. The results of such an autoregression show that the lagged values of tax rate do not have an impact on the tax rate in the current period. This shows that the changes in tax rates are not influenced by tax rates prevailing in the previous periods thus confirming the tax smoothing behaviour. The equation of the following form has been taken:

$$T_t = a + b_1 T_{t-1} + b_p T_{t-2} + e_t \quad \text{.....(4)}$$

Where,

T_t = tax rates at time t

A maximum lag of two has been taken which is in conformity with the LM test of residuals. The probability values associated with the coefficient of the lagged variable in equation 4 is more than 5 percent meaning that they are do not have a significant impact on the dependent variable. Thus, confirming the case for tax smoothing.

Further to assess the impact of other factors on tax rate a Vector Autoregressive (VAR) model has been constructed where the independent variables include public expenditure, growth rate and lagged values of tax rates. Thus, a Vector Autoregressive Model has been run. The results of the analysis show that

the coefficients associated with the lagged values of the variables are not significant in explaining changes in the dependent variable. The tax rates do not exhibit any systematic factor reflecting that deviation in expenditure are met by incurring debt and not by altering the tax rates frequently. This is in line with the tax smoothing behaviour. The equation of the following form has been taken in the VAR analysis:

$$T_1 = \alpha + \beta_1 T_{t-1} + \cdots + \beta_p T_{t-p} + \gamma_1 Z_t + \cdots + \gamma_p Z_{t-p} + \delta_1 g_t + \cdots + \delta_p g_{t-p} + \mu_t \quad ...(5)$$

Where,

T_i = Tax rate in time period i

Z_i = Public expenditure rate in time period i

g_i = Growth rate of real GDP in time period i

μ_t = vector of residuals

The results of the VAR analysis have been presented in table 3 below:

Table 3: Results of VAR Analysis

Variable	Tax Rate	Public Expenditure	Growth Rate
TAX(-1)	0.857585	-0.166596	358.4697
	(0.45154)	(0.42428)	(313.279)
	[1.89925]	[-0.39266]	[1.14425]
TAX(-2)	0.051928	-0.063796	110.5641
	(0.26026)	(0.24455)	(180.569)
	[0.19952]	[-0.26087]	[0.61231]
PUBEXP(-1)	-0.298164	0.852781	-128.0207
	(0.25058)	(0.23545)	(173.850)
	[-1.18991]	[3.62196]	[-0.73639]
PUBEXP(-2)	0.092620	-0.875144	160.2562
	(0.22797)	(0.21421)	(158.169)
	[0.40628]	[-4.08544]	[1.01320]
GROWTHRATE(-1)	0.000341	-0.000574	-0.378282
	(0.00081)	(0.00076)	(0.56019)
	[0.42189]	[-0.75706]	[-0.67528]
GROWTHRATE(-2)	-0.001257	-7.91E-05	-0.491631
	(0.00091)	(0.00085)	(0.62840)
	[-1.38747]	[-0.09297]	[-0.78236]
C	0.028476	0.104439	-8.416971
	(0.02368)	(0.02225)	(16.4282)
	[1.20261]	[4.69410]	[-0.51235]
R-squared	0.737295	0.831145	0.235101
Adj. R-squared	0.594002	0.739042	-0.182116
Sum sq. Resids	8.80E-05	7.77E-05	42.37518

S.E. equation	0.002829	0.002658	1.962725
F-statistic	5.145353	9.024112	0.563498
Log likelihood	84.51273	85.63364	-33.24661
Akaike AIC	-8.612526	-8.737072	4.471846
Schwarz SC	-8.266270	-8.390816	4.818101
Mean dependent	0.040281	0.088570	7.131313
S.D. dependent	0.004440	0.005203	1.805216
Determinant resid covariance (dof adj.)		3.94E-11	
Determinant resid covariance		9.00E-12	
Log likelihood		152.2821	
Akaike information criterion		-14.58691	
Schwarz criterion		-13.54814	

Source: Author's own calculation from RBI data

The p-values associated with the independent variables in equation 6 is more than 5 percent. This means that the independent variables are not significant in explaining the changes in the dependent variable. Thus, it means that the government in order to avoid the distorting effect of taxes relies on non-tax sources of revenue to finance its expenditure.

The maximum lag taken in the model is two and has been in line with the results of LM test of VAR Residuals as presented below in table 4. The results show that the LM test show that the probability value is more than 5 percent and thus the null hypothesis of no autocorrelation cannot be rejected when a lag of two is taken.

Table 4: Results of LM Test of VAR Residuals

Lags	LM-Stat	Probability
1	6.262920	0.7133
2	2.577351	0.9787
Probs from chi-square with 9 df.		

Source: Author's own calculation from RBI data

Again as far as test of stability of the VAR model is concerned the results show that the roots of the characteristic equation lie within the unit circle. The results of the VAR stability test have been presented in table 5 below. And thus the model is stable.

Table 5: Results of VAR Stability Analysis

Root	Modulus
1.000000 - 2.94e-16i	1.000000
1.000000 + 2.94e-16i	1.000000
0.447743 - 0.764171i	0.885681
0.447743 + 0.764171i	0.885681
-0.091908 - 0.765538i	0.771035
-0.341575 + 0.351052i	0.489807
-0.313680	0.313680

VEC specification imposes 2 unit root(s).

Source: Author's own calculation from RBI data

Section V

Conclusion

The results of the discussion show that there are evidences of tax smoothing behaviour in India during the period1992-2014. These results are confirmed by all the tests namely unit root, autoregression as well as VAR modelling. The tax rates do not show any systematic pattern. Further variations in public expenditure do not significantly affect the tax rates. This explains that the government with the aim of minimizing the distorting effect of taxes eyes on non tax sources to finance its expenditure and does not vary the tax rates much. Thus, empirical analysis systematically reflects evidences in favour of tax smoothing in India in the post reform period.

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Performance Appraisal of Bank of Baroda as Bareilly District Lead Bank for the Priority Sector Lending Under the Lead Bank Scheme

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Abstract

This paper is an effort to study the performance of the Bank of Baroda as Bareilly District Lead Bank for priority sector lending under the lead bank scheme, the flagship programme of the RBI for facilitation of the formal credit flow through the mandatory target of 40 per cent of the total advances rendered by the banks to the neglected priority sectors of the Indian economy.The analytical study is based on the Bareilly district only. The performance appraisal is done for the achievements of targeted funds for the priority sectors viz. agriculture & allied sector, non-farm sector and other priority sectors for the period from 2011-12 to 2022-23. The statistical tools like paired t-test and ANOVA is used.

It has been found that there is a high degree of positive correlation between targets and achievements for agricultural & allied sector and non-farm sector (MSME sector), while a positive correlation for other priority sectors. The performance of achievements has been increased form 105 percent to 109 per cent of the targeted funds.

Keywords: Lead Bank, Performance Appraisal, Priority Sector, Agriculture & Allied Sector, Non-Farm Sector (MSME Sector), Other Priority Sector

INTRODUCTION

In all nations, regardless of their level of development, the establishment of a sophisticated banking system can facilitate the attainment of economic and distributive fairness. Banks facilitate the aggregation of individuals' modest financial savings and allocate them towards optimal and efficient purposes by means of credit expansion. Although the practise of banking by local merchants is recognised in ancient Indian communities. The establishment of formal banking in India can be historically attributed to the initiation of the business association with the East India Company. In 1850, a provision was established for the registration of joint-stock corporations in India, building upon the English Joint Stock corporations Act of 1844. The Joint Stock Companies Act was enacted in 1866. The majority of joint-stock banks in India during this period were under European ownership and management. During the early 20th century, the swadeshi movement advocated for the construction of several joint stock banks, which were owned and operated by Indian capital and under Indian administration. The swadeshi movement led to the establishment of several joint inventory banks, including the Punjab Countrywide Financial Institution Ltd. (1895), the Financial Institution of India Ltd. (1906), the Bank of Baroda Ltd. (1908), the Financial Institution of India Ltd. (1911) and the United Industrial Bank Ltd. (1943). India is host to around 18% of the global population, although occupying a mere 2.41% of the Earth's land area (www.worldometers.info). According to the 2011 census, around 72.2 percent of the population in India resides in approximately 638,000 villages, while the remaining 27.8 percent is distributed throughout 100 towns and over 380 metropolitan areas. The Indian economy is significantly dependent on the economic activity of rural areas. The primary sources of seasonal employment for rural communities are agriculture and its associated activities.

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Nevertheless, the banking industry was mostly centred in the port cities of Bombay, Calcutta, Chennai, the capital city of Delhi, and a few other prominent urban centres. Business banks have historically played a crucial role in meeting the credit needs of corporate entities by offering loans at reduced interest rates through government subsidies. Despite the acceptance of cash deposits from the general people into their savings accounts, commercial banks refrained from extending loans to these individuals. Consequently, individuals among the general population were compelled to satisfy their credit requirements by resorting to the informal cash market, where interest rates were excessively inflated.

As a result, the Reserve Bank of India (RBI) established the National Credit Council (NCC) on December 22, 1967, with the aim of creating a platform for deliberating and evaluating credit priorities within the Indian context. The primary objective of the Council was to provide support to the Reserve Bank of India (RBI) and the government in identifying and implementing strategies aimed at facilitating access to credit in rural areas. In late October 1968, the National Coordinating Committee (NCC) established a study group led by Professor D.R. Gadgil to oversee the development of an organisational framework for the implementation of social objectives. The Gadgil study group wastasked to identify significant territorial and functional credit gaps and provide recommendations to address. The objective was to ensure that sufficient institutional credit, with favourable terms, could be accessed by marginalised sectors, neglected areas, and vulnerable segments of the community (High-Level Committee to Review the Lead Bank Scheme, 2009).

The Reserve Bank of India (RBI) has established a Committee, led by Shri F. K. F. Nariman, to oversee and evaluate the Public-Sector Banks'Branch Expansion Programme. The report of the Nariman Committee was officially submitted in the month of November in the year 1969. The concept of the area approach was supported by it. The public sector banks have the potential to achieve their social obligations by strengthening the weaker and unbanked parts of our society. To effectively carry out this responsibility, they should prioritise particular regions where they have a widespread presence and may act as the lead bank. The recommendation was adopted by the Reserve Bank of India (RBI), leading to the announcement of the 'Lead Bank Scheme' in December 1969. The High-Level Committee to Review the Lead Bank Scheme (2009)placed significant importance on designating specific banks in each district as the primary means of local development. These banks were tasked to identify growth centres, evaluate deposit potential, identify gaps in credit availability, and develop a synchronised approach to credit development within their respective districts. This collaborative effort involved coordination with other banks and credit institutions.

Each district was allocated to a designated bank, either public or private, which assumed the role of the lead bank responsible for coordinating branch expansion and credit planning endeavours. The primary bank was required to assume the role of a consortium leader in order to effectively coordinate with all financial institutions in the designated area for the purpose of expanding branches in regions without banking services. This coordination was also necessary to address the financial requirements of priority sectors, particularly agriculture and related industries. The Bank of Baroda designated as the Lead Bank for the Bareilly district in the state of Uttar Pradesh.

This study aims to evaluate the performance of various priority sectors, namely the agriculture and allied sector, the non-farm sector (specifically the MSME sector), and other priority sectors, in order to assess their contribution towards achieving the targeted funds under different schemes of the lead bank. The successful implementation of the district credit plan is crucial in attaining these funds.

Literature review:

Literature review provide a comprehensive review of the existing literature on the chosen topic.Conducting a thorough evaluation of existing literature is a crucial step in any research endeavour, as it serves to prevent duplication of studies and provides novel perspectives for future investigations. The review of literature serves as a valuable resource for researchers as it offers a conceptual foundation for their research endeavours. The next section provides a summary of the literature review conducted for this research project.

The Committee to Review Arrangements for Institutional Credit for Agriculture and Rural Development (CRAFICARD) was established by the Reserve Bank of India (RBI) on March 30, 1979. The committee was chaired by Shri B. Sivaraman. The research underscored the need of assessing rural lending systems in India and proposed the creation of a national bank dedicated to agricultural and rural development. The establishment of the National Bank for Agriculture and Rural Development (NABARD) took place through the enactment of Act 61 by the Indian Parliament in the year 1981 and founded on July 12, 1982, while officially inaugurated on November 5, 1982, by Prime Minister Smt. Indira Gandhi, with the objective of serving the nation.

According to Ganesan's (1998) study, there was a significant increase in public-sector bank advances for priority sectors over a period of time. The advances grew with an average annual growth rate (AGR) of 19.2 percent. The proportion of advances provided by public-sector banks experienced a notable increase from 9.78 percent in 1969 to 16.6 percent of total bank credit in 1997. The use of a streamlined financial institutional approach for evaluating the operational capital needs of small-scale enterprises has enhanced the prompt availability of loans to facilitate their expansion. According to Shahjahan's (1999) research on the obligatory objective of advancing loans to priority sectors, it was seen that banks successfully achieved the target of allocating 40% of their total loans to these sectors by increasing the scope of priority sectors. In a study conducted by Kareemulla (2008), it was observed that the rate of improvement in credit flow was comparatively slower in Uttar Pradesh and throughout India. The study specifically focused on the correlation between bank credit for agriculture and farm indebtedness. Nevertheless, due to the relatively limited reach of the banking infrastructure in rural regions, the accessibility of credit in Uttar Pradesh was merely 75% of the national average. However, it is noteworthy that the state's contribution to agricultural production accounted for 20% of the whole national production. However, a significant obstacle was the considerable level of indebtedness among a substantial number of farmers in the state. Ensuring appropriate adherence to credit regulations was of utmost importance in revitalising the agricultural credit circulation within the state. During the mid-term assessment of the annual policy for the fiscal year 2007-08, the Reserve Bank of India (RBI) established a High-Level Committee to evaluate the Lead Bank Scheme. This committee was headed by Smt. Usha Thorat, who served as the Deputy Governor of the RBI. As to the study, the LBS serves as the exclusive platform for high-ranking bank and government officials to convene at both the state (SLBC) and district (DCC) levels, facilitating discussions on diverse shared concerns. Parvathy (2010) examines the theoretical framework and practical challenges associated with the Service Area Approach (SAA) in the context of credit planning by lead bank. The objective of the SAA is to enhance the process of credit planning at the village level, with the intention of aligning it with the anticipated devolution and development duties of local organisations. This study highlights the significance of local governments in enhancing the quality of lending and establishing a connection between lending activities and output and productivity. The criticality of integrating loan-making plans with economic activities outlined within the government's improvement plans lies in its potential to facilitate credit expansion in the priority sector. The study suggested that credit plans which lack integration with grassroots development plans may provide counterproductive outcomes.Surendran and Manoharan (2012) as well as Parameshwari and Saravanan (2014) argue that an integrated approach should be

adopted by the Lead Bank in order to evaluate the growth potential of a district and effectively address the credit requirements of certain target groups. Minimising the discrepancy between actual fund achievement and targeted fund achievement should be prioritised by adopting a pragmatic approach.

OBJECTIVE OF THE STUDY:

The main objective is to study the performance appraisal of Bank of Baroda as Bareilly district lead bank for priority sector lending. The data of the Bareilly district lead bank has been used for the purpose of performance appraisal and trend analysis.

HYPOTHESES

In order to achieve the above-mentioned objective of the study, the following hypotheses were formulated for testing:

H_{01}: There is no significant difference in the targets and achievements of the targeted funds for the agriculture and the allied sector.

H_{02}: There is no significant difference in the fund targets and achievements of targeted funds for the non-farm sector (MSMEs sector).

H_{03}: There is no significant difference in the fund targets and achievements of the targeted fund for the other priority sectors.

H_{04}: There is no significant difference in the targets and achievements of the targeted funds for the total priority sector.

RESEARCH METHODOLOGY

This research paper is an analytical study based on the secondary data only. The secondary sources including the annual credit plans of the lead bank of the Bareilly district (Bank of Baroda), and the RBI bulletins about the lead bank schemewere utilised for data collection. The targets and achievements of targeted funds for the priority sectors, viz., the agriculture & allied sector, the non- farm sector, and the other priority sectors have been analysed for the period from 2011-2012 to 2022- 2023. The various statistical tools like mean, standard deviation, Karl Pearson's coefficient of correlation, paired 't' test, and One-Way ANOVA have been used for better performance appraisal.

DATA ANALYSIS AND FINDING

The data was segregated and tabulated for better presentation and analysis. The performance appraisal has been done through the targets and achievements of targeted funds for the priority sectors. Karl Pearson's correlation coefficient has been used to establish the relationship between the targets and the achievements of the targeted funds for the priority sectors. One-way ANOVA test and the paired ‘t' test are used for hypothesis-testing to determine the presence of any significant difference between targets and the achievements of the targeted fund for priority sectors.

Performance Appraisal of Bank of Baroda as Bareilly District Lead Bank for Agriculture & Allied Sector:

The data of fund targets and achievements of the targeted funds for the agriculture and allied sector for twelve years from 2011-12 to 2022-23 is summarized in Table 1. The ratio of the achievement to the target is used for trends presentation.

Table 1: Targets and Achievements of Targeted Fund for the Agriculture and Allied Sector

(`in lakhs of Rs.)

Year	Target	Achievement	Performance (%)	Increase/ Decrease
2011-2012	26,140	17,634	67.46%	--
2012-2013	33,962	26,506	78.05%	10.59%
2013-2014	45,450	22,217	48.88%	-29.16%
2014-2015	51,060	35,742	70.00%	21.12%
2015-2016	48,937	43,558	89.01%	19.01%
2016-2017	59,163	46,387	78.41%	-10.60%
2017-2018	66,630	71,586	107.44%	29.03%
2018-2019	68,111	85,293	125.23%	17.79%
2019-2020	76,227	66,787	87.62%	-37.61%
2020-2021	79,321	71,353	89.95%	2.34%
2021-2022	83,106	83,105	100.00%	10.04%
2022-2023	88,084	1,02,396	116.25%	16.25%

Source: Annualcreditplans,leadbankBareillydistrict

From the above table, it is noted that the performance of the agriculture & allied sector has increased from 67.46 per cent in the year 2011- 2012 to 116.25 percent in the year 2022-2023. The performance of agriculture & allied sector displays negative trends with high fluctuations for every third year except for 2022-2023. Moreover, in the years 2012-2013, 2014-2015, 2015-2016, 2017-2018, 2018-2019, 2020-2021, 2021-2022 and 2022-2023 the performance shows positive trends whereas in the years 2013-2014, 2016-2017, and 2019-2020, it shows negative trends.

Figure 1: Performance of Agriculture and Allied Sector

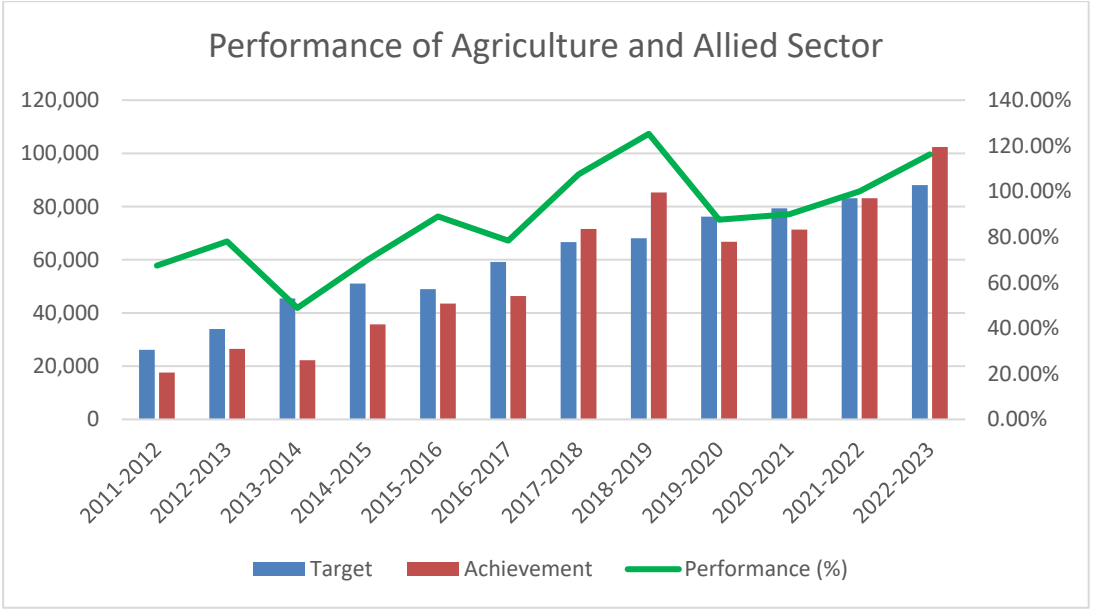


Table 2: Paired t-Test Analysis of Targets and Achievements of Targeted Funds for Agriculture and Allied Sector

Paired t-Test		
	Target	Achievement
Mean	60515.91667	56047
Variance	391359975	771005212.2
Observations	12	12
Pearson Correlation	0.931246979	
df	11	
t Stat	1.311741529	
P(T<=t) one-tail	0.1081621	
t Critical one-tail	1.795884819	
P(T<=t) two-tail	0.216324199	
t Critical two-tail	2.20098516	

*Source:*Author calculation

Form above Paired t-Test analysis table, it is evident that:

1. Correlation coefficient is 0.931 which shows a high positive correlation between targets and achievements of targeted funds for agriculture& allied sector.

2. Decision about the null hypothesis (H_{01}: There is no significant difference betweentargets and achievements of targeted funds for the agriculture &allied sector).

Since it is observed that t = 0.216 <tc = 2.20, then concluded that the null hypothesis is accepted.

One-Way ANOVA is used to analyse targets and achievements of targeted funds for agriculture and allied sector. The null hypothesis, H_0: there is no significant difference in the average performance score of targets and achievements of targeted funds for agriculture and allied sector.

Table 3: One-Way ANOVOA Analysis

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1.2E+08	1	1.2E+08	0.206178	0.654227	4.30095
Within Groups	1.28E+10	22	5.81E+08			
Total	1.29E+10	23				

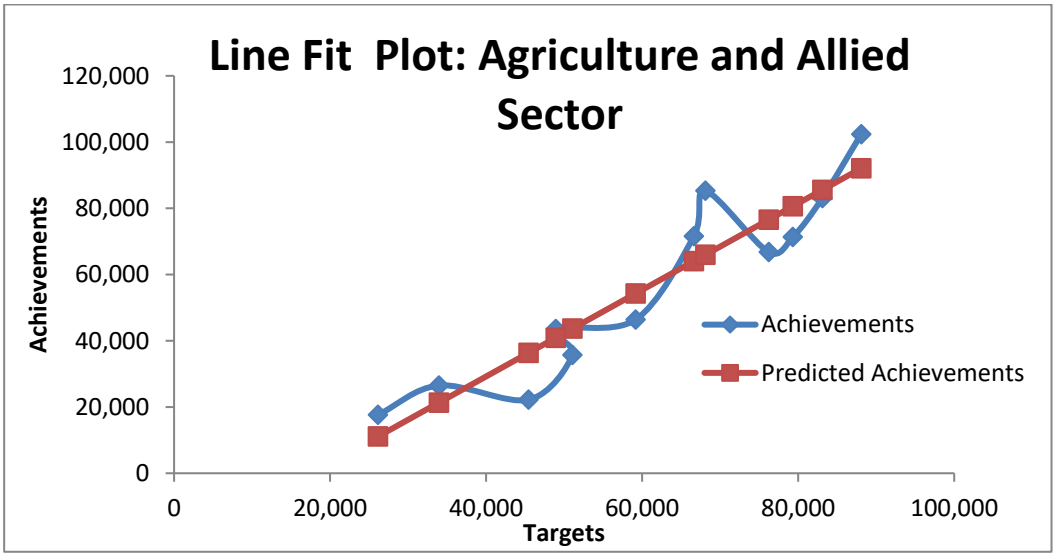
*Source:*Author calculation

From table 3,

1. The p-value (0.654) is more than 0.05.
2. The value of F test (0.206) is less than the critical value of F (4.301).

Thus, the null hypothesis is accepted.There is no significant difference in the average performance score of targets and achievements of targeted funds for agriculture and allied sector.

Figure 2: Line Fit Plot for Agriculture and Allied Sector



Performance Appraisal of Bank of Baroda as Bareilly District Lead Bank for Non-Farm Sector (MSME Sector):

The data of fund targets and achievements of the targeted funds for the non-farm sector (MSME sector) for twelve years from 2011-12 to 2022-23 is summarised in Table 4. The ratio of the achievement to the target is used for trends presentation.

Table 4: Fund Targets and Achievements of Targeted Fund for the Non-Farm Sector (MSME Sector)

(`in lakhs of Rs.)

Year	Target	Achievement	Performance (%)	Increase/ Decrease
2011-2012	6,510	2,822	43.35%	--
2012-2013	6,825	3,753	54.99%	11.64%
2013-2014	5,305	4,713	88.84%	33.85%
2014-2015	2,773	5,440	196.18%	107.34%
2015-2016	5,856	8,595	146.77%	-49.40%
2016-2017	5,392	4,723	87.59%	-59.18%
2017-2018	7,913	7,175	90.67%	3.08%
2018-2019	8,527	4,104	48.13%	-42.54%
2019-2020	9,147	8,943	97.77%	49.64%
2020-2021	10,607	55,929	527.28%	429.51%
2021-2022	11,559	53,680	464.40%	-62.88%
2022-2023	19,716	76,115	386.06%	-78.34%

*Source:*Annualcreditplans,leadbankBareillydistrict

From the above table, it is noted that the performance of the non-farm sector (MSME sector) has increased from 43.35 per cent in the year 2011- 2012 to 386.06 percent in the year 2022-2023. The performance of non-farm sector displays positive trends with high fluctuations. Moreover, in the years 2012-2013, 2013-2014, 2014-2015, 2017-2018, 2017-2018, 2019-2020, and 2020-2021 the performance shows positive trends whereas in the years 2015-2016, 2016-2017, 2018-2019, 2021-2022, and 2022-2023, it shows negative trends.

Figure 3: Performance of non-farm Sector

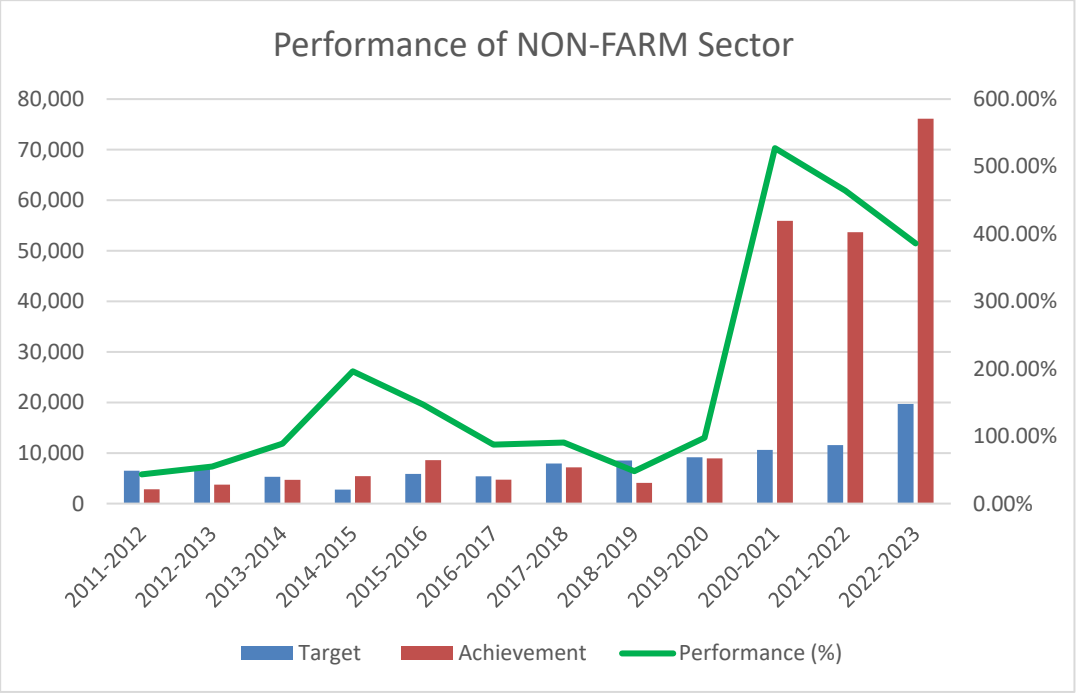


Table 5: Paired t-Test Analysis of Targets and Achievements of Targeted Funds for Non-Farm Sector

Paired t-Test		
	Target	Achievement
Mean	8344.166667	19666
Variance	18771887.61	680036918.2
Observations	12	12
Pearson Correlation	0.867933534	
df	11	
t Stat	-1.74928535	
P(T<=t) one-tail	0.054025177	
t Critical one-tail	1.795884819	
P(T<=t) two-tail	0.108050353	
t Critical two-tail	2.20098516	

Source: Author calculation

Form above Paired t-Test analysis table, it is evident that:

1. Correlation coefficient is 0.8679 which shows a high positive correlation between targets and achievements of targeted funds for non-farm sector.

2. Decision about the null hypothesis (H_{02}: There is no significant difference between targets and achievements of targeted funds for the non-farm sector).

Since it is observed that t = 0.108<tc = 2.20, then concluded that the null hypothesis is accepted.

One-Way ANOVA is used to analyse targets and achievements of targeted funds for non-farm sector. The null hypothesis,H_0: that there is no significant difference in the average performance score of targets and achievements of targeted funds for non-farm sector.

Table 6: One-Way ANOVOA Analysis

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	7.69E+08	1	7.69E+08	2.201184	0.152091	4.30095
Within Groups	7.69E+09	22	3.49E+08			
Total	8.46E+09	23				

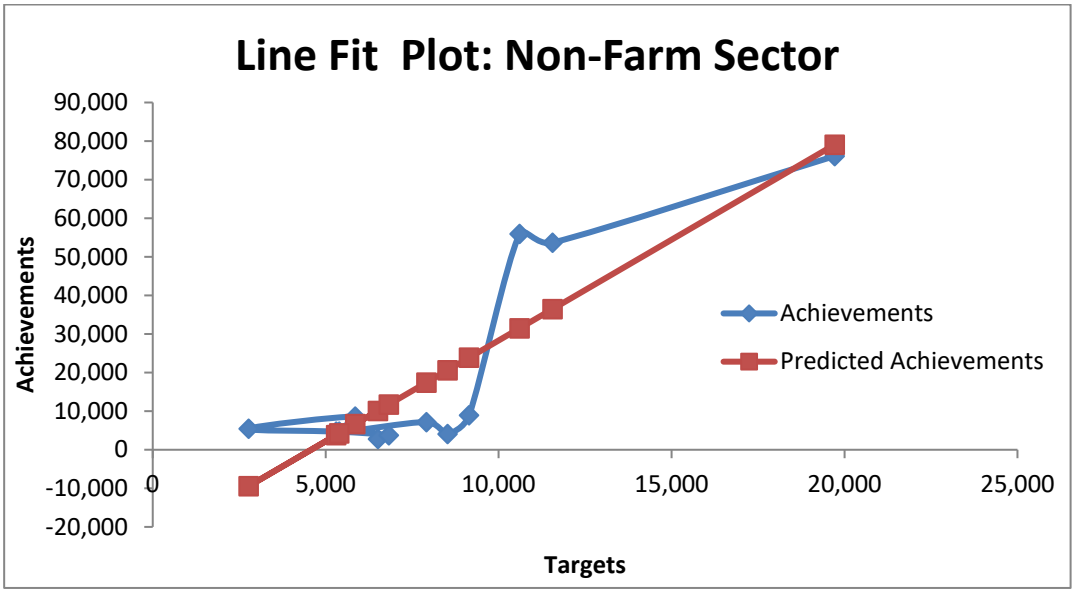
Source: Author calculation

From table 6,

1. The p-value (0.152) is more than 0.05.
2. The value of F test (2.201) is less than the critical value of F (4.301).

Thus, the null hypothesis is accepted. There is no significant difference in the average performance score of targets and achievements of targeted funds for non-farm sector.

Figure 4: Line Fit Plot for Non-Farm Sector



Performance Appraisal of Bank of Baroda as Bareilly District Lead Bank for Other Priority Sectors:

The data of targets and achievements of the targeted funds for the other priority sectors for twelve years from 2011-12 to 2022-23 is summarised in Table 7. The ratio of the achievement to the target is used for trends presentation.

Table 7: Targets and Achievements of Targeted Fund for the Other Priority Sectors

(`in lakhs of Rs.)

Year	Target	Achievement	Performance (%)	Increase/ Decrease
2011-2012	1,720	1,430	83.14%	--
2012-2013	1,780	1,123	63.09%	-20.05%
2013-2014	1,825	772	42.30%	-20.79%
2014-2015	6,111	3,000	49.09%	6.79%
2015-2016	4,012	3,394	84.60%	35.50%
2016-2017	5,076	3,287	64.76%	-19.84%
2017-2018	7,070	4,750	67.19%	2.43%
2018-2019	8,458	4,433	52.41%	-14.77%
2019-2020	9,804	9,105	92.87%	40.46%
2020-2021	9,931	10,131	102.01%	9.14%
2021-2022	10,131	19,482	192.30%	90.29%
2022-2023	11,437	31,979	279.61%	87.31%

*Source:*Annualcreditplans,leadbankBareillydistrict

From the above table, it is noted that the performance of the other priority sectors has increased from 83.14 per cent in the year 2011- 2012 to 279.61 percent in the year 2022-2023. The performance of other priority sectors displays positive trends with high fluctuations. Moreover, in the years 2014-2015, 2015-2016, 2017-2018, 2019-2020, 2020-2021, 2021-2022, and 2022-2023 the performance shows positive trends whereas in the years 2012-2013, 2013-2014, 2016-2017, and 2018-2019, it shows negative trends.

Figure 5: Performance of Other Priority Sectors

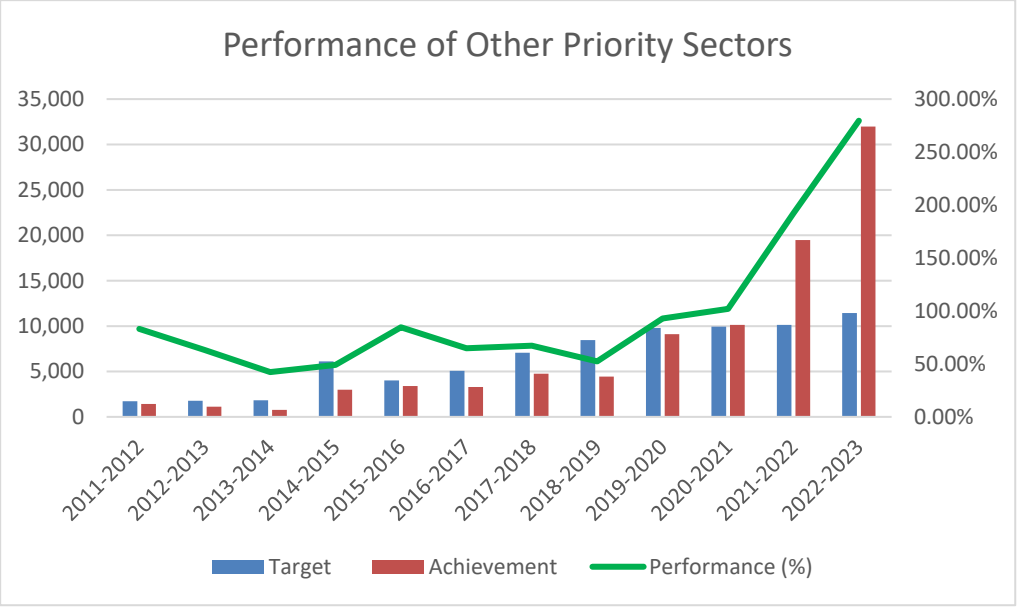


Table 8: Paired t-Test Analysis of Targets and Achievements of Targeted Funds for Other Priority Sectors

Paired t-Test		
	Target	Achievement
Mean	6446.25	7740.5
Variance	12701997	86018043
Observations	12	12
Pearson Correlation	0.769541	
df	11	
t Stat	-0.64816	
P(T<=t) one-tail	0.265088	
t Critical one-tail	1.795885	
P(T<=t) two-tail	0.530177	
t Critical two-tail	2.200985	

Source: Author calculation

Form above Paired t-Test analysis table, it is evident that:

1. Correlation coefficient is 0.769 which shows a positive correlation between targets and achievements of targeted funds for other priority sectors.

2. Decision about the null hypothesis (H_{03}: There is no significant difference between targets and achievements of targeted funds for the other priority sectors).

Since it is observed that t = 0.530<tc = 2.20, then concluded that the null hypothesis is accepted.

One-Way ANOVA is used to analyse targets and achievements of targeted funds for other priority sectors. The null hypothesis, H_0: there is no significant difference in the average performance score of targets and achievements of targeted funds for other priority sectors.

Table 9: One-Way ANOVOA Analysis

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	10050498	1	10050498	0.203616	0.656234	4.30095
Within Groups	1.09E+09	22	49360020			
Total	1.1E+09	23				

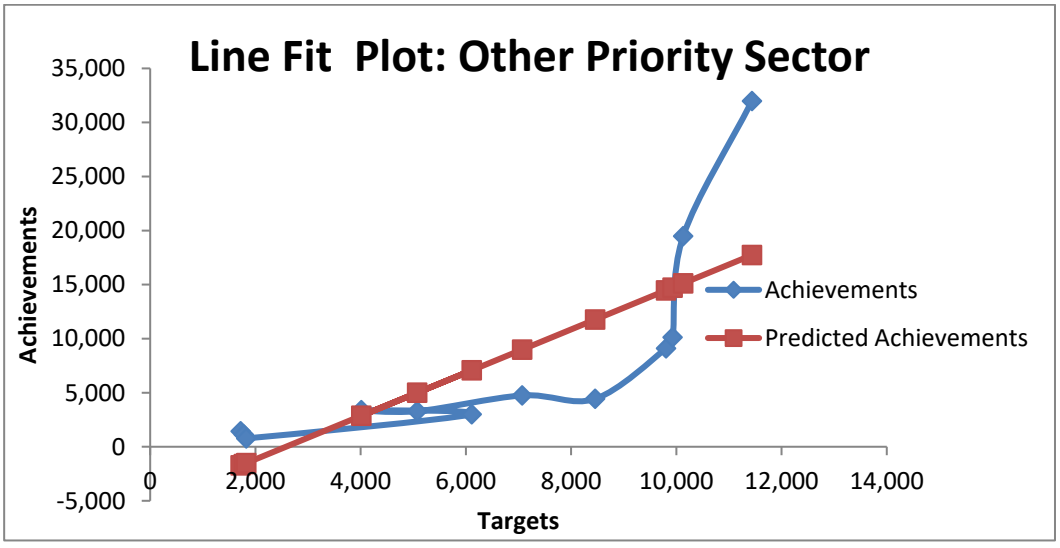
*Source:*Author calculation

From table 9,

1. The p-value (0.656) is more than 0.05.
2. The value of F test (0.204) is less than the critical value of F (4.301).

Thus, the null hypothesis is accepted. There is no significant difference in the average performance score of targets and achievements of targeted funds for other priority sectors.

Figure 6: Line Fit Plot for Other Priority Sectors



Performance Appraisal of Bank of Baroda as Bareilly District Lead Bank for Priority Sectors Targets:

The data of targets for priority sector lending for twelve years from 2011-12 to 2022-23 is summarised in Table 10. The ratio targets to the total priority sector target is used for trends presentation.

Table 10: Targets for the Priority Sectors Lending in Bareilly District

(`in lakhs of Rs.)

Year	Agriculture and Allied Sector		Non-Farm Sector		Other Priority Sectors		Total Priority Sector Targets
	Targets	% of Total Targets	Targets	% of Total Targets	Targets	% of Total Targets	
2011-2012	26,140	76.05%	6,510	18.94%	1,720	5.00%	34,370
2012-2013	33,962	79.78%	6,825	16.03%	1,780	4.18%	42,567
2013-2014	45,450	86.44%	5,305	10.09%	1,825	3.47%	52,580
2014-2015	51,060	85.18%	2,773	4.63%	6,111	10.19%	59,944
2015-2016	48,937	83.22%	5,856	9.96%	4,012	6.82%	58,805
2016-2017	59,163	84.97%	5,392	7.74%	5,076	7.29%	69,631
2017-2018	66,630	81.64%	7,913	9.70%	7,070	8.66%	81,613
2018-2019	68,111	80.04%	8,527	10.02%	8,458	9.94%	85,096
2019-2020	76,227	80.09%	9,147	9.61%	9,804	10.30%	95,178
2020-2021	79,321	79.43%	10,607	10.62%	9,931	9.95%	99,859
2021-2022	83,106	79.30%	11,559	11.03%	10,131	9.67%	1,04,796
2022-2023	88,084	73.87%	19,716	16.54%	11,437	9.59%	1,19,237

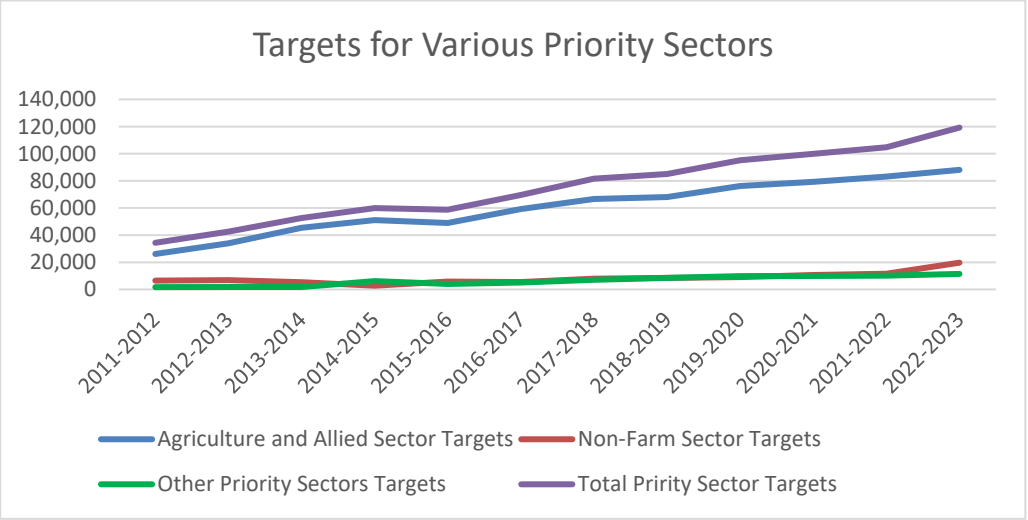
From table 10,

1. The targets for agriculture and allied sector range from 73 to 86 per cent of the total priority sector lending targets.

2. The targets for non-farm sector (MSME Sector) range from 4 to 18 per cent of the total priority sector lending targets.

3. The targets for other priority sectors range from 3 to 10 per cent of the total priority sector lending targets.

Figure 7: Targets for Various Priority Sectors



One-Way ANOVA is used to analyse targets for various priority sectors. The null hypothesis, H_0: There is no significant difference in the average performance score of targets for various priority sectors.

Table 11: One-Way ANOVOA Analysis

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2.26E+10	2	1.13E+10	80.15946	2.15E-13	3.284918
Within Groups	4.65E+09	33	1.41E+08			
Total	2.72E+10	35				

Source: Author calculation

From table 11,

1. The p-value (2.15E-13) is less than 0.05.

2. The value of F test (80.159) is more than the critical value of F (3.285).

Thus, the null hypothesis is rejected. There is significant difference in the average performance score of targets for various priority sectors.

Performance Appraisal of Bank of Baroda as Bareilly District Lead Bank for Priority Sectors Achievements:

The data of achievements for priority sector lending for twelve years from 2011-12 to 2022-23 is summarised in Table 12. The ratio achievements to the total priority sector achievements is used for trends presentation.

Table 12: Achievements for the Priority Sectors Lending in Bareilly District

(`in lakhs of Rs.)

Year	Agriculture and Allied Sector		Non-Farm Sector		Other Priority Sectors		Total Priority Sector Achievements
	Achievements	% of Total ACH	Achievements	% of Total ACH	Achievements	% of Total ACH	
2011-2012	17,634	80.57%	2,822	12.89%	1,430	6.53%	21,886
2012-2013	26,506	84.46%	3,753	11.96%	1,123	3.58%	31,382
2013-2014	22,217	80.20%	4,713	17.01%	772	2.79%	27,702
2014-2015	35,742	80.90%	5,440	12.31%	3,000	6.79%	44,182
2015-2016	43,558	78.42%	8,595	15.47%	3,394	6.11%	55,547
2016-2017	46,387	85.27%	4,723	8.68%	3,287	6.04%	54,397
2017-2018	71,586	85.72%	7,175	8.59%	4,750	5.69%	83,511
2018-2019	85,293	90.90%	4,104	4.37%	4,433	4.72%	93,830
2019-2020	66,787	78.73%	8,943	10.54%	9,105	10.73%	84,835
2020-2021	71,353	51.93%	55,929	40.70%	10,131	7.37%	1,37,413
2021-2022	83,105	53.18%	53,680	34.35%	19,482	12.47%	1,56,267
2022-2023	1,02,396	48.65%	76,115	36.16%	31,979	15.19%	2,10,490

From table 12,

1. The achievements for agriculture and allied sector range from 48 to 90 per cent of the total priority sector lending achievements.

2. The achievements for non-farm sector (MSME Sector) range from 4 to 40 per cent of the total priority sector lending achievements.

3. The achievements for other priority sectors range from 2 to 15 per cent of the total priority sector lending achievements.

Figure 8: Achievements for Various Priority Sectors

One-Way ANOVA is used to analyse achievements for various priority sectors. The null hypothesis, H_0: There is no significant difference in the average performance score of achievements for various priority sectors.

Table 13: One-Way ANOVOA Analysis

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	*1.52E+10*	*2*	*7.6E+09*	*14.83083*	*2.54E-05*	*3.284918*
Within Groups	*1.69E+10*	*33*	*5.12E+08*			
Total	*3.21E+10*	*35*				

***Source**:*Author calculation

From table 13,

1. The p-value (2.54E-05) is less than 0.05.

2. The value of F test (14.830) is more than the critical value of F (3.285).

Thus, the null hypothesis is rejected. There is significant difference in the average performance score of achievements for various priority sectors.

Performance Appraisal of Bank of Baroda as Bareilly District Lead Bank for Total Priority Sectors Lending:

The data of targets and achievements of targeted fund for priority sector lending for twelve years from 2011-12 to 2022-23 is summarised in Table 14. The ratio achievements to targets is used for trends presentation.

Table 14: Targets and Achievements for Total Priority Sectors Lending in Bareilly District

(`in lakhs of Rs.)

Year	Total Priority Sector Targets	Total Priority Sector Achievements	Performance (%)	Increase/ Decrease
2011-2012	34,370	36,090	105.00%	
2012-2013	42,567	44,347	104.18%	-0.82%
2013-2014	52,580	54,405	103.47%	-0.71%
2014-2015	59,944	66,055	110.19%	6.72%
2015-2016	58,805	62,817	106.82%	-3.37%
2016-2017	69,631	74,707	107.29%	0.47%
2017-2018	81,613	88,683	108.66%	1.37%
2018-2019	85,096	93,554	109.94%	1.28%
2019-2020	95,178	1,04,982	110.30%	0.36%
2020-2021	99,859	1,09,790	109.95%	-0.36%
2021-2022	1,04,796	1,14,927	109.67%	-0.28%
2022-2023	1,19,237	1,30,674	109.59%	-0.08%

Source: Annualcreditplans,leadbankBareillydistrict

From the above table, it is noted that the performance of the total priority sectors has increased from 105 per cent in the year 2011- 2012 to 109.59 percent in the year 2022-2023. The performance of total priority sectors displays positive trends with mild fluctuations. Moreover, in the years 2014-2015, 2016-2017, 2017-2018, 2018-2019, and 2019-2020 the performance shows positive trends whereas in the years 2012-2013, 2013-2014, 2015-2016,2020-2021, 2021-2022, and 2022-2023, it shows negative trends.

Figure 9: Performance of Total Priority Sectors

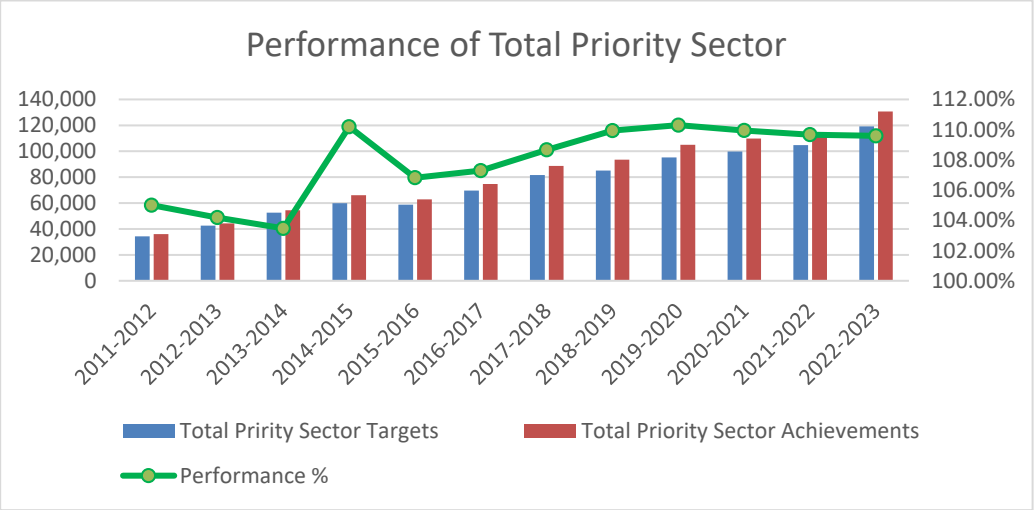


Table 15: Paired t-Test Analysis of Targets and Achievements of Targeted Funds for Total Priority Sectors

Paired t-Test		
	Target	Achievement
Mean	75306.33	81752.66
Variance	7.03E+08	8.99E+08
Observations	12	12
Pearson Correlation	0.999578	
df	11	
t Stat	-6.26562	
P(T<=t) one-tail	3.06E-05	
t Critical one-tail	1.795885	
P(T<=t) two-tail	6.12E-05	
t Critical two-tail	2.200985	

Source: Author calculation

Form above Paired t-Test analysis table, it is evident that:

1. Correlation coefficient is 0.999 which shows a high positive correlation between targets and achievements of targeted funds for total priority sectors.

2. Decision about the null hypothesis (H_{04}: There is no significant difference between targets and achievements of targeted funds for the total priority sectors).

Since it is observed that t = 6.12E-05 <tc = 2.20, then concluded that the null hypothesis is accepted.

One-Way ANOVA is used to analyse targets and achievements for total priority sectors. The null hypothesis, H_0:There is no significant difference in the average performance score of targets and achievements for total priority sectors.

Table 16: One-Way ANOVOA Analysis

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2.49E+08	1	2.49E+08	0.311113	0.58263	4.30095
Within Groups	1.76E+10	22	8.01E+08			
Total	1.79E+10	23				

*Source:*Author calculation

From table 16,

1. The p-value (0.583) is more than 0.05.

2. The value of F test (0.311) is less than the critical value of F (4.30).

Thus, the null hypothesis is accepted that there is no significant difference in the average performance score of targets and achievements for total priority sectors. Hence,

Findings of the study:

Under the lead bank scheme, lead bank allocates their most valuable resources to ensure timely achievement of targets. The results of the paired t-Test analysis indicate a statistically significant association between targets and achievements of targeted funds in agriculture and allied sector, non-farm sector and other priority sectors.

The correlation analysis results indicate a strong positive connection (0.999) between the targets and achievements of targeted funds for the lead bank in the total priority sector. The performance of lead bank has seen a snail's pace growth, rising from 105 per cent in the fiscal year 2011-2012 to 109 percent in the fiscal year 2022-2023. The performance of the whole priority sector exhibits a rising trajectory accompanied by significant variations.

Conclusion and Policy Implications:

In conclusion, the findings of this study provide valuable insights into the topic at hand. The data collected and analysed shed light on the phenomenon under investigation and contribute to the existing body of Banks serve as the principal means for facilitating local credit allocation, encompassing responsibilities such as identifying areas of economic expansion, gathering deposits, identifying areas lacking credit access, and formulating a cohesive credit allocation strategy within each district in cooperation with other banks and credit institutions.

The lead bank has achieved more than the targets of priority sector lending in the Bareilly District. Thus, performed very well and played vital role for the priority sector credit availability. Hence, the targets are to be increased substantially to fulfil the credit need of the priority sectors.

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Growth and Structural Change: Evidence from Payments System and Digital Financial Inclusion

Ruchi Kumari

Abstract:

This paper explains the growth and structural change in the Indian economy after the covid-19 with a comparison to before the covid-19 regarding the payment system and digital financial inclusion. This research aims to analyze the condition of digital payment modes and digital financial inclusion. Our research variables are mobile banking, credit cards, debit cards, NEFT (national electronic fund transfer), customer transactions (which is the indicator of economic activities of common people moreover growth and prosperity among common people), prepaid payment interfaces which include online wallets, paper vouchers, and prepaid smart cards further these variables represent the increasing rate of digital financial inclusion. The data source is imported from RBI's official website. The research period is from June 2015 to June 2023. During the research period, India faced demonetization and the COVID-19 pandemic shock. We saw an Increasing trend of customer transactions (figure 1.) which represents the increasing economic activities among the people. Increasing economic activities show the overall growth of the Indian economy. We can easily observe the slowdown from Feb. 20 to June 21 during the pandemic in the customer transaction trend. Similarly, we can see in Figure 2 an increasing trend of credit cards and a decreasing trend of debit cards. In Figure 3. Mobile banking was increasing smoothly before the covid -19 but increased multiple times after the COVID-19 pandemic. Whereas NEFT is smoothly increasing before COVID-19 but highly fluctuated after COVID-19 with an increasing trend. Prepaid payment interfaces are increasing smoothly but it is also feeling a little bit slowdown during the COVID pandemic (figure 4). We use the t-test: paired two samples for means. Based on the p-value, we try to know the significance value and reject the null hypothesis or accept the null hypothesis. We find that these variables were statistically significant at a 95% significant level. We conclude that the statistical test is significant in the case of mobile banking data, credit cards, debit cards, prepaid payment interface (PPI), and customer transactions. So, we reject the null hypothesis and accept the alternative hypothesis.

Introduction:

A payment system is one of the most important components of any economy across the world. It is the era of technological innovations that leads towards digital payment systems. In the 1960s debit and credit cards were introduced and massively used when the first ATM (automated teller machine) was set up in 1987 by HSBC in Mumbai. In the following ten to fifteen years, it was used at a broad level. **Electronic payment transfer through mobile phones was launched on 22 Nov. 2010** by the NPCI in India. The **digital India movement launched on 1 July 2015** to empower the society and knowledge of India however digital payment boosted after the **demonetization declared in India on 8 November 2016.** GOI declared that 86%of currency in circulation is an illegal tender. In 2020, during the era of covid crisis digital payment system was revolutionized. *"Payment system means a system that enables payment to be effected between a payee and a beneficiary, involving clearing, payment or settlement service or all of them but does not include a stock exchange"* (payment and settlement act 2007).

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An easy payment system boosts the economy and positively impacts growth and structural changes. Nowadays digitalization of money saves the cash of individuals during travelling, home, office, etc. means everywhere money is safer and convenient than before. My research discussed the impact of digitalization of payment systems make growth and structural change in digital financial inclusion.

UPI (Unified Payment Interface) is the most popular way of money transactions. It facilitates multiple bank accounts in a single mobile app. The leverage of the simplicity of UPI makes the finances more speedily digital. UPI's advantages are secure payment, no transaction charge, convenience, cashback offers, maximum bank support instant, and real-time pay, etc. It is accelerating the digitalization of finances.

Jaan Dhan-Aadhar -Mobile (JAM) is linking the bank account with biometric identification and mobile number. JAM spreads financial awareness among vulnerable people.

Digital financial inclusion is based on the three parameters availability, accessibility, and affordability of digital access for financial services. Nearly 48% of people's accounts made no deposits and withdrawals over the past 10 years (*Global Findex*: *https://globalfindex.worldbank.org). We* can see some benefits in our daily life such as the service charges of these financial facilities are approximately zero so it is more approachable to a vulnerable group of societies for example poor people, women etc. Digital finances leave financial footprints which is accessible by financial service providers and facilitate the ease of living too. Availability of internet transaction facilities, mobile apps, credit and debit cards, e-wallets, UPI, etc. reduce the time and traveling cost of payments. Encourage government-to-person digital payment. It helps in DBT (direct benefit transfer) and reduces corruption to avoid the role of mediators. Digital financing reduces the risk of theft, robbery, and other financial crimes. It encourages growth and stability in the economy by increasing aggregate expenditure and tax revenue collections. Digital financial inclusion is the win & win situation which beyond the way of growth in any economy. Despite these benefits, some negative prospects also present like lack of awareness about the technology, security problems, lack of willingness, etc. Data privacy and data security problems will arise.

Some Tools or Instruments for Digital payment systems are:

- debit cards
- credit cards
- mobile money
- internet banking
- e-money accounts
- retail point of sales
- agent network

Some problems exist in the digital payment system. We mention some real-life examples following: Garbage -in-garbage -out the problem; It means in the system of financial inclusion there is the possibility of tiny mistakes losing a lot. For example, an extra zero during the payment a too much damage to the payee. Consumers may pay one lakh rather than ten thousand. Sometimes people confuse two people who have the same name and pay the wrong person.

It lacks the human touch; In this case, consumers and providers are connected with a specific app That's causes a reduction of some options like bargaining and other facilities that will may consumer wish.

A lot of people still really like cash; It seems like a lot of complexities to use the digital mode of payment.

Some literature is available related to how the change in payment system impacts digital financial inclusion and shows that UPI is the most popular way of financial transaction. Moreover, they try to find out the condition of India as a country in the field of digital payment transactions. This paper provides the answer of what is the impact of structural change in the payment system on digital financial inclusion.

Literature Review:

Durie T. & G. S. (2019). They discuss Digital Finance and Its Impact on Financial Inclusion. He prepared the primary data with the help of a well-structured questionnaire. Data was analyzed by the Statistics Package of Social Science (SPSS). The data analysis techniques that were applied statistically include the Reliability test and one-way ANOVA. digital finances make it easy to live with some negative issues like security affordability adaptability etc. Despite all these researchers conclude that every human being intends to use digital finance in their daily lives.

Kandpal V. & Mahrotra R. (2019). They are clarified about the Financial Inclusion: The Role of Fintech and Digital Financial Services in India. They are mainly concerned about the vulnerable group who are unable to enjoy fintech and digital financial services due to a lack of awareness and financial literacy. They concluded that new technologies should earn the confidence of customers and satisfy the privacy and security obligations. Indian government should use their untapped digital financial resources for the sake of bust growth.

Godambe A.C. (2020) explores the advantages and challenges of the unified payment interface (UPI). UPI is a function that provides multiple bank accounts in a single mobile app. He explained what is the UPI. how does it is work? Advantages and challenges with UPI. The researcher chose online mode to fill up their questionnaire with 25 participants. He concluded that nearly 76% of participants say UPI is safe and 54% face a transaction problem.

Wang X. & Fu Y. (2021) studied digital financial inclusion vulnerability to poverty: pieces of evidence from Chinese rural households. They use data from China's labor force dynamics survey and regional DFI index. The PROBIT and mediation models are used to find the conclusion. They find that the DFI can mitigate the vulnerability to poverty in Chinese rural households and non-farming activities alleviating the poverty among rural households.

A.M.& Bhat G. (2021) discuss The Digital Payment System in India- A Case Study of a Unified Payment Interface. According to them, the Indian banking system is facing structural reform in the payment system in UPI which is the most popular way of transaction. Their study is based on secondary data and has used a strength, weakness, opportunities, and threats (SWOT) analysis format. The increasing use of smartphones and penetration of internet facilities digitalized the payment mode. However, UPI and QR codes are only accessible to those who have a bank account. In rural areas, digital payment and awareness about UPI need to be increased.

K. Ozili P. (2022) The researcher studies digital financial inclusion. He concludes that digital financial inclusion is a journey rather than a destination. he studies the merits and demerits of digital financial inclusion and different literature related to digital financial inclusion. He mentions the goal, and

components of digital financial inclusion like digital devices, retail agents, a digital transaction platform, a backend server, and costumer, etc. moreover instruments of digital financial inclusion. He found that digital financial inclusion is not without problems, policymakers should tackle the challenges present in it and further provide a better digital service.

A report on 'Digital Transactions **of India'** by **Ministry of Electronics & IT (2023).** According to this report from the past five financial years from 2017-18 to 2022-23 digital transaction is increasing continuously. It also discusses about benefits of digital payment. Some of *these* benefits are an instant and convenient mode of payment, enhanced financial inclusion, increased transparency in the government system, improved speed and timely delivery, enhanced credit access, a national electronic toll collection (NEFT) system, and Bharat bill payment.

Objective:

- To examine the impact of COVID-19 on the growth and structural change in the Indian economy.
- To understand the state of digital financial inclusion before the covid -19 and after the covid-19.

Hypothesis:

H_0= There is no significant difference between the mean value of mobile banking before the covid-19 and after the covid -19.

H1 = There is a significant difference between the mean value of mobile banking before the covid-19 and after the covid -19.

H_0= There is no significant difference between the mean value of credit cards and debit cards before the covid-19 and after the covid -19.

H1 = There is a significant difference between the mean value of credit cards and debit cards before the covid-19 and after the covid -19.

H_0= There is no significant difference between the mean value of NEFT (national electronic fund transfer) before the covid-19 and after the covid -19.

H1 =There is a significant difference between the mean value of NEFT (national electronic fund transfer) before the covid-19 and after the covid -19.

H_0= There is no significant difference between the mean value of PPIs (prepaid payment interface) before the covid-19 and after the covid -19.

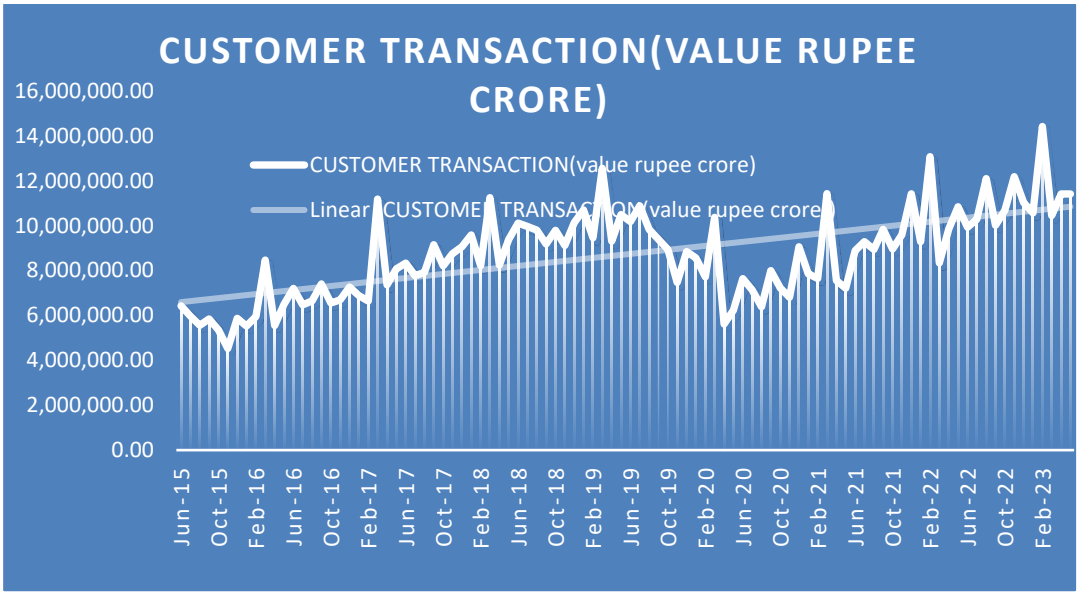
H1 =There is a significant difference between the mean value of PPIs (prepaid payment interface) before the covid-19 and after the covid -19.

H_0= There is no significant difference between the mean value of customer transactions before the covid and after COVID-19.

H1 =There is a significant difference between the mean value of customer transactions before the covid-19 and after the covid-19.

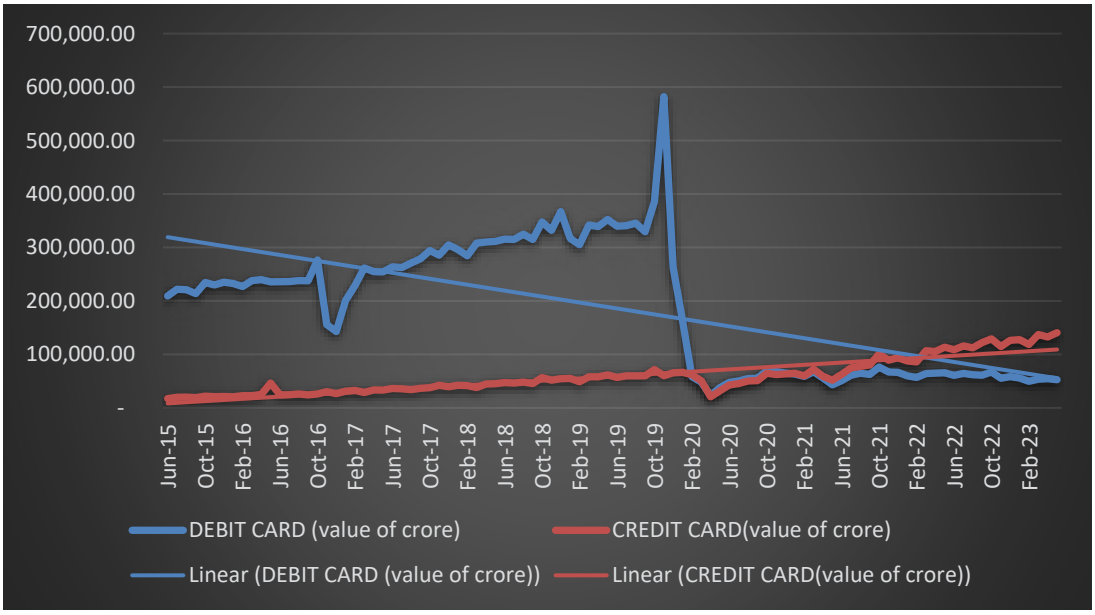
DATA:

Figure 1.



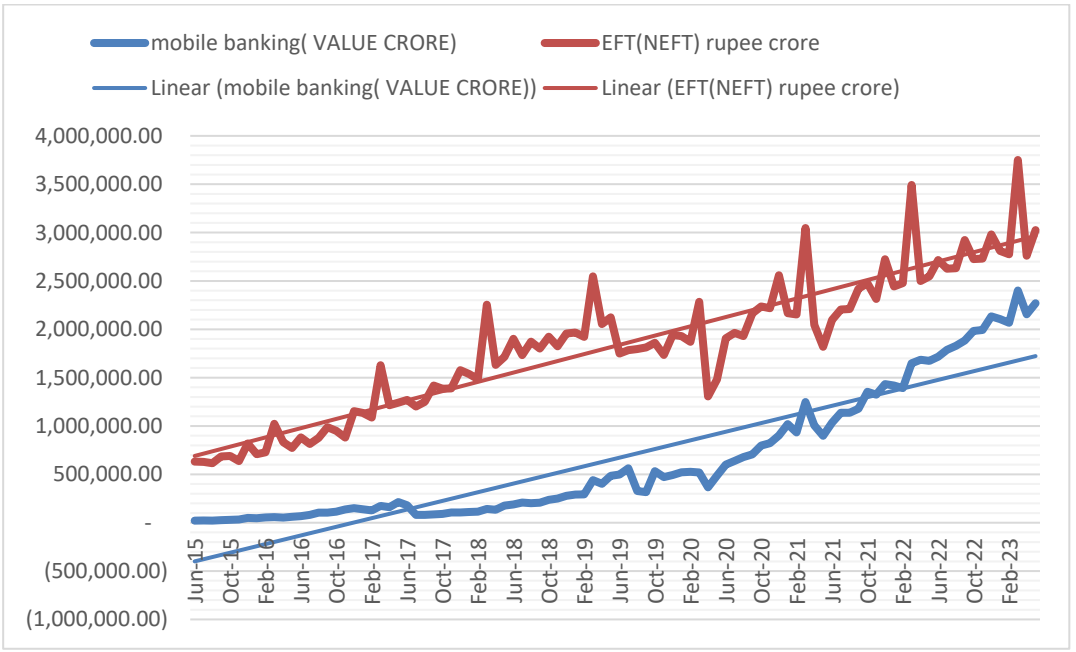
Source of data: RBI official website.

Figure 2.



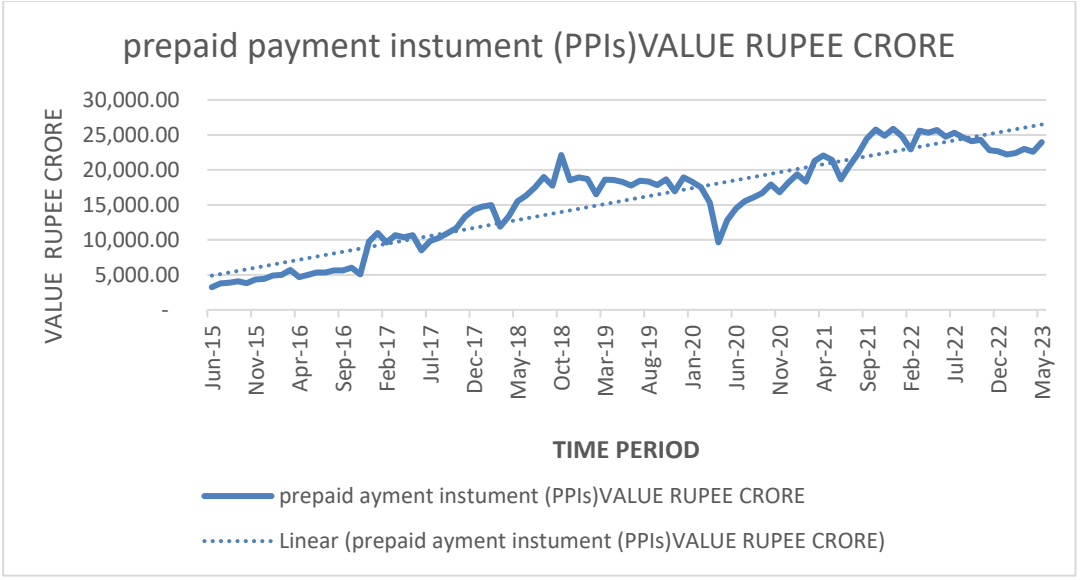
Source of data: RBI official website.

Figure 3.



Source: RBI official website.

Figure 4.



RBI: RBI official website.

METHODOLOGY:

Five variables represent the digital financial inclusion state. We compare the mean value of these variables from May 2016 to May 2023 with the help of the test: paired two samples for means. These variables are the following….

- mobile banking
- prepaid payment interface (PPI)
- debit card
- credit card
- NEFT

Moreover, customer transaction represents the economic activities and state of growth. The period is from May 2016 to May 2023. We applied the same t-test: paired two samples for means with the help of Excel.

Analyzing of mobile banking data (value rupee in crore):

Table 1.

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	208708.5425	1283466.449
Variance	18386558777	3.44865E+11
Observations	42	42
Pearson Correlation	0.834106302	
Hypothesized Mean Difference	1000000	
df	41	
t Stat	-28.01166565	
P(T<=t) one-tail	1.17522E-28	
t Critical one-tail	1.682878002	
P(T<=t) two-tail	2.35044E-28	
t Critical two-tail	2.01954097	

Explanation of data analysis: here we can see that the p-value two tail is lesser than the significant value of 0.05%, and the difference between means is statistically significant. We reject the null hypothesis and accept the alternative hypothesis.

Analyzing of credit card data (value rupee in crore):

Table 2.

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	42556.37426	84020.80805
Variance	156872652.9	999229391.4
Observations	43	43
Pearson Correlation	0.916386742	
Hypothesized Mean Difference	0	
df	42	
t Stat	-13.10500854	
P(T<=t) one-tail	9.82663E-17	
t Critical one-tail	1.681952357	
P(T<=t) two-tail	1.96533E-16	
t Critical two-tail	2.018081703	

Explanation of data analysis: here we can see that the p-value two tail is less than the significant value of 0.05%, and the difference between means is statistically significant. We reject the null hypothesis and accept the alternative hypothesis.

Analyzing of debit card data (value rupee in crore):

Table 3.

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	288012.0605	84020.80805
Variance	2805465106	999229391.4
Observations	43	43
Pearson Correlation	0.841140376	
Hypothesized Mean Difference	0	
df	42	
t Stat	42.55576618	
P(T<=t) one-tail	1.79612E-36	
t Critical one-tail	1.681952357	
P(T<=t) two-tail	3.59224E-36	
t Critical two-tail	2.018081703	

Explanation of data analysis: here we can see that the p-value two tail is less than the significant value of 0.05%, and the difference between means is statistically significant. We reject the null hypothesis and accept the alternative hypothesis.

Analyzing of NEFT-national electronic fund transfer data (value rupee in crore):
Table 4.

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	1516290.703	2398227.58
Variance	1.95189E+11	2.42966E+11
Observations	43	43
Pearson Correlation	0.697034988	
Hypothesized Mean Difference	0	
df	42	
t Stat	-15.7653233	
P(T<=t) one-tail	1.51249E-19	
t Critical one-tail	1.681952357	
P(T<=t) two-tail	3.02498E-19	
t Critical two-tail	2.018081703	

Explanation of data analysis: here we can see that the p-value two tail is less than the significant value of 0.05%, and the difference between means is statistically significant. We reject the null hypothesis and accept the alternative hypothesis.

Analyzing of PPIs prepaid payment interfaces data (value rupee in crore):

Table 5

t-Test: Paired Two Sample for Means		
	VARIABLE 1	VARIABLE 2
Mean	13369.23771	20958.29915
Variance	24605445	16227663.5
Observations	42	42
Pearson Correlation	0.8178561	
Hypothesized Mean Difference	0	

df	41	
t Stat	-17.23012182	
P(T<=t) one-tail	1.09924E-20	
t Critical one-tail	1.682878002	
P(T<=t) two-tail	2.19847E-20	
t Critical two-tail	2.01954097	

Explanation of data analysis: here we can see that the p-value two tail is less than the significant value of 0.05%, and the difference between means is statistically significant. We reject the null hypothesis and accept the alternative hypothesis.

Analyzing of customer transaction data (value rupee in crore):

Table 6.

t-Test: Paired Two Sample for Means		
	5551568.135	*7469568.879*
Mean	8822866.936	9382114.351
Variance	2.30531E+12	3.80931E+12
Observations	42	42
Pearson Correlation	0.555961629	
Hypothesized Mean Difference	0	
df	41	
t Stat	-2.15842715	
P(T<=t) one-tail	0.018400417	
t Critical one-tail	1.682878002	
P(T<=t) two-tail	0.036800833	
t Critical two-tail	2.01954097	

Explanation of data analysis: here we can see that the p-value two tail is less than the significant value of 0.05%, and the difference between means is statistically significant. We reject the null hypothesis and accept the alternative hypothesis.

Conclusion:

We conclude, In India digital payments are smoothly increasing. We can see the Increasing trend of customer transactions (figure 1.) which represents the increasing economic activities among the people. Increasing economic activities show the overall growth of the Indian economy. We can easily observe the slowdown from Feb. 20 to June 21 during the pandemic in the customer transaction trend. Similarly, we can see in Figure 2 the increasing trend of credit cards and the decreasing trend of debit cards. In Figure 3. Mobile banking was increasing smoothly before the covid -19 but increased multiple times after the COVID-19 pandemic. Whereas NEFT smoothly increased before COVID-19 but highly fluctuated after COVID-19 with increasing trend. Prepaid payment interfaces are increasing smoothly but are also feeling a little bit slow during the COVID-19 pandemic (figure 4). We use a t-test: paired two samples for means. We analyze mobile banking data, credit cards, debit cards, NEFT, PPIs, and customer transactions we conclude that here we can see that the p-value two tail is less than the significant value 0.05%, and the difference between means is statistically significant. We reject the null hypothesis and accept the alternative hypothesis with all these variables. Improving digital financial inclusion in India is crucial for making financial services accessible to a wider population.

Here are some suggestions with examples:

Government Initiatives:

Pradhan Mantri Jan Dhan Yojana (PMJDY): The government's flagship program has helped open millions of no-frills bank accounts. Expanding on this initiative can further promote financial inclusion.

Mobile Banking and Wallets:

BHIM (Bharat Interface for Money): Encourage the use of mobile apps like BHIM, which allow people to make digital transactions easily. Promote awareness and educate people on how to use such apps.

Rural Banking Infrastructure:

Establish More Banking Correspondents: Expand the network of banking correspondents in rural areas. For example, appoint local grocery store owners as banking correspondents, allowing villagers to perform basic banking operations.

Financial Literacy:

Financial Literacy Programs: Conduct financial literacy programs to educate people, especially in rural areas, on the benefits and safe usage of digital financial services.

Digital Identity and Aadhar:

Aadhar Integration: Link digital services to the Aadhar system for secure and straightforward identification. This has already been successfully implemented in various services.

Microfinance and Fintech:

M-Pesa Model: Explore partnerships between microfinance institutions and fintech companies. M-Pesa in Kenya is a good example, where mobile money has transformed financial access.

Incentivize Digital Payments:

Cashback and Discounts: Encourage digital transactions by offering cashback and discounts. The government's initiatives like "Lucky Grahak Yojana" and "Digi-Dhan Vyapar Yojana" have shown how this can work.

Cybersecurity and Data Protection:

Data Security Measures: Strengthen cybersecurity and data protection regulations to ensure that people feel secure when using digital financial services.

Accessibility for Persons with Disabilities:

Accessible Apps and Websites: Ensure that digital financial platforms are accessible to persons with disabilities, such as the visually impaired, by implementing features like screen readers.

Financial Inclusion in Government Schemes:

Direct Benefit Transfers (DBT): Integrate financial inclusion into government welfare schemes like DBT, ensuring that beneficiaries receive their funds directly into their bank accounts.

Regional Language Support:

Multilingual Interfaces: Create multilingual digital interfaces to cater to the linguistic diversity in India, making it easier for non-English speakers to use digital services.

Encourage Entrepreneurship:

Support Local Fintech Startups: Encourage the growth of fintech startups that focus on financial inclusion. Provide them with mentorship, funding, and regulatory support.

Improving digital financial inclusion requires a multi-pronged approach, involving government, financial institutions, fintech companies, and the public. It's about creating an ecosystem that not only offers digital financial services but also empowers people to use them effectively and securely.

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Rethink Inclusive Growth Strategy to Propel to Highest Level of Growth in India

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Introduction

Economic Growth is essential for comprehensive development in India. It must benefit all sections of people and reach the peak level depending on its potentialities, resources, skills and many other advantages. However in the process of growth it benefits some sections and leaves many people due to drawbacks not controlled by policy makers. The paper discusses remification of growth and its capacity to exclude many and provide benefits a few section in the society, rich, and high income earning skilled people, and firms and sectors owned by them. Hence the paper suggests that policy makers to adapt inclusive growth strategy benefitting all sectors and sections of society, particularly lower levels of population which helps to propel to highest levels growth in India.

Exclusive growth :

Exclusive growth (opposite of inclusive growth) means growth that moves to benefit a preferred section – the rich – of the population. In other words, exclusive growth shows that from growth benefits, poorer sections of the population are mostly excluded. It causes due essentially from non-utilisation of the factors of production – unskilled and low skilled labour – held by the poorer sections of the population. Exclusive growth is mainly growth in the production of goods and services which are intensive in capital and skilled labour – the factors of production held by the rich.

Pattern of growth :

After introduction of Reforms in 1992, the Indian Economy's growth was at about 7% per annum during two decades during 1993-2017[1]; but the rapid growth gave little development. The gap between growth and development is the sign of exclusive growth. More evidence of exclusive growth will be seen in the trends in income distribution and in employment that followed growth. The movement of income inequality quite stable between 1983-1992, began increasing steadily and also quickly afterwards. The Gini coefficient, indicating this trend, was stable at 0.47 during 1983-1992, but afterwards rose steadily to 0.63% in 2014. Such rising inequality indicates the rapidly growing income share of the richest 10% of population. This share stable at about 36% (between 1983-1992, but rose steadily to 57% in 2014. Naturally the share of bottom 90% fell from 64% in 1992 to 43% in 2014[2].

This clearly proves that the benefits of growth in the post 1992 period got by the richest 10% of population. The share of the richest 10% in the incremental income generated by growth was 64% during the period. This share also revealed a rising trend of income (from 35% during 1983-92 to 53% during 1992-2002 and to 68% during 2002-2014.

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The consequence of this skewed distribution of incremental income led to rapid widening of the income gap between the richest 10% and the rest of the population. The ratio of the average income of the richest 10% to the national average rose from 3.6% in 1992 to 5.7% in 2014, but the average income for the remaining 90% of population the ratio of average income declined from 0.7 to 0.5% during the same period. In 2014, therefore, the average income of top 10% was more than six times the average of income of the middle 20% and more than 16 times the average income of the bottom 70% of population.[3] Hence national income got increasingly concentrated in the thin layer of already rich population in the post 1992 period. Even the middle class also could not develop, eventhough middle class in India actually belong to the richest 10%. The exclusiveness of growth is clearly proved through increasing income inequality due to concentration of wealth in the small group rich 10% of population were by 2014.

Employment growth :

The similar development confirming the exclusive growth relates to the speed and pattern of employment growth. Total employment growth, started with, small 1.7% per annum between 1993-2014 fell rapidly even after 2014 and entered negative pace after 2011. This was due to a large extent, the progressive exclusion of unskilled and low skilled workers from employment. This type of unskilled employment fell at an increasing rate of the entire period of 1993-2017 - 24 years (two decades). Even the low skilled growth of employment also decelerated speedily and became negative during 2011-17. Surprisingly, moreover, even the growth of employment of the skilled revealed a sharp fall after 2011; growth created jobs mainly for the skilled, but it did not create enough jobs even for them in this period. As the total employment growth was falling, it was also showing increasingly skill based and its share in employed rose from 16% in 1993 to 35% in 2017. But this trends in employment rates, however not influenced by the trends in the share of the working-age population studying. It is also seen that employment rate fell for each group of skilled persons in the entire period, but in particularly sharp after 2011. It is clearly found that employment rate of the even educated declined sharply during this period shows that jobs were available for only the best and highly educated.[4]

Nature of the Economy and Demand preferences :

The economy broad and basic characteristic features with population by house-holds with differing in terms of income, but possess identical preferences with set priority in purchase of goods and services. They first, usually, satisfy their basic goods like food and clothing and later move on to other less basic and luxury goods and services. It means, they first prefer consumption of high priority goods and services and then move to slowly lower – priority goods and services. This pattern is clearly describes well-known Engel curve.[5]

The demand for particular group of goods and services that a household consumers on the amount of income earned. For eg. High, medium and low priority is considered. Higher the level of income (for a household) the larger the range of goods and services consumed, may be larger also the share of medium and low priority goods services in the consumption group; at the lowest income level, consumption is utmost exclusively of high priority goods and services. At the highest income level, consumption is largely of low priority goods and services. In between levels of income, consumption is a mix of high, medium and low priority goods and services.

On the whole, i.e., aggregate, the consumption of goods and services demanded (for consumption) in the economy depends on the distribution of income. In an economy for any given level of average income, the higher the inequality of distribution, the higher is the share of low priority goods and services in aggregate consumption (demanded). Thus when growth takes place and total income

increase, the distribution of incremental income determines the change in the consumption of goods and services produced and consumed – a situation exclusion and exclusive growth.

In the above situation, the pattern (hierarchy) of production technologies relating to factor intensity, moves closely matching priority ordering of goods and services in consumption. For eg. Production of low priority goods and services, is in general, more skill incentive than production of higher priority goods and services. Production of automobiles or air conditioner is more skill intensive than production of food or garments. Similarly the delivery of IT (Information Technology) or financial services is more skill-intensive than delivery of retail trade or transport services. Thus capital and skill, in general, are complimentary factors of production, hence capital and skill intensity go together; more skill intensive production technologies are also more capital intensive production technologies.[6]

Factor Endowments :

Factor endowments held by a household (working population) depend on the level of income. Higher the level of income, the higher is the ability to save and own capital. It also means higher the level of income, higher is the capacity to borrow and greater the access to credit, as the household have higher own assets. A less known, but more impart fact is that in developing economies, in particular, the ability of the person to secure education (and skill) mostly depends on the level of income of the household to which they belong. The level of income of a household depends on the level of education – higher income promotes higher level of education of its working members. Hence both capital and skills are held mostly and fully by the rich. The factor of production held by the poor is unskilled and or low skilled labour.

Growth of the Economy :

The economy possesses many sectors, some producing final consumption of goods and services and some capital and intermediate goods and services needed for the production of final products. Growth starts with lead sectors first, and later start other type of goods demanded for consumption by other sectors. First start with goods for home consumption and later for export promotion. With government intervention, start producing investment goods and services required to produce those consumption goods and services.[7] Thus growth brings out changes in commodity composition of output, which correspondingly create changes in the spectrum of technologies in practice and in the composition of demand for factors of production. The growth process moves by the interaction between growing income inequality and changing production structure for low priority goods and services, having skill bias in employment growth and continues exclusion of the low skilled from employment, causing economy experiences exclusive growth.[8]

For growth to be inclusive, the lead sectors should come from among those that produce high priority goods and services. Then the incremental incomes coming by such growth go manly to the poorer sections of the population, who are the suppliers of unskilled / low skilled labour because production is intensive in such a labour. However rich are not fully excluded, being the holders of capital they still receive a high share of incremental incomes. Growth continues to be inclusive always provided that human resource development maintained with the level of income growth. If poorer sections of the population are the main beneficiaries of growth to start with, it can be definitely expected that human resources development to be at the level of income growth.[9]

It is to be kept in mind, that even the process of inclusive growth in developing economies typically characterized by dualism and excess supply of unskilled / low skilled labour, can be accompanied by increasing income inequality. The first reason is that share of profits in the national income rises as growth takes place and profits reach the rich. Second cause is as surplus unskilled / low skilled workers

move from under-employment in the low-production agriculture (traditional sector) to employment in non-agriculture (higher productivity modern sector), income inequality among the working population increases. These occurrences lead to rising income inequalities in the economy.[10] However rising income inequality, such case is also to be seen steadily improving employment conditions. There are also natural limits to the increase in income inequality when growth is inclusive; it is because the share of profits in national income rises only upto a point (and then remain stable) and labour productivity in the traditional sector (agriculture) rises as surplus labour diminishes.

India's picture of Exclusive Growth :

In the beginning of 1990s and at the time of Economic Reforms in 1991, the period of economic growth started and Services became both the dominant and the fastest growing sector of India's economy. During 1993-2017, nearly two decades (14 years) as pointed earlier, India's economy grew at about 7% per annum. Growth was led by Services, grew faster, at close to 8% per annum. Even in 1993, Services Sector occupied the dominant position in India's economy; the share of services in Gross Value Added (GVA) at 41% larger than that of agriculture 34% and much larger than that of manufacturing (15%). The services share moved up steadily in this period of 24 years and reached to 53% in 2017, but that of agriculture fell to 15% and of manufacturing posted only a small increase to 18%.

The Services Sector from the beginning (traditionally) the highly skill intensive sector in the Indian economy as in the World. Its growth was led by some highly skill intensive services during 1993-2017, which intensity steadily increased. Communication, Financial and Business services (which include information technology and helped services as professional services) were growing much faster at 11% per year, than other services at 7% per annum.

The way forward is to recognise clearly what went wrong and where we can get it right, with the ambitious development strategy India launched immediately after independence. The aggressive attempt to build technological and industrial capabilities with full generous state support was the correct way to follow even now in 2023-24 and afterwards. The government should adapt such mission mode policies in the fast growing economic fields, be it semi-conductor or biotechnology. After 1991, India gave-up planning for industrial growth, thinking mistakenly that there is no role for industrial policy in globalised economy which is a costly error to continue with that now, when both USA and China are providing full government support for their industries.

Beside the above policy change, following Moonshot development strategy and Sun reaching themes with success, India must make redouble efforts to make economic growth more inclusive and broad based. If this policy to be successful, education, especially, higher education, should be accessible to all including the disposed – SCs, STs, other backward and marginalised classes of people.

India is successful Moonshot Mission using technology, should be continued to move up (propel) itself to higher level of development – this would be half won. As India reached billion strong masses and if they acquire the social and human capabilities needed for upward mobility, that will be equivalent of a human successful take off in economic progress to reach the pare position of highly developed India/Bharat with United States of America, China and other highly developed nations at the Gobal level. (The Hindu, Friday, September 22, 2023, Tirupati, Editorial, p.8).

The pattern of growth in India at the time of Economic Reforms of 1991, can not be stated that the reforms had been designed to take place in this way.[11] It is because stimulus, that is, encouragement for growth of the highly skilled intensive services, came from different sources like end of government monopoly and liberal policy by Government to foreign finance in respect of communication services;

financial sector liberalization and openness to inflows of foreign finance in the case of financial services; legacies from the past and lack of interest (serendipity) in the business services. Government monopoly in communication services was officially ended in 1992 and the sector was free to invite both domestic and foreign private investments, the result was explosive growth. The liberalization of financial sector and removal of control on capital issues and free licencing policy of government for inward flows of foreign finance was fully utilized by Services Sector to achieve explosive growth and also financial services. The ready availability of educational human power (due to past policy of giving priority to education) as a coincidence at relatively low wages and information technology revolution in advanced countries (creating high demand for high-skilled services) led to explosive export-prone growth of business services.[12]

Hence India's rapid growth started in 1993 was led by communication, financial and business services – the highly skill intensive services. The beneficiaries of growth naturally, were the holders of capital and skills, rich sections, the recipients of a large share of incremental income generated by growth. Therefore the new demand was high-end services and manufacturers, providing strong stimulus for their growth. The new demand also came for high-end-variants of some of the traditional services – shopping malls and e-commerce for retail trade; luxury hotels, restaurants and holiday resorts, luxury travels; elite private education and health care services etc, thus increasing the skill intensity of even traditional services. The new demand was also for high-end manufacturers and encouraged explosive growth of manufacture and equipment – the high skill – intensive sub-sector manufacturing.[13] Thus the new demand also encouraged high-end variants or traditional manufacturers – a variety of luxury consumption goods like luxury food and drinks, fashion textiles and clothing, designer leather goods etc, pushing the increasing intensity of even the traditional manufactures.

The new demand also served to increase the demand for factors of production (capital and skills) owned by the rich. It is a self sustained process of exclusive growth that emerged in every round of growth, the main beneficiaries – the rich owners of capital and skills – general demand leading to change in the commodity composition of the output that helped increase in demand for the factors production owned by the same beneficiaries. The poorer sections of the population – the suppliers of unskilled / low skilled labour – were increasingly excluded from employment. This chain reinforcing process of income – inequality, falling employment growth and increasing skill-bias in employment became the actual features of growth process.

The sectoral growth pattern also led to exclusive growth. The fastest growing sectors of the economy were "communication, financial and business" services and manufacturing of machinery and equipment. Communication services grew at 19% per annum in a decade 1993-2003, afterwards at a slower but still quicker rate 8% per annum in the following period 2004-2017. Financial services grew at nearly 8% per annum in the entire period (1993-2017); Business sources rose at 19% during 1993-2003 and at 14% per annum during 2004-17. The rest of the services grew at a much slower rate of 7% per annum between 1993-2017. The share of "communication, financial and business services", in the total sources output rose from 15% in 1993 to 30% in 2017.

The manufacturing of machinery and equipment increased at the rate of 11% per annum (P.A) during 1993-2003 and at 14% per annum in the following period 2004-17. The rest of the manufacturing industries grew at a lower rate of 7% per annum in the total period 1993-2017. The share of machinery and equipment in total manufacturing output rose from 9% in 1993 to 24% in 2017.[14]

Employment Growth :

In the above fastest growing sectors employment had been and remained small in numbers. In 1993, employment in communication, financial and business sources and "machinery and equipment" put

together was a mere 7 million (2% of total employment in the economy). This rose to 12 million (3.8% of total employment) in 2011 and then to 24 million (5.4% of total employment) in 2017. In these patterns of sectoral growth is seen the falling employment growth overall and increasing skill-prone in employment. The surplus unskilled / low skilled workers have been moving out of agriculture in search of jobs while non agriculture (creating employment mainly for the skilled) have not absorbed them.

Surprisingly, even the growth of skilled employment in non-agriculture decelerated quite sharply after 2011; 5.9% per annum during 1999-2011, but very small 3% during 2011-17. Very clearly, the growth of high skilled employment in non-agriculture also declined from 6% during 1999-2011 and to 4.2% between 2011-17. Hence after 2011, though growth was still creating jobs mainly for the skilled; it was creating required jobs even for the same category. The employment rate of the non-student skilled (working age) population fell from 64.5% in 2011 to 58.3% in 2017. Even the employment rate of non-student highly skilled (working age) population also declined from 66% in 2011 to 58% in 2017.

However declining employment rate did not always mean increasing unemployment. It is because lack of jobs forced workers out of labour force so that declining labour force participation rate followed falling employment rate. As the employment rate declined (fell) from 68% in 1993 to 62% in 2011, the labour force participation rate also declined from 78% to 63%, so that the unemployment rate remained 2%. This adjustment process changed after 2011; labour force participation still adjusted to the employment rate but only partially, resulting in increased unemployment rate. The employment rate declined from 62% to 54% and the labour force participation rate fell from 63% to 58%, therefore the unemployment rate rose quite sharply from 2% in 2011 to 6% in 2017.[15]

During 2018-2023 (Six years) :

During the six years from 2018 to 2023, similar exclusive growth pattern is continued and the same is presented in six Tables in Appendix:[15(a) to 15(e)]

It is very clear that annual growth at constant prices (Table No.1) has not crossed 7%, except in 2021-22 at 8.5% (PE); it decelerated from 6.9% in 2017-18 to 6.5%; 3.9%; (minus) 7%; 6.6% (AE) and 6.5% (BE) in subsequent years upto 2022-23 (1st AE). In annual growth rates of real gross value added at basic prices by industry origin at constant prices (Table No.2) reveal low rates during 2017-18 to 2022-23. Trade, Hotels, Public administration, Financing Real Estate fared better, while others Manufacturing, Agriculture stayed at lower levels.[15(a)]

The Gross domestic saving and Gross fixed capital formation and Gross capital formation as per GDP at current market prices (Table 3) have shown small rise of 6% in domestic savings, fall in Gross fixed capital formation by 1.6% and Gross capital formation declined by 5.6% during 2017-18 to 2020-21. In all segments fall in Gross capital formation clearly reveal it has continued (favoured) exclusive growth.[15(b)] The same situation prevailed in Labour Force participation (LFPR), small rise by 0.9%[15(c)] (Table 4), Worker Population Rate (WPR), rise by 1.5%[15(d)] (Table 5), and Unemployment Rate (UR), fall by 1.7% (Table 6) which is higher (8.2%) Jan-March 2022.[15(e)] The data in tables 4,5,6 reveal the continuation of exclusive growth pattern during 2017-18 to 2022-23.

Though budget for 2022-23 assumed nominal GDP growth of 11.1% compared to realisation of 15.9% as per N.S.O. second advance estimates, it means under estimation of growth. The Budget may not realize India's current growth estimate of 10.5%, if inflation not contained to mandated level of 6% ((4% ± 2%)[16]

In the beginning of 21st century, Indian economy has been called as one of the fastest growing economies in the World. But it faced many problems in the initial phases and situation became worse

at the time of 2008 global financial crisis (GFC). The changes introduced not so much pro-market (as assumed and believed) as pro-business in reality, with advantages or benefits flowing mainly to powerful corporate organizations, securing uneven dispersal of rewards (benefits) from market reforms and prosperity excluding lower sections of population. In the name of liberal reforms, big corporations destroyed forests and rural land, neglecting the lives of the poor and disadvantaged in the informal economy and agriculture. This referred to decades of economic expansion but called as predatory growth. Before the time of the economy could regain its initial faster pace of growth, the problem continued until the economy went into further troubles with COVID-19 Pandemic. Now it is facing economic slowdown. Indian economy declined for six consecutive quarters with growth falling to 4.5% in the second quarter of 2019-20 and also in 2020-21 minus 7%. This is reflected in reduction of labour force participation and growing unemployment, decline in rural consumption, a low rate of capital formation, decline in core sector production, reduced rate of growth in exports, and advance tax collection far below the fiscal year target.[17]

The negative functioning of the economy is linked with demonetization, improper implementation of goods and service tax (GST), the banking and non-banking sector financial crisis, the reduction in aggregate demand and agrarian difficulties. The two main driving forces of the Indian economy – export and investment have fallen due to stagnation of the World, and the two waves of balance sheet crisis, after the GFC. The structuralist view the problem to restriction on labour and land, governance, and income disparity. The second view of cyclicalists which focuses on recent happenings of the fall to a drop in aggregate demand caused by agricultural hardship, demonetization and GST implementation, government policies and political uncertainities.[18]

Many studies forcefully state that the economy is suffering from low levels of capacity utilization, stockpiling of foodgrains, and banks filled with excess liquidity. Hence it might be stated that the economy has been facing demand constraints. In this case, the policy rate cuts by RBI and corporate tax cuts by the Union government may be ineffective in correcting the negative trend of Gross Domestic Product (GDP) growth because these policies act to solve the supply side problems. Industrial growth in the Indian economy has been falling from the last decade due to domestic slowdown and global disruptions. The problem is structural in nature. The cyclical solutions could not revive the economic slowdown. To solve it, the government should create cycles of demand in the economy adopting long term demand stimulating policies.[19]

Nagaraj (2020) analysis indicated that the Indian economy went through economic boom in the 2000s, but after 2010 growth path began to decline. This he viewed as drastic job losses problems from 6.2 million to 15.8 million; hike in the rate of unemployment from 3.3% to 8.8% of work force, stagnation of rural wages, slump in the per capita consumption, absolute poverty rising by 30 million and also decrease in the labour force participation. Hence the solution is boosting up in public infrastructure investment and the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) would push up the private sector demand, solve to the agrarian distress and create jobs in the rural economy respectively.[20]

Jobless to Job loss growth :

As per some studies stated that the Indian economy has been rapidly moving from Jobless to Job-loss growth – indication of exclusive growth. In India 90% of the population is employed in the unorganized sector which with Job loss resulted in employment and income deficit in this sector and also vice versa. This also results in the fall in aggregate demand in the economy. To overcome the demand deficiency problem, it is necessary to focus more on the revival of the rural economy. But seeing the prevailing situation of the economy, some authors opined that the current government has been implementing pro-corporate and pro urban biased polices for the revival of the economy; it is helping in worsening the

situation and stand as a bigger challenge to boost the informal economy (Kannan and Raveendran 2019). Another economist argued that GDP can be thought of as a measure not so much of size; it measures the movement of money through and around the economy; it measures activity. In other words it reveals how the economic activity transforms into GDP; the expenditure of one agent becomes the income of an other and shows that how income be spent and so on. This way cycle of aggregate demand operates and leads to economic activities.[21]

It is important for political leaders and policy makers to change the nation's economic discourse, debate and idea and give up the blind emphasis or focus for headline GDP growth. Economists, technocrats and the IMF (International Monetary Fund) emphasise (peddle) GDP growth, since it is a convenient measure to compare what they can forecast through excel models on their computers. For political leader who are entrusted with people's real Welfare, it is critical not to fall pray and question whether such headline GDP delivers true economic prosperity to all its people. The Finance Minister has convened a "Chintan Shivir (thought workshop) of all true economic policy officials, with a view to discuss ideas for a high GDP growth rate. It is also essential to think and debate and finalise, in this Chintan Shivir (thought workshop) whether should ask or not what our nation's GDP growth should be, but instead what our JDP should be i.e. Jobs Data Product (The Hindu, Saturday August 19, 2023, Tirupati Editorial, p.8). Employment must be created by increased growth of GDP. But employment enhancement without growth is not sustainable in India to promote inclusive growth benefiting also sections including lower castes of people like SCs, STs, OBCs to achieve the goal of highly developed India.

The present economic slow down be attributed to the internal factors within Indian economy like banking crisis and stagnant corporate, automobile and real estate sector. They are interlinked with each other through backward and forward linkages. Falling demand in one sector affects the demand in another. The structural reforms recently introduced – the insolvency and bankrupting code (2016) and other regulatory measures to solve the problem of non-performing Assets (NPAS) and slow credit growth. Aggregate demand has an important effect on credit growth as well as NPAs. For example, higher aggregate demand in the economy gets reflected from increased profit shares of the private sector, which can help reduce the NPAs. Alternatively, the reduction of demand in the economy by reducing growth will contribute to the rise in the NPAs in the economy. To recover NPAs and increase credit growth in the Indian economy demand boost is a necessary condition (Goyal and Verma 2018).[22]

The influence of Monetary Policy on aggregate demand in India was empirically examined by KhundraKbam (2012). He found that an increase in interest rates has a large negative influence on aggregate demand growth. The change in interest demonstrate, however, more than one-third of the volatility in the aggregate demand growth. It shows that the interest rate mostly and significantly determines the fluctuations in economic activity in India. At a disaggregated level, the study reveals that the interest rate significantly impacts growth of all components of the aggregate demand except government consumption. Even the study on the European Union Countries (Barran et al 1996) showed that the aggregate demand is affected by monetary shocks mainly through its impact on investment. The summary of above explanation provides us the necessary insight about determinants of aggregate demand, including the contribution of its component elements. The components can translate into affecting economic growth, implying the components of aggregate demand can be the key in determining the economic growth. However in India's case real evidence on the components of aggregate demand and economic growth is barely sufficient or adequate.[23]

The idea of aggregate demand supply is central to economies. The capacity of the economy to generate goods and services at certain prices is called as aggregate supply, while the ability or desire of consumers to secure goods and services at particular price is called aggregate demand. The dynamic

inter play of supply and demand decides the path of production and inflation. The economic growth depends on the aggregate demand in the economy. The lack of demand from consumer leads to low investment and that inturn, culminates into slower growth which develops a various circle until it consequently rejects the growth rise from its long run trend. It is to be seen as a concern that there is decline in consumer purchasing power and also a concern to be observed about the operations of India's limited fiscal and monetary policy in providing a desired equilibrium demand stimulus to the economy. It is clearly to be seen that there is a deceleration of demand in the Indian economy, affecting the growth prospects. The major portion of business hesitation comes from investors assessment of only moderate growth in demand for their products. Economic growth is essentially the long-term, continuous increase in the potential of the economy to produce goods and services. The growth is driven by the components of aggregate demand. The demand side economics show that the output of an economy is determined by effective demand (Harvey 2012). The investment in the economy depends on the demand for products produced by produces. If consumer spending is higher on the goods and services produced by the business, then it pulls up the investment in the economy. Higher investment create more job opportunities and it leads to a rise in the economic levels. The income have spillover effects which further drive the aggregate demand, resulting in a hike in economic growth (Liu and Hanauer 2011).[24]

At a disaggregated level, the aggregate demand components – gross fixed capital formation (GFCF), Private Final Consumption Expenditure (PFCE), Imports (M), Exports (X), and Government Final Consumption Expenditure (GFCE) can have major influences on economic growth. It is also found that in the dynamic relationship between economic growth and PFCE, household consumption expenditure is the key driver of economic growth (Bouyon 2015). The Wagner Law (1883) states that an increase in National income leads to the expansion of public expenditure, while John Maynard Kyenes (1936) propounded the idea that public expenditure causes expansion in national income. In a sense economic growth causes public expenditure rather the reverse holding true. Investment and exports have a significant positive impacts on economic growth and for rapid and sustained economic growth. India should therefore promote export oriented policies. In European Countries it is revealed aggregate demand components have a major influence on economic growth.[25]

The latest study on understanding the structural dynamics of aggregate demand components and economic growth in India, reveals that the PFCE holds a larger share of expenditure component in GDP in the entire period 1951-52 to 2019-20 by accounting the structural changes that the economy witnessed. Its share in the GDP came down from 85% in 1951 to 57% in 2019; GFCF is the second largest aggregate demand component after PFCE. The GFCE, imports, exports are also significantly contributing to the economic growth of India during the study period. As all the five aggregate demand components are interlinked with each other, they significantly influence the economic growth. The structural changes initiated since 1991 (economic reforms) accelerated the pace of economic growth by encouraging private investment, trade liberalization etc by generating more employment opportunities in the economy. This has brought about the virtuous cycle of economic growth in India. Therefore the concern of studying this low level aggregate domestic demand and growth rate in the economy, suggests to raise the domestic demand by adapting appropriate macroeconomic policy[26] both structuralist and cyclical policies.

Latest India's Growth 1922 – 23:

According to Economic Survey 2022-23, India is on inclusive growth trajectory. It stated Growth is inclusive when it creates jobs, both official and unofficial sources confirm that employment levels have risen in the current fiscal year. The Periodic Labour Force Survey (PLFS) shows that the certain unemployment rate (aged 15 years and above) declined from 9.8% in September 2021 to 7.2% in

September 2022, this is followed by an improvement in the Labour Force Participation Rate (LFPR) both trends confirming the Indian economy came out of Pandemic forced slowdown in the beginning of FY23. Job creation appears to have moved upwards to higher level with the initial rise in exports, indicating a strong move of the pent-up demand, and quick roll out of the copex. As export growth reach high level and the pent-up move of the demand will have definite upwardness, it will see that copex continues to rise and help employment in the economy until global economy rebounds and through exports mode, provide an additional window to India for job creation. Moreover, the private sector has necessary Phillip and help capex to grow. Then internal resource generation is good, capacity utilization is high, and demand phase continues to improve. This will make capital markets encourage to finance new investments, as like financial institutions. A relative higher growth forecast among major economies, the estimated retail inflation only slightly higher than the tolerance limit, and also current account deficit possible to meet successfully with normal capital inflows and forex reserves large enough to meet one year imports are evidence of economic resilience amidst a global poly crisis. Strong consumption pick-up, higher revenue collections, continued capex in both the public and the private sector, growing employment levels in both urban and rural areas, and targeted social security measures further guarantee the prospects for economic and social stability and sustained growth. All in all with all the parameters and economic characteristics are sound and effective to meet any situation and help grow rapid growth, India is rated as the third-largest economy in the World in PPP (Purchasing Power Parity) terms and the fifth largest in market exchange rates. It is expected that the Nation of this high size, occupying top positions, the Indian economy in FY23 has nearly regained what was lost, renewed what had paused, and re-energised what had slowed during the pandemic and since the conflict in Europe.[27]

Out look for 2023-24 :

India's recovery from the Pandemic was relatively quick, growth in the upcoming year will be supported by strong and solid domestic demand and pick-up in capital investment. The current growth trajectory will be supported by multiple structural and cyclical changes that have been implemented over the past few years, all these enhanced the efficiency and transparency of the economy with guaranteed financial discipline and better compliance with this sound back-drop, Economic Survey projects a baseline GDP growth of 6.5% in real terms in FY 2024, which is broadly comparable to the estimates provided by multilateral agencies like the World Bank, the IMF, and the ADB and by RBI domestically. The actual rate for real GDP growth will likely lie in the range of 6% to 6.8% depending on the trajectory of economic and political developments globally[28] and more and best governance and least government by Government of India.

According to USA Treasury Secretary Janet Yellen, the World Bank's ongoing reform could result in a $50 billion lending boost over the next decade. She told at Agency France – Presse in Washington, there to be an update for the bank's mission to add building resilience against climate change, Pandemics and conflict and fragility to the core goals – these are inextrically linked and are not separate, there would be an announcement at the IMF and World Bank's spring meeting in the coming week (15 to 25th April 2023) where 180 member countries are expected to attend the meeting (Central Bankers, finance ministers and participants), on updating the Bank's operational model "Orient it towards the goals that we are setting". In the opinion of Deepak Parekh, Chairman HDFC Bank, India has enough tail winds in terms of a robust domestic consumption-based economy, political stability, vaccine security, digitisation robust regulatory stem to meet Global headwinds to slow India's GDP growth.[29]

Latest Trend :

The economic growth in India in real terms, has been on the declining trend during the last few years. The second advance estimates released by Ministry of Statistics and programme implementation on

28th February, 2023, estimated the real Gross Domestic Product (GDP) growth to be at 9.1% in 2021-22 and 7% in 2022-23. The trend is expected to continue in subsequent period as agreed by Economic Survey for 2022-23. It predicted the real GDP growth for India at 6.5% in 2023-24. Against this background, the Finance Minister through her Fifth full year Budget (presented on 1st February 2023 to Parliament) estimated and sought to achieve an inclusive economic growth, while continuing the path of fiscal consolidation. To achieve economic growth, the budget focused on reviving the consumption demand and capital formation. Increase in capital expenditure along with the rise in expenditure on critical sectors as proposed in the budget, will be helpful in raising the economic growth, crowding in private investment, employment generation and insulating the Indian economy from adverse impact of global headwinds.[30]

The Asian Development Bank (ADB) on Wednesday September 20,2023 paned its forecast for India's economic growth in the fiscal year 2023-24, to 6.3% from 6.4% estimated earlier, citing the impact of declining exports and erratic rainfall pattern that could hit farm output (The Hindu, Thursday, September 21, 2023, Tirupati, Business, p.14). India becoming the fifth largest economy in the World is an "impressive achievement", there is a need to grow fast to increase the per capita income from the present levels. As per calculations, if the country achieves a 7% male of growth continuously over the next two decades and more, it will make a substantial change to the level of the economy and India may almost touch the status of developed economy. Employment must come out of increased growth Employment enhancement without growth is not sustainable (C. Rangarajan, Farmer Chairman of the Prime Minister's Economic Advisory Council (The Hindu, Sunday, September 17, 2023, Tirupati, Business, P.15).

Latest Growth forecast :

The World Bank on Tuesday October 3, 2023 retained Indians growth forecast at 6.3% for 2023-24, due to challenging external conditions and falling pending demand. RBI's latest forecast for the economy would be 6.5% for 2023-24. The World Bank said despite significant global challenges, India was one of the fastest growing major economies in 2022-23 at 7.2%, its growth rate was the second highest among G-20 countries and almost twice the average for emerging market economies. (The Hindu, Wednesday October 4, 2023, Tirupati Business p.12)

Concluding Remarks :

India's rapid growth during 1993-2017 and in the consecutive period upto 2023 has been exclusive. Growth in this period was led by skill intensive services, the main initial beneficiaries had been the holders of capital and skills, the rich, who obtained a large share of the incremental income. The growth has declined after 2017; it fell from 6.8% per annum during 2011-17 to 5.8% in 2018 and 3.8% in 2019. The slowdown was structural. Exclusive growth leads to slowdown because consumption of a small portion of the population approaches saturation point, resulting in a slowdown of demand growth in the economy. The fact was growth of non-agriculture slowed down. The exclusive growth has been associated with growing income inequality, increasing skill intensity of employment, and progressive exclusion of low skilled from employment. This trend continued even after 2019 upto 2023. Aggregate demand mainly depends on aggregate consumption and reduced or low inequality of income. But India faces low level of aggregate domestic demand and growth rate; this concern could be solved only through appropriate macro economic policy implemented by Central Government with right mix of structural and cyclical policies based on least government and most best and efficient governance to achieve inclusive growth which alone could make India, a fast moving economy with a goal of highly developed economy paring with USA, in financial strength and technology efficiency covering all sectors of the economy – agriculture, industry, services etc for the overall high position and robust strength in the World utilizing the potential strength and efficiency possessed by India. Realising the

declining trend of the economic growth in India from 9.1% in 2021-22 and 7% in 2022-23, as during the last few years, and may reach to 6.5% (RBI) (6.3% by ADB) in 2023-24, the Finance Minister in her fifth full year budget (on 1st February, 2023) estimated and sought to achieve an inclusive economic growth, a paradigm shift, while following the path of fiscal consolidation. Finance Minister correctly stated to achieve economic growth; the budget focused on reviving the consumption demand and capital formation. It is true the proposal, to increase in capital expenditure along with the rise in expenditure on critical sectors will definitely help in rapid rise in the economic growth, crowding in private investment, employment generation and insulating the Indian economy from adverse impact of global headwinds.

The way forward is to recognise clearly what went wrong and where we can get it right. Change the policy, following Moonshot development strategy and Sun reaching attempt with success, India should redouble efforts, following ambitious and aggressive development strategy to make economic growth more inclusive and broad based using technology – this would be half won. India reached billion strong masses and if they acquire the social and human capabilities, with gaining higher education facilities, needed for upward mobility that will be equivalent of a Lunar (Sun) successful take off in economic progress to reach the pare position of highly developed India / Bharat with U.S.A., China and other highly developed nations, very soon, at the Global level. According to World Bank, despite notable global challenges, India was one of the fastest growing major economy in 2022-23 at 7.2% India's growth rate was the second-highest among G-20 countries and almost twice the average for emerging market economies. This appreciation of India's growth rate in future India's highest growth potential, despite Global challenges and India should make efforts to achieve the highest growth rate paring with highly developed nations in the World.

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1. Ajit K. Ghose (2023). India's Exclusive Growth. Economic and Political Weekly, February 11, 2023, Vol.LVIII, No.6, p.35.

2. Ibid, p.36.

3. Ibid, p.36.

4. Ibid, p.36.

5. Ibid, p.37.

6. Ibid, p.37.

7. Ibid, pp.37-38.

8. Ibid, p.38.

9. Ibid, p.38.

10. Lewis (1954), Kuznets (1955), pointed to the factors to causing income inequality to increase as growth took place in labour supply dual economies and see also Ajit K. Ghose (2023), Ibid, pp.38-39.

11. See for path of reforms taken Kochan et al (2006) and Kotwal et al (2011).

12. For details see Kochan et al (2006) and Ghose (2016) for Policy priority in higher Education.

13. Ajit K. Ghose (2023), p.39.

14. Ibid, pp.39-40.

15. Ibid, p.40.

15 (a) to 15(e). National Statistical office : Economic Survey 2022-23 by Government of India – Statistical Appendix, (a) pp.6 and 15, (b) p.29, (c) p.184, (d) p.185 and (e) p.186.

16. D.K. Srivastava (2023). Balancing Growth in the Fiscall consideration, Economic and Political weekly March 25, 2023, p.45.

17. See Sing M (2019) and Subramnian and Felman (2019) referred in Economic and Political Weekly, February 18, 2023, p.55.

18. Ibid, pp.55-56.

19. Ibid, p.56.

20. Ibid, p.56.

21. Ibid, pp.56, 57, 62.

22. Ibid, pp.56, 57, 62.

23. Ibid, pp.56, 57, 62.

24. Ibid, pp.56, 57, 62.

25. Ibid, pp.56, 57, 62.

26. Ibid, pp.56, 57, 62.

27. Economic Survey, Government of India, 2022-23, pp.19 and 21.

28. Ibid, pp.21-23.

29. The Hindu, April 9, 2023, Tirupati, Business, p.17.

30. Economic and Political Weekly, April 1st, 2023, Vol.LVIII, No.13, p.4.

STATISTICAL APPENDIX

Table 1 : Annual Growth rates : Gross National Income and Net National Income 2011-12 Series (percent) during 2017-18 to 2022-23

	Gross National Income		Net National Income	
	Current prices	**Constant prices**	**Current prices**	**Constant prices**
2017-18	11.1	6.9	11.1	6.7
2018-19 (3rd RE)	10.6	6.5	10.4	6.2
2019-20 (2nd RE)	6.3	3.9	6.0	3.4
2020-21 (1st RE)	1.7	(-) 7.0	(-) 2.9	(-) 8.7
2021-22 (PE)	19.3	8.5	19.4	8.5
2022-23 (1st AE)	15.0	6.6	14.9	6.6

Source : National Statistical office : Economic Survey 2022-23 by Government of India – Statistical Appendix, p.6.

Government of India : PE : Provisional Estimates

RE : Revised Estimates

AE : Advanced Estimates

Table 2: Annual Growth Rates of Real Gross Value added at Basic Prices by industry origin at constant prices (Percent) during 2017-18 and 2022-23

	Agriculture, Forestry, Fishing, Mining and quarrying	**Manufacturing construction, electricity, gas and water supply**	**Trade, hotels transport, communication**	**Financing, real estate and professional services**	**Public administration, defence and other services**	**Gross value added**
2017-18	4.5	7.1	10.3	1.8	8.3	6.2
2018-19 (3rd RE)	1.6	5.9	7.2	7.0	7.5	5.8
2019-20 (2nd RE)	4.5	(-) 1.4	5.9	6.7	6.3	3.8
2020-21 (1st RE)	1.6	(-) 2.8	(-) 20.2	2.2	(-) 5.5	(-) 4.8
2021-22 (PE)	4.1	10.2	11.1	4.2	12.6	8.1
2022-23 (1st AE)	3.3	4.3	13.7	6.4	7.9	6.7

Source : National Statistical Office. Economic Survey 2022-23, Government of India – Statistical Appendix , p.15

PE (Provisional Estimates)
RE (Revised Estimates)
AE (Advanced Estimates)

Table 3 : Gross Domestic Saving and Gross Capital Formation as per GDP at current market prices as percent of GDP during 2017-18 to 2020-21

	Gross Domestic Savings				Gross fixed Capital formation			Gross Capital formation				Adjusted Total
	Household Sector	Private Corporate Sector	Public Sector	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector	Valuable	Total	
2017-18	19.3	11.2	1.6	32.1	6.7	21.5	28.2	6.8	22.7	1.4	31.0	33.9
2018-19	20.3	10.5	0.9	31.7	7.1	22.4	29.5	7.3	23.9	1.2	32.3	33.8
2019-20	19.6	10.5	(-) 0.2	29.9	6.5	22.1	28.6	6.9	22.4	1.0	30.2	30.7
2020-21	22.2	10.0	(-) 4.0	28.2	7.0	19.6	26.6	7.2	19.3	1.4	27.9	27.3

Source : National Statistical Office : Economic Survey 2022-23, Government of India – Statistical Appendix, p.29

Table 4 : Labour Force participation Rate (LFPR) – as per current weekly status in India in % 2018-2022.

	2018	2019	2020	2021	2022
Oct-Dec	36.3	37.2	37.3	37.2	37.2 Jan-March

Source : Economic Survey, Government of India 2022-23, p.184 Statistical Appendix

Table 5 : Worker Population Rate (WPR) (in percent) according to current weekly status (persons, all ages) 2018-2022

	2018	2019	2020	2021	2022
Oct-Dec	32.7	34.2	33.5	33.9	34.2

Source : Economic Survey, Government of India 2022-23, p.185 Statistical Appendix

Table 6: Unemployment Rate (UR) in percent according to current weekly status (persons all ages)

	2018	2019	2020	2021	2022
Oct-Dec	9.9	7.9	10.3	8.8	8.2 Jan-March

Source : Source : Economic Survey, Government of India 2022-23, p.186 Statistical Appendix

Trends in the Growth of Finances of Government of Himachal Pradesh from 1999-2000 to 2021-22

Vijay Nag *
Manoj Kumar **

The focus of the present empirical study is to investigate the growth of revenue and expenditure of the Government of Himachal Pradesh from 1999-00 to 2021-22.The annual average growth in different components of revenue account and capital account income and expenditure is calculated to understand the long run trends in finances of Government of Himachal Pradesh. The trends in deficit in the budgets of Government of Himachal Pradesh are analysed to find out the financial position of the state government in the recent decades. For this purpose we have compiled the component wise data on revenue and capital account receipts and expenditure from 1999-2000 to 2021-22 from various statistical abstracts of Himachal Pradesh. The results shows that the revenue receipts is growing with declining trend whereas revenue account expenditure showing fluctuations and stable increasing trend particularly expenditure on health and family welfare. The capital account income is maintained and expenditure is rising with fluctuations. It means greater liabilities of the state government in coming years. The expenditure on physical and social infrastructure is although increasing in successive years but it shows declining growth, which means budget, is more skewed towards revenue account expenditure. The long term trends of deficit shows that the state is heavily borrowing to meet its expenditure thereby increasing its liabilities.

I. INRODUCTION

It has been observed that the debt of the Government of Himachal Pradesh has been rising continuously in the recent decade and the financial position of the government is worsening each year. The budget of the state government in the year 2023-24 reflects rupees 4704 crore as revenue deficit and estimated fiscal deficit is rupees 9900 crore, which is 4.6 percent of GSDP.

In this context this study investigates the long run growth of revenue and expenditure of the Government of Himachal Pradesh from 1999-00 to 2021-22. The annual average growth in different components of revenue account and capital account income and expenditure is calculated to understand the long run trends in finances of Government of Himachal Pradesh. The trend of the deficit of the budgets of the state government is studied in the recent decade to find out the reasons for increasing liabilities of the state government. The annual average growth in different components of revenue account and capital account income and expenditure, particularly expenditure on social and physical infrastructure.

II. REVIEW OF LITERATURE

The review of literature on state finances and its components particularly on infrastructure in India is presented below:

Ahluwalia, Isher Judge (1985) She examined the evidence of infrastructure constraint and the demand side impact of public investment on industrial growth in India from 1956-57 to 1979-80. The study point out that infrastructure bottlenecks in railways, electricity etc and insufficient management of these sectors are the important factors in affecting industrial growth in India.

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Ahluwalia, M. S. (1998) point out that improvement of growth performance of Indian economy in eighth plan and after will put demand pressure on power, roads, ports and airports after the initial slack in infrastructure is over. The author sees infrastructure as critical constraint on economic growth and underline the need for bold steps for private participation in infrastructure.

N. J. Kurian (1999) studied state government finances: a survey of recent trends. Study includes 15 major Indian states and concluded that there were substantial inter-state differences in the level of per capita income and their growth rates in recent years. The share of borrowing in plan financing was steadily going up in almost all states irrespective of their level of development. States own tax revenues and own non tax revenues were more important for relatively richer states, and share in central taxes and grants from center was more important for relatively poor states.

Nirupam, Bajpai and Jeffrey, D. Sachs (1999) examined the state of state government finances in India. Study revealed that fiscal deficits have remained high in the states, and a large component of these was made up of revenue deficits. Quite evidently, both expenditure and tax reforms have a long way to go in the states. The state expenditure-GDP ratio needs to be brought down considerably. The study also suggested that in present regime of subsidies there was need for reducing the overall scale of subsidies, making them transparent, and using them for well-defined economic objectives and focusing on final goods and services with a view to maximizing their impact on the targeted strata of the society at minimum cost, instituting systems for periodic reviews and setting clear limits on the duration of any new subsidy schemes.

Lekha Chakraborty and Kaushik K. Bhadra (2010) examined subnational public finance in times of recession. The article critically reviews the findings of the RBI study on state finances in 2009-10. The study points out that while few states announced stimulus packages to undertake investment in order to revive demand due to economic recession of 2008-09 and also announced tax concession, but the actual effect of the physical measures on overall imbalance appeared marginal. The quantum of physical stimulus packages' was not specified in states other than for Kerala, Haryana and west Bengal.

Kripa Shankar (2000) examined Parlous State of Government Finances. Study found that West Bengal's Loans and advances from the center constitute three-fourths of the state's outstanding liabilities. Whereas, growth rate in non-developmental expenditure at the state level was considerably higher than that of West Bengal.

Narayan, Luxmi (2015) analyzed recent trends in Haryana state finances on three broad indicators: revenue and spending patterns, resources gaps and debt sustainability. The time period of study was 2000-01 to 2013-14. The study found that state own tax revenue share has decreased and share of central transfer of taxes and grants to Haryana has showed increasing trends. The study suggested that state needs to increase its revenue base by following a prudent fiscal strategy by increasing its own tax non-tax revenue through user charges and by recovering cost from government services.

Shah and Joshi (2020) studied budgetary trends of Uttarakhand government an analysis of Almora district. The period of study was 2016-17 to 2019-20. The study found that budget was sufficiently allocated towards water supply, transport, Irrigation, sanitation and housing, social welfare and miscellaneous sector. Budget utilization was insufficient by sectors like medical and health, rural development, urban development and education sector. Budget allocated towards agriculture and allied services, energy and industry seems to be insufficient.

III. DATA

The data on budgets of the Government of Himachal Pradesh is collected from 1999-00 to 2021-22 from statistical abstracts of Himachal Pradesh. The component wise data on infrastructure is taken from economic activity wise GSDP of Himachal Pradesh from CSO and the Department of Economic and Statistics Himachal Pradesh. The data on deficit of the state government for the period of study is taken from state statistics and finances, RBI website.

IV. METHODOLOGY

To calculate the growth rate in different components of budget for the period 1999-00 to 2021-22 the annual average growth rate as well as compound growth rate method is used in the study. The long run trend is studied through best fit line estimated through regression. The growth of different components of the infrastructure is studied through linear regression model

V. REVENUE ACCOUNT RECEIPTS AND EXPENDITURE OF GOVERNMENT OF HIMACHAL PRADESH FROM 1999-00 TO 2021-22

Revenue account receipts for state own tax was rupees 549.38 crore for the year 1998-99 which increased to rupees 9769.53 crore in the year 2021-22. Tax revenue, which was rupees 1299.36 crore in the year 1998-99, increased to rupees 15932.79 crore in the year 2021-22. Total tax revenue receipts was rupees 2311.93 crore in the year 1998-99 which increased to rupees 37312.35 crore for the year.

Revenue expenditure for interest payment and debt services was rupees 551.92 crore for the year 1998-99 which increased to rupees 4804.61 crore in the year 2021-22. Expenditure on education, sports and culture was rupees 533.04 crore for the year 1998-99 which increased to rupees 7390.7 crore in the year 2021-22. Expenditure on health and family welfare was rupees 205.74 crore for the year 1998-99 which increased to rupees 2900 crore in the year 2021-22. The net revenue expenditure was rupees 317.89 crore for the year 1998-99 which increased to rupees 37034.24 crore in the year 2021-22.

Annual growth rate of revenue receipts which include state own tax (SOT), tax revenue (TRV), total revenue receipts (TRR) and revenue expenditure which include interest payment and debt services (IPD), education, sports and culture (ESC), health and family welfare (HFW), net revenue expenditure (NRE) are shown in Table 1.

The data reveals that annual average growth rate of state own tax revenue is 13.96 percent from period 1999-00 to 2021-22. State own tax revenue annual growth was highest at 48.52 percent for the year 2001-02. State own tax revenue annual growth rate was lowest at 0.97 percent in the year 2017-18. State own tax revenue annual growth rate displayed a declining linear trend in the long run.

The annual growth rate of tax revenue remains higher 55.92 percent for the year 2010-11. Whereas, annual average growth rate tax revenue remain lowest -31.31 percent for the year 2000-01. The data reveals that there is fluctuations in the state own tax revenue whereas the overall tax revenue was stable. The annual average growth rate of total tax revenue of the state is 12.63 percent during the period 1999-00 to 2021-22.

Tax revenue annual growth rate displayed a constant linear trend in the long run.

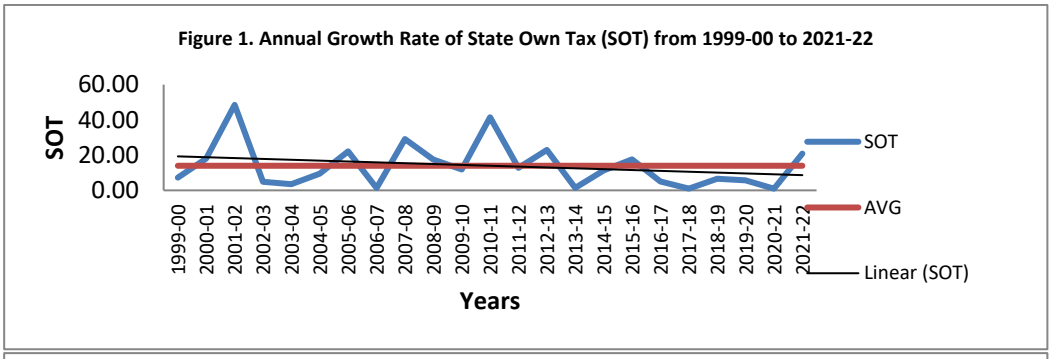
Table 1
Annual Growth Rate of Revenue Receipts and Expenditure

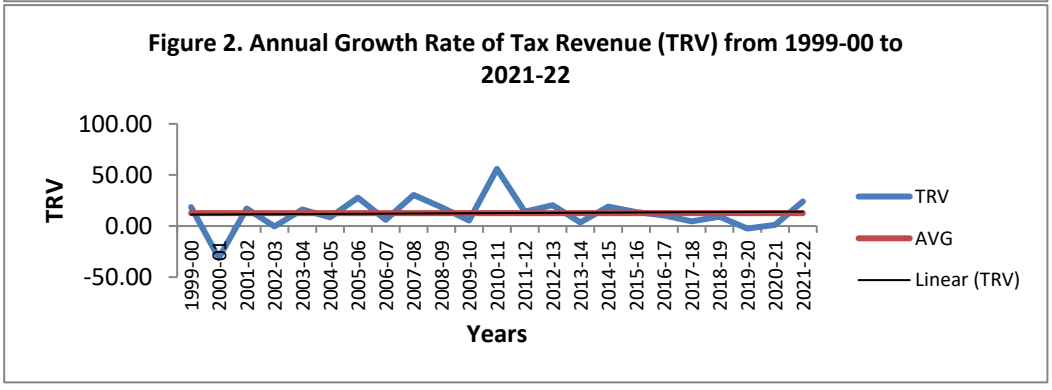
Revenue Receipts				Revenue Expenditure			
YEARS	SOT	TRV	TRR	IPD	ESC	HFW	NRE
1999-00	7.23	18.62	60.70	8.23	54.03	20.46	21.40
2005-06	22.10	27.75	54.63	-11.12	13.79	17.75	11.66
2010-11	41.48	55.92	22.85	-0.31	29.78	25.15	18.79
2015-16	17.55	13.73	23.98	17.25	-9.34	-5.99	9.09
2020-21	0.98	1.22	3.43	-1.70	-12.48	-12.73	-7.71
2021-22	20.86	24.11	11.59	7.43	16.49	32.12	10.43
1999-2022	13.96	12.63	14.04	10.53	12.96	12.97	11.53

Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual average growth rate of total revenue receipts for the whole period remains 14.04 percent. Annual growth rate of total revenue receipts remains highest 60.70 percent for the year 1999-00. Whereas, annual growth rate of total revenue receipts remains lowest -18.03 percent for the year 2000-01. The data on total revenue receipts shows less fluctuation than tax revenue and more fluctuation than state own taxes for the whole study period.

Total revenue receipts annual growth rate also displayed a declining linear trend in long run like state own tax. State own tax and total revenue receipts showed high degree of fluctuations than the total tax revenue. It shows deficient tax effort by the state.





Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The average annual growth rate of revenue expenditure on interest payment and debt service remained at 10.53 percent for the whole study period. The annual growth rate of revenue expenditure on interest payment and debt service remains highest 22.64 percent for the year 2000-01. Whereas, the annual growth rate of revenue expenditure on interest payment and debt service remained lowest at -0.31 percent for the year 2010-11. The annual growth rate of revenue expenditure on interest payment and debt service was fluctuating from 1999-00 to 2007-08 and after 2008-09 to 2021-22 it shows less fluctuation.

Figure 3. Annual Growth Rate of Total Revenue Receipts (TRR) from 1999-00 to 2021-22

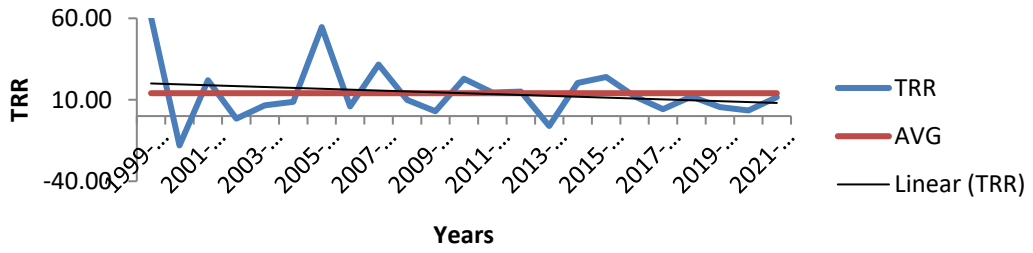
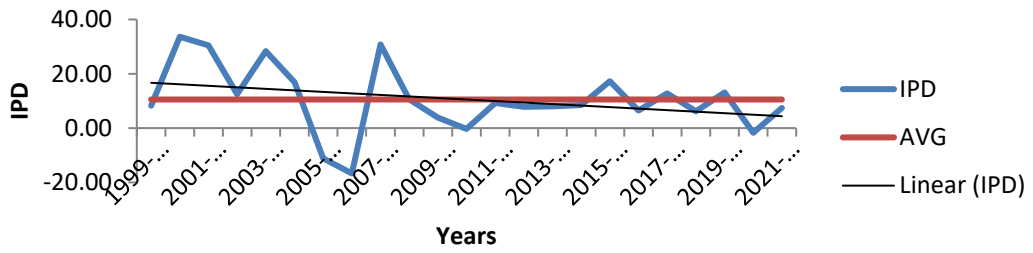


Figure 4. Annual Growth Rate of Interest Payment and Debt Services(IPD) from 1999-00 to 2021-22

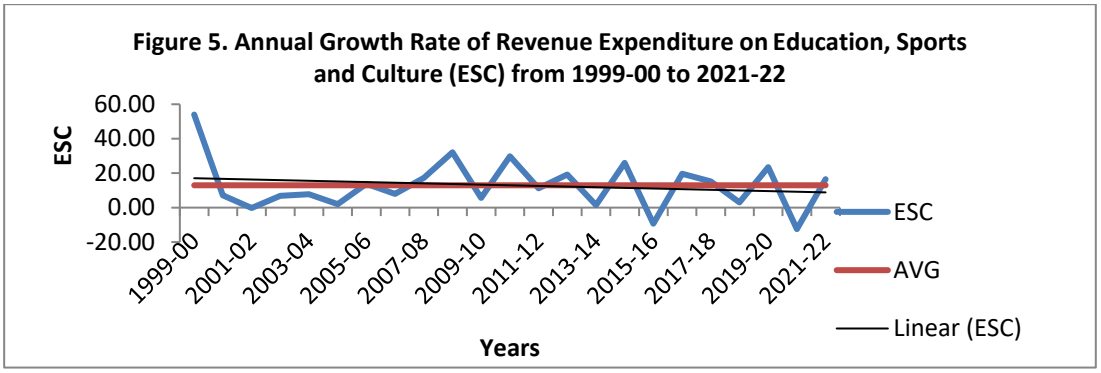


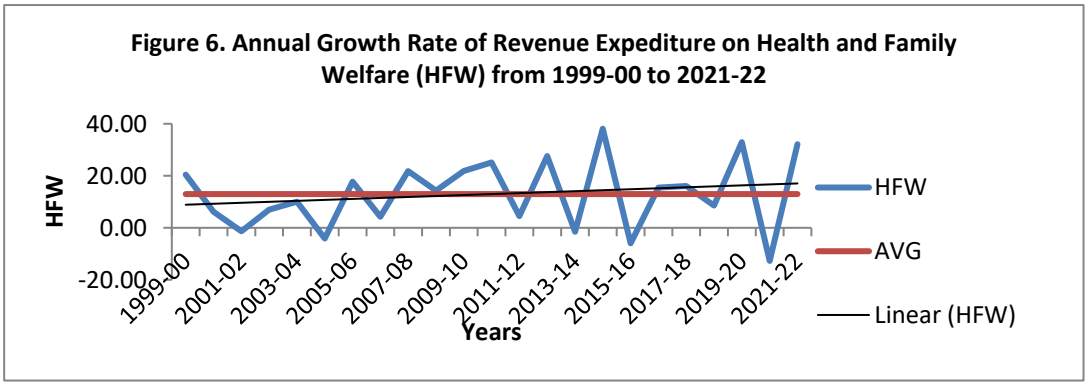
Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual growth rate of revenue expenditure on interest payment and debt service displayed a declining trend in long run. It means increasing liabilities of the state government in successive years.

The annual growth rate of revenue expenditure on education, sports and culture was highest at 54.03 for the year 1999-00. Whereas, annual growth rate of revenue expenditure on education, sports and culture remains lowest at -12.48 for the year 2020-21. The annual average growth rate of revenue expenditure on education, sports and culture remains for the whole period remains 12.96 percent. The annual growth rate of revenue expenditure on education, sports and culture shows fluctuations for the whole period.

The annual growth rate of revenue expenditure on education, sports and culture displayed a declining trend in long run.

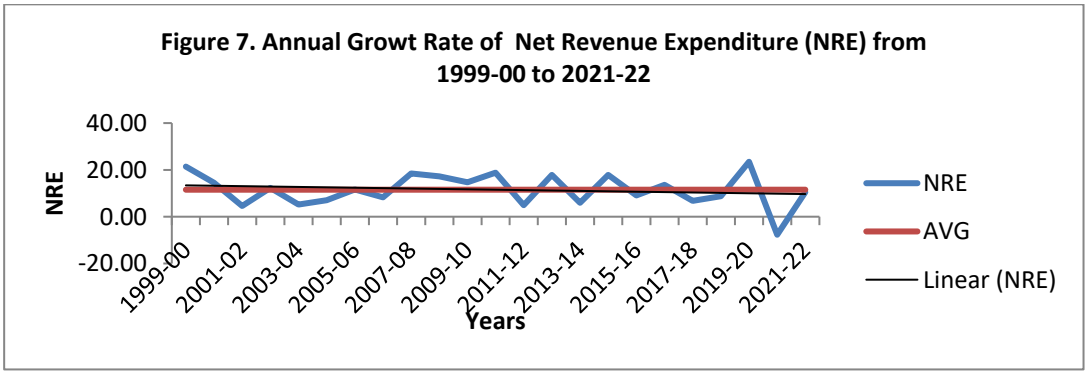




Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual average growth rate of revenue expenditure on health and family welfare remains 12.97 percent for the whole study period. The annual growth rate of revenue expenditure on health and family welfare remains highest 38.11 percent for the year 2014-15. Whereas, annual growth rate of revenue expenditure on health and family welfare remains lowest -12.73 for the year 2020-21. The annual growth rate of revenue expenditure on health and family welfare shows greater fluctuation after the year 2010-11.

The annual growth rate of revenue expenditure on health and family welfare displayed an increasing trend in the long run.



Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual growth rate of net revenue expenditure remains highest 23.47 percent for the year 2019-20. Whereas, annual growth rate of net revenue expenditure was lowest at -7.71 percent for the year 2020-21.

The annual average growth rate of rate of net revenue expenditure shows high fluctuations after the year 2018-19. The annual average growth rate of rate of net revenue expenditure displayed a minor declining trend in long run.

The broad results from above analysis show slower growth in revenue of the state and faster growth in the expenditure of the state. Some component like health shows greater growth in expenditure relative to other component like education. Given this trend the liabilities of the state government is likely to increase in future.

VI. CAPITAL ACCOUNT RECEIPTS AND EXPENDITURE

The capital receipts was rupee 3057.24 crore in the year 1998-99 which increased to rupee 12913.8 crore for the year 2021-22. Capital expenditure on general services was rupee 14.57 crore in the year 1998-99 which increased to rupee 360.06 crore for the year 2021-22. Expenditure on social service was rupee 128.98 crore in the year 1998-99 which increased to rupee 2037.01 crore for the year 2021-22. Expenditure on economic services was rupee 403.47 crore in the year 1998-99 which increased to rupee 4772.55 crore for the year 2021-22.

Annual growth rate of capital receipts (CAR) and capital expenditure which include general service (GEN), social services (SOS), economic services (ECS) and total expenditure (TEP) are shown in Table 2.

Table 2

Annual Growth Rate of Capital Account Receipts and Expenditure

Capital Receipts		Capital Expenditure			
YEARS	**CAR**	**GES**	**SOS**	**ECS**	**TEP**
1999-00	53.17	131.84	55.81	-6.21	15.38
2005-06	-17.38	141.18	45.43	30.90	40.22
2010-11	19.97	20.14	-6.25	-14.89	-11.22
2015-16	-42.86	6.09	47.43	4.40	13.42
2020-21	44.07	-34.80	26.42	-20.78	-10.59
2021-22	-23.36	100.58	17.33	37.92	33.24
1999-2022	13.11	25.24	15.54	14.35	13.61

Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual average growth rate of capital receipts was 13.11 percent from 1999-00 to 2021-22. The annual growth rate of capital receipts was highest at 53.17 percent for the year 1999-00. Whereas, annual growth rate of capital receipts remains lowest -42.86 percent for the year 2015-16.

The annual growth rate of capital receipts was stable between 2004-05 to 2009-10 and highly unstable after the year 2010-11. The annual growth rate of capital receipts displayed an increasing trend in long run.

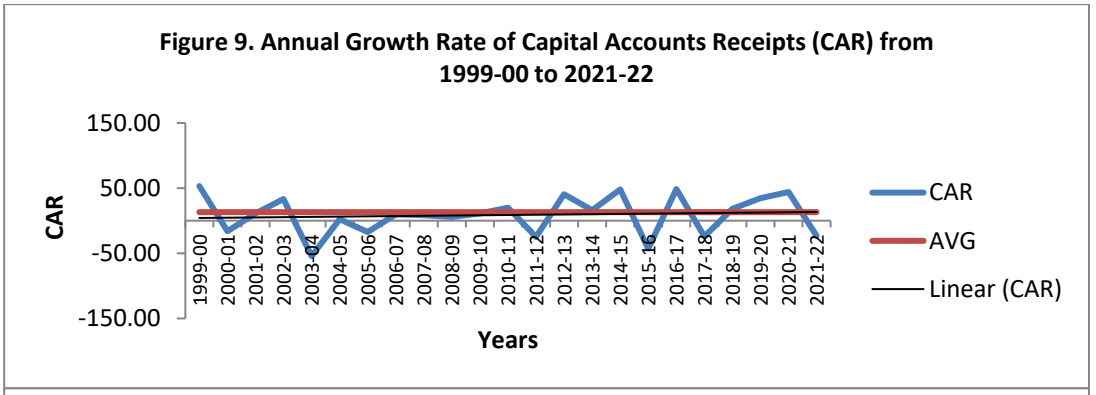


Figure 9. Annual Growth Rate of Capital Accounts Receipts (CAR) from 1999-00 to 2021-22

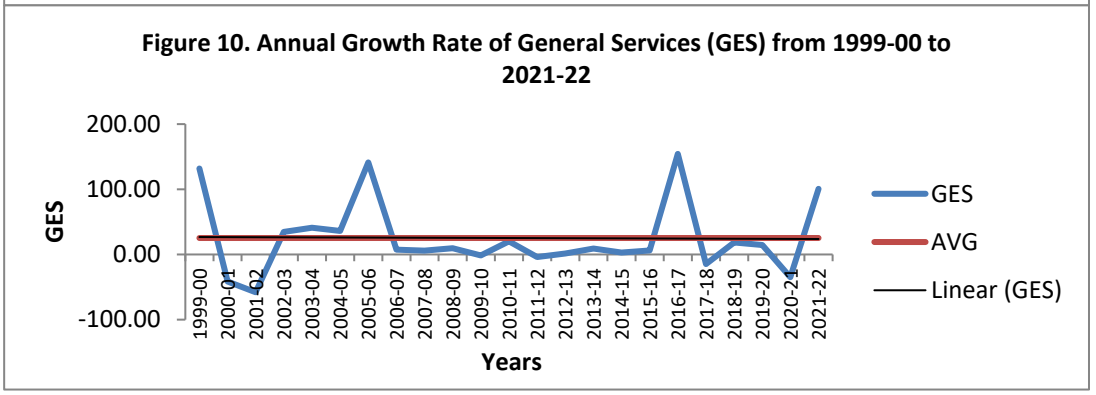


Figure 10. Annual Growth Rate of General Services (GES) from 1999-00 to 2021-22

Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual average growth rate of capital expenditure for general services remains 25.24 percent for the whole study period. The annual growth rate of capital expenditure for general services remains highest 154.31 percent for the year 2016-17. Whereas, the annual growth rate of capital expenditure on general services remained lowest at -57.97 percent for the year 2001-02. The expenditure on general services was highly unstable for the whole study period.

The expenditure on general services displayed a constant trend in long run same as the annual average of the capital expenditure for general services. It shows that the expenditure on general services is growing at stable rate.

Figure 11. Annual Growth Rate of Social Services (SOS) from 1999-00 to 2021-22

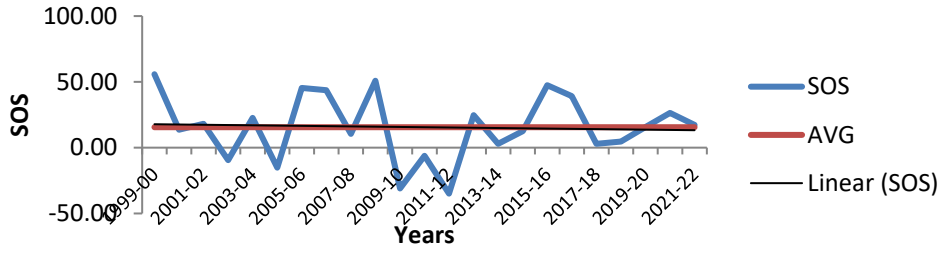
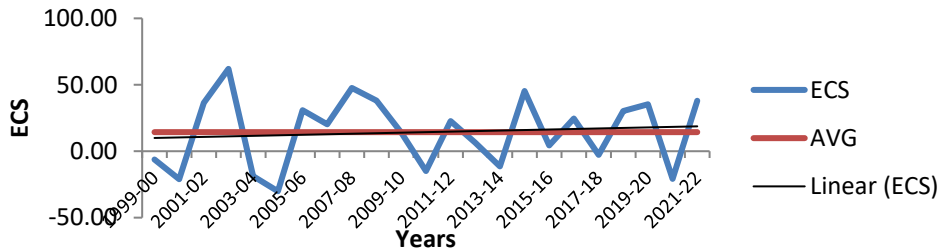


Figure 12. Annual Growth Rate of Economic Services (ECS) from 1999-00 to 2021-22



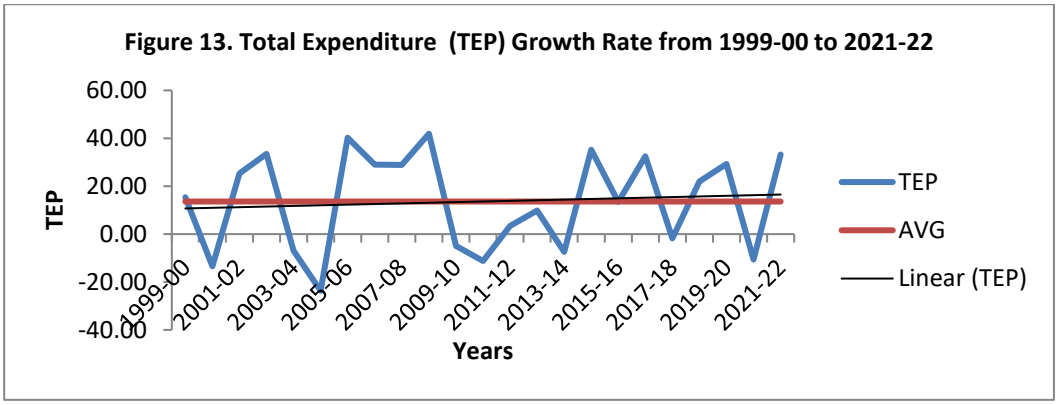
Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual growth rate of capital expenditure for social services was highest at 55.81 percent for the year 1999-00. Whereas, annual growth rate of capital expenditure for social services remained lowest at -34.93 percent for the year 2011-12. The annual average growth rate of capital expenditure for social services remains 15.54 percent for the whole study period.

The growth in expenditure on social services was fluctuating for the whole study period. The growth in expenditure on social services displayed a declining trend in long run. The result shows the expenditure on social services is maintained.

The annual average growth rate of capital expenditure for economic services remains 14.35 percent for the whole study period. The annual growth rates of capital expenditure for economic services remain highest at 61.99 percent for the year 2002-03. Whereas, the annual growth rate of capital expenditure for economic services remained lowest at -30.16 percent for the year 2004-05.

The expenditure on economic services was also highly unstable like general and social services for whole the study period. The expenditure on economic services displayed an increasing trend in long run. The result shows that the expenditure on economic services is rising in successive years.



Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual average growth rate of total capital expenditure remains 13.61 percent for the whole study period. The annual growth rates of total capital expenditure remain highest 41.92 percent for the year 2008-09. Whereas, the annual growth rate of total capital expenditure was lowest at -23.67 percent for the year 2004-05.

The expenditure on total capital expenditure was also fluctuating, like previous three sectors (General, Social and Economic) for whole the study period. The expenditure on total capital expenditure displayed an increasing trend in long run.

The result from above analysis of capital account growth shows that income is maintained but expenditure is rising continuously although with fluctuations. It means greater liabilities of the state government in the coming years.

VII.EXPENDITURE ON PHYSICAL AND SOCIAL INFASTRUCTURE FROM BUDGETS OF THE GOVERNMENT OF HIMACHAL PRRADESH FROM 1999-00 TO 2021-22

The expenditure on social infrastructure was rupee 738.79 crore for the year 1998-99 which increased to rupee 10290.70 crore to 20221-22. Expenditure on physical infrastructure was rupee 333.80 crore for the year 1998-99 which increased to rupee 4468.09 crore to 20221-22.

Annual growth rate of revenue account expenditure on social infrastructure (SIF) and physical infrastructure (PIF) are shown in Table 3.

Table 3
Annual Growth Rate infrastructure Expenditure

Infrastructure Expenditure		
YEARS	**SIF**(Social Infrastructure)	**PIF**(Physical Infrastructure)
1999-00	44.68	26.84
2005-06	14.67	37.44
2010-11	28.73	18.11
2015-16	-8.56	9.41
2020-21	-12.55	-1.51
2021-22	20.51	-2.75
1999-2022	12.88	12.82

Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The annual average growth rate of expenditure on social infrastructure remains 12.88 percent for the whole study period. The annual growth rates of expenditure on social infrastructure remain highest 44.88 percent for the year 1999-00. Whereas, annual growth rate of expenditure on social infrastructure remains lowest at -12.55 percent for the year 2020-21.

Figure 14. Social Infastructure (SIF) Growth Rate from 1999-00 to 2021-22

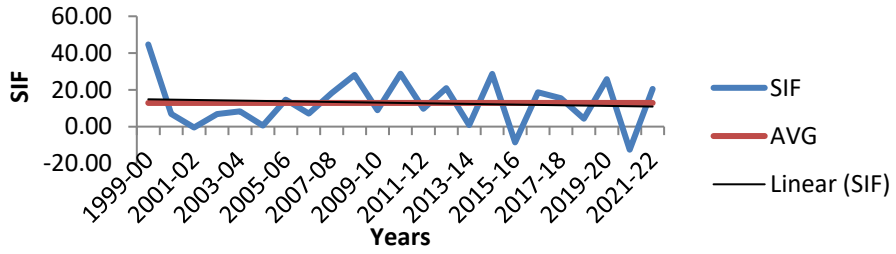
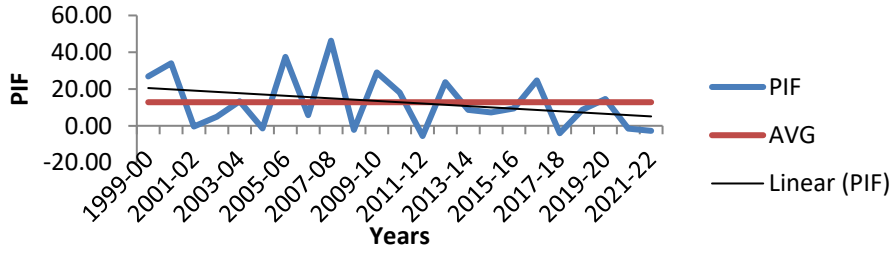


Figure 15. Physical Infastructure (PIF) Growth Rate from 1999-00 to 2021-22



Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The growth in expenditure on social infrastructure expenditure was highly unstable for the whole study period. The growth in expenditure on social infrastructure expenditure displayed a declining trend for long run.

The annual average growth rate of expenditure on physical infrastructure remains 12.82 percent for the whole study period. The annual growth rates of expenditure on physical infrastructure remain highest at 46.27 percent for the year 2007-08. Whereas, the annual growth rate of expenditure on physical infrastructure remains lowest at -5.56 percent for the year 2011-12.

The growth in expenditure on physical infrastructure shows fluctuations like social infrastructure for whole the study period. The expenditure physical infrastructure expenditure displayed a declining trend in the long run.

The above results shows that expenditure on physical and social infrastructure is although increasing in successive years but it shows declining growth, which means budget is more skewed towards revenue account expenditure.

VIII. FISCAL, REVENUE AND PRIMARY DIFICIT IN BUDGETS OF GOVERNMENT OF HIMACHAL PRADESH FROM 2004-05 TO 2020-21

The gross fiscal deficit was rupee 1810 crore for the year 2004-05 which increased to rupee 6993 crore for the year 2020-21. Revenue account deficit was rupee 1158 crore for the year 2004-05 which declined to rupee 545 crore for the year 2020-21. Primary account deficit was rupee 169 crore for the year 2004-05 which increased to rupee 2370 crore for the year 2020-21.

The gross fiscal account deficit (GFD), revenue account deficit (RVD) and primary account deficit (PRD) of Government of Himachal Pradesh are shown in Table 4.

As shown in Table 4 gross fiscal deficit is continually increasing from 2004-05 to 2020-21 that is from 1810 crore to 6993 crore.

The long run trend line of gross fiscal deficit displays increasing trend.

Table 4

Fiscal, Revenue and Primary Deficit in Crore from 2004-05 to 2020-21

YEARS	GFD	RVD	PRD
2004-05	1810	1158	169
2009-10	2784	805	828
2014-15	4200	1944	1351
2019-20	5602	-8	1368
2020-21	6993	545	2370

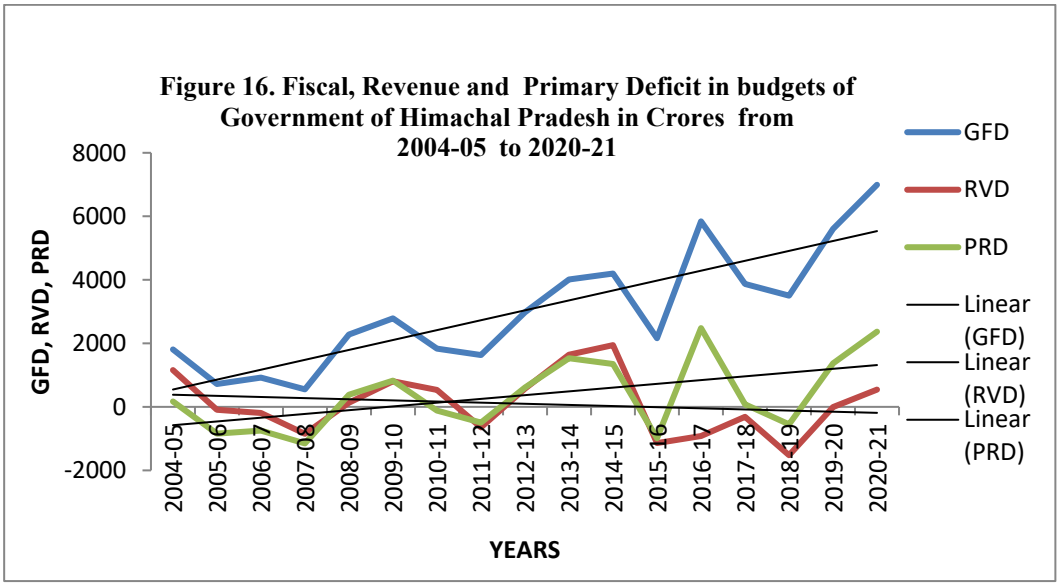
Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The revenue account deficit was highest in the year 2014-15 (that is rupee 1944 crore). It was lowest in the year 2018-19 (that is rupee -1522 crore), which means that for the year 2018-19 there was no revenue account deficit (rupees 1522 crore surplus).

The long run trend line of revenue account deficit is displaying a decreasing tendency.

The primary account deficit was lowest for the year 2007-08 that is rupee -1151 crore. It was highest for the year 2020-21 that is rupee 2370 crore. The primary account deficit was continuously increasing from 2004-05 to 2020-21.

The primary account deficit displayed an increasing trend in long run like gross fiscal deficit as shown in the Figure No. 16 below.



Source: Authors calculations from various Statistical Abstracts of Himachal Pradesh

The above results of deficit shows that the state is heavily borrowing to meet its expenditure, it means growing liabilities in successive budgets.

IX. CONCLUSION

The study of recent two decades of growth of finances of Government of Himachal Pradesh shows growing liabilities in revenue account as well as capital account in the successive budgets. The results shows that the revenue receipts is growing with declining trend whereas revenue account expenditure showing fluctuations and stable increasing trend, particularly the expenditure on health and family welfare. The capital account income is maintained and expenditure is rising with fluctuations. It means greater liabilities of the state government in coming years. The expenditure on physical and social infrastructure is although increasing in successive years but it shows declining growth, which means budget, is more skewed towards revenue account expenditure. The long term trends of deficit shows that the state is heavily borrowing to meet its expenditure, thereby increasing its liabilities.

Unless greater tax efforts and increase in economic activities in agriculture and industrial sector is undertaken, the growing fiscal deficit will lead to greater liabilities particularly interest and principal amount in coming years.

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An Analysis of India's Trade Relations with Indonesia: Since Look East Policy

Dinesh Yadav *
Abhishek Yadav **

ABSTRACT

The relation between India and Indonesia is not new and it had dated back to the ancient period which is quite evident from the architectural remnants in Indonesia. Since the 1955 Bandung Afro- Asian Conference, when Jawaharlal Nehru and Sukarno's combined voice was able to effectively put forward the concerns and interests of non-aligned countries at international forums, there have been many ups and downs in the relationship between India and Indonesia. The Indo-Pak War of 1965 marked the lowest point of the relationship, when the Indonesian government not only supplied weapons to Pakistan but also allegedly stage-managed a mob attack on the Indian embassy in Jakarta. This was further slowed down by India's friendship with communist Vietnam and the USSR as well as Indonesia's domestic and regional priorities. The shift in power in Indonesia with Suharto's accession, as well as both countries' emphasis on the "China-threat theory," helped to reduce tensions in their bilateral ties and identify areas of mutual collaboration. Following the introduction of India's Look East policy in 1993, bilateral relations flourished, and ever then, India's involvement with Indonesia and the ASEAN have been mutually beneficial. India's growing prominence in Southeast Asia has facilitated stronger ties with Indonesia; however, India's standing in the ASEAN area has been further enhanced by Indonesia's strategic engagement with India. India's admission to ASEAN, the ASEAN Regional Forum, and the East Asian Summit is largely due to Indonesia. A shared understanding of the need to counterbalance China and their unwavering focus on enhancing regional peace and security has further paved the way for the two nations to forge a strategic alliance in the area. Since then, there has been a new degree of understanding between Indonesia and India, indicating a similar desire to create a "arc of advantage and prosperity" around Asia. By leveraging their shared history and culture, both nations have strengthened their bilateral relations while also exploring new avenues for collaboration, thereby expanding and strengthening the sphere of cooperation. Along with working on bilateral concerns, the two nations have collaborated on regional and global projects. While the Look East strategy accelerated Indo-Indonesian economic interaction, the economic crisis in Southeast Asia and India's economic expansion further bolstered their bilateral economic ties. The development of India-Indonesia ties is examined in this article. It makes the case that there are reasons to think that in the long run, this connection may grow into a significant trading alliance. Whether this happens sooner rather than later will depend on how much both nations believe it is necessary to translate their many complimentary interests into real actions.

KEYWORDS: Economic Cooperation, Trade, ASEAN, Export, Import

Introduction

The certified name of Indonesia is the Republic of Indonesia.it is the prime economy in Southeast Asia. It is located between the Indian and Pacific Ocean; it is the biggest island country, with more than thirteen thousand islands. Java is a chief island located in Indonesia, and it is the world's most populous island of Java and it contains more than half of the country's population. Indonesia shares land borders with Papua New Guinea, East Timor, and Malaysia (Encyclopedia, 2018).

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Indonesia, the largest archipelago country in the world and the most populous member of the Organisation of Islamic Cooperation (OIC) and the Association of South East Asian Nations (ASEAN) became a trillion-dollar economy at the end of 2017, the first country in both ASEAN and the OIC to have entered the trillion-dollar economy club. According to the International Monetary Fund (IMF), Indonesia's gross domestic product (GDP) was an estimated $1.004 trillion in 2017, the achievement being an opportunity to reflect on what has already been accomplished and what more can be done in the future. Over the last two decades from 1997 to 2017, Indonesia has maintained an average 4.2 percent GDP growth annually, only behind Turkey, India and China in the G20's major economies. The country's main exports are led by palm oil and coal briquettes, with jewellery, cars and vehicle parts, rubber, and copper ore making up the majority of other exports, while imports mainly consist of refined petroleum and crude petroleum, with telephones, computers, vehicle parts and wheat cover the majority of other imports. Indonesia is the world's biggest producer and consumer of palm oil and it delivers almost half of the world's supply. India is the largest buyer of crude palm oil from Indonesia and imports coal, minerals, rubber, pulp and paper and hydrocarbons reserves. India exports refined petroleum products, maize, commercial vehicles, telecommunication equipment, oil seeds, animal feed, cotton, steel products and plastics to Indonesia.

The overall investment scenario in Indonesia is very encouraging. It is an attractive destination for Indian investment in the region. Indian companies have made significant investments in infrastructure, power, textiles, steel, automotive, mining machinery, banking and consumer goods sectors.

India, one of the emerging economies in the world, has extensively involved in international trade and developed strong multilateral and bilateral trade relations with major countries. Economic reforms initiated in 1991 led to significant changes in the country's trade patterns and direction. In 1991, India's commodity trade was primarily dominated by Organization for Economic Co- operation and Development (OECD) countries, with an export share of 56.6% and Intra-Industry Trade Between India and Indonesia an import share of 57.2%, but, by 2017–2018, these shares had declined to 39.4% and 27.2%, respectively. During the same period, the country's export share with Asia increased from 14.4% to 32% and its share of imports increased from 14.4% to 35.6% (OECD, 2018). These shifts in the destination of trade indicate India's growing interconnectedness with Asian economies. Among Asian economies, India's trade with Indonesia also increased substantially during this period. Indonesia has emerged as India's largest trading partner within Asia.

Objective

1. To analyse the trade pattern of India- Indonesia Trade.
2. To find out the major trading goods in India- Indonesia Trade.
3. To find out trends of major exporting and importing goods in India- Indonesia Trade.

Methodology, source of data collection

The comprehensive data on foreign trade are officially collected and published by Directorate General of Commercial Intelligence and Statistics (DGCI&S). A new commodity classification system, known as harmonized system has been adopted by DGCI&S from April 1987. This data is also available on Ministry of Commerce, India's trade site. Trade data from 1996-97 to 2022-23 has been taken under study. Data has been taken from Export and import data Bank, Ministry of Commerce and Industry, Government of India.

Revealed Comparative Advantage Index

Measures of revealed comparative advantage (RCA) have been used to help assess a country's export potential. It can also provide useful information about potential trade prospects with new partners. Countries with similar RCA profiles are unlikely to have high bilateral trade intensities unless intra-industry trade is involved. RCA measures, if estimated at high levels of product disaggregation, can focus attention on other nontraditional products that might be successfully exported. The RCA index of country i for product j is often measured by the product's share in the country's exports in relation to its share in world trade:

RCAij= (xij/Xit) / (xwj/Xwt)

where xij and xwj are the values of country i's exports of product j and of world exports of product j to partner country respectively and where Xit and Xwt refer to the country's total exports and world total exports to partner country respectively. A value of less than unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product.

c. Percentage Change- It is used to calculate the total percentage change from the previous year to current year.

$$\text{Percentage change} = \frac{(Figure\ in\ current\ year) - (\ Figure\ in\ privious\ year)}{(Figure\ in\ Privious\ year)}\ X\ 100$$

d. Compound Annual Growth Rate (CAGR)- It is used to calculate the compound annual growth rate between the two period of time as here exports and imports CAGR has been calculated between the periods of V(T0) 1996 -97 to V(Tn) 2022-23. The formula used is as follows:

$$CAGR = (V(Tn)/V(To))^{\frac{1}{tn-to}} - 1)$$

Here, V (To) = start value, V (Tn) =finish value, tn -to =number of years

e. Trend line –Least Square Method has been used to present the trend of India's exports, imports and total merchandise trade with Singapore, it simply present that in long term, whether the trend of data is positive, negative or no trend.

f. Percentage Share – Trade share (in %) of Indonesia in India's total trade with world, in terms of exports , imports and total trade has been presented in this study. It has been calculated by using this formula Percentage Share of Singapore in India's total trade (n)

$$= \frac{value\ of\ India's\ total\ trade\ with\ Singapore\ (n)}{value\ of\ India's\ total\ trade\ with\ world\ (n)}\ \text{X}\ 100$$

Here, (n) = year

India- Indonesia Trade Relation

Table-1: General Profile of Indonesia

Capital	Jakarta
Official Languages	Indonesian, English
Total Area	1904569 km^2
Population	270.20 million (2020)*
Economic Structure (in terms of GDP composition, 2020)	**Agriculture-** 13.7% **Industry-** 41% **Services-** 45.40%
HDI(2021)	0.705 (rank- 114th)
GDP Total (in US$)	1319.10 billion (2022)*,
GDP per capita (in US$)	4788(2022)*,
Literacy Rate	96.00 % (2020)
Currency	Indonesian Rupiah (IDR)

*Source- World Bank *Estimated*

India's Exports to Cambodia during 1996-97 to 2022-23

Indonesia is one of biggest exports destinations of India among ASEAN member countries, India's exports to Indonesia has grown up from 591.86 US$ Millions in 1996-97 to 3,963.77 US$ Millions in 2017-18, India's exports volume to Indonesia has seen a high increase after 2005-06, it reached to the level of 6677.99 US$ millions in 2011-12 but after this year India's exports to Indonesia has started to decline and became 3,963.77 US$ Millions in 2017-18.

India's Imports from Indonesia during 1996-97 to 2022-23

Indonesia is the biggest imports partner of India among ASEAN member countries, India's imports from Indonesia has seen continuous increase during the study period. The volume of India's imports from Indonesia has reached to the level of 16,438.80 US$ Millions in 2017-18 from 597.05 US$ Millions which was in 1996-97.

India's Balance of Trade with Indonesia during 1996-97 to 2022-23

India's Balance of Trade with Indonesia remained unfavorable for India during the study period, as with time Indonesia has become India's biggest imports destination, India's Balance of Trade with Indonesia has increased in negative direction, India mainly imports hides and skins, animal or vegetable oils, organic chemicals, electrical machinery and equipment's etc. from Indonesia. As we can see in the given table and graph that volume of Balance of Trade of India with Indonesia remained negative during 1996-97 to 2017-18. India's Balance of trade with Indonesia has grown up from 5.19 US$ Millions in 1996-97 to 12475.03 US$ Millions in 2017-18 which is unfavorable from India's point of view.

Table-2: India's Exports, Imports and Balance of Trade with Indonesia (US$ Millions)

Year	India's Exports to Indonesia	Annual Growth Rate of India's Exports to Indonesia	India's Imports from Indonesia	Annual Growth Rate of India's Imports from Indonesia	Total Trade with Indonesia	Balance of Trade with Indonesia
1996-97	591.86	_	597.05	_	1188.91	-5.19
1997-98	437.27	-26.12	731.63	22.54	1168.9	-294.36
1998-99	185.27	-57.63	829.1	13.32	1014.37	-643.83
1999-2000	325.58	75.73	953.7	15.03	1279.28	-628.12
2000-01	399.75	22.78	910.24	-4.56	1309.99	-510.49
2001-02	533.71	33.51	1,036.81	13.91	1570.52	-503.1
2002-03	826.06	54.78	1,380.87	33.18	2206.93	-554.81
2003-04	1,127.20	36.45	2,122.06	53.68	3249.26	-994.86
2004-05	1,332.60	18.22	2,617.74	23.36	3950.34	-1285.14
2005-06	1,380.20	3.57	3,008.11	14.91	4388.31	-1627.91
2006-07	2,032.96	47.29	4,181.96	39.02	6214.92	-2149
2007-08	2,164.17	6.45	4,821.25	15.29	6985.42	-2657.08
2008-09	2,559.82	18.28	6,666.34	38.27	9226.16	-4106.52
2009-10	3,063.36	19.67	8,656.66	29.86	11720.02	-5593.3
2010-11	5,700.78	86.10	9,918.63	14.58	15619.41	-4217.85
2011-12	6,677.99	17.14	14,765.93	48.87	21443.92	-8087.94
2012-13	5,331.30	-20.17	14,879.49	0.77	20210.79	-9548.19
2013-14	4,850.20	-9.02	14,748.30	-0.88	19598.5	-9898.1
2014-15	4,043.32	-16.64	15,004.64	1.74	19047.96	-10961.3
2015-16	2,819.54	-30.27	13,131.93	-12.48	15951.47	-10312.4
2016-17	3,488.12	23.71	13,427.99	2.25	16916.11	-9939.87
2017-18	3,963.77	13.64	16,438.80	22.42	20402.57	-12475
2018-19	5,275.60	33.10	15,849.67	-3.58	21125.27	-10574.1
2019-20	4,129.33	-21.73	15,061.87	-4.97	19191.2	-10932.5
2020-21	5,026.21	21.72	12,470.17	-17.21	17496.38	-7443.96
2021-22	8,471.51	68.55	17,702.83	41.96	26174.34	-9231.32
2022-23	10,024.30	18.33	28,820.41	62.80	38844.71	-18796.1
CAGR	11.04%		CAGR	15.44		

Source- Ministry of Commerce, Govt. of India.

Graph: 1 India's Trade with Indonesia

Source: compiled by author on the basis of data from Ministry of Commerce, Govt. of India.

Graph 4.10: India's Trade with Indonesia

As we can see in the above graph that India's exports to Indonesia has increased with positive tendency from 1996-97 to 2012-13. After that this shows declining trend from 2012-13 to 2015-16, again India's exports to Indonesia is increasing till date.

India's imports from Indonesia is high in volume and it has growing up over the time during the study period. India mainly imports industrial products from Indonesia.

Graph:2 Trends Line of India's Exports, Imports and Balance of Trade with Indonesia

Source: compiled by author on the basis of data from Ministry of Commerce, Govt. of India.

1. INDIAN ECONOMY HEAVILY DEPENDS ON THE IMPORTS OF MINERAL FUELS AND ELECTRONIC ITEMS FROM INDONESIA AND IN CONTRAST IT EXPORTS VERY LESS AMOUNT OF GOODS TO INDONESIA, SO THAT INDIA HAS BEEN CONSISTENTLY FACING UNFAVORABLE BALANCE OF TRADE WITH INDONESIA.

2. MAJOR COMMODITIES TRADED BETWEEN INDIA AND INDONESIA

The major commodities which were exported from India to Indonesia during the year study period are presented in the following table.

TABLE 4.13 TOP FIVE COMMODITIES EXPORTED FROM INDIA TO INDONESIA

Year	Ships, boatsand floating structures.	Organic chemicals	Vehicles other than railway or tramway rolling stock, and parts and accessories Thereof.	Nuclear reactors, boilers, machinery and mechanical appliances; parts Thereof.	Meat and edible meat offal.
1996-1997		27.83	5.42	32.30	0.01
1997-1998		25.41	5.67	21.26	0.37
1998-1999		15.49	2.48	11.99	0.15
1999-2000		49.37	8.00	10.56	
2000-2001	0.06	36.48	23.34	15.25	0.04
2001-2002		27.80	13.92	13.26	0.04
2002-2003		61.93	15.00	29.51	0.01
2003-2004		153.75	14.61	29.51	0.35
2004-2005	4.92	281.03	13.96	69.30	0.39
2005-2006	5.14	344.77	18.68	45.32	0.00
2006-2007	2.28	359.22	22.09	48.94	
2007-2008	34.30	386.68	44.13	73.83	
2008-2009	87.97	367.28	87.85	111.48	0.13
2009-2010	213.15	291.39	74.40	135.54	1.22
2010-2011	131.33	522.83	436.25	167.04	
2011-2012	647.28	776.71	208.53	235.25	
2012-2013	170.06	562.85	231.48	285.50	2.41
2013-2014	65.66	517.01	216.61	271.86	
2014-2015	53.40	536.58	239.65	322.26	0.16
2015-2016	84.15	406.65	185.50	269.70	2.36
2016-2017	304.50	374.67	277.97	271.83	228.06
2017-2018	36.07	425.40	565.44	373.12	95.50
2018-2019	734.61	629.71	558.76	512.93	323.32
2019-2020	527.45	547.45	311.86	328.95	233.61
2020-2021	831.48	465.15	145.88	221.87	305.83
2021-2022	258.35	560.76	435.19	366.46	307.51
2022-2023	400.20	455.27	780.60	450.27	317.05

Source: Computed data - DGCI&S, Kolkata

It was observed from the table that the major commodity which was exported from India to Indonesia during 2022-2023 was vehicles other than railway or tramway rolling stock. The value of the export of vehiclesother than railway or tramway rolling stock from India to Indonesia during 2022-2023 was 780.60 USD. The value of export of vehicles otherthan railway or tramway rolling stock from India to Indonesia was 5.42 USD during 1996-97. It rose to 436.25 USD during 2010-11. The value of export of vehicles other than railway or tramway rolling stock from India to Indonesia was more than 10 billion since 2010-11 except 2011-12 The value of export of vehicles other than railway or tramway rolling stock from India to Indonesia was 565.44 USD during 2017-18.

The second major commodity which was exported from India to Indonesia during 2022-2023 was organic chemicals. The value of export of organic chemicals from India to Indonesia during 2022-2023 was 455.27 USD. There was sustained increase in the exportof organic chemicals from India to Indonesia during the study period. The value of export of organic chemicals crossed 10 billion during 2004-05 and surpassed 20 billion during 2010-11. Since 2010-11, the value of export of organic chemicals was more than 20 billion till the end of the study period.

The third major commodity exported from India to Indonesia during the year 2022-2023 was nuclear reactors, boilers, machinery and mechanical appliances. The value of the export of nuclear reactors, boilers, machinery and mechanical appliances from India toIndonesia during was 32.30 USD during 1996-97. It declined to less than 1 billion during 1997-98 to 2001-02. The value of export of nuclear reactors, boilers, machinery and mechanical appliances from India to Indonesia was 29.51 USD during 2002-03. It rose to 111.48 USD during 2008-09 and to Rs.235.25 during 2011-12. At the end of the study period, i.e., 2022-2023, the value of export of nuclear reactors, boilers, machinery and mechanical appliances from India to Indonesia was 450.27 USD.

The fourth largest commodity exported from India to Indonesia during 2022-2023 was ships, boats and floating structures. The value ofships, boats and floating structures exported from India to Indonesia was 734.61 USD.The export of ships, boats and floating structures from India to Indonesia was negligible before 2003-04. There were fluctuations in the value of export of ships, boats and floating structures during the study period. During 2016-17, the value of export of ships, boats and floating structures were 304.50 USD and it decreased to 36.07 during 2017-18.

The fifth largest commodity exported from India to Indonesia during 2022-2023 was meat and edible meat. The export of meat and edible meat from India to Indonesia was negligible till the year 2015-16. The highest value of meal and edible meat which was exported from India to Indonesia was 2.36 USD till 2015-16. It increasedtremendously during 2016-17 to 228.06USD and fell in the subsequent year i.e., 2017-18 to 95.50 USD. The value of the export of meat and edible meat from India to Indonesia during 2022-2023 was 317.05 USD.

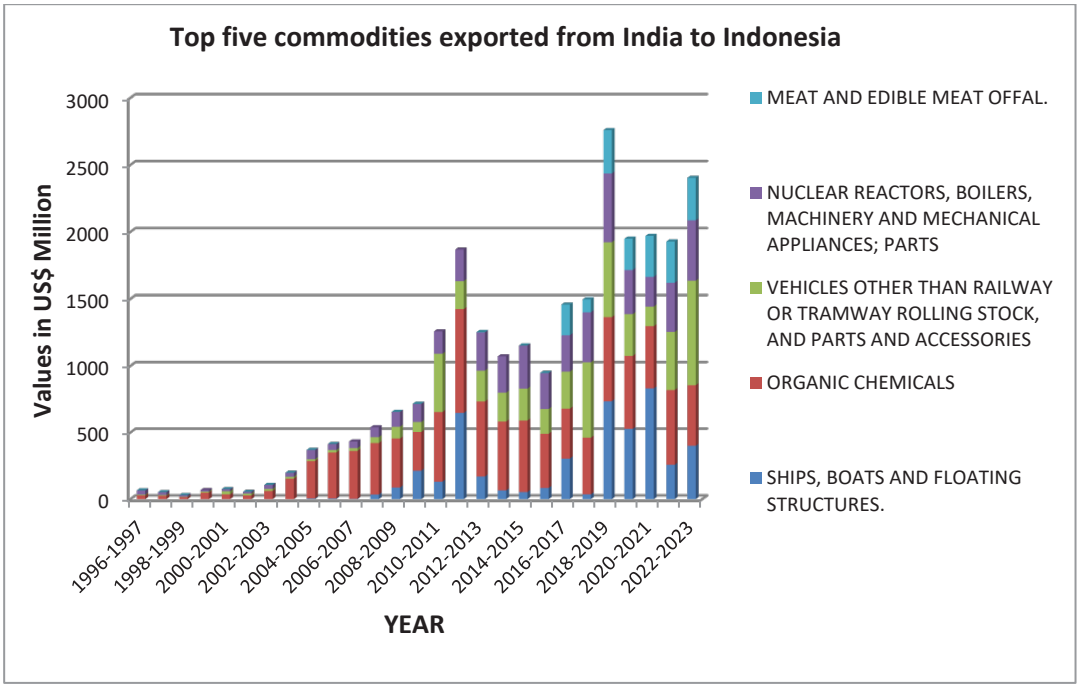


TABLE 4.15 TOP FIVE COMMODITIES IMPORTED TO INDIA FROM INDONESIA

year	mineral fuels, mineral oilsand products of their distillation; bituminous substances; mineral waxes.	animal or vegetablefats and oils and their cleavage products; pre. edible fats; animal or vegetable waxex.	miscellaneous chemical products.	iron andsteel	ores, slag and ash.
1996-1997	170.99	132.53	35.84	1.19	10.05
1997-1998	209.46	143.27	49.35	1.29	16.83
1998-1999	115.07	294.17	62.26	1.00	40.27
1999-2000	197.53	311.71	55.22	0.62	30.93
2000-2001	85.58	391.41	33.79	1.86	20.13
2001-2002	116.17	388.13	56.06	1.35	57.25
2002-2003	114.83	665.77	71.72	3.47	94.05
2003-2004	178.24	1,262.11	68.36	4.39	117.73
2004-2005	481.13	1,338.35	53.05	17.76	98.88
2005-2006	823.99	929.62	53.13	53.72	330.83

2006-2007	1,090.67	1,053.41	79.62	92.01	896.25
2007-2008	1,585.89	1,554.61	137.56	55.25	307.78
2008-2009	2,847.85	2,183.81	154.74	42.60	349.09
2009-2010	2,655.48	3,413.64	119.26	33.43	1,063.70
2010-2011	3,054.14	3,950.67	119.34	40.93	557.26
2011-2012	5,593.74	5,658.82	171.92	27.19	1,004.76
2012-2013	6,110.42	5,625.93	119.03	28.39	584.47
2013-2014	6,896.05	4,615.43	132.28	34.52	725.07
2014-2015	7,497.34	3,893.77	223.60	114.17	511.50
2015-2016	5,089.67	3,642.56	218.62	244.03	713.59
2016-2017	5,036.24	4,244.97	342.24	235.52	713.51
2017-2018	6,322.78	5,024.80	452.99	298.04	731.72
2018-2019	7,283.42	3,440.97	476.68	456.78	407.97
2019-2020	6,716.12	2,850.45	338.71	817.94	96.49
2020-2021	4,956.99	3,214.41	386.28	294.97	310.61
2021-2022	6,876.78	4,123.29	683.68	1,260.01	626.68
2022-23	14,775.51	5,668.71	689.92	1,598.14	969.12

Source: Computed data - DGCI&S, Kolkata

The commodity which was majorly imported to India from Indonesia during 2022-2023 was mineral fuels, mineral oils and products of their distillation. The value of the import of mineral fuels, mineral oils and products of their distillation in the overall import to India fromIndonesia was 170.99 USD during 1996-97. It raised to 481.13 during 2004-05. The value of the import of mineral fuels, mineral oils and products of their distillation in the overall import to India from Indonesia rose to 7497.34 USD during 2014-15. The value of the import of mineral fuels, mineral oils and products of their distillation in the overall import to India from Indonesia was highest during 2022-2023 with 14775.51 USD.

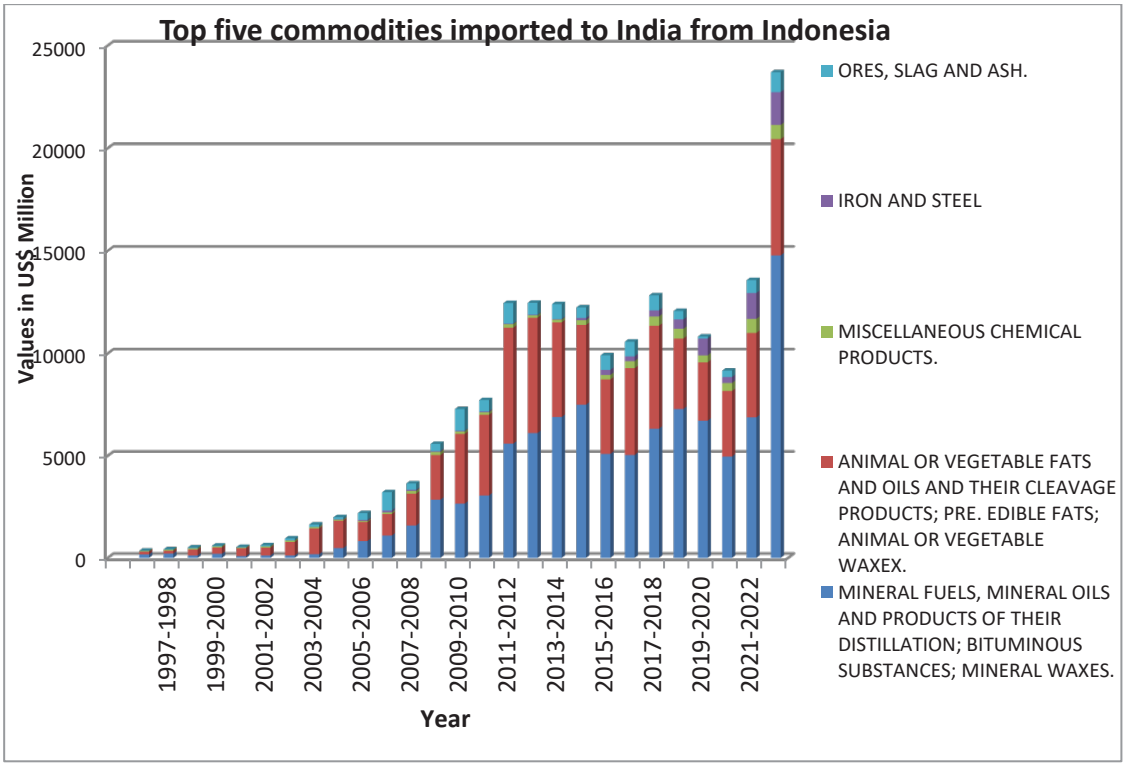
The second major commodity which was imported to India from Indonesia during 2022-2023 was animal or vegetable fats and oils and their cleavage products. The value of its imports during 2022-2023 was 5668.71 USD. The value of the import of was highest during 2022-2023.The value of the import of animal or vegetable fats and oils and their cleavage products increased significantly during the study period with certain exceptional years.

The third major commodity which was imported to India from Indonesia during 2022-2023 was iron and steel. It was found that the value of import of iron and steel from Indonesia to India increased significantly in the recent years. The value of the import of iron and steel from Indonesia to India was less than 2 billion till 2014-15 since the beginningof the study period. The value of import of iron and steel from Indonesia to India rose to 244.03 USD in 2015-16. It increased to 298.04 USD in 2017-18 and reached its peak in 2022-2023 with 1598.14 USD.

The fourth major commodity which was imported from Indonesia to India during 2022-2023 was ores,

slag and ash. It was found that value of import of ores, slag and ash was higher than miscellaneous chemical products between 2001-02 to 2017-18

The fifth major commodity which was imported into India from Indonesia during 2022-2023 was miscellaneous chemical products worth 689.92 USD. There was significant gap observed in terms of value of imports between the first two major commodities with the latter three of the major five commodities which was imported to India from Indonesia. There was significant increase in the value of import of miscellaneouschemical product since 2009-10.



Source: compiled by author on the basis of data from

Indonesia

Table-6.5 Top Twenty Exportable Commodities of India with Indonesia On the basis of RCA alue according to 2009

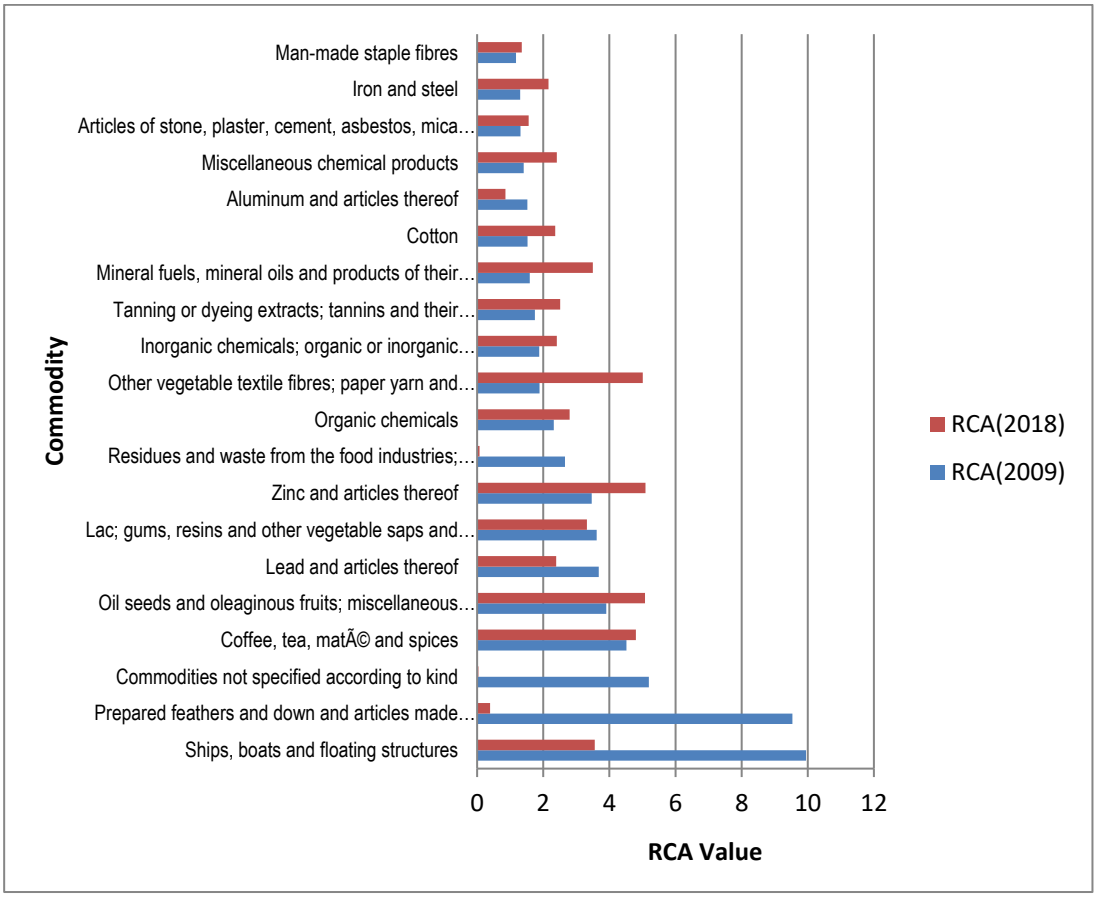
Rank (2009)	Commodity Code	Commodity	RCA (2009)	RCA (2018)
1	89	Ships, boats and floating structures	9.947061	3.558573
2	67	Prepared feathers and down and articles made of feathers or of down; artificial flowers; articles of human hair	9.536599	0.39106
3	99	Commodities not specified according to kind	5.191761	0.040968
4	9	Coffee, tea, matÃ© and spices	4.51687	4.803109
5	12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	3.90557	5.075979
6	78	Lead and articles thereof	3.679666	2.392297
7	13	Lac; gums, resins and other vegetable saps and extracts	3.61485	3.321698
8	79	Zinc and articles thereof	3.465703	5.089702
9	23	Residues and waste from the food industries; prepared animal fodder	2.659316	0.071799
10	29	Organic chemicals	2.316501	2.795905
11	53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn	1.888949	5.012043
12	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	1.879196	2.412196
13	32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics; inks	1.745211	2.513143
14	27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	1.593473	3.498059
15	52	Cotton	1.524074	2.364481
16	76	Aluminum and articles thereof	1.518157	0.858795
17	38	Miscellaneous chemical products	1.407324	2.412345
18	68	Articles of stone, plaster, cement, asbestos, mica or similar materials	1.312473	1.557459
19	72	Iron and steel	1.300322	2.160446
20	55	Man-made staple fibres	1.178624	1.350572

Source: Researcher's calculation on the basis of data extracted from ITC, UN COMTRADE database.

The above table is showing the Revealed Comparative Advantage Value of commodities for the year 2009 and 2018 respectively where RCA index base year is 2009. The table is revealing the fact that

the commodity with HS code 89 have got first rank in 2009 where as commodity code 55 rank as 20th commodity code 67 rank as 2nd, commodity code 99 rank as 3rd, commodity code 9 rank as 4th and commodity code of 29 rank as 10th in comparative advantage index.

Graph-6.5 Top Twenty Exportable Commodities of India with Indonesia On the basis of RCA Value according to 2009



Source: compiled by researcher on the basis of data from ITC, UN COMTRADE database.

The above bar diagram is showing the Revealed Comparative Advantage values of trading commodities of India with Indonesia for year 1991 and 2018.

Table-6.6 Top Twenty Exportable Commodities of India with Indonesia On the basis of RCA Value according to 2018

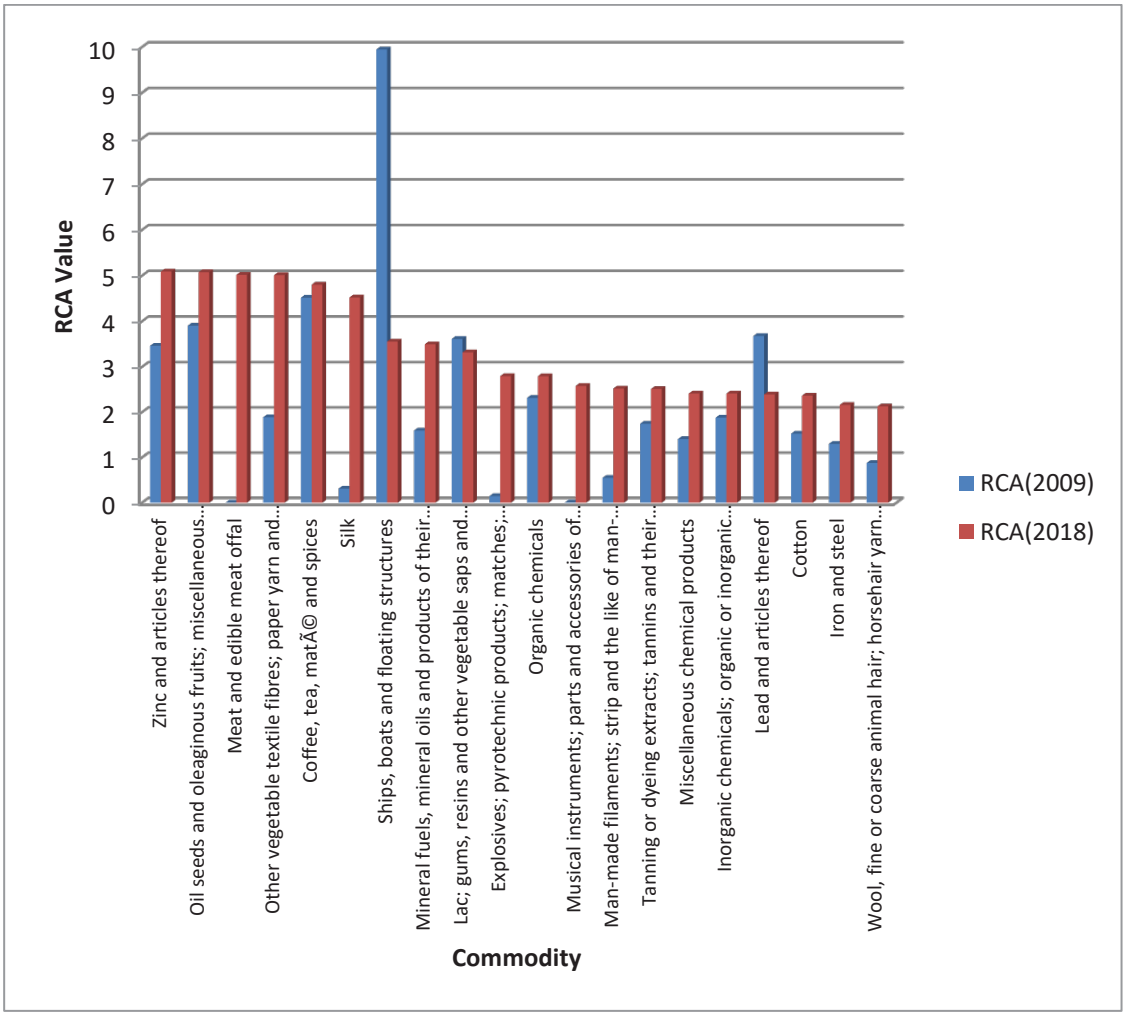
Rank (2018)	Commodity Code	Commodity	RCA (2009)	RCA (2018)
1	79	Zinc and articles thereof	3.465703	5.089702
2	12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	3.90557	5.075979
3	2	Meat and edible meat offal	0	5.01745
4	53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn	1.888949	5.012043
5	9	Coffee, tea, matÃ© and spices	4.51687	4.803109
6	50	Silk	0.312054	4.522611
7	89	Ships, boats and floating structures	9.947061	3.558573
8	27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	1.593473	3.498059
9	13	Lac; gums, resins and other vegetable saps and extracts	3.61485	3.321698
10	36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations	0.146111	2.796772
11	29	Organic chemicals	2.316501	2.795905
12	92	Musical instruments; parts and accessories of such articles	0.005413	2.580437
13	54	Man-made filaments; strip and the like of man-made textile materials	0.549736	2.522424
14	32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics; inks	1.745211	2.513143
15	38	Miscellaneous chemical products	1.407324	2.412345
16	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	1.879196	2.412196
17	78	Lead and articles thereof	3.679666	2.392297
18	52	Cotton	1.524074	2.364481
19	72	Iron and steel	1.300322	2.160446
20	51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	0.87891	2.1286

Source: Researcher's calculation on the basis of data extracted from ITC, UN COMTRADE database.

The above table is showing the Revealed Comparative Advantage Value of commodities for the year 2009 and 2018 respectively where RCA index base year is 2018. The table is revealing the fact that

the commodity with HS code 79 have got first rank in 2018 where as commodity code 51 rank as 20th commodity code 12 rank as 2nd, commodity code 2 rank as 3rd, commodity code 53 rank as 4th and commodity code of 36 rank as 10th in comparative advantage index.

Graph-6.6 Top Twenty Exportable Commodities of India with Indonesia On the basis of RCA Value according to 2018



Source: compiled by researcher on the basis of data from ITC, UN COMTRADE database.

The above bar diagram is showing the Revealed Comparative Advantage values of trading commodities of India with Indonesia for year 2009 and 2018.

FINDINGS

1. India's export with Indonesia has a rising trend during the study period.
2. India's import from Indonesia also has a rising trend during the study period.
3. The total trade (Trade Volume) between India and Indonesia has also increasing during WTO era.

4. But the balance of trade is against to India and in favour of Indonesia.
5. The compound annual growth rate (CAGR) of total export is 11.04 percent and total imports Compound Annual Growth rate (CAGR) is 15.44 percent, suggesting that in the coming years the trade between India and Malaysia is going to increase.

6. The Major exportable commodity in India is ships, boatsand floating structures., organic chemicals, vehicles other than railway or tramway rolling stock, and parts and accessories thereof., nuclear reactors, boilers, machinery and mechanical appliances; parts thereof. and meat and edible meat offal. etc.

7. The Mazor imporable goods from Indonesia are mineral fuels, mineral oilsand products of their distillation;bituminous substances; mineral waxes., animal or vegetablefats and oils and their cleavage products; pre. edible fats; animal or vegetablewaxex., miscellaneouschemical products., iron andsteel and ores, slag andash.

CONCLUSION

The above study reveals the fact that India's trade with Indonesia has a rising trend in the recent years, but the Balance of trade is against India. Hence it is important to find out the commodity group in which India has export potential with Indonesia. There are number of items in which India has revealed comparative Advantage. Some of them are Zinc and articles thereof, Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder, Meat and edible meat offal, Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn and Coffee, tea, matÃ© and spices. So that the focus of our policy makers must be on the above items related to its cost and Quality. This may bring the Balance of Trade in the favour of India in future

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Navigating Uncertain Conditions in Inventory Management: A Comprehensive Review of Fuzzy Logic Applications

Chhavi Jain*
Deepti Taneja**

Abstract:

Uncertainty in demand, supply chain disruptions, and market changes are some of the uncertainties found in the modern business environment. Managing these uncertainties is crucial to sustaining optimal levels of inventory, satisfactory customers, and cost-efficiency. This abstract presents an extensive literature review based on the study of applications in fuzzy logic methods in controlling inventory management under uncertainty. Fuzzy logic provides the adaptability in decision-making, especially in uncertain environments, through the capture and processing of imprecise or vague information. The present chapter further elaborates on the theoretical aspects, methodologies, and practice-based implementations of fuzzy logic in inventory management as derived from existing literature in a systematic review format. It analyzes how fuzzy logic models can cope with uncertain parameters such as demand forecasts, lead times, and inventory levels and dynamically change the policies of inventory management in order to minimize risks and optimize performance. More, this abstract centers on benefits and limitations of fuzzy logic approaches used in inventory management: highlighting trends that are now growing and directions for further studies. This abstract thus will help guide practitioners and researchers by providing insights from varied contributions that may be synthesizing towards using fuzzy logic and improving the practice of inventory management under uncertain dynamic environments within business operations.

Keywords: Inventory Management, Uncertainty, Fuzzy Logic, Decision-making, Optimization

Introduction:

Efficient inventory management is the key factor that maximizes operational efficiency, reduces cost, and meets the demands of customers in today's dynamically changing business environment. However, inherent uncertainty from market conditions, demand patterns, and supply chain disruptions makes the inventory decision-making process a challenging task. Deterministic approaches fail to deal with the uncertainties properly and produce suboptimal results along with higher operational risks. These problems have seen researchers and practitioners increase their applications of advanced decision techniques, such as fuzzy logic, in managing inventories under uncertainties. Fuzzy logic is a flexible adaptive framework for handling imprecise or vague information, which makes it particularly best suited for modeling and optimizing inventory systems under uncertain environments.

This would involve capturing and processing uncertain parameters like demand forecasts, lead times, and inventory levels so as to arrive at more resilient and responsive solutions for inventory management.

An enormous amount of research and academic studies has been conducted on the use of fuzzy logic in inventory management. A critical review of disparate research studies opined that the application of fuzzy logic technique is justified to handle uncertainty in the performance of inventory management.

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For instance, Wang et al. (2018) successfully utilized fuzzy logic to enhance the inventory control policies that would optimize the multi-echelon supply chain decision and prove the workability of the technique while using it for the purpose of inventory replenishment decision management with varying demand pattern and uncertainty in lead times. Further, Gupta et al. (2020) focused on the integration of the sophisticated optimization algorithms with the fuzzy logic to make the inventory decision-making process better. In the above problem of inventory with inflation, the vagueness in the cost parameters was represented by pentagonal and hexagonal fuzzy numbers. Total cost used signed distance method for defuzzification. A comparative study presented the final cost of the crisp inventory problem with the defuzzified costs under the pentagonal and hexagonal systems.

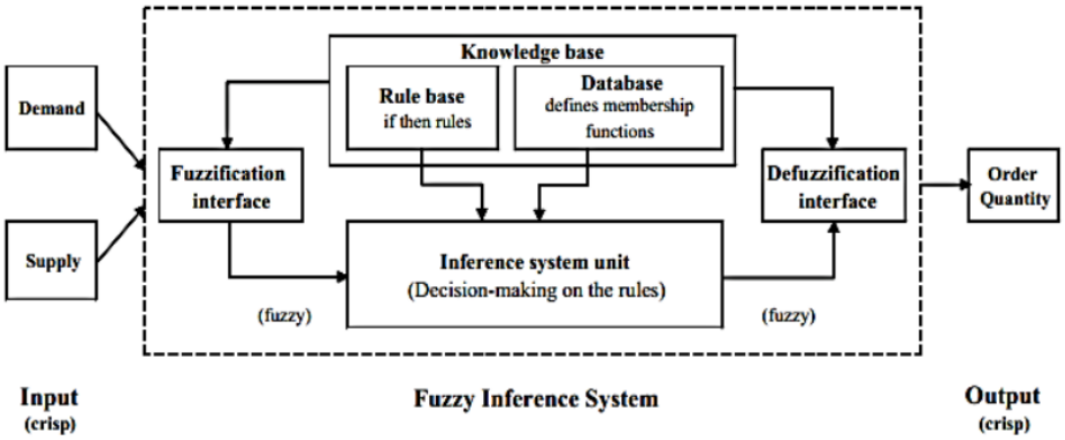

Fig 1: Scheme of Inference Fuzzy Inventory System

Both numerical solutions were validated, and logical insights from the problem were analyzed in the light of the numerical findings. Similarly, Zhang et al., (2023) compared different approaches for inventory optimization, which showed that fuzzy logic-based methods outperformed other methodologies in handling conditions of uncertain demand and supply.
To address the greater relevance of fuzzy logic in uncertain inventory management, this literature review attempts an all-round scrutiny of literature up to the present time, showing new trends and outlining directions for further research. In an attempt to increase our knowledge of how fuzzy logic addresses the complexity of inventory management in uncertain and dynamic business environments, the present review undertakes a highly elaborate study of the pertinent academic contributions

Literature Review

Given the increased relevance of fuzzy logic in uncertain inventory management, this literature review attempts to provide an overview of the existing body of knowledge, identify emerging trends, and suggest future directions for further research. In this direction, by carefully scanning the relevant scholarly studies, the review tries to better understand how fuzzy logic manages the challenge of inventory management in an uncertain environment with changing business landscapes.

A number of research studies explored the possibility of using fuzzy logic in uncertain inventory management situations. Samanta and Al-Araimi (2001) developed a model using fuzzy logic for inventory control, within the context of the periodic review framework using variable order quantity. With the basis of control theory, this model dynamically managed production-inventory systems based on the use of fuzzy logic with a PID control algorithm for stabilizing inventories when demand varies.

Its effectiveness was proven with operational data from an Omani packaging company. Fu and Pan discussed (2005) the inventory issues under uncertainty, which were resolved using fuzzy methodology. Fuzzy theory is introduced in brief followed by describing the representation of fuzzy parameters in inventory management. A demonstration highlighted the relevance and added value of fuzzy methods towards the resolution of inventory problems under uncertainty. Tanthatemee and Phruksaphanrat (2012) proposed a fuzzy inventory system for continuous single-item control setup. The system used fuzziness both on the demand and supply availability. The system introduces linguistic terms both on demand and supply availability against the traditional models which have only considered uncertainty in demand. Fuzzy rules continuously compute the fuzzy order quantity and reorder point.

This system was more flexible when compared to conventional approaches that could adjust both order quantity and reorder point. Simulation results did show that the fuzzy inventory control system significantly reduced the overall costs of inventory when compared to conventional stochastic models.

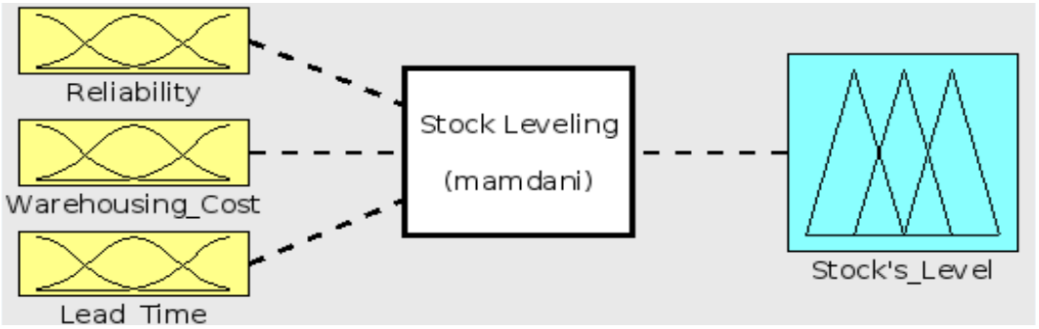

Fig 2: The Fuzzy Stock Leveling Method

Shekarian et al. (2017) endeavored to characterize the major themes in research and publication outlets in the context of fuzzy set theory application in POM. The study found popular applications including capacity planning/scheduling and a rising interest in semi/unstructured POM problems in which the survey confirmed and uncovered some surprising trends in this area. In their 2020 study, Chakraborty et al. delved into the hexagonal number, examining it from different rational angles as a robust framework for tackling vagueness. Different representations, rankings, defuzzification methods, and applications of hexagonal fuzzy numbers are portrayed. A new ranking method and defuzzification approaches are proposed. Ultimately, the study delves into a production inventory management issue within a hexagonal fuzzy setting, showcasing its efficacy amid uncertain conditions.

Risk specialists sought to understand risks better and employed complex models for risk assessment, despite some risks remaining poorly understood. Fuzzy logic models, grounded in fuzzy set theory, offered a solution for analyzing risks with insufficient data. They simplified large-scale risk management frameworks by modeling cause-and-effect relationships, assessing risk exposure levels, and ranking key risks consistently. Fakhravar, 2020 explored fuzzy logic's potential in improving risk

assessment and decision-making processes . Díaz-Curbelo et al., 2020 aimed to analyze the role of fuzzy logic in addressing epistemic uncertainty in supply chain risk management. Through a literature review, common approaches like multicriteria decision-making and disruptive analysis methods were identified, with trends towards petri nets and multicriteria decision-making. Supply risks were extensively studied, particularly in identification and assessment processes. However, limitations were noted regarding the holistic complexity of supply chain risks, dynamic environmental factors, and the reliability of background knowledge in assessment. Despite highlighted publications, these constraints underscored the need for further research in the field.

Nuamchit and Chiadamrong (2021) investigated production planning in a hybrid manufacturing/remanufacturing system, considering different prioritizations. Uncertainties in customer demand, operating costs, and lead times complicated production and inventory control. Fuzzy set theory and Fuzzy Linear Programming (FLP) were utilized to optimize the model under uncertainty. The approach aimed to maximize profit, minimize risk, and enhance decision-making. Results favored the Priority-To-Remanufacturing (PTR) policy over Priority-To-Manufacturing (PTM), indicating FLP's effectiveness in mitigating uncertainties and informing proactive decision-making.

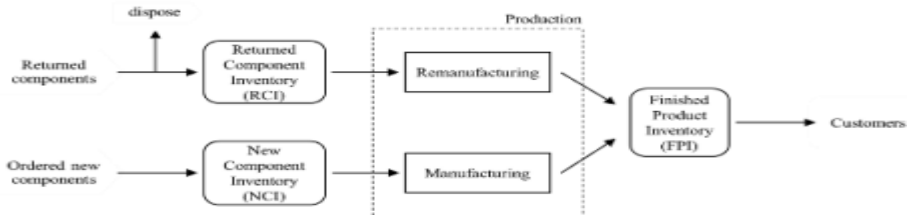

Fig 3: General flowchart of a hybrid manufacturing/remanufacturing system

Imran et al. (2021) addressed uncertain costs in perishable product supply chains with a multi-objective inventory routing problem. They introduced a priority index objective to quantify social aspects like coordination and trust. Their model utilized a mixed-integer multi-objective mathematical framework and a time series integrated regression fuzzy method to handle cost uncertainty. Their solution approach incorporated expert preferences through a modified interactive multi-objective fuzzy programming. A case study on surgical instruments supply chain demonstrated optimal flow and sequencing, minimizing costs and Greenhouse gas emissions while maximizing the priority index for social sustainability.

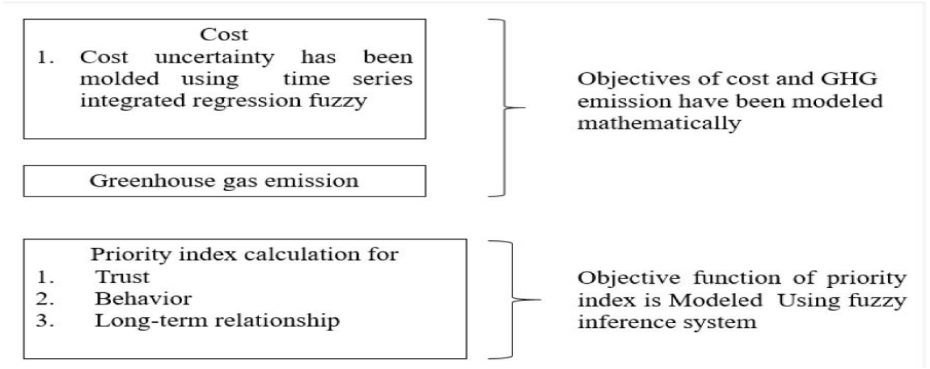

Fig 4: Procedure for objective function development

Khatua et al. (2021) devised a single-period fuzzy production inventory control model for a finite time frame. They introduced a nonlinear demand function dependent on stock, selling price, and product quality, influenced by uncertain advertising rates, stock rates, and selling prices. Utilizing granular differentiability for defuzzification, the model required testing stability and control. This innovative approach employed fuzzy derivatives based on horizontal membership functions for defuzzification.

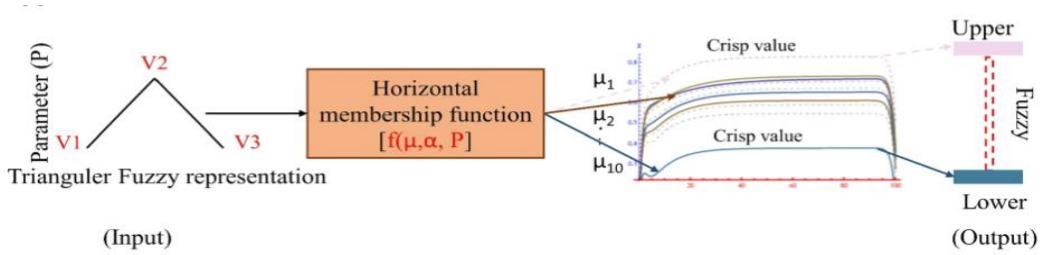

Fig 5: Fuzzy Inventory Control Model with Granular Differentiability Approach

Malik and Garg (2021) aimed to introduce an enhanced inventory system with fuzzy constraints for a dual-warehouse setup—owned and rented. The system was analyzed without shortages, assuming a linear demand function. Constraints such as storage, deteriorating, and ordering costs were acknowledged as varying in today's business scenario for seasonal products. Hence, these costs were treated as triangular fuzzy numbers. The key objective was to determine optimal inventory levels and schedules to minimize overall inventory costs. Two numerical examples were demonstrated to observe constraint behavior and compare performances with and without the fuzzy environment.

Previously, the significance of memory and learning in inventory planning was acknowledged, yet seldom explored simultaneously in literature. Rahaman et al., 2021, bridged this gap by extending an EOQ model to incorporate memory and learning, utilizing fractional calculus and Zadeh's extension principle. Numerical analysis showcased positive impacts on cost reduction objectives.

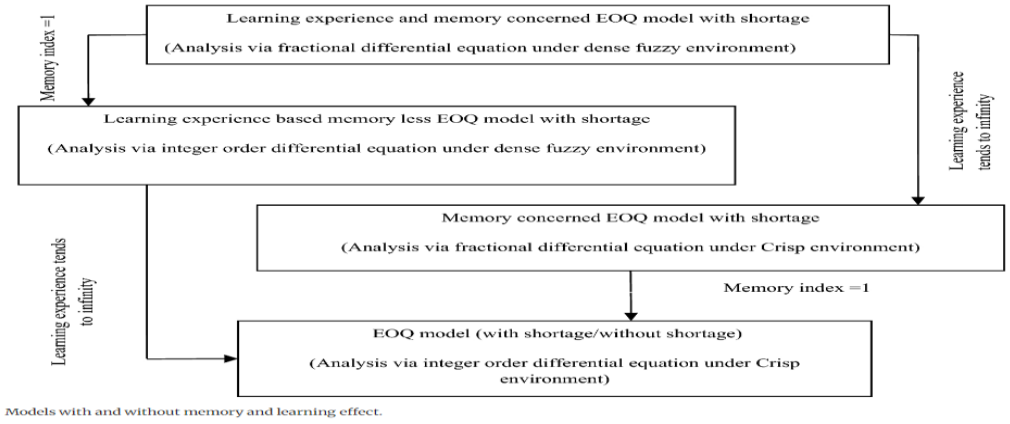

Fig 6: Inventory Management in Uncertain Environments: Memory and Learning Effects

In the competitive and dynamic business landscape, managing inventory and financial flows became increasingly challenging. Previous studies seldom integrated financial considerations into inventory management. Hence, a multi-objective programming model was proposed by Taheri et al., 2023 for optimizing dairy product inventory management, incorporating material substitution to manage inventory value. A fuzzy model was utilized to address uncertain. Berbiche et al. (2024) provided an innovative application of fuzzy logic automation in supply chain decision making about disruptions with the use of if-then scenarios to enable accuracy in predictions and wiser planning for supply supply, particularly in key supply areas like semiconductors through sourcing suppliers. AI enabled augmented supply planning that could support regulation in decisions including extension into forecasted demand and market segments. Validations of the model capabilities for optimizing supply measures toward supply chain safety and efficiency were done from MATLAB simulations. Lakhouil and Soulhi (2024) introduced a new decision-making model with fuzzy logic, first proposed by Loutfi Zadeh in 1965. The criteria for this model were Lead Time, Equipment Production Reliability, and Warehousing Costs. The model showed potential in uncovering intricate patterns and aiding inventory optimization, with promising outcomes in integrating fuzzy logic for prediction.

In brief, fuzzy logic provides a promising solution for navigating uncertainties in inventory management and supply chain operations. Utilizing fuzzy logic-based models enables businesses to enhance decision-making, optimize inventory strategies, and improve overall supply chain performance in dynamic and uncertain environments.

Research Objectives:

This article aims to delve into the effectiveness of fuzzy logic in addressing uncertainty within inventory management systems by exploring the following research questions(RQs)

RQ1: How has fuzzy logic been utilized in addressing uncertainty within inventory management systems?

RQ2: What are the key theoretical frameworks and methodologies employed in fuzzy logic models for inventory control under uncertain conditions?

RQ3: What practical implementations of fuzzy logic models have been utilized in optimizing inventory management practices amidst uncertainty?

RQ4: What are the predominant themes and trends observed in the literature regarding the use of fuzzy logic in navigating uncertain conditions within inventory management?

RQ5: How can fuzzy logic be conceptualized and applied to enhance decision-making processes in inventory management under uncertainty?

RQ6: What insights can be derived from the literature to inform future research and practical applications of fuzzy logic in inventory management?

Research Methodology

This study utilizes a systematic literature review to explore the utilization of fuzzy logic in addressing uncertainties in inventory management. The approach entails a thorough search across academic databases and journals to identify relevant scholarly articles and research papers focusing on the application of fuzzy logic in managing inventory under uncertain conditions. A structured search strategy is employed, utilizing keywords such as "fuzzy logic," "inventory management," "uncertainty," and related terms to ensure the retrieval of relevant literature. The inclusion criteria

encompass studies that discuss theoretical frameworks, methodologies, and practical implementations of fuzzy logic models in addressing uncertainty in inventory control. The retrieved literature is then analyzed to identify key themes, trends, and insights pertaining to the use of fuzzy logic in mitigating uncertainty within inventory management systems. Additionally, the research methodology involves the synthesis of findings to develop a conceptual framework elucidating the fundamental principles of fuzzy logic and its applicability to inventory management under uncertain conditions.

Inventory Management Factors & Fuzzy Logic Utility

Sr No	Factor	Description	Utility in Fuzzy Logic
1	Demand Uncertainty	Variation and unpredictability in customer demand for inventory items.	Fuzzy logic can model uncertain demand patterns and adjust inventory levels accordingly.
2	Lead Time Variability	Fluctuations and unpredictability in the time taken for inventory replenishment.	Fuzzy logic can incorporate lead time variability to determine optimal reorder points and order quantities.
3	Stockout Cost	Cost incurred due to inventory shortages and unfulfilled customer demand.	Fuzzy logic can optimize inventory policies to minimize stockout costs while considering uncertainty in demand.
4	Holding Cost	Cost associated with holding and storing inventory over a certain period.	Fuzzy logic can optimize inventory levels to balance holding costs with the risk of stockouts.
5	Production Capacity	The maximum rate at which goods can be produced or replenished in the inventory system.	Fuzzy logic can adjust production schedules based on uncertain factors such as demand fluctuations and lead times.
6	Supplier Reliability	The reliability and consistency of suppliers in delivering inventory on time.	Fuzzy logic can model supplier reliability to optimize inventory management and mitigate supply chain disruptions.
7	Quality of Inventory	The level of quality or condition of inventory items, affecting their usability and value.	Fuzzy logic can account for uncertain factors impacting inventory quality and adjust inventory policies accordingly.

8	Lead Time Demand	The quantity of inventory demanded during the lead time for replenishment.	Fuzzy logic can estimate lead time demand considering uncertain demand patterns and lead time variability.
9	Seasonal Variations	Periodic fluctuations in demand or production due to seasonal factors or trends.	Fuzzy logic can adjust inventory policies to account for seasonal variations and optimize inventory levels accordingly.
10	Economic Conditions	Changes in economic factors such as inflation rates, interest rates, and market trends.	Fuzzy logic can incorporate economic conditions to adapt inventory management strategies and mitigate financial risks.
11	Product Lifecycle Stage	The stage of a product's lifecycle, including introduction, growth, maturity, and decline.	Fuzzy logic can adjust inventory levels based on the product's lifecycle stage to optimize stock levels and minimize obsolescence.

Results and Discussion : This shows fuzzy logic as emerging effective to manage uncertainties and complications while deciding on inventory along with choices in a chain supply. Several such works show their efficacy in optimizing controlling strategies to ensure better performance concerning an overall inventory system. Research shows how a fuzzy logic-based inventory control model can maintain the inventory level efficiently against the fluctuations in demand with the help of the proportional-integral-derivative (PID) control algorithm combined with fuzzy logic. Similarly one researcher mentioned the use of fuzzy methods in solving the problem of inventory under uncertainty with the help of fuzzy models of single-inventory systems and multi-fuzzy parameters. Later a researcher proposed a soft fuzzy inventory control system that demonstrated drastically lower costs than any other traditional models developed as they used a set of fuzzy rules to re-adjust quantities ordered and reordering points with some uncertainty of demand and supply. Few researchers outlined popular research trends in fuzzy set theory applications, particularly in capacity planning and scheduling, while few discussed the effectiveness of hexagonal fuzzy numbers in dealing with vagueness and uncertainty in inventory management.
Some studies revealed that fuzzy logic has been used in risk assessment with risk improvement and supply chain risk management, respectively, indicating the possibility of using fuzzy logic to enhance decision-making. The studies by several researchers revealed that fuzzy logic was used in a vast variety of applications to optimize production planning, inventory routing, inventory systems with fuzzy constraints, and inventory control models with memory and learning effects.
Collectively, these papers demonstrate the flexibility and power of the fuzzy logic approach to the complexities and uncertainties of inventory management and chain supply operations, thus providing useful material for practitioners and researchers.

Here are some significant suggestions:

Based on the in-depth review of the content discussed, several key suggestions can be made:

1. **Fuzzy Logic Integration into the System:** Given that fuzzy logic has been proved efficient in handling uncertainties during inventory management and supply chain decision-making, business organizations need to integrate fuzzy logic-based models into planning and optimization processes.

2. **Advanced Techniques:** Researchers and practitioners should explore advanced techniques such as hexagonal fuzzy numbers, memory and learning effects in inventory management, and hybrid manufacturing/ Fuzzy Logic Integration into the System: remanufacturing systems to further enhance decision-making capabilities and optimize supply chain operations.

3. **Risk Management Improvement**: The fuzzy logic-based model would be of significant importance in supply chain risk assessment and management improvement. Businesses should adopt fuzzy logic-based models that would help in understanding the uncertainties related to demand and supply availabilities and mitigation thereof. More case studies and real-world application, like those in the reviewed literature, should be carried out in other industries and contexts to validate the effectiveness of fuzzy logic-based approaches.

4. **Interdisciplinary collaboration:** For example, through collaboration by operations management, supply chain management, computer science and fuzzy logic theory experts will produce innovative solutions to resolve more complex issues associated with inventory and supply chain optimization.

By implementing these suggestions, businesses and researchers will utilize the resources provided by fuzzy logic to its best potential in responding to uncertain situations, perfecting inventory management procedures, and enhancing overall supply chain performance.

Conclusion: This paper highlights the importance of fuzzy logic in addressing uncertainties and complexity issues in inventory management and decision-making processes of a supply chain. After going through extensive literature and research outcomes, a few significant topics emerged. First, this has established that fuzzy logic can be a strong instrument in modeling uncertainties within the said operations, where managers could easily handle imprecise data and uncertain parameters more effectively. Further, its applicability in a wide variety of contexts in the use of inventory control and supply chain management, such as control of inventory, production planning, and risk assessment, indicates flexibility and usefulness in responding to numerous problems in a vast range of industries and situations. These authors have further proposed new techniques and models based on the concept of fuzzy logic, which include hexagonal fuzzy numbers and memory and learning effects, which bring new insight and methodologies for optimizing a process and enhancing performance. Importantly, empirical analysis and case studies have also shown tangible benefits of the use of fuzzy logic-based models, including improvements in inventory costs, supply chain efficiency, risk mitigation, and decision-making accuracy.

Further research on integrating fuzzy logic with advanced techniques, interdisciplinary collaboration, and practical tools and frameworks for industrial applications in the future is recommended. The most important aspect will be real-world experimentation and case studies on validating the applicability of fuzzy logic in various business settings.

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Unveiling the Space Economy from an Economical and Environmental Perspective with Special Reference to India

Dillip Anand M

Abstract

Space Economy includes any activity that involves exploring, researching, understanding, managing and utilizing space. The present article includes the development, significant actors, country-specific spending, environmental effects, and economic significance of the space economy with particular reference to India. The budgets of the major spacefaring countries and highlights of national spending on space programs are also discussed. It emphasizes that while developing and less developed nations find it difficult to afford space programs, those with high GDPs can often invest in space research. The connection between the space economy and the environment is also examined, along with the advantages of satellite-based Earth monitoring for the environment and studies on climate change, as well as the production of space trash and efforts to mitigate its effects. Finally, the economic contribution of the space economy is studied, highlighting its significance in raising global GDP through various enterprises and endeavors.

Keywords: Space Economy, Satellites, Mission, Spending, Environmental, Economic

1. INTRODUCTION

The space economy refers to the economic activities and industries related to space exploration, satellite communications, and the utilization of space resources. It encompasses various sectors and activities that contribute to developing, utilizing, and commercializing space technologies, services, and applications (OECD, 2020). The space economy includes government-funded space programs and private-sector companies involved in space-related activities (Ronci et al. 2020; Ricard et al. 2015). The space economy includes a wide range of sectors and activities (Hegadekatti 2017), such as: Satellite Industry which involves the design, manufacturing, launching, and operation of satellites for various purposes, including communication, navigation, Earth observation, and scientific research, Space Launch Services which focuses on developing and operating launch vehicles and services to deliver payloads into space, including satellites and spacecraft, Space Tourism which allows individuals to travel to space for leisure, adventure, or research, Space Research and Development which includes scientific research conducted in space, such as experiments on the International Space Station (ISS) and the development of new technologies for space exploration, Earth Observation and Remote Sensing which uses satellites to gather data and images of the Earth's surface for applications such as weather forecasting, environmental monitoring, agriculture, and urban planning, Satellite Communication and Broadcasting that focuses on providing communication services, including voice, data, and video transmission, via satellites.

It also includes satellite broadcasting for television and radio, Space Mining and Resource Utilization, which involves the exploration and extraction of valuable resources from celestial bodies, such as the Moon and asteroids, for commercial purposes.

Space-based Navigation and Positioning Systems that include developing and operating satellite-based navigation systems like GPS (Global Positioning System) and other positioning technologies for navigation, mapping, and timing applications.

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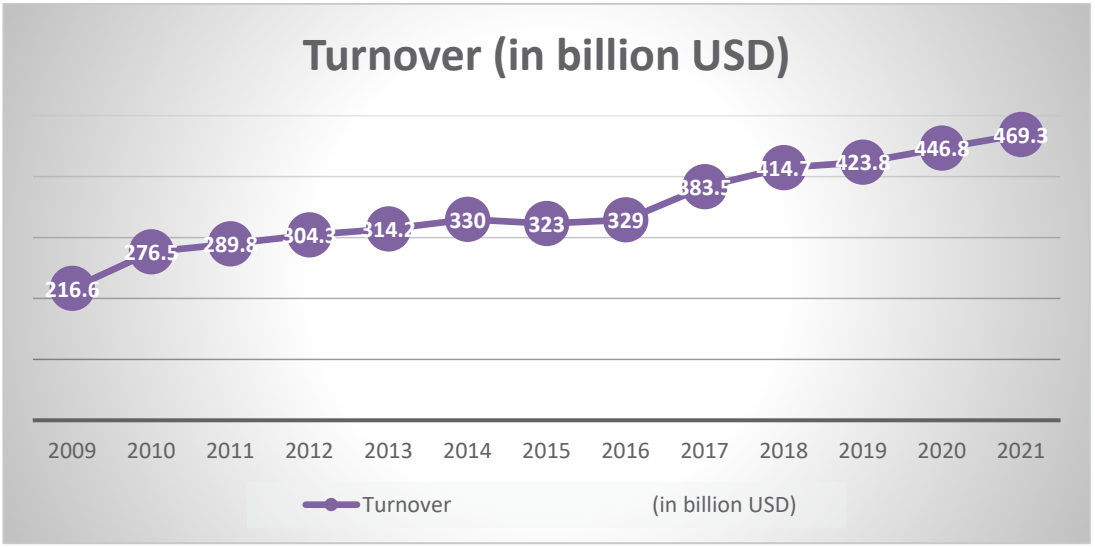
FIGURE 1

GLOBAL TURNOVER OF THE SPACE ECONOMY OVER THE YEARS



Source: https://www.statista.com/statistics/946341/space-economy-global-turnover/

There is much room for technological innovation, scientific discovery, and economic growth in the space economy, a subject that is expanding quickly. It supports many different industries and sectors on Earth, including telecommunications, weather forecasting, navigation, agriculture, disaster management, and national security (Iliopoulos & Esteban 2020). Increased investment and competition in the space economy have resulted from commercializing space operations fueled by establishing private space enterprises and alliances between public and private institutions (Space Safety Magazine 2020). As a result, new technologies have been created, space access costs have decreased, and new prospects for commercial space endeavours have emerged.

2. EVOLUTION OF THE SPACE ECONOMY

The space race between the United States and the Soviet Union in the middle of the 20th century was a turning point in space exploration and technology (Launius et al., 2012). The development of the space economy over time is a shift from a government-driven space exploration model to a more varied and dynamic ecosystem comprising both public and private sector organizations. Here are some significant turning points in the development of the space economy:

***Initial Space Exploration*:** The first artificial satellite, Sputnik 1, was launched by the Soviet Union in 1957, marking the beginning of the space economy. This occurrence ushered in the Space Age and set off a race to set new records between the United States and the Soviet Union.

Apollo Moon Missions: The Apollo program by NASA in the 1960s and 1970s aimed to land humans on the Moon. The successful Apollo 11 mission in 1969, which saw Neil Armstrong and Buzz Aldrin become the first humans to set foot on the Moon, demonstrated the potential for human space exploration and captured the public imagination.

Satellite Communications: The development of satellite communications systems in the 1960s and 1970s revolutionized global telecommunications. Satellites enabled long-distance telephone calls, television broadcasts, and data transmission, transforming global communication.

Space Shuttle Program: The launch of the Space Shuttle program in 1981 by NASA introduced reusable spacecraft, allowing for more cost-effective access to space. The Space Shuttle facilitated the deployment of satellites, conducted scientific research in space, and supported the construction of the International Space Station (ISS).

International Space Station (ISS): The collaboration between multiple countries led to the establishment of the ISS in 1998. The ISS serves as a research laboratory and a platform for international cooperation in space exploration involving government agencies and commercial entities.

Commercial Space Industry: In recent decades, the space economy has significantly shifted towards commercialization. Private companies like SpaceX, Blue Origin, and Virgin Galactic have emerged as key players in space exploration, satellite launches, and space tourism. These companies have developed reusable rockets, reduced launch costs, and opened up new opportunities for commercial space ventures.

Small Satellites and Cubesats: The miniaturization of satellites and the development of CubeSats (small standardized satellites) have lowered the barrier to entry for space-related activities, as a result in a proliferation of small satellite constellations for various purposes, such as Earth observation, communication, and scientific research.

Space Resource Utilization*:* There is increasing interest in the potential utilization of space resources, such as water ice on the Moon and asteroids, which can enable in-space manufacturing, refuelling of spacecraft, and resource extraction for commercial purposes.

3. KEY PLAYERS IN THE SPACE ECONOMY

The space economy is a global initiative encompassing numerous nations and areas. While traditionally, some countries have had a more significant influence on space exploration and the space industry, and the situation is changing due to the entry of new players and rising commercialization (Weinzierl & Sarang 2021).

TABLE 1

COUNTRIES WITH A SIZABLE PRESENCE IN THE SPACE ECONOMY

Country	Description
United States	The United States has been a leader in the space economy for decades. NASA, the National Aeronautics and Space Administration, has been at the forefront of space exploration, scientific research, and the development of space technologies. The country also has numerous private space companies, including SpaceX, Blue Origin, and Boeing, which drive commercial space activities and innovation.
European Union	The European Union has significantly contributed to the space economy through the European Space Agency (ESA). The ESA collaborates with member states to undertake space missions, satellite launches, and scientific research. The EU also has its satellite navigation system called Galileo, providing positioning and timing services.
	Russia has a long history in space exploration and remains a crucial player in the space economy. The country's space agency, Roscosmos, operates the Soyuz spacecraft and

Russia	Proton rockets, conducts space research, and collaborates with other nations on space missions. Russia's expertise in human spaceflight has made it a crucial partner in crewed missions to the International Space Station.
China	China has rapidly developed its space program and has made significant strides in recent years. The China National Space Administration (CNSA) has conducted crewed missions, lunar exploration, and satellite launches and is actively involved in space research and development. China's space capabilities continue to expand, with plans for space station construction and long-term exploration goals.
Japan	The Japan Aerospace Exploration Agency (JAXA) has been engaged in space exploration, satellite launches, and space research. Japan has developed technologies for Earth observation, lunar missions, and scientific research, including the Hayabusa missions to asteroids.
India	The Indian Space Research Organisation (ISRO) has made notable advancements in the space economy. India has successfully launched satellites for communication, Earth observation, and scientific research, including missions to the Moon and Mars. ISRO's cost-effective approach to space technology has garnered attention globally.

The rise of commercial space companies, particularly in the United States, has significantly impacted the space economy. Companies like SpaceX, Blue Origin, and Virgin Galactic are driving innovation, lowering launch costs, and expanding commercial space capabilities. These companies are involved in satellite launches, cargo resupply missions, and developing new space technologies. It is crucial to remember that the space economy is a worldwide endeavour and that many other nations, such as Canada, Australia, Brazil, and South Korea, are actively engaged in space-related activities. International partnerships, like those with the International Space Station, further highlight the cooperative character of space exploration and the international scope of the space industry.

4. COUNTRY-SPECIFIC SPENDING ON THE SPACE ECONOMY

Space economy spending varies from nation to nation and consists of only governmental investments. The space economy budgets can change annually, and specific details may vary. Table 3 exhibits the significant countries' space expenditures. It is evident that countries with high GDPs typically have the funds available to invest in space exploration. According to the list of spacefaring countries, the number of countries capable of sending rockets into space is only about 8 or 9.

TABLE 2

EXPENDITURE ON SPACE PROGRAMS

Country	2009-2010		2021-2022	
	GDP, PPP (constant 2017 international) ($ trillion)	Spending on Space Program[1] ($ billion)	GDP, PPP (constant 2017 international) ($ trillion)	Spending on Space Program[2] ($ billion)
United States	16.86	17.80	21.13	62.00
Russia	3.42	5.60	4.08	3.42
Japan	4.88	2.46	5.13	4.90
France	2.74	2.17	3.05	4.20
Germany	3.84	2.00	4.42	2.53

Italy	2.53	1.80	2.48	1.74
China	11.88	1.30	24.86	11.94
India	5.23	1.40	9.28	1.93
Canada	1.53	0.48	1.83	0.32
United Kingdom	2.65	0.41	3.03	1.15
Europe	17.22	20.74	19.74	2.60
Global	96.66	42.00	134.08	103.00

Source: [1]Hegadekatti, (2017), [2]Statista (2023)

As a result, it is challenging for most countries to invest in space research. Additionally, space programmes require very high technical knowledge and skill. As a result, the entire cost of a space programme increases. As a result, only countries with sufficient financial, material, and human resources and political will can support space programmes. Therefore, these countries also gain the most from such initiatives. However, developing and less developed countries need help to afford the cost of the space programme or its associated benefits (Hegadekatti 2017). Global government spending on space initiatives reached a record high of over 103 billion dollars in 2022. In 2022, the United States government invested about 62 billion dollars in its space programmes, giving it the nation with the most significant space spending globally. China came in second, spending about 12 billion dollars on space programmes behind the United States.

Several Asian countries have actively participated in the space economy and have made significant strides in space exploration, satellite launches, and space-related technologies. China has emerged as a significant player in the space economy. In 2021-22, china spent around $11.9 million. The China National Space Administration (CNSA) has achieved significant milestones, including crewed missions, lunar exploration, and developing its satellite navigation system called BeiDou. China has also established a strong presence in commercial satellite launches, providing launch services to domestic and international customers. India has been increasing its investments in space activities in recent years (CNSA 2022).

5. SPACE ECONOMY AND ENVIRONMENT

The environment and the space economy are intertwined, and the effects of the space industry's operations on the environment can be both positive and detrimental. As it relates to the environment and the space economy, the following are some essential factors to consider:

5.1. Environmental Benefits

Satellites used for Earth observation provide valuable data on climate change, weather patterns, deforestation, and other environmental factors. This information supports environmental monitoring, disaster management, and sustainable resource management. Space-based instruments are crucial in monitoring greenhouse gas emissions, studying climate patterns, and understanding the Earth's climate system. This data contributes to climate change research, modelling, and mitigation efforts. Satellites can detect and monitor environmental hazards such as oil spills, wildfires, and pollution. This information helps in early detection, response planning, and implementing measures to protect ecosystems and human health.

5.2. Space Debris and Environmental Impact

Space activities contribute to generating space debris, including defunct satellites, spent rocket stages, and fragments. Space debris poses a risk of collisions, which can generate more debris and damage operational satellites. Space agencies and organizations are actively working on space debris mitigation strategies, including designing satellites and rockets for safe disposal after their operational life. Additionally, efforts are being made to develop technologies for active debris removal to clean up existing debris.

5.3. Sustainable Practices

Satellite manufacturers are increasingly adopting sustainable design practices, including environmentally friendly materials and components. Satellite operators are also implementing measures to improve operational efficiency and reduce energy consumption. Ensuring responsible end-of-life disposal of satellites is essential to minimize the creation of space debris. Satellites are designed with deorbiting mechanisms to bring them back into the Earth's atmosphere for controlled re-entry and burn-up.

5.4. Renewable Energy from Space

There have been proposals for space-based solar power satellites that capture solar energy in space and transmit it back to Earth for clean energy generation. This concept could provide a sustainable and renewable energy source without relying on fossil fuels. It is significant to emphasize that the space sector understands the value of sustainability and environmental stewardship. The environmental impact of space activities is being reduced through various efforts. For instance, both public and commercial organizations in the space industry are looking into environmentally friendly propellant alternatives, enhancing the performance of launch vehicles, introducing rocket recycling and reusability, and implementing sustainable practices throughout the lifecycle of space systems.

Even though the space economy contributes to GHG emissions, its overall impact is minimal compared to other industries and sectors, including transportation, energy, and manufacturing. However, ongoing initiatives to cut emissions, adopt sustainable habits, and encourage environmental responsibility are still crucial to ensuring the long-term viability of space activities.

6. ECONOMIC CONTRIBUTION OF SPACE ECONOMY

The space economy significantly boosts global GDP through various industries and ventures. The space economy has a bright future, full of innovative possibilities. The space economy's economic contribution in the form of Satellites provides a wide range of services contributing to economic growth. These include communication services, such as satellite TV, internet connectivity, and long-distance calls. Satellite-based navigation systems like GPS also support transportation, logistics, and location-based services, enhancing efficiency and productivity in various industries.

Earth observation satellites generate valuable data for various applications. Industries such as agriculture, forestry, urban planning, disaster management, and natural resource exploration utilize satellite data for informed decision-making. This data contributes to increased productivity, risk management, and resource optimization. The space sector drives technological advancements that have ripple effects across various industries. Innovations in materials, manufacturing processes, miniaturization, and data analysis from space-related research and development find applications in sectors like aerospace, automotive, healthcare, telecommunications, and more. The transfer of space technology to terrestrial industries fosters economic growth and competitiveness.

The launch industry is crucial in the space economy. Companies and organizations that provide launch services for satellites, spacecraft, and payloads generate revenue and employment opportunities. The increasing demand for satellite launches, including small satellite constellations, drives the launch industry's growth globally. The emergence of commercial space tourism presents a new avenue for economic contribution. Companies offering space tourism experiences create jobs, stimulate tourism, and generate revenue. Additionally, space-related entertainment, including documentaries, films, and media coverage of space missions, attracts audiences and contributes to the entertainment industry's economic value.

The space economy creates employment opportunities across various sectors, including engineering, manufacturing, research and development, operations, and support services. The demand for skilled professionals in aerospace engineering, satellite technology, data analysis, and space sciences drives workforce development and contributes to economic prosperity. The space industry has a record of generating spin-off technologies and intellectual property with commercial applications beyond the space sector. Examples include advancements in robotics, telecommunications, medical devices, software, and environmental monitoring tools. These spin-off technologies contribute to innovation, entrepreneurship, and economic diversification.

The space economy's growth has a multiplier effect on other industries and the overall economy. Investments in space research and development, infrastructure, and commercial ventures create demand for goods and services, generating economic activity and stimulating related sectors. Recalling that the space economy has economic benefits beyond just generating money is crucial. Technological developments, research collaboration, educational opportunities, and multinational alliances are indirect economic advantages promoting innovation, knowledge transfer, and long-term economic development.

7. SPACE ECONOMY AND INDIA

The nation runs a sizable fleet of earth observation and satellite communications satellites for civil purposes, including disaster management, tele-education, and telehealth. It launches its satellites from the Satish Dhawan Space Centre in Sriharikota. The Department of Space's Indian Space Research Organisation (ISRO), which includes facilities and labs throughout the nation, oversees R&D, operations, and production (OECD 2019). India is one of the few spacefaring countries in the world, although it only makes up 2% of the global space industry, now estimated to be worth roughly USD 360 billion. Private sector firms like SpaceX, Blue Origin, Virgin Gigantic, and Arianspace have changed the space industry by slashing prices and turnaround times while leveraging innovation and cutting-edge technology. In India's case, the private sector's involvement has been circumscribed to that of providers or vendors to its government space programme (Government of India 2022).

The government expenditure on space economy in India was 804 billion rupees in FY2017 which rose to 913.06 billion rupees in 2018 and to 1119.27 billion rupees in 2019 and in 2020 it was estimated to be around 1313.93 billion rupees. In 2021-22, the Indian Space Research Organisation (ISRO) had an approximately $1.9 billion budget. This budget supports missions such as satellite launches, lunar exploration, and communication satellite programs (Krishnamurthy, 2022). The total budgetary allocation for FY 2023-24 towards the department of space is INR 12543.91 crores. One of the many reforms implemented to advance the space economy is the newly created Indian National Space Promotion and Authorization Centre (IN-SPACe), which will be encouraging Non-Governmental Entities (NGE) to conduct independent space activities, opening up ISRO infrastructure and facilities, using a demand-driven approach to develop space assets, and providing startup businesses with essential supplies. Bellatrix, Aerospace, Dhruva Space, ISRO, Agnikul Cosmos, Skyroot Aerospace, ABL Space Systems, Astrosale, Rocket Lab, GHGSAT, and Pixxel are the top 10 Indian space firms

that have been setting the bar for space innovation. Other Asian countries such as South Korea, Iran, Israel, and Malaysia, among others, are also actively involved in space-related activities. The positions of these countries in the space economy continue to evolve as they advance technology, increase international collaborations, and participate in commercial space ventures.

Additionally, the demand for goods and services from the space industry will only expand significantly with the development of the digital sectors (Mani et al., 2023). Through satellite surveillance, intelligence, and communications, India's space capabilities are now sufficiently developed to be employed for power projection and force multiplication. According to research created by Ernst & Young (EY) and the Indian Space Association (ISpA), India is expected to reach USD 13 B by 2025. The commercial space sector could advance up the value chain thanks to ISRO-created launch pads and laboratories with facilities for testing, monitoring, and telemetry.

The conventional satellite communication and remote sensing industries have been liberalized due to the government's most recent updates to the SpaceCom and SpaceRS laws. New drone regulations, as well as instructions for gathering and creating geospatial data, were also made public by the government. Under different space technology programs, the IN-SPACe, an interim autonomous nodal agency under the Department of Space, has received nearly 40 applications from major corporations, startups, MSMEs (micro, small and medium-sized companies), and academic institutions. These suggestions span upstream (manufacturing of launch vehicles and satellites) and downstream (earth observation applications, communications) operations.

Five satellites have been registered as part of implementing the national space object registration mechanism: Six memorandums of agreement for exchanging technological know-how and resources have been inked with business or academic organizations. According to the PM Gati Shakti National Master Plan, the government wants to increase logistics efficiency by providing multimodal connections to various economic zones and integrating infrastructural links for the movement of people, products, and services. Additionally, it will make substantial use of technology, such as the spatial planning tools made possible by the Bhaskaracharya National Institute for Space Applications and Geoinformatics using ISRO images. Due to its end-to-end domestic space capability, cost-effectiveness, skilled human resources, well-developed space ecosystem for entrepreneurship, well-structured institutional setup and management, along with space applications and a potential space business market, India has the potential to become a space economy power (Shaijumon 2022). The government's most recent changes to the SpaceCom and SpaceRS rules have resulted in the liberalization of the traditional satellite communication and remote sensing businesses. The government has made available new drone laws as well as guidelines for collecting and producing geospatial data.

8. CHALLENGES OF THE SPACE ECONOMY

The space economy has positive outcomes, including employment, revenues, and technological and scientific innovation (OECD, 2020). Although there are many opportunities in the space economy, several difficulties must be overcome to expand and explore sustainably. The issues facing the space economy are distinctive. They are primarily connected to the enormous distances between celestial bodies, their gravitational forces, which are responsible for the high cost of lifting payloads from various planetoids, and the unfavourable climate, which increases the scarcity of resources for human survival (Jora et al. 2023). Some significant issues facing the space economy are the high cost of space exploration and access to space remains a significant challenge. Launching payloads into space, developing spacecraft, and maintaining space infrastructure requires substantial financial resources. Lowering the cost of space access through technological advancements, reusable rockets, and increased competition is crucial to expanding the space economy.

Space debris, including defunct satellites, spent rocket stages, and fragments, poses a growing threat to space activities. It increases the risk of collisions and can damage operational satellites. Therefore, Managing and mitigating space debris through international cooperation, responsible satellite design, and end-of-life disposal strategies are necessary to ensure the long-term sustainability of the space environment. The space economy involves numerous countries and entities operating in space. Establishing clear regulations, international standards, and frameworks for space activities is challenging. Cooperation among nations is essential to address issues such as traffic management, resource utilization, intellectual property rights, and preventing conflicts in space. Space weather events like solar flares and geomagnetic storms can impact space-based systems, including satellites and communication networks. The effects of space weather and radiation challenge the reliability and durability of space infrastructure. Developing technologies to mitigate the impacts of space weather and protect sensitive space assets is crucial.

The space economy requires a skilled and diverse workforce, including scientists, engineers, technicians, and professionals from various disciplines. Attracting and retaining talent in the space industry is essential for innovation and continued growth. Encouraging STEM education, promoting diversity and inclusion, and fostering collaboration between academia and industry are essential in addressing this challenge. The public perception of space activities and their importance can impact funding and support for space programs. Advocating for the societal and economic benefits of space exploration, scientific discoveries, and the development of space technologies is essential for garnering public and political support, which drives funding for space initiatives.

Advancing space technologies and fostering innovation are crucial for the space economy. Research and development efforts are needed to improve launch technologies, propulsion systems, communication networks, robotics, and resource utilization capabilities. Encouraging private sector innovation and partnerships with academia can drive technological advancements in the space industry. Due to the influence of objective and subjective elements, the process of social development is dynamic, necessitating the introduction of the PPP concept (Karpenko et al. 2023). International cooperation, regulatory reforms, technical improvements, and environmentally friendly practices are necessary to address these issues. By overcoming these obstacles, the space economy can develop further, promote academic research, spur economic progress, and open the door for more space exploration and use.

9. CONCLUDING REMARKS

The use of space resources, satellite communications, and other associated companies and activities are all included in the space economy, a sector that is quickly growing. It has changed from being a model pushed by the government to one that is more varied and includes both public and private sector organizations. The first artificial satellite's launch, the Apollo Moon missions, the advancement of satellite communications, and the construction of the International Space Station are all notable turning points in the history of the space industry. The United States, the European Union, Russia, China, India, and Japan are significant actors in the space industry and private sector firms like SpaceX, Blue Origin, and Virgin Galactic. These organizations support satellite launches, space exploration, space science research, and the creation of new technology. The United States is the biggest spender on space programmes, followed by China. However, other nations also contribute to space programmes.

Nevertheless, given the high degree of technical expertise, finances, and political will needed, the cost of space programmes creates difficulties for many nations, particularly developing ones. The space economy has both positive and negative effects on the environment. On the positive side, satellites used for Earth observation contribute to environmental monitoring, climate change research, and the protection of ecosystems. However, space debris generated by space activities poses risks, and efforts

are being made to mitigate and remove debris. Sustainable practices like responsible end-of-life disposal of satellites and exploring renewable energy sources from space are also being pursued. The economic contribution of the space economy is significant, boosting global GDP through various industries and ventures. It supports sectors such as telecommunications, weather forecasting, navigation, agriculture, disaster management, and national security. The space economy fosters technological innovation, scientific discovery, and economic growth, with increased investment and competition driven by the commercialization of space operations. In conclusion, the space economy is a rapidly expanding sector with many industries and activities. It has evolved from a government-driven model to a more diverse ecosystem involving public and private sector entities.

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India's Economic Expansion: A closer look at the allegations of Immiserizing Growth

Poonam Kumari

Abstract:

This article delves into the intriguing debate on whether India's rapid economic growth has paradoxically resulted in 'immiserizing growth', a phenomenon where the negative aspects of growth outweigh the benefits, leading to a decrease in economic welfare. We explore the multidimensional facets of India's economy, examining the underlying data and scholarly perspectives to determine the veracity of these claims.This article discusses the conundrum of India's economic growth in light of JagdishBhagwati's concept of "immiserizing growth." Despite India's strong GDP growth since liberalisation, this study investigates the distribution of economic benefits and their true influence on the country's wellbeing. The article examines India's shift from a closed, socialist-inspired economy to a liberalised market, with an emphasis on information technology and services. While these industries have gained international attention, economic disparities and persisting poverty raise concerns about the equitable distribution of growth advantages. The study examines whether economic gains have resulted in improved social welfare across various strata of Indian society. Statistical evaluations of income distribution, health, education, and resource access shed light on the quality of India's economic development. It goes on to examine the role of government policies, the regulatory environment, and India's trade conditions, highlighting successful industries such as information technology and pharmaceuticals against the backdrop of obstacles faced by traditional export areas. The ramifications of structural changes in employment, with a focus on the service sector, and the paradox of decreased female workforce participation are examined. In addition, the report assesses the impact of global market dynamics on India, taking into account capital inflows, trade openness, and India's vulnerability to global economic shocks such as the financial crisis and geopolitical crises. Finally, the article dives into Indian government efforts such as MGNREGA, PMJDY, and NRLM, which aim to alleviate poverty and distribute income. While these measures demonstrate a commitment to inclusive growth, their effectiveness in the face of rising economic inequality is being questioned. The report finds that, while India has achieved progress in economic growth, considerable hurdles remain in ensuring that this expansion does not impoverish but rather actually improves the wellbeing of its people.

Keywords: Economic Growth in India, Immiserizing Growth in India, Poverty Alleviation, Export-Led Growth Strategy of India, Structural Changes and Employment Trends in India

1.Introduction:

India's remarkable economic journey since the 1990s, marked by liberalization and integration into the global economy, has been both praised and critiqued. The term 'immiserizing growth', coined by JagdishBhagwati(Bhagwati, 1958), suggests that growth can be detrimental to a country's welfare if the losses from worsening terms of trade surpass the gains from increased production. It provides a cautionary perspective that compels us to scrutinize the quality and distribution of India's economic growth.

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While this concept may seem counterintuitive, it is a critical lens through which to examine India's economic trajectory. This article scrutinizes India's growth to understand whether it aligns with the principles of immiserizing growth, considering economic indicators, social welfare metrics, and the distribution of economic gains.

2. India's Economic Growth: An Overview

Since the economic reforms of the early 1990s, India's GDP has grown at an impressive rate. In the last two decades, India has seen significant economic growth and increased prosperity, though it remains unevenly distributed(Hashim, 2020).The country has transitioned from a closed economy to a burgeoning market with significant global influence (Ahluwalia, 2002). The IT boom and service sector expansion have been cornerstones of this growth, establishing India as a global powerhouse in these domains.India's economic trajectory has been among the most discussed and argued in the colourful and complicated narrative of global economic transitions. The current discussion dives into the heart of this phenomena as it relates to India, a country that has experienced remarkable economic growth in recent decades and the closer look at the Allegations of Immiserizing Growth, the subject of this inquiry, seeks to unravel the many layers of India's economic growth and the strong charges that this progress has not been consistently beneficial.

The beginning of this investigation needs a broad overview of India's economic landscape, charting its evolution from the post-independence era to the present. It entails delving into the complexities of economic policies, structural reforms, and demographic dividends that have moulded the country's growth path. India followed a socialist-inspired approach after independence, with a substantial public sector and protectionist policies. The liberalisation of 1991 was a watershed point in Indian history, as it opened its doors to the rest of the world, resulting in a considerable increase in growth rates. The economy grew, and the world began to see India as a key global power.

However, the lustre of this quick growth has been frequently questioned by opponents who point to rising inequities and continuing poverty that afflict broad swaths of the population. In the context of India, the story of immiserizing growth becomes a canvas on which to analyse the relationship between growing GDP and actual welfare of its population. The main question that this investigation seeks to answer is if India's economic progress has resulted in a contradictory damage to the wellbeing of its people.

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The investigation starts with an examination of actual data on the distribution of wealth and opportunity in the aftermath of economic expansion. It entails doing a statistical analysis to determine whether economic advantages have trickled down to the grassroots level or have been hoarded by a select few, aggravating income and wealth inequality. This assessment also involves a look at social factors including health, education, and access to resources, all of which are important in determining the quality of growth(Malhotra & Kumari, 2017).

Following that, the conversation shifts to structural and policy-induced elements that may contribute to the phenomena of immiserizing growth. It investigates the role of government policies, the regulatory environment, taxation, and public spending in affecting economic growth results. There is a focus on how, while globalisation has brought in capital and technology, it has also exposed domestic businesses to competition that is not necessarily beneficial to the local community, particularly the vulnerable and unskilled portions.The story also touches on the critical topic of population dynamics. With a huge young population, India's demographic dividend has been hailed as a possible growth accelerator. However, the introduction explores whether this demographic advantage has been

efficiently utilised or whether it has resulted in a system in which the expansion in job opportunities is insufficient to fulfil rising ambitions, hence impeding progress.

Furthermore, this investigation does not operate in a vacuum, but rather situates the Indian experience within the broader context of global economic developments. It compares India's growth pattern to those of other rising countries in order to determine whether immiserizing growth is a uniquely Indian phenomena or part of a bigger story of contemporary capitalism.It promises a rigorous, data-driven investigation as well as a theoretical exploration of the underlying principles of growth and welfare economics. This discourse aims not only to outline a country's economic path, but also to critically evaluate the fundamental measures by which we measure development and advancement. It tries to uncover the deeper implications of growth, not just in aggregate numbers, but in the lived realities of a diverse and complex population.

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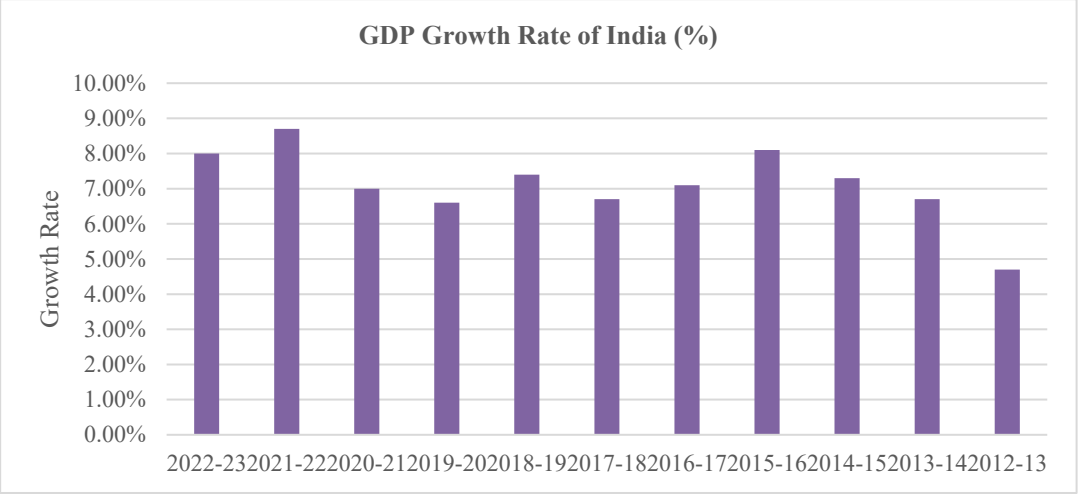

Table: 1Sources:(World Bank, 2023)

3. Terms of Trade and Export-Led Growth:

India's terms of trade, which assess the ratio of export prices to import prices, have not demonstrated a prolonged decrease, implying that growth is being slowed (Panagariya, 2005). Furthermore, India's export-led growth strategy has been mostly effective, with the IT and pharmaceutical industries seeing significant global demand (Nayyar, 2006). Long-term CO2 emissions are favourably reinforced by trade openness, energy consumption, and economic expansion. In contrast, technical innovation and FDI have a negative long-term impact on CO2 emissions (Zameer et al., 2020). According to (Panagariya, 2005), India's terms of trade have not declined significantly, which would be required for the Bhagwati hypothesis to hold true. Furthermore, export sectors, particularly services, have enjoyed sustained foreign demand, opposing the principle of immiserizing growth.

India, like many emerging countries, has traditionally struggled with trade challenges. When a country's exports (e.g., agricultural products, raw resources) are cheaper than its imports (e.g., machinery, technology), the trade terms may be unfavourable. This might lead to a trade imbalance and economic issues.

3.1 To address this challenge and foster export-led growth, India has implemented a number of policies and measures. Here are some key components of India's strategy:

3.1.1 Economic Liberalisation and Reforms: In the early 1990s, India embarked on a series of economic reforms that liberalised the country's economy. These changes included decreasing trade barriers, attracting foreign investment, and expanding market access for foreign goods. The goal of this economic liberalisation is to improve India's trading terms by increasing exports.

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3.1.2 Export Promotion Schemes: India has adopted a number of export promotion schemes and incentives in order to increase exports. Export Promotion Capital Goods (EPCG) plans, Export Oriented Units (EOUs), and Special Economic Zones (SEZs) are examples of such initiatives. These schemes offer tax advantages, tariff exemptions, and other incentives to encourage manufacturing and export-oriented companies. India has acknowledged the potential of its service sector, particularly information technology (IT) and business process outsourcing (BPO), in addition to products. The country has actively promoted the export of IT services, software, and outsourced services, all of which have considerably contributed to India's export revenues.

3.1.3 Bilateral and Regional Trade Agreements: In order to increase market access for its products, India is negotiating a variety of bilateral and regional trade agreements. Two prominent accords are the India-ASEAN Free Trade Agreement and the Comprehensive Economic Cooperation Agreement (CECA) with Singapore.

3.1.4 Export Credit and financing: India has formed entities such as the Export-Import Bank of India (EXIM Bank) to provide export credit and financing to exporters. These organisations help exporters by offering competitive financing options and reducing financial risks.

*3.1.5 Investment in infrastructure***:** Adequate infrastructure is crucial for export-led growth. India has invested in transportation, logistics, and port facilities to boost its export competitiveness.

4. Income Distribution and Poverty Alleviation:

The distribution of income in India presents a mixed picture. A small segment of the population controls a disproportionate amount of wealth. This inequality is mostly due to historical circumstances, regional economic imbalances, and different social and structural challenges (Deaton & Dreze, 2002). The Gini coefficient, a measure of income inequality, has risen, indicating growing disparities (Bardhan, 2012).

4.1 India's Poverty Alleviation Policies:

4.1.1 MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act): MGNREGA is a flagship programme that provides rural households with 100 days of pay work each year. It attempts to improve rural income security and alleviate poverty. This programme has been critical in creating job possibilities and improving the economic situation of many rural households. MGNREGA has considerably helped to poverty reduction in rural India, according to (Ministry of Rural Development, 2018) report, by giving job and financial support to millions of households.

4.1.2 Pradhan Mantri Prime Minister's Jan DhanYojana (PMJDY): The goal of this financial inclusion effort is to provide banking services to every family in India. It attempts to eliminate poverty and improve revenue production among marginalised populations by giving access to banking and financial services. According to the Reserve Bank of India (RBI), the Pradhan Mantri Jan DhanYojana has

played an important role in increasing financial inclusion and allowing low-income persons to access credit and savings.

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4.1.3 National Rural Livelihood Mission (NRLM): The NRLM promotes self-employment and enterprise growth among low-income rural households. It empowers rural entrepreneurs by providing financial aid, skill training, and financing. According to a (Ministry of Rural Development, 2018), NRLM has successfully established livelihood options for millions of rural poor people, resulting in lower income disparity and poverty.

4.1.4 Food Security Programmes: The Indian government has developed several food security programmes, notably the National Food Security Act (NFSA), which aims to distribute subsidised food grains to eligible households. These programmes aid in the alleviation of food insecurity and the reduction of poverty.According to a Food and Agriculture Organisation report(Jenkins et al., 2019),the National Food Security Act (NFSA) has been crucial in boosting food access for disadvantaged groups.These are only a few instances of income distribution and poverty reduction policies and activities in India. It is important to note that addressing income disparity and poverty is a continuous problem, and the government is constantly refining and implementing policies to create inclusive economic growth and eliminate gaps in income and living standards.

Despite impressive growth figures, the distribution of wealth remains a concern. (Deaton & Dreze, 2002)point out that while the poverty rate has decreased, the income inequality measured by the Gini coefficient has increased. This indicates that the economic benefits have not been evenly distributed, which could be suggestive of a form of immiserizing growth for certain sections of the population.

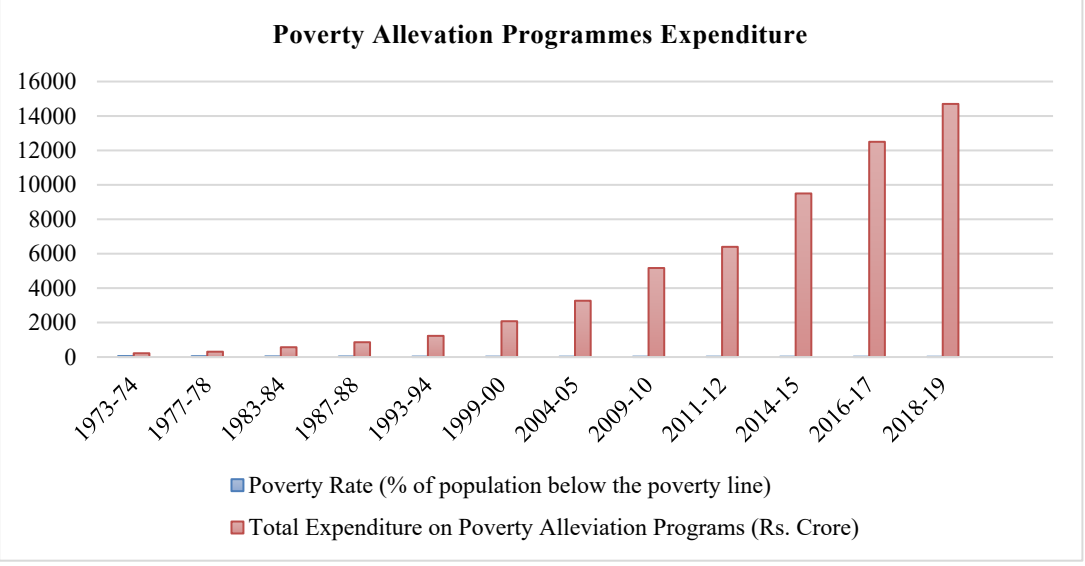

Table: 2 **Sources:** (World Bank Report, 2022)

5. Structural Changes and Employment:

The structural transformation of the Indian economy has been skewed towards the service sector, with manufacturing lagging behind (Kochhar et al., 2006). This shift has implications for

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employment since the service sector is less labor-intensive, potentially exacerbating income inequality and not providing enough jobs for the growing labor force (Bosworth et al., 2007). Increase in education and infrastructure facilities, have increased chances for female to earn their living. However, on contradiction, the National Sample Surveys provide evidence of a significant decrease in women's rates of engagement in the workforce, specifically among rural women.An optimistic interpretation of these developments argues that rising income explains women's labor-force participation. Pessimistic interpretations of these trends suggest that decreased female labour force participation is due to a lack of suitable employment rather than women's exit from the labour force(Desai & Joshi, 2019).

6. Impact of Global Market Dynamics:

(Sehrawat & Giri, 2019)suggested that the simultaneous presence of capital inflows and trade openness serves as a catalyst for financial development.Globalisation results in the globalisation of capital markets, hence facilitating the integration and interconnectedness of financial systems worldwide(Rousseau & Sylla, 2003). The enhancement of financial development in the Indian economy is facilitated by the improvement in economic performance, which occurs through the influx of foreign capital into recipient nations. However, India's vulnerability to global economic volatility has been evident in various financial crises and trade dynamics that have impacted its growth and welfare. The global financial crisis of 2008, for instance, had significant repercussions on India's economy (Subramanian, 2010).The war between the two nations has always emerged as a significant impediment to the global economy, exerting harmful effects on both growth and inflation. These crisis have the potential to decelerate worldwide economic expansion while simultaneously accelerating inflationary pressures(Nazeeruddin, 2022). The latest example of this is war between Russia- Ukraine and Israel- Palestine.

7. Government Policies and Reforms:

Within a democratic political framework, economic policies and programmes were introduced and executed. The policy changes occurred within the framework of the "socialist" economy and were subject to the demands of a democratic political system in which interest groups saw themselves winning or losing when specific controls were relaxed(Rosen, 2019).The RBI is main institution which gives guidance to the monetary policies for the country. The RBI work in accordance to the RBI Act 1934, under dual mandate, first to keep check on inflation and second to meet credit needs of the economy (Adil & Rajadhyaksha, 2021). Further, The Indian government has implemented various policies to promote inclusive growth, for instance, MGNREGA seeks to provide a safety net for the rural poor by guaranteeing employment. Additionally, the GST, a landmark tax reform, is designed to create a unified market and could potentially enhance the efficiency of the Indian economy (Drèze & Sen, 2013).

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8. Conclusion:

India's growth narrative is complex and cannot be succinctly classified as 'immiserizing'. While there are areas of concern, particularly in terms of income inequality and job creation, the overall welfare of the nation has improved. However, this does not negate the existence of pockets within the economy that may experience immiserizing effects. It is essential for policy interventions to focus on mitigating these adverse impacts through inclusive and sustainable development strategies.It is critical to capture the complexities of the issues addressed, from the nuances of trade policy to the social aspects of economic decisions, in constructing a conclusion for this comprehensive discussion on India's economic progress and its implications. The research into whether India's growth has been 'immiserizing' or empowering goes beyond economic measures and into the daily lives of its people.

The assessment of India's economic trajectory, particularly in the post-liberalization era, reveals a story of striking disparities. On the one hand, there is unquestionable success in GDP growth, sectoral expansion, particularly in IT and services, and improved worldwide standing. On the other hand, poverty, injustice, and underemployment remain chronic challenges. As we go deeper into this dichotomy, the concept of limiting growth becomes an important yardstick against which to judge progress.

To begin, India's trade policies, which emphasise export-led growth, have somewhat undermined the immiserizing growth concept. While trade terms are not universally favourable, they have not deteriorated to the point where economic gains are nullified. However, commerce is only one component of the greater economic fabric. The benefits of trade liberalisation and globalisation have not reached all layers of society equitably, implying that while the nation as a whole may gain, portions of the people may indeed be 'immiserized'.

Income distribution and poverty reduction measures demonstrate that the government is aware of these inequities. MGNREGA and PMJDY have shown promise, but the fight against poverty and injustice is far from ended. While millions have been pulled out of poverty, a sizable segment of the population continues to face basic food insecurity.

The structural changes in the economy, which favour services over manufacturing, have highlighted the difficulties of finding work in a labor-intensive country. The paradox of rising GDP and declining female labour force participation, particularly in rural areas, illustrates a mismatch between the evolving structure of the economy and demographic reality.

The impact of global market dynamics complicates matters even more. As evidenced by its response to the global financial crisis and more recent geopolitical conflicts, India's economy is becoming increasingly vulnerable to foreign financial volatility. These incidents highlight India's vulnerability to external shocks and raise concerns about its long-term viability.

The importance of government policies and changes in influencing this economic trajectory cannot be overstated. The pace and direction of transformation have frequently been impacted by democratic procedures, with numerous interest groups determining the policy environment. The

Reserve Bank of India's monetary policies, as well as the implementation of GST, indicate continued efforts to steer the economy towards inclusive growth.

Drawing these threads together, it is clear that India's economic expansion has been both empowering and, in some ways, immiserizing. Although the country has established itself on the global scene, the shadows of inequality, poverty, and insufficient employment remain. Immiserizing growth is not a comprehensive story for India; rather, it is a cautionary tale that underlines the dangers of growth that is not holistically designed or dispersed fairly.

The final question of whether India's economic expansion has been beneficial or harmful cannot be stated in black and white terms. Growth has unquestionably benefited the country, improving its international status and moving millions out of poverty. However, the expansion has not been a rising tide that has lifted all boats; others have stayed anchored on the shores of poverty, inequality, and a lack of opportunity.

To summarise, India's adventure is still underway, with the script still being written. The task for politicians, public society, and business is to guarantee that the fruits of growth are not only plentiful but also distributed equally. The way forward must be charted with a sophisticated grasp of the economic, social, and political complexities shown by this investigation. The lessons of the past, the realities of the present, and the hopes for the future must all influence a vision of growth that is inspirational in its impact on every Indian life, not just remarkable in its statistics. The investigation into India's growth narrative reveals a complex picture that does not conform neatly to the 'immiserizing growth' hypothesis. Although India faces challenges related to income distribution and employment, the general trend of improved welfare metrics suggests that growth has, on balance, been beneficial. However, continued vigilance and adaptive policy-making are necessary to ensure that the benefits of growth are broadly shared across all strata of Indian society.

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An Economic Evaluation of Women Workers in India: A Study with Special Reference to Meerut in Uttar Pradesh

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Ruby **

Abstract

Economic growth affects women's decisions to enter the labour market as well as the general status of the female population in a given region. Both global and microscale alterations are seen. To detect macro-scale improvements, the UNDP created the two most well-known indicators in 1995: the Gender-Related Development Index (GDI) and the Gender Empowerment Measure (GEM). However, these indicators are not the best for recognising micro-scale changes in labour force participation in the economy. The issue lies in the fact that women have always worked; the notions of labour and work plans, however, have never been realistically defined to consider their contributions to the economy and society. This paper tries to find out the factors that influence women workers to enter into the unorganized sector. The distributive justice purpose of government aid schemes needs to prioritize this marginalized worker class.

Key Words: Push Factor, Pull Factor, Women Workers, Unorganized Sector

Introduction

In Indian culture, women have been regarded with tremendous honour and dignity since the beginning of civilization, however, there are sometimes disparaging remarks made about them. She is the driving force behind society's and organisations' development. She is the race's mother and the link between generations, creating the groundwork for upcoming bonds. These days, women are progressing in many spheres of life. They even infiltrate fields where men predominate. This woman has overcome her captivity within a house's four walls and the traditional home responsibilities she has performed since the beginning of time. It's ironic that while she is frequently praised for her ability to portray a variety of roles, she is almost always accused of defying the unwavering social code of conduct that has been established for her. In the underprivileged world, millions of women now work for pay thanks to globalization. However, these female employees are often excluded from reaping the full benefits of globalization. Women are frequently employed on short-term contracts or without any contracts at all, and they labour in unsafe circumstances at fast speeds for meagre pay. They have to work long hours in order to make ends meet. Few are registered in health or unemployment programmes, the majority do not have maternity or sick leave, and even fewer have savings for the future. One of the apparent shortcomings of the present globalisation paradigm is shown by the hard reality that women workers must deal with. For a substantial portion of the Indian labour population, the unorganised sector is always essential in terms of job chances. The unorganized/informal sector accounted for over 92% of all employment in the Indian economy between 1999 and 2000 (NSSO 55th Round 1999-2000). The percentage of unemployed workers in most states is comparable to the national average. The percentage of women who work has always been lower than that of males, at 26.97% vs 52% (World Bank Report, March 2018). The issue lies in the fact that women have always worked; the notions of labour and work plans, however, have never been realistically defined to consider their contributions to the economy and society.

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Gender Budgeting was introduced in India in 2004 as a means of addressing gender inequality and promoting women's involvement in the work market. The results, however, indicate that while their circumstances have improved in the legal sector, the working conditions have not much changed in the unofficial sector.

Economic growth affects women's decisions to enter the labour market as well as the general status of the female population in a given region. Both global and microscale alterations are seen. To detect macro-scale improvements, the UNDP created the two most well-known indicators in 1995: the Gender-Related Development Index (GDI) and the Gender Empowerment Measure (GEM). However, these indicators are not the best for recognising micro-scale changes in labour force participation in the economy.

Micro-level variables, social-cultural and personal factors, political issues, demographic factors, and other factors are among the many factors that influence women's labour market involvement. Certain circumstances—such as a high level of education and skill—are pull factors, while others—such as poverty, family responsibilities, and a high dependence ratio—are push factors. Before formulating policies aimed at improving the lot of women in the workforce, policymakers had to monitor all relevant factors.

The pull factors draw the female workers to their preferences by drawing attention to the positive and advantageous reason for women's engagement in the labour force in the unorganised sector. The element may encourage and motivate female employees, particularly those who work for themselves, to launch their ventures or get employment. This component is predicated on a person's internal drive to advance their living conditions and skill set before entering the unorganised sector. Pull forces guarantee that female employees maintain the ability to further explore and develop their cognitive abilities.

Conversely, there are passionate reasons that don't always motivate people to start something. Sometimes, external forces compel an individual to begin working and stay busy in order to ensure that it occurs. Therefore, "push factors" are those that force people to perform a task. This element stems from human anxiety and specifically acts to combat fear.

A few push factors that lead women in the labour market to work in the unorganized sector are low productivity caused by unmet necessities, a lack of employment options, harassment or domestic abuse, illiteracy, and low levels of education.

Review of Literature

Choudhury, Sayantani Roy. (2013), attempted to demonstrate if social or economic factors influence women's decisions to enter the labour field. The result of combined variables is the participation rate of women in the labour force. It's probable that social and economic variables have two distinct functions. This study looked for these push and pull variables and assessed how important they are in determining whether or not women choose to enter the workforce in Kerala and West Bengal, two Indian states. Macroscopic variables like as SDP, urbanisation, literacy rate, and so on can 'push' the FLPR down, whereas microeconomic ones such as personal poverty and insecurity can 'pull' the FLPR up. be changed by using the binary logistic regression approach. The research revealed that the micro-level personal characteristics have a stronger impact on FLPR. According to the research, in order to assess women's progress using the FLPR, we need first look for the causes of their high FLPR. If the underlining components are "push factors," the GDI calculation algorithm must also be modified.

Shamala, B. (2021), attempted to identify the primary causes of migration, particularly towards Bangalore's building sector and concentrated on several of the push and pull variables that cause people to migrate into the construction industry. Since the study finds that both push and pull forces contribute equally to migration, it can be concluded that efficient government policy execution towards balanced regional development will greatly reduce migration. Consequently, this would lessen the concerns associated with urbanization and its consequences.

Mattos et.al (2022), presented credence to the theory that the Covid-19 shock both drew women into the labour force and prevented them from leaving it, a phenomenon known as the "added-worker effect." The impacts on rural women were more pronounced than those on other worker categories, such as urban women and males from both rural and urban areas. However, the factors that affected rural women's employment status through the Covid-19 crisis (losses in household employment, increases in unpaid care work, and an increase in household size as migrants returned from urban centres) are ones that have long-lasting effects and will continue to affect women's employment after the crisis has passed.

Research Methodology

Primary and secondary data are both used in the construction of the study. The relevant books, journals, magazines, labour commission reports, labour department surveys, and other significant published and unpublished papers and other works were the sources of the secondary data. For the primary data, 500 women workers (respondents) from various locations around Meerut City completed a standardized questionnaire. Convenient and snowball non-random sampling methods were used to choose these 500 samples.

Objective of the study

To identify the factors that influence women workers to enter into the unorganized sector.

Factors Responsible for Entering Towards the Unorganized Sector

Push and pull aspects are the two key components. Many components are taken into account under the push and pull variables, and each item is methodically examined as follows:

Push and Pull Factor Indicators: the test the significance of observed values of push and pull factors indicator, in the present study researcher includes push factors variables like poverty, illiteracy/low level of education, domestic violence, sole-bread earner, supplement to the Family income which compel to the respondents to enter into unorganized sector.

Pull factors variables includes like easily available, to be independent, to improve standard of living, no/meagre entry barrier, skill induced willingness which attract to the respondents to enter this unorganized sector.

Table: 1 Frequencies of Push and Pull Factors based on women workers Statement

Variables	Statements	SD	D	UN/NE	AG	SAG	Total
Push Factors							
1	Poverty	95	15	8	67	315	500
2	Illiteracy/ Low Level of Education	51	66	8	115	260	500
3	Domestic Violence	266	61	93	25	55	500
4	Sole-Bread Earner	223	79	74	26	98	500
5	To Supplement Family Income	81	27	26	78	288	500
Pull Factors							
6	Easily Available	167	42	35	136	120	500
7	To Be Independent	209	98	42	71	80	500
8	To Improve Standard of Living	169	54	64	91	122	500
9	No/Meagre Entry Barrier	208	61	92	80	59	500
10	Skill Induced Willingness	266	61	94	19	60	500

Source: Based on Field Survey

SD= Strongly Disagree, D= Disagree, UN=Undecided, AG= Agree, SAG= Strongly agree.

Table: 2 Details of Likert Scale and its value Allocation with their Interpretation

Scale	Weight of scale	Square of Scale	Value Allocation	Interpretation
Strongly Disagree	1	1	1.00-1.80	Very Low
Disagree	2	4	1.81-2.60	Low
Undecided	3	9	2.61-3.40	Moderate High
Agree	4	16	3.41-4.20	High
Strongly Agree	5	25	4.21-5.00	Very High

With the help of a structured interview scheduled the push 5 statements (poverty, illiteracy/low level of education, domestic violence, sole-bread earner, supplement to the family income) and pull 5 statements (easily available, to be independent, to improve standard of living, no/meagre entry barrier, skill induced willingness) factors influencing women workers to enter in the unorganized sector is assessed through a total of 10 statements. during survey researcher requested to the women workers to indicate their level of agreement/disagreement on a five Point Likert scale from strongly disagree to strongly agree. Appropriate weights are given ranging from strongly disagree (1) to strongly agree (5) to analyzed collected statistics. The reliability of the scale is applied also calculated by using **Cronbach Alpha that is 0.763** with the help of Free Statistics Software (v1.2.1) for the women workers which is come acceptable level.

Table:3 Push and Pull Factors in the Women Workers: Descriptive Analysis

Variables	Statements	WAS	Mean2	Interpretation
Push Factors				
1	**Poverty**	**3.984**	**18.348**	**High**
2	**Illiteracy/ Low Level of Education**	**3.934**	**17.454**	**High**
3	**Domestic Violence**	**2.084**	**6.244**	**Low**
4	**Sole-Bread Earner**	**2.394**	**8.142**	**Low**
5	**To Supplement Family Income**	**3.93**	**17.742**	**High**
Pull Factors				
6	**Easily Available**	**3**	**11.652**	**Moderate High**
7	**To Be Independent**	**2.43**	**8.23**	**Moderate High**
8	**To Improve Standard of Living**	**2.886**	**10.934**	**Moderate High**
9	**No/Meagre Entry Barrier**	**2.442**	**8.07**	**Low**
10	**Skill Induced Willingness**	**2.092**	**6.32**	**Low**

WAS = Weighted Average Score, Mean2 = Mean2 of weighted average score,

Table shows descriptive analysis of 10 statements along with their respective weighted average score, mean2 of weighted average score and standard deviation with interpretation. It is very clear that the respondents surveyed have been found agreeing that 'poverty' (WAS 3.984), 'illiteracy/low level of education' (3.934), 'domestic violence' (2.084), 'sole-bread earner' (2.394), 'supplement to the family income' (3.93), are push factors influencing women workers for entering to do job in the unorganized sector. Among push factors poverty, illiteracy/low level of education, supplement family income having high weighted average more than other push factors in the table.

The respondents have also been found agreeing that 'easily available' (WAS 3), 'to be independent' (2.43), 'to improve standard of living' (2.886), 'no/meagre entry barrier' (2.442), 'skill induced willingness' (2.092) are pull factors influencing women workers for entering to do job in the unorganized sector. Among pull factors only easily available, to be independent, to improve standard of living, having moderately high influence while others two i.e., no/meagre entry barrier, skill induced willingness having low influence.

Kendall's Co-efficient of Concordance: it measures the agreement between the respondents who ranked ordered a set of items.

Here researcher tried to examine the concordance among the respondents for observing the statements assigned for examining the factors influencing women workers to enter in the unorganized sector. For this purpose, Kendall's Co-efficient of Concordance has applied calculating by SPSS Statistics (17.0).

Kendall's W Test

Ranks	
	Mean Rank
Poverty	**7.17**
Illiteracy/Low Education Level	**7.19**
Violence (Domestic violence)	**4.28**
Sole-Bread Earner	**4.64**
To supplement Family income	**7.16**
Easily available	**5.37**
To be Independent	**4.71**
To improve the standard of Living	**5.50**
No/ meagre entry barrier	**4.71**
Skill induced willingness	**4.28**

Table:4 Kendall's Co-efficient of Concordance

W	N	X^2
.190	**500**	**853.529**

***Significant (p<0.01), (df = 9)**

Table 4 discloses that Kendall's (W) is found to be .190 where (n=500); (x^2= 853.529) and (df = 9). the value of Kendall's (W) is asymptotically significant at 1% level of significance which indicates that there is a close concordance among the perception of the women workers relating to the statements assigned for examining the factors influencing respondents for entering in this sector.

H_{o1} (Null Hypothesis) Push and Pull factors both are equally strong i.e., push and pull factors are not independent but associated.

H_{A1} (Alternative Hypothesis) Pull factors are not as much strong as push factors i.e., Push and Pull factors are independent.

To test this hypothesis researcher applied Chi-square test.

Formula of Chi-square (x^2) = $\sum (O-E)^2/E$

Table: 5 Observed Frequencies (O) of Push Factors and its Scale Measurement

Push Factors	SD (B1)	D (B2)	UN(B3)	AG(B4)	SA (B5)	Total
Poverty (A1)	95	15	8	67	315	500
Illiteracy/ Low Level of Education (A2)	51	66	8	115	260	500
Domestic Violence (A3)	266	61	93	25	55	500
Sole-Bread Earner (A4)	223	79	74	26	98	500
To Supplement Family Income (A5)	81	27	26	78	288	500
Total	716	248	209	311	1016	2500

Source: Estimation based on Field Survey

Table: 6 Expected Frequencies (E) of Push Factors and it's Scale Measurement

Push Factors	SD (B1)	D (B2)	UN(B3)	AG(B4)	SA(B5)	Total
Poverty (A1)	143.2	49.6	41.8	62.2	203.2	500
Illiteracy/ Low Level of Education (A2)	143.2	49.6	41.8	62.2	203.2	500
Domestic Violence (A3)	143.2	49.6	41.8	62.2	203.2	500
Sole-Bread Earner (A4)	143.2	49.6	41.8	62.2	203.2	500
To Supplement Family Income (A5)	143.2	49.6	41.8	62.2	203.2	500
Total	716	248	209	311	1016	2500

Table: 7 Chi-square Statistic of each Push Factors and its Scale Measurement

Push Factors	SD (B1)	D (B2)	UN(B3)	AG(B4)	SA(B5)	Total
Poverty (A1)	16.22	24.14	27.33	0.37	61.51	129.57
Illiteracy/ Low Level of Education (A2)	59.36	5.42	27.33	44.82	15.88	152.81
Domestic Violence (A3)	105.31	2.62	62.71	22.25	108.09	300.98
Sole-Bread Earner (A4)	44.47	17.43	24.8	21.07	54.46	162.23
To Supplement Family Income (A5)	27.02	10.3	5.97	4.01	35.39	82.69
Total	252.38	59.91	148.14	92.52	275.33	828.28

Degree of freedom= (r-1) (c-) (5-1) (5-1) = 16, at 0.05 significance level, Chi-square statistics of push factors = 828.28 and 16 degrees of freedom at 0.05% significance chi-square statistical tabular value = 26.30.

Table: 8 Observed Frequencies (O) of Pull Factors and its Scale Measurement

Pull Factors	SD(B1)	D(B2)	UN(B3)	AG(B4)	SA (B5)	Total
Easily Available (A1)	167	42	35	136	120	500
To Be Independent (A2)	209	98	42	71	80	500
To Improve Standard of Living (A3)	169	54	64	91	122	500
No/Meagre Entry Barrier (A4)	208	61	92	80	59	500
Skill Induced Willingness (A5)	266	61	94	19	60	500
Total	1019	316	327	397	441	2500

Source: Estimation based on Field Survey

Table:9 Expected Frequencies (E) of Pull Factors and their Scale Measurement

Pull Factors	SD (B1)	D (B2)	UN(B3)	AG (B4)	SA(B5)	Total
Easily Available (A1)	203.8	63.2	65.4	79.4	88.2	500
To Be Independent (A2)	203.8	63.2	65.4	79.4	88.2	500
To Improve Standard of Living (A3)	203.8	63.2	65.4	79.4	88.2	500
No/Meagre Entry Barrier (A4)	203.8	63.2	65.4	79.4	88.2	500
Skill Induced Willingness (A5)	203.8	63.2	65.4	79.4	88.2	500
Total	1019	316	327	397	441	2500

Table: 10 Chi-square Statistic of each Pull Factors and its Scale Measurement

Pull Factors	SD(B1)	D(B2)	UN B3)	AG(B4)	SA(B5)	Total
Easily Available (A1)	6.64	7.11	14.13	40.35	11.47	79.7
To Be Independent (A2)	0.13	19.16	8.37	0.89	0.76	29.31
To Improve Standard of Living (A3)	5.94	1.34	0.03	1.69	12.95	21.95
No/Meagre Entry Barrier (A4)	0.09	0.08	10.82	0	9.67	20.66
Skill Induced Willingness (A5)	18.98	0.08	12.51	45.95	9.02	86.54
Total	31.78	27.77	45.86	88.88	43.87	238.16

Degree of freedom= (r-1) (c-) (5-1) (5-1) = 16, at 0.05 significance level, Chi-square statistics of pull factors = 238.16 and 16 degree of freedom at 0.05% significance chi-square statistical tabular value = 26.30.

Table: 11 Observed Frequencies (O) of Pull and Push Factors and its Scale Measurement

Factors	SD (B1)	D (B2)	UN (B3)	AG (B4)	SA (B5)	Total
Push Factors (A1)	716	248	209	311	1016	2500
Pull Factors (A2)	1019	316	327	397	441	2500
Total	1735	564	536	708	1457	5000

Source: Estimation based on Field Survey

Table :12 Expected Frequencies (E) of Pull and Push Factors and its Scale Measurement

Factors	SD (B1)	D (B2)	UN (B3)	AG (B4)	SA (B5)	Total
Push Factors (A1)	867.5	282	268	354	728.5	2500
Pull Factors (A2)	867.5	282	268	354	728.5	2500
Total	1735	564	536	708	1457	5000

Table:13The Chi-square Statistic of Push and Pull Factors and its Scale Measurement

Factors	SD (B1)	D (B2)	UN (B3)	AG (B4)	SA (B5)	Total
Push Factors	**26.46**	**4.1**	**12.99**	**5.22**	**113.46**	**162.23**
Pull Factors	**26.46**	**4.1**	**12.99**	**5.22**	**113.46**	**162.23**
Total	**52.92**	**8.2**	**25.98**	**10.44**	**226.92**	**324.46**

Degree of freedom= (r-1) (c-) (5-1) (5-1) = 16, at 0.05 significance level, Chi-square statistics of both push and pull factors = 324.46 and 16 degree of freedom at 0.05% significance chi-square statistical tabular value = 26.30.

Table: 14 Push and Pull factors in women workers: Overall Analysis

Factors	WAS	$MEAN^2$	Chi-square test
Push Factors	3.27	13.59	828.28
Pull Factors	2.57	9.04	238.16
Push + pull Factors	2.92	11.31	324.46

WAS= Weighted Average Score, $MEAN^2$ =Mean Square,

Above table 14 reveals that push factors are more responsible than pull factors for influencing women workers into entering this sector. The similar table also represents that overall weighted average score and standard deviation of push and pull factors for the women workers, push factors has shown more agreement level than pull factors.

The application of Chi-square statistics finds that all statements either push and pull considered in the study influencing the women workers, both push and pull factors either individual or collectively influencing the women workers for entering in the unorganized sector significantly.

Here researcher consider at 0.0 5% level of significance tabular value of chi-square is 26.30.

For chi-square test rejection rule (H_o) is if Chi-square calculated value > Chi-square tabular value

i.e., Chi-square T_c > Chi-square T_b

Where Chi-square T_c = Chi-square calculated value

Chi-square T_b = Chi-square tabular value

Hence 828.28 > 26.30 i.e., (Chi-square T_c > Chi-square T_b) for push factors

238.16 > 26.30 i.e., (Chi-square T_c > Chi-square T_b) for pull factors

324.46 > 26.30 i.e., (Chi-square T_c > Chi-square T_b) for both push and pull factors

Hence, we reject the null hypothesis $\mathbf{H_{o1}}$ and accept alternative hypothesis $\mathbf{H_{A1}}$ i.e., push and pull factors are not independent but associated i.e., There is no association between Push and Pull factors are independent i.e., Pull factors are not as strong as push factors.

Conclusion

To sum up, this study has concentrated on several of the push and pull variables that cause women workers to enter into the unorganized sector. The study found that push factors contribute more or influence on women workers as compared to pull factors engaged in this sector. In brief, the distributive justice purpose of government aid schemes needs to prioritize this marginalized worker class. In order to safeguard the interests of this group of workers, it is necessary to take concentrated and targeted actions to guarantee that they have access to sufficient service provisions, favorable working circumstances, and social security safeguards.

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