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# AMITY MANAGEMENT REVIEW

**Editorial**

We are pleased to launch the 11th issue of Amity Management Review (AMR). The journal in its endeavour to encourage new ideas and breed fresh perspectives in Management research provides a platform to researchers to pen down their valuable insights in the form of articles and research papers. The content in the current issue reflects the rendition of our aspirations into meticulously chosen and finely curated content for the readers. In this issue, we tried amalgamating a broad range of topics and theoretical paradigms which are of great significance in the current market conditions.

The paper titled 'An Investigation into the Distinctive Growth Trajectory of selected Emerging Market Economies' is written by Ms. Anchal Andrews and Dr Deepa Pareek. The study dives deep into investigating literature on nearly sixteen aspects that contribute towards economic growth of 19 emerging economies. The findings of the study can provide great insight in making informed policy decisions. The study concluded that factors such as domestic credit and health expenditure have a negative impact on the GDP growth of these emerging economies.

The paper 'Bibliometric Analysis of Robotic Process Automation' authored by Ms. Monika Sharma and Dr Abhineet Saxena reviews the scholarly literature on Robotic automation with the help of Vosviewer and Publish or perish software. The studies cited in WOS and Scopus databases were referred for this paper and a time frame of 22 years from 2000 to 2022 was considered. The results revealed that India is outshining and securing the second position in terms of Robotic Process Automation research.

Moving forward another interesting manuscript titled 'A Review of the Indian state of Rajasthan's Handicraft Sector' penned by Mr. Basu Vansit and Dr Monika Sheoran showcases the existing condition and gaps in boosting the Indian handicraft sector. The study emphasises on Government intervention in protecting the heritage and also empowering the artisans with innovative and advanced technological skills, which can be highly instrumental in creating innovative product designs and opportunities for sustainable livelihoods of these artisans and their families.

The banking sector is considered to be the backbone of an economy and studies related to the banking industry are always very crucial. The paper titled 'Supervisory Rating of Selected Public and Private Sector Banks: A CAMEL Model Approach' was drafted by Mr Mahesh Chandra Meena and Professor P R Dadhich. The study tries to explore the rating of various public and private players in the banking industry with the help of the established CAMEL model approach. The study helps in identifying the factors that could immune the banks from external environment crisis and help them to smoothly operate and profitably sail through the turbulent financial market environment.

The current journal issue pertains to another interesting piece of research titled 'Regression Model for Predicting the Shareholders' Wealth' authored by Dr Mukesh Kumar Verma and Prof. Shurveer S Bhanawat. The study tries to predict the shareholders' wealth in terms of EVA. For this purpose, five industries were chosen and overall, 10 companies from these five industry verticals were selected. The

study revealed that net sales and PBIDT negatively impact EVA whereas equity paid-up cash profit in enterprise value and positively impact EVA. In another paper titled 'Credit Risk Management Practises in Indian Banking: A Review' was contributed by Mr Ramesh Kumar Jabdolia and Dr Anil Verma. In their study they have conducted a comprehensive review of credit risk management practices adopted by different players in the Indian banking industry. The study examines the regulatory framework governing credit risk management in India. The study also identifies the measures and monitors to mitigate credit risk which are currently being used by banks. The findings of the study are truly insightful and useful for the policymakers and regulatory bodies for improving the state of credit risk management in Indian banks.

Another important paper is curated by Ms. Ekaspreet Kaur Rekhi and Dr Abhineet Saxena. Titled 'Income Tax Returns Filed in India: A Trend Analysis of Tax Collection', it gives insight into the trends of tax collection based on the income tax returns filed in India between the financial year 2015 and 2020. The study tries to investigate the changes in the pattern of filing income tax returns by Indian citizens during this period. Especially with the intervention of e-filing provision provided by the government and the availability of customised return form by tax authority of India, the process of filing tax has become hassle-free and user-friendly. The study embarks upon the success of e-filing provisions in comparison to the traditional filing of income tax.

The research paper titled 'Recovery performance of Non-Performing Assets in microfinance: A comparative study of banks operating in Rajasthan' authored by Madhur Gupta and Jitesh Bansal explores the recovery performance of Non-Performing Assets (NPAs) in microfinance within banks operating in Rajasthan. The findings of the study emphasize the critical concerns arising from rising NPAs and propose recommendations to improve financial stability for all stakeholders. The last paper titled 'Green accounting: The environmental policy' offers a framework to tackle environmental challenges and foster sustainable development. It outlines the government's objectives, goals, targets, strategies, and measures for environmental protection and management.

We would like to express heartfelt gratitude to the authors who have submitted such insightful manuscripts, the editorial advisory board and the reviewers who helped us greatly in the entire process of creating this Issue of Amity Management Review.

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# An Investigation into the Distinctive Growth Trajectory of Selected Emerging Market Economies

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## Abstract

*The paper aims to research the impact of factors instrumental in the economic growth of the selected 19 economies deemed as emerging by IMF. There are 16 independent variables selected across the following categories: agriculture development, healthcare, education development, economic indicators, infrastructure development and financial sector growth based on the review of relevant literature. Using data from 2000 to 2017, the study aims to analyse the factors and suggest policies that would enhance the growth trajectory of the selected emerging market economies (EMEs) individually. This objective is achieved with the help of, correlation and bivariate regression models applied on the collected secondary data for selected EMEs individually to study the possible heterogeneity within these EMEs. For selected EMEs, the majority of factors such as foreign investment, capital formation, agriculture, and air transportation were noted with a significant and positive influence on the GDP growth of these economies whereas factors such as domestic credit and health expenditure have a negative impact on the GDP growth of these economies.*

**Keywords:** Economic growth, emerging market economies (EMEs), bivariate regression model

## Introduction

Emerging market economies (EMEs) are countries with a high degree of volatility and a transitional character and experience transitions occurring in different economic, political, social and demographic dimensions at the same time.

(Moody, 2004, p.5). On the other hand, countries with developed economies have strong commercial and solid infrastructures and their citizens enjoy a comfortable and sufficient life (Roztocki & Weistroffer 2008; Purkayastha et al., 2012).

Overall growth in the wealth of a country during a specific period indicates strong economic growth (Burlando & Tartaglia, 2018). The growth rate of GDP and per capita GDP are perhaps the two most frequent measures used to quantify wealth and growth (Petrakis, 2020, p.31). Analysts have already been speculating on a new global economic order in which emerging markets will play a vital role which is why research on emerging market economies has become an important issue in the global outlook. This paper aims to research the impact of multiple factors and identify those factors unique to each country that are influential in the economic growth of the selected 19 economies deemed as emerging by IMF using data from 2000 to 2017. This study focuses on 19 emerging markets as recognized by IMF which are Argentina, Brazil, Bulgaria, China, Chile, Colombia, Hungary, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, Romania, South Africa, Russia, Thailand and Turkey. The study deals with identifying vital factors unique to each country that are recognized as important by the World Bank.

Selection of variables envelopes categories like agricultural and rural development, education development, health-related factors, infrastructure development, economic factors and financial development. Within these categories, variables are selected based on a review of relevant literature and the availability of consistent data from 2000 to 2017 for all selected countries. The following section highlights the relevant literature instrumental in the selection of the independent variables in the study. The "Agriculture sector" in rural areas is developed and measured with respect to total "value-added" in economic growth (GDP) of a country (World Bank, 2012). Khan et al. (2020) examined agriculture's role in West Bengal's (WB) economic growth. Empirical analysis revealed that economic growth of West Bengal is strongly driven by the agriculture sector. Agriculture was considered a root cause of livelihood and raw material supplier to industries in this study. Similarly, using empirical and integration analysis, it had been found that agriculture production contributed significantly to economic trajectory (GDP) of China over subsequent years in terms of product, market, factor, foreign exchange and income for proper maintenance of its rural population. Further, lack of investments by state remained a major constraint on its structural development (Yao, 2000). Additionally, Baig & Straquadine

(2014) conducted a review noting agriculture sector made the largest revenue in terms of GDP significantly fuelling the livelihoods of the population and development in rural areas. Consequently, "Agricultural and rural development" factors have been considered in this study for investigation.

"Health sector" is measured in terms of total expenditure to maintain the good health of the entire population. "Life expectancy" (in years) and the estimated "mortality rates" are determinants of good health (World Bank, 2012). In examining the influence of health on the economic rise of a group of major countries that operated every ten years from 1960 to 1990, Bloom et al. (2004) found that health positively and significantly influenced labour productivity within the larger dimension of human capital. It also improved countries' GDP, resulting in lower mortality rates at the same time. The population's expectations of their lives materialized as a yearly increase in health. Sarwar et al. (2021) investigated data of 83 countries from 2002 to 2017 and verified that health, as evaluated by human capital, positively influenced economic growth of these countries (GDP). Therefore, from the preceding paragraph, Health-related factors may prove

significant in the growth trajectory of these EMEs.

"Education" is measured as the total expenditure made by a country to improve its GDP. Here, it is measured in terms of "age dependency ratio" and "individuals using internet". The World Bank displays these measures on its official website (World Bank, 2012). Peng (2005) scrutinized role of human capital (education) on growth trajectory of the Chinese economy. Empirical results indicated that education from within human capital perspective was significantly linked to China's economic growth between periods 2000 and 2030. Employing a Computable General Equilibrium model, it was predicted that education could substantially reduce age dependency ratio among Chinese people by the end of 2030, resulting in a rise in the working-age population's percentage. Oketch (2006) analyzed capital in humans on the economic development of 47 African countries every five years from 1960 to 1998. Results from OLS and 2SLS estimations indicated that investment in education within a human capital perspective by these countries benefitted, among other things, easy access to the internet by their population, which enhanced the country's GDP in terms of its per capita growth. Therefore,

Education development may have a significant influence the growth of selected EMEs.

"Infrastructure development", as indicated by the World Bank on its official website, is measured in terms of "gross capital" or "fixed capital" (World Bank, 2012). Infrastructure development is mainly related to roads, rails, air transport, and electricity supply infrastructures (Palei, 2015). Sahoo & Dash (2009) analyzed the data at regional level from 1970 to 2006 to investigate infrastructure development's impact on economic growth of India. Results noted that infrastructure development positively and significantly influenced total gross domestic output, i.e., GDP of India. Further, in analyzing the causal relationship between the variables, it was also found that a unidirectional relationship existed between the two variables. Therefore. Factors related to Infrastructure development have been considered for further investigation in the research.

"Economic indicators" are measured in terms of "employment to population ratio". This measure provides information on current and future employment growth with respect to its GDP (World Bank, 2012). Akeju & Olanipekun (2014) tried to find the causal link between the unemployment rate in youth and Nigeria's overall economic growth by employing Johansen cointegration test. An empirical analysis observed that a negative relationship existed between the observed variables. Therefore, authors have suggested that to reduce high unemployment rate in Nigeria, more FDI and other fiscal measures must be encouraged in their economic policy. Further, a review on how FDI drives transition economies concluded that a positive effect was prevalent between the variables for such economies (Jensen, 2006). "Economic indicators" are also measured using "inflation rate" and "broad money". Akinsola, & Odhiambo. (2017) reviewed existing literature to determine how inflation in industrialized and developing countries was connected to the growth of these economies. A detailed subject investigation found that inflation was negatively linked to economic growth in these economies. Nwanne (2014), while studying the factors that influenced Nigerian growth, discovered that money supply was positively and significantly related to Nigerian GDP. This study was given a final shape using OLS technique and data from 1987 to 2010. On contrary, Khan and Gill (2010) discovered a positive and substantial link between inflation and GDP deflator in Pakistan from 1971 to 1972 and from 2005 to 2006.

Consequently, these factors have been selected for investigation in this research paper.

"Financial sector growth" is measured in terms of "domestic credit provided by the financial sector" (World Bank, 2012). Duican & Pop (2015) analyzed data from Romania at regional level from 2005 to 2014 to find out how credits impacted the country's economic growth. Review found that credits significantly influenced GDP of Romania. In investigating how credits influenced economic growth of Germany, Italy and Spain, Pistoresi & Venturelli (2015) found that between 1995 and 2000, commercial bank credits strongly and positively influenced the economic growth of these three countries. Economic growth was measured with regard to gross output or GDP. Consequently,

 Financial development indicators may have a significant impact in determining the growth trajectory of the selected EMEs and have been considered for investigation in this research paper. This data is collected from World Bank databases. See Table 1 below.

**Table 1:** Variables

| Variable | Definition |
|---|---|
| *Dependant Variable* | |
| GDP | GDP per capita growth (annual %) |
| *Independent Variables* | |
| AR | Age dependency ratio (% of working-age population) |
| AFF | Agriculture, forestry, and fishing, value added (% of GDP) |
| AFG | Agriculture, forestry, and fishing, value added (annual % growth) |
| AP | Air transport, passengers carried |
| APC | Air transport, registered carrier departures worldwide |
| BRD | Broad money (% of GDP) |
| CA | Current account balance (% of GDP) |
| CE | Current health expenditure (% of GDP) |
| EP | Employment to population ratio, 15+, total (%) (modelled ILO estimate) |
| DCF | Domestic credit provided by financial sector (% of GDP) |
| FDN | FDI, net inflows (% of GDP) |
| GP | Gross capital formation (% of GDP) |
| IUI | Individuals using the internet (% of population) |
| ID | Inflation, GDP deflator (annual %) |
| LEB | Life expectancy at birth, total (years) |
| MR | Mortality rate, under-5 (per 1,000 live births) |

**Data Analysis and Applied Methodology**

Bivariate regression model is applied between the GDPs of each country separately as dependent variable and the different selected economic variables as independent variables to assess the role of these selected economic variables on the economic growth of each country. The research paper conceives a null hypothesis, which is that "There exists no significant impact of selected independent variables on the GDP of the EMEs".

This hypothesis has been tested through the 19 bivariate regression models for 19 EMEs with 16 selected independent variables. The results for all 19 countries were noted separately and significant and insignificant selected variables for each country through regression was recorded separately. Table 2 below summarizes the results of bivariate regression conducted for each country. It lists each country and the respective

variables that were found significant through the bivariate regression.

It is seen that out of the sixteen independent variables selected, Russia is the country with highest significant economic variables that influence the GDP per Capita Annual growth of Russia followed by Philippines, Bulgaria, Indonesia, China, India and South Africa. Thailand, Mexico and Columbia have shown lowest number of economic variables significantly influencing the GDP per Capita Annual Growth of their country. This is because these three countries are known to grow from unconventional economic variables like tourism and creative industry space growth. In these countries the independent variables selected in the study were not found to be significant in explaining the GDP per capita growth. See table 2 below.

**Table 2:** Countries with Economic Variable

| S.no. | Country | Contributing economic variables | Number of Contributing economic variables |
|-------|---------|--------------------------------|-------------------------------------------|
| 1 | Russia | LEB, MR, CE, AP, APC, IUI, CA, EP, DCF, ID, BRD | 11 |
| 2 | Philippines | AFF, LEB, MR, CE, AR, AP, APC, IUI, BRD | 9 |
| 3 | Bulgaria | AFF, LEB, MR, IUI, FDN, CA, DCF, ID, BRD | 9 |
| 4 | Indonesia | AFF, CE, AP, APC, FDN, DCF, BRD | 7 |
| 5 | China | CE, IUI, FDN, CA, DCF, ID, BRD | 7 |
| 6 | India | AFF, LEB, MR, AR, AP, APC | 6 |
| 7 | South Africa | LEB, MR, CE, AP, APC, IUI | 6 |
| 8 | Peru | AFF, AFG, CE, FDN, DCF | 5 |
| 9 | Malaysia | AFG, GP, FDN, ID, BRD | 5 |
| 10 | Brazil | CE, GP, EP, DCF, BRD | 5 |
| 11 | Chile | AFG, CE, IUI, DCF | 4 |
| 12 | Hungary | AFF, GP, DCF, BRD | 4 |
| 13 | Romania | FDN, CA, DCF | 3 |
| 14 | Argentina | AFG, GP, EP | 3 |

| 15 | Turkey | AFG, GP, CA | 3 |
| 16 | Poland | GP, FDN, CA | 3 |
| 17 | Thailand | FDN | 1 |
| 18 | Mexico | APC | 1 |
| 19 | Colombia | MR | 1 |

Table 3 below summarizes the results of 19 regression models by stating the 16 independent variables on one side and listing all the relevant EMEs for which the independent variable was noted as significant in influencing the GDP growth rate of that country.  From the bivariate regression model between the GDP per capita (dependent variable) of each selected country and the different selected economic variables as independent variables it is observed that DCF is the most significant economic variable impacting the GDP per capita growth rate of the selected 19 countries, followed by BRD, CE and FDN. Out of the 19 countries, AFF, AP, APC, GP, MR, CA and IUI are seen to influence the GDP per capita growth rate of 6 countries. EP and AR variables are seen to have the least influence on the GDP per capita growth rate of these 19 selected emerging economies. See Table 3 below.

**Table 3:** Contributing Economic Variables across Countries

| S.no | Variable | Countries | | | | | | | | |
|------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|      |          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | DCF | Chile | Romania | Hungary | Brazil | Indonesia | Bulgaria | Peru | Russia | China |
| 2 | BRD | Philippines | Hungary | Brazil | Indonesia | Bulgaria | Russia | Malaysia | China | |
| 3 | CE | South Africa | Philippines | Brazil | Indonesia | Peru | Russia | Chile | China | |
| 4 | FDN | Romania | Thailand | Indonesia | Bulgaria | Peru | Malaysia | Poland | China | |
| 5 | AFF | Philippines | Hungary | Indonesia | Bulgaria | Peru | India | | | |
| 6 | AP | South Africa | Philippines | Indonesia | Russia | Mexico | India | | | |

| 7 | APC | South Africa | Philippines | Indonesia | Russia | Mexico | India |
|---|-----|-----|-----|-----|-----|-----|-----|
| 8 | GP | Argentina | Hungary | Brazil | Turkey | Malaysia | Poland |
| 9 | MR | South Africa | Philippines | Bulgaria | Russia | Colombia | India |
| 10 | CA | Romania | Bulgaria | Russia | Turkey | Poland | China |
| 11 | IUI | South Africa | Philippines | Bulgaria | Russia | Chile | China |
| 12 | AFG | Chile | Argentina | Peru | Turkey | Malaysia | |
| 13 | LEB | South Africa | Philippines | Bulgaria | Russia | India | |
| 14 | ID | Bulgaria | Russia | Malaysia | China | | |
| 15 | EP | Argentina | Brazil | Russia | | | |

## Conclusions and Discussion

The study also found a significant influence of DCF, AFG BRD CE, FDN, AFF, AFG AP, APC, GP, CA and IUI on the growth of the 19 selected countries individually. DCF and IUI are mostly observed to have a negative impact on the growth of the selected emerging countries individually. DCF has a significant impact on the GDP growth rate of these EMEs. The significance of DCF has also been highlighted in the study of the economic growth of Germany, Italy and Spain measured with regard to gross output or GDP, Pistoresi & Venturelli (2015) found that, commercial bank credits had a significant and positive impact of credits on the economic GDP growth of these countries' economies.

With regard to the majority of selected EMEs, DCF and BRD have a negative and significant impact on GDP. Due to the existence of inefficiencies in lending business, lending to non-productive ventures and also due to the existence of a large informal sector when employees evade taxes due to low wages DCF has a negative impact on the growth of most of the 19 EMEs. These countries also lack robust governance and supervision in the financial sector and the risk-based supervision in the lending sector is relatively new, which makes returns from the lending business uncertain. Also, overall financial inclusion still is an area of concern for the selected 19 emerging market economies.

Technology has tried to increase financial inclusion but due to a lack of financial education and information financial inclusion has remained low. IUI has a negative and significant impact on the GDP of South Africa, the Philippines, Bulgaria, Russia, Chile and China. Despite the increase in IUI in these countries, there is a disparity in internet accessibility, only urban homes have access to high-speed internet whereas rural lack even basic coverage. Also, to reap the positive benefits of IUI by providing IT and advisory services, these countries need to address a severe digital skills gap as much of their population does not possess basic digital skills. In addition to this, the majority of people use the internet from phones to make audio and video calls through various applications along with Facebook and therefore IUI is not for activities contributing to the GDP of these countries.

CE has a significant impact on the GDP growth rate of these EMEs. The importance of CE in economic growth has been highlighted in a study by Bloom et al. (2004) that evaluated how health impacts the economic rise on a group of selected major countries. It was again noted that health had a significant positive impact on labour productivity and human capital. However, CE is seen to have a negative impact on the economic growth of most of the selected EMEs individually. Despite healthcare expansion in these EMEs there exists high regional inequality in the availability of healthcare with poorer regions and lower socioeconomic population groups being at a disadvantage. These structural problems and disparities have had a negative impact. Also, structural problems persist in the healthcare system including gaps in governance and organization, low public funding and suboptimal resource allocation.

AFF and AFG exhibited positive and significant bearing on the majority of the 19 selected EMEs, indicating that higher values of AFG increase the GDP of emerging countries. These emerging market economies are conventionally rich in natural resources and have fertile soil, sufficient water resources and favourable climate. They also enjoy the comparative advantage of a comparatively low-cost but qualified labour force, sophisticated infrastructure and favourable government incentives and policies. These markets are an export hub for a banquet of agricultural products like rubber, palm oil, wheat,

rice, tea, fruits and vegetables etc. This has led to an increase in exports from the agriculture sector which has had a favorable influence on the GDP of 19 of the selected emerging market economies. AP and APC have a significant and positive influence on the GDP of most selected EMEs CA and GP also positively influence the GDP growth rate of the emerging countries. CA showed a positive and significant bearing on the GDP of most selected EMEs. This is because of substantial trade surpluses in these countries where the imports are greater than exports. These emerging markets are major manufacturing hubs due to the availability of cheap labour and other raw materials. In addition, the economic policies are also export-oriented, which allows these emerging markets to earn high export revenue. This is in tendon with the results of the review conducted by Baig & Straquadine (2014) that examined growth factors for Saudi Arabia, it was noted that the agricultural sector was the largest contributor to the country's revenue for GDP and had a significant impact on the development of rural areas including the livelihoods of the rural population.

FDN has a positive impact on the GDP growth rate of most of the 19 selected EMEs. This is primarily because along with FDN, the transfer of knowledge by MNCs, associated development of social infrastructure like investment risk and capital market development has had a positive impact on the GDP. As such, the authors recommended that the country's economic policy should promote more FDN and other fiscal measures to reduce the high unemployment rate in the country. These EMEs have become attractive for FDN due to their low corporate tax rate, low labour costs and its well positioned place for foreign investments.

Overall, these EMEs should concentrate on improving their economic growth by increasing efficiency in the agricultural sector, particularly for optimal resource allocation as far as exports from the agricultural sector are concerned. The EMEs should focus on increasing foreign investors' attractiveness towards their country by maintaining macroeconomic stability, controlling foreign debt, and abundant natural resources and export-oriented policy which will contribute significantly to the growth of GDP in these countries. Also, the domestic credit lending

systems should be strengthened by ensuring resources are allocated to productive avenues and by reducing the presence of the informal sector in the leading business. To overcome the impact of regional inequalities, especially in EMEs, they should also ensure credit availability in rural geography as well. EMEs should also aim at improving their current account balance to further pivot on their positive GDP growth trajectory.

The current research paper focuses on the selected 19 EMEs from 2000-2017, the data for which is collected from the World Bank. This data is not available consistently across all 19 EMEs for the 16 selected variables from 2018 onwards, which limits the ability to include the results for more recent periods in order to analyze the impact of COVID-19 on the economic trajectory of the EMEs. The current research paper can be built on with more recent data being available to incorporate suggestions on the future direction of economic development post-COVID-19.

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# Bibliometric Analysis of Robotic Process Automation

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## Abstract

*Robotic process automation (RPA) is a recent technology that focuses on automating routine, repetitive, rule-based human operations with the intention of giving firms that choose to utilize such software a competitive edge. The scholarly literature on robotic process automation is still lacking since it is a relatively new technology that has just entered the market. So, the goal of this article is to find out how academics define robotic process automation and how much research has been done on it in terms of state, number of papers, authors' citations, keyword networks, country-by-country number of publications and type of source, GS score of paper, citations per year author by author, citations per year title by title, trends, and robotic process automation applications. In the study, Bibliometric Analysis based on Scopus and WoS databases has been conducted for 22 years, from 2000 to the year 2022. The paper provides the results of the undertaken Bibliometric Analysis on Robotic process automation. It was explored in the Research that Research on robotic process automation across the globe is being populated. And India is prominently digging deep into robotic process automation research and securing the second position and, most importantly, surpassing China in the domain, despite being a less techno-savvy nation. For Bibliometric Analysis and developing network, Vosviwer and publish or perish software was used by the researcher, respectively.*

**Keywords:** Bibliometric Analysis, Robotic Process Automation, Co-authorship, Citation Analysis, Process automation

## Introduction

Businesses must adapt more swiftly to client wants and requirements as a result of fluctuations in the globalized economy brought on by the development of new Technology. Additionally, companies must be more efficient due to financial and competitive demands. As a result, they are continuously looking for new technologies and processes that can increase their productivity, cut

expenses, and add value to their operations. RPA is a new technology that is one of the solutions that is being used to automate repetitive jobs that people do, freeing up staff to work on more complex tasks that provide more value to the firm. According to studies from consulting firms, robotic process automation is acknowledged as a new, disruptive technology that is already providing benefits [10, 15].

Regardless of the view of several researchers and academicians who have reported different advantages of robotic process automation implementation inside an organization [7, 8, 16, 29, 39], to the best of the authors' knowledge, Research is currently being done on robotic process automation less often than it is being used in practice. Thus, it is critical to comprehend how robotic process automation differs from related technologies and methodologies, including business process management, as well as how they complement one another. For instance, it is advised that the integration of robotic process automation be looked at [33]. Therefore, the purpose of this study is to do a bibliometric analysis of the above-stated subject, where the Number of Papers, Authors' Citation, Google Score of Paper, Citation per year author wise, Cites Per Year title wise, trends, and application of Robotic process automation haven been analyzed for 22 years since 2000 to 2022.

**Background On Robotic Process Automation**

Preliminary literature analysis defined robotic process automation as the use of certain Technology and technique that relies on software and algorithms with the aim of automating repetitive human acts [16, 33, 39]. It is principally guided by straightforward rules and logic with several information systems using already-existing visual user interfaces [17]. Its features include the automation of repetitive tasks using a non-intrusive software robot or "bot." Its features include the automation of repetitive and rule-based tasks using a non-intrusive software robot or "bot" [27, 29, 38]. The concept of robotic process automation has lately been widened to encompass its connections to process mining, artificial intelligence, cognitive computing, and data analytics. Thanks to the development of new digital technologies, robotic process automation may be shifted from performing routine, prone-to-mistake activities in business processes to more challenging, knowledge-intensive, and value-adding work [3, 17, 45].

Forrester [15] selected 12 robotic process automation manufacturers that provide enterprise-level, full-corporate solutions that may fulfil the needs of a "shared service" or enterprise-wide robotic process automation utility in order to evaluate the condition of the robotic process automation industry. Schmitz et al. [42] See "the overall notion of robotic process automation as sector neutral" despite the fact that

certain robotic process automation suppliers provide solutions tailored to particular industries.

More than half of the 400 businesses Deloitte surveyed [10] had already begun their robotic process automation journeys, and almost a quarter more expect to do so over the next two years. Additionally, they state that payback times often last a year and that their goals for cost savings, speed, accuracy, flexibility, and increased compliance have been met or robotic process automation. By 2021, there will likely be over 4 million robots executing repeated activities, according to Forrester [15], but the emphasis will shift to robotic process automation analytics advancements and ai connections.

Despite the significant advantages of robotic process automation, just 5% of the businesses surveyed by Deloitte in their study [10] had more than 50 robots operating in their operations. The effectiveness of robotic process automation initiatives depends heavily on organizational competence and knowledge of the business objectives of robotic process automation adoption.

Key obstacles to automating processes include a lack of management support, a lack of awareness of what robotic process automation is and where it can be used, and employee fear of losing their jobs [43]. The gap between robotic process automation's status as a tool and its use on the business side may be closed with the aid of a change management strategy, a modification of organizational culture, and a change in perspective [10, 28, 43]. On the other hand, Everest group research [13] participants identified solid vendor ecosystems for complementing technologies, training and educational resources, robotic process automation maintenance services, and good customer support as particularly critical drivers of robotic process automation adoption. In addition, the development of new technologies raises issues about the governance, centralization, and administration of robots [15].

Despite the fact that, according to Taulli (2020), RPA is the second fastest-growing job field, it has gotten less academic attention than process automation, a more developed study area. However, there have been several case studies and uses of robotic process automation during the last ten years.

Manual financial frameworks are no longer able to keep up with the rapidly evolving business environment. Therefore, banks must concentrate on digitizing a few internal processes (Daru 2015). Investment in data analytics is crucial for businesses that wish to be successful with AI/ML. Expertise in AI/ML is required to solve unique applications requiring supervised learning or NLP. Start here to discover the finest opportunities for your company and to begin your path toward smart process automation. (Schmitz, M., Stummer, C., & Gerke, M., 2019).

## Research Methodology

The literature review is a common process for putting the literature's contents into objective and systematic forms so that they may be identified, described, mapped out, and evaluated. The literature research, however, was unable to locate the associated intellectual domain (Tranfield et al., 2003). By measuring the available literature, the bibliometric study finds a solution to this issue. Additionally, the bibliometric analysis may be utilized to identify knowledge gaps and provide suggestions for future studies in the developing field. Additionally, the bibliometric methodology can manage large-scale publications to create a scientific framework of research topics, in contrast to the outdated structured method (Zupic and Cater, 2014).

The two main analyses employed in this Research are the descriptive analysis and the network analysis. The descriptive analysis discusses the research performance based on productivity measures and contains the fundamental facts related to the current literature. By locating latent predictive connections in the literature, network analysis broadens the area of study as opposed to only reporting on the database's facts. The researcher evaluated 990 research papers based on robotic process automation. This Research mainly focused on the Number of Papers, Authors' Citation, keyword network, country-wise number of publications and type of source of publication, GS Score of Paper, Citation per year author wise, Cites Per Year title wise, trends, and application of Robotic process automation.

## Research Questions

Establishing research questions, the outcomes of the quick literature review showed the importance of robotic process automation for academics and business professionals, as well as the absence of a Bibliometric Analysis review in the robotic process automation field. The early results revealed gaps in study settings, a lack of theoretical frameworks, and differences between the concept and substance of robotic process automation. Additionally, the ad-hoc analysis of current robotic process automation literature revealed that robotic process automation is accepted in corporate practice as a tool for enhancing performance.

The research questions are established using earlier annotations on academic and professional works that concentrate on robotic process automation. From broader to more particular, they are defined as follows:

**Table 1 - Research Question**

| Research Questions | Significance |
| --- | --- |
| | |

| **What is the publication Trend of Robotic Process Automation across various industries?** | The yearly number of publications on robotic process automation is helpful in predicting the future trend. |
|---|---|
| **Which sectors and sorts of papers have published more Research on robotic process automation?** | It will make it easier to track down research projects on robotic process automation in different sectors. It will assist the researcher in determining potential future study areas. |
| **Which nations publish the most papers on robotic process automation?** | It would be useful to know which nation causes the most concern among scholars and practitioners about robotic process automation. This will provide them with the chance to submit their study from that nation to journals in the future. |

Table 1 consist of all the research questions which are to be addressed in this study in detail, and the research results will help in predicting the future trend and unmapped research possibilities that will help in industry automation in the country.

**Table 2 Citation Details**

| Particulars | Figures |
|---|---|
| Publication Years | 2000-2022 |
| Citation years | 22 (2000-2022) |
| Papers | 990 |
| Citation | 7258 |
| Cites/years | 329.91 |
| Cites/year | 7.33 |
| Authors/paper | 2.12 |

| | |
|---|---|
| H-Index | 44 |
| G-Index | 71 |
| HI, Norm | 27 |
| HI, annual | 1.23 |
| Ha-Index | 19 |
| Papers with ACC> - | 1,2,3,10,20,357,226,111,59,17 |

Table 2 is of Citation Details, where it came in notice that Bibliometric analysis of robotic process automation has been analyzed for 22 years, since the year 2000 to 2022, and during these years, more than 990 papers were written on the stated subject, where 289 papers were from Scopus and the rest were taken from WOS Database, total citations were 7258 in these years; therefore, this can be stated, that every year 329.9 citation on an average took place and each paper got the average citation of 7.33. From the author's point of view, each author has been credited with 2.12 papers to his credit, while the h index was 44 in these 22 years, and G index was almost double of h index, i.e., 71, while the Hi norm was 27, and Hi annual was 1.23, whereas Ha-index was 19 only. Hence this is the overall contribution by the various researchers and academicians regarding robotic process automation in these years.

**Author Network Visualization**

An author's relationships with other authors in a dataset are shown in an ego graph called the Author Collaboration Network. Below in figure 1, Items are represented in the network representation by their label and, by The Author Collaboration Network (ACN) is a self-referential network that illustrates how writers in a given dataset have worked together. Default, a circle as well. The weight of an object determines the size of the circle and label for that item. Links are indicated by lines between items.
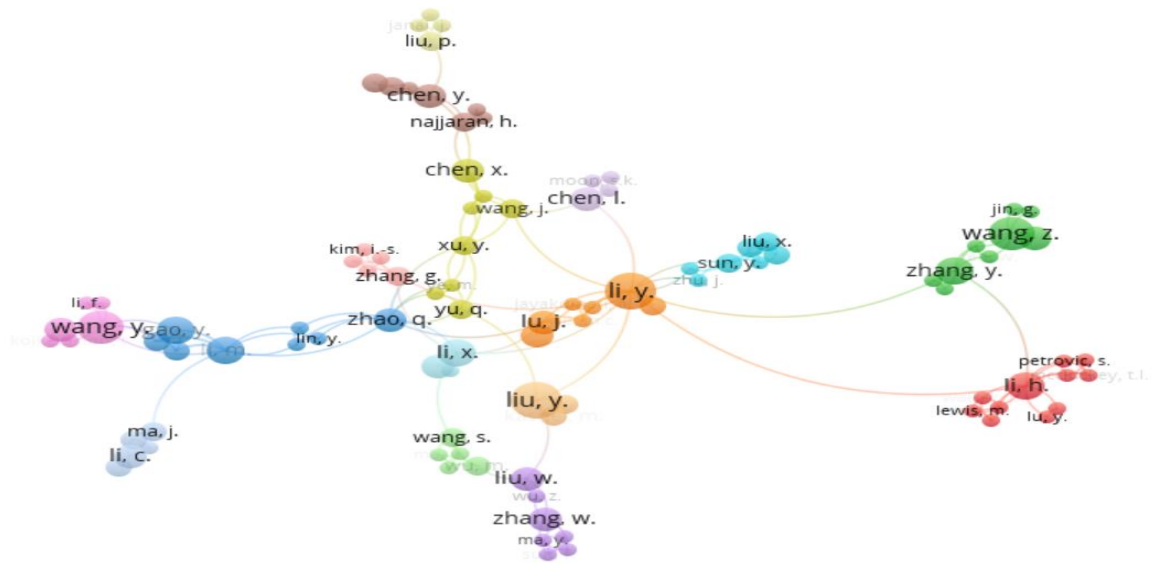
**Figure 1 Network Visualization**

Figure 1 displays a sample of the network visualization. In the image, the estimated distance between the two journals shows how closely associated the journals are in terms of co-citation relationships. In general, the more geographically near two journals are to one another, the more closely they are connected. Additionally, lines show the most robust journal-to-journal co-citation connections. In total, there are 99 items, 16 clusters, links are 200, and total link strength is 211.

**Keyword Network Visualization**

When applied to any market, Keyword Graph's network analysis capabilities reveal the most promising subset of the industry in record time. The tool is effective because it helps you close the information gap between what consumers are looking for and what you're offering. Here keyword network analysis measures the strength of the relationships between sample terms in relevant texts in order to get insight into the conceptual structure and trends of a certain topic.

**Figure 2 Keyword Network Visualization**
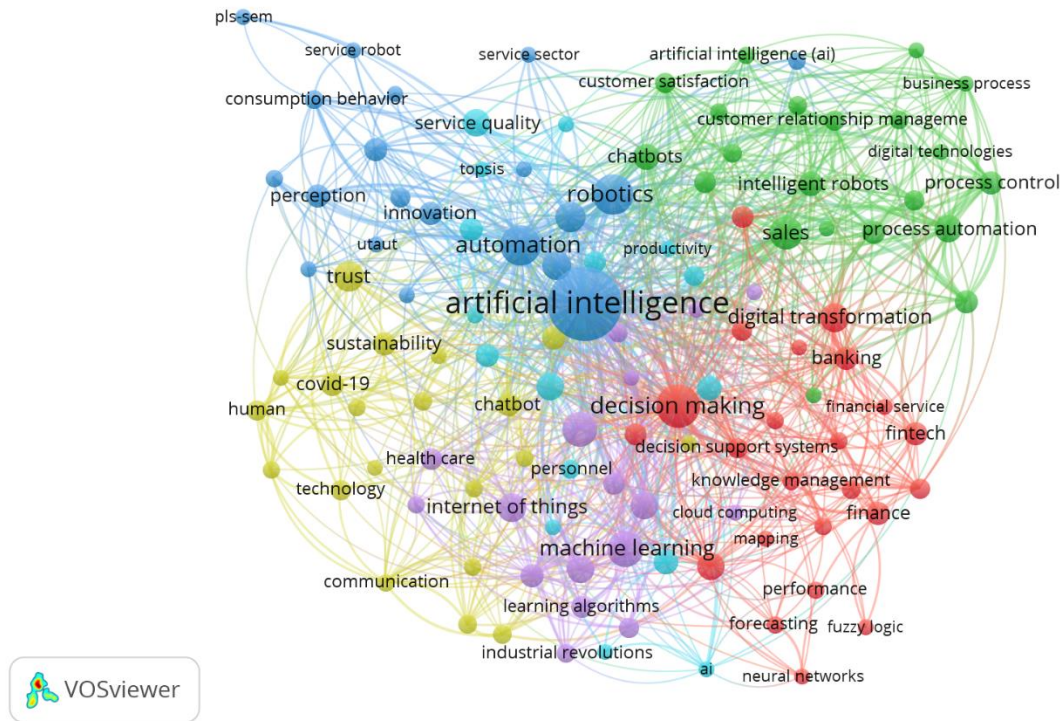
In figure 2 it has been figured out that in total, there are 117 items, 6 clusters, and links are 1566, and the total link strength is 2458 in network analysis of keyword search. If the table is to be analyzed, this can be noticed that Artificial Intelligence has been searched a maximum of 103 times, while automation and robotics were found 32 times each, and the rest keyword list has been mentioned in table number 2 below.

**Table  3 keyword network**

| Keyword | Frequency |
|---|---|
| **Artificial Intelligence** | 103 |
| **Decision Making** | 38 |
| **Automation** | 32 |
| **Robotics** | 32 |
| **Machine Learning** | 26 |
| **Industry 4.0** | 23 |
| **Data Mining** | 20 |

| Keyword | Frequency |
|---|---|
| **Trust** | 18 |
| **Digital Transformation** | 17 |
| **Internet Of Things** | 17 |
| **Technology Adoption** | 16 |
| **Big Data** | 15 |
| **Literature Reviews** | 15 |
| **Process Automation** | 15 |
| **Robotic Process Automation** | 11 |

Table 3 is of keyword network, which shows the frequency of a particular keyword which has been mentioned in the published research papers. It is evident from the table that the term artificial intelligence has been searched the most, with a frequency of 103, followed by the term decision making 38, demonstrates that automation in industry is on a high and Technology and robotic process automation are employed extensively in Finance activities. The word process automation was also used 15 times in this search; therefore, the frequency of these keywords demonstrates that you cannot imagine the operations of finance without robotic process automation in the future, especially after 2030.

**Paper Publication**

**I**n this section, the details of publication of papers on robotic process will be identified on robotic process automation since year 2000 to 2022.

**Table  4 Publication of Papers**

| Year | Number of Papers | Year | Number of Papers |
|------|------------------|------|------------------|
| 2000 | 2 | 2012 | 7 |
| 2001 | 2 | 2013 | 6 |
| 2002 | 3 | 2014 | 5 |
| 2003 | 3 | 2015 | 10 |
| 2004 | 1 | 2016 | 12 |
| 2005 | 5 | 2017 | 41 |
| 2006 | 4 | 2018 | 89 |
| 2007 | 1 | 2019 | 173 |
| 2008 | 3 | 2020 | 196 |
| 2009 | 4 | 2021 | 232 |
| 2010 | 3 | 2022 | 101 |
| 2011 | 3 | | |

Table 4 above shows that the publication of papers on robotic process automation increased dramatically after 2016; mainly, before the year 2002, research papers were on robotic process automation, and the number of papers was not significant, although, in 2016, 12 papers were

written related to the stated topic, while in 2017, there was dramatic increased was observed. Table 2 shows of publication of papers, during the last 22 years, from 2000 to 2022, and this is clearly observed that the publication of papers on

## Country-wise paper publication

Table 5 below shows Country wise paper publications on robotic process automation in the banking sector, and it shows that the USA has topped this list, where it has published a

robotic process automation has increased dramatically after 2016 particularly, 232 research articles were produced in 2021, whereas 101 research papers written to next year.

maximum paper 109, followed by India with 75, Iran 20 and Turkey 20. Publication of other nations is not as significant as it should have been surprisingly, India has the second rank in paper publications on robotic process automation in the banking sector.

**Table 5  Country-wise paper publication**

| Country | Papers | | | | |
|---|---|---|---|---|---|
| United States | 109 | Saudi Arabia | 15 | Singapore | 5 |
| India | 75 | Portugal | 14 | Belgium | 5 |
| Germany | 72 | Indonesia | 14 | Greece | 5 |
| United Kingdom | 65 | Russian Federation | 12 | Croatia | 4 |
| Australia | 60 | | | Nigeria | 4 |
| China | 52 | New Zealand | 12 | Sweden | 4 |
| France | 42 | Switzerland | 12 | Viet Nam | 4 |
| South Korea | 29 | Pakistan | 11 | Bahrain | 3 |
| Poland | 28 | Denmark | 11 | Bangladesh | 3 |
| Malaysia | 24 | Romania | 10 | Colombia | 3 |
| South Africa | 22 | Ireland | 10 | Lithuania | 3 |
| Iran | 20 | Taiwan | 9 | Mexico | 3 |
| Turkey | 20 | Finland | 8 | Philippines | 3 |
| Italy | 19 | United Arab Emirates | 8 | Slovenia | 3 |
| Canada | 17 | | | Ecuador | 2 |
| Netherlands | 16 | Egypt | 8 | Estonia | 2 |
| Brazil | 16 | Austria | 7 | Kazakhstan | 2 |
| Spain | 15 | Thailand | 6 | Kuwait | 2 |
| Hong Kong | 15 | Undefined | 6 | Macao | 2 |
| | | Morocco | 5 | Malta | 2 |

| | | | | | |
|---|---|---|---|---|---|
| **North Macedonia** | 2 | **Cyprus** | 1 | **Malawi** | 1 |
| **Qatar** | 2 | **Czech Republic** | 1 | **Namibia** | 1 |
| **Serbia** | 2 | **Ethiopia** | 1 | **Nepal** | 1 |
| **Sudan** | 2 | **Hungary** | 1 | **Oman** | 1 |
| **Brunei Darussalam** | 2 | **Iraq** | 1 | **Uganda** | 1 |
| | | **Israel** | 1 | **Venezuela** | 1 |
| **Afghanistan** | 1 | **Jordan** | 1 | **Zambia** | 1 |
| **Azerbaijan** | 1 | **Kenya** | 1 | **Zimbabwe** | 1 |
| **Bulgaria** | 1 | **Latvia** | 1 | **Total** | 990 |
| **Chile** | 1 | **Lebanon** | 1 | | |

## Source Type

Here in this section researcher has explored the source of paper publication, means whether the paper got published in journal or books or at some other place.

*Table 6 Source Type*

| SOURCE TYPE | NUMBER OF PAPERS |
|---|---|
| JOURNAL | 706 |
| BOOK | 160 |
| CONFERENCE PROCEEDING | 65 |
| BOOK SERIES | 59 |
| TOTAL | 990 |

Table 6 is of source type of paper publications, where it shows Journal publications 706, followed by Book publications 160, Conference Proceedings 65 and Book Series 59.

## Authors Citation

Whenever a researcher refers to the work of another author, they will often do so with a short parenthetical citation, so here in table 7 the author citation on robotic process automation has been mentioned.

**Table 7 Authors Citation**

| Authors | Citation |
|---|---|
| SL Dolan, S Garcia | 336 |
| SL Dolan, S Garcia, A Auerbach | 227 |
| A Uszok, P Kunstman | 204 |
| J McLurkin, J Smith | 193 |
| RD Pedersen, TD Blake, JH Lemelson | 191 |
| LA Cooper, DK Holderness Jr, ... | 173 |
| M Leo, S Sharma, K Maddulety | 156 |
| F Huang, MA Vasarhelyi | 134 |
| F Bertoni, MG Colombo, L Grilli | 129 |
| J Kokina, S Blanchette | 128 |
| H Takahashi, T Kosaka | 128 |
| R Rongo | 118 |
| PJ Perrone | 111 |
| MG Colombo, A Croce, M Guerini | 109 |
| M Chui | 108 |

Table 7 is of the author's citation; here, researchers with maximum sources have been mentioned. SL Dolan, S Garcia has a maximum citation of 336, followed by SL Dolan, S Garcia, A Auerbach (227), F Bertoni, MG Colombo, L Grilli (129), J Kokina, S Blanchette (128), MG Colombo, A Croce, M Guerini (109) and M Chui (108).

**Google Score**

Through the use of Google Scholar Metrics, writers may examine journal rankings and ratings according to a wide range of h-indices.

The top 100 journals are ranked and available for viewing. And here this has been explained in table 8 below.

### Table 8 Google score

| Title | GS Score |
|---|---|
| Managing by values: Cultural redesign for strategic organizational change at the dawn of the twenty-first century | 990 |
| Understanding and managing chaos in organizations | 989 |
| Intelligent software agent system architecture | 988 |
| System and methods for adaptive control of robotic devices | 987 |
| Robotic manufacturing and assembly with relative radio positioning using radio-based location determination | 986 |
| Robotic process automation in public accounting | 985 |
| Machine learning in banking risk management: A literature review | 984 |
| Applying Robotic process automation in auditing: A framework | 983 |
| Venture capital investor type and the growth mode of new technology-based firms | 982 |

Table 8 represents the Google score of research papers on various papers on robotic process automation, where this can be observed that the article titled "Managing by values: Cultural redesign for strategic organizational change at the dawn of the twenty-first century" has a maximum google score of (990), followed by a paper titled, "Understanding and managing chaos in organizations" (989), Intelligent software agent system architecture (988), Machine learning in banking risk management: A literature review (984), Applying Robotic process automation (983) and Venture capital investor type had (982) google score.

**Authors Cite Per Year**

Authors now have a straightforward tool in Google Scholar Citations with which to monitor how often their publications are cited and has been explained in the table 9 below:

### Table 9 Authors Cites Per Year

| Authors | Cites Per Year |
|---|---|
| LA Cooper, DK Holderness Jr, ... | 57.67 |
| M Leo, S Sharma, K Maddulety | 52 |
| T Burström, V Parida, T Lahti, J Wincent | 46 |
| F Huang, MA Vasarhelyi | 44.67 |
| J Kokina, S Blanchette | 42.67 |
| L Reinkemeyer | 40 |
| M Gotthardt, D Koivulaakso, O Paksoy, ... | 37 |

| | |
|---|---|
| JG Enríquez, A Jiménez-Ramírez, ... | 33 |
| MC Annosi, F Brunetta, F Bimbo, M Kostoula | 32 |
| M Javaid, A Haleem, RP Singh, R Suman | 31 |
| EA Bhuiyan, MZ Hossain, SM Muyeen, ... | 28 |
| Y Zhang, F Xiong, Y Xie, X Fan, H Gu | 25.5 |
| F Santos, R Pereira, JB Vasconcelos | 25.33 |
| KM Bakarich, PE O'Brien | 25 |
| F Ludbrook, KF Michalikova, Z Musova, ... | 24.33 |

Table 9 shows, Authors Cites Per Year, where this can be observed that LA Cooper, DK Holderness Jr, has maximum Authors Cites Per Year of 57.67, followed by M Leo, S Sharma, K Maddulety, who has 52 Authors Cites Per Year, while T Burström, V Parida, KM Bakarich, PE O'Brien 25 and F Ludbrook, KF Michalikova, Z Musova, has lowest Authors Cites Per Year of 24.33.

**Title-wise Cites Per Year**

Here in this part, table 10 illustrates the title-wise cites per year based on paper title, which is important since citations are seen as a possible criterion to evaluate connectivity between research publications.

**Table 10 Title-wise Cites Per Year**

| Title | Cites Per Year |
|---|---|
| Robotic process automation in public accounting | 57.67 |
| Machine learning in banking risk management: A literature review | 52 |
| AI-enabled business-model innovation and transformation in industrial ecosystems: A framework, model and outline for further research | 46 |
| Applying Robotic process automation in auditing: A framework | 44.67 |
| Early evidence of digital labour in accounting: Innovation with Robotic Process Automation | 42.67 |
| Process mining in action | 40 |
| Current state and challenges in the implementation of smart robotic process automation in accounting and auditing | 37 |
| Robotic process automation: a scientific and industrial systematic mapping study | 33 |
| Digitalization within food supply chains to prevent food waste. Drivers, barriers and collaboration practices | 32 |
| Substantial capabilities of robotics in enhancing industry 4.0 implementation | 31 |
| Towards next generation virtual power plant: Technology review and frameworks | 28 |
| The impact of artificial intelligence and blockchain on the accounting profession | 25.5 |
| Toward robotic process automation implementation: an end-to-end perspective | 25.33 |
| The robots are coming… but aren't here yet: The use of artificial intelligence technologies in the public accounting profession | 25 |
| Business models for sustainable innovation in industry 4.0: Smart manufacturing processes, Digitalization of production systems, and data-driven decision making | 24.33 |

Table 10 shows the Title wise Cites Per Year on the robotic process automation area, where this is clearly observed from the above table that the paper titled "Robotic process automation in public accounting" has 57.67 "Title wise Cites Per Year" maximum among all the studies while paper titled "Business models for sustainable innovation in industry 4.0: Smart manufacturing processes, digitalization of production systems, and data-driven decision making" has 24.33 Cites Per Year that is minimum among all the cites for titles.

## Advantage And Disadvantage of Robotic Process Automation

Due to their superior precision in performance, robots can execute certain activities quicker and more effectively than humans. In fact, A company that just manufacturing two to three products per day, using a robot will allow you to more precisely produce 50 to 100 items each day. Additionally, businesses may use robots in locations where it would be dangerous for people to perform certain tasks manually. They are regarded as being more prolific than humans since they can work constantly for months at a time without resting or upkeep. When people labour continuously without a break or sleep, they lose their minds and become insane. Robots, however, are able to operate continuously without rest.

Robots need a significant amount of electricity to operate, which is a drawback of automation. Robots need ongoing maintenance to keep them in excellent shape. To purchase robots, a substantial sum of money would be required. Additionally, developing software to meet your demands would be significantly more expensive, and putting industrial robots into use would need a significant investment.

Another major worry is that if robots become popular, many skilled employees will lose their employment and wind up on the streets, which is one of robotics' drawbacks. Several daily wage employees would lose their employment, which serve as their families' primary source of income.

When they fail or are built for combat, robots may be deadly to people. Some nations have already begun deploying robots in different types of warfare. One of the drawbacks of robotics is that because they lack empathy, robots can never connect with people the way humans can. Robotics won't be able to replace human touch in numerous areas of customized services if they are forced to do so.

## Research Application

This research is useful because it may be used to forecast future trends based on observable data like the number of publications on robotic process automation, moreover Robotic process automation research projects in different sectors will be easier to find, More than that, it will point

the researcher in the direction of promising new areas to investigate.

**Discussion and Conclusion**

The purpose of this part is to examine and debate the research questions that have already been posted. In order to respond to the research question, a bibliometric analysis of a sample of publications was performed, which revealed that robotic process automation research increased by approximately six times between 2016 to 2021 alone, although the number went down more than 100% in the year 2022. This may support the prediction that robotic process automation research will continue to increase in the next years (Taulli 2020). Given that robotic process, automation is still a relatively young and developing discipline, the findings showing the publication of 990 papers suggest that the entire research potential on the issue hasn't yet been realized, despite being dominating and most sought field nowadays. Thus, it can be said that Research on robotic process automation is still in its infancy and that it will likely increase during the next several years, appearing in peer-reviewed journals, among other places (Taulli 2020).

Research on robotic process automation in the banking sector across the globe is being populated but not in the implementation stage in a few countries (Carmo, Gonçalo Pires de Carvalho Mota (2020), although the financial sector is keeping RPA implementation in top priority as a future course of action (UiPath, 2019). However, RPA Research is not uniform, and much variation has been noticed among countries; a most interesting fact is that India is prominently digging deep into robotic process automation research and securing the second position and, most importantly, surpassed China in the domain, despite being a less techno-savvy nation. Therefore, this would be useful to know which nation causes the most concern among scholars and practitioners about robotic process automation.

Robots have long been used in the industrial sector, safely working alongside humans and learning from them, but some organizations are still hesitant to use them for technical and financial reasons. Despite the fact that certain robotic process automation providers provide solutions that are especially suited to particular industries, consider "the overall principle of robotic process automation as sector neutral," according to Schmitz and others. Robotics has developed and now offers a wider variety of capabilities than those already in use, making it appropriate for modern services and more challenging jobs. Integrating auxiliary Technology is easier. The power, protection, and interface modules were included in the modular architecture specifically for the current collaborative assembly method, which allows people and robots to work together in the same room without being physically separated. Numerous other fields, particularly those

involving robotics, have potential uses. The next phases of this project will concentrate on combining distinct RPA approaches as well as practical implementations for various businesses, among others. Formerly anti-robot businesses, including the banking sector, may soon include human-robot cooperation to increase productivity, save resources and electricity, and enhance operator working conditions. Robots will have a significant impact on the industrial sector both now and in the future.

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# A Review of the Indian state of Rajasthan's Handicraft Sector

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## Abstract

*Crafts are extremely important. They are symbols of people's culture and traditions. It promotes a country's heritage by utilising indigenous materials. It preserves traditional knowledge and talents and is given out daily. It employs a large number of artisans in rural and semi-urban areas and generates significant foreign exchange for the country while preserving its cultural heritage. There are several issues that must be addressed in order to achieve development. As a result, alternative solutions to these problems are required. The development of small-scale industries is one option. The focus of this study is the possibility of the handicraft industry as a small-scale industry as a solution to current development problems including the creation of globally competitive handicrafts and provision of sustainable livelihood opportunities to the artisans through innovative product designs, better product quality & use of technology while preserving traditional art. Therefore, the current development of the traditional handicraft industry requires both external heritage protection by the government and the internal transformation and innovation of the industry.*

**Keywords**: Artisans of Rajasthan, Craft culture, Handicraft Industries.

## Introduction

Rajasthan conjures images of royal heritage, ancient forts, remarkable architecture, patriotic and romantic stories, and the Great Indian Desert in the minds of people. However, there is another side of Rajasthan which is known for its lively culture and remarkable handicraft. Every city of Rajasthan offers its unique set of attractions.

Rajasthan is the source of beautiful, colourful handicrafts that fit all tastes and preferences. The region is the source of timeless, traditional handicrafts that are bound to enthral tourists. The colours, themes, and craftsmanship of Rajasthani handicraft are unparalleled. In India and across the globe, a unique position was formed.

Handmade things are still created by hand with the aid of tiny instruments even in today's technologically advanced and mechanical age. Products that are handcrafted have distinct looks and one-of-a-kind designs that are not possible for products that are manufactured. The unique and ingenious artistic talents encouraged by royal patronage made the realm of kings well-known around the world. Some of the desires in the states are:-

**Crafts are:** Pottery, Metal Work, Handicraft of Rajasthan, Tie and Die, Block Printing, Dabu Printing, Furniture, Stone carving, Ajarak Printing, KOfatgiri, Damascus, Embroidery, Quilts, Kagzi pottery, Pokharan pottery,

Jaisalmer stone Work, Carpets, Durrie, Theva, Miniature Painting, Patwa Craft, Danka Art, and many more. {33}

• **Handicrafts made of fabric:** Hand-printed textiles including block and screen printing, batik, kalamkari (hand printing by pen), and bandhani (tie and die) are used to create products like sheets, bedcovers, apparel, furniture, and tapestries. Another nation that makes the well-known embroidered silk and cotton clothing that is typically embellished with mirrors, shells, beads, and metallic accents is India. You may embroider on leather, felt, velvet, and other fabrics. This area of the industry employs up to 500,000 people in addition to the sizeable number of designers, block makers, weavers, and packers involved in the trade.

• **Terracotta, Jewellery and Metal Artifacts:** There are many different patterns, compositions, and types of shimmering decorations. These decorations, which are made of precious metals, base metals, and precious and semi-precious stones, come in both classic and contemporary designs. Metals such as brass, copper, bronze, and bell are used in a variety of products and finishes.

• **Woodwork:** In India, using wooden tools chiselling might be exceedingly simple or extremely finely crafted. The artistry and uniqueness of the craftsman can be seen in toys, furniture, ornamental items, etc. India is particularly well-known for its lacquered wood products.

• **Stone-craft:** The intricately carved stoneware composed of marble, alabaster, soapstone, sandstone, etc. and inlaid with semiprecious stones carries on the legacy of Indian stone crafts.

**Learning Outcome**

Jaipur is the base of culture and crafted in Rajasthan State. The golden sheen of brass makes it valuable, metal sheet or casted & a range of imaginations of invention are taken care by skilled craftsmen. The metal artwork, metal caste, casting pieces, while the sheet metal workers and engravers have their own workshops. Typically, the complete fabrication and embellishment process takes 3-4 weeks. *Kalamkari,* the Urdu word for enhancing the sheets & pen work, is created by deliberate *thapi* (mallet) strokes on finely pointed chisels. In the deficiency of a request for a new design, the artisan engraves from memory. Both shallow engraving, known as *Naqqashi* or *sada kalam*, deep engraving, known as khudai or sia kalam, is used. In *khudai* work, the pursue depressions are filled in with coloured lac, and the motifs are *marori* and detailed. After being heated, on the metal, lac sticks would be used. Against the transparent lac that is tinted like a gem, the design shimmers in golden tracery. Sometimes *naqqashi* is performed on a surface made of tin. Most traditional designs feature floral arabesques. However, because household things are scrubbed with dirt or ash after usage, ornamentation is restricted to dowry and decorative items. *Paandaan*, a classic item manufactured by a special mention should be made of casting heavy-gauge sheet metal made of copper or brass.

Traditional kitchen apparatus (Containers, Spoons, Plates, etc) every bride's dowry includes items created by manually cold forging sheet brass and dye-pressing the metal. Water collection and storage pots are an extremely essential resource in this area since water should be carried over great distances. At a second workshop in Jaipur, skilled artisans manually slice circular brass ingots into rounds and die-press the sheets into hemispheres before casting them in sand. In a third workshop, the hemispheres are physically shaped with heavy

mallets over a period of time. The mouth is beaded, the joints are gas welded, and the neck is welded. The goods are hand-polished using mud, tamarind, and sandpaper in a rigorous manner. The sheet metal is then manually pounded against the walls with polished hammerheads. The artisans' extensive hammering practise is evident in the glossy indentations that were made with flawless alignment and symmetry. Using my free hand, I struck each one of them precisely and quickly.

The primary purpose of the study is to pinpoint the challenges that the handicraft industry encounters so that it can be partially incorporated into the development process as a partial solution to the current development problem. This study focused on five handicrafts. Wood-based industries include mark making and woodcarving, whereas textile-based industries like handloom, lace, and batik study nature, problems, and challenges. The nature of handicraft industries is studied, as well as the raw materials and tools and equipment used the nature of labour, how it is financed and marketed, and the social and economic nature of the craftsmen. Addressing these challenges will require a multi-pronged approach. Here are some potential strategies:

**1. Access to raw materials:** Governments can help by establishing raw material banks or facilitating better supply chain networks. Partnerships with local agricultural or forestry operations could be a sustainable source of materials.

**2. Labour attraction**: Increase recognition and appreciation of craft skills through promotional campaigns, education and showcasing opportunities. Improved income prospects and working conditions can also attract younger artisans.

**3. Technology and finance problems:** Grants, low-interest loans or subsidies could help artisans

afford new technology. Training programs can help them learn to use it effectively. Local, national or international craft associations could also help share knowledge and resources.

**4. Marketing problems:** Use of digital marketing and online marketplaces can expand the reach of individual artisans or cooperative groups. Collaboration with tourism boards can help tap into the tourist market. Branding strategies that highlight the unique cultural value and craftsmanship of the products can help them stand out in the market.

**5. Skill transmission:** Establishing craft training programs or mentorship arrangements can ensure that valuable craft skills are passed on to younger generations.

**6. Recognition of handicrafts**: Promoting the cultural significance of handicrafts, both domestically and internationally, can increase their social recognition. This could involve government campaigns, inclusion in school curricula, or events like craft festivals.

**7. Urban-rural divide**: Policies that encourage or incentivize urban craft businesses to form partnerships with rural artisans could help bridge this divide, providing urban markets for rural products and rural employment opportunities.

**8. Government intervention:** Government policies can help address many of the above issues, but it's also important for governments to engage in dialogue with artisans to ensure that their policies are actually addressing the artisans' needs.

**9. Expansion of tourist industry:** As you noted, the expansion of the tourist industry can help boost demand for handicraft products. However, it's also important to ensure that this doesn't lead to the commoditisation and loss of cultural authenticity of these crafts.

Remember, these are just suggestions and potential strategies. Actual strategies should be developed based on thorough research and consultation with the artisans themselves, to ensure that their needs and perspectives are being fully considered.

## CLIMATE AND CULTURAL INFLUENCES

Digital technologies enable larger production sizes while maintaining "local" production, which benefits producers' businesses. Localized craft production models are also being supported by Digital printing, cutting, and finishing services are part of newly economical digital fabrication technologies. Additionally, these technologies are assisting in giving craft techniques new relevancy among a wider range of craft consumers. Think about it, producers can now offer customization possibilities, and some are leveraging these technologies to collaborate on the design of unique craft items.

## REASON FOR THE DIFFICULTIES ARTISANS ARE FACED

The conditions in which rural craftsmen are situated are largely to blame for the issues they encounter. In their community, the value of these craftsmen' handmade goods is dwindling. Due to intense competition from highly developed and affordable commercial alternatives, the quality of these handmade goods is steadily declining. The following list includes the main reasons for their failure. [17]

### 1. Lack of resources and difficulty to obtain bank debt

Due to their unstable financial condition, the craftsmen must rely on money lenders to cover their expenses. These lenders impose high interest rates on the loans they grant to the artisans, and frequently, if the latter are unable to repay the principal or interest, they purchase their handiwork for a very cheap price that is far below market value. Because these artisans only have a small amount of money to spend, they are unable to purchase large amounts of a raw material, which drives up manufacturing costs and reduces the number of lucrative sales.

Although the government has acknowledged debt and finance at preferential charge for procure of equipment and toolkits, they are unable to obtain them due to the extensive procedures upheld by government-owned banks. The main problem for artists is that they have inadequate funds and cash flow. These craftsmen are still in the making for immediately forward and appropriate financial reward that will enable them to maintain their livelihood and trade.

Financial difficulties and lack of access to loans is a common issue in the handicraft sector. Most artisans are small-scale operators who lack the collateral, credit history, or formal business registration that banks typically require for loans. The irregular income, seasonal nature of some crafts, and volatile markets also pose risks that many banks are unwilling to take on. Here are a few potential solutions to these challenges:

1. Microfinance Institutions:

2. Cooperative Societies or Artisan Groups:

3. Government Loan Programs:

4. Non-Governmental Organizations (NGOs):

5. Crowd funding or Peer-to-Peer Lending:

6. Financial Literacy Training:

7. Artisan Credit Cards

While these solutions can help, it's important to acknowledge that financial barriers are just one of many challenges facing the handicraft sector. A holistic approach that addresses other issues such as market access, skill development, and cultural preservation will also be necessary to support the sustainable growth of this sector.

### 2. Illiteracy of Artisans

Maintaining a catalogue, obtaining access to federal programmes, and negotiates with dealers and middlemen when one lacks information. The majority of rural artisans are uneducated and illiterate. According to a 2003 World Bank research titled Handmade in India: Preliminary Analysis of Crafts Producers and Craft Production that was published in Economic and Political Weekly, 90% of female artists are completely uneducated. 50% of household heads of families that produce crafts are uneducated. Although many of them are given education for their new generation but still number is less.

### 3. Fighting with raw material

Craftsmen in rural areas frequently lack access to excellent-quality raw materials, which forces them to rely on intermediaries and business owners who charge outrageous prices for their items costs and occasionally of inferior quality. They are also forced to acquire inferior materials at greater prices due to their low purchasing power and inability to purchase large amounts of raw materials. The result is that these rural artisans are gradually entering the agriculture industry as employees.

### 4. Lack of Technological advancement and skill development

Having the necessary skills and funding to advance industrial technology are not resources that artisans routinely have. The vast widely held of craftspeople occupied in handcrafted and weaving industries employ inadequate and outmoded tools, technology, and equipment, which has an enormous impact on the output's quantity and quality.

### 5. Rural consumers are turning more towards industrial products.

As industrialization advances, demand for handicrafts and woven goods is drastically decreasing, in addition to the fact that produced goods with appealing packaging and aesthetics are more appealing to rural b to b. Due to globalisation and the availability of more variety, affordable, and accessible items, crafts face fierce competition in today's market. They are generally regarded as traditional, outdated, and unsuitable for modern tastes. The interaction between craftspeople and consumers drove the evolution of design in the majority of modern cultures; nevertheless, rural craftspeople lack knowledge of the socio-cultural background of the shopper and were unable to make goods that suited their needs and preferences.

### 6. Nonexistence of infrastructural amenities

As buyers of handcrafted goods become more urbanized, artisan's deficient a variety of infrastructure facilities like exchange information, storage space, packaging amenities, and shipping, farmers in urban areas are forced to rely on middlemen to market their products. Few options exist for these craftsmen to attract new clients through effective retail channels like department shops and shopping centres. Furthermore, craftsmen frequently struggle selling what owing to a lack of knowledge and training, they develop on a technical platform.

### 7. Absence of agglomeration

For achieving scale economies in transportation, storage, and retail, items from decentralised production units are combined. A large number of the bottlenecks in the current supply chain for crafts are caused by India's weak infrastructure and connectivity, making it challenging to aggregate products. Currently no methods in place that can economically combine wares from small producers, carry out quality checks, store goods that have passed muster in warehouses, and sell them to wholesalers and retailers in urban areas.

### 8. For artisans, near to the ground pay and sporadic employment are issues

A lack of funds, credit for loans, and other finance is a problem for the majority of persons working in handicrafts. Most tribal people in countries like India have chosen handicraft as their profession and are fully dependent on it for revenue. Compared to other professions like agriculture or other non-firm activities, even the highest compensation for craft artisans is low. When bad compensation and insufficient employment are combined, poverty among craft workers is likely to worsen. Making something for your own use versus making something for a market that sells it are completely different. The artisan needs cautious adaptability, efficient value control, and true estimate if they want to prosper and remain their set in this cutthroat, ever-changing market. Having the right combination of human, financial, physical, and social capital is therefore necessary for progress. In the past ten years, the government has introduced new initiatives for this population, although not everyone is eligible to participate. The Economic Review (2003–2004) also featured an analytical piece outlining problems with small-scale industries.

## OBJECTIVES OR ACKNOWLEDGEMENT

The pink city's handicraft industry represents its cultural legacy. Similar to some plant and animal species whose survival is in jeopardy, this sector has to be conserved, the continuation of traditional art and craft has been severely harmed by urbanisation and westernisation, and this is gradually changing the excellence of the wonderful traditional works produced by earlier generations of artisans, artists, and craftsmen. This segment is grappling with a be deficient in of credit, which is slowly robbing it of its distinctiveness. The obstacles that these small-scale enterprises countenance should be acknowledged, and appropriate steps should be made to help them advance, according to this study. The key goal of this SWOT analysis is to identify the issues that artists working in the construct sector are facing and look for solutions.

Purpose of the recent swot was to identify the issues and obstacles that handicraft workers in Jaipur, Rajasthan, encountered. Numerous studies have been done that show this industry has issues. According to our study, preserving one's livelihood and financial stability is difficult for those working in the handicraft industry because of the following reasons:

The craftspeople involved in the handicraft business compete in a throat-cutting manner. Globalization has given developing nations the chance to compete with developed nations and achieve headway in a few specific industries. Taking the export of handicrafts as an example, this generates foreign currency. On the other hand, it has also presented numerous issues and difficulties. Many of these needs cannot be disregarded by the manufacturers because of the impact that globalisation has had on consumer product preferences. When the pressures of globalisation hit home with firms who are highly averse to change in their established systems of operation, a number of problems come to the fore. Additionally, these new expectations often change along the elegance and uniqueness of handicrafts. Globalization is a significant factor affecting Rajasthan's handicraft development, according to Bhatnagar and Rai's study (2008–2009). According to Vaijayanti (2011), globalisation is making it tough for people to engage to contend in the market and meet demand from around the world.

The growth and popularity of the handicraft sector in Jaipur has led to a shortage of trained personnel. Young people in this industry have limited access to government programming due to their lack of education. In its subsequent reports from 2009, 2010, 2011, and 2006, AIACA analysed the underlying issues affecting the handicraft industry and came to the conclusion that a shortage of skilled workforce had a more detrimental impact on the handloom and hand-woven industries.

These people are adequately connected to the information channel due to their lack of education, so they aren't aware of latest advancement and techniques in their field. Due to inappropriate information channels and links, this group is uninformed of and unable to take advantage of the financial and easy loan plans the government has included for them in its most recent five-year plan. Due to the lack of comprehensive statistics reflecting their statistics, social status, and economic circumstances, both the federal and state governments have long overlooked the needs of craftspeople, according to the information that is now available. Skilled work receives minimal consideration in the implementation and evaluation of the programmes intended for artisans. Governments have made expanding the export market a top priority, investing 70% of their financial plan to crafts. It is used to create plans that would allow for handicraft export. A similar situation of additionally, government assistance for artisans has been emphasised. by Nathuramka (2005), Indian Design and Interiors (2005), the Indira Gandhi National Center for the Arts (2011), World Bank study (2003), among others.

Second age bracket or young artisans are losing interest in their careers due to the industry's lack of financial growth and deterioration. They've observed their parents struggle to find consumers and set fair prices for their items, which has inspired them to consider alternative trades. In their survey on Craft Economics and Impact Study, the Crafts Council of India (2011) also came to the conclusion that youth are losing interest in the profession of their fathers and that it is disappearing day by day. AIACA (2011) repeated the same conclusions from their previous analysis that young people in this community are selecting different careers rather than remaining in their current ones.

## OBSERVATION

Given results of recent study, it would be cooperative to improve the literacy rates of men who work in handicrafts and improve communication between the government and programmes recipients.

India's small-scale and handicraft industries contribute about 5% of the country's GDP. This sector has to be preserved because it is significant and historic. The following are the main issues facing the handcraft sector:

1. Small-scale industries have limited profitability since they must pay for raw materials on a daily basis. The owner has no further funds to invest in the growth of the sector.

2. As a result of the increasing production costs, there are fewer handicrafts available. If goods are created on a large scale to compete in the free market, the traditional feel of the handicrafts is lost.

3. The local employees and business owners in the tiny handicraft industry are taken advantage of by the middlemen and entire sellers, who keep the majority of the profits. Owners are discouraged and produce less, with inferior quality and volume when items are occasionally sold to wholesalers for cost.

4. It is challenging to establish a handicraft sector in rural areas due to a lack of road and rail network, raw material availability, and access to utilities like electricity and water.

5. Local rural artists and craftspeople receive their techniques and talents on or after their elders. The availability of technical guidance and additional training is therefore constrained.

6. Because most workers prefer to produce more things in fewer hours, the effects of urbanization, westernization, and the introduction of computerised technology have resulted in a decline in the quality of handicrafts.

## METHODOLOGY

Purpose of craft research is to establish craft as an important and thriving contemporary field that provides a vision for the future and for the sustainable advancement of human social, economic, and ecological challenges. Craft plays a crucial role in society thanks to its adaptability as a link between design and art.

Jaipur's traditional society of artisans and craftsmen is going from side to side an identity crisis. The Indian government is funding and implementing promotional programmes yet if they are to thrive, these small handcraft businesses also need assistance in other areas.

In the state of Rajasthan, there are several cultural variances, with a change occurring approximately every 100 km. Due to this characteristic, Rajasthan has the potential to develop a wide range of handicrafts, and as a result, Rajasthan has distinguished itself in the global handicraft sector. Rajasthan's handicraft sector is experiencing a variety of handicrafts that have become well-known & famous worldwide. In Rajasthan, this industry plays a significant role in creating employment possibilities both in urban and semi-urban areas as well as in rural ones.

## CONCLUSION

Even though efforts have been made, its effectiveness has been hampered by issues like poor enforcement of policy and a focus on a broad perspective. It becomes necessary to improve this workforce's skills after an assessment of the situation of Indian craftsmen today. This idea is backed up by current national plans. A lot of employment opportunities exist among this workforce, which makes up a sizable portion of the unorganised economy. The ancient society of artists and craftspeople in Jaipur might be experiencing an identity crisis. For these small-scale handicraft businesses, the Indian government provides funds and implements

promotional initiatives, but if they are to thrive, they also need assistance in other areas. Warriors and a regal legacy have always been a part of Rajasthan. Almost every king or queen who ruled over various regions of Rajasthan has helped to develop various arts and crafts. In the state of Rajasthan, there are several cultural variances, with a change occurring approximately every 100 km. Due to this characteristic, Rajasthan has the potential to develop a wide range of handicrafts, and as a result, Rajasthan has distinguished itself in the global handicraft sector. Rajasthan's handicraft sector is experiencing a variety of handicrafts that have become well-known & famous worldwide. In Rajasthan, this industry plays a significant role in creating employment possibilities both in urban and semi-urban areas as well as in rural ones. Increased interest in global items and the expansion of the worldwide market for home accessories have given Craft-person access to new markets. Indian industry, it's an important rural areas' primary source of income, has almost 6 million artisans working for it, many of them are women and people from underprivileged social groups. However, industry watchers believe that the growing number of small enterprises shifting to handicraft production won't likely decrease substantially in the next years. In order to support and promote the traditional sector, the present study includes a number of issues pertaining to the handicraft industry that can be resolved through a partnership between the Indian government and exporters of handicrafts.

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# Supervisory Rating of Selected Public and Private Sector Banks: A CAMEL Model Approach

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## Abstract

*A healthy banking system is necessary for any economy which is aiming to achieve growth and sustainability in the increasing business environment. The banking sector in India asserts itself as the backbone and has sustained various global meltdowns and economic crises and lately the situation of the pandemic. According to past research, Indian banking system has shown the healthiest progression compared to the banking industry worldwide despite many challenges. Achieving stability is not just the only goal for the banking system in India but making them immune to the external environment crisis, and odd situations while maintaining its operations smoothly and profitably is the primary goal. In this study, the key parameters for performance evaluation of the major four banks in India are -- capital adequacy, capability for management, earnings, and liquidity. The study uses information gathered from the State Bank of India, Punjab National Bank, HDFC, and ICICI Bank based on their annual report. These banks fall under public and private sector banks in India and are studied from 2017 to the year 2021 using the CAMEL model. The study of the data and analysis can help us to ascertain the problems that can be encountered in the path of sustainability and stability for a longer period.*

**Keywords:** Public sector banks, CAMEL, Performance analysis, Capital adequacy, Liquidity.

## Introduction

The banking sector plays a vital role in the development of an economy, especially in India. Due to economic liberalization and financial sector reforms in the country, the banking sector was reformed and has served as a lifeline for the economy. Since the beginning of the year 1991, there have been several changes in the rules and regulation scope and variety, and level of activity in the Indian banking system. One of the many changes includes permission to banks to raise capital from the market to meet their capital adequacy norms as well as the Issuance of guidelines to reduce NPA by tightening the norms while also providing flexibility in project loans to infrastructure and core industry projects. While in the past there have been instances of rising

NPAs and irregular returns, the present study aims at analysing this sustainable model of the top four commercial banks of India.

## Camel Model for financial analysis

To ascertain the financial soundness of the top four banks in India, the CAMEL rating parameter which is internationally accepted was used. It is an acronym for five parameters namely capital adequacy, asset quality management soundness, earnings, and liquidity. It is a subjective model capable of indicating the financial strength of a bank. Each part of the CAMEL model studies the ratios and holds significance to produce the evaluation criteria for the outcome. Capital adequacy studies three major ratios namely, CRAR, Debt/Equity Ratio, and coverage ratio. Asset quality studies net NPA/net advances ratio, government security/investment ratio, and standard advances/total advances ratio. management quality under the CAMEL model studies totals advances/total deposit ratio,

business per employee, and profit per employee ratio. Earning ability deals with return on asset ratio, income spread/total asset ratio, operating profit/total assets ratio, and cost-income ratio. The last parameter under the CAMEL model is liquidity with studies cash asset to total asset ratio, government security to total asset ratio, and liquid asset total deposit ratio.

The banks were judged on five different components under the acronym C*A*M*E*L:

**Table:1**

| C | Capital Adequacy | <ul><li>Capital Adequacy Ratio (CAR)</li><li>Total Debts to Owner's Fund Ratio</li><li>Advance to Total Asset Ratio</li></ul> |
|---|---|---|
| **A** | Asset Quality | <ul><li>Total Investment / Total Assets Ratio</li><li>Net NPA / Net Advance Ratio</li><li>Govt. Securities / Investment Ratio</li><li>Gross NPAs / Total Assets</li><li>Gross NPA / Gross Advance Ratio</li></ul> |
| **M** | Management Soundness | <ul><li>Total Advances / Total Deposits</li><li>Profit Per Employee Ratio</li><li>Business Per Employee Ratio</li></ul> |

| E | Earnings Capacity | ● The ratio of non-interest income / Total assets<br>● (ROE) Return on Equity<br>● (ROA) Return on Assets Ratio<br>● Interest Income / Total Assets Ratio<br>● Net Interest Margin (NIM) / Total Assets Ratio |
|---|---|---|
| L | Liquidity | ● Liquid Asset / Total Assets Ratio<br>● Liquid Asset / Total Deposit Ratio<br>● Government Security / Total Assets Ratio |

**Source: Author's Compilation**

## Review of Literature

The review of the literature published and researched in the past provides an underlying base for capitalizing and a better understanding of the application of the model, especially in the aspect of the Indian banking system. Some of the relevant literature published in the past helps to identify the gaps in the analysis used for the major four banks in India. The findings and suggestions to fill these gaps will be mentioned towards the end of the paper.

- **Prabhjot Kaur (2015)** did a study on the performance of Indian private banks and public sector banks for five years using the parameters of the CAMEL model, as well as regression analysis. It was done to analyse the factors which contributed to 96% variance in return on assets of the banks. **Majumdar (2016)** conducted a detailed study of the financial results of 15 banks in Bangladesh using the CAMEL model as well as average and Anova composite ranking, and the results had major differences that needed to be rectified. **Aswini Kumar Mishra, et etc. (2013)** did an analysis of the effectiveness and accuracy of 12 key banking companies operating in the public and private sectors

on the data spread over 12 years using the CAMEL model. The financial strength of banks was analysed using the financial ratios of the CAMEL model. It was found that private sector banks were more competitive in comparison to government banks. **Erol (2014)** conducted a comparative analysis between Muslim banks and traditional banks in Turkey that revealed that Islamic banks had better management and higher profits in terms of overall profitability and asset management and were also less sensitive to market risks. **Anita Makkar (2013)** did a study on the financial performance of private sector banks and public sector banks in India. It revealed that the performance gap was not very large, but the government banks had to improve their ratios to maintain competitiveness. **Sushendra Kumar Misra (2013)** by using the CAMEL model assessed the performance and financial dependability of the State Bank group and concluded that the quality and adequacy of ratios had to be improved.

### Objectives

- ❖ To analyse the trends of CAMEL model indicators for selected Indian public and Private sector banks during 2017-2021
- ❖ To compare overall ranking of selected banks based on CAMEL parameters.

### Rational of the study

Any nation's economic development is largely determined by the expansion of its banking sector. The CAMEL analysis is a ratio-based approach that assesses a bank's performance based on factors such as capital adequacy, asset quality, managerial effectiveness, earning potential, and liquidity risk (Kumar, 2017). In India, the Reserve Bank of India (RBI) has the authority to assess the risk taken by banks. The RBI ranks each bank according to the CAMELS grading system, giving each one a grade between one and five. As far as each factor is concerned, a rating of one is the best and a rating of five is the worst.

### Data Analysis and interpretation

Ratio analysis for the selected public sector banks has been applied as a statistical technique

### Research design

**Research Approach**: - The research analysis is focused on deductive analysis from the five-year data of the selected banks.

**Research Strategy:** - With a descriptive research design, strategies of quantitative research are applied based on the hypotheses of the study.

### Sampling

The current study is based on judgmental and purposive sampling. The selected banks for the study are based on characteristics of high asset parameter value from the year 2017 to 2021. Two public sector banks are also included based on the asset value parameter.

| S. No. | Public Sector Banks |
|--------|---------------------|
| 1 | SBI-State Bank of India |
| 2 | PNB-Punjab National Bank |
| | **Private Sector Banks** |
| 4 | HDFC Bank |
| 5 | ICICI Bank |

and a comparative investigation has been done and presented in the below section.

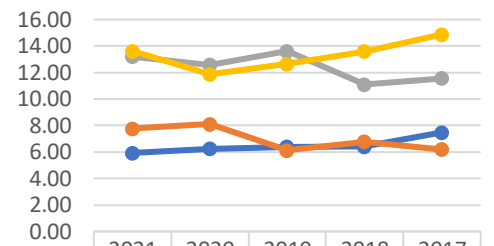- ❖ **Trend of selected ratios of CAMEL model of selected banks for the period of 2017-21:**

| Graph :1 | Graph :2 |
|----------|----------|
| **Capital Adequacy Ratio (CAR)** | **Debt/Equity Ratio** |

### Capital adequacy ratio
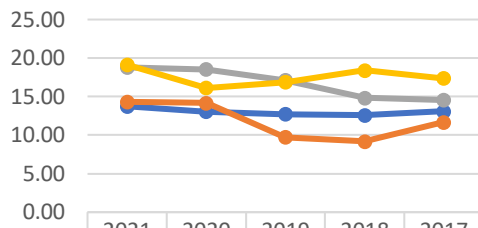
| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 13.74 | 13.06 | 12.72 | 12.60 | 13.11 |
| PNB | 14.32 | 14.15 | 9.73 | 9.20 | 11.66 |
| HDFC BANK LTD. | 18.79 | 18.52 | 17.11 | 14.82 | 14.55 |
| ICICI BANK LIMITED | 19.12 | 16.11 | 16.89 | 18.42 | 17.39 |

### Debt/Equity Ratio

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 5.93 | 6.24 | 6.38 | 6.41 | 7.48 |
| PNB | 7.77 | 8.12 | 6.13 | 6.77 | 6.21 |
| HDFC BANK LTD. | 13.20 | 12.58 | 13.62 | 11.10 | 11.55 |
| ICICI BANK LIMITED | 13.62 | 11.87 | 12.66 | 13.59 | 14.88 |

| | **Graph :3** | | **Graph :4** | |
|---|---|---|---|---|
| | **Advance to Assets Ratio** | | **Net NPA To Net advances Ratio** | |

### Advance To Assets Ratio

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 23.27 | 20.33 | 20.70 | 72.28 | 76.83 |
| PNB | 27.27 | 24.51 | 20.81 | 71.49 | 67.47 |
| HDFC BANK LTD. | 20.10 | 21.11 | 19.46 | 83.46 | 86.16 |
| ICICI BANK LIMITED | 17.36 | 17.15 | 15.34 | 91.34 | 94.73 |
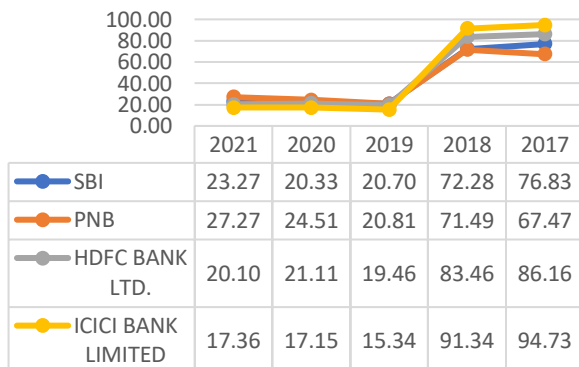
### Ratio of net NPA To net advances
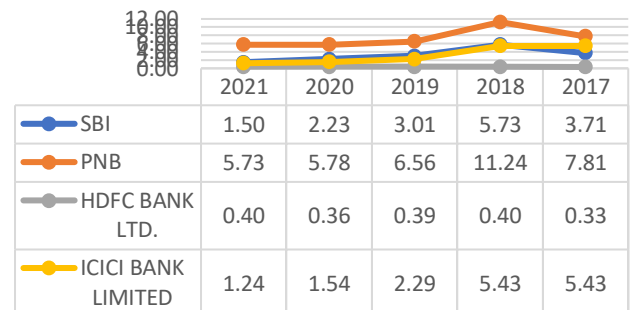
| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 1.50 | 2.23 | 3.01 | 5.73 | 3.71 |
| PNB | 5.73 | 5.78 | 6.56 | 11.24 | 7.81 |
| HDFC BANK LTD. | 0.40 | 0.36 | 0.39 | 0.40 | 0.33 |
| ICICI BANK LIMITED | 1.24 | 1.54 | 2.29 | 5.43 | 5.43 |

| | **Graph :5** | | **Graph :6** | |
|---|---|---|---|---|
| | **Govt. Securities to Investment Ratio** | | **Govt. Securities to Total Assets ratio** | |
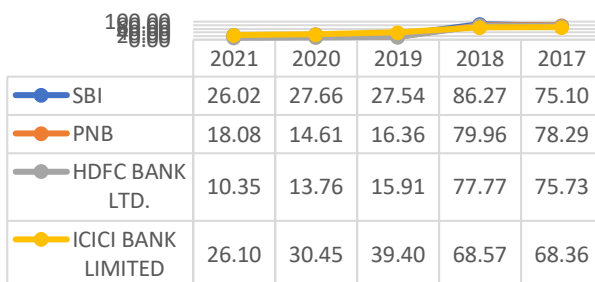
### Govt Securities to Investment Ratio

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 26.02 | 27.66 | 27.54 | 86.27 | 75.10 |
| PNB | 18.08 | 14.61 | 16.36 | 79.96 | 78.29 |
| HDFC BANK LTD. | 10.35 | 13.76 | 15.91 | 77.77 | 75.73 |
| ICICI BANK LIMITED | 26.10 | 30.45 | 39.40 | 68.57 | 68.36 |

### Govt Securities toTotal Assest
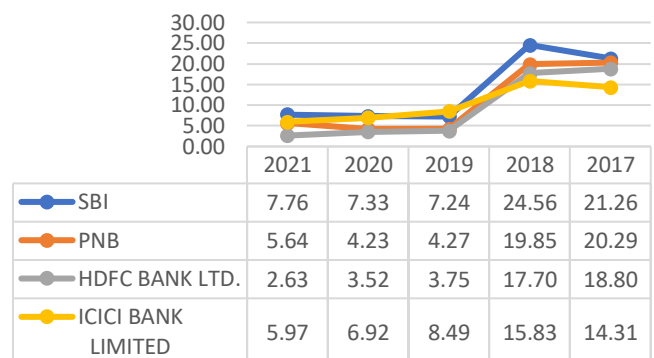
| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 7.76 | 7.33 | 7.24 | 24.56 | 21.26 |
| PNB | 5.64 | 4.23 | 4.27 | 19.85 | 20.29 |
| HDFC BANK LTD. | 2.63 | 3.52 | 3.75 | 17.70 | 18.80 |
| ICICI BANK LIMITED | 5.97 | 6.92 | 8.49 | 15.83 | 14.31 |

| | **Graph :7** | | **Graph :8** | |
|---|---|---|---|---|
| | **Total Investments to Total Assets Ratio** | | **Gross NPAs to Total Assets Ratio** | |

### Total Investments To Total Assets

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 29.81 | 26.50 | 26.27 | 22.66 | 28.31 |
| PNB | 31.17 | 28.95 | 26.08 | 30.71 | 25.92 |
| HDFC BANK LTD. | 25.40 | 25.60 | 23.55 | 22.76 | 24.83 |
| ICICI BANK LIMITED | 22.86 | 22.72 | 21.54 | 23.09 | 20.93 |

### Gross NPAs to Total Assets
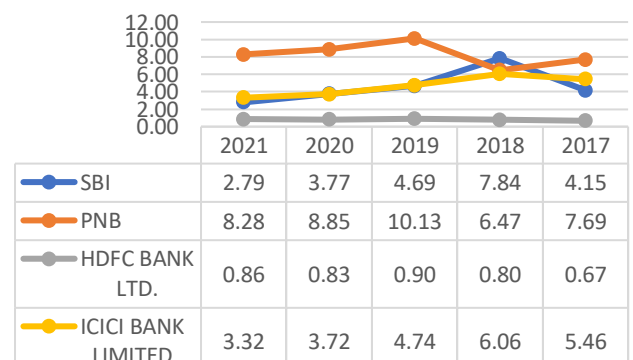
| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 2.79 | 3.77 | 4.69 | 7.84 | 4.15 |
| PNB | 8.28 | 8.85 | 10.13 | 6.47 | 7.69 |
| HDFC BANK LTD. | 0.86 | 0.83 | 0.90 | 0.80 | 0.67 |
| ICICI BANK LIMITED | 3.32 | 3.72 | 4.74 | 6.06 | 5.46 |

| | **Graph :8** | | **Graph :10** | |
|---|---|---|---|---|
| | **Gross NPAs to Gross Advances Ratio** | | **Business per employee** | |

## Gross NPAs to Gross Advances Ratio (%)

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 5.160 | 6.412 | 7.903 | 12.26 | 6.90 |
| PNB | 15.488 | 15.573 | 17.124 | 10.91 | 12.53 |
| HDFC BANK LTD. | 1.332 | 1.273 | 1.370 | 1.28 | 1.04 |
| ICICI BANK LIMITED | 5.566 | 6.327 | 7.786 | 9.90 | 8.74 |
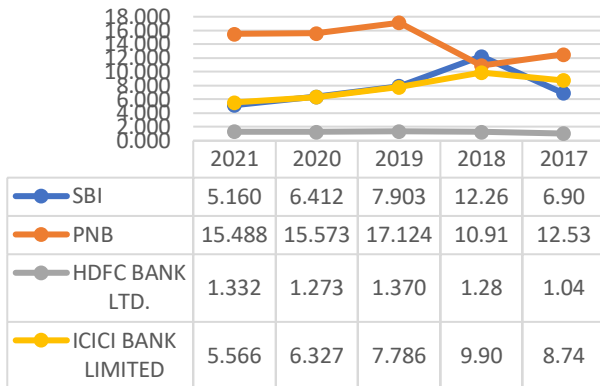
**Graph :11**

**Profit per employee**

## Business per employee (in Rupees Million)

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 237.3 | 210.5 | 187.7 | 167.00 | 162.40 |
| PNB | 188.5 | 181.4 | 168 | 147.40 | 141.70 |
| HDFC BANK LTD. | 193 | 174.9 | 168.7 | 150.80 | 123.60 |
| ICICI BANK LIMITED | 149.201 | 127.481 | 122.2 | 107.80 | 98.90 |
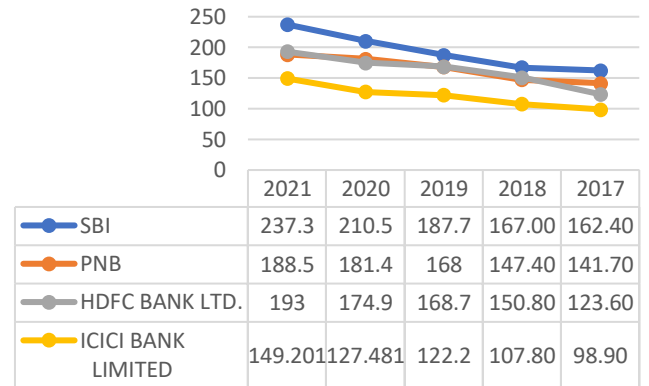
**Graph :12**

**Total Advances To Total Deposits ratio**

## Profit per employee (in Rupees Million)

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 8.28 | 5.79 | 0.33 | -0.24 | 0.51 |
| PNB | 2.00 | 1.00 | -15.00 | -1.70 | 0.20 |
| HDFC BANK LTD. | 26.00 | 24.00 | 23.00 | 2.00 | 1.60 |
| ICICI BANK LIMITED | 16.90 | 8.25 | 4.00 | 0.80 | 1.20 |
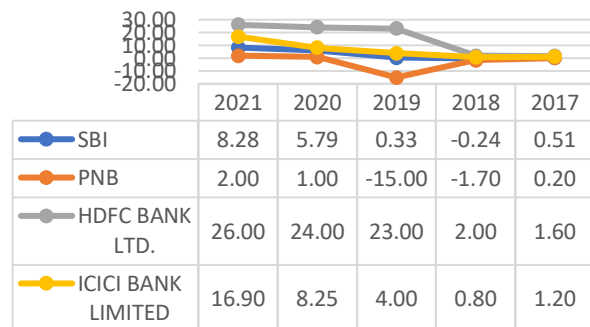
**Graph :13**

**Interest income to total assets ratio**

## Total Advances To Total Deposits

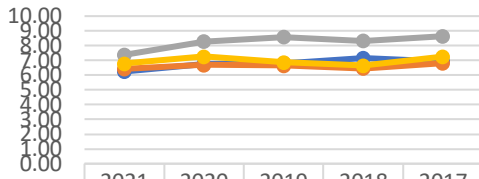| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 28.67 | 24.78 | 26.17 | 72.28 | 76.83 |
| PNB | 31.07 | 28.92 | 23.85 | 71.49 | 67.47 |
| HDFC BANK LTD. | 26.30 | 28.15 | 26.23 | 83.46 | 86.16 |
| ICICI BANK LIMITED | 30.36 | 23.41 | 25.63 | 91.34 | 94.73 |
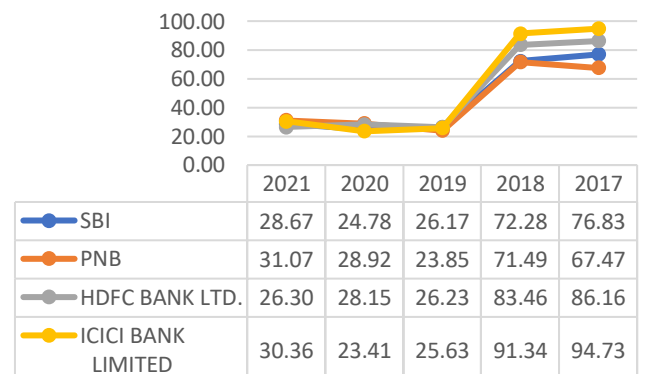
**Graph :14**

**Net Interest income to total assets ratio**

**Ratio of interest income to total assets**



| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 6.25 | 6.74 | 6.81 | 7.16 | 6.93 |
| PNB | 6.43 | 6.70 | 6.66 | 6.46 | 6.81 |
| HDFC BANK LTD. | 7.38 | 8.27 | 8.57 | 8.32 | 8.64 |
| ICICI BANK LIMITED | 6.79 | 7.25 | 6.88 | 6.66 | 7.26 |

**Graph :15**

**Non-Interest income to total assets ratio**

**Ratio of net interest income to total assets (Net Interest Margin)**
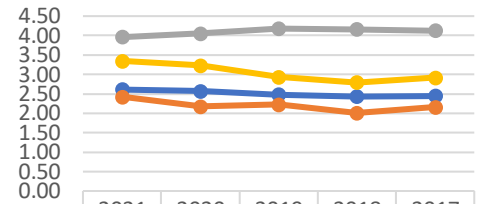


| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 2.61 | 2.57 | 2.48 | 2.43 | 2.44 |
| PNB | 2.43 | 2.17 | 2.23 | 2.01 | 2.16 |
| HDFC BANK LTD. | 3.96 | 4.05 | 4.18 | 4.16 | 4.13 |
| ICICI BANK LIMITED | 3.35 | 3.23 | 2.93 | 2.79 | 2.91 |

**Graph :16**

**Return on assets ratio**

**Ratio of non-interest income to total assets**
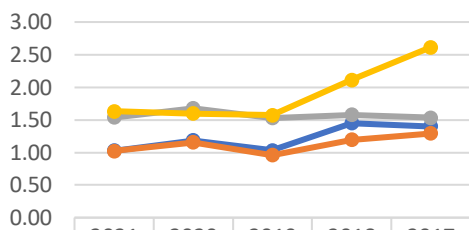


| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 1.03 | 1.19 | 1.03 | 1.45 | 1.40 |
| PNB | 1.02 | 1.16 | 0.96 | 1.20 | 1.29 |
| HDFC BANK LTD. | 1.54 | 1.68 | 1.53 | 1.58 | 1.53 |
| ICICI BANK LIMITED | 1.63 | 1.59 | 1.57 | 2.11 | 2.61 |

**Graph :17**

**Return on equity ratio**

**Return on assets**
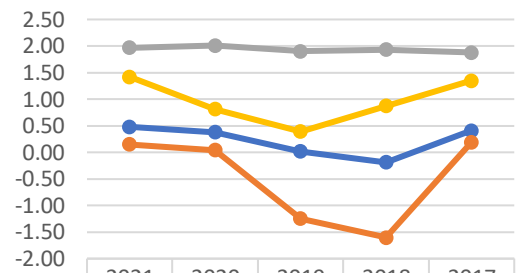


| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 0.48 | 0.38 | 0.02 | -0.19 | 0.41 |
| PNB | 0.15 | 0.04 | -1.25 | -1.60 | 0.19 |
| HDFC BANK LTD. | 1.97 | 2.01 | 1.90 | 1.93 | 1.88 |
| ICICI BANK LIMITED | 1.42 | 0.81 | 0.39 | 0.87 | 1.35 |

**Graph :18**

**Liquid Assets to Total Deposits ratio**

### Return on equity

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 8.40 | 6.40 | 0.39 | -3.21 | 6.31 |
| PNB | 2.29 | 0.63 | -23.24 | -29.54 | 3.30 |
| HDFC BANK LTD. | 16.61 | 16.40 | 16.50 | 17.87 | 17.95 |
| ICICI BANK LIMITED | 12.27 | 7.05 | 3.15 | 6.61 | 10.33 |

### Liquid Assets To Total Deposits

| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 9.32 | 7.75 | 7.64 | 7.09 | 8.41 |
| PNB | 10.06 | 10.80 | 11.14 | 14.86 | 14.21 |
| HDFC BANK LTD. | 8.95 | 7.55 | 8.81 | 15.58 | 7.61 |
| ICICI BANK LIMITED | 14.28 | 15.46 | 12.30 | 15.00 | 15.45 |
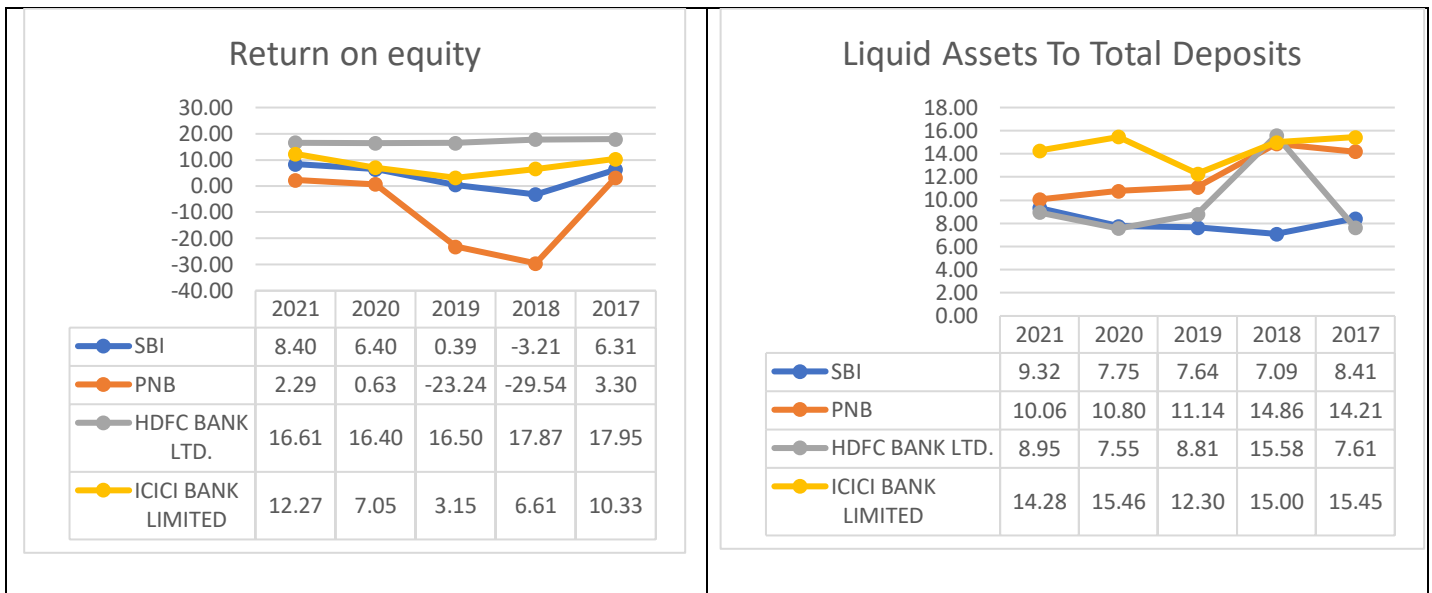
**Graph :19**

**Liquid Assets to Total Assets ratio**

### Liquid Assets To Total Assets



| | 2021 | 2020 | 2019 | 2018 | 2017 |
|---|---|---|---|---|---|
| SBI | 7.57 | 6.35 | 6.04 | 5.55 | 6.36 |
| PNB | 8.83 | 9.15 | 9.72 | 12.47 | 12.26 |
| HDFC BANK LTD. | 6.84 | 5.66 | 6.54 | 11.55 | 5.67 |
| ICICI BANK LIMITED | 10.82 | 10.85 | 8.33 | 9.57 | 9.81 |
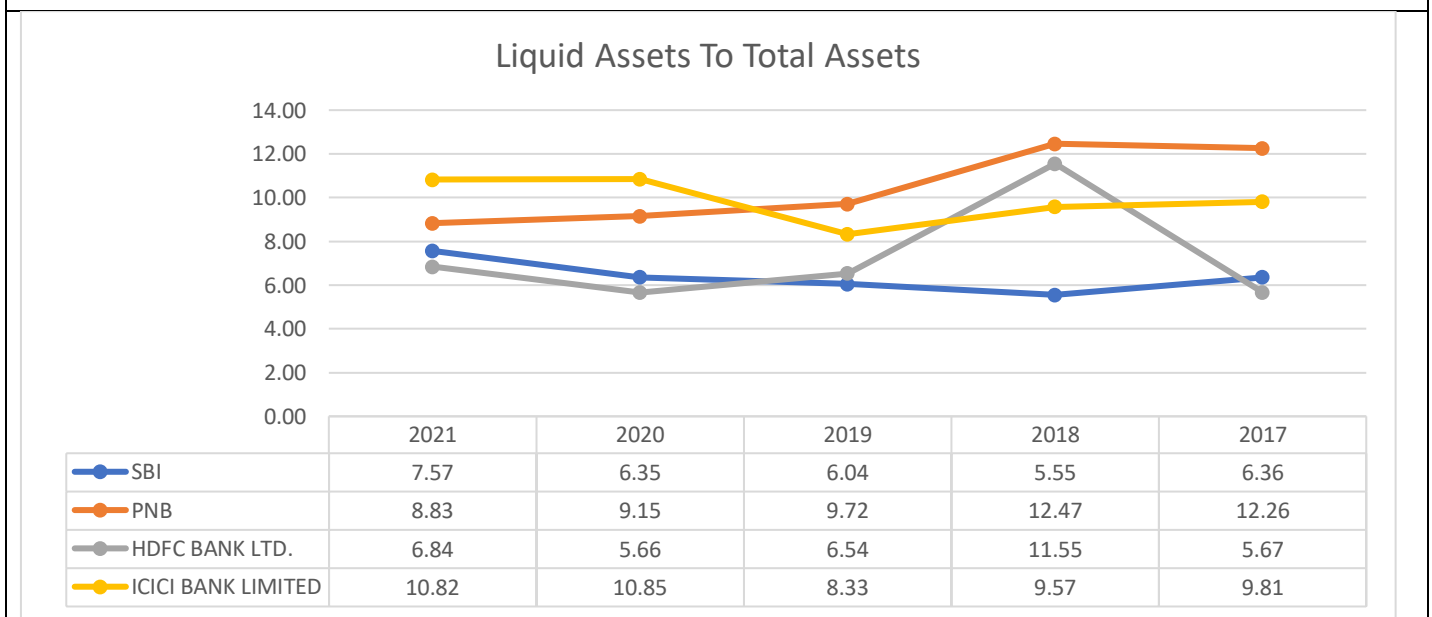
**Source: Author's Computation**

### Interpretation

Capital adequacy ratio for private sector banks i.e., ICICI Bank Limited and HDFC Bank limited maintained more than close to 15% adequacy in the year 2017 while public sector banks namely, PNB and SBI maintained a capital adequacy ratio of less than 15% in the year 2017. Collectively, all the banks maintained a capital adequacy ratio of more than 10% since the year 2017 while PNB had fallen below 10% capital adequacy ratio in the year 2018 as well as in the year 2019 but started to maintain and increase the capital adequacy ratio from 2019 to the year 2021 to close to 15%. All other banks consistently maintained a capital adequacy ratio of more than 15% while

private sector banks in the study increased to almost 20% in the year 2021.

From the chart, it is visible that public sector banks under the study maintained a debt-equity ratio of less than 10% from the year 2017 to 2021 while private sector banks under the study maintained a higher debt-equity ratio of above 10% and ICICI Bank almost maintain the 15% debt-equity ratio in the year 2017.

All four banks under study maintained a high advance-to-assets ratio in the year 2017 with ICICI Bank maintaining the highest ratio of more than 90% and HDFC Bank maintaining the ratio of more than 80% while SBI and PNB banks keeping it above 60% but less than 80% as advance to assets ratio in the year 2017 and 2018. This trend took a steep fall in the year 2019 and all the banks collectively changed their advance to asset ratio to lower levels of almost 20% and have maintained it ever since above 20% but have kept it less than 30%.

The study of five years for the banks in the study reveals that HDFC Bank maintained a consistent ratio of NPA to net advances from the year 2017 to the year 2021 close to 0%, while ICICI Bank maintained 5% NPA to net advances ratio in the year 2017. ICICI Bank has seen a consistent decline since then with its ratio going below 3% in 2021. PNB had the highest ratio understudy in the year 2017 of more than 6% which rose further and crossed almost 11% in the year 2018. Its ratio has seen a decline since then, but it is still more than 5%. SBI bank maintained this ratio of less than 5% in the year 2017 but saw an increase in the year 2018 but has bought it down to 10 and maintained it at almost 3% in the year 2021.

The ratio of government securities to investment was maintained at a high percentage of more than 65% and less than 80% in 2017 but SBI bank increased this value to more than 80% in the year 2018 while all other banks maintained it to almost 80% or less consistently. After the year 2018, all the banks started to maintain low government security-to-investment ratio and brought it down in the year 2019 where HDFC Bank had the steepest decline of less than 20% along with PNB to the same level. In the year 2021, all four banks managed to keep it between 10% and 30% where the highest (30%) was maintained by ICICI Bank and SBI Bank. PNB was able to take it to 20% while HDFC Bank recorded the lowest government securities to investment ratio of almost 10%.

Government securities to total asset ratio was maintained at high levels by the selected banks in the year 2017. ICICI Bank maintained the lowest ratio of less than 15% and HDFC Bank maintained a ratio to less than 20%. Public sector banks maintained it to 20% or more but less than 25% in the year 2017. SBI increased this level to almost 25% in the year 2018 but all four banks bought this ratio steeply down in the year 2019 and kept it below 10% while PNB and HDFC maintained it even below 5%. In the year 2021, all four banks maintained a ratio below 10% while HDFC Bank registered the lowest ratio of 3% and SBI kept it at the highest of close to 8%.

Total Investment to total asset ratio maintained in the year 2017 by all four banks was more than 20% and less than 30% but PNB increased this ratio to more than 30%. In the year 2018,

while all other banks kept it below 25%, ICICI Bank was the only bank that maintained it below 25% consistently since the year 2018 after increasing it while all other banks have increased this ratio to more than 25% gradually from 2018. PNB maintained the highest, more than 30% ratio followed by SBI Bank, close to 30% ratio in the year 2021.

Gross NPAs to total asset ratio for the banks showed irregularity in maintaining the ratio, while HDFC Bank consistently kept it low to almost 1% or below from 2017 to 2021. SBI had a ratio of almost 4% in the year 2017 and increased it to almost 8% in 2018 and then bought it down gradually to almost 3% in the year 2021. ICICI Bank maintained the ratio to almost 6% in the year 2017 and witnessed a slight increase in 2018. Its ratio has been declining since then with the year 2021 registering a ratio of 4%. PNB maintained a gross NPA to total asset ratio of almost 8% in 2017 and witnessed a recline in 2018 to just a little above 6% but witnessed a steep increase to almost 10% in the year 2019 and then gradually brought it down to a little above 8% in 2021.

The ratio of gross NPAs for the period from 2017 to 2021 reveals that HDFC Bank has been consistently keeping the ratio below 1% for the entire duration of the study while SBI saw irregularity in maintaining it at above 5% ratio in 2017 and saw a further increase to almost 12% in the year 2018 but has brought it down gradually and maintained it at about 5% in the year 2021 along with ICICI Bank at the same level. PNB maintained the ratio to almost 13% in the year 2017 but saw a little decline in the

year 2018 to just above 10% and maintained this ratio to more than 15% since that year. PNB had the highest gross NPAs to gross advances ratio in 2021.

The business ratio per employee has consistently increased between 2017 and 2021 for all four banks. While ICICI Bank maintained this ratio of 200 in the year 2017 and maintained a 2 level 150 in the year 2021, the highest increase in the ratio of business per employee is showcased by SBI since the year 2017 as it already had more than 150 per cent ratio in 2017 and increased it to almost 250 level in 2021 while HDFC Bank and PNB kept this ratio below 200 level in 2021.

Profit per employee for all four banks since the year 2017 to 2021 has been close to 0% from the beginning of the study as well as in 2018 while PNB was the only bank that witnessed a negative profit per employee ratio in the year 2019. All other banks kept their ratio a little above 0%. HDFC Bank showed a steep increase in profit per employee from 2018 and maintained it above 30% in the year 2021. ICICI Bank also increased the ratio of profit per employee and kept it to more than 20% in the year 2021 while SBI improved the ratio of profit per employee and kept it a little close to 10% in the year 2021.

The ratio of total advances to total deposits in the year 2017 was above 60% for all the banks where ICICI Bank had the highest ratio of almost 100% followed by HDFC Bank and SBI. the same ratio was consistently maintained in 2018 but all four banks showed a steep decline in the year 2019 and brought it down to a little

above 20%. ICICI Bank maintained it between 25% to 35% in the year 2021.

The ratio of interest income to total assets for all four banks from the year 2017 to the year 2021 has been consistent in maintaining it under 10% and a little above 5% for the entire duration. HDFC Bank has consistently maintained this ratio of interest income to total assets significantly higher than all three banks for the entire duration.

The ratio of net interest income to total assets for all four banks and a study has been between 2% to 4% for the entire duration of the study of the year 2017 to the year 2021 while HDFC Bank has kept it a little above 4% consistently for the entire duration of the study and ICICI Bank has maintained it almost close to 3% but increased it gradually to almost 4% in the year 2021. The only bank that maintained it below 2% in the year 2018 was PNB but it got its value back to a little above 2% along with SBI in the year 2021.

The ratio of non-interest income to total assets for three banks namely HDFC Bank, PNB and SBI has been a little above 1% and less than 2% for the entire duration of the study from the year 2017 to the year 2021. Only ICICI Bank had a ratio of non-interest income to total assets of more than 2.5% in the year 2017 but gradually bought it down to 1.5% approximately in the year 2019 and has kept it consistently at the same level. The public sector banks SBI and PNB maintained the ratio at almost 1% in 2021 while private sector banks kept this ratio to more than 1.5% in the same year.

Return on assets ratio has been irregular for SBI, PNB and ICICI since 2017 with only

HDFC Bank maintaining it consistently close to 2% for the entire duration of the study. PNB saw a decline since 2017 and fell almost below minus 1.5% in 2018 and almost -1% in 2019 and managed to increase the ratio to close to zero per cent in 2021. SBI also faced a little negative ratio maintenance in the year 2018 but has kept it to 0 or a little above zero since then. In the year 2019, even ICICI Bank witnessed a decline but did not go to a negative ratio. It has been consistent in maintaining it at above 1% ratio since then.

Return on equity ratio from 2017 to 2021 has been positive for four private sector banks throughout and the most consistent ratio was maintained by HDFC Bank of close to 20%. The public sector banks on the other hand saw a decline in the year 2018 with a test negative ratio for SBI but a drastic fall of more than 25% negative was witnessed with PNB in 2018. It tried to recover in the year 2019 and 2020 as well but was still negative. All the banks maintained a little positive ratio in the year 2021. The highest ratio maintained was by HDFC Bank at close to 18% and the lowest was by PNB.

The ratio of liquid assets to total deposits for the four banks through the chart reveals that only SBI bank has been able to maintain a consistent ratio of close to 7% throughout the five years of study, while the other public sector bank i.e., PNB maintained this ratio close to 15% in the year 2017 and 2018 but bought it down gradually to 10% in 2021. HDFC Bank maintained this ratio at about 7% in the year 2017 but witnessed a steep rise of more than 15% in the year 2018 and gradually bought it

down to less than 10% and is maintaining this level even in the year 2021. ICICI Bank has always kept its ratio above 15% and it came down to less than 13% only in 2019 but its ratio increased again to more than 15% and it was about 15% in 2021.

Liquid asset to total assets ratio for all four banks during the study reveals that SBI bank maintained a consistent ratio throughout of a little above 5% while ICICI Bank maintained its ratio to close to 10%. It had a little decline in 2019 but recovered and took it above 10%. On the other hand, PNP bank maintained a ratio of more than 12% in 2017 and 2018 but fell below 10% in successive years. HDFC Bank in the year 2017 maintained this ratio close to 5% and increased it to more than 13% in the year 2018. However, it decreased rapidly to below 5% in 2019. It has kept it close to 7% since then.

**Overall rank of selected public sector banks on the basis of CAMEL model**

The following table presents the overall rank of selected public sector banks on the basis of CAMEL model.

Table: 2

Overall Performance (Rank) of selected commercial Banks

| Bank Name | C | A | M | E | L | Average | Rank |
|---|---|---|---|---|---|---|---|
| **SBI** | 3 | 2 | 1 | 3 | 3 | 2.40 | 2 |
| **PNB** | 4 | 1 | 3 | 4 | 2 | 2.80 | 4 |
| HDFC BANK LTD. | 2 | 4 | 2 | 1 | 4 | 2.60 | 3 |
| ICICI BANK LIMITED | 1 | 3 | 4 | 2 | 1 | 2.20 | 1 |

**Source: Author's Compilation**

In the overall performance under CAMEL parameters of selected commercial banks covered in this study, ICICI Bank Ltd ranked number one followed by SBI, HDFC and PNB bank respectively. In the parameter of capital adequacy also, ICICI Bank ranked number one and PNB ranked number four while on the parameter of asset quality, PNB ranked number one and HDFC ranked number four. On the parameter of management efficiency, SBI ranked number one and ICICI Bank ranked number four. On the parameter of Earnings Quality, HDFC Bank ranked number one and PNB ranked number four. The last parameter under the camel model, liquidity ICICI bank ranked number one and HDFC bank ranked number four. So, it can be concluded that during the study ICICI Bank ranked as the strongest bank on the parameters of the CAMEL model.

**Results of Hypothesis Testing**

H0: There is no significant difference in the overall performance of selected commercial banks for CAMEL parameters.

Ha: There is significant difference in the overall performance of selected commercial banks in CAMEL parameters.

| Table: 3 | | | | |
|---|---|---|---|---|
| ANOVA: Two-Factor Without Replication | | | | |
| *SUMMARY* | *Count* | *Sum* | *Average* | *Variance* |
| SBI | 5 | 131.6855 | 26.33709 | 969.1443 |
| PNB | 5 | 120.6842 | 24.13685 | 700.2104 |
| HDFC BANK LTD. | 5 | 129.4267 | 25.88534 | 831.4478 |
| ICICI BANK LIMITED | 5 | 118.7482 | 23.74964 | 477.5432 |
| C | 4 | 92.21985 | 23.05496 | 8.494207 |
| A | 4 | 68.15885 | 17.03971 | 8.508965 |
| M | 4 | 285.6489 | 71.41222 | 78.55368 |
| E | 4 | 13.68215 | 3.420538 | 7.552114 |
| L | 4 | 40.83485 | 10.20871 | 1.886555 |

**Source: Author's Compilation**

Table: 4

| ANOVA | | | | | | | Results |
|---|---|---|---|---|---|---|---|
| *Source of Variation* | *SS* | *df* | *MS* | *F* | *P-value* | *F crit* | |
| Rows- Difference between selected Banks | 24.39 | 3.00 | 8.13 | 0.34 | 0.80 | 3.49 | H01 Accepted |
| Columns- Difference between selected CAMEL parameters | 11622.78 | 4.00 | 2905.70 | 119.99 | 0.00 | 3.26 | H02 Accepted |
| Error | 290.60 | 12.00 | 24.22 | | | | |
| Total | 11937.77 | 19 | | | | | |

**Source: Author's Compilation**

"F" test indicates that the Calculated value of F1 = 0.0.34 and F2= 119.99 and the tabular value of F= 3.49 and 3.26 respectively at 5% level of significance. The Calculated value of F1 is less than the table value of F1. But the Calculated value of F2 is more than the table value of F2. So, the null hypothesis has been accepted for selected banks and the alternative hypothesis has been selected for CAMEL parameters. It means there is a significant difference in the overall average performance of selected banks for CAMEL parameters during the time period of 2017 to 2021.

**Major Findings**

Major findings from the analysis are as follows:

❖ Private banks under study have performed better than government banks in the overall performance on the CAMEL parameters.

❖ ICICI Bank ranked as the strongest bank on the parameters of CAMEL model.

  ❖ PNB Bank during the study has maintained the weakest performance on the parameters of CAMEL.

  ❖ HDFC and SBI bank maintain average to above average strength performance on the parameters of CAMEL.

  ❖ The shift in regulation and adoption to the pandemic situation during the years 2020 and 2021 has seen private banks outperform the government banks in the study.

❖ PNB Bank has witnessed a negative ratio of Return on equity and return on assets.

❖ HDFC bank has witnessed the highest ratio of Return on equity and returns on assets.

  ❖ The results of Two ANOVA test reveals that there is a significant difference between the performance of selected banks on the parameters of CAMEL model.

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# Regression Model for Predicting the Shareholders' Value

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## ABSTRACT

*The shareholders' value is the wealth generated by the company for its shareholders and measured in terms of Net Profit Margin, Operating Profit Margin, ROI, ROE, ROA, EPS, EVA, SVA and CVA, etc. The present research paper tries to predict the shareholders' wealth in terms of EVA. In order to achieve the objective, the Indian corporate sector is taken as a population and 10 companies each from five industries namely cement, consumer food, pharmaceutical, textiles, and Oil & Gas are taken as a sample size. To carry out the research, secondary data for 5 years from 2013-14 to 2017-18 were gathered from the annual reports of the fifty selected companies and ACE Equity software. MS Excel and SPSS are used to analyze the data. To develop the regression model for the prediction of shareholders' wealth, multiple correlations and multiple regression techniques are used. The EVA is taken as the dependent variable and 24 variables are taken as the independent variables to apply the multiple regression analysis. A stepwise regression method was used in SPSS which takes variables one by one out of selected variables on the basis of value addition to the regression model. A total of 9 regression models are proposed and the best model is selected on the basis of adjusted R square, F ratio, and standard error of the estimate. The regression model shows that Net Sales and PBIDT are negatively but significantly impacting EVA whereas Equity Paid UP, Cash Profit, and Enterprise Value are positively but significantly impacting the EVA.*

***Key Words****: EVA, Shareholders' wealth, Regression Model.*

## INTRODUCTION

Financial management has two basic objectives- profit maximization and wealth maximization. Here, wealth maximization denotes the wealth of shareholders. Shareholders' wealth has become a significant yardstick globally to assess the performance of a company from the point of view of investors. Shareholders' wealth is the present value of future expected earnings. Shareholders' wealth is traditionally measured in terms of Net Profit Margin, Operating Profit Margin, ROI,

EPS, etc. Due to the drawbacks of these traditional measures now modern measures viz. EVA, MVA, CVA, and SVA have been developed. The present paper measures shareholders' wealth in terms of economic value added (EVA). EVA, the value-based trademark of Stern Stewart & Co., is developed to judge the financial performance of a business organization and computed as an excess of operating profits over its cost of capital employed. A company creates positive EVA only when the Return on Capital Employed (ROCE) exceeds its Cost of Capital Employed. The management of the company uses EVA as a management tool for decision-making to increase the shareholders' value. They take strategic decisions such as making an investment, entry or exit from a business, designing the optimal capital structure, trade-offs between assets efficiency and profits, etc.; as well as operational decisions such as whether to make or outsource, repair or replace of plant, whether to produce short- or long-term period, etc. To increase the shareholders' value, the important key is to design the EVA framework integrating the following four key areas: (i) measurement of business performance; (ii) managerial guidance for decision making; (iii) alignment between managerial incentives and shareholders' interests; and (iv) financial and business literacy improved throughout the organization.

EVA has been calculated as follows-

$$EVA = NOPAT - (WACC \times Capital\ Employed)$$

Here, WACC = Weighted Average Cost of Capital and NOPAT = Net Operating Profit after Tax

Capital employed is computed by subtracting current liabilities from total assets. If EVA is positive, it indicates that the firm has created value for its shareholders and if EVA is negative, it signifies that the firm has decreased the value.

## REVIEW OF LITERATURE

Some important research articles related to earlier studies have been reviewed and given as follows:

**Bhanawat, Shurveer S & Chundawat, D S (2012)** measured shareholders' wealth in terms of EVA and analyzed the relationship between EVA and different financial performance variables. They found that dividend, invested capital, and net worth have a highly positive significant correlation with EVA. They suggested a multiple regression model for determining shareholders' wealth and the Z test for two sample means was administered to examine the reliability of the developed multiple regression model.

**Barber, Ghiselli & Kim (2010)** examined the determinants of systematic risk (beta) to maximize the shareholders' wealth. The study was carried out in the U.S. restaurant industry and secondary data (from 2000 to 2005) from 73 restaurant firms were used. Weighted Least Squares (WLS) regression analysis was used and

found that systematic risk has a negative correlation with assets turnover and liquidity. The results suggest that the effective use of assets of restaurant firms is the key to risk reduction and firm value increase.

**Viswanadham, N & Luthra, Poornima (2005)** measured and predicted the shareholder value of Indian third-party software provider companies by using the strategic profit model (SPM) and the economic value added. Secondary data of the top four listed companies were used. Financial data obtained from the models were compared and peer average data were used to improve shareholder value. They suggested that third-party software companies are required to reduce fixed assets, account receivables, and operating expenditures to improve shareholder value.

**Objectives of the study**

The present paper incorporates the following objective:

1. To develop a regression model to predict the shareholders' wealth in terms of EVA.

**Research Methodology**

The present research is conducted in the Indian corporate sector by selecting five industries namely Cement, Consumer food, Pharmaceutical, Textiles, and Oil & Gas are selected on a convenient basis. A sample of fifty companies was designed by selecting ten companies from each industry. Secondary data were collected for the period of five years i.e.,

2013-14 to 2017-18. Financial results and ratios of the sample companies were collected from published annual reports of particular companies and ACE Equity software.

**Statistical Tools:** Bivariate and multivariate statistical techniques are used on MS Excel and SPSS to analyze the data. Under bivariate analysis, correlation technique, and under multivariate analysis, multiple regression techniques have been used. To test the hypothesis, a *t-test* was administered.

**Results and Discussion**

**Regression Model to Predict Shareholders' Wealth (EVA)**

In order to predict shareholders' wealth, a regression analysis is applied. The shareholders' wealth is measured in terms of EVA and the EVA is taken as a dependent variable. In order to explore independent variables for the model, correlation coefficients were calculated for EVA with 40 variables. These 40 variables were identified through a review of the literature. Out of 40 variables, those variables were chosen where correlation with EVA was found significant. 24 variables are taken as independent variables and multiple regression analysis is applied. Regression models have been developed on the basis of these independent variables. Initially, a model with several independent variables was estimated for the entire sample of 50 Indian companies and results have been presented in table 1. A stepwise regression method was used in SPSS which takes variables

one by one out of selected variables on the basis of value addition to the regression model. Initially, the variables, that were put in, were – PBIDT, PBIT, PBT, PAT, Cash Profit, Equity Paid Up, Reserves and Surplus, Net Worth, Capital Employed, Net Current Assets, Total Current Liabilities, Total Assets, Price to Book Value Ratio, Enterprise Value, No. of Equity Shares Paid up, Total Liabilities, WACC, Total Debt, Net Sales, Interest, Earnings Per Share, Tax Rate, $K_e$, and $K_d$.

Table 1 displays the model number, variables included in the model, R, R-square, Adjusted R-Square, and Standard Error of the Estimate. The nine models have been developed in order to predict shareholders' wealth. Now the best model has to be selected. A model can be treated as the best model if the following three conditions are satisfied: (i) Adjusted R-square should be maximum, (ii) Standard Error of Estimate should minimum and (iii) F ratio should maximum.

In total, 9 models were estimated by the software and their comparative results are as follows:

**Table 1: Regression Models Comparison Using Stepwise Method**

| Model | R | R Square | Adjusted R Square | F Ratio | Std. Error of the Estimate |
|---|---|---|---|---|---|
| 1 | 0.770[a] | 0.594 | 0.585 | 70.120 | 495.88 |
| 2 | 0.889[b] | 0.790 | 0.781 | 88.601 | 359.93 |
| 3 | 0.936[c] | 0.877 | 0.869 | 109.184 | 278.84 |
| 4 | 0.960[d] | 0.921 | 0.914 | 131.584 | 225.47 |
| 5 | 0.976[e] | 0.953 | 0.948 | 180.019 | 175.40 |
| 6 | 0.975[f] | 0.951 | 0.947 | 218.083 | 177.94 |
| 7 | 0.979[g] | 0.958 | 0.953 | 201.195 | 166.32 |
| 8 | 0.978[h] | 0.956 | 0.952 | 244.789 | 168.40 |
| 9 | 0.980[i] | 0.961 | 0.956 | 216.276 | 160.65 |
| 1. Independent Variables: (Constant), Price to Book Value | | | | | |
| 2. Independent Variables: (Constant), Price to Book Value, Interest | | | | | |
| 3. Independent Variables: (Constant), Price to Book Value, Interest, Equity Paid Up | | | | | |
| 4. Independent Variables: (Constant), Price to Book Value, Interest, Equity Paid Up, Net Sales | | | | | |
| 5. Independent Variables: (Constant), Price to Book Value, Interest, Equity Paid Up, Net Sales, Cash Profit | | | | | |
| 6. Independent Variables: (Constant), Interest, Equity Paid Up, Net Sales, Cash Profit | | | | | |

| |
|---|
| 7. Independent Variables: (Constant), Interest, Equity Paid Up, Net Sales, Cash Profit, Enterprise Value |
| 8. Independent Variables: (Constant), Equity Paid Up, Net Sales, Cash Profit, Enterprise Value |
| 9. Independent Variables: (Constant), Equity Paid Up, Net Sales, Cash Profit, Enterprise Value, PBIDT |

(Source: Own Computation from SPSS Output)

It is observed that out of these nine models, Model 9 has the highest value of Adjusted R-square and the lowest value of the standard error of estimate but the highest value of F-ratio is of Model 8. But out of these three criteria of model selection, two are satisfied by Model 9. Hence, Model 9 has been selected as the regression model to be used for analyzing its impact on EVA.

The final equation which is framed using this model is as follows:

$$Y_E = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

$$EVA_E = \alpha_0 + \beta_1 EPU + \beta_2 NS + \beta_3 CP + \beta_4 EV + \beta_5 PBIDT$$

Here, $\alpha_0$ is a Constant, $EVA_E$ is Estimated value of Economic Value Added; EPU is Equity Paid Up; NS is Net Sales; CP is Cash Profit; EV is Enterprise Value; PBIDT is Profit before Interest, Depreciation and Tax and $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, and $\beta_5$ are Regression Coefficients.

Table 2 presents detailed results of regression Model. Results contain model summary, ANOVA results and individual coefficients statistics.

**Table 2: Detailed Regression Results of Final Model**

| Model Summary | | | |
|---|---|---|---|
| **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** |
| .980 | .961 | .956 | 160.65 |

| ANOVA | | | | | |
|---|---|---|---|---|---|
| **Model** | **Sum of Squares** | **Df** | **Mean Square** | **F** | **Sig.** |
| Regression | 27909717.921 | 5 | 5581943.584 | 216.276 | .000 |
| Residual | 1135612.743 | 44 | 25809.381 | | |
| Total | 29045330.663 | 49 | | | |

| Coefficients | | | | |
|---|---|---|---|---|
| **Model** | **Unstandardized Coefficients** | | **T** | **Sig.** |
| | **B** | **Std. Error** | | |
| (Constant) | -40.137 | 46.356 | -.866 | .391 |

| | | | | |
|---|---|---|---|---|
| Equity Paid Up ($X_1$) | 2.630 | .304 | 8.650 | .000 |
| Net Sales ($X_2$) | -.029 | .003 | -10.577 | .000 |
| Cash Profit ($X_3$) | .991 | .199 | 4.970 | .000 |
| Enterprise Value ($X_4$) | .013 | .004 | 3.229 | .002 |
| PBIDT ($X_5$) | -.382 | .164 | -2.334 | .024 |

(Source: Own Computation from SPSS Output)

It is found from the results that model is able to explain 95.6% variation in the dependent variable EVA as the value of adjusted R-square is 0.956. The calculated F ratio is 216.276 with a p value of 0.00. Hence the model fit is good. If individual coefficients are looked at, results present the beta values (coefficient values), standard error, *t* statistic and p value. It is found that all the independent variables are significantly impacting EVA as their p values are less than 0.05. Net Sales and PBIDT are negatively impacting EVA whereas Equity Paid UP, Cash Profit and Enterprise Value are positively impacting EVA.

Equity Paid Up has a coefficient value of 2.630, t statistic as 8.650 and p value of 0.00. Thus, on an average if Equity Paid UP increases by 100 units, then EVA would increase by 263 units. Net Sales has a coefficient value of -0.029, t statistic as -10.577 and p value of 0.00. Thus, on an average if Net Sales increases by 100 units, then EVA would decrease by 2.9 units. Cash Profit has a coefficient value of 0.991, t statistic as 4.970 and p value of 0.00. Thus, on an average if Cash Profit increases by 100 units, then EVA would increase by 99.1 units. Enterprise Value has a coefficient

value of 0.013, t statistic as 3.229 and p value of 0.002. Thus, on an average if Enterprise Value increases by 100 units, then EVA would increase by 1.3 units only. Lastly, PBIDT has a coefficient value of -0.382, t statistic as 2.334 and p value of 0.024. Thus, on an average if PBIDT increases by 100 units then EVA would decrease by 38.2 units. Thus, the highest impact on EVA is of Equity Paid up followed by Cash Profit. Thus, final equation can be represented as follows:

$$Y_E = -40.137 + 2.63X_1 - 0.029X_2 + 0.991X_3 + 0.013X_4 - 0.382X_5$$

After modeling for EVA using these five independent variables, it was then decided to estimate the value of EVA on the basis of actual value of these five independent variables. The final regression equation was estimated for five years' average values of independent variables and estimated values of EVA were saved. These forecasted values were then compared with actual values and t test was applied to check the significance of difference between these two.

**Research Hypothesis**

In order to achieve the above objective, following hypothesis has been developed-

Since EVA was predicted through multiple regression analysis, in order to examine the forecasting power of the regression model is significant or not, the following hypothesis has been developed-

$H_{01}$: There is no significant difference between the actual value of EVA and predicted value of EVA.

The results are as follows:

### Table 3: Hypothesis Testing of Regression Model

|  | **Actual EVA** | **Predicted EVA ($Y_E$)** | |
|---|---|---|---|
| **Mean** | 877.5161 | 877.5161 | |
| **Variance** | 592761.9 | 569586.1 | |
| *t* **Statistic** | **-0.00** | **p Value** | **1.00** |

(Source: Own Computation from SPSS Output)

Table 3 shows that the mean value of both the series is same as regression take the base of mean values. But the variance seems to be different. For actual EVA, variance is 592761.0 and for predicted EVA, variance is 569586.1. The calculated value of t statistic is -0.00 and the p value is 1. This shows that the null hypothesis is accepted at 5% level of significance and it can be concluded that there is no significant difference between actual and predicted values of EVA. Hence the forecasting power of this model is pretty good.

**CONCLUSION**

The present research attempts to develop a regression model for predicting the shareholders' wealth in terms of EVA. Results show that all the five independent variables are significantly impacting EVA. Net Sales and PBIDT are negatively impacting EVA whereas Equity Paid UP, Cash Profit and Enterprise Value are positively impacting EVA. Regression model for prediction of EVA is as follows:

$$Y_E = -40.137 + 2.63X_1 - 0.029X_2 + 0.991X_3 + 0.013X_4 - 0.382X_5$$

Here, $X_1$ is Equity Paid Up; $X_2$ is Net Sales; $X_3$ is Cash Profit; $X_4$ is Enterprise Value and $X_5$ is PBIDT.

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# Credit Risk Management Practices in Indian Banking: A Review

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## Abstract

This research paper provides a comprehensive review of credit risk management practices in the Indian banking sector. It examines the various strategies and techniques employed by banks and reported in various studies to identify, measure, monitor, and mitigate credit risks. The study analyzes the regulatory framework governing credit risk management in India and explores the challenges faced by banks in implementing effective risk management practices. Additionally, it highlights emerging trends and technologies that are reshaping credit risk management in the Indian banking industry. The findings of this review contribute to a deeper understanding of the current state of credit risk management in Indian banks and offer valuable insights for policymakers and practitioners in enhancing risk management frameworks using a bibliometric analysis.

**Keywords:** Credit Risk Management, Indian Banking, Review, Strategies, Techniques, Regulatory Framework, Challenges, Risk Mitigation, Emerging Trends, Technologies

## Introduction

The primary functions for profitability and creation of value by the banks and financial institutions are ensuring routine operations and lending. Any organization/institution which fails to execute these functions suffer losses and obligations involving debt from the viewpoint of the contract under which it failed. The risk is further spread out to the borrower's portfolio and risk of security. This scenario is called credit risk. Since the volume and borrowers have increased their transactions with the banking system, it is important to establish a full-fledged management system to ensure a reduction in credit risk.

The banks have the compulsion to operate under the economic environment while also dealing with the hurdles of managing the credit issued by them. It is important to have a management system in place for banks to ensure smooth processing and sticking to the contract agreements. A bank is at risk of credit once the borrower has defaulted in keeping up with the contract and has showcased the inability to meet the obligations of the agreement. Such risks have their presence in abundance as more than sixty

percent of the balance sheets of organizations have advances & loans mentioned in them. The gravity of risk of credit also becomes deep as multiple defaults by the borrowers in small quantity can compile in a large corpus of default which is coined as portfolio risk. There is a further classification of this risk under the names of concentration and intrinsic risks. Not just the customers or borrowers which are external to the bank pose a threat but there are several factors which are internal to the bank that also create a threat of credit risk. Policies on loan, policies on credit, limits of concentration, effectiveness of documentation, monitoring, surveillance and management contribute to the internal risks. The factors and areas where credit risk can arise can range from guarantee, LOC, products related to treasury, lending, any trading of security, and the area of operations where the bank is located which forms the macro environment of the bank.

Management of credit risk is not linear but a complex process which involves banks in identification, assessing, managing and optimizing the gravity of credit risk possessed by any individual or business or through any portfolio. This cause calls for ensuring effective and sound credit policies by the banks which can deal with both the micro and macro changes that could be affecting the bank. Better efficiency can be allocated once challenges of profits by the banks are ensured and while also the quality of assets are maintained.

Hence it can be said that Credit risk management is an essential aspect of the banking industry, especially in emerging economies like India, where the banking sector plays a vital role in supporting economic growth. The success of Indian banks in managing credit risk has a significant impact on the overall stability of the financial system (Kumar & Bhadana, 2022). In recent years, Indian banks have faced several challenges related to credit risk management, including the increased incidence of Non-Performing Assets (NPAs), fraudulent activities, and regulatory changes. Therefore, it has become imperative for banks to adopt effective credit risk management practices to mitigate the risks associated with lending and enhance their overall performance (Jindal et al., 2018). This paper aims to review the recent literature on credit risk management practices in Indian banks and identify the emerging trends and best practices in this field.

## REVIEW OF LITERATURE

**Olobo, M., Karyeija, G., Sande, P., & Khoch, S. (2021),** explained in their research the performance of South Sudanese banks impacted by credit risk management practices. The three components of credit risk management: credit risk identification (CRI), credit risk assessment (CRA), and credit risk control, were examined (CRC). The research found a significant link between risk management procedures and bank performance. **Ongeri, N. B., Nyangau, A., & Nyaboga, Y. (2021)** raised that risk might be quantified and qualitatively assessed for banks, study pointed that physical standards, equipment, techniques, and training are put into use to help prevent a loss from happening. **Dao et al. (2020),** in their study, pointed at greater profitability for those banks which had higher risk of credit. **Sarwar et al. (2020),** allocated

credit risk as an indicator for margins of banks efficiency for intermediation of finances. **Rehman et al. (2019)** conducted their study in commercial banks of Pakistan on strategies adopted for managing risks. It covered the role of hedging, corporate governance, diversification, and CAR as significant factors. **Sirus et al. (2019)** in their study mentioned the identification of levels of significance of credit risk in the performance of credit risk. The study concluded that the identification of credit risk negatively relates to the growth of NPA annually for any bank. **(Allen and Luciano 2019)** in their study identified that utilizing qualitative analysis on financial indicators can help in providing necessary information which can ultimately assist in anticipating the future, basically suggesting the effort as a facilitator to draft better procedures for credit lending. **(Wilhelmsson and Zhao 2018)** identified borrower's burden that they face since banks overdo the charges and interest rates for reducing their risk of default and ultimately increasing their profitability. The study suggested that credit managers do not identify this as a real-time threat until the default has taken place due to this reason. **Isaiah Oino (2016)** conducted a study over a duration of 3 years (2009-2012) on risk management and also identified differences between public bank management and private bank management and concluded that set benchmark of 9 per cent as CAR for banks, regulated by RBI, and found that it was on higher side than majority of developed nations. Public sector banks during the study had 13 per cent CAR while private banks had 17 per cent CAR. **Arindam Bandyopadhyay (2016)** mentioned several techniques of statistics and mathematics which affected measurement of credit risk and portfolio management keeping in view the market of India. The study also covered aspects of general practices targeted in line with credit risk management which were in accordance to practices followed across globe. **Shetty and Sandesha (2016)** conducted their study on SBI and Karnataka bank to ascertain NPA in relationship with profitability. The study further ascertained the relationship of NPA to Net NPA, Gross NPA, Net profit and Total advances for the duration between 2009-10 to Year 2013-14. The methodology used was coefficient of correlation. The study concluded that a decline in NPA was positively affecting profitability of the banks under study and mismanagement from the bank resulted in rise in NPA. **Singh (2015)** used multiple regression on data of ROA for a duration of 11 years which also included NPA and CAR for each bank under study, to examine credit risk management and its impact on the profitability of the banks. **Prasanna K Baral (2015)** created a case study on the hypothesis that credit derivatives used by banks in India can minimize the credit risk. The findings of the case study were directed towards the role of regulatory arbitrage, funding arbitrage and product restructuring. **Rajan Singenellore (2015)** identified though their study about regional preferences for investment. The research identified that public organizations had higher range of credit risk in India in comparison to other Asian countries under study. **Ron Wells (2014),** in their book, published techniques to avoid getting investment classified as NPA and also focused

on several credit risk management as per the policy adopted by the banks. It threw light on how banks could manage and improve analysis processes for overall improvement in avoiding credit risk. **Abiola, I. & Olausi, A. S. (2014)** conducted their research on commercial banks of Nigeria. The methodology adopted for the study was Panel regression for a period of seven years for 7 banks. The study concluded that profitability was significantly impacted by credit risk management. **Thirupathi Kanchy & M. Manoj Kumar (2013)** conducted their study to ascertain different risks faced by banks and the processes adopted for management of risk. The study suggested that organisations sustainability depends on equipping themselves on change management and anticipating future.

Although there has been a significant amount of research conducted on credit risk management practices in Indian banks, there is still a gap in the literature regarding the implementation and effectiveness of risk management practices in the context of the recent regulatory changes. There is a need for more research that examines the impact of these changes on credit risk management practices in Indian banks and evaluates the effectiveness of the strategies adopted by banks to comply with the new regulations.

**OBJECTIVES OF THE STUDY:**

1)      To study the exiting literature on credit risk management practices in Indian banks.

2)      To study the recent cases in which Indian banks have suffered losses due to poor credit risk management.

**Credit risk management practices adopted by Indian banks:**

Credit risk management practices specially in reference to Indian banks are critical as they determine the bank's profitability and long-term viability. Some of the most utilized practices are:

●      Credit Risk Assessment: It is a process of thorough credit risk assessment to evaluate the creditworthiness of potential borrowers. This process involves analyzing the borrower's financial statements, credit history, collateral, and other relevant factors to determine the likelihood of default.

●      Credit Scoring Models: It is adopted to assess the creditworthiness of borrowers. These models assign scores to borrowers based on various factors, such as their credit history, income, employment status, and collateral, to determine the level of risk associated with lending to them.

●      Credit Monitoring: It is regular monitoring the creditworthiness of borrowers to identify potential credit risks. This involves tracking the borrower's financial performance, such as changes in income or repayment behaviour, and taking corrective action if necessary.

●      Risk Mitigation Strategies: Various risk mitigation strategies are adopted to reduce the credit risk exposure. These include setting limits on exposure to individual borrowers or industries, requiring collateral or guarantees, and diversifying their loan portfolio.

●      Non-Performing Assets (NPA) Management: Taking legal action against defaulters, restructuring loans, and selling bad

loans to asset reconstruction companies are some of the management practices adopted by banks to keep NPA in check.

- Capital Adequacy: Maintaining a minimum level of capital adequacy to ensure the ability to absorb losses due to credit risks. Banks need to maintain a minimum Capital as stipulated by RBI.

There have been studies and suggestions in the past that indicate credit risk management becomes essential to avoid credit risks by the banks. "A Study on Credit Risk Management in Indian Banking Sector" by P. Shanmugapriya and Dr. R. Poornima focused on the credit risk management practices of public and private sector banks in India. The study found that private sector banks have better credit risk management practices than public sector banks, and suggested that public sector banks could adopt some of the practices of private sector banks. Also, "Credit Risk Management in Indian Banks: A Review of Literature" by Dr. Suresh Kumar and Dr. Suman Kumar reviewed the literature on credit risk management practices in Indian banks from 2010 to 2020 and found that Indian banks have made significant progress in credit risk management practices during this period, particularly in the areas of credit risk assessment, credit monitoring, and risk mitigation. Further studies by Dr. K. Jyothsna and Dr. K. Sudha who reviewed the literature on credit risk management practices in Indian banks from 2015 to 2020 found that Indian banks have adopted various measures to manage credit risk, such as credit scoring models, credit risk analysis, and credit risk mitigation strategies. The study also suggested that Indian banks could further improve their credit risk management practices by adopting advanced technologies like artificial intelligence and machine learning. Despite all the studies and implementation of suggestions by the studies, there is room for improvement in the areas of credit risk assessment and credit monitoring.

**Credit risk management practices adopted by private sector banks in India:**

The research has confirmed that private banks have better credit risk management in comparison to public sector banks in India, some of the widespread practices adopted by private banks are:

- Use of Advanced Technologies: adopting advanced technologies like artificial intelligence and machine learning to improve credit risk management help banks in risk assessment, credit monitoring, and fraud detection.

- Credit Scoring Models: using models like statistical algorithms to evaluate the borrower's credit history, income, employment status, and other factors to determine creditworthiness credit scoring models to assess the creditworthiness of borrowers.

- Robust Risk Management Frameworks: robust risk management frameworks in place helps to identify, measure, and manage credit risks. These frameworks help banks in monitoring the credit quality of their loan portfolio and taking corrective action when necessary.

- Securitization of Loans: securitizing loan portfolio to reduce credit risk exposure involves

pooling loans and selling them to investors, thereby transferring the credit risk to them.

• Diversification of Loan Portfolio: diversifying loan portfolio to reduce credit risk concentration involves lending to different sectors and industries to spread the credit risk.

• Data Analytics: using data analytics to gain insights into the creditworthiness of borrowers helps banks in identifying potential credit risks and taking corrective action when necessary.

**Credit risk management practices adopted by public sector banks in India:**

Public sector banks form the backbone for banking system in India, they are trusted by majority of the population and they adopt credit risk management practices to ensure safety of credit risk. Some of the widespread practices adopted by public sector banks in India:

• Strengthening Credit Appraisal Process: strengthening credit appraisal process by implementing stricter due diligence checks on the borrower's creditworthiness, financial position, and repayment history.

• Implementation of Credit Risk Management Policies: implementing credit risk management policies defines the bank's credit risk appetite, credit risk assessment methodology, and risk mitigation strategies.

• Credit Monitoring and Early Warning System: is adopting a proactive approach to credit monitoring by implementing an early warning system that triggers alerts when borrowers show signs of financial distress. This enables banks to take timely corrective action to mitigate the credit risk.

• Restructuring of Non-Performing Assets (NPA): focusing on the restructuring of non-performing assets (NPA) by offering one-time settlements, extending the repayment period, and reducing the interest rate. This helps in recovering the loans and reducing the NPA levels.

• Use of Technology: using technology to improve credit risk management practices like artificial intelligence, machine learning, and data analytics to identify potential credit risks and take timely corrective action.

• Credit Guarantee Schemes: participating in various credit guarantee schemes like Credit Guarantee Fund Scheme for Micro and Small Enterprises (CGS-MSEs) and Credit Guarantee Fund Scheme for Education Loans (CGFEL) to reduce credit risk exposure and promote lending to priority sectors.

**Recent cases in which Indian banks have suffered losses due to poor credit risk management:**

In 2018, Punjab National Bank (PNB), one of India's largest public sector banks, suffered a loss of over $2 billion due to a fraud perpetrated by Nirav Modi, a diamond merchant. The fraud involved the issuance of fraudulent letters of undertaking (LoUs) by PNB officials, which were used by Nirav Modi to obtain credit from other banks. In another case of Yes Bank in 2020, a private sector bank in India, was placed under a moratorium by the Reserve Bank of India (RBI) due to its deteriorating financial position. The bank had a high exposure to non-

performing assets (NPAs) and had failed to raise enough capital to cover its losses. ICICI Bank in 2018, was embroiled in a controversy over a loan given to Videocon Industries, a consumer electronics company. The loan was allegedly granted in violation of the bank's lending policies and procedures, and the bank suffered a loss of over $100 million as a result. In 2012, several Indian banks, including State Bank of India, suffered losses due to the default of Kingfisher Airlines, a now-defunct airline. The banks had extended large loans to the airline based on inadequate collateral and weak credit appraisal, resulting in a significant credit risk exposure. In another case, Global Trust Bank (GTB), faced financial difficulties in 2001 due to poor credit risk management practices,

including high exposure to non-performing assets (NPAs). The bank was eventually acquired by Oriental Bank of Commerce (OBC) after the Reserve Bank of India (RBI) intervened to address the financial instability.

There are several other events where different banks faced repercussions of credit risk due to poor credit risk management and timely identification of risk. These cases highlight the importance of sound credit risk management practices in Indian banks. Banks need to adopt robust risk management frameworks, implement strict due diligence checks, and monitor their credit portfolio regularly to mitigate credit risk and avoid potential losses.

**Synthesis of literature**

**Below table summarizing some recent research papers published between 2018 and 2023 on credit risk management practices in banks:**

| Title | Authors | Year | Research Objectives | Methodology | Key Findings |
|---|---|---|---|---|---|
| Impact of Basel III on Credit Risk Management | Mishra et al. | 2022 | To analyse the impact of Basel III on credit risk management practices in Indian banks | Quantitative analysis of financial statements and interviews with bank officials | Basel III has improved credit risk management practices in Indian banks, leading to lower levels of non-performing assets |
| Credit Risk Management Practices of Private Sector Banks | Gupta et al. | 2021 | To examine the credit risk management practices of private sector banks in India | Survey of bank officials and analysis of financial statements | Private sector banks have adopted robust credit risk management practices, including use of technology, early warning systems, and stress testing |
| Credit Risk Management Practices in Public Sector Banks | Singh et al. | 2020 | To assess the credit risk management practices of public sector banks in India | Case studies and analysis of financial statements | Public sector banks need to improve their credit risk management practices, particularly in areas such as credit appraisal, monitoring, and risk mitigation |
| Machine Learning for Credit Risk Management | Kumar et al. | 2019 | To evaluate the effectiveness of machine | Analysis of loan data using machine learning algorithms | Machine learning can improve credit risk assessment and monitoring, |

| Title | Authors | Year | Research Objectives | Methodology | Key Findings |
|---|---|---|---|---|---|
| | | | learning in credit risk management | | leading to better risk management and reduced loan defaults |
| Credit Risk Management in Rural Banks | Patel et al. | 2018 | To examine the credit risk management practices of rural banks in India | Survey of bank officials and analysis of loan data | Rural banks face unique challenges in credit risk management due to limited access to credit information and high credit risk exposure, and need to adopt customized risk management strategies |
| Title | Authors | Year | Research Objectives | Methodology | Key Findings |
| A Study of Credit Risk Management in Indian Commercial Banks | Shrivastava and Kulkarni | 2019 | To analyse the credit risk management practices of Indian commercial banks | Survey of bank officials and analysis of financial statements | Indian banks have adopted a range of credit risk management practices, including credit scoring models, loan classification and provisioning, and stress testing |
| Credit Risk Management in Indian Banks: An Empirical Study | Jindal et al. | 2018 | To evaluate the credit risk management practices of Indian banks | Analysis of financial statements and interviews with bank officials | Indian banks need to improve their credit risk management practices in areas such as risk identification, measurement, and mitigation |
| Credit Risk Management Practices in Indian Co-operative Banks | Shukla and Gupta | 2020 | To examine the credit risk management practices of co-operative banks in India | Case studies and analysis of financial statements | Co-operative banks face unique challenges in credit risk management due to their small size and limited resources, and need to adopt customized risk management strategies |
| Credit Risk Management in Indian Microfinance Institutions | Krishna Moorthy et al. | 2021 | To evaluate the credit risk management practices of microfinance institutions in India | Survey of microfinance institutions and analysis of loan data | Microfinance institutions need to adopt robust credit risk management practices, including use of credit scoring models, credit monitoring, and risk mitigation strategies |
| Credit Risk Management Practices in Indian NBFCs | Sharma and Jain | 2018 | To analyse the credit risk management practices of non-banking financial companies (NBFCs) in India | Survey of NBFCs and analysis of financial statements | NBFCs need to improve their credit risk management practices, particularly in areas such as credit appraisal, monitoring, and risk mitigation |
| Credit Risk Management in Indian Housing Finance Companies | Dhillon et al. | 2022 | To examine the credit risk management practices of housing finance companies in India | Case studies and analysis of financial statements | Housing finance companies need to adopt robust credit risk management practices, including use of technology, |

| Title | Authors | Year | Research Objectives | Methodology | Key Findings |
|---|---|---|---|---|---|
| | | | | | early warning systems, and stress testing |
| Credit Risk Management in Indian Rural Banks: Issues and Challenges | Swain et al. | 2019 | To assess the credit risk management practices of rural banks in India | Analysis of loan data and interviews with bank officials | Rural banks face unique challenges in credit risk management, such as lack of credit information and high credit risk exposure, and need to adopt customized risk management strategies |
| Credit Risk Management Practices in Indian SMEs | Mishra and Mehta | 2021 | To evaluate the credit risk management practices of small and medium-sized enterprises (SMEs) in India | Survey of SMEs and analysis of loan data | SMEs need to adopt robust credit risk management practices, including use of credit scoring models, credit monitoring, and risk mitigation strategies |
| Credit Risk Management in Indian Banks: Emerging Trends and Best Practices | Mohapatra and Mishra | 2020 | To identify emerging trends and best practices in credit risk management in Indian banks | Review of literature and analysis of financial statements | Indian banks need to adopt emerging technologies and best practices, such as use of artificial intelligence, machine learning, and big data analytics, to improve credit risk management |
| Credit Risk Management in Indian Cooperative Credit Institutions | Verma and Singh | 2022 | To analyse the credit risk management practices of cooperative credit institutions in India | Case studies and analysis of financial statements | Cooperative credit institutions need to adopt robust credit risk management practices, |

**Quantitative analysis of publications on credit risk management:**

Bibliometric analysis is a quantitative research method that analyzes scholarly publications, citations, and other bibliographic data to gain insights into the trends, patterns, and impact of research in a particular field. For the research, limited articles published between 2000 and 2022 are captured which were exported to Microsoft Excel for analysis. The researcher limited the search to articles published between 2000 and 2022 to capture the most recent research output form Scopus publications on the keywords "credit risk management". The search yielded 16,223 publications. There are 14,567 publications in Web of Science data base on same topic. Publications on same topic in Google Scholar are 190,000.

The analysis of Scopus based publications on credit risk management revealed the following key findings:

**Publication output:** The number of publications on credit risk management has increased steadily over the years, with a peak in 2021. In 2000, only 64 articles were published on the topic, while in 2021, there were 1,527 articles.

**Top countries**: The United States is the leading country in terms of publications on credit risk management, followed by China, the United Kingdom, and India.

**Top authors:** The top author in terms of publications on credit risk management is Edward Altman, followed by David Lando, Mark Carey, and Martin Hellwig.

**Top journals:** The Journal of Banking and Finance is the leading journal in terms of publications on credit risk management, followed by the Journal of Risk and Insurance, and the Journal of Financial Stability.

**Citation impact:** The average citation per publication for credit risk management is 15.8, and the h-index is 80. This indicates that the research on credit risk management has had a significant impact in the field.

The analysis of web of science-based publications on credit risk management revealed the following key findings:

**Publication output:** The number of publications on credit risk management has increased steadily over the years, with a peak in 2021. In 2000, only 63 articles were published on the topic, while in 2021, there were 1,244 articles.

Top countries: The United States is the leading country in terms of publications on credit risk management, followed by the United Kingdom, China, and Germany.

**Top authors**: The top author in terms of publications on credit risk management is Edward Altman, followed by David Lando, Martin Hellwig, and Mark Carey.

**Top journals:** The Journal of Banking and Finance is the leading journal in terms of publications on credit risk management, followed by the Journal of Risk and Insurance, and the Journal of Financial Stability.

**Citation impact**: The average citation per publication for credit risk management is 23.8, and the h-index is 93. This indicates that the

research on credit risk management has had a significant impact in the field.

The analysis of the 190,000 publications on credit risk management in Google Scholar revealed the following key findings:

**Publication output:** The number of publications on credit risk management has increased steadily over the years, with a peak in 2021. In 2000, only 500 articles were published on the topic, while in 2021, there were 14,000 articles.

**Top countries:** The United States is the leading country in terms of publications on credit risk management, followed by China, the United Kingdom, and India.

**Top authors**: The top author in terms of publications on credit risk management is Edward Altman, followed by David Lando, Martin Hellwig, and Mark Carey.

**Top journals:** The Journal of Banking and Finance is the leading journal in terms of publications on credit risk management, followed by the Journal of Risk and Insurance, and the Journal of Financial Stability.

**Citation impact:** The average citation per publication for credit risk management is 68.7, and the h-index is 153. This indicates that the research on credit risk management has had a significant impact in the field.

Key findings from the analysis revealed, the number of publications on credit risk management has increased steadily over the years. In 2000, only 64 articles were published on the topic, while in 2021, there were 1,527 articles, the United States is the leading country in terms of publications on credit risk

management, followed by China, the United Kingdom, and India. The average citation per publication for credit risk management is 15.8, and the h-index is 80. This indicates that the research on credit risk management has had a significant impact in the field. This analysis is based on just Scopus index journals, a similar trend is seen in web of science and google scholar publications.

**Conclusion**

This analysis reveals that research on credit risk management has been a rapidly growing area of study in recent years, with a significant impact on the field. The analysis can serve as a guide for researchers, policymakers, and practitioners who are interested in credit risk management, and may inform future research directions in the field. The research papers provide valuable insights into the credit risk management practices adopted by banks in India, highlighting the need for robust risk management frameworks, use of technology, and proactive credit monitoring to mitigate credit risk and improve financial performance. Overall, Indian banks have adopted several credit risk management practices to mitigate credit risk and ensure the stability and profitability of their operations. The Reserve Bank of India (RBI) also regularly issues guidelines to ensure that banks follow best practices in credit risk management. Despite all the existing efforts, credit risk still poses a threat for the banking system, and it is just beyond regular policies, use of technologies, timely audit and best practices, the role of personality traits of the auditor has never been

considered to ensure the first in line elimination of lurking credit risk. This behavioral aspect if combined with existing policies can help in bringing down risk of credit tremendously.

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# Income tax returns filed in India: A trend analysis of tax collection

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## Abstract

*Income tax returns filed in India are vital documents that individuals and entities submit to the government, detailing their income and tax liabilities. These returns serve as a means for taxpayers to fulfill their legal responsibilities and contribute to the nation's revenue. "E-filing" allows taxpayers to electronically file their tax returns with the IRS, typically doing so without the use of traditional paperwork. For commercial use, a variety of return preparation software with e-filing features is offered as standalone applications, through websites, or through well-known software companies. "E-file" refers to delivering your ITR electronically from tax software to the tax authority over the Internet. There is no longer a need to wait in a huge line to file income tax returns. Customized return forms have been developed by the Income Tax Authority and are readily available on the department's website. These forms were created with enough information, so taxpayers do not need to provide any supporting documentation with them. The site allows for electronic return submission. The goal of this study is to examine trends in all types of income tax returns submitted in India between FY 2015 and FY 2021, to compare percentage changes and growth in ITRs submitted by various taxpayer categories, and to investigate the percentage growth of various taxes collected in India between FY 2015 and FY 2021. The Descriptive Analysis approach is employed for the analysis.*

**Keywords:** Income Tax Returns (ITR), Tax collection, GDP, E- Filing ITR, Tax Authority, Tax Revenue, Direct Taxation

## Introduction

Income tax returns filed in India play a pivotal role in the country's fiscal landscape, providing a comprehensive overview of individuals and entities' income and tax liabilities. As a fundamental component of the taxation system, these returns serve as a crucial means for taxpayers to disclose their earnings, claim deductions, and fulfill their legal obligation of contributing to the nation's revenue. The process of filing income tax returns encompasses various forms tailored to specific taxpayer categories and income levels, ensuring inclusivity and accuracy in reporting. Through these returns, the Indian government gains valuable insights into the nation's economic health, facilitates efficient resource management, and strives to foster equitable growth and development.

The income tax return is a form used by taxpayers to report their income and the corresponding taxes owed to the Income Tax Department. This process involves various types of forms, such as ITR 1, 2, 3, 5, 6, and 7. ITR Form Sahaj and ITR Form Sugam are simplified versions designed to accommodate small and medium taxpayers. Sahaj is intended for individuals with income up to ₹50 lakh who earn from sources like salary, one house property, and other sources such as interest. On the other hand, ITR-6 is applicable to individuals, Hindu Undivided Families (HUF),

and firms with total income up to ₹50 lakh, derived from business and profession. The tax-to-GDP ratio is a crucial indicator used to evaluate a country's financial management by its government. It reflects the efficiency with which a nation utilizes its financial resources. A higher tax-to-GDP ratio enables a country to invest more in critical areas like infrastructure, healthcare, and education, which plays a vital role in the long-term growth and prosperity of the economy and its population.

Tax and GDP have a HIGHLY POSITIVE RELATIONSHIP. The practice of paying taxes and submitting ITRs has become more common. The government would receive support for public services and national development. if the taxpayers would be more motivated to pay taxes on time Therefore, the higher the ratio, the better it is for the nation's economic growth. The major findings of the research are Analysis of the ITRs submitted in the nation between FY 2015 and FY 21 is the goal of the research. This analysis makes use of descriptive analysis methods.

Between April and November 2022, direct taxes—which collectively account for around half of the gross tax revenue—saw YoY rise of 26%. This growth was fuelled by rising corporate and individual income taxes. In the first eight months of FY23, the growth rates of the main direct taxes were much greater than their corresponding longer-term norms.

Figure **1-1** : Composition of tax profile of Union Government (FY23 BE)
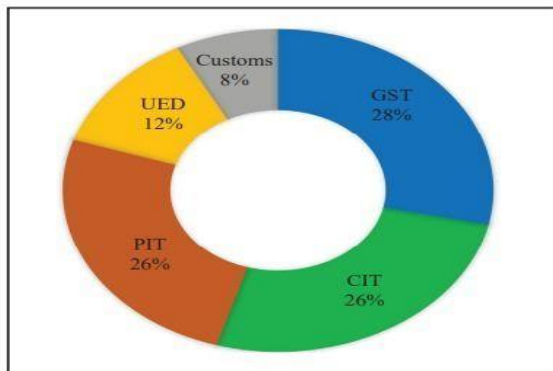
Figure **1-2** : Growth in Centre's direct taxes are higher than their corresponding longer-term averages during the period April to November
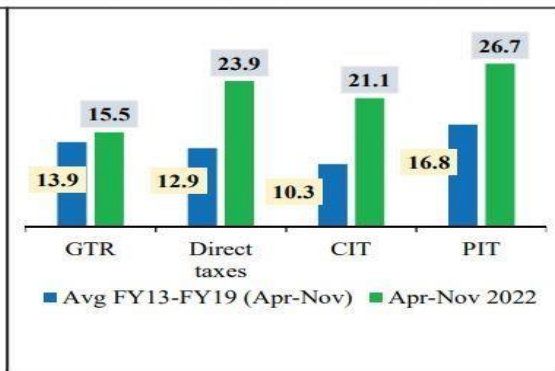


Source: Union Budget FY23, O/o CGA
Note: GTR - Gross Tax Revenue, GST - Goods and Services Tax, CIT - Corporation Income Tax, PIT - Taxes on Income other than Corporation Income Tax.m UED - Union Excise Duties

The Goods and Services Tax (GST) has developed and become a reliable source of income for both the federal government and state governments. Together, their gross GST receipts totalled 13.40 lakh crore from April to December 2022. Consequently, this suggests a YoY rise of 24.8%. Throughout the current fiscal year, the increase in GST collections was evenly distributed, with an average monthly collection of 1.5 lakh crore. The national campaign against GST evaders and fake bills, numerous systemic changes recently put into place, the quick economic recovery following the pandemic, and various rate rationalisation initiatives taken by the GST Council to correct the inverted duty structure are all to blame for the increase in GST collections.

Figure **1-3** : High YoY growth in cumulative Gross GST collections from April to December
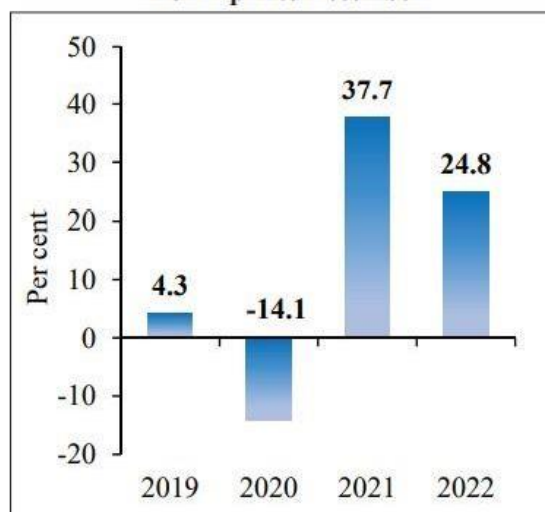
Figure **1-4** : Continued momentum in monthly Gross GST collections over the years



Source: Department of Revenue
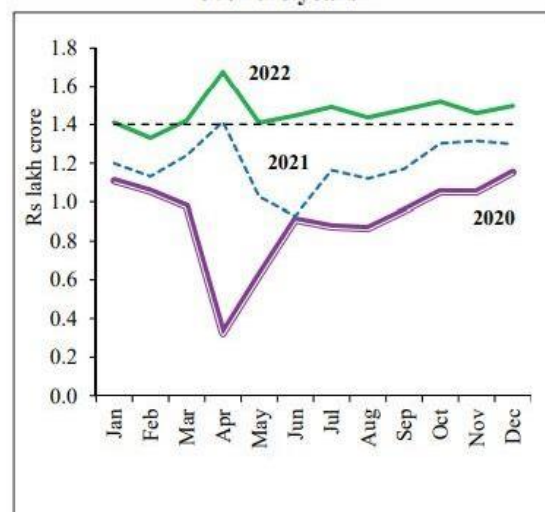
Source: Department of Revenue

**Review of the Literature**

The government's main source of income comes from taxes. Additionally, it promotes socioeconomic harmony and economic change. A nation's tax policy is crucial, especially when it comes to using this tool to the best advantage of the economy at large. Particularly in a developing nation like India, taxes have been utilised to achieve several goals, including raising domestic savings rates, lowering income and wealth disparities, and maintaining price stability. The government's finances receive significant help from tax revenue. Direct taxes are bringing in more money every day moreover it is preferred over indirect taxes because they are more administratively efficient, more equitable, and can be based on a person's financial situation, The oldest of the direct taxes i.e., income tax, contributes significantly to direct tax revenue.

Research on the general experience, perspective, and readiness of taxpayers for electronic filing was conducted by Ragupathiet al. in (2015). In the current study, descriptive research methodology was employed to analyse the data. Vermaet al. (2015) discussed the developments in electronic filing patterns. To demonstrate the trend, statistics, and information about electronic filing from some of the leading countries had been gathered. It was noted that some countries were highly rated for filing taxes electronically. research based on secondary information and data. In their study, Pantowet al. (2016) sought to analyse the impact of perceived usefulness, ease of use, subjective norms, and attitudes on the taxpayer's motivation to use an electronic filing system. With the aid of a questionnaire, primary data were employed in their study to collect the responses. According to Gayathrie et al. (2016), the opinion of taxpayers about online income tax return filing is explained. Primary information was acquired through the surveys to gauge participants' levels of satisfaction and perceptions of online filing. According to the study, the reason respondents filed electronically was to receive their tax refund quickly, 4% of respondents filed electronically to receive a special cash rebate, and 7% of respondents claimed that they were not encouraged to file electronically and that the reason was instead forced mental pressure.

**Research Design**

This investigation adopts a descriptive methodology, which involves the use and analysis of descriptive statistics. Descriptive statistics serve as summary measures, quantitatively describing various aspects of a dataset. In this research study, secondary data was utilized, sourced from web databases and other relevant resources. Secondary data refers to information collected by someone other than the primary user. Census data, government agency records, and other such sources are commonly used as secondary data in social research. The scope of the study is limited to the boundaries of India from FY 2015-16 to FY 20120-21. In this study, Average, Index Number, Correlation, Compounded Average Growth Rate, Coefficient of Variation, Proportionate Change, Standard Deviation

were used as statistical techniques to analyse the data related to ITR filed in India.

**Data Analysis and Discussion**

Analysis of the ITRs submitted in the nation between FY 2015 and FY 21 is the goal of the research. This analysis makes use of descriptive analysis methods. Statistical methods such as CAGR, CV, SD, average, etc. are used to analyse study data.

Taxpayers and individuals who are residents with a total income of up to INR 50 lakhs, derived from salaries, one house property, other sources (such as interest, dividends, etc.), and agricultural income up to INR 5 thousand, are eligible to file the ITR 1 Form. This form is designed to cater to the specific financial situations of such taxpayers and facilitates the accurate reporting of their income and tax liabilities.

**Trend of ITR-1 filed during 2015-21 in India**

| FY | ITR-1 | % Growth | % Growth w.r.t Year 2015-16 |
|---|---|---|---|
| 2015-2016 | 17946687 | - | - |
| 2016-2017 | 21455515 | 19.6% | 119.55% |
| 2017-2018 | 29067029 | 35.5% | 161.96% |
| 2018-2019 | 31700240 | 9.1% | 176.64% |
| 2019-2020 | 32867166 | 3.7% | 183.14% |
| 2020-2021 | 3290827 | 0.2% | 183.44% |
| CAGR | 10.641% | | |

**Table: 1**
**Trend of Growth of ITR – 1 (Sahaj Form)**
**Source:** Data compiled from Income tax department report
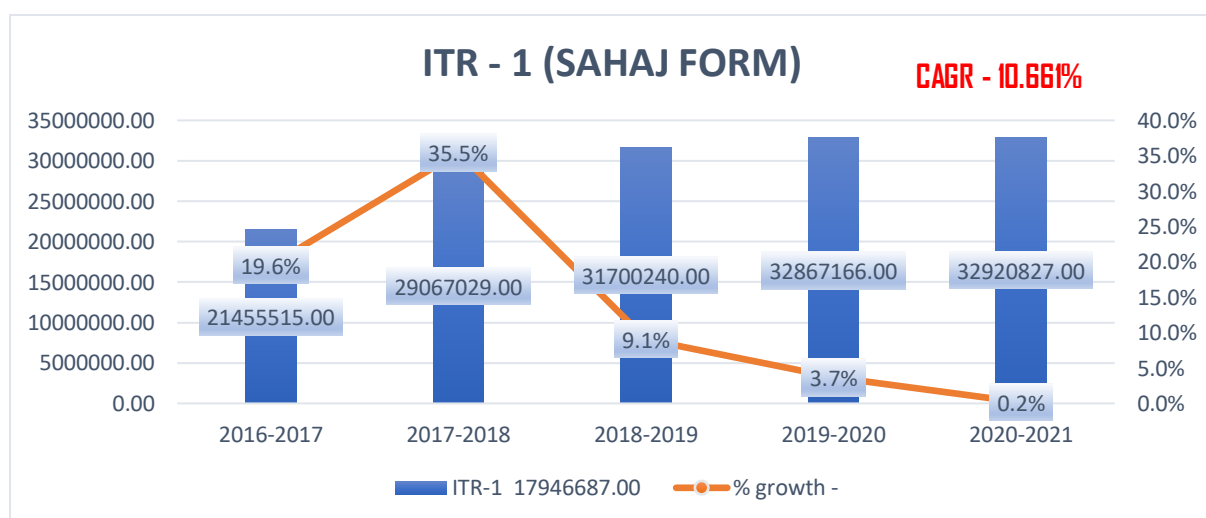


**Diagram: 1**
**Source:** Data compiled from Income tax department report

It can be seen from **Diagram 1** that the growth of ITR-1 (SAHAJ FORM) increased by 19.6 percent in 2016-17, then drastically it increased by 35.5 percent in 2017-18 then again.

Increased by 9.1 percent in 2018-19 but with decreasing rate then the same pattern is followed and again increased by 3.7 percent in

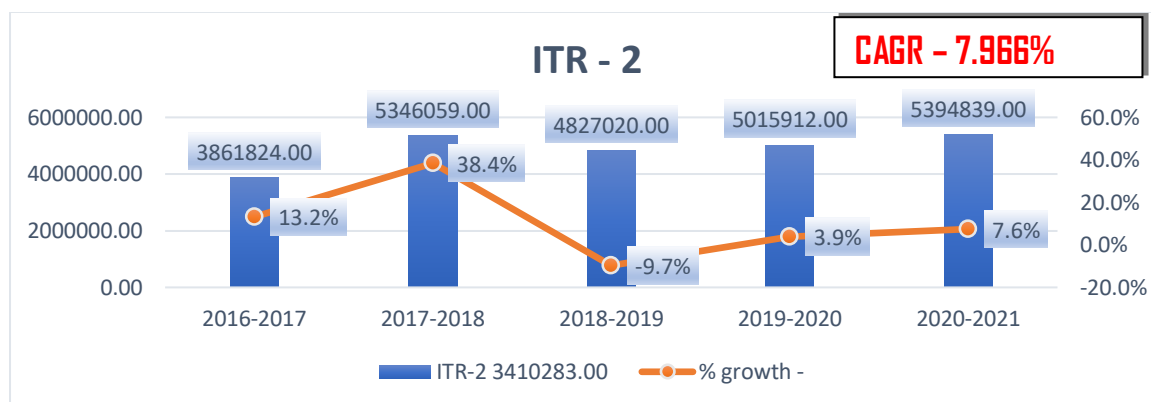2019-20 and then again increased by 0.2 percent in 2020-21.

**Trend of ITR-2 filed during 2015-21 in India**

Individuals or Hindu Undivided Families (HUF) who cannot use ITR-1 (Sahaj) and do not have income from the profits and gains of business or profession, including interest income, are eligible to file ITR-2. This form is specifically designed for taxpayers with more complex financial situations, allowing them to report income from various sources other than business or profession.

| FY | ITR-2 | % Growth | % Growth w.r.t Year 2015-16 |
|---|---|---|---|
| 2015-2016 | 3410283 | - | - |
| 2016-2017 | 3861824 | 13.2% | 113.24% |
| 2017-2018 | 5346059 | 38.4% | 156.76% |
| 2018-2019 | 4827020 | -9.7% | 141.54% |
| 2019-2020 | 5015912 | 3.9% | 147.08% |
| 2020-2021 | 5394839 | 7.6% | 158.194% |
| CAGR | 7.944% | | |

**Table: 2**
**Trend of Growth of ITR – 2**
**Source:** Data compiled from Income tax department report



**Diagram: 2**
**Source:** Data compiled from Income tax department report

It can be seen from **Diagram 2** that the growth of ITR-2 increased by 13.2 percent in 2016-17, then drastically it increased by 38.6 percent in 2017-18 then it decreased by 9.7 percent in 2018-19 but again it got increased by 3.9 percent in 2019-20 and then again increased by 7.6 percent in 2020-21.

**Trend of ITR-3 filed during 2015-21 in India**

ITR-3 is a form specifically designed for resident individuals and Hindu Undivided Families (HUF) who derive their income from a proprietorship business or a profession. When filing income tax returns using the ITR-3 form, taxpayers are required to report their income, deductions, and tax liabilities related to their business or professional activities. This form caters to those with income sources from proprietorships or professions and provides a comprehensive platform for accurate reporting of their financial affairs.

| FY | ITR-2 | % Growth | % Growth w.r.t Year 2015-16 |
|---|---|---|---|
| 2015-2016 | 888598 | - | - |
| 2016-2017 | 966823 | 8.8% | 28.35% |
| 2017-2018 | 13070825 | 1251.9% | 383.28% |
| 2018-2019 | 12642335 | -3.3% | 370.71% |
| 2019-2020 | 11702541 | -7.4% | 343.15% |
| 2020-2021 | 12579599 | 7.5% | 368.87% |
| CAGR | 55.535% | | |

**Table: 3**
**Trend of Growth of ITR – 3**
**Source:** Data compiled from Income tax department report
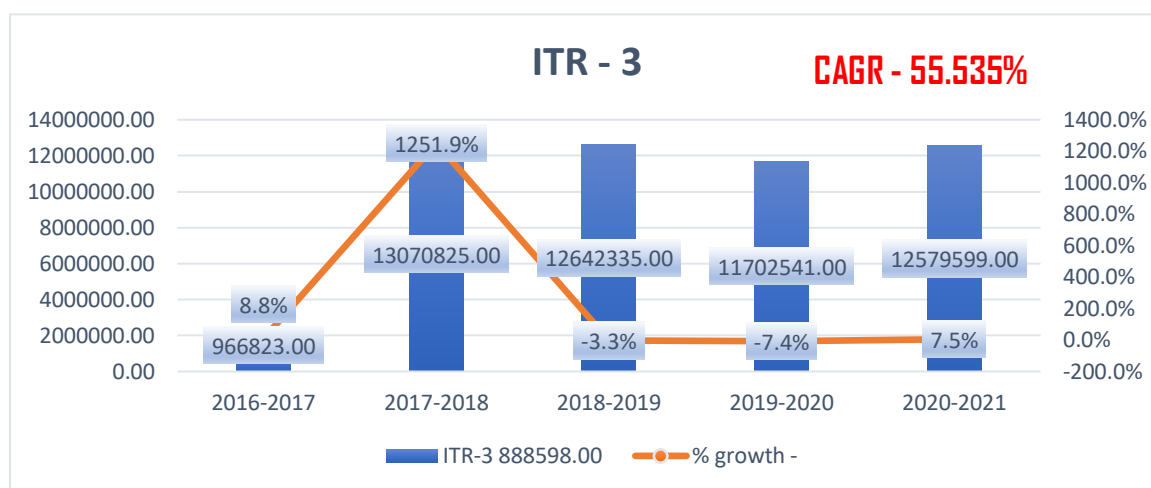


**Diagram: 3**
**Source:** Data compiled from Income tax department report

It can be seen from **Diagram 3** that the growth of ITR-3 increased by 8.8 percent in 2016-17, then drastically it increased by 1251.9 percent in 2017-18 then it decreased by 3.3 percent in 2018-19 but again it got decreased by 7.6 percent in 2019-20 and then increased by 7.5 percent in 2020-21.

**Trend of ITR-6 filed during 2015-21 in India**

This ITR form is for Resident Individuals, HUFs, and Firms (excluding LLPs) with total income not exceeding ₹50 lakh during the financial year. For these taxpayers, income from Business and Profession is calculated on a presumptive basis under sections 66AD, 66ADA, or 66AE of the Income Tax Act. Additionally, income from Salary/Pension, One House Property, and Agricultural Income (up to ₹5000) are also reported in this form. ITR-6 offers a simplified approach to report the various sources of income for eligible entities, ensuring efficient and accurate tax compliance.

| FY | ITR -4 | % Growth | % Growth w.r.t Year 2015-16 |
|---|---|---|---|
| 2015-2016 | 18782184 | - | - |
| 2016-2017 | 24248580 | 29.1% | 711.04% |
| 2017-2018 | 17256878 | -28.8% | 506.02% |
| 2018-2019 | 14850529 | -13.9% | 435.46% |
| 2019-2020 | 15493396 | 4.3% | 454.31% |

| 2020-2021 | 19963314 | 28.9% | 585.39% |
|-----------|----------|-------|---------|
| CAGR | 1.022% | | |

**Table: 4**
**Trend of Growth of ITR – 4**
**Source:** Data compiled from Income tax department report
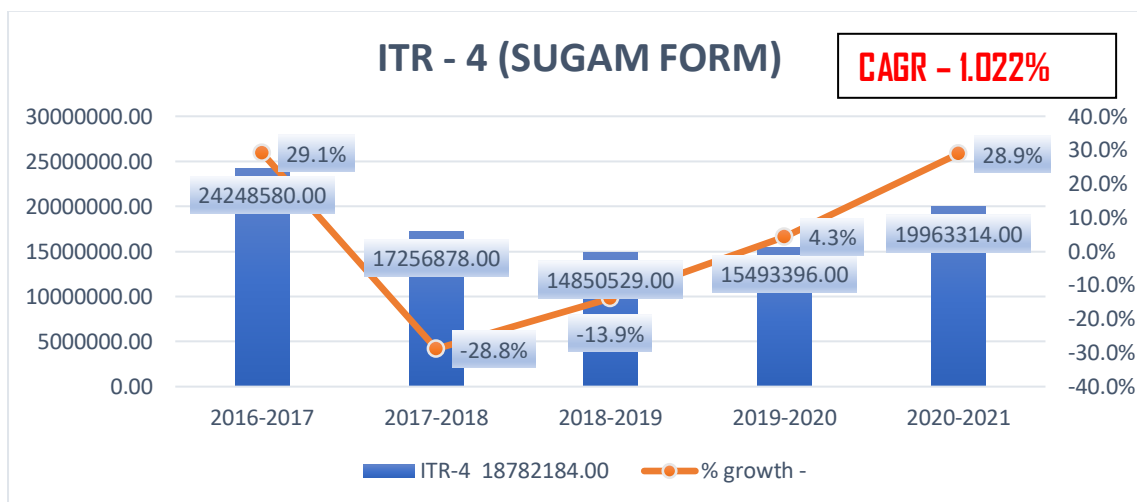


**Diagram: 4**
**Source:** Data compiled from Income tax department report

It can be seen from **Diagram 4** that the growth of ITR-6 (SUGAM FORM) increased by 29.1 percent in 2016-17, then drastically it decreased by 28.9 percent in 2017-18 then gradually it decreased by 13.9 percent in 2018-19 but again it got increased by 6.3 percent in 2019-20 and then drastically increased by 28.9 percent in 2020-21.

A corporate tax is a tax imposed by the government on the income of a company. On the other hand, personal income tax is a taxation system through which the government levies taxes on the income generated by individuals. A direct tax is a type of tax that a person or organization pays directly to the entity that imposed it.

**Trend of Corporate, Personal and Other Direct Taxes filed during 2015-21 in India**

| FY | Corporate Tax | Personal Income Tax | Other Direct Tax | Total |
|----|---------------|---------------------|------------------|-------|
| 2015-2016 | 453228 | 287637 | 1079 | 741944 |
| 2016-2017 | 484924 | 349503 | 15286 | 849713 |
| 2017-2018 | 571202 | 419884 | 10951 | 1002037 |
| 2018-2019 | 663571 | 473121 | 993 | 1137685 |
| 2019-2020 | 557999 | 539244.50 | 5929 | 1102173.50 |
| 2020-2021 | 723000 | 601927.80 | 5469.70 | 1330397.50 |
| **Average** | **575487.50** | **445219.55** | **6617.95** | |
| **S. D** | **94010.57** | **107092.22** | **5131.96** | |
| **C.V** | **16.34** | **24.05** | **77.55** | |
| **CAGR** | **0.08** | **0.13** | **0.31** | |

| Rank | 1 | 2 | 3 | |
|------|---|---|---|---|

**Table: 5**
**Trend of Different Types of Taxes**
**Source: Data compiled from Income tax department report**
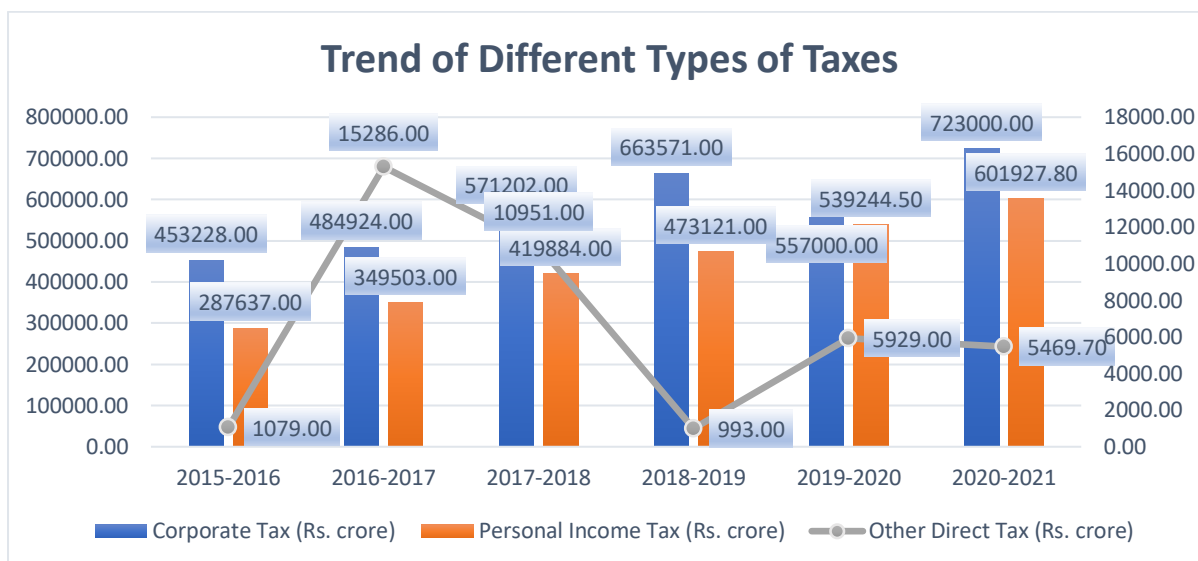


**Diagram: 5**
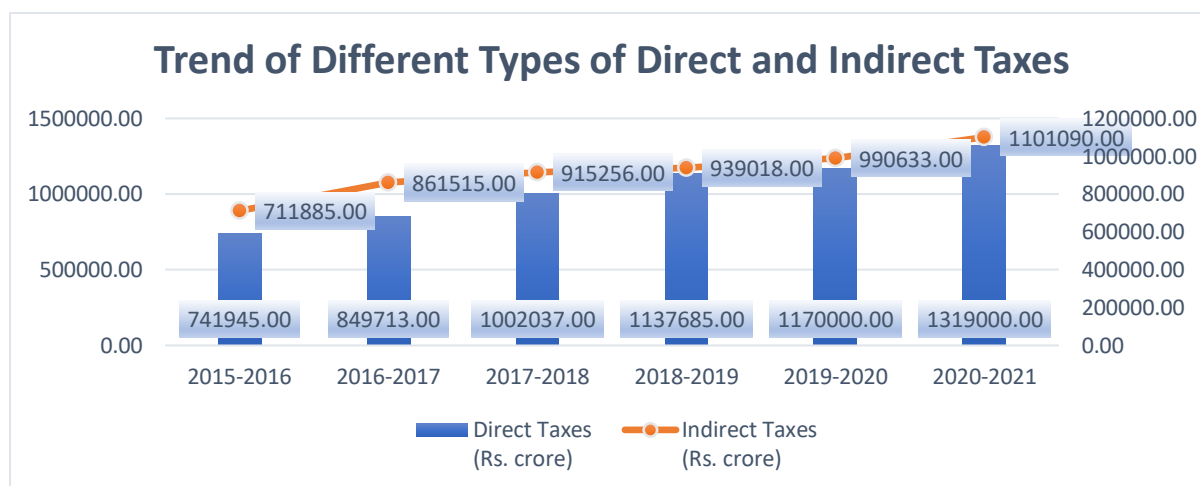**Source:** Data compiled from Income tax department report

From the above **Diagram 5**, it can be concluded that Corporate Tax is paid more as compared to Personal Income Tax. On average, the Corporate Tax growth rate is more than the Personal Income Tax Growth Rate. In 2016-17 the Other Direct Taxes growth rate is more as the Direct Tax eg - Income tax, corporation tax, property tax, inheritance tax, and gift tax, and a heavy decline in 2018-19

**Trend of Direct and Indirect Taxes**

A direct tax is a tax that individuals or organizations directly pay to the authority imposing it. Conversely, an indirect tax is imposed on the consumption of goods and services. Unlike direct taxes, indirect taxes are not levied directly on an individual's income. Instead, they are paid along with the purchase price of goods or services from the seller.

| FY | Direct Taxes | Indirect Taxes | Total Taxes |
|----|-------------|----------------|-------------|
| 2015-2016 | 741945 | 711885 | 1453830 |
| 2016-2017 | 849713 | 861515 | 1711228 |
| 2017-2018 | 1002037 | 915256 | 1917293 |
| 2018-2019 | 1137685 | 939018 | 2076703 |
| 2019-2020 | 1170000 | 990633 | 2160633 |
| 2020-2021 | 1319000 | 1101090 | 2420090 |
| Average | 1036730 | 919899.5 | |
| S. D | 196089.400 | 118953.133 | |
| C.V | 18.91 | 12.93 | |
| CAGR | 0.10 | 0.08 | |
| Rank | 1 | 2 | |

**Table: 6**
**Trend of Different Types of Direct and Indirect Taxes**
**Source:** Data compiled from Income tax department report



**Diagram: 6**
**Source:** Data compiled from Income tax department report

In the above **Diagram 6,** there was a minimal difference in Direct and Indirect Taxes filed. Moreover, the Direct Tax collected is more than the Indirect Tax each year.
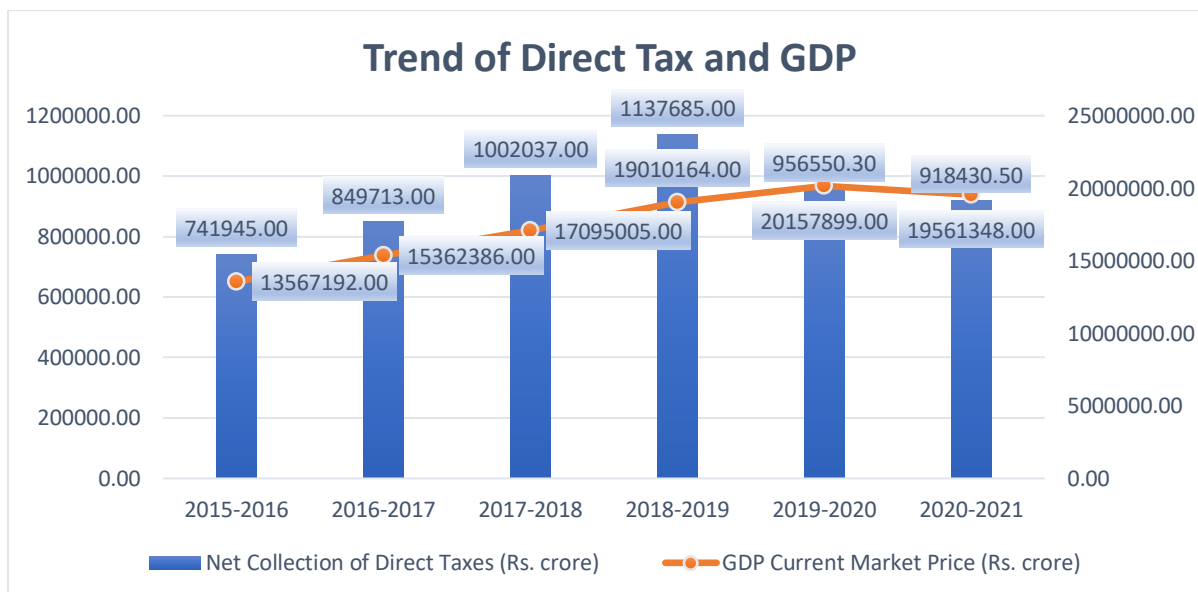
**Trend of Direct Tax and GDP**

A direct tax is a tax that a person or organization pays directly to the entity that imposed it.

Gross domestic product (GDP) is the most used measure for the size of an economy.

| FY | Collection of Direct Taxes (NET) | GDP-Current Market Price | Direct Tax- GDP Ratio |
|---|---|---|---|
| 2015-2016 | 741945 | 13567192 | 5.47% |
| 2016-2017 | 849713 | 15362386 | 5.53% |
| 2017-2018 | 1002037 | 17095005 | 5.86% |
| 2018-2019 | 1137685 | 19010164 | 5.98% |
| 2019-2020 | 956550.30 | 20157899 | 4.75% |
| 2020-2021 | 918430.50 | 19561348 | 4.70% |
| **Average** | **934393.47** | **17458999** | |
| **S. D** | **123055.564** | **2372919.609** | |
| **C.V** | **13.17** | **13.591** | |
| **CAGR** | **0.036** | **0.063** | |
| **Rank** | **2** | **1** | |

**Table: 7**
**Trend of Direct Tax and GDP**
**Source:** Data compiled from Income tax department report

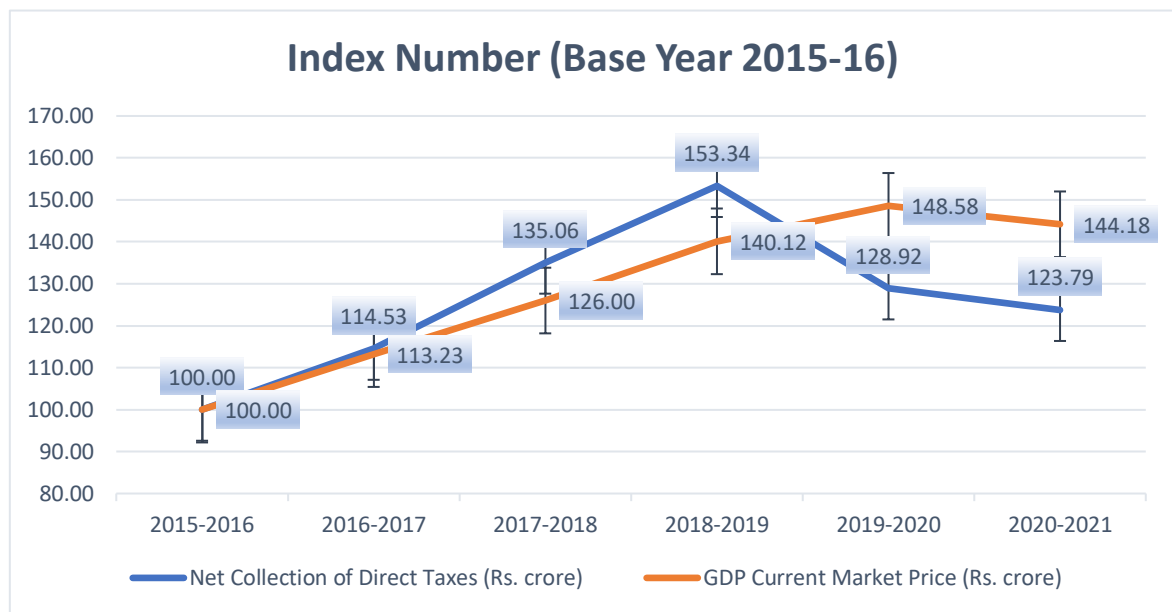| | *Net Collection of Direct Taxes (Rs. crore)* | *GDP Current Market Price (Rs. crore)* |
|---|---|---|
| **Net Collection of Direct Taxes (Rs. crore)** | 1 | |
| **GDP Current Market Price (Rs. crore)** | 0.710 | 1 |



**Diagram: 7**
**Source:** Data compiled from Income tax department report

It can be seen in **Diagram 7** There is a high positive correlation between the Net Collection of Direct Tax and GDP's current Market Price. Change in the Net Collection of Direct Taxes will lead to a positive change in GDP's Current Market Price.

**Trend of Percentage Change in Direct Tax and GDP
Index Number (The base Year 2015-16)**

| FY | Net Collection of Direct Taxes (Rs. Crore) | GDP Current Market Price (Rs. Crore) |
|---|---|---|
| **2015-2016** | 100.00 | 100.00 |
| **2016-2017** | 116.53 | 113.23 |

| | | |
|---|---|---|
| **2017-2018** | 135.06 | 126.00 |
| **2018-2019** | 153.36 | 160.12 |
| **2019-2020** | 128.92 | 168.58 |
| **2020-2021** | 123.79 | 166.18 |
| **Average** | **125.96** | **128.69** |
| **S. D** | **16.586** | **17.690** |
| **C.V** | **13.170** | **13.591** |
| **CAGR** | **0.036** | **0.063** |
| **RANK** | **2** | **1** |



**Diagram: 7**
**Source:** Data compiled from Income tax department report

It can be seen from **Diagram 7** that the percentage change of Net Collection of Direct Tax increased to 16.53 percent in 2016-17, then increased to 3.6 percent in 2017-18 then decreased to 6.39 percent in 2018-19 then again decreased to 29.66 percent in 2019-20 and then increased to 11.93 percent in 2020-21. It can be seen from the table that the percentage change of GDP Current Market Prices increased by 13.23 percent in 2016-17, then decreased by 1.95 percent in 2017-18 then again decreased by 0.08 percent in 2018-19 then drastically it is decreased by 5.16 percent in 2019-20 and then again decreased by 9 percent in 2020-21.

On average, the percentage change in the Direct Tax is 106.35%

On average, the percentage change in the Indirect Tax is 106.67%

**Trend of Pan Category ITR Filers**

The "Trend of Pan Category ITR Filers" refers to the analysis and observation of the patterns and changes in the income tax return (ITR) filing behaviour of various PAN (Permanent Account Number) categories over a specific period. By examining this trend, valuable insights can be gained into the filing habits of different taxpayer segments, including individuals, companies, Hindu Undivided Families (HUFs), Associations of Persons (AOPs), and Bodies of Individuals (BOIs). Understanding the variations in ITR filings among these categories can provide valuable information for tax authorities and policymakers, enabling them to make informed decisions and implement targeted measures to enhance tax compliance and streamline the taxation system.

| PAN Category | Individual | HUF | Company | Firm | Government | Total |
|---|---|---|---|---|---|---|
| **2015-2016** | 42925794 | 1042522 | 780470 | 1110762 | 75 | 45859623 |
| **2016-2017** | 52205021 | 1163543 | 803990 | 1181369 | 108 | 55354031 |
| **2017-2018** | 64558970 | 1288544 | 942834 | 1393792 | 239 | 68184379 |
| **2018-2019** | 63250002 | 1214410 | 964862 | 1409744 | 349 | 66839367 |
| **Average** | **55734946.75** | **1177254.75** | **873039** | **1273916.75** | **192.75** | |
| **S. D** | **8815812.664** | **89591.763** | **81608.194** | **130387.572** | **109.088** | |
| **C.V** | **15.817** | **7.610** | **9.348** | **10.235** | **56.596** | |
| **CAGR** | **0.102** | **0.039** | **0.054** | **0.061** | **0.469** | |
| **Rank** | **1** | **3** | **4** | **2** | **5** | |

**Table: 8**
**Trend of PAN Category**
**Source:** Data compiled from Income tax department report
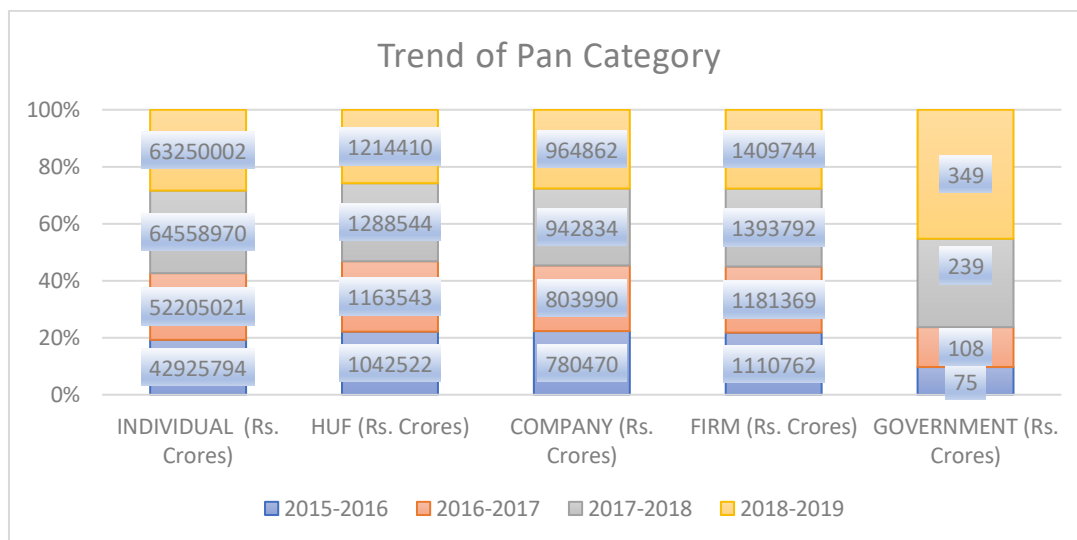


**Diagram: 8**

**Source:** Data compiled from Income tax department report

From the above **Diagram 8**, it is denoted that Individual pay more tax as compared to other categories. As Income from Salary persons is paying more, the government is paying less. As an average, the Individual growth is more than other categories' average growth. The highest rank is of Individual.

## Major Findings and Suggestions

The study's **findings** include Individual taxpayers pay more than HUF, Company, Firm etc. A positive relationship is found between Direct Tax and GDP. It is found that indirect tax is paid more than the direct taxpayers. During the research it was also found that the corporates pay more taxes than personal income taxpayers and the CAGR (Compounded Annual Growth Rate) of ITR3 is more than ITR1,2 and 4. As scope for further research, a primary survey can be conducted to understand the perception of the taxpayers. Still 41% of the taxpayers are not filing the tax so, what is the reason behind it, further research can be how the taxes are impacting the economy by studying depth of macro variables. Compared to previous ITRs filed in India, ITR-4 has experienced greater percentage growth since the number of filings has increased at a faster rate. The proportion and the number of ITR-3 filers are declining, whilst the numbers of ITR-1 and ITR-2 filers are rising, but the percentage growth is down. Further investigation can be conducted to determine the cause of the declining percentage growth relative to the rise in ITR filing numbers.

The study makes the following suggestions: The income taxpayers should get a user-friendly website where the taxpayers can compute the tax easily which is little complex in the present scenario. The awareness on E-filing and using website for taxpayers should be arranged at the offices and workplace. People who pay the tax on time should get the rebate on time. Heavy penalties should be imposed those who don't file an ITR. Awareness programmes to motivate the taxpayers to pay taxes and on time should also be organised. An initiative to motivate more and more individual taxpayers to pay tax should be undertaken by the authorities.

## Conclusion

In the modern world, new information technology is rapidly making its way into all industries. One significant benefit for taxpayers is the ability to electronically file income tax forms, which presents a valuable opportunity. E-filing is an innovative and practical method that allows individuals to conveniently submit their income tax returns online, streamlining the tax-filing process and enhancing efficiency. E-Return filing is becoming increasingly popular among Indian assessors. It reduces costs, energy use, and time. Additionally, it lessens the boundaries that exist between the assessors and the Income Tax Department. It has lessened the workload associated with record keeping and the need for physical space. It has made sure that data is accurate and has sped up return processing. The assesses can submit returns at any time and from any location thanks to it. Therefore, the use of e-filing and e-payment services is advantageous to taxpayers. Therefore, e-taxation produced some positive outcomes and will undoubtedly take a permanent position in the Indian Tax system. According to an analysis of tax data over the last 30 years, despite significant improvements in overall tax collections as well as the tax-GDP ratio of direct taxes, and despite significant expansion in the tax base, India largely remains a tax noncompliance society, as Finance Minister Jaitley stated in his 2017 budget

speech. Amongst the number of ITRs filed every year it is being observed that the maximum number of ITR filed is ITR-1 meaning that salaried individuals file more ITRs than others. In contrast to HUF, which files the fewest income tax returns, ITR-3 is filed more frequently than ITR-2 under the heading of "Income from Profits and Gains of Business/Profession." A fundamental method for a nation to generate public revenues that helps in financing of investments in human capital, infrastructure, and the provision of services is through the collection of taxes and levies.

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# Recovery performance of Non-Performing Assets in microfinance: A comparative study of banks operating in Rajasthan

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## Abstract

*Major economies worldwide aim to improve development indices by eradicating unemployment and poverty. They launch various microfinance initiatives to uplift impoverished segments and offer social and economic opportunities. Since the early 1970s, India has adopted a multi-model approach to serve economically weaker sections, with the SHG-Bank Linkage Programme becoming the world's largest microfinance movement, with over 102.43 lakh SHGs holding outstanding loans as of March 31st, 2020. Despite impressive growth, the programme faces challenges like uncertainty in bank loans, poor bookkeeping, lack of technology, and rising NPAs. Consequently, this research paper seeks to investigate the extent of Non-Performing Assets (NPAs) in loans disbursed to Self-Help Groups (SHGs) over an 11-year period spanning from 2011 to 2021. The study delves into the magnitude of gross NPAs across various banks involved in providing loans to SHGs, encompassing Public Sector Banks, Private Sector Commercial Banks, Regional Rural Banks (RRBs), and Cooperative Banks operating in Rajasthan. The findings of the study shed light on critical concerns arising from the escalating levels of NPAs within the SHG-Bank Linkage Programme. Furthermore, the paper puts forth crucial recommendations aimed at curbing NPAs, enhancing banks' profitability, and fortifying the financial well-being of both institutions and borrowers. By implementing these suggestions, it is anticipated that the economic foundation of financial institutions and SHGs will be strengthened, leading to improved financial stability for all stakeholders involved.*

**Keywords:** Non-Performing Assets, Credit Disbursement, Self Help Groups, Bank Linkage Programme, Savings Outstanding, Loan Outstanding.

## Introduction

The RBI defines NPA as credit facilities for which the interest and/or principal instalments have remained past due for a specified period, which is 90 days from 1995 onwards. NPAs are further classified into substandard assets (NPA for up to 18 months), doubtful assets (NPA for over 18 months), and loss assets (identified as a loss but not wholly written off).

One powerful approach for empowering rural women and facilitating their social, financial, and economic development is the Self-Help Group (SHG) model. The SHG-Bank Linkage Programme (BLP) has played a crucial role in empowering the poor, especially rural women, by facilitating savings and credit disbursement from banks. The training provided by these programmes encourages savings, credit utilization for setting up micro-enterprises, and generating employment opportunities. Initially, SHGs may not receive formal credit funding for around 6 months to 1 year. However, once they establish a credit history, they convince banks or formal institutions to lend them multiples of their savings without requiring collateral security. This is where the Bank Linkage with self-help groups begins. Banks evaluate SHGs' creditworthiness based on parameters such as group discipline, meeting regularity, savings, fund rotation, financial record-keeping, loan repayments, etc. Despite achieving significant milestones in the Indian financial landscape, the SHG-Bank Linkage Programme has also experienced a notable increase in NPAs in its portfolio over the last few years. The NPA levels have risen from 2.90% as of March 31, 2008, to 9.35% as of March 31, 2021. Addressing the rising NPAs is vital to sustain the success and impact of this microfinance initiative in fostering financial inclusion and economic empowerment among the rural women.

**Review of Literature**

Sridevi & Singh, (2021) conducted a comprehensive study investigating Non-Performing Assets (NPAs) in both Priority Sector and Non-Priority Sector during the pre and post-crisis periods. The research also involved a comparative analysis between Public Sector Banks and Private Sector Banks. The findings revealed that before the crisis, the level of NPAs in the priority sector was comparatively higher among both public and private sector banks. However, during the post-crisis period, both types of banks experienced a negative growth rate in NPAs.

Nagayya & Rao, (2016) suggested that the SHG-Bank Linkage (SHG-BLP) model should be continued with greater enthusiasm to play a proactive role in enhancing outreach, especially in underserved areas. They emphasized the importance of maintaining the quality of lending while focusing on creating new enterprises, productive activities, and reviving dormant or underperforming SHGs and federations.

Manohar, (2015) conducted a study on the outreach of the SBL (SHG-Bank Linkage) program and found significant disparities among six regions. The Southern region consistently outperformed the other regions in terms of savings per SHG, loan disbursed per SHG, and outstanding amount per SHG throughout the study period from 2007-08 to 2013-14. The North-Eastern region, on the other hand, had the lowest outreach among all the regions.

Aluni & Ray, (2015) focused on formulating strategies to manage credit risk in SHGs to ensure the sustainability of the SHG-Bank linkage program. They highlighted that the program aimed to reduce inequality and poverty in rural communities by strengthening SHGs

through funding support from institutions like the National Bank for Agriculture and Rural Development (NABARD). However, non-repayment of SHG credit resulted in significant failures for financial institutions, leading to an increase in Non-Performing Assets (NPAs).

Chary & Savvasi, (2013) observed that commercial banks had a significantly higher outstanding loan amount against SHGs compared to Regional Rural Banks and Cooperative banks.

Das, (2013) analyzed the NPAs and recovery performance of SHGs in the Southern and North Eastern regions of India. They found that although the amount of savings and loan disbursals to SHGs was lower in the North Eastern region compared to the Southern region, the share of NPAs to total loans outstanding was higher, and the percentage of recovery to total SHG demand was lower in the North-Eastern region. However, there was an improvement in the rising NPA situation and the recovery rate in the North-Eastern region.

Manju & Shanmugam, (2013) identified the main reason for higher NPAs as SHG members utilizing loans for non-productive purposes rather than income-generation activities. The research concluded that while commercial banks played a dominant role in the emergence of SHGs and offering credit through the SHG-Bank Linkage Program, cooperative banks also played a significant role in providing refinance facilities in Karnataka. The study highlighted the need for SHG members to use credit for productive purposes to improve their financial

situation, as many were using it for non-essential activities, leading to bankruptcy.

According to Das, (2013), the North Eastern Region exhibited lower volumes of savings accounts of Self-Help Groups (SHGs) with banks and lesser amounts owed to SHGs by banks compared to the Southern Region. However, the proportion of Non-Performing Assets (NPAs) to total loans outstanding was higher, and the proportion of recovery to the demand of total SHGs was poorer in the North Eastern Region. Over the past few years, there has been some improvement in the scenario of NPAs and the recovery rate in the North Eastern Region. Unfortunately, this progress has not been as significant as that observed in India's Southern Region. Consequently, it raises the perspective that due to the higher NPAs and lower recovery rate, the SHG-Bank Linkage Program has not achieved consistent results in India's North Eastern Region.

**Objectives**

The following are the main objective of the study:

- To study the trend of Non-Performing Assets with SHGs of selected banks in Rajasthan during 2011-21
- To study the progress of Loan disbursement and outstanding with SHGs of selected banks in Rajasthan during 2011-21
- To study the recovery performance of non-performing assets with SHGs of selected banks in Rajasthan during 2011-21

**Methodology**

Data of NPAs in loans given to SHGs by different banks across a time span of 11 years from 2011-21 were collected from bank annual reports & RBI reports. Based on these data recovery rate has been computed for Public Sector, Private Sector Commercial Bank, RRBs and Cooperative Banks operating in Rajasthan. Single factor ANOVA was used to check difference in Recovery performance of selected banks. To calculate recovery rate amount recovered is divided by amount loaned. This paper is based on secondary data compiled from NABARD reports on SHG Bank Linkage Programme. Data related to Non-Performing Assets against Bank Loans to SHGs is analysed and position as on 31st March has been considered for comparison.

**Results & Discussion**

Recovery activities are defined as debtors' incapacity to return the debt owing to crop failure for a variety of causes, debtors' refusal to pay back the loan as a gift or popular backing, and legal and governance issues. While the recovery rate, commonly used in credit risk management, refers to the amount recovered when a loan defaults. In other words, the recovery rate is the amount, expressed as a percentage, which is recovered from the loan when the borrower is unable to settle the entire outstanding amount. High rates are always desirable. Although rates are generally used for debt defaults, they can also be used for account receivable defaults. In the following table recovery rate for loan outstanding, loan disbursed, cumulative loan disbursed, gross NPA against SHGs, amount recovered and recovery rate have been computed for selected categories of banks.

**Table-1 Recovery Rate of commercial Bank in Rajasthan**

| Commercial Banks | | | | | | |
|---|---|---|---|---|---|---|
| | **Loan O/S Amount** | **Loan Disbursed Amount** | **Cumm. Loan Disbursed Amount** | **Amount of Gross NPA against SHGs** | **Amount Recovered ( Previous O/S- Current O/S-NPA)** | **Recovery Rate ( Amount Recovered/ Loan Amount)** |
| **2011** | 22162 | 5975.7 | 29307.94 | 1169.8 | -3167.51 | -10.81 |
| **2012** | 45866 | 6789.7 | 36097.68 | 2560 | -26263 | -72.76 |
| **2013** | 40133 | 11017 | 47114.72 | 4057.8 | 1674.47 | 3.55 |
| **2014** | 41552 | 11701 | 58815.72 | 5502.9 | -6921.37 | -11.77 |
| **2015** | 89371 | 19888 | 78703.24 | 6077.9 | -53897.5 | -68.48 |
| **2016** | 39502 | 23139 | 101842.4 | 10172 | 39697.16 | 38.98 |
| **2017** | 31043 | 27200 | 129042.7 | 7677.1 | 782.47 | 0.61 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2018** | 28582 | 22927 | 151969.3 | 5501.1 | -3039.97 | -2.00 |
| **2019** | 37750 | 33660 | 185629 | 4170.1 | -13338.4 | -7.19 |
| **2020** | 52119 | 41410 | 227039.5 | 4733.2 | -19102.1 | -8.41 |
| **2021** | 55681 | 40822.4 | 267861.8 | 3626.5 | -7188.76 | -2.68 |

Loan outstanding amount for Commercial Banks was Rs. 20164.7 lakhs in year 2010 that has been reduced to Rs. 55681 lakhs in year 2021. Loan disbursed amount was Rs. 23332 lakhs in year 2010 and that increased to Rs. 40822.4 lakhs in year 2021. Cumulative loan disbursed amount was Rs. 23332 in year 2010 and rose to Rs. 267861.8 in year 2021. Amount of Gross NPA against SHGs was Rs. 1169.8 lakhs in year 2011 that increased to Rs. 3626.5 lakhs in year 2021. Amount Recovered (Previous O/S-Current O/S-NPA) was Rs. -3167.51 lakhs in year 2011 but regret to mention here that it declined by huge margin to -7188.76 lakhs in year 2021. Recovery Rate (Amount Recovered/ Loan Amount) was -10.81 in year 2011 but it became -2.68 in year 2021.

**Table-2 Recovery Rate of RRBs in Rajasthan**

| RRBs | | | | | | |
|---|---|---|---|---|---|---|
| | **Loan O/S Amount** | **Loan Disbursed Amount** | **Cumm. Loan Disbursed Amount** | **Amount of Gross NPA against SHGs** | **Amount Recovered (Previous O/S-Current O/S-NPA)** | **Recovery Rate (Amount Recovered/ Loan Amount)** |
| **2011** | 11371 | 5544.2 | 17806.66 | 891.12 | -6117.87 | -34.36 |
| **2012** | 13668 | 6053.5 | 23860.17 | 460.71 | -2756.98 | -11.55 |
| **2013** | 12226 | 4702.9 | 28563.06 | 1546.7 | -105.19 | -0.37 |
| **2014** | 11799 | 3002.7 | 31565.75 | 482.8 | -55.68 | -0.18 |
| **2015** | 11118 | 2744.2 | 34309.93 | 1727.5 | -1046.86 | -3.05 |
| **2016** | 9859.5 | 2841.6 | 37151.5 | 4042.2 | -2783.41 | -7.49 |
| **2017** | 9902.5 | 11647 | 48798.84 | 3348.8 | -3391.79 | -6.95 |
| **2018** | 10807 | 8239 | 57037.85 | 3264.4 | -4169.33 | -7.31 |
| **2019** | 11076 | 8555.8 | 65593.66 | 2968.9 | -3237.53 | -4.94 |
| **2020** | 13107 | 16430 | 82023.98 | 2374.8 | -4406.12 | -5.37 |
| **2021** | 20055 | 26507.6 | 108531.6 | 998.6 | -7946.01 | -7.32 |

Loan outstanding amount for RRBs was Rs. 11118 lakhs in year 2015 that has been raised to Rs. 20055 lakhs in year 2021. Loan disbursed amount was Rs. 2744.2 lakhs in year 2015 and that increased to Rs. 26507.6 lakhs in year 2021. Cumulative loan disbursed amount was Rs. 34309.93 in year 2015 and rose to Rs. 108531.6 in year 2021. Amount of Gross NPA against SHGs was Rs. 1727.5 lakhs in year 2015 that decreased to Rs. 998.6 lakhs in year 2021. Amount Recovered (Previous O/S-Current O/S-NPA) was Rs. (-) 1046.86 lakhs in year 2015 but regret to mention here that it declined by huge margin to (-) Rs. 7946.01 lakhs in year 2021. Recovery Rate (Amount Recovered/ Loan Amount) was (-) 3.05 in year 2015 and it went more negative (-) 7.32 in year 2021.

**Table-3 Recovery Rate of cooperative banks in Rajasthan**

| | Loan O/S Amount | Loan Disbursed Amount | Cumm. Loan Disbursed Amount | Amount of Gross NPA against SHGs | Amount Recovered ( Previous O/S-Current O/S-NPA) | Recovery Rate ( Amount Recovered/ Loan Amount) |
|---|---|---|---|---|---|---|
| **2011** | 11006 | 8295.4 | 21021.6 | 1720 | -10997.3 | -52.31 |
| **2012** | 11958 | 5430.1 | 26451.72 | 1615.7 | -2566.98 | -9.70 |
| **2013** | 10935 | 5368.5 | 31820.17 | 1958.9 | -936.44 | -2.94 |
| **2014** | 10878 | 4756.1 | 36576.28 | 1843.6 | -1786.9 | -4.89 |
| **2015** | 7529.5 | 6289.1 | 42865.38 | 1256.6 | 2092.33 | 4.88 |
| **2016** | 15821 | 6196.5 | 49061.88 | 3622 | -11913.9 | -24.28 |
| **2017** | 12009 | 1803.1 | 50864.97 | 2401.3 | 1410.73 | 2.77 |
| **2018** | 10300 | 1428.3 | 52293.27 | 2649.1 | -939.77 | -1.80 |
| **2019** | 9718.4 | 1603.1 | 53896.4 | 2848.1 | -2266.32 | -4.20 |
| **2020** | 6880.3 | 1005.8 | 54902.15 | 4285 | -1446.9 | -2.64 |
| **2021** | 5496.8 | 24668.5 | 79570.64 | 3878.5 | -2494.97 | -3.14 |

Loan outstanding amount for cooperative banks was Rs. 7529.5 lakhs in year 2015 that has been raised to Rs. 5496.8 lakhs in year 2021. Loan disbursed amount was Rs. 6289.1 lakhs in year 2015 and that increased to Rs. 24668.5 lakhs in year 2021. Cumulative loan disbursed amount was Rs. 42865.38 in year 2015 and rose to Rs. 79570.64 in year 2021. Amount of Gross NPA

against SHGs was Rs. 1256.6 lakhs in year 2015 that increased to Rs. 3878.5 lakhs in year 2021. Amount Recovered (Previous O/S-Current O/S-NPA) was Rs. 2092.33 lakhs in year 2015 but regret to mention here that it declined by huge margin to (-) Rs. 2494.97 lakhs in year 2021. Recovery Rate (Amount Recovered/ Loan Amount) was 4.88 in year 2015 and it went more negative (-) 3.14 in year 2021.

**Table-4 Recovery Rate of cooperative banks in Rajasthan**

| | Total | | | | | |
|---|---|---|---|---|---|---|
| | **Loan O/S Amount** | **Loan Disbursed Amount** | **Cumm. Loan Disbursed Amount** | **Amount of Gross NPA against SHGs** | **Amount Recovered ( Previous O/S-Current O/S-NPA)** | **Recovery Rate ( Amount Recovered/ Loan Amount)** |
| **2011** | 44540 | 19815 | 68136.2 | 3780.9 | -20282.6 | -29.77 |
| **2012** | 71490 | 18273 | 86409.57 | 4636.3 | -31586.5 | -36.55 |
| **2013** | 63294 | 21088 | 107498 | 7563.4 | 632.4 | 0.59 |
| **2014** | 64229 | 19460 | 126957.8 | 7829.4 | -8763.95 | -6.90 |
| **2015** | 108019 | 28921 | 155878.6 | 9062 | -52852 | -33.91 |
| **2016** | 65183 | 32177 | 188055.7 | 22190 | 20646.11 | 10.98 |
| **2017** | 52954 | 40651 | 228706.5 | 13427 | -1198.35 | -0.52 |
| **2018** | 49689 | 32594 | 261300.5 | 11415 | -8149.31 | -3.12 |
| **2019** | 58544 | 43819 | 305119 | 9987.1 | -18842.3 | -6.18 |
| **2020** | 72106 | 58847 | 363965.6 | 11393 | -24955.1 | -6.86 |
| **2021** | 81233 | 68356.5 | 432322.1 | 8503.5 | -17629.7 | -4.08 |

Loan outstanding amount for all type of selected banks as a whole was Rs. 108019 lakhs in year 2015 that has been declined to Rs. 81233 lakhs in year 2021. Loan disbursed amount was

Rs. 28921 lakhs in year 2015 and that increased to Rs. 68356.5 lakhs in year 2021. Cumulative loan disbursed amount was Rs. 155878.6 in year 2015 and rose to Rs. 432322.1 in year 2021. Amount of Gross NPA against SHGs was Rs. 9062 lakhs in year 2015 that increased to Rs. 8503.5 lakhs in year 2021. Amount Recovered (Previous O/S-Current O/S-NPA) was Rs. -52852 lakhs in year 2015 but regret to mention here that it declined by huge margin to (-) Rs. 17629.7 lakhs in year 2021. Recovery Rate (Amount Recovered/ Loan Amount) was -33.91 in year 2015 and it went more negative (-) 4.08 in year 2021.
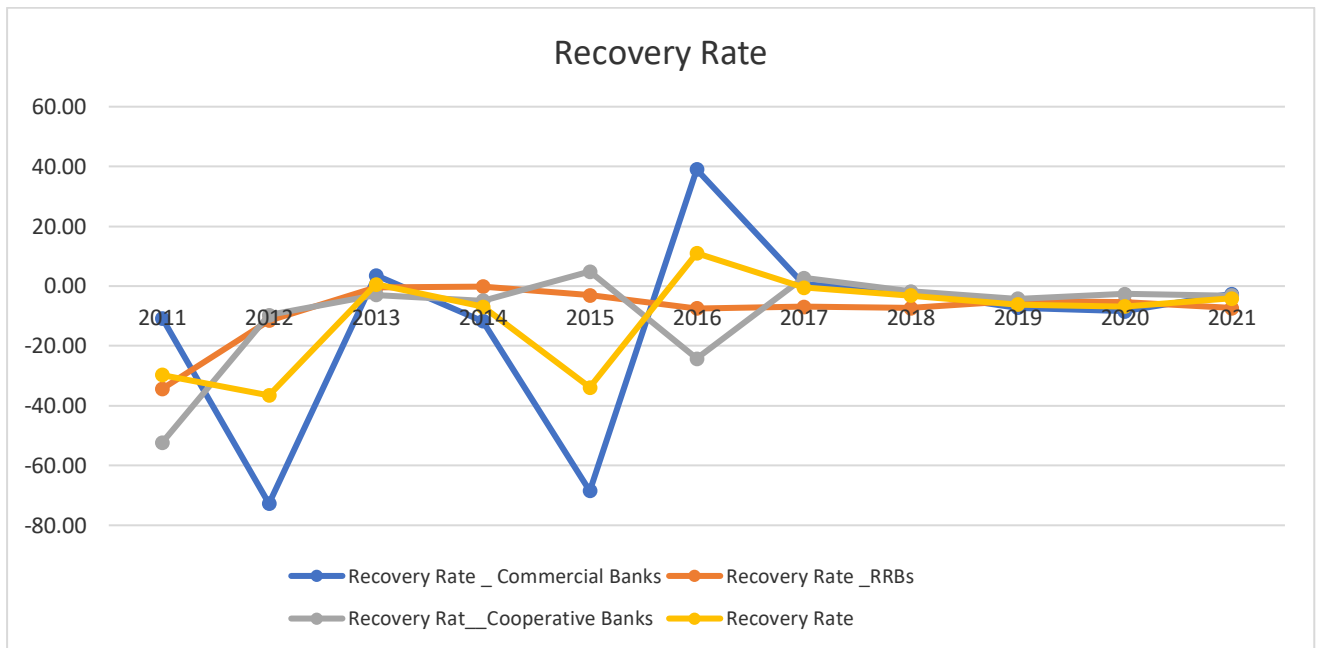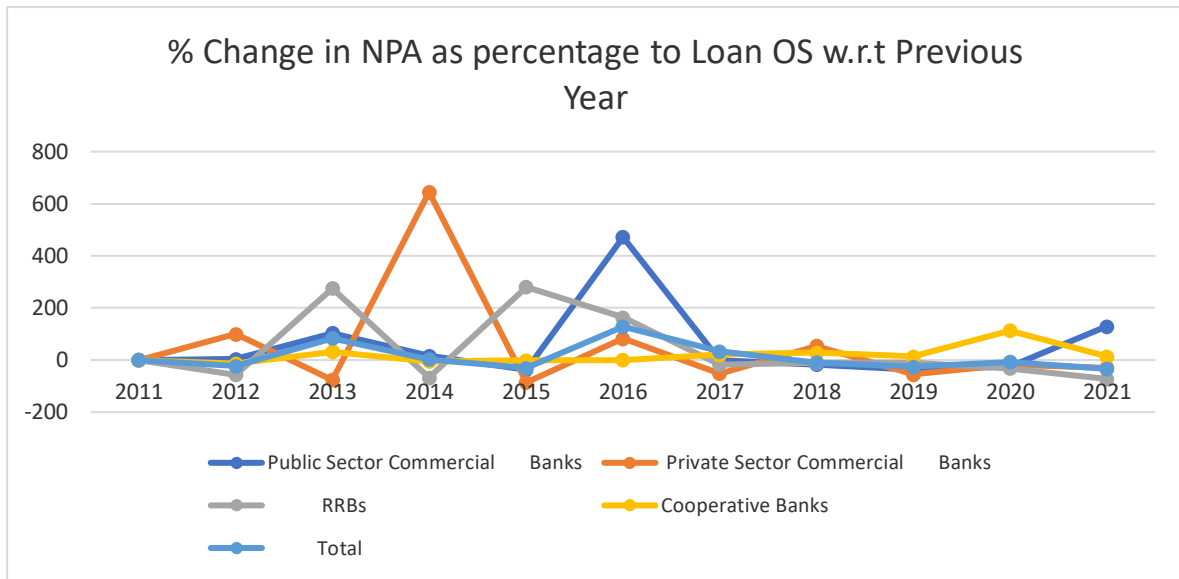


Graph:1

Graph:2

Graph:3



Graph:4

**% Change in NPA as percentage to Loan OS w.r.t Previous Year**
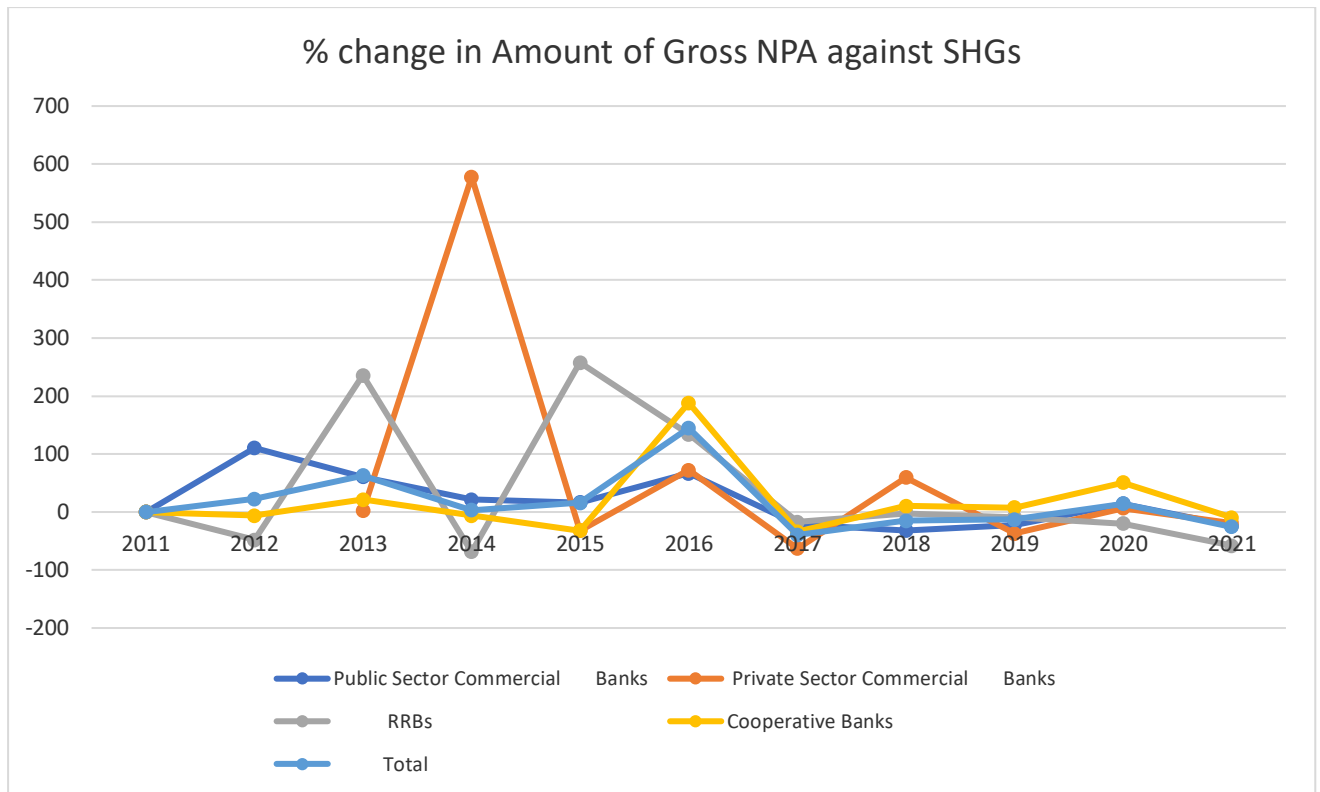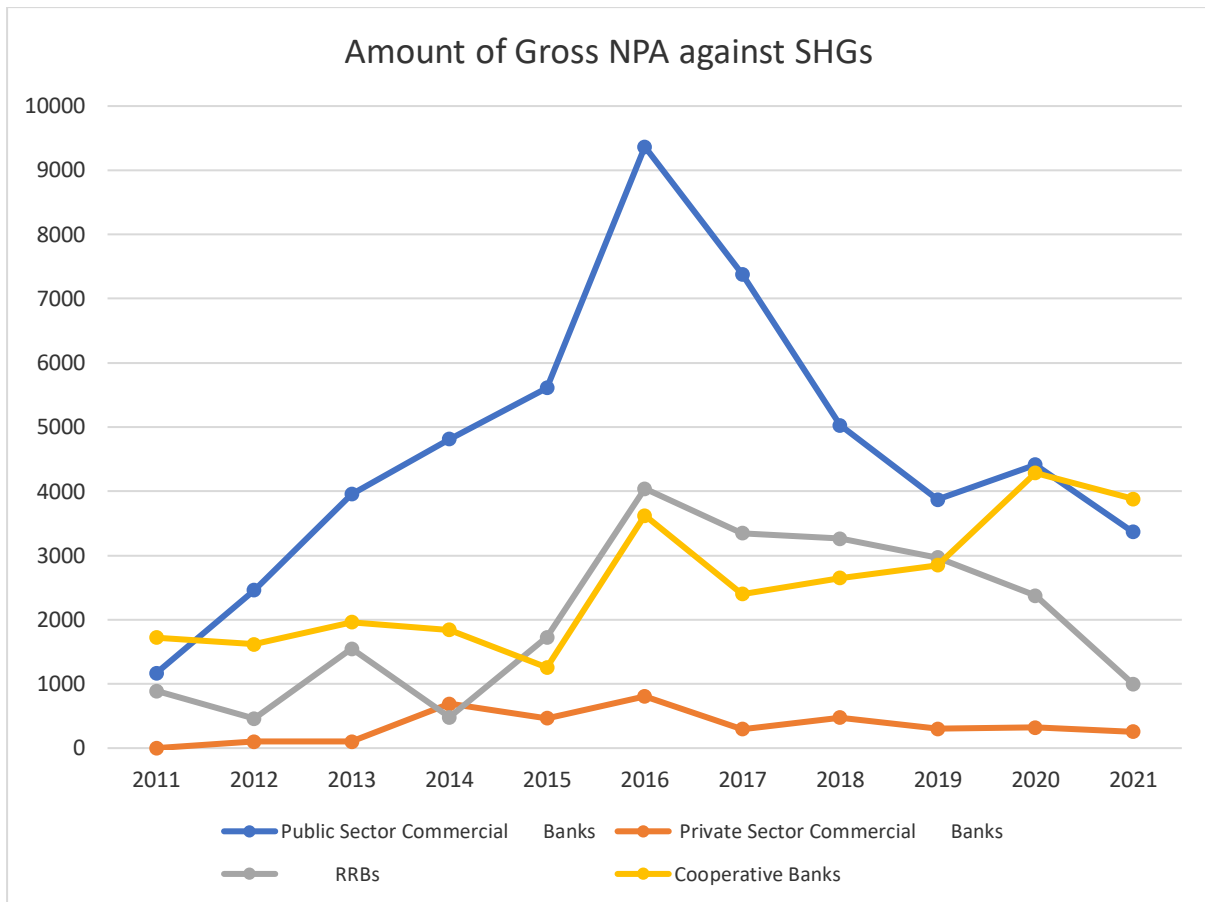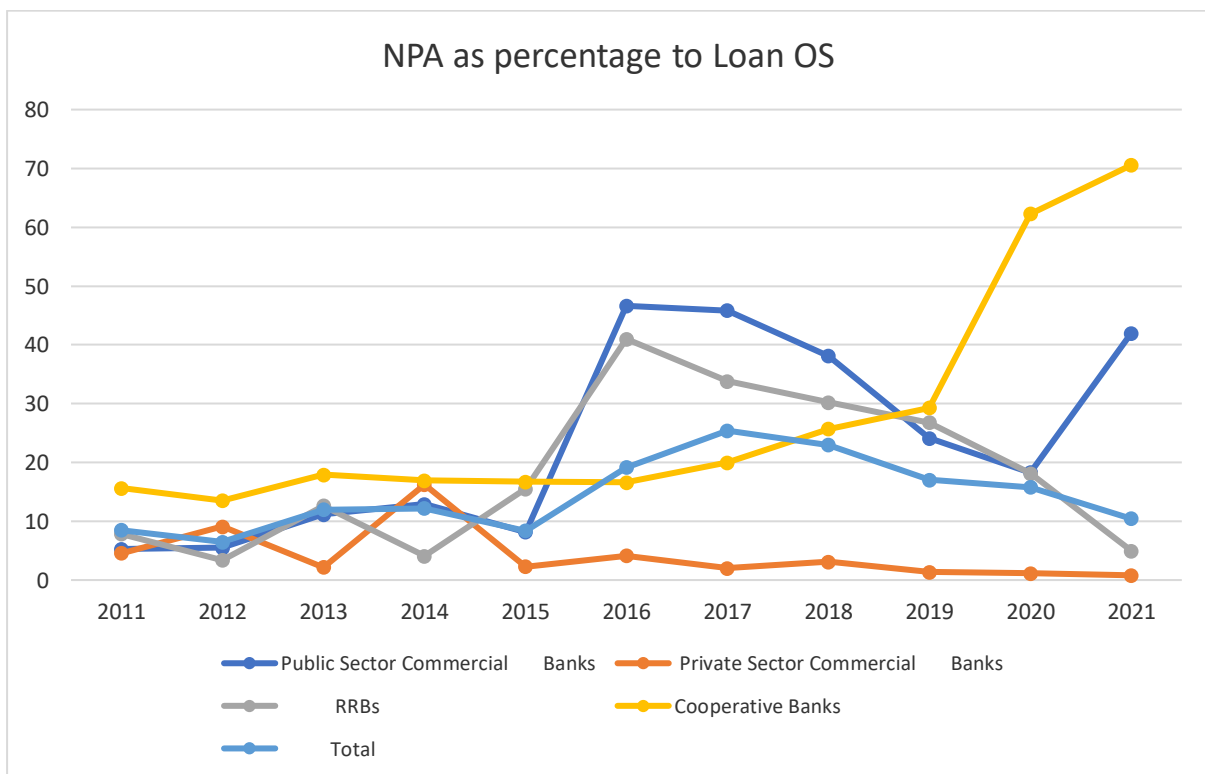
Graph:5

In these tables above, Recovery Performance of selected Banks is shown. During these years, on an average Loan O/S Amount, Loan Disbursed Amount, Cumulative Loan Disbursed Amount, Amount of Gross NPA against SHGs is found highest for commercial banks. Recovery rate is comparatively way better for RRBs. In the case of Public Sector Commercial Banks, Recovery Rate was highest (12.46) in year 2016 whereas it was lowest (-0.70) in year 2020. Private sector banks have shown negative recovery rate during the study period except year 2016 and 2017 where recovery rate was 0.01 and 0.09% only. RRBs have shown declining trend throughout the study period and same as cooperative banks.

**Results of Hypothesis Testing:**

Following sections presents comparison of Commercial Banks, RRBs and Cooperative Banks in Rajasthan

**H0: Recovery performance of selected banks is Equal.**

**Ha: Recovery performance of selected banks is not same.**

|  | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | |
|---|---|---|---|---|---|---|
|  |  |  |  |  | Lower Bound | Upper Bound |
| Commercial Banks | 11 | -12.8145 | 31.77829 | 9.58152 | -34.1635 | 8.5344 |
| RRBs | 11 | -8.0809 | 9.32649 | 2.81204 | -14.3465 | -1.8153 |
| Cooperative Banks | 11 | -8.9318 | 16.26083 | 4.90282 | -19.8560 | 1.9924 |
| Total | 33 | -9.9424 | 20.73092 | 3.60879 | -17.2933 | -2.5916 |

**ANOVA-** Recovery Rate (5% Level of Significance)

|  | Sum of Squares | Df | Mean Square | F | Sig. |  |
|---|---|---|---|---|---|---|
| Between Groups | 140.092 | 2 | 70.046 | .154 | .858 |  |
| Within Groups | 13612.579 | 30 | 453.753 |  |  |  |
| Total | 13752.671 | 32 |  |  |  |  |

Recovery performance of selected banks is equal since the P value > 0.05. Thus, null hypothesis is accepted and it can be stated that the commercial, RRBs, Cooperative banks of Rajasthan are at a similar position in terms of recovering loans. Recovery performance is negative for Commercial Banks, RRBs and Cooperative Banks. Although RRB found with better recovery rate as compared to other categories of banks.

## Conclusion

The paper reveals a clear declining trend in the NPA levels of SHGs during the final year compared to the initial year, which is a positive development. However, achieving a higher recovery rate for NPAs remains a desirable goal. Amongst the studied banks, commercial banks, RRBs, and cooperative banks all show negative recovery performance, despite RRBs having a relatively higher recovery rate. This indicates that NPA continues to be a significant concern for banks across Rajasthan.

Though there hasn't been a drastic and continuous increase in NPAs over the last five years, it remains a formidable challenge for the recovery of bad loans. The banking sector faces recessionary pressures, which contribute to the growth of NPAs, necessitating proactive measures to manage credit risk efficiently. To maintain a healthy and viable banking environment, banks need to address the increased level of NPA additions, focusing on improved credit risk management. By adhering to the norms set by the Finance Ministry and the Reserve Bank of India, banks can take proactive steps to control Non-Performing Assets.

Ensuring better sustainability for Rajasthan's banks entails reducing NPAs, and this can be achieved through adopting appropriate legal and diplomatic strategies for effective loan recovery.

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# Green Accounting in India as a Sustainable Vision for Future: A Review

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## 1    Abstract

*The term "green accounting" refers to the measurement of environmental and natural resource accounting, which typically covers the organization's natural and environmental assets and resources. It has always been of the utmost importance to protect the environment. The ecology is deteriorating, primarily as a result of many types of pollution, including soil erosion, noise, water, and air pollution, and deforestation. This kind of degradation would be fuelled, in part, by developing sectors for economic expansion.*

*Green accounting, commonly referred to as environment accounting or natural resource accounting is a tool used to measure the harm produced by business activities and the benefits obtained from the environment. A clearly defined environmental policy can help provide a framework for addressing environmental challenges and promoting sustainable development. This policy should outline the government's objectives, goals, and targets for environmental protection and management, as well as the strategies and measures to achieve them. This can include regulations and incentives to reduce environmental pollution, protect natural resources, and promote sustainable practices in various sectors of the economy. As a result, the current study also intends to analyze the necessity, goals, and advantages of green accounting for the long-term growth of 21st-century businesses in India.*

**Keywords**: Sustainability, Natural resources, Green accounting, Environment, and economic growth

## Introduction

Due to the growing business world and the need for sustainable development, industrial and corporate organizations all over the world are incorporating the idea of environmental consideration into their business operations. A measure that offers financial information certainty is called an account. In order to include both economic and environmental information, a subset of accounting known as "green accounting" was developed.

Green accounting, often known as environmental accounting, was created in 1980 by economist PETER WOOD. In today's "CSR", it is essential. The practice of accounting that considers the costs, impacts, and repercussions of the environment is known as green accounting. It is the statistics as a whole that are intimately related to the financial

element of the business and have a long-run effect on the organization's economic and environmental strategy.

Green accounting thereby increases our understanding of the cost of future pollution and the stock of human capital. (2005) Haripriya Gundimeda. The Corporation is trying to illustrate the nature of expended resources and the costs incurred by the organization in using them. Since the concept is equally important in the process of product design and development, this style of accounting can be referred to as environment oriented.

## 2 Conceptual Framework

A technique known as "green accounting" combines economic and environmental considerations. It defines how the business's environment is analyzed in order to achieve the target level of performance and, finally, analyses the skills needed to collect and access the data. Those reports are required by regulatory and corporate firm norms. The introduction of green accounting in developing nations is very beneficial for the country since it raises awareness of environmental damage, environmental development and protection. Its objective is to inform both the general public and corporate organizations about the part the environment plays in the growth of the economy.

Businesses and corporate entities set aside money for ecosystem balance and environmental pollution reduction through the use of green accounting. Thus, following the introduction of green accounting, businesses create unique environmental policies, implement necessary measures to reduce and control pollution, adhere to relevant laws and regulations, and finally, adequately detail environmental analysis in annual reports and financial statements.

## Types of green accounting

Following are three types of Green Accounting:

**1.** Environment Management Accounting includes identification, estimation, analysis, internal reporting, and utilization of data relating to resources and energy.

**2.** Accounting for environmental liabilities and other environmental costs is the focus of environmental financial accounting.

**3.** Environmental national accounting emphasizes externality costs and national resource.

## Need and importance for the study

In order to preserve and advance the environment, green accounting is necessary. Therefore, it is important to conduct the current study to familiarize people with the idea of green accounting and raise awareness of it. Reviewing its development, history, and significance is also a necessity of the current study. Those, who are already working on the study, and those, who might be interested in learning about green accounting, can be benefitted from the study.

It would motivate both the government and business to invest in eco-friendlier and effective technologies. It would support the creation of greener procedures and goods. Businesses have a moral obligation to do their share to lessen the damage they cause to the environment as good corporate citizens. Enhancing environmental behaviour can cut costs centred on the environmental management system.

**Review of Literatures**

**Solanki, Alka (2016)** concentrated on studying and analyzing the material that was already available on green accounting in order to comprehend how it had been examined and assessed by the various researchers who were working on it.

**Ms. Shavita Deshwal (2015)** provided insights into her assessments of particular organizations' green accounting and reporting methods. She chose 27 manufacturing and 23 non-manufacturing companies for their opinions on green accounting, and she created a draft questionnaire on 15 issues, including environmental policy, energy conservation, corporate sustainability, environmental initiative, sustainability reporting, and renewable energy sources. According to her findings from the "F"test, manufacturing and non-manufacturing enterprises significantly differ from one another in terms of the use of green practices adopted.

**Dr. Alka Mittal and Dr. Preeti Malik (2015)** focused on the steps that businesses must take in India to implement green accounting, such as identifying parameters, defining environmental targets, deciding and developing environmental indicators, and reporting environmental results.

**Robert Ombatiat.el (2015)** focused on the environment and its various contamination stages were covered. The paper also studied how green accounting promotes economic growth while maintaining a balance between environmental preservation.

**Objectives of Green Accounting:**

1) Discuss the value of a green accounting system.

2) Study necessity, goals, and advantages of green accounting for the long-term success of businesses in India.

**The advantages of implementing Green Accounting**

Green accounting offers a multitude of advantages encompassing various aspects of sustainability and organizational management. Some of its key benefits include:

Green accounting aids in effectively monitoring and controlling pollution levels, enabling organizations to implement eco-friendly practices and minimize their environmental impact. It facilitates efficient environmental administration and fosters responsible stewardship of natural resources. Through green accounting, companies can optimize their product distribution processes by factoring in environmental considerations. This approach ensures that goods are transported in an environmentally friendly manner, reducing carbon emissions and promoting sustainable logistics. Green accounting supports the implementation of a focused management system that aligns business practices with ecological objectives. It empowers organizations to prioritize sustainable initiatives and allocate resources efficiently to achieve environmental goals. Green accounting enables the assessment, testing, and documentation of the effectiveness of environmental actions undertaken by organizations. This data-driven approach facilitates evidence-based decision-making and continuous improvement in sustainability efforts. By integrating social, environmental, and economic aspects, green accounting assesses how company operations impact society, the environment, and the economy. This comprehensive evaluation helps organizations

understand their broader role in promoting sustainability. Green computing, as facilitated by green accounting, contributes to the achievement of sustainable development goals. It ensures the preservation of the value of goods and services while promoting economic growth, environmental conservation, and social responsibility.

Hence, green accounting serves as a powerful tool for organizations seeking to operate in an environmentally responsible manner. By embracing green accounting practices, companies can foster sustainable practices, enhance their environmental performance, and contribute positively to society and the economy.
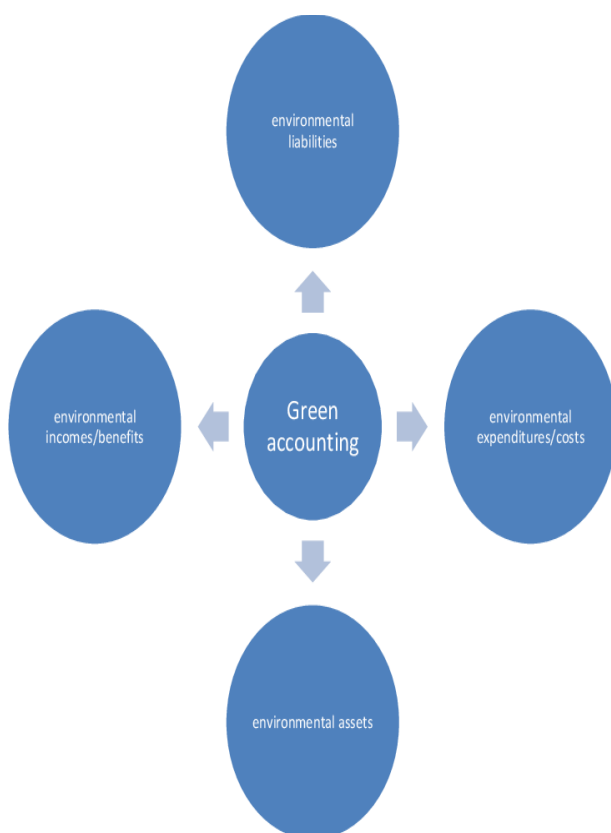


**Figure: Scope of Green Accounting**

## Green Accounting: Evidence from India

In the context of India, Green Accounting plays a crucial role in fostering sustainable development, requiring a well-defined environmental strategy, effective follow-up mechanisms, and sound accounting procedures. To measure the organization's overall environmental performance, environmental accounting must cover the following six aspects: identifying the parameters, defining the environmental reporting parameters, defining the environmental target to be attained, developing the environmental performance indicators, measuring the performance indicators, and reporting the performance results.

The first public statement on green accounting was released in 1991, immediately following the application of new economic principles. The Ministry proposed that "every company be in its board of director's report disclose briefly about the steps taken or proposed to be taken towards prevention of pollution, pollution control measures, adoption of pollution-free modern technologies, minimization of waste, recycling and utilization of wastages, investment on environment protection, conservation of water and scarce resources," and issued various directives.

The Ministry of Corporate Affairs announced national cooperative suggestions for national business voluntary guidelines (NVGs) in 2011 to enhance corporate social responsibility (CSR) operations. SEBI ordered the listed businesses to report in 2011 on the environmental and governance (ESG) efforts they had carried out in compliance with NVGs. In India, only a small number of businesses provide reliable

information about environmental issues.

Although green accounting is becoming more popular, in their annual reports, businesses present inaccurate and incomplete information. Green accounting techniques used in India have not been socially accepted by society, and businesses believe that, rather than being a profit-enhancing factor, advantageous to society.

**Negative aspects of Green Accounting**

- There isn't a standard accounting method.

- It is impossible to compare two firms' accounting systems if they are different.

- Green accounting does not have any accounting guidelines.

- Green accounting is not required outside of a few Indian industries.

- There aren't any accepted techniques for calculating the social value of environmental products and services.

**Suggestions and Conclusion**

While the majority of businesses mention their environmental initiatives in annual reports, this practice is minimal as it fails to disclose information about the financial implications and cost policies. Estimating the financial value of environmental liabilities and assets and integrating all environmental data with the current accounting system at a micro level may pose challenges. Therefore, it is recommended to embrace the 3R principle (Reducing, Reusing, and Recycling) wherever possible. Businesses should strive to eliminate electricity waste by turning off lights, computers, and other electronics when not in use. This could increase

the corporate sector's level of commitment to environmental protection and conservation. Additionally, the government should run some programmes to inform the business community about green accounting and how it is practised in firms. To monitor and investigate regularly green accounting and its use in commercial organizations, a special audit committee should be established. The government must also rely on technology to inform the populace of the environmental cost of India's development. This can be accomplished by ranking each project, be it public or private, based on how much it will cost the environment. Citizens should be informed as a result, and project managers should be made completely aware of their duty to ensure ecologically responsible development. In a nutshell, it can be said that Green Accounting presents challenges to accountants in ensuring organizational sustainability. Implementing Green Accounting is crucial in contributing to Climate Action, one of the Sustainable Development Goals (SDG) to be achieved by 2030.

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