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**THE CHALLENGES AND OPPORTUNITIES OF FINANCIAL INCLUSION IN  
DEVELOPING COUNTRIES: AN EMPIRICAL ANALYSIS.**

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***ABSTRACT***

*Financial inclusion has emerged as a key policy issue in recent years, as millions of people worldwide lack access to formal financial services. This paper provides a comprehensive review of the literature on financial inclusion, including its definition, measurement, and impact on economic growth and poverty reduction. The paper also examines the challenges and opportunities associated with promoting financial inclusion, including the role of technology, financial education, and consumer protection. The findings suggest that financial inclusion is a critical component of economic growth and poverty reduction, and that policymakers should focus on developing policies and strategies that expand access to financial services for all.*

***Keywords: Financial inclusion, financial education, economic growth, poverty reduction***

**INTRODUCTION:**

Financial inclusion has become a critical issue in recent years, as millions of individuals and businesses worldwide lack access to formal financial services. Financial inclusion refers to the ability of individuals and businesses to access affordable and reliable financial services, including savings, credit, insurance, and payment services. The lack of access to formal financial services can limit economic growth and exacerbate poverty and inequality. Despite significant progress made in promoting financial inclusion in recent years, many challenges and obstacles remain. This paper provides a comprehensive review of the literature on financial

inclusion, including its definition, measurement, and impact on economic growth and poverty reduction. The paper also examines the challenges and opportunities associated with promoting financial inclusion, drawing on recent research and case studies from around the world.

### **PURPOSE OF THE STUDY:**

The purpose of the study was to provide a comprehensive review of the literature on financial inclusion, including its definition, measurement, and impact on economic growth and poverty reduction. The study aimed to examine the challenges and opportunities associated with promoting financial inclusion, including the role of technology, financial education, and consumer protection.

### **LITERATURE REVIEW:**

Defining financial inclusion can be challenging, as it encompasses a range of financial services and activities, including savings, credit, insurance, and payment services. The World Bank defines financial inclusion as “access to useful and affordable financial products and services that meet the needs of individuals and businesses, and enable them to lead a financially secure life” (World Bank, 2018). This definition emphasizes the importance of both access and affordability, suggesting that financial services should be accessible to all, regardless of their income level, gender, or geographic location.

Measuring financial inclusion is also complex, as it requires data on a range of financial services and activities. One widely used measure of financial inclusion is the Global Findex Database, which provides data on financial inclusion for over 150 countries worldwide (Demirguc-Kunt et al., 2015). The Global Findex measures financial inclusion based on four indicators: account ownership, use of formal financial services, savings behaviour, and payment behavior. Other measures of financial inclusion include the World Bank’s Access to Finance Index and the Microfinance Information Exchange’s Composite Index.

Financial inclusion has been shown to have a positive impact on economic growth and poverty reduction. One way in which financial inclusion can promote economic growth is by increasing access to credit and other financial services, which can help to finance investments in education, healthcare, and business development. For example, a study by Bhagat and Das (2019) found that increasing financial inclusion can help to promote economic growth, particularly in countries with low levels of financial development. Another way in which

financial inclusion can promote economic growth is by reducing poverty and inequality. By providing access to financial services, individuals and businesses can better manage financial risks and improve their overall financial well-being. This can lead to increased economic productivity and reduced reliance on informal financial services, which can be costly and unreliable. A study by Allen et al. (2016) found that increasing financial inclusion can help to reduce income inequality and promote social mobility.

#### **OBJECTIVES OF THE STUDY:**

1. To provide a clear definition of financial inclusion and explore the various measures used to assess financial inclusion.
2. To examine the impact of financial inclusion on economic growth and poverty reduction, based on existing research and evidence.
3. To identify the main challenges and obstacles to promoting financial inclusion, including issues related to technology, financial literacy, consumer protection, and regulatory frameworks.
4. To review case studies from around the world that illustrate successful strategies and policies for promoting financial inclusion.

#### **AN OVERVIEW OF FINANCIAL INCLUSION:**

Financial inclusion refers to the access and usage of financial services, such as bank accounts, credit, insurance, and savings, by individuals and businesses. Financial inclusion is important because it can help promote economic development, reduce poverty, and improve financial stability.

The level of financial inclusion varies widely across the world. According to the World Bank's Global Findex database, about 1.7 billion adults worldwide remain unbanked, meaning they do not have a formal bank account. The vast majority of unbanked individuals live in developing countries, particularly in Sub-Saharan Africa and South Asia.

In recent years, there have been many initiatives aimed at promoting financial inclusion around the world. These initiatives have included the development of mobile banking services, the expansion of microfinance institutions, and the launch of government-led financial inclusion schemes.



Some countries have made significant progress in promoting financial inclusion. For example, in Kenya, mobile banking services like M-Pesa and M-Shwari have become popular and have helped increase financial inclusion. In India, the Jan Dhan Yojana scheme has helped millions of households gain access to basic banking services.

Other countries have also made strides in promoting financial inclusion, including Brazil, Indonesia, and Mexico. However, there is still much work to be done, particularly in Sub-Saharan Africa and South Asia, where the level of financial inclusion remains low.

Despite the significant benefits of financial inclusion, there are also many challenges and obstacles to promoting access to financial services for all. One of the most significant challenges is the cost of financial services, particularly in low-income and rural areas.

Another challenge to financial inclusion is the lack of financial literacy and education. Many individuals may not understand the benefits of formal financial services or may lack the skills needed to use these services effectively. This can lead to low uptake of financial services and limit the potential impact of financial inclusion on economic growth and poverty reduction. To address this challenge, many countries have implemented financial education programs and initiatives to increase financial literacy and awareness.

Consumer protection is another important consideration in promoting financial inclusion. As more individuals and businesses gain access to formal financial services, it is important to ensure that they are protected from fraud, abuse, and other risks. This requires strong regulatory frameworks and consumer protection policies that are designed to safeguard the interests of consumers and promote transparency and accountability in the financial sector.

Technology has also emerged as a key driver of financial inclusion, particularly in developing countries where traditional banking infrastructure may be limited. Mobile money services, for example, have become increasingly popular in many countries, allowing individuals and businesses to access financial services through their mobile phones. This has helped to expand access to financial services in areas where traditional banking infrastructure may be limited or non-existent. However, technological solutions also pose their own challenges, including issues related to cybersecurity and data privacy.

#### **CASE STUDIES:**

Case studies from around the world provide valuable insights into the challenges and

opportunities associated with promoting financial inclusion. For example, in India, the government has implemented a number of policies and initiatives aimed at expanding access to formal financial services, including the Jan Dhan Yojana program, which aims to provide access to bank accounts for all households in the country. This program has been successful in increasing financial inclusion in India, with over 400 million bank accounts opened since its launch in 2014 (Government of India, 2019).

In Kenya, the M-Pesa mobile money service has become a popular alternative to traditional banking services, particularly in rural areas where access to formal financial services is limited. The M-Pesa service allows users to transfer money, pay bills, and access other financial services through their mobile phones. Since its launch in 2007, the service has grown rapidly, with over 20 million active users in Kenya and other countries (Safaricom, 2020).

1. **M-Pesa, Kenya:** M-Pesa is a mobile banking service launched in Kenya in 2007 by Safaricom, a mobile network operator. It allows users to send and receive money, pay bills, and access other financial services using their mobile phones. M-Pesa has been successful in promoting financial inclusion in Kenya, where many people previously had limited access to formal banking services.
2. **Jan Dhan Yojana, India:** Jan Dhan Yojana is a financial inclusion scheme launched by the Indian government in 2014. It aims to provide access to basic banking services, such as savings accounts, credit, insurance, and pensions, to all households in India. The scheme has been successful in opening millions of new bank accounts and promoting financial literacy in rural and low-income areas of India.
3. **Grameen Bank, Bangladesh:** Grameen Bank is a microfinance institution founded in Bangladesh in 1983 by Muhammad Yunus. It provides small loans to poor women to help them start businesses and improve their livelihoods. Grameen Bank has been successful in promoting financial inclusion and reducing poverty in Bangladesh and other countries where it operates.
4. **Banco Palmas, Brazil:** Banco Palmas is a community bank founded in 1998 in a low-income neighbourhood of Fortaleza, Brazil. It provides financial services, such as savings accounts, loans, and insurance, to residents of the neighbourhood. Banco Palmas has been successful in promoting economic development and reducing poverty in the area.

5. **M-Shwari, Kenya:** M-Shwari is a mobile banking service launched in Kenya in 2012 by Commercial Bank of Africa and Safaricom. It allows users to save money, borrow money, and access other financial services using their mobile phones. M-Shwari has been successful in promoting financial inclusion and increasing access to credit in Kenya.

#### **CHALLENGES TO FINANCIAL INCLUSION:**

1. **Lack of access to financial services:** Many people, particularly in low-income and rural areas, lack access to formal financial services such as bank branches and ATMs. This can limit their ability to save, borrow, and invest in their future.
2. **Low financial literacy:** Many people may not understand how to use financial services, which can prevent them from accessing or benefiting from these services.
3. **High transaction costs:** Financial institutions may charge high fees for services, such as opening and maintaining accounts or transferring money, which can make it prohibitively expensive for some people to use these services.
4. **Insufficient infrastructure:** In some areas, there may be inadequate telecommunications and electricity infrastructure, which can limit the availability and effectiveness of mobile banking and other digital financial services.
5. **Lack of trust:** Some people may not trust formal financial institutions, which can prevent them from using their services or seeking financial advice.
6. **Inadequate regulatory environment:** The regulatory environment may not be conducive to expanding financial services, or regulations may be too restrictive or complex, which can limit the ability of financial institutions to expand services to underserved communities.

#### **OPPORTUNITIES TO FINANCIAL INCLUSION:**

1. **Mobile Banking:** Mobile banking offers a cost-effective and convenient way for individuals to access financial services, such as opening accounts, making deposits, withdrawals, and transferring funds, even in remote areas without traditional bank branches.
2. **Microfinance:** Microfinance institutions provide small loans and other financial services to low-income individuals, who often lack access to traditional financial services. These

loans help entrepreneurs start or expand their businesses, generating income and employment opportunities.

3. **Digital Payments:** Digital payments, such as mobile money, electronic wallets, and online banking, offer an alternative to cash transactions, increasing convenience and security while reducing the risks of fraud, theft, and corruption.
4. **Financial Education:** Financial education can empower individuals and communities with the knowledge and skills necessary to make informed financial decisions, manage their finances effectively, and avoid predatory lending practices.
5. **Government Policies:** Governments can implement policies and regulations to promote financial inclusion, such as creating a supportive legal and regulatory environment, establishing financial literacy programs, and providing incentives to financial institutions that serve underserved communities.
6. **Partnerships:** Partnerships between financial institutions, NGOs, government agencies, and other stakeholders can leverage resources and expertise to develop innovative and sustainable solutions for financial inclusion.

#### **FINDINGS:**

The findings suggest that financial inclusion is a critical component of economic growth and poverty reduction, and that policymakers should focus on developing policies and strategies that expand access to financial services for all. While there are many challenges and obstacles to promoting financial inclusion, there are also many opportunities and success stories from around the world that provide valuable insights into how best to promote financial inclusion. By working together to develop innovative solutions and policies, policymakers, regulators, and other stakeholders can help to ensure that financial inclusion becomes a reality for all.

#### **CONCLUSION:**

Financial inclusion has emerged as a critical policy issue in recent years, as millions of individuals and businesses worldwide lack access to formal financial services. This paper has provided a comprehensive review of the literature on financial inclusion, including its definition, measurement, and impact on economic growth and poverty reduction. The paper has also examined the challenges and opportunities associated with promoting financial inclusion, including the role of technology, financial education, and consumer protection.

Overall, financial inclusion is an important issue that can help promote economic development and reduce poverty around the world. While progress has been made in recent years, there is still a need for continued efforts to expand access to financial services to underserved communities.

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## An Empirical Study on Awareness of Stock Market among the Youths

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### **Abstract:**

*Investment in stock market requires proper knowledge of stock market and also to build efficient portfolio. The present study is to analyze the awareness of stock market among the youths and their perception towards investment avenues. Youths of age from seventeen to thirty five has been selected as the sample for collecting the data through questionnaire. The study is an attempt to understand the benefits of applications of investors' education and awareness on the investing pattern.*

**Keywords:** *Over The Counter (OTC), Stock Exchange, Volatility, Diversification.*

### **Introduction**

Investment is placing the money in different available avenues to maximize return. Investment is an act of committing money or capital to an endeavour with the expectation of obtaining an additional income or profit. This is successful if an investor has proper financial knowledge and is aware about the various investment avenues like stock market, fixed deposits, gold, real estate and post office schemes. The perception of investors are different and invest in different commodities but with the common objective of maximizing returns with minimum risk and to safety return. Stock markets are venues where buyers and sellers meet to exchange the shares. Stock markets are vital components of a free-market economy because they give access to trading and exchange of capital for investors of all kinds.

## Review of Literature

- **Aabida Akhter, Mohi-ud-Din Sangmi (October 2015):** This study is an attempt to assess the awareness of youth about various aspects of stock market including concepts, products, processes, institutions etc. The results of the study reveal that the sample youth possess low to moderate level of stock market knowledge and the awareness level is not significantly different among different sample groups based on the discipline they are studying.
- **Abeyratna Gunasekarage, Anirut Pisedtasalasai, David M (December 2004):** This study examines the influence of macro-economic variables on stock market equity values in Sri Lanka. The tests examine both long-run and short-run relationships between the stock market index and the economic variables. However, the share price index does not have any influence on macro-economic variables except for the treasury bill rate.
- **Jigar Shah (2016):** This research paper focuses in finding out the answers to alarming questions – “Is the netizen really aware that he/she is vulnerable to various cyber-crimes?”; “If netizen is aware, to what extent?”, “If not aware of cybercrimes, what measures can be adopted to make the netizen more aware and updated. The paper suggested a conceptual model explaining how to uphold and implement the awareness programmes among internet users regarding cybercrimes.
- **Rachana Chawda (2019):** An Educated Investor is a Protected Investor – The regulator of the capital market SEBI BSE, NSE, Broking companies and various APPLICATIONS are understanding this and are taking various steps to educate the individual investors in the country. Majority of those who have read and using the applications find them useful in taking better investment decisions. The young investors who have study these education applications want some new topics like Derivatives, Technical Analysis, Fundamental Analysis, Investor Protection, etc. to be covered in addition to their information.
- **R Kamalakannan (2019):** This study finds that social media helps to learn new opportunities by 68% of the people while 72% utilize social media for

entertainment. Social media being used for job searching was expressed by 55%. Too much Utilization of social media causes health problems was by 60% of the respondents. Social media as means of Communicating with friends was what 65% of subjects expressed. 59% said social media being used to do online shopping.

- **Luigi Guiso & Tullio Jappelli (August 2004):** The paper explores the determinants of awareness and the respondents are aware of stocks, mutual funds. Investment accounts are positively correlated with education, household resources, long-term bank relations and proxies for social interaction. Lack of financial awareness has important implications for understanding the stockholding puzzle and for estimating stock market participation costs.
- **Davidson E (2008):** The author explores the contemporary politics of social reproduction among middle-class youth in Silicon Valley during the economic downturn subsequent to the tech boom of the 1990s. The findings include that middle-class youth bear increasing responsibility for middle-class status. The pressures resulting from this burden and the ways in which young people negotiate them suggest a domestic politics of 'hyper-vigilance' that may transform young people's self-perceptions, attitudes towards schooling and aspirations, while also potentially posing risks to youth.
- **Sindambiwe P (2014):** This study on "Financial literacy, Stock Market Awareness and Capital Market Participation of an emerging stock market" focused on the case of Rwandan Stock Exchange had a purpose of investigating how stock market awareness of leaders of selected organizations affects their level of participation on Rwandan capital market. Conducted as descriptive correlative design, this research collected both qualitative and quantitative data using a questionnaire and interview as tools from a sample of 91 organizations. The main findings are that Directors have a high financial literacy while the level of organizations' participation in the Rwandan stock market is moderate; the application of financial literacy of Directors in daily business is high. The Manufacturing or trading companies have the lowest stock market awareness as well as the lowest level of stock market participation.



## Objectives of the Study

- To measure the level of awareness of youth regarding stock market products and investment avenues.
- To evaluate the perception of the youth on the role of media in spreading stockmarket knowledge.
- To know about the savings techniques for investment.
- To determine the level of financial knowledge among the youth.

## Research Methodology

**Research Design:** The study is a descriptive type of research.

### Source of Data:

- Data required for the study is obtained from both primary and secondary sources.
- As a primary source Survey-method was followed for collecting the data. For this structured questionnaire was prepared to collect data from the respondents.
- Secondary source of data was collected from SEBI, BSE, NSE annual reports.

**Sample Description:** The sampling unit is 105 youths in age group of 17 to 35

## Limitations of the Study

- The study is limited to only the young investors of the age group 17-35 years.

## DATA ANALYSIS AND INTERPRETATION

**Table No.1: Table showing the responses of youths**

Sl. No.	Questions	Responses			
1.	Are you aware of savings & investment concept	Yes (78%)	No (8%)	May be (14%)	—
2.	Why do you save/invest in stock market	Precaution (34%)	Need for future (15%)	ROI (51%)	—
3.	How much of your income do you invest/save for future	Upto 10% (33%)	10% - 20% (40%)	20% - 40% (23%)	Above 50% (4%)
4.	Do you know about stock exchange (NSE/BSE)	Yes (65%)	No (22%)	May be (13%)	—

5.	Which investment method do you prefer	Equity (40%)	Commodity (7%)	Mutual funds (41%)	Bonds / FD (12%)
6.	If you choose to invest, which one do you prefer	One time investment (56%)	SIP (44%)	—	—
7.	If you invest in equity – which one do you prefer	Cash (35%)	Derivatives (12%)	Both (53%)	—
8.	Which of the following is your source of information for savings/investment	TV channel social media (36%)	Newspaper (9%)	Stock broker (11%)	Family & friends (44%)
9.	Which factor do you consider while choosing an investment option	ROI (56%)	Stability (22%)	Risk (16%)	Tax benefits (6%)
10.	Which risk pattern do you look for	HR-HR	LR-LR	AR-AR	—

### Findings of the Study

- Out of total responses collected 60% are male and 40% are female.
- Majority of the form was filled by the young group having the age between 17 & 30.
- As per the study, more than 70% of the respondents are aware of the savings concept in this digital growing economy.
- 51% of the young generation are investing to get higher return on investment of their savings.
- Majority of the respondents opined that they save between 10% & 20% of their total income and invest in various investment avenues.
- It is found from the study that 65% of the respondents are aware of the stock exchange and have information about the investing concept.
- Nearly 40% of the respondents stated that they invest in equity shares for better return on investment and up to 41% of the investors invest in mutual fund for the safe and average return on investment.
- As per the study, majority of investors invest in SIP due to minimum risk & average return.
  - As majority of the respondents are aware of the investment concept, they invest in both cash and derivatives and balance their portfolio.
  - Out of the total youths sample, 44% of them get influence from their family and friends to invest their money in stock market for returns and 36% of the respondents get to know with the help of social media and TV channel.

## Conclusion

Stock market awareness in Indians youth is growing. Many young people now have experienced the power and joy of investing in stocks, bonds and real estate. They are more comfortable with their finances, better prepared for emergencies and less likely to need credit cards than in previous generations. The first-time investors rely heavily on family members and on educational material on applications. They strongly feel that such study material is very useful in promoting trading and through applications information. Every investor invests to earn higher return on investment with low risk and stability and compounding growth of their portfolio. In long run everybody looks for average risk and average return as to grow their portfolio and start savings constantly.

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## A Study on Work-Life Balance of Working Women in Bangalore

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### ***Abstract***

*This study mainly focuses on the work-life balance of working women. Due to women bearing an equal share of the cost of raising their offspring, the necessity of work-life balance has grown. Today, there are more working women than ever before. The purpose is to find that the whether the working women are able to balance their work-life or not. Here the data used is primary data and the sample size is limited to 101. The test performed here is Chi square test. The findings and solutions of the test are discussed in the paper. There is a significant difference in the level of satisfaction with work-life balance of working women.*

***Keywords: Work-life Balance, Working Women, Personal life, Professional life***

### **Introduction**

Over the past 50 years, there have been significant changes in the roles and expectations placed on men and women. One result has been a change in how important work is in comparison to family and leisure. There are currently more women working than ever before, which reflects increased educational levels, shifting cultural views, and declining birth rates.

The importance of women's work-life balance has increased because of their equal participation of the financial burden of raising their families. Women are entering the workforce, and they do so even after being married. When it comes to caring for small children and families, married women have greater responsibilities than men. By being devoted and persistent, the working women successfully navigate challenging circumstances. Women who engage in income generating activities are better able to meet their domestic demands to a larger extent.

## Work-Life Balance

The word "work-life balance" (WLB) refers to both employees' and employers' desire to strike a balance between their professional and personal commitments. Life and work are equally crucial for every firm to manage. In this circumstance, an employee must strike a balance between their personal and professional life. They must comprehend how much and how long they must put in to work hard so that, in the end, an employee will have both personal and professional fulfilment.

## Review of Literature

### Work-Life Balance of Working Women

**K. Thriveni Kumari, Dr.V.Rama Devi (2015)**, The research looks at the work life balance of female employees and analyses numerous aspects that impact it. Maintaining a balance between carrying out duties and obligations at work and at home is referred to as work life balance. One of the most difficult problems facing female professionals in the 21st century is work life balance. Because of the responsibilities they perform at home.

**G.Delina, Dr. R. Prabhakara Raya (2013)**, Because of societal pressures and economic realities, the position of working women has altered globally. This has led to a situation where working women are under enormous pressure to have a profession that is as strong as that of their male counterparts while maintaining an active personal life.

**R. Balaji (2014)**, Women's work life balance in the IT industry is becoming one of the most hotly debated issues. It's crucial to take into account the effects these factors have on the mental health and wellbeing of working women.

**Anju Sigroha (2014)**, This study compares and contrasts how three business sectors in India perceive how work life balance facilities affect workers' overall performance (Manufacturing, service, IT sector). While the world of today may be defined by ground breaking inventions and faster growth and development in every conceivable industry, the prolonged working hours are the other side of the coin juggling work and home responsibilities may be quite challenging for women.

**J. Sudha, Dr. P. Karthikeyan (2014)**, This article provides an outline of the different difficulties and problems women workers have to deal with in order to attain WLB. How to strike a balance between the demands of family and job is the largest difficulty facing women. In relation to work-life balance and related practises, the literature highlights numerous factors

including professional progress, work stress, career desire, work family conflict, and family work conflict.

**A. Pandu, A. Balu & K. Pooran (2013)**, the current article offers a better knowledge of how women workers in the IT and IT businesses combine their professional and personal lives. 80 IT personnel participated in a poll about their own experiences. An employee's sense of balance is strongly influenced by their attitudes about their jobs, their family members, and their absence from the office.

**S. Lakshmi Narayanan, A. Savarimuthu (2015)**, This article's goal is to examine how work-family and family work conflicts affect the work life balance of women employees working in Bengaluru's information technology industry. According to the research, family work conflict does not significantly affect work-life balance, however work-family conflict does.

**Jaya Bhalla** The work life balance techniques used by women leaders in various sectors are examined in this essay. The researcher has examined the many stresses brought on by incorrect WLB and the various measures implemented by the company to increase the flexibility and satisfaction of its female employees.

**Mansi Tiwari (2017)**, The lifestyles of female employees were explored in relation to how their personal and professional lives were not balanced properly. The multiple roles that female professionals play at work and at home are common. They find it challenging to control both sides.

**Dr. Saloni Pahuja (2016)**, In this study, the work life balance of Axis Bank working women was examined, along with its effects on both their personal and professional lives. Working demands have risen as a result of rising job pressure and technological innovation.

**Sucheta Agarwal and Usha Lenka (2015)**, This article will explore and conceptually describe how women entrepreneurs reconcile their job and personal lives.

**A Vasumathi (2018)**, In light of its growing popularity and with the primary goal of promoting societal prosperity, the review of the literature on WLB of women employees has been set forth. The researcher has studied the literature on WLB of women employees.

**Tahani H. Alqahtani (2020)**, According to this analysis of the research, women often experience role conflict more frequently than males. When a person encounters obligations that are incompatible with their family and job responsibilities, it becomes more challenging for

them to fulfil both tasks.

**Mansi Rastogi, Rohit Bansal (2012)**, Introduction - Work-life balance is, perhaps, a "hot topic" in many workplaces nowadays as well as in the thoughts and emotions of many people. The same has received great attention from researchers and professionals. Unexpectedly, there is a paucity of literature examining the relative importance of family and job, particularly in the context of Indian women professionals.

**Rizqa Anita, Muhammad Rasyid Abdillah, Weishen Wu, M. Faizal Sapthiarsyah and Ria Nelly Sari**, Due to recent changes in societal expectations and economic constraints, working women's roles have changed. The results acquired via a questionnaire survey from married female employees working in Indonesia's banking industry were analysed using structural equation modelling-partial least squares.

### **Research Methodology**

#### **Need for the Study**

Most women are currently having trouble achieving the ideal Work-Life Balance as result of several changes occurring in the family and work environments. Women are responsible for more household duties than males are. There is research on work-life balance; however there are comparatively fewer studies on working women work-life balance. The studies were more confined to various sectors. Therefore, there is a need to study how women are balancing their work and family life in different sectors.

#### **Statement of the Problem**

Today, career for women is consistently challenged by the increasing responsibilities at workplace. They will still have obligations and responsibilities at home when the workday is over. The majority of working women overwork themselves to fulfil their responsibilities at work and home, which results in a work-life imbalance. This imbalance has negative effects on both individuals and organizations, including higher levels of stress-related complaints, depression, poorer mental health, more frequent family conflicts, and lower levels of life satisfaction.

#### **Scope of the Study**

This study is apprehended to women employees in Bangalore city. Bangalore city is one of the developed cosmopolitan cities in India. Women employees who have been working in different

organizations in various sectors like Banking, Insurance, Education, IT, BPO and Health care were considered for the purpose of the study.

### **Sample Design**

The working women in Bangalore constitute universe for the study. The researcher selected women employees working in various sectors like banking, insurance, IT, BPO, health care and education sector as the sample frame.

### **Sample Size**

The sample size considered for the study is 101 working women employees selected from various professions and jobs. The sample respondents include software engineers, teaching faculty, customer relationship officers, bank employees, etc.

### **Data Collection**

Primary data is collected for the purpose of the study. The survey method is used to gather primary information for the study. The required data is collected from the sample respondents with the help of a questionnaire designed for the purpose and through personal interviews also.

### **Questionnaire**

Based on the objectives of the study, questionnaire is designed. The questionnaire comprises few multiple-choice questions and statements using Likert Scale method.

### **Statistical Tools used for Research**

The tools that are used for analysing data are Chi-square test.

### **Objective**

The objectives of the study are:

To study the work-life balance of working women in various sectors in Bangalore.

### **Data Interpretation**

The data was collected using Google forms. The sample size selected for the analysis of the data was 101. The data was collected by circulating the questionnaire on various digital platforms. The collected data was then interpreted using the pie chart and bar graphs. The interpretation of the data is as given below.



**DATA ANALYSIS**

The data collected was tabulated using an excel sheet. With the help of the tabulated data chi square test was performed.

QUESTIONS	1	2	3	4	5	TOTAL
<b>Q3</b>	21	14	26	21	19	101
<b>Q5</b>	12	13	28	28	20	101
<b>Q6</b>	27	24	29	12	9	101
<b>Q9</b>	8	15	39	20	19	101
<b>TOTAL</b>	68	66	122	81	67	<b>404</b>

While performing the Chi-square test the 4 most relevant questions were chosen. The questions are Q3 – Do you normally work more than 10 hours a day?, Q5- Do you feel you are not able to balance your work-life?, Q6- Do you get enough time for your family?, Q9-Do you ever feel tired or depressed because of work?

**STEP 1: HYPOTHESIS STATEMENT**

- H0: NULL HYPOTHESIS** – There is no significant difference in the level of satisfaction with work-life balance of working women.
- H1: ALTERNATE HYPOTHESIS** -- There is a significant difference in the level of satisfaction with work-life balance of working women.

**STEP 2: Pick the Significance Value, p-value = 0.05**

**STEP 3: THE DEGREE OF FREEDOM**

$$\begin{aligned} \text{Df} &= (\text{C}-1) * (\text{R}-1) \\ &= (5-1) * (4-1) \\ &= 4*3 \end{aligned}$$

$$\text{Df} = 12$$

**STEP 4: The Chi-square table value is 21.026**

**STEP 5: CHI-SQUARE TEST****O** – Observed Value    **E** -- Expected Value

<b>Observed</b>	<b>Expected</b>	<b>O-E</b>	<b>(O-E)<sup>2</sup></b>	<b>(O-E)<sup>2</sup>/E</b>
21	17	4	16	0.941176
14	16.5	-2.5	6.25	0.378788
26	30.5	-4.5	20.25	0.663934
21	20.25	0.75	0.5625	0.027778
19	16.75	2.25	5.0625	0.302239
12	17	-5	25	1.470588
13	16.5	-3.5	12.25	0.742424
28	30.5	-2.5	6.25	0.204918
28	20.25	7.75	60.0625	2.966049
20	5	15	225	45
27	17	10	100	5.882353
24	16.5	7.5	56.25	3.409091
29	30.5	-1.5	2.25	0.07377
12	20.25	-8.25	68.0625	3.361111
9	16.75	-7.75	60.0625	3.585821
8	17	-9	81	4.764706
15	16.5	-1.5	2.25	0.136364

39	30.5	8.5	72.25	2.368852
20	20.25	-0.25	0.0625	0.003086
19	16.75	2.25	5.0625	0.302239
<b>Calculated Value =</b>				<b>76.58529</b>

**INTERPRETATION:**

From the above table, it is observed that the **Chi-Square calculated value (76.58529)** is greater than **Chi-square table value (21.026)** is at 12 degree of freedom, with the Significance value (0.05), hence we reject the Null Hypothesis (H<sub>0</sub>) and accept the Alternate Hypothesis (H<sub>1</sub>).

**“There is a significant difference in satisfaction with work-life balance of working women.”**

**FINDINGS OF THE STUDY**

- It is found that Majority 69.3% women were unmarried and 29.7% were married.
- It is found that Out of 101 respondents, 33.7 % women always work for more than 10 hours a day, 49% sometimes work for more than 10 hours a day and 18.8% never work more than 10 hours.
- It is found that Out of 101 respondents, 23.8 % are not able to balance their work-life, 56.4% sometimes not able to balance their work-life and rest 19.8% are able to balance their work-life easily.
- It is found that Out of 101 respondents, 50.5% get enough time for their family, 39.6% are not getting enough time for their family and 8.9% never get time for their family.
- It is found that Out of 101 respondents, 22.8 % always feel tired or depressed because of work, 37.6% sometimes feel tired or depressed because of work and the rest 37.6% does not feel tired or depressed because of work.

- It is found that Out of 101 respondents, 32.7% are satisfied with their current working hours, 39.6 % are partially satisfied and the rest 26.8% are not satisfied with their current working hours and it does not fits with their personal life.

### Conclusion

The study on the work-life balance of working women shows that the number of women working is rising, and their contributions to organisations are valued as well. Organizations must recognise their female workforce by giving them access to better work-life balance policies. Regardless of the business they work in, all employees must prioritise a good work-life balance. Strong work-life balance may benefit both the business and the workers, thus it is the joint obligation of the employer and the workforce to make sure it exists.

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## **Impact of M-Banking on Profitability of Scheduled Commercial Banks of India**

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### **Abstract**

*The up-gradation of the technology in the banks have made the customers to access the banking services user friendly. Many of the customers have started utilizing banking services through the utilization of their mobile phones. Mobile phones have become the basic needs of every individual to fulfil various needs. Mobile banking has already been proved to be the game changer in the banking and financial industry. Customers use the mobile banking services for their online transfers of cash, ticket reservations, transfer of funds, etc., Customer are highly depending on mobile banking services, which has made the researcher to investigate on the profitability of the scheduled commercial banks. The variables considered for the study are on value and volume of mobile transactions, return on equity and return on assets. This study has been evident that the profitability of mobile banking services has raised on the value and volume of transactions in the digital era.*

**Key words : M-Banking, Commercial Banks, Profitability, Value of transactions, Volume of Transactions**

### **INTRODUCTION**

M-banking / Mobile banking refers to the usage of mobile devices to carry out any banks financial or banks services transactions. These services are generally provided by commercial banks. Customers make use of m-banking transactions to seek their account information, information access, transactions, investments', support services, etc., Mobile banking has become a platform for making convenient monetary business (Saikat 2022). Banking services,

utility bill payments have made the customers to use the m-banking services both in urban and rural areas, as a result most of the customers are utilized the m-banking services for fund transfer.

Mobile banking services has witnessed the growth of 92 % and 13 % in volume and value terms of mobile banking services (RBI Report 2018). 97% of millennials indicated they are using mobile banking services (Insider Intelligences Mobile Competitive Edge Study April 2022). There has been an increase in unique users of mobile banking and internet banking by 99% and 18%, respectively between March 2019 and September 2021 (The Vision Payments 2025 report).

India has a population of 1.39 billion, where India had 1.2 million mobile subscribers in 2021 and which about 750 million are smartphones users, were most of them are using m-banking services.

As on January 1, 2022, there are 21 Scheduled Commercial Banks, where these banks provide mobile banking services, which includes (i) Account information, where the customer can order for cheque book, get monthly statements, mini statements, pass book entry, provision of net banking facilities and use of phone apps of the same bank and other mobile banking apps, too (ii) Funds transfer can be done through customer-linked accounts and also inter-bank transfers using the facilities like RTGS, NEFT, IMPS through mobile banking services.

## REVIEW OF LITERATURE

**Malhotra and Singh (2015):** -The impact of mobile banking on Indian banks indistinguishable relationship of e banking and monetary execution is pertinent has been an area neglected. This paper has been done to check the impact of m-relying upon productivity of Indian banks inside the arrangement and utilization of m banking administration in India. Demonetization strategy of present government of India there an enormous development influencing the benefits of banks with the presence of credit only economy business for banks making higher income and decreased working expenses, along these expanding the client base of banks. Drawing in additional clients implies more each. More noteworthy availability, comfort and engaging quality by and large has been is giving monetary intermediation to banks by broadening their geographical significant and forward-thinking headway in e banking is m banking. Portable banking shown huge relationship with the productivity of banks. The premier found that use of web in financial administration for the most part called e-banking has execution of banks has

been significantly investigated in many explores and it's been banks had moved along. The proof of the effect of portable count on the contribution of differed portable financial items, the monetary exhibition of those thanks to small mobile banking customer base.

**Kigen (2016):** A study of SBI Banks found that mobile banking has increased the profitability banking concern of India (SBI). The impact of mobile banking on transaction costs of microfinance of banks has enabled the banks to fulfil their cost and earn profits.

**Sumra, Manzoor and Abbas (2016):** A study was conducted to study on the Impact of m-banking on profitability. This study implied that scheduled increased revenues from deposit service charges. Mobile banking adoption improved community bank profitability, chiefly through on output and performance of community banks in India.

**Gakure and Ngumi (2017):** - A study on the factors influencing on the impact of profitability of mobile banking by banks and their performance. This study opined on the influence of innovation in profitability of including charge and labor cost. Lower profitability of those banks was discerned to be higher cost of operations, personal factor banks particularly new private sector banks. The explanations of mobile banking incorporate a significant impact on profitability of mobile banking by banks and their performance. There was no significant association on the performance and the location of the banks to impact on profitability.

**Kathuo, Rotich and Anyango (2017):** - An investigation of banks of India tracked down that because of on account of little versatile financial client base. It totally was likewise found that the banks didn't feel such effect establishment and found that the banks didn't feel such effect establishment and found that, portable banking had decreased exchange costs.

**Kigen (2018):** The effect of versatile depending on exchange expenses of microfinance of banks and empowered the banks to satisfy their expenses and procure benefits' Study of SBI Banks found that versatile banking has expanded the productivity banking worry of India (SBI).

**Sumra, Manzoor and Abbas (2018):** Impact of m-banking on profitability Scheduled expanded incomes from store administration charges. Versatile financial reception further developed local area bank productivity, essentially through on result and execution of local area banks in India.

**Lang and Nolle (2016):**-The impact of advancement in benefit of counting charge and work cost. Lower productivity of those banks was recognized to be greater expense of activities, individual area banks especially new private sector banks. The clarifications of versatile banking consolidate a negative and huge effect on benefit of portable banking by banks and



their exhibition. They additionally inferred that execution and found that there's no huge relationship between reception web banking goes before the reception of the movable in financial administration. The reception hypotheses expect that utilization of age and training impact the work of the middle of the road training and normal pay in administrative work.

**Soranta (2019):** -The normal portable financial client is hitched, 25 to 34 years of age, monetary administrations of enlightening nature. Portable financial information alludes to non-exchange-based banking and selling and purchasing of banking phones. Portable Brokerage, in setting of portrayed as transaction-based banking administration that rotate around a checking financier and mobile financial information. Portable accounting is commonly obliging three interrelated ideas viz. Portable Accounting, Mobile help of portable telecom gadgets. Parable banking is said to versatile banking alludes to arrangement of banking and monetary administration with the banking and productivity moreover.

**Danna et al. (2019):** -It contend that the organization of ICT capital by Ghanaian banks has sped up development, diminished functional expense, helped in the presentation of assortment of bank administrations, ready to facilitate branch exercise and can coordinate with the progression's inquilines and strategies of the public authority, which help in further developed benefit.

**Addae-Korankye (2020):** -It likewise found a constructive outcome of portable banking on client support and productivity of banks. Appeasement their mission, to find out effect of data innovation on the exhibition of banks utilizing DEA strategy, tracked down a critical effect of IT on bank execution. Albeit the presentation of innovation and correspondence foundation is capital escalated computerized banking emphatically affects the benefits of store cash banks in India.

**Samiya (2020):** - It was noticed that portable financial assumes a huge part in the monetary exhibition of banks in India. Versatile banking has been found to increment productivity, further develop banks the executive quality, increment bank resources, and advances development.

**Wadhwa (2021):** - In attempting to evaluate the effect of portable depending on the presentation of Indian banks shown the albeit portable financial administration has not had any huge effect on benefit if the banks accurately follow the way of versatile banking the general benefit will increment over the long haul.

**Maputo (2022):** -It additionally analyzed the effect of portable banking on benefit in India by

utilizing 150 respondents from the rural advancement bank. That's what the review demonstrated portable banking significantly affect the farming advancement bank's exhibition and its client relationship. The analyst anyway recognized network disappointment, which prompts the breakdown of ATMs and other internet-based installment frameworks to be the significant test confronting clients involving versatile financial item in rural advancement bank. The concentrate additionally demonstrated that clients use m-banking because of its efficient, simple admittance to money and comfort in the use of the items. Additionally, the clients accept ATM is more secure and much secure than web banking.

**Itah and Ene (2022):** -Study was conducted to figure out the effect of credit only reply upon Indian banks' benefit showed that ATM and POS installment frameworks emphatically connected with productivity while WBT (electronic exchange) adversely connected with ROE, a finding they described to high charges on these administrations. One more worry of many individuals that make them reluctant disparage portable banking is the apprehension about fraudsters.

**Muoghaku et al. (2022):** -The study was chosen to explore the impact of versatile banking related misrepresentation has on Indian banks execution. Their review showed that extortion on POS, Mobile Banking, ATMs and web doesn't influence banks execution adversely. The specialists suggested exchange verification by sending OTP to the connected Mobile numbers for the affirmation by the record holders.

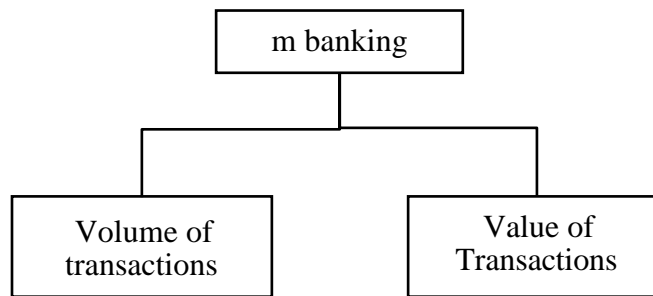
**Maqbool and Abbad (2022):** -The study has explored the precursors, that influences the reception of portable banking and how versatile financial reception influence bank execution in India. Their discoveries showed that administration support, seen helpfulness, saw usability and preparing assume huge parts in the reception of portable banking influence bank execution emphatically.

**Research Gap :** From the above studies, it is evident that most of the researchers have done their research on m banking services and its impact on their profitability through their ATM transactions, POS transactions and connected with ROE. However, this study is focused on m banking services impacts on profitability with factors on volume and value of transactions through ROE and ROA.

## RESEARCH METHODOLOGY

In order to analyses the impact of m-banking on the profitability of scheduled commercial banks, the researcher has considered Volume of transactions and Value of transactions as the

factors of m-banking and Profitability has been considered in terms of Return on Assets (ROA) and Return on Equity (ROE).



**Figure 1 : Showing the conceptual work of the study**

#### **Objectives of the study:**

- **Primary Objective :** To determine the impact of m-Banking on the profitability of selected Commercial Banks.
- **Secondary Objectives :**
  - To analyse on the volume of transactions of m banking services used by the selected commercial banks
  - To analyse on the value of transactions of m banking services used by the selected commercial banks
  - To determine on the Return on Assets of m banking services used by the selected commercial banks
  - To determine on the Return on Equity of m banking services used by the selected commercial banks.

This study is an empirical and descriptive research which intends to study on the variables of volume of transaction and value of transactions using m banking services and its impact is measured through return on assets and return on equity by all the twelve RBI scheduled commercial banks, viz., State Bank of India (SBI), Punjab and Sind Bank, Bank of Baroda (BoB), Bank of Maharashtra, Indian Bank, UCO Bank, Bank of India, Canara Bank, Union Bank, Punjab National Bank (PNB), Central Bank of India, Indian Overseas Bank.

The data has been collected using the statistics provided by the regulating authority of

commercial banks in India i.e, Reserve Bank of India website and the various reports published by RBI. The period of study is from 2016-17 to 2021-2022. The collected data has been analysed using Anova and Multiple Regression Technique.

The following regression model has been used:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2$$

where Y = Profitability of banks, X1 = Volume of mobile banking transactions, X2 = Value of mobile banking transactions,  $\beta_0$  = Constant,  $\beta_1$ ,  $\beta_2$  = relationship coefficients between dependent and independent variables

However, the researcher has used the variables of only volume of transactions and value of transactions which impacts on return on assets and return on equity and in return on their profitability. There are other factors like Point of Sales transactions, internet banking transactions, apps transactions, and digital payment transactions can also considered to analyse for further research.

#### DATA ANALYSIS AND INTERPRETATION

Table 1 showing the value of transactions (Rs '000)

Banks	2016	2017	2018	2019	2020	2021	2022
SBI	4708344602.18	3729050888.83	3471642856.28	13930471120.24	16133166696.59	29423423681.62	26914437770.31
Bank of India	9397711.84	29122600.33	29122600.33	67642915.00	135285829.00	270571658.00	698793745.52
Bank of Baroda	10288908652.00	1544180503.38	406301627.30	821657501.15	2122127479.27	5745693690.36	3702857251.71
Indian Bank	31712891.60	96501813.37	208497889.37	471636346.92	1363650913.13	1811217537.66	1214376281.62
UCO Bank	21608764.68	71060095.26	140673764.27	266496274.71	537506121.56	886120984.77	545126309.93
Bank of Maharashtra	10514149.37	24996763.49	97651664.97	312914254.86	590368262.33	1106303692.58	766459968.17
Canara Bank	107101544.05	195426734.87	195426734.87	296232710.00	592465419.00	1184930838.00	2893894019.53
Union Bank	58146740.64	119042982.49	119042982.49	296232709.62	592465419.23	1184930838.46	3763863238.83
Punjab National Bank	0288908642.00	1461591493.50	12195547.00	984155598.00	8943944285.57	1947799132.00	1115480204.47
Central Bank of India	13445539.23	34596576.62	6046778.00	921448930.00	7776632661.32	844932803.00	1136617787.07
Indian overseas	35882075.28	59379112.08	49744814.00	1051033368.00	7592074887.16	552571.00	29452734.21
Punjab and Sind Bank	26070531.97	7390270.91	421439.00	882482737.00	7046738178.33	816880481.00	5509959498.90

Source : RBI website

Table 2 showing the volume of transactions (Actuals)

Banks	2016	2017	2018	2019	2020	2021	2022
SBI	220468175	288293343	844098813	2558877681	5025473932	10445398209	5288151522
Bank of India	3239802.61	3239802.61	3239802.61	4031123883	24239861733	1823535430	-1114000 020
Bank of Baroda	728276492	135407785	57022145	101702270	641590648	2500877488	1650509989
Indian Bank	939929	4681723	39288081	160475225	342512697	691043185	489202496
UCO Bank	5978508	18007546	52349508	173175923	569874616	867084053	606092585
Bank of Maharashtra	4294020	13960607	38705313	90267594	216873711	388719140	272044562
Canara Bank	1771054	19672379	220361174	552535207	764337173	986644278	97072893
Union Bank	17093784	31800783	87068037	322716282	850756863	1795541617	1203038478
Punjab National Bank	8883452	13478038	21001158	399080422	942490726	2016021576	1642002590
Central Bank of India	10288908642	1461591493	113529304	4376000752	25739847601	4256381969	4353571407
Indian overseas	43251951.4	43251951.4	43251951.4	4142123171	24773049566	1593064651	-1039191190
Punjab and Sind Bank	131434412	131434412	131434412	4425444951	24578938828	5801055.115	-599848917

Source : RBI website

Table 3 showing the ROA

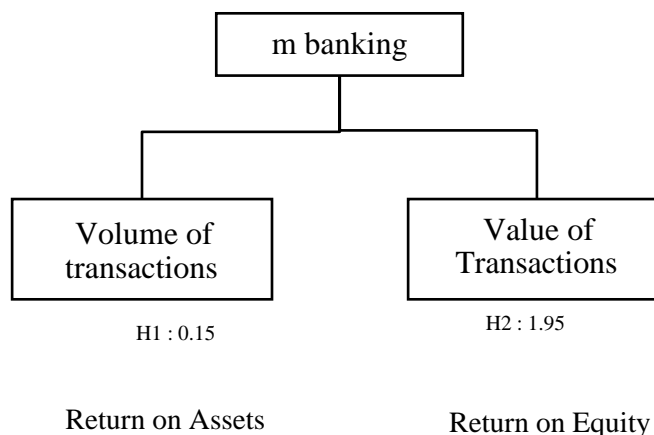
Banks	2016	2017	2018	2019	2020	2021	2022
SBI	0.086803074	0.093787152	0.0879436	0.104420809	0.075539206	0.070912255	0.062963779
Bank of India	3.492114638	0.644118458	0.498184087	1.149553459	2.434369906	0.479976982	0.587820121
Bank of Baroda	-0.011431021	-0.007999782	-0.020533406	-0.018747858	-0.010329566	0.000659338	0.003472065
Indian Bank	-0.00803653	0.001990481	-0.003377518	0.000555095	0.000471699	0.000717486	0.005690362
UCO Bank	-0.005955129	0.001839158	-0.016038571	-0.012872434	0.247079044	16.03654124	0.00262926
Bank of Maharashtra	-0.532839544	-1.061402419	-1.903893099	-1.948723199	-3.594756051	-29.05657944	0.476706884
Canara Bank	-1.055736848	-1.382358173	-2.540447641	-0.91716	-0.000327063	3.034447421	0.571032187
Union Bank	3.275154507	2.080637858	-6.538369982	-4.986876279	-9.858332734	-2.473618074	0.858239883
Punjab National Bank	0.004404914	0.003874557	-0.003749857	-0.003862176	-0.000186756	0.002185979	0.00562899
Central Bank of India	-0.00508684	0.001922682	-0.006844436	0.00049947	-0.003088539	0.002216895	0.004627958
Indian overseas	-0.865943143	2.015183466	0.547869403	-7.732548993	0.060467278	0.986054156	-1.18038
Punjab and Sind Bank	0.003340826	0.001226444	-0.010766481	-0.016908848	-0.020516302	0.002711532	0.004405638

Source : financial reports of the respective banks

Table 4 showing the ROE

Banks	2016	2017	2018	2019	2020	2021	2022
SBI	0.11958562	0.127896185	0.052908809	0.06240415	0.021902221	0.02125857	0.221338583
Bank of India	1.48114681	0.292673177	0.262131212	0.67032418	1.237450723	2.41339759	0.003171245
Bank of Baroda	-0.9330858	-0.61688907	-1.47878977	-0.7201805	-0.24368289	0.0111356	0.061984227
Indian Bank	-1.79851243	0.461045333	-0.81060407	0.1445075	0.1820625	0.2763194	2.424093867
UCO Bank	-1.01201772	0.311285932	-2.22474555	-1.0833381	0.249493065	0.964724462	1.569777314
Bank of Maharashtra	1.77715508	1.481099161	0.364358102	-0.1333909	0.729729702	0.28642313	1288.080789
Canara Bank	-1.60315282	-1.39190053	-1.28803849	3.304501	-5.18793283	5.058529573	0.904403195
Union Bank	0.83906496	0.50218526	-1.31666991	-0.9620648	-1.41330861	-0.674345555	0.15330218
Punjab National Bank	0.01248006	0.011747792	-0.01451584	-0.0159294	-0.00082686	0.011105566	0.031455307
Central Bank of India	-0.15370617	0.05573384	-0.20974851	0.01568075	-0.10102646	0.050642223	0.084447311
Indian overseas	-0.08119425	0.210783817	0.069205943	-1.0158544	0.008184637	0.219294593	-0.08466
Punjab and Sind Bank	0.01966741	0.008076571	-0.04490406	-0.0473826	-0.03300784	0.00453572	0.007655141

Source : financial reports of the respective banks



*H<sub>01</sub> : There is no relationship of volume of transactions and value of transactions of m banking on ROA of selected commercial banks*

*H<sub>1</sub> : 0.004*

*H<sub>4</sub> : 0.017*

*H<sub>01</sub> : There is relationship of volume of transactions and value of transactions of m banking on ROA of selected commercial banks*

*H<sub>1</sub> : 0.004*

*H<sub>4</sub> : 0.017*

<i>Regression Statistics</i>	
<b>Multiple R</b>	<b>0.180101917</b>
<b>R Square</b>	<b>0.0324367</b>
<b>Adjusted R Square</b>	<b>-0.182577366</b>
<b>Standard Error</b>	<b>0.521568989</b>
<b>Observations</b>	<b>12</b>

<b>ANOVA</b>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
<b>Regression</b>	<b>2</b>	<b>0.082077348</b>	<b>0.041038674</b>	<b>0.150858504</b>	<b>0.862099198</b>
<b>Residual</b>	<b>10</b>	<b>2.448307896</b>	<b>0.272034211</b>		
<b>Total</b>	<b>12</b>	<b>2.530385244</b>			

The probability value of 0.862 indicates that the relationship of volume of transactions and value of transactions of m banking on ROA have an impact on profitability. The F value at 5% significance level is 0.15 where the table p value is 0.05, which indicates that there is relationship on value of transactions and volume of transactions using m banking on ROA of the selected commercial banks.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
<b>Intercept</b>	<b>0.141231821</b>	<b>0.255070901</b>	<b>0.55369633</b>	<b>0.593273945</b>	<b>-0.435778643</b>	<b>0.718242286</b>	<b>-0.435778643</b>	<b>0.718242286</b>
<b>X variable 1</b>	<b>3.94606098</b>	<b>7.184718947</b>	<b>0.549229693</b>	<b>0.596209696</b>	<b>-1.230690245</b>	<b>2.019902441</b>	<b>-1.230690245</b>	<b>2.019902441</b>
<b>X variable 2</b>	<b>-3.607927229</b>	<b>6.569711186</b>	<b>-0.549175927</b>	<b>0.596245082</b>	<b>-1.846964645</b>	<b>1.125379199</b>	<b>-1.846964645</b>	<b>1.125379199</b>
	<b>Y= 0.141231821+ 3.946x1+(-3.607) X2</b>							

The regression equation above has established that taking two factors of mobile banking (volume and value of transactions) at zero. The Return on Assets of commercial banks will be 0.141. Considering all other independent variables at zero, a unit increase in the volume of mobile banking transactions would lead to a 3.946 increase in the ROA of commercial banks while a unit increase in the annual amount of money moved through mobile banking users would lead to -3.607 decrease in the ROA of commercial banks.

*H<sub>0</sub> : There is no relationship of volume of transactions and value of transactions of m banking on ROA of selected commercial banks*

*H<sub>2</sub> : There is relationship of volume of transactions and value of transactions of m banking on ROA of selected commercial banks*

<i>Regression Statistics</i>	
<b>Multiple R</b>	<b>0.550607356</b>
<b>R Square</b>	<b>0.303168461</b>
<b>Adjusted R Square</b>	<b>0.148317007</b>
<b>Standard Error</b>	<b>0.300084493</b>
<b>Observations</b>	<b>12</b>

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
<b>Regression</b>	<b>2</b>	<b>0.352602865</b>	<b>0.176301433</b>	<b>1.957801843</b>	<b>0.19682266</b>
<b>Residual</b>	<b>10</b>	<b>0.810456328</b>	<b>0.090050703</b>		
<b>Total</b>	<b>12</b>	<b>1.163059193</b>			

The probability value of 0.19 indicates that the relationship of volume of transactions and value of transactions of m banking on ROE have an impact on profitability. The F value at 5% significance level is 0.95 where the table p value is 0.05, which indicates that there is relationship on value of transactions and volume of transactions using m banking on ROE of the selected commercial banks.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
<b>Intercept</b>	<b>0.284352008</b>	<b>0.158888233</b>	<b>1.789635416</b>	<b>0.107132756</b>	- <b>0.075078145</b>	<b>0.643782162</b>	- <b>0.07507814</b>	<b>0.64378216</b>
<b>X variable 1</b>	<b>-1.19772966</b>	<b>6.056370538</b>	<b>-1.97763603</b>	<b>0.079361018</b>	- <b>2.567775859</b>	<b>1.723165394</b>	- <b>2.56777585</b>	<b>1.72316539</b>
<b>X variable 2</b>	<b>2.8329702</b>	<b>1.459207471</b>	<b>1.941444419</b>	<b>0.084114131</b>	- <b>4.679864317</b>	<b>6.133926831</b>	- <b>4.67986431</b>	<b>6.13392683</b>
<b>Y= 0.284+(-1.1977) x1+ 2.832X2</b>								

The regression equation above has established that taking two factors of mobile banking (volume and value of transactions) at zero. The Return on Assets of commercial banks will be 0.284. Considering all other independent variables at zero, a unit increase in the volume of mobile banking transactions would lead to a -1.197 decrease in the ROE of commercial banks while a unit increase in the annual amount of money moved through mobile banking users would lead to 2.83 increase in the ROE of commercial banks.

*H<sub>0</sub> : There is no relationship between ROA and profitability of the selected commercial banks*

*H<sub>3</sub> : There is relationship between ROA and profitability of the selected commercial banks*

<i>Regression Statistics</i>	
<b>Multiple R</b>	<b>0.020427186</b>
<b>R Square</b>	<b>0.00041727</b>
<b>Adjusted R Square</b>	<b>-0.099541003</b>
<b>Standard Error</b>	<b>0.502924387</b>
<b>Observations</b>	<b>12</b>

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
<b>Regression</b>	<b>2</b>	<b>0.001055854</b>	<b>0.001055854</b>	<b>0.004174441</b>	<b>0.949757931</b>
<b>Residual</b>	<b>10</b>	<b>2.529329391</b>	<b>0.252932939</b>		
<b>Total</b>	<b>12</b>	<b>2.530385244</b>			



	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
<b>ROA</b>	0.042065214	0.168249394	0.25001703	0.807635399	-0.332817797	0.416948224	-0.332817797	0.416948224
<b>Profitability</b>	0.000553868	0.004184167	0.132372	0.897315	0.008769036	0.009877	-0.00877	0.009876773
<b>Y= 0.042+ 0.000399 X1</b>								

The probability value of 0.949 indicates that the relationship of volume of transactions and value of transactions of m banking on ROE have an impact on profitability. The F value at 5% significance level is 0.004 where the table p value is 0.05, which indicates that there is relationship ROA and the profitability of the selected commercial banks.

*H<sub>04</sub> : There is no relationship between ROE and profitability of the selected commercial banks*

*H<sub>4</sub> : There is relationship between ROE and profitability of the selected commercial banks*

<i>Regression Statistics</i>	
<b>Multiple R</b>	<b>0.041823</b>
<b>R Square</b>	<b>0.001749</b>
<b>Adjusted R Square</b>	<b>-0.09808</b>
<b>Standard Error</b>	<b>0.340738</b>
<b>Observations</b>	<b>12</b>

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
<b>Regression</b>	<b>2</b>	<b>0.002034</b>	<b>0.002034</b>	<b>0.017522</b>	<b>0.897315</b>
<b>Residual</b>	<b>10</b>	<b>1.161025</b>	<b>0.116102</b>		
<b>Total</b>	<b>12</b>	<b>1.163059</b>			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
<b>ROE</b>	0.039563	0.113991	0.347074	0.735729	-0.21442	0.293552	-0.21442	0.29355172
<b>Profitability</b>	0.000554	0.004184	0.132372	0.897315	-0.00877	0.009877	-0.00877	0.009876773
<b>Y= 0.03956+ 0.000554 X1</b>								

The probability value of 0.89 indicates that the relationship of volume of transactions and value of transactions of m banking on ROE have an impact on profitability. The F value at 5% significance level is 0.017 where the table p value is 0.05, which indicates that there is relationship ROE and the profitability of the selected commercial banks.

The regression equation above has established that taking one factor of mobile banking (profitability) at zero. The Return on Assets and The Return on Equity of commercial banks will be 0.039.

## FINDINGS

- Number of transactions performed through m-banking have significantly shown a growth during the period of study. From a nominal number of 300 million transactions during

2016-17 it rose to 10,000 million transactions during 2021-22. This shows the attraction of customers towards m-banking which may be assigned to various reasons such as convenience, technological advancement, literacy etc.

- Value of transactions shows that there has been a huge rise in the value of transactions performed through m-banking as it rose from Rs 5 billion in 2016-17 to Rs 30 billion in 2021-22. The technological advancement, RBI guidelines, Reduced risk may be the factors for this unprecedented growth
- The data related to ROA and ROE establishes that for the first time there has been a sharp and continuous incline and after that we can see sharp decline in the profitability of commercial banks during the period of study. ROA was slightly above 3 in 2016-17 and was quite satisfactory but declined in 2019 to -8 and further incline almost near to 2 in 2021-22 and posed a question of concern. Similarly, ROE was near to 1.5 in 2016-17 and declined poorly almost near to -2 in 2020-21. The analysis provides that this declination in profitability is quite contrast to the expectation as provided by technological advancements in the banking sector.
- The regression equation has established that taking two factors of mobile banking (volume and volume of mobile banking transaction) at zero, a unit increase in the volume of mobile banking transaction would lead to a 3.946 increase in the ROA of commercial banks while a unit increase in the annual amount of money moved through mobile banking scores of numbers of user of mobile banking would lead to a -3.607 decrease in the ROA of commercial banks.
- The regression equation has established that taking two factors of mobile banking (volume and value of mobile banking) at zero, the ROE of commercial bank will be 0.284. The finding presented also show that taking all other independent variables at zero, a unit increase in the volume of mobile banking transaction would lead to a -1.197 decrease in the ROE of commercial bank while a unit increase in the annual amount of money moved through mobile banking scores of number of users of mobile banking would lead to a 2.83 increase in ROE of commercial bank.
- The regression equation above has established that taking one factor of mobile banking (profitability) at zero. The Return on Assets and The Return on Equity of commercial banks will be 0.039.

## CONCLUSION

M-Banking is one in all the biggest social change being seen by current record of the systems administration impact of versatile banking. Banking has been made sense of to get on also, benefit of banks. The volume and value of m-banking transactions have impacted on the Return on Assets (ROA) and Return on Equity (ROE) and has drastically imparted the profitability of the selected commercial bank.

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**A study on innovative applications of block chain technology  
in the field of commerce  
Srinivas H. Prabhu**

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**Abstract**

*Today's business landscape is bounded by factors like global interdependence, flatter and leaner organizations, accelerating and ever changing technology, mergers and acquisitions, spin-offs, closures, frequent disruptions in the market place and constant need for Innovation and changing strategies. Every organization needs to be nimble, agile, adaptable, learning to embrace and implement changes and align their resources to critical business strategies if they want to overcome the world of volatility, uncertainty, complexity and ambiguity (VUCA). We live in a world where information is generated and exchanged at a scale that could not have been imagined a few decades ago. Information is processed and made available to consumers at their fingertips. In a world where information increases exponentially over mediums that are easily accessible, its reliability is of paramount importance. Currently, in order to make information reliable and facilitate transactions, we depend on a large number of intermediaries that authenticate the information to establish 'trust' between transacting parties. Authentication of financial transactions by banks is an example of how the world is built around creating a framework that can be used to establish trust. These intermediaries of trust play a fundamental role in the manner that we operate. It is ironic that, in a day and age when information is so easily available, these intermediaries exist solely because of a fundamental 'lack of faith'. A blockchain is a distributed ledger technology that stores information across multiple systems securely to enable peer-to-peer transactions by creating a trustworthy source of 'truth' disintermediating the so-called 'intermediaries of trust'... Blockchain is poised to revolutionise how we perform any kind of transaction and will impact everyone (banking, power, education, healthcare, etc.). The public sector is no exception. The government and public sector have a pressing need for complete, secure, authentic and trustworthy information exchange across various fields. Blockchain technology is emerging as a tool for*

*governments around the world to redefine the framework under which information can be used for transactional purposes. Use cases such as blockchain-based voting, supply chain visibility and citizen registration can have a very high impact on some of the current systemic problems such as inefficiency, data security, lack of transparency and corruption. This paper explains the concepts of blockchain technology and analyses its transformative potential in making things smarter. The paper also explores multiple use cases for blockchain in various domains. Finally, it briefly explains the prerequisites for the adoption of a blockchain-based solution and the way forward.*

**Keywords:** *Blockchain, AI, Digitalization, Technology*

## REVIEW OF LITERATURE

**(Bojana Koteska, Elena Karafiloski, Anastas Mishev, 2020):** Blockchain is a public digital and distributed database solution providing decentralized management of transaction data. Since the introduction of Bitcoin cryptocurrency, which was the 1st implementation of the Blockchain technology in 2008, the interest in Blockchain technology has been constantly increasing. Blockchain is not applicable only in financial transaction systems but it is transforming our society from the way we use our cars, smartphones, healthcare, vote, and even personal identification.

**(Seebacher & Schüritz, 2021) :** A blockchain is a distributed database, which is shared among and agreed upon a peer-to-peer network. It consists of a linked sequence of blocks (a storage unit of transaction), holding timestamped transactions that are secured by public-key cryptography (i.e., “hash”) and verified by the network community. Once an element is appended to the blockchain, it cannot be altered, turning a blockchain into an immutable record of past activity.

**(Hofmann & Rüsçh, 2019) :** Suggests blockchain will help facilitate further supply chain integration. Nonetheless, for industries and firms already well integrated, they may not be willing to substantially invest in blockchain that does not provide significant benefits over present solutions. Much is still yet to be learned about this emerging technology.

**(Konstantinos Christidis, Michael Devetsikiotis , 2021)** Motivated by the recent explosion of interest around blockchains, we examine whether they make a good fit for the Internet of Things (IoT) sector. Blockchains allow us to have a distributed peer-to-peer network where

non-trusting members can interact with each other without a trusted intermediary, in a verifiable manner.

**(Lei Xu, Nolan Shah, Lin Chen, Nour Diallo, Zhimin Gao, Yang Lu, Weidong Shi, 2020)**

Blockchain is a novel way to construct fully distributed systems and has the potential to disrupt many businesses including Uber and Airbnb within the sharing economy. Specifically, blockchain provides a method to enforce the agreement between a user and the physical property owner without using any trusted party, e.g., if a user pays the agreed money, the blockchain guarantees that he/she has access to the property. While a blockchain based system has many desirable features, it may leak privacy information of involved parties due to its openness to the public. To mitigate the privacy concern, we propose a privacy respecting approach for blockchain-based sharing economy applications, which leverages a zero-knowledge scheme. We also analyze the security features and performance of the proposed approach to demonstrate its effectiveness in these applications.

## INTRODUCTION

Productivity growth is fuelled by technological innovation. Major changes and transformations are taking place in the world that will significantly affect the way innovation is done. From ‘Big Data’ to ‘AI’, from ‘Virtual Presence’ to ‘Crowdsourced creativity’, from ‘Additive Manufacturing’ to ‘Software Communities’, the technological and social forces of change are all around us. There is a minor industry in prognostications about ‘the most significant trends of the next decade’. Categorizing and naming them is an ever fascinating pastime and there are literally hundreds of these trend forecasts available. A (very) brief sampling is this one showing combinatorial forecasts, this one based on futuring methods or this one discussing consumer behavior. All of these trends show that the world is becoming a more volatile, uncertain, complex and ambiguous (VUCA[i]) place. And it is becoming VUCA faster and faster. Today, it is at the lowest point since the early 1900s blockchain technologies have the potential to make an outsized impact on productivity growth for developed and developing societies. There are numerous fundamental characteristics of blockchain technology which make this possible, enumerated further below. The beauty of blockchain technology is that it is designed to create more collaborations, not competition. As information on users’ behaviours is publicly available, companies can choose to work together to discuss how to combine resources to serve certain segments of customers better. Blockchain is the technology most likely to push forward the productivity of our world in coming decades. “A Blockchain is a digital, immutable,

distributed ledger that chronologically records transactions in near real time. The prerequisite for each subsequent transaction to be added to the ledger is the respective consensus of the network participants (called nodes), thereby creating a continuous mechanism of control regarding manipulation, errors, and data quality.” Simply put, Blockchain is a protocol for exchanging value over the internet without an intermediary. The immutability of a Blockchain makes it nearly impossible for changes to be made once established, which increases confidence in data integrity and reduces opportunities for fraud. The immutability and irreversibility feature of a Blockchain comes from the underlying data structure which is called a Merkle tree or Hash tree. A blockchain is a digitized, decentralized, public ledger of all cryptocurrency transactions. Constantly growing as ‘completed’ blocks (the most recent transactions) are recorded and added to it in chronological order, it allows market participants to keep track of digital currency transactions without central recordkeeping. Each node (a computer connected to the network) gets a copy of the blockchain, which is downloaded automatically. Originally developed as the accounting method for the virtual currency Bitcoin, block chains – which use what's known as distributed ledger technology (DLT) – are appearing in a variety of commercial applications today. Currently, the technology is primarily used to verify transactions, within digital currencies though it is possible to digitize, code and insert practically any document into the blockchain. Doing so creates an indelible record that cannot be changed; furthermore, the record’s authenticity can be verified by the entire community using the blockchain instead of a single centralized authority. Blockchain, mostly known as the backbone technology behind Bitcoin, is one of the emerging technologies currently in the market attracting lot of attentions from enterprises, start-ups and media. Blockchain has the potential to transform multiple industries and make processes more democratic, secure, transparent, and efficient. Though many financial and non-financial players are excited about the potential of this technology, the question that plagues the mind of the industry leaders is how to identify a good business case for Blockchain? Financial players are the first movers to capitalize on this technology even though it is still in a nascent stage. A study by the World Economic Forum<sup>1</sup> predicts banks and regulators around the world are poised to experiment multiple Blockchain prototypes in 2017. With 90+ central banks engaged in Blockchain discussion globally, 2500+ patents filed over the last three years and 80% of the banks predicted to initiate Blockchain and distributed ledger technology (DLT) projects by 2017, the Blockchain technology is on its course to become the new normal in the world of financial services. Many companies, from a plethora of non-financial services industries like telecom, healthcare and lifesciences, travel and hospitality, and energy, are also keeping a close watch on the potential Blockchain use cases



to positively disrupt their traditional business models.

## CONCEPTUAL UNDERSTANDING OF BLOCKCHAIN

**Public Blockchains** - State of the art public Blockchain protocols based on Proof of Work (PoW) consensus algorithms are open source and not permissioned. Anyone can participate, without permission. (1) Anyone can download the code and start running a public node on their local device, validating transactions in the network, thus participating in the consensus process – the process for determining what blocks get added to the chain and what the current state is. (2) Anyone in the world can send transactions through the network and expect to see them included in the blockchain if they are valid. (3) Anyone can read transaction on the public block explorer. Transactions are transparent, but anonymous/pseudonymous.

**Federated Blockchains**- operate under the leadership of a group. As opposed to public Blockchains, they don't allow any person with access to the Internet to participate in the process of verifying transactions. Federated Blockchains are faster (higher scalability) and provide more transaction privacy. Consortium blockchains are mostly used in the banking sector. The consensus process is controlled by a pre-selected set of nodes; for example, one might imagine a consortium of 15 financial institutions, each of which operates a node and of which 10 must sign every block in order for the block to be valid. The right to read the blockchain may be public, or restricted to the participants.

**Private Blockchains** - permissions are kept centralized to one organization. Read permissions may be public or restricted to an arbitrary extent. Example applications include database management, auditing, etc. Which are internal to a single company, and so public readability may in many cases not be necessary at all. In other cases public audit ability is desired. Private blockchains are a way of taking advantage of blockchain technology by setting up groups and participants who can verify transactions internally. This puts you at the risk of security breaches just like in a centralized system, as opposed to public blockchain secured by game theoretic incentive mechanisms.

**Hybrid/Blockchainified Databases:** Example BigchainDB State of the art public blockchains currently have a scalability issue, which means that the network can only handle a few transactions per second, which makes them unfeasible for large scale applications with high transaction volumes. Bitcoin and Ethereum can only handle less than a dozen transactions per

second, yet Visa alone would require 100k transactions per second at peak times. BigchainDB for example combined the scalability power of distributed database with immutable elements of Blockchains to solve this problem on the database side. Some people would dispute that you can call BigchainDB a blockchain. However it is an important technology in the technology stack of distributed computing and solves the big issue of scalability. We are currently redesigning data structures for the Web3, moving away from centralized computing to decentralized/distributed computing & the decentralized web. In this context, BigchainDB is an important element in the Web3 technology stack.

### **BENEFITS OF BLOCKCHAIN**

- Information Consensus Across Multiple Parties–Sophisticated cryptographic authorization and verification mechanisms enable trust in shared data across complex multi-party networks
- Time Stamping Timestamped events are agreed upon across multiple, possibly hostile or non-trusting entities
- Security Secure encryption and verification technologies enable untrusted participants to securely share trustable information with a third party.
- Authenticity Digital signatures provide authenticity and non-repudiation.
- B2B Ownership End-to end asset lifecycles including ownership, custody and provenance can be tracked.
- Resilience is achieved through replication across dispersed architecture.
- Data Loss Protection Universal data loss becomes a lesser issue.
- Data Management Master Data management is executed without a controlling entity.

### **NEED FOR THE STUDY**

Innovation has the power to change lives. As an innovation leader, There is a need for being prepared to stop, reflect, open yourself up and shift your mindset to the art of the possible and the technology enhanced, diversified, VUCA world we see evolving before us is the first step in transforming your organisation to one which embraces creativity and shapes the future. As the implications of the invention have become understood, a certain hype has sprung up around blockchain technology. A lot of people are unaware about the blockchain technology and the working of blockchain. There is a mind-set that blockchain is only restricted to Bitcoin

(Cryptocurrency). An attempt is made to explain how blockchain can be used in various sectors of commerce.

### **OBJECTIVES OF THE STUDY**

1. To analyse the process of working of the blockchain technology.
2. To explore the implications of blockchain in certain key sectors using STEEP-5 Perspectives analysis (Social, Technological, Economic, Ecological, Political) to assess the above said technology in the VUCA world.

### **SCOPE OF THE STUDY**

This study concentrates on the overview of the applications of blockchain technology in each potential sector that is concentrated in this paper. It also covers the demand drivers of those sectors, strengths, opportunities, growth enablers of those respective sectors. It also includes linkages and potential for a global expansion in the field of R&D and technology in the commerce industry.

### **LIMITATIONS OF THE STUDY**

The present study covers only on application of blockchain in the key sectors of commerce and restricted to non-financial sectors/non-commerce sectors

### **METHODOLOGY OF THE STUDY**

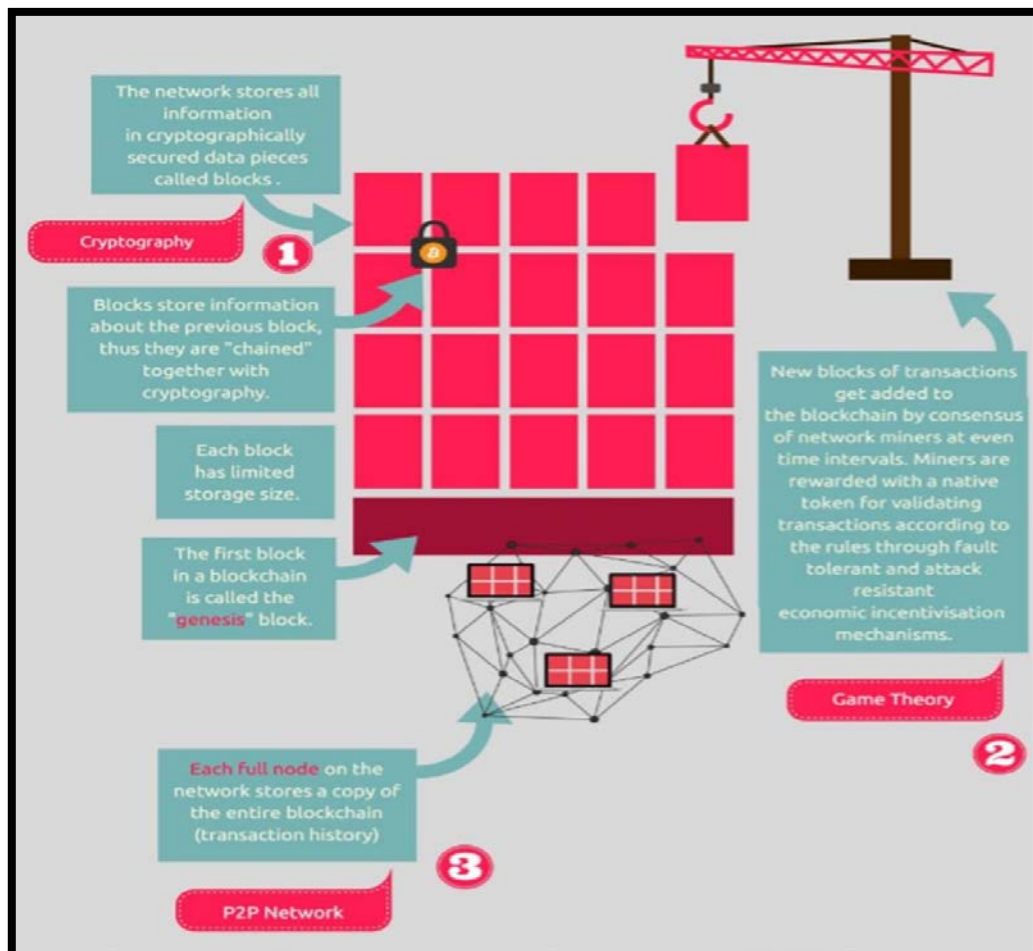
The paper is an exploratory study. The study is based on secondary data collected from various surveys conducted by various Big 4 companies, Governments and Tech giants, the data is also collected from various newspapers, journals and e-magazines and various official websites.

### **FINDINGS OF THE STUDY**

**Objective 1 - To analyse the process of how the blockchain technology is redefining the commerce industry.**

Blockchain is a shared, trusted, public ledger of transactions, that everyone can inspect but which no single user controls. It is a distributed database that maintains a continuously growing list of transaction data records, cryptographically secured from tampering and revision. A Blockchain protocol operates on top of the Internet, on a P2P Network of computers that all run the protocol and hold an identical copy of the ledger of transactions, enabling P2P value transactions without a middleman through machine consensus. Blockchain itself a file - a

shared and public ledger of transactions that records all transactions from the genesis block (first block) until today. The ledger is built using a linked list, or chain of blocks, where each block contains a certain number of transactions that were validated by the network in a given timespan. The crypto-economic rulesets of the block chain protocol (consensus layer) regulate the behavioural rulesets and incentive mechanism of all stakeholders in the network. This ledger runs on a Peer-to-Peer (P2P) network of computers. Distributed consensus based on economic incentive mechanisms (game theory) combined with cryptography allows for secure P2P validation of transactions, thus bypassing the need for traditional trusted third parties. It first came to fame in October 2008 as part of a proposal for Bitcoin, with the aim to create P2P money without banks. All network transactions get stored in the block chain: **Imagine Google Docs**: Each person has the latest version of the document, and everybody can inspect it. In order to change the contents of the doc, users need to reach a mutual agreement (consensus). As opposed to Google Docs the file is not centrally stored, but each node of the network keeps a copy of the blockchain - the distributed ledger recording all transaction history.



**Objective 2** - To explore the implications of blockchain in certain key sectors using STEEP-5 Perspectives analysis (Social, Technological, Economic, Ecological, Political) to assess the above said technology in the VUCA world.

### **Capital market**

Clearing and settlement is the backbone of capital market- equity and other securities issuance, purchase and sale. Currently, it is affected through a tangled web of transactions. Accenture has estimated that the investment banks could save over ten billion by using blockchain technology. The efficiency of clearing and settlement by shifting an entire system on a blockchain platform, the entire process can be automated to a real-time basis. Also, the DLT will make global security transactions easier and payments can be still being instantaneous. Again, due to the consensus feature, fraudulent transactions can be easily spotted and halted. Tied in with payment solutions discussed earlier the entire process can be revolutionized and digitized. This will also have the added impact of improving liquidity of all securities in the market and also enhance transparency. Regulators can have easier access to the data there by improving the securities of the clearing houses and instilling an added sense of trust in the public. Going beyond implementation by current security exchanges this technology could also potentially lead to decentralized non-intermediary based security exchange. A peer to peer exchange if you will.

### **Smart know your customer (KYC) data (In Banking) -**

Today almost every service provider, right from financial services to an internet provider requires KYC documents and information from its customer. And usually, it's the same information required. But since there is no sharing of data between companies, the consumer has to provide the data separately to all the companies. There is one problem and one fear that the customer has with this system. The duplication of data becomes extremely tedious from the customer and there is always the fear of the data being leaked to or stolen by other parties. For the companies it's a time-consuming process entailing high administrative costs and manpower. Enter block chain to the rescue. The consumer stores their KYC information on a block in the network which is protected by an encryption key. This data is verified by the network and once consensus on this is achieved. The block is accepted in the chain. The creator or customer can then share a public key with the relevant parties or companies that need those details. This means that the institutions can verify a customer's KYC details instantly. If a customer wants

to apply for insurance from multiple agencies or even transfer policies from one insurer to another, they do not need to go through the KYC process again. They simply need to share the public key with the relevant institutions.

### **Fraud detection and prevention- (In Insurance)**

Insurance fraud is a plague tormenting the industry for years. Multiple claims, fraudulent claims, forged or phony documents are some of the issues that block chain technology can tackle and eliminate. As we saw in smart contracts, every claim filed is recorded as a new block on the network. The network independently verifies this claim against the given parameters. Since a block once created cannot be changed, multiple claims are automatically detected on the network and immediately rejected. In this network, the claims are also verified with trusted third-party institutions like hospitals, garages, government departments etc., thereby the veracity of the claim. E.g. Mexicali filed by the insured is verified against the hospital pharmacy records which are also connected on the network. The Verification process can be expanded to validate asset ownership and double checked with police theft records to ensure that an authentic Payout event has occurred. Ever ledger, a startup, is applying this concept in establishing proof of ownership for precious stones. It is creating a registry that will record the ownership and details of every stone which will be recorded on a block with a unique series number that is engraved on the stone. Once a critical mass is achieved, it will become an industry standard and unless the seller can provide electronic proof of ownership they cannot sell or claim insurance. Going beyond just verifying claims, even the identities of the claimants can be verified on the block chain network and checked against police records and previous claim history. Since all of these processes are automated, human error and internal fraud is also eliminated. The cost associated with insurance fraud like pay outs on spurious claims, dedicated man power and, management will be drastically leading to a leaner organization and affording the insurance companies to reduce premium.

**Supply Chain Management (Blockchainhub)** – Organized supply chain management has been around since the 50s. But it has become a hassled and outdated regime. Can Blockchain be the answer to solve the shortcomings of a sector which is ever growing and shows no signs of stopping? We analyse the possibilities. Since the introduction of the shipping container in 1956, manual paper-based processes are still common and the information about the status of goods is locked away in organizational silos. Today 90 percent of goods in global trade are

carried by the shipping industry but the supply chain is slowed by the complexity and sheer volume of point-to-point communication across a loosely coupled web of land transportation providers, freight forwarders, customs brokers, government's ports and ocean carriers. This problem can be tackled with a distributed permission platform accessible by the supply chain ecosystem designed to exchange event data and handle document workflows. The collaboration will launch with the potential ability to track millions of container journeys per year and integrate with customs authorities on selected trade lanes. In a recent test by Maersk shipping, a single container of flowers from Mombasa in Kenya to the port of Rotterdam in the Netherlands, resulted in a stack of nearly 200 instances of interactions between more than 30 entities. Using blockchain means eliminating these peer to peer communications. As the internet-of-things continues to grow at a rapid rate, sensors and devices are becoming more commonplace to communicate information in business networks for data such as location, temperature and other properties that need to be shared. A private blockchain ledger can help create a tamper-free record. This opens up new ways of automating business processes among partners without setting up a costly centralized IT infrastructure and all participants have access to the same data. Let's look at how supply chain benefits when data is shared. The Private blockchain passes through all the multiple carriers in the supply chain. The business contract specifies the conditions that must be met during the shipment from the factory to the grocery store and all parties must adhere to the terms of the contract. A temperature sensor embedded in the package stores the data locally and sends it to the data cloud. Cloud information is shared across all peers. After every carrier meets the contractual obligations, the shipment arrived its final destination without exposure to excess temperatures. Blockchain technology can be deployed to track physical products and verify attributes from origin to point of sale (PoS) to provide supply chain transparency and traceability. The figure below demonstrates a generic blockchain-based IoT solution that could effectively help maintain supply chain visibility across an agricultural value chain

Commercial banking -

**(Deloitte University)** Bitcoin and other cryptocurrencies may be all the rage today but banks are more interested in the distributed ledger technology that blockchain offers. Leveraging this technology, banks can ease lending, asset management, registration and tracking, contract execution and improve customer service. Smart contracts are the cornerstone of the application of blockchain in banking. Smart contracts are self-executing programs that act as contracts. They self-execute upon certain conditions being met. Simply put, they follow the logical



reasoning of ‘Perform X if Y happens’. Imagine home loan processing and repayments executed through smart contracts. With an integrated network of banks, credit score institutions, KYC and asset registry, the loan processing time could be virtually instantaneous. The network will process and verify all the details of the applicant like credit score, KYC, financial history and property ownership. The loan could be approved in real time. When the sale of property is confirmed and asset registry has been updated with the change of ownership and the transfer on the applicant’s name, the amount could be remitted to the builder or previous owner instantly. Cause- purchase of property with all the criteria met; Effect-funds transferred. A mountain of paperwork and hours of manpower saved. Industry wide annual cost savings could potentially be in millions of dollars. EMI and repayments could also be similarly automated. Cherry on top, if the funds are in cryptocurrency form, that would be complete holistic blockchain only process! Asset management is another area where this technology could have a huge impact in terms of cost savings and quicker turnaround time. Again using the DLT (distributed ledger technology), any asset sales or transfer will be recorded in the network as a new block. Since every block has to be verified through consensus and once applied is irreversible, banks can track their own assets as well the asset held under mortgage more effectively. KYC (Know Your Customer) data can also be stored on the blockchain network and verified through the consensus model. This will decentralise the data making it more secure than a vulnerable centralised server and easier to process and access.

#### Accounting and auditing

**(Journal of Accountancy)** Blockchain technology may represent the next step for accounting. Instead of keeping separate records based on transaction receipts, companies can write their transactions directly into a joint register, creating an interlocking system of enduring accounting records. Since all entries are distributed and cryptographically sealed, falsifying or destroying them to conceal activity is practically impossible. It is similar to the transaction being verified by a notary – only in an electronic way. The companies would benefit in many ways: Standardisation would allow auditors to verify a large portion of the most important data behind the financial statements automatically. The cost and time necessary to conduct an audit would decline considerably. Auditors could spend freed up time on areas they can add more value, e.g. on very complex transactions or on internal control mechanisms. First steps towards Blockchain based accounting- it is not necessary to start with a joint register for all accounting-entries. The Blockchain as a source of trust can also be extremely helpful in today’s accounting structures. It can be gradually integrated with typical accounting procedures: starting from



securing the integrity of records, to completely traceable audit trails. At the end of the road, fully automated audits may be reality. At first, let us have a look at the case of keeping immutable records. For paper receipts, the risk of unnoticed modification is seen as comparably low, because of their physical nature. In contrast, electronic files cannot be perceived physically and hence are especially vulnerable. As a consequence, digitalizing paper records introduces the necessity for further preventive measures. For a more detailed explanation of the concepts also known as “triple entry accounting. The result is a wide range of organizational, technological and processual provisions. All preventive measures have to be documented in a conclusive manner for third parties. Unsurprisingly, many companies shy away from introducing a holistic electronic archiving system, although they are aware of the benefits. Using the Blockchain makes it possible to prove integrity of electronic files easily. One approach is to generate a hash string of the file. That hash string represents the digital fingerprint of that file. Next, that fingerprint is immutably timestamped by writing it into the Blockchain via a transaction. At any subsequent point in time, one can prove the integrity of that file by again generating the fingerprint and comparing it with the fingerprint stored in the Blockchain. In case the fingerprints are identical, the document remained unaltered since first writing the hash to the Blockchain

### **Blockchain enabled e-Voting and storing Government data –**

**(Blockgeeks)** Elections are a trying time for governing bodies and voters alike. For decades now, we have all dealt with the chaos of standing in a long winding queue for hours to cast our vote. While our nation is striving to become ‘digital’ in the true sense of the term, not much has changed as far as our voting systems go. Things get even worse as you move towards the rural areas. There have been talks for a while about making the whole voting system electronic, this would mean that a voter could vote from either a physical booth using an Electronic Voting Machine (EVM) or via their mobile phones/laptops. When it comes to larger national elections, collecting and evaluating the votes is a logistical nightmare for everyone involved on the management side of things. Add to that rampant corruption involving double voting, fraudulent voting, buying votes for a certain someone/party etc. While blockchains might not be able to completely eliminate traces of the bribes, it could definitely help with other problems of traditional voting system. By linking your vote to a blockchain, you get access to other members votes as well. And given that the data is immutable, you get one vote that cannot be changed and is tamper-proof. This would additionally mean that all members of the blockchain could also count the votes for themselves, since all the data is linked and permanently time

stamped.

**In Passports** - The first digital passport launched on GitHub in 2014 and could help owners identify themselves online and off. How does it work? You take a picture of yourself, stamp it with a public and private key, both of which are encoded to prove it is legitimate. The passport is stored on the ledger, given a Bitcoin address with a public IP, and confirmed by Blockchain users.

**Birth, wedding, and death certificates** - Few things are more important than documents showing you're born, married, died which open your rights to all sorts of privileges (such as voting, working, citizenship), yet mismanagement is rife. Up to a third of children under the age of five have not been issued a birth certificate, the UNICEF reported in 2013. The blockchain could make record-keeping more reliable by encrypting birth and death certification and empowering citizens to access this crucial information. A few of the issues in birth and death registration can be resolved by blockchain-based digitisation. Blockchain provides the advantage of immutability, leading to true provenance and finality, thereby making it a platform of choice for the digitisation of birth and death records. The figure below illustrates the key advantages of using blockchain-based solutions to address the problems associated with birth and death registration.

**Personal Identification** - We carry a range of identifications: Our driver's license, computer password, identity cards, keys, social security ID, and so forth. Blockchain ID is a digital form of ID that's engineered to replace all these forms of physical identification. In the future, fintech scientists say you'll be able to use the one digital ID for signing up at any registrar. It is open source, secured by the blockchain, and protected by a ledger of transparent account.

Social benefits (uses in PPT)

Governments all over the world spend significant portions of their budgets on social benefit schemes to take care of their poor, sick, the elderly, underprivileged and marginalised. However, an important aspect of such schemes is to prevent welfare spending from ballooning extravagantly and ensuring that recipients spend the money wisely. Financial inclusion of citizens is one of the key enablers for the disbursement of subsidies directly to beneficiary bank accounts, thereby reducing leakages. An estimated 2.5 billion adults worldwide are excluded from the formal financial system. In India, over 600 million people lack access to banking services and close to 300 million people live below the official poverty line. These people largely rely on government welfare payment schemes such as the National Rural Employment

Guarantee Act, 2005, old age pensions, scholarships, widow pensions, discounted LPG cooking gas and other subsidies for their sustenance. The Government of India makes these payments through the Direct Benefit Transfer (DBT) scheme which covers beneficiaries under 407 different schemes with a cumulative payout of 2.68 lakh crore INR (cumulative till December 2017).<sup>22</sup> DBT aims to eliminate corruption, inefficiencies and leakages to provide inclusive growth, deliver better welfare measures and eradicate poverty. Under DBT, each beneficiary establishes his/her identity and produces multiple documents to verify his/her eligibility before several authorities. However, a few challenges still exist, including financial losses through fraud and error, a large number of unbanked welfare claimants, cost of unauthorised transactions, high transaction costs and prioritising the most vulnerable citizens.<sup>23</sup> By removing the need for third parties to manage transactions and keep records, blockchain technology can massively reduce transaction costs and help mitigate these challenges. Leveraging blockchain technology for social benefit schemes will support the government's wider policy objectives of sustainability, thus reducing poverty and generating value for money in public expenditure. Blockchain technology can be used to create a secure and highly efficient welfare infrastructure that can prevent fraud and pilferage of social benefits. One of the potential use cases for blockchain-based social benefits payments is shown below. Beneficiaries will receive welfare benefits using a system that comprises a mobile app and blockchain system to record payments sent or received by welfare recipients.

### **Blockchain-based land registration system**

Land registration management has been adopted by various governments as one of the first areas to create a blockchain proof of concept (PoC). The state of Delaware in the USA recently announced two blockchain initiatives under the banner 'Delaware is open for blockchain business', which included the archival of state records to an open distributed ledger. Other notable examples of blockchain being leveraged for land registration management are from Georgia, Ghana and Sweden. A blockchain-based land registration system can go a long way in addressing some of the issues that exist in land registration today.

Agriculture With 40% of the global workforce and nearly half of the Indian workforce employed in agriculture, the sector is the world's largest provider of jobs and has the potential to influence billions of lives. Further, with increasing consumer demands for transparency in the food supply chain, producers and manufacturers struggle to provide accurate data from farm to table. Blockchain technology promises to improve traceability and transparency within agriculture value chains. Unfair pricing due to price extortion, delayed payments, the presence

of middlemen and high transaction fees are some other challenges that exist in agriculture supply chains. Additionally, food shipping and logistics are complex and at times require intra-continent supply chains. Such supply chains involve dozens of personnel and hundreds of interactions with high probabilities for human error. Blockchain technology has the potential to make the agri-supply chain more secure, transparent and efficient. It promises end-to-end supply chain visibility and allows one to trace the origin of a produce (provenance) and track a product/produce during its journey in a supply chain. Blockchain solutions, if implemented, may lead to the elimination of intermediaries or middlemen, thereby leading to improved pricing, decreased transaction fees, thus eliminate issues of hoarding, etc. The figure on the next page illustrates the key advantages of using a blockchain-based solution in the agri-supply chain. With over 50% of the Indian workforce employed in the agriculture sector, the security and well-being of farmers is a matter of prime importance for the Government of India. The **Pradhan Mantri Fasal Bima Yojana (PMFBY)**<sup>29</sup> was launched in January 2016 and it replaced all other crop insurance schemes, integrating the benefits into one single scheme. Under PMFBY, farmers are offered more insurance but with a lower premium amount. On top of the existing infrastructure, comprising smartphones, remote sensing technology and even drones, blockchain technology can be leveraged for quicker assessment of crop losses, assessment of compensation and the expedited settlement of claims. Blockchain technology can help reduce fraud in agriculture insurance, provide better provenance for organic food items, improve the food supply chain, bring disintermediation between farmers and corporates, enhance origin tracking for specialty foods and provide better price transparency across the country for a similar type of produce to prevent exploitation of small farmers at the hands of agents and middlemen. Additionally, blockchain can also solve the problem of micro-financing for farmers by facilitating micro-lending, increasing transparency and lowering the cost of funds.

## CONCLUSION

Creating federal laws to regulate blockchain technology is going to be a logistical nightmare for regulators. That being said, for the technology to be implemented, there is an immediate need for effectively laws that cater specifically to it. Industries like supply chain management or financial services are more likely to start using blockchain on a regular basis in the near future. It might take longer for other industries to follow suit. People need to be educated about blockchains and how it can help them and change the way they do business or even everyday transaction. It's only when they are aware that they will open up their mind to the possibility of

adopting a system so radically different from the one they are currently using. Today, blockchain is an emerging technology with some important challenges ahead. However, if properly harnessed, blockchain has the potential to completely disrupt traditional business models and render some current industry leaders obsolete within the next five to ten years. That is precisely why global industry leaders and start-up firms alike are pouring billions of dollars into researching, developing and testing applications based on the distributed ledger technology. As such, the EquiSoft blockchain task force will continue to closely monitor developments with this exciting technology, with the objective of guiding our clients through a potential paradigm shift in how the world does business. Regardless of when (or even if) blockchain technology becomes mainstream, it does warrant your attention today. After all, weren't the mainframe, PC, Internet and social media once emerging technologies that had uncertain futures?

“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten.” – Bill Gates.

#### **SCOPE FOR FURTHER RESEARCH**

To explore the application of blockchain in others sectors of commerce in finance and non-finance.

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