

## **An Exploratory Study on the Financial Inclusion of Digitalisation of the Indian Economy on the Rural and Urban Sectors in India and their role in meeting Macroeconomic Goals**

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### **ABSTRACT**

*Digitalisation in India is important for financial inclusion of the rural and urban sectors and achieving the country's macroeconomic goals. In examining the transformative influence of digital technologies, particularly in small businesses like kirana stores and the gig economy, it has empowered individuals, increased access to financial services, and boosted productivity. Adopting this technology has reduced unemployment, promoted women's empowerment, and enhanced overall economic development. Despite the positive outcomes, challenges such as digital literacy gaps, limited accessibility, and job insecurity in the gig economy remain. Digitalisation offers a vast potential for inclusive growth and economic progress; continued efforts are needed to ensure equitable access and sustainable development across India's diverse population.*

**Keywords:** Digitalisation, Financial Inclusion, Gig Economy, Digital Literacy, Economic Development, Kirana Stores, Digital Economy.

**Research question:** This paper would attempt to analyse the role of digitalisation in the Indian economy. How far has this helped the rural and urban poor? Has this helped small businesses in increasing profits? Is it an important tool in the reduction of poverty in the economy? Has this spread reduced unemployment rates? With the spread of this technology, have new avenues like the 'gig economy' opened up? Has it led to skilling of the workforce? These and other such questions would be attempted to be answered.

### **1. Introduction**

The digital revolution in India started with the Government of India (GOI) initiating the Digital India program in July 2015 to transform India into a digitally enabled, knowledge- based

economy. The program aimed to promote inclusive growth in areas of electronic services, products, manufacturing and job opportunities. The main aim has been centred around three key areas:

- Digital infrastructure to every citizen
- Governance and service on demand
- Empowerment of citizens

**Figure 1: Digital India Logo**



*Source: Digital India Corporation*

This revolution involves technology that lowers the cost of storing, sharing, and analysing data. The spread of the digital economy has been aided by cheap smartphones as well as internet facilities, available to a large majority of Indians. It is the combination of all these factors that has led to the spread of this economy to all sections of society in both the rural and urban areas. People are more adept with using their phones, irrespective of whether they are educated in the traditional way (the three Rs) or not. It has given them a sense of power and enabled them to increase their understanding, reasoning, and provided them with some sort of education with respect to their savings, as well as increasing their incomes, at times. People have become more aware of government schemes and their own rights through the use of the mobile instrument, which in turn has led to the advertisement and spread of knowledge on various topics by various agencies – government, private and a new breed in the form of ‘influencers’.

Technology and automation initially spread due to the globalisation of the Indian economy, which started in 1991 when the second set of major reforms were introduced. The advancement of information and communication technology, along with the spread of internet and mobile communication, as well as the changing computer technology, has led to its acceptance and growth across the nation. At every stage, with the advancement of technology, the ease at which

all the instruments can be used has majorly impacted an increase in its adoption. In India, despite the level of illiteracy, the simplified versions that have been adopted have helped the population in both the rural and urban areas. This has also impacted the socioeconomic as well as the sociocultural and are currently altering traditional forms of commercial exchange. This economy is about dynamic efficiency, new activities and products, rather than just being concerned with increased productivity. As technology grows, it leads to a number of new combinations that emerge.

## **2. Definitions**

### **2.1. Digitalisation**

Digitalisation refers to the leveraging of digital technologies and digitized data to enable and improve processes. The term is also used to describe the ‘digital transformation’ of an economy. India has experienced significant digitalisation across various sectors in recent years, acting as a powerful driver of efficiency, transparency and accessibility in each one. Its widespread nature has resulted in a profound impact on various aspects of life and the economy.

India's strategic use of digital technologies has catalysed significant advancements across multiple sectors, including digital payments and applications, E-governance initiatives under the Digital India campaign, digital banking services, as well as the telecommunications sector.

### **2.2. Rural and Urban Poor**

Rural poverty addresses the lack of financial resources and basic necessities to meet the minimum standard of living for individuals in rural areas, while urban poverty addresses the same in towns and cities. Traditionally, the Tendulkar Methodology set different poverty lines for rural and urban regions across India using calorie consumption-based poverty estimation. This method anchored poverty definitions on a daily per capita calorie requirement of 2400 kcal in rural areas and 2100 kcal in urban areas, applied uniformly across all states.

However, recent approaches have moved away from this calorie-based norm, recognizing that poverty is multifaceted. The poverty line now encompasses broader criteria, including expenditure on education and healthcare. This shift reflects the understanding that access to basic services is as critical as calorie intake in determining poverty.

The poverty line was computed for the year 2004/05 to match purchasing power parity (PPP) at approximately Rs. 33 per day, with separate thresholds for rural and urban areas.

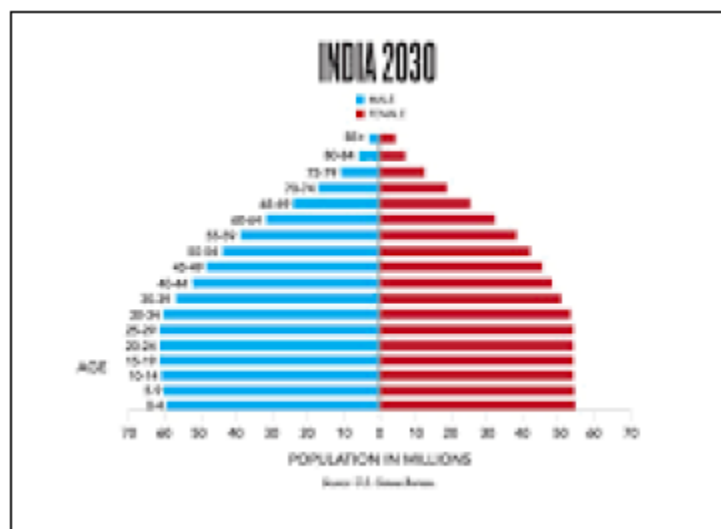
Specifically, the poverty line was set at Rs. 446.68 per capita per month for rural areas and Rs. 578.80 per capita per month for urban areas. These thresholds can be updated by adjusting for

changes in prices and consumption patterns over time, ensuring that the poverty line remains relevant and reflective of current living standards.

Therefore, rural poverty encompasses households with income or consumption levels falling below these specified poverty lines. Such households are typically engaged in agriculture, casual labour, or small-scale rural industries, lacking adequate infrastructure and essential services like healthcare and education. Urban poverty, defined under similar parameters, applies to low-income households residing in urban areas – living in slums and informal settlements, who are often engaged in informal sectors such as construction, domestic work, or street vending.

### 2.3. Demographic dividend

**Figure 2: India’s Demographic Pyramid (2030 – projected)**



*Source: Asian Development Bank*

India is presently at a state where the number of independent workforces is much higher than the dependent workforce. The independent from the age group 15-59 years, while the dependent are below 15 and above 59. India experienced the second stage of the demographic transition theory from 1921 onwards, which states a high birth rate and a low death rate. This led till the last decade of 2000 and increase in population of 2% per annum approximately. It is very recently that India has achieved the replacement rate of population which means that the number of births is equal to the number of deaths. It is the replacement rate for most of the states in India except in Bihar, UP, and in certain states it is even below the replacement rate. India’s TFR declined from 3.4 to 2.0 per family. The states that are yet to achieve the replacement level of fertility are Bihar, Meghalaya, Uttar Pradesh, Jharkhand, and Manipur.

China took advantage of this demographic dividend and achieved high levels of GDP growth. India is now in a position that it should take advantage of this dividend, if it wants to achieve the status of a developed economy. For this it is essential that the economy finds adequate employment opportunities for this section of the workforce.

### **3. Impact of digitalisation on Rural and Urban Small Businesses**

A major sector that has been impacted by the rise of digitalisation are 'Kirana stores. A backbone of the Indian informal economy, these mom-and-pop stores serve as neighbourhood grocery stores and act as an informal credit source in rural and urban areas.

As of 2023, the number of Kirana stores across rural and urban India stands at 13.01 million, which accounts for 75-78% of the consumer goods market. Out of India's retail market worth approximately \$883 billion, grocery retail accounts for \$608 billion and is expected to further grow to \$1.3 trillion this year.

E-commerce and big retail chains pose a major risk form small retail stores like these, which is why digitisation offers an edge for them to remain competitive and maintain the size of their segment in the consumer goods market.

The Indian Government's Open Network for Digital Commerce (ONDC) is a digital platform for Kirana stores to sell products, allowing them to compete with the grocery giants like Amazon, Flipkart, BigBasket, etc. However, this is still in its initial stages and is yet to come up to its promise for the time being.

Additionally, these small retail stores were able to mitigate the hit of the pandemic by integrating 'Kiranatech'. This term refers to any technology mechanism that brings efficiency in the Kirana value chain or their day-to-day functioning. This digitisation has been adopted in inventory procurement, inventory management, credit access, payments, bookkeeping, online sales, as well as staff management. Thanks to the game changing technology in the form of UPI payments, its rapid adoption took place in this segment primarily during Covid which led to a boom in online transactions for Kirana stores, and has continued ever since.

The appeal of Kirana stores is their ability to let loyal customers pay with credit, and was traditionally maintained in a loan book. This has successfully translated to a digital medium with the rise of BNPL (buy now pay later) services which uses digitisation to transform the traditional credit models.

Despite technology and digitalisation acting as a great enabler for the unorganised retail sector, barriers for adoption do exist. A large majority of shopkeepers surveyed are comfortable with

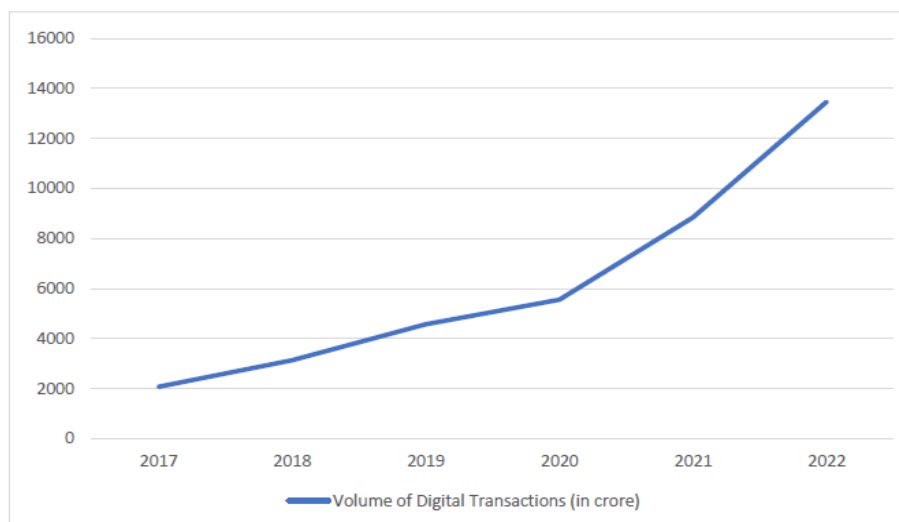
digital tools and utilise them to purchase inventory, communicate with suppliers and /or customers, however 26% of them have reported difficulties in learning and adopting them – 16% of them attributing this to monetary issues. This is a problem arising from ‘skilling’ of the workforce and digital services being inaccessible and/or unaffordable, and should be placed at the forefront of the government’s agenda considering the size of the market and the potential for growth in this segment.

**Table 1: Volume of Digital Payment Transactions**

Financial Year	Volume of Digital Payment Transactions (in crore)
2017-18	2,071
2018-19	3,134
2019-20	4,572
2020-21	5,554
2021-22	8,839
2022-2023	13,462

Source: Data from Reserve Bank of India (RBI), National Payments Corporation of India(NPCI) & DIGIDHAN Portal

**Graph 1: Volume of digital transactions**



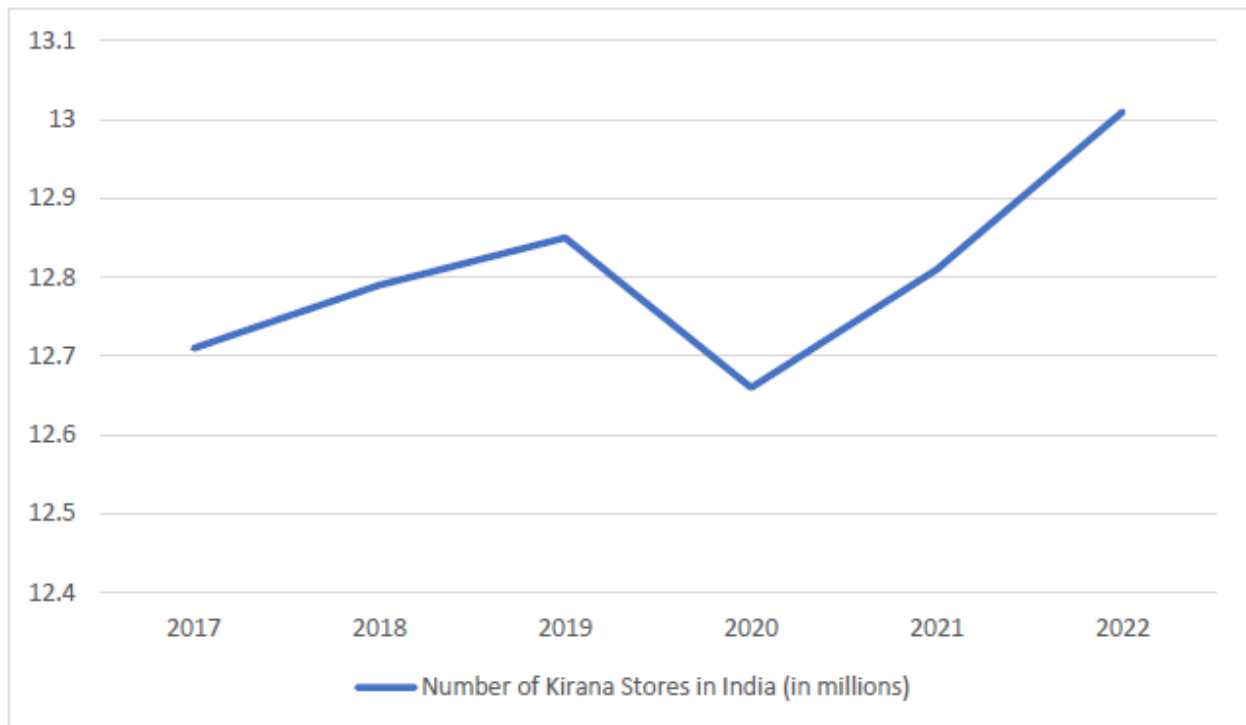
Source: Own Source

**Table 2: Number of Kirana Stores in India**

Year	Number of Kirana Stores in India (in ten thousand)
2017	1271
2018	1279
2019	1285
2020	1266
2021	1281
2022	1301

Source: Data from Statista

**Graph 2: Number of Kirana Stores (in millions)**



Source: Own source

A notable trend highlighting the impact of digitalization on the growth of Kirana stores is the decline in candy sales, particularly evident in data from Lotte India, alongside the rise of UPI payments since its introduction in 2016. This seemingly unusual relationship can be traced back to the practice of Kiranas giving 1-rupee candies as a substitute for small change.

However, with the advent of UPI, this practice has largely disappeared.

**Table 3: Yearly Gross income of Lotte Confectionary (2015 – 2021)**

Year	Gross Income of Lotte Confectionary
2015	48,132
2016	40,245
2017	42,576
2018	42,621
2019	45,490
2020	44,070
2021	41,882

*Source: Annual Report of Lotte India 2020-21*

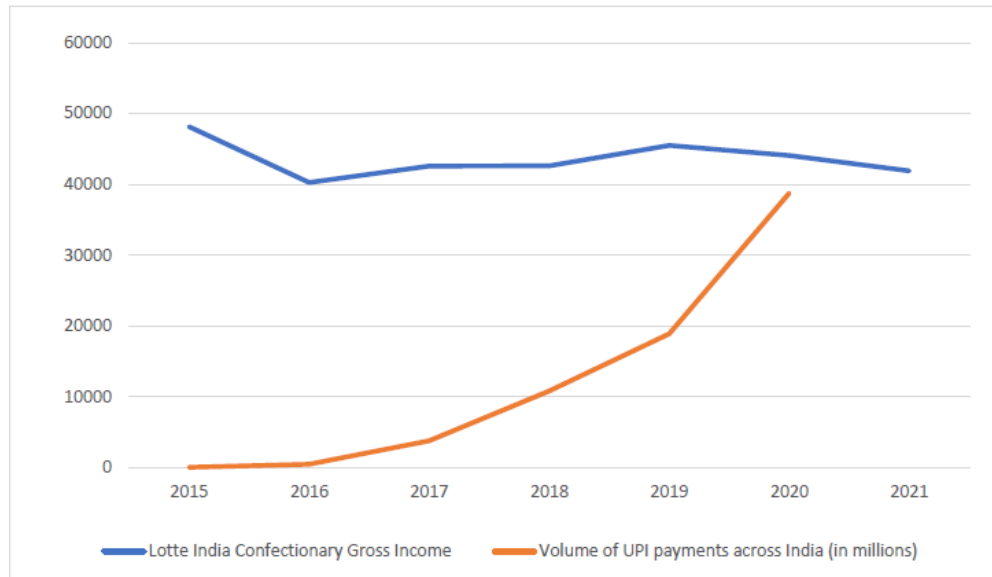
**Table 4: Volume of UPI payments (2016-2021)**

Year	Volume of UPI payments (in millions)
2016	2.65
2017	429.15
2018	3,746.32
2019	10,787.54
2020	18,880.89
2021	38,744.12

*Source: Data from Statista*



**Graph 3: Comparison of Lotte Confectionary Gross Income and Volume of UPI payments**



*Source: Own source*

Based on the data from the tables and graphs, as well as the inverse relationship between candy sales and UPI payments - the rising trend in digital payments can be linked to the rise in the number of Kirana stores, exemplifying how digitalisation and integration of technology in their supply chain has boosted efficiency and productivity, while accelerating the growth of this sector.

### **3.1. Reduction in Unemployment**

The gig economy – an economic system characterized by flexible, temporary, or freelance jobs, is becoming an increasingly significant part of the global economy. In developed countries (DCs), platforms like Uber have redefined transportation services by providing flexible work opportunities that fit within a well-regulated environment. However, in underdeveloped countries (UDCs) like India, the gig economy serves a dual purpose. It is not only a necessary alternative to traditional employment but also an integral part of the economic system, especially for those in the informal sector. The advent of digital platforms such as Swiggy and Zomato has transformed employment opportunities, leading to a surge in gig work and contributing to the reduction of unemployment.

Digitalisation has played a pivotal role in the rapid expansion of the gig economy in India. By lowering barriers to entry and providing platforms for workers to connect with employers, digitalization has democratized access to employment. For instance, Swiggy and Zomato, two of

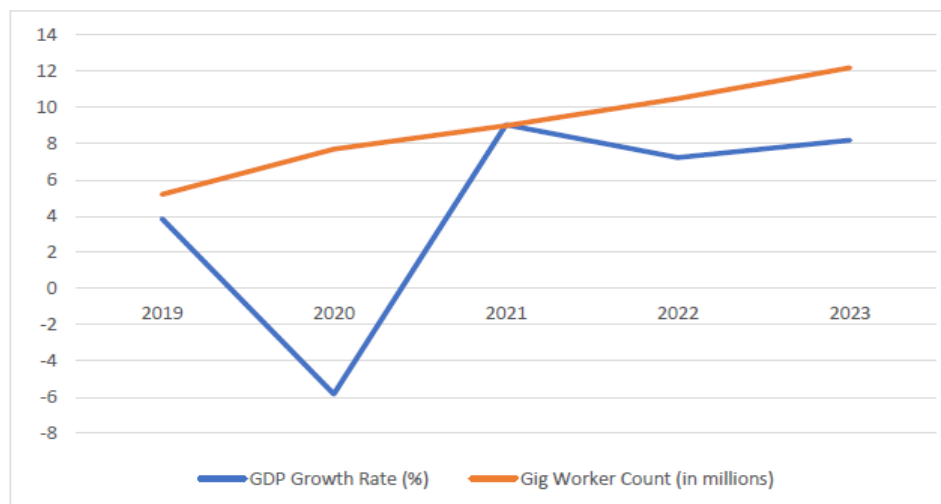
India's leading food delivery platforms, have significantly increased their workforce over the years. According to reports, these platforms have collectively created millions of jobs, many of which are part-time or flexible, catering to individuals who are unable to engage in full-time employment. This has had a direct and mostly positive impact on unemployment rates, particularly among women, who often seek flexible work due to family responsibilities.

**Table 5 – GDP Growth Rate and Gig Worker Count in India**

Year	GDP Growth Rate (%)	Gig Worker Count (in millions)
2019	3.87	6.2
2020	-5.83	7.7
2021	9.05	9.0
2024	7.24	10.5
2023	8.20	12.2

*Source: Data from PIB*

**Graph 4: Graphic Representation of GDP Growth Rate and Gig Worker Count (Table 5)**



Despite not seeing a direct correlation between the two variables, it is important to acknowledge the role of the gig economy in certain periods of economic growth. For example, the devastating effects of the covid 19 pandemic led to a period of economic downfall - as seen by the negative growth rate in 2020 of -5.83. However, this was accompanied by a surge in the gig worker count by 1.5 million. The pandemic provided a unique opportunity to expand on flexible jobs –

particularly for those willing to engage in gig economy work.

### **3.2. Women's Empowerment through Digitalisation:**

The gig economy, bolstered by digitalisation, has also empowered women by providing them with more flexible work options. Women can now participate in the workforce without compromising their roles within the household, leading to greater financial independence.

Historical data from macroeconomic trends suggest that married women, particularly in rural India, withdraw from the labour force on account of caregiving responsibilities and for enabling her family's upward social mobility. However, platform work offers the unique advantage of flexible work hours while providing high earning opportunities – making it a consistently popular choice amongst this segment. This 'platform work' specifically refers to the matching of demand and supply of paid work through an online platform using an algorithm, facilitated by the rise of digitalisation. In the Indian context, popular platform-based job opportunities for women range from homebased services, cleaning and beauty services, to tailoring and embroidery.

**Figure 3: Image of a Woman engaged in platform work**



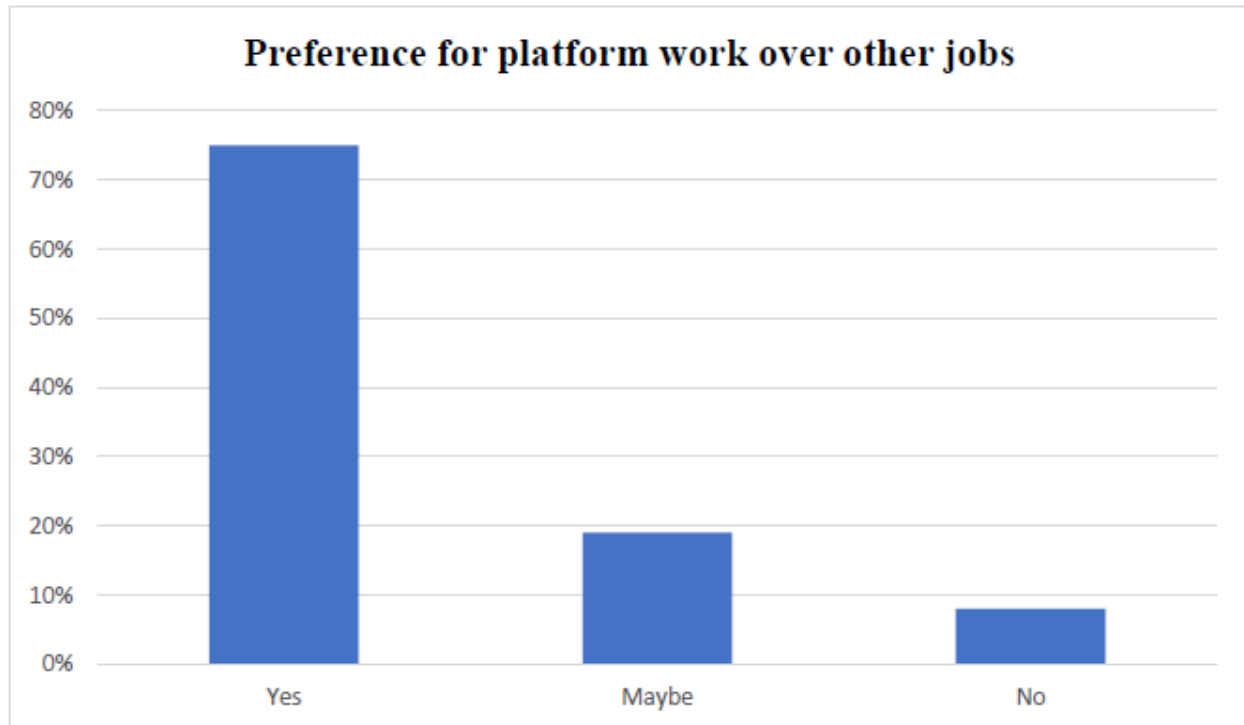
*Source: United Nations Development Programme Website*

### **3.4. 2022 Case Study on impact of platforms on women's economic empowerment:**

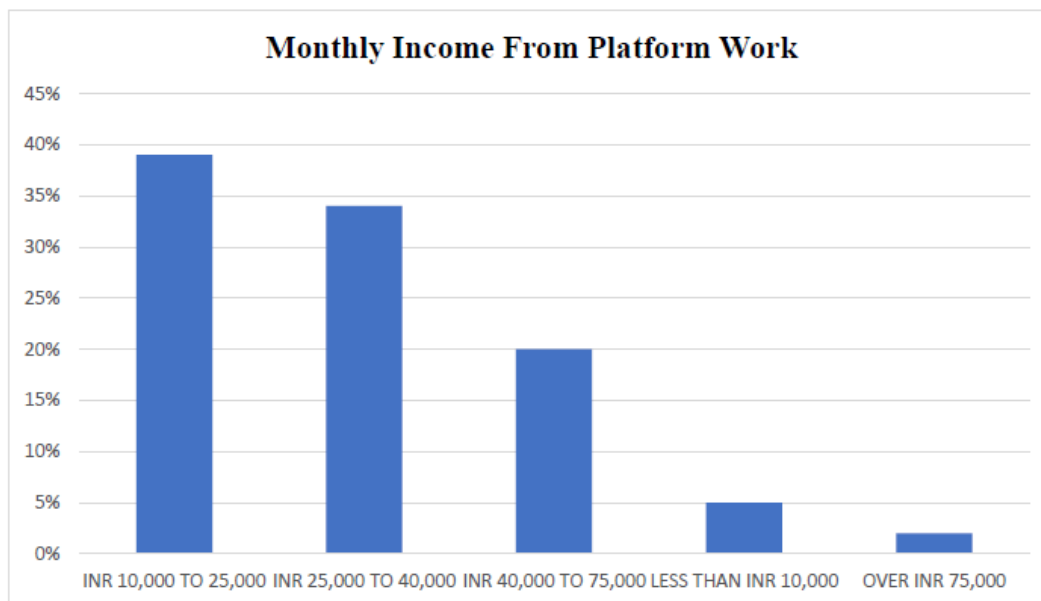
Raman, Ramachandran & Sindhu (from Niti Aayog Final report on India's Booming Gig and Platform Economy) focused on delineating the facilitators and barriers for women's participation in the platform economy. They collected primary data through both online surveys and in-person interviews for two distinct sets of respondents: Individual Platform Workers and, and Aspirational Women.

Key highlights from the study are presented below.

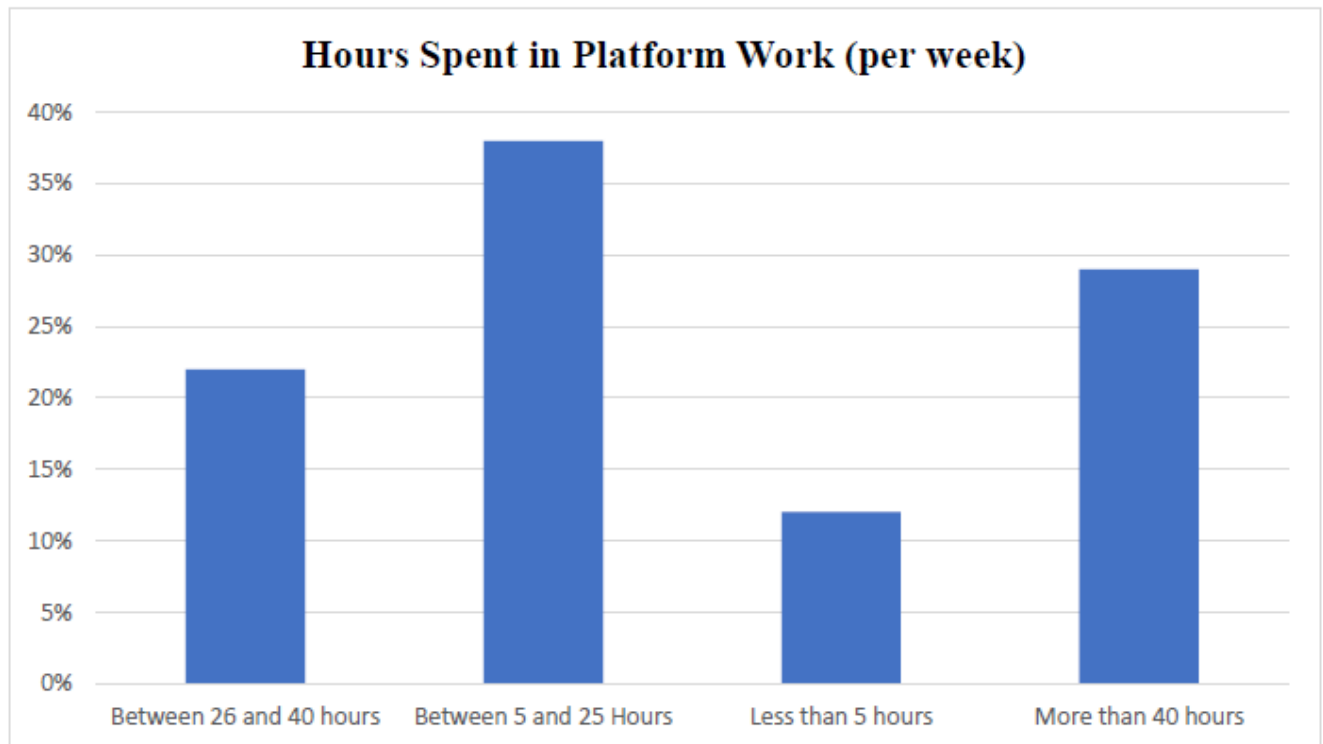
**Graph 5: Women's Preference for Platform Work from Survey Data**



**Graph 6: Range of Monthly Income for Platform Work amongst Women from Survey Data**



**Graph 7: Hours spent by Women engaged in Platform Work per week**



Based on the data collected, they concluded that platform work is seen as one of the more popular choices of employment (working less than 25 hours per week). This highlighted the part time nature of platform work and the high level of convenience that comes with it for women in the labour force. These hours earned them income between 10,000 to 25,000 INR per month. This clearly indicated that though the volume of jobs is high, platform work may not be the most lucrative employment option.

### **3.5. Limitations of digitalisation:**

Despite its many advantages, the gig economy has significant drawbacks, particularly in UDCs, where workers often lack job security, health insurance, and other benefits typical of formal employment. Platforms like Zomato and Swiggy illustrate these challenges. A 2023 Fairwork India survey revealed that less than 10% of gig workers on these platforms have access to any social security, leaving them vulnerable in times of illness or financial distress. Earnings are also unstable; a 2022 TeamLease report showed that while top-performing delivery partners could earn up to ₹35,000 per month, average earnings were much lower, around ₹15,000 to ₹20,000, with significant fluctuations. Moreover, career advancement is limited—an IIM Bangalore study found that 85% of Swiggy and Zomato delivery partners saw no path to higher-paying jobs,

trapping them in low-wage work. Additionally, algorithms used by these platforms can lead to worker exploitation, with over 70% of gig workers feeling that rating systems were unfair, according to a 2023 report by the Centre for Internet and Society.

#### **4. Impact on Macroeconomic Indicators**

The digitalisation of the Indian economy has been a transformative force, significantly influencing key macroeconomic indicators such as poverty, unemployment, and economic growth. This section examines the impact of digitalization on these indicators, using real-time data and statistics to explore correlations and trends.

##### **4.1. Poverty**

Digitalisation has the potential to reduce poverty by increasing access to financial services, improving agricultural productivity, and creating new employment opportunities.

Government data shows a declining trend in poverty levels in both rural and urban areas over the past decade. According to the Ministry of Rural Development, poverty in rural areas has dropped from 25.7% in 2011-12 to 17.6% in 2019-20, while urban poverty has decreased from 13.7% to 9.1% in the same period. This reduction can be partly attributed to various digital initiatives like Direct Benefit Transfers (DBT), which have ensured that subsidies and benefits reach the intended recipients, reducing leakage and corruption.

##### ***Central Government Initiatives for Digitalisation to reduce Rural Poverty:***

The Pradhan Mantri Jan Dhan Yojana (PMJDY), launched in 2014, aimed to provide universal access to banking facilities, particularly for the rural poor. As of 2023, over 480 million bank accounts have been opened under this scheme, with 67% of these accounts in rural areas. The impact has been profound, as rural households now have better access to savings, credit, and insurance, which are crucial for poverty alleviation. Moreover, initiatives like eNAM (National Agriculture Market) have connected farmers directly to buyers, reducing middlemen and improving farmers' income.

##### **4.2. Urban Poverty and Digitalization:**

In urban areas, digital platforms such as e-commerce and gig economy apps have created new income opportunities, helping to lift people out of poverty. However, the impact has been uneven, with the benefits of digitalization often concentrated among those with better digital literacy and access to technology. The challenge remains to ensure that the urban poor are not left behind in the digital divide.

**Table 6: Yearly Rural and Urban Poverty Rates**

Year	Rural Poverty Rate (%)	Urban Poverty Rate (%)	Impact of Digitalization
2011-12	25.7	13.7	Initial stages of digital penetration, limited impact on poverty reduction
2013-14	23.7	12.3	Increased smartphone adoption, early-stage digital services (e-commerce, payments)
2015-16	21.9	11.1	Rapid growth of digital infrastructure (internet, mobile banking), increased access to information and services
2017-18	20.3	9.9	Maturation of digital ecosystem, emergence of digital platforms for agriculture, education, and healthcare
2019-20	18.9	8.7	Widespread digital adoption, significant impact on poverty reduction, especially in rural areas

Source: PIB gov

### 4.3. Unemployment and Skilling

Digitalization has had a mixed impact on unemployment in India. On one hand, it has created new job opportunities, particularly in the gig economy, which was discussed in section 4.1.

According to the Periodic Labour Force Survey (PLFS) 2022-23, the unemployment rate in India fell to 4.8%, down from 6.1% in 2017-18, indicating a positive trend. However, the rise of automation and digital technologies in sectors like manufacturing and services has also led to job displacement, particularly in low-skilled roles.

The rise of automation, driven by advances in AI and machine learning, poses a significant challenge to employment. While automation has improved efficiency and productivity, it has also rendered certain jobs obsolete. For instance, the introduction of automated kiosks in retail and self-checkout systems has reduced the need for cashiers. The challenge for India is to

balance the adoption of technology with the creation of new employment opportunities.

To address the challenges posed by automation, the Indian government has launched several skill development initiatives aimed at equipping the workforce with the necessary skills to thrive in a digital economy. The Skill India Digital program, part of the broader Skill India initiative, has been at the forefront of these efforts. As of 2023, over 150 million people have received training under this initiative, with a focus on digital skills such as coding, data analytics, and cybersecurity.

Data from the National Skill Development Corporation (NSDC) indicates that the Skill India Digital program has significantly improved the employability of participants. The placement rate for trainees has increased from 47% in 2017 to 63% in 2022. This improvement can be directly linked to the emphasis on digital skills, which are increasingly in demand across industries.

**Table 7: Sectoral Unemployment Rates and Respective Impact of Digitalisation**

Sector	Sectoral unemployment rates				Impact of Digitalisation/Automation
	2017-18	2019-20	2021-22	2022-23	
Manufacturing	4.90%	4.80%	4.60%	4.50%	Increased automation in manufacturing processes, leading to job displacement in some areas
Construction	6.30%	7.20%	6.90%	6.80%	Increased use of construction technology (e.g., 3D printing, drones)
Wholesale and Retail Trade	7.10%	8.20%	7.90%	7.80%	Growth of e-commerce and online retail, impacting traditional brick-and-mortar stores
Transport, Storage, and Communication	5.50%	6.10%	5.90%	5.80%	Increased use of technology in transportation (e.g., GPS, autonomous vehicles)



Accommodation and Food Services	7.70%	9.20%	8.90%	8.80%	Impact of online food delivery platforms and automation in hospitality
Other Services	7.20%	8.00%	7.80%	7.70%	Varying levels of impact depending on the specific service sector

*Source: Own Source*

#### 4.4. Economic Growth

Digitalisation has been a key driver of economic growth in India, contributing to increased productivity, greater efficiency, and the creation of new markets. The contribution of the digital economy to India’s GDP has grown significantly, from 7.5% in 2015 to 10% in 2023. The World Bank projects that this figure could reach 20% by 2030, driven by continued investments in digital infrastructure, the expansion of internet access, and the growth of digital services.

Digitalisation has also led to enhanced productivity and efficiency across various sectors. For instance, the adoption of digital technologies in agriculture has led to better crop management, reduced wastage, and improved supply chain efficiency. In the manufacturing sector, the implementation of Industry 4.0 technologies has streamlined production processes which has led to reduced costs and increasing output.

The IT and IT-enabled services (ITES) sector, which has been at the forefront of India’s digital transformation, has seen remarkable growth. The sector’s revenue has increased from \$143 billion in 2015 to \$227 billion in 2023, with exports accounting for a significant portion of this growth. The rise of fintech, e-commerce, and digital entertainment has also contributed to economic growth, creating new revenue streams and boosting consumer spending.

**Table 8 – Contribution of Digital Economy to India’s GDP**

Year	Contribution to of Digital Economy to GDP (%)
2015	3.54
2016	5.4
2017	6.23
2018	7.38

2019	7.5
2020	7.70
2021	8.34
2022	8.50
2023	10.01
2030 (projected)	20

*Source: Niti Aayog*

While digitalization has driven economic growth at the national level, regional disparities remain a concern. States with better digital infrastructure and higher levels of digital literacy, such as Karnataka, Maharashtra, and Tamil Nadu, have benefited more from digitalization compared to states like Bihar and Uttar Pradesh. Ensuring that digitalization leads to inclusive growth across all regions is crucial for sustaining economic development.

## **5. Conclusion**

The digitalisation of the Indian economy has undeniably played a transformative role in reshaping both rural and urban sectors, contributing significantly to India's economic progress. By bridging the digital divide through affordable smartphones, widespread internet access, and government initiatives like Digital India, digital technologies have empowered individuals and small businesses alike. The impact of this digital revolution is evident in areas such as financial inclusion, increased access to information, and enhanced productivity for sectors like Kirana stores and the gig economy.

For rural and urban small businesses, especially Kirana stores, the integration of digital tools has increased operational efficiency, widened market access, and fostered competitiveness against larger retail chains. Meanwhile, the gig economy has emerged as a vital source of employment, particularly in underdeveloped areas, creating flexible job opportunities that have reduced unemployment and facilitated women's participation in the workforce.

However, challenges remain. The full potential of digitalisation has yet to be realised, with barriers like inadequate skilling, digital literacy, and accessibility still hindering widespread adoption. Additionally, issues such as job security and fair wages in the gig economy demand attention to ensure that the benefits of digitalisation are equitably distributed.

While digitalisation is a powerful tool for economic development and poverty reduction, its

success hinges on inclusive and sustainable growth. The Indian government, private sector, and society must continue to collaborate on expanding access, improving digital literacy, and creating policies that ensure digital technologies uplift all segments of the population. Only then can digitalisation fulfil its promise as a driver of economic well-being and national progress.

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