

# THE HYBRID EQUILIBRIUM: DECONSTRUCTING THE CASH PARADOX & THE STRATEGIC ASCENT OF CBDCS IN INDIA'S FINTECH ECOSYSTEM

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## ABSTRACT:

The rapid evolution of financial technology has pushed forward the global economies into a “production era,” characterized by the advanced digital payment infrastructures, large-scale deployment of artificial intelligence (AI) & distributed ledger technologies (DLT). India is placed in the front line by the unprecedented success of the Unified Payments Interface (UPI). However, an apparent contradiction has emerged in the form of the “Cash Paradox,” wherein digital payment volumes keep on increasing along with the constant simultaneously rise observed in the circulation in currency (CIC). This paper conceptualizes this phenomenon as a Hybrid Equilibrium, discussing the successful coexistence of both the currencies, which may be the result of the distinct economic & behavioural utilities. Furthermore, it investigates the limited adoption of Central Bank Digital Currency (CBDC), which remains at a nascent in comparison of the overall circulation. Using a mixed-methods approach, the paper aims to identify the structural, psychological & technological barriers associated with the CBDC adoption & also tries to propose a strategic framework focusing on the usability, awareness, AI-driven integration, institutional partnerships, etc. The findings will ultimately provide a comprehensive & in-depth contribute towards understanding & disclosing the insights of next-generation monetary systems & digital financial inclusion.

**Key Words:** *Cash Paradox, Circulation in currency (CIC), Central Bank Digital Currency (CBDC), distributed ledger technologies (DLT), Unified Payments Interface (UPI), Real-World Asset (RWA) tokenization etc.*

## INTRODUCTION

The global financial landscape has transitioned from speculative experimentation into the "Production Era" of Fintech. From the past few years the technologies such as blockchain, distributed ledger technology (DLT), Artificial Intelligence (AI), etc. were taking a back seat may be because of regulatory aspects or crypto. But, now they have taken the forefront & they are integrating themselves globally. This shift has brought them to life from the grounds & their innovations, autonomy (mildly), technology & scaling all are escalated. Agentic AI based autonomous systems are capable of executing financial transactions & managing risk without constant human intervention not conceptually but operationally at global level in many top-tier firms (Kellogg et al., 2025). It has been observed that almost 81% of financial institutions which are running successfully have already adopted AI & are heavily invested in integrating these agents into data visualization & cybersecurity protocols (Grand View Research, 2026).

Simultaneously, it is also observed that the maturation of blockchain has led to the rise of Real-World Asset (RWA) tokenization for bringing sophistication & efficiency in handling, government bonds, real estate & credit, etc. This adoption was brought up & cemented by the legislative involvement of the various act's indifferent continents, i.e., such as the GENIUS Act (2025) in the United States, MiCA framework in Europe (Regulation EU 2023/1114). Now the most important question is navigating between the national currencies of physical & digital nature.

Over the last few years India has strengthened its position globally as a digital payments leader due to Unified Payments Interface (UPI) it has also acted as a backbone for Indian economy too via digital payments. Despite this digital dominance we are still facing the phenomenon - "Cash Paradox" (State Bank of India [SBI], 2026). Economists were keenly observing that our overall transactions including physical & digital both of which have sky rocketed. Currency in Circulation (CIC) experienced an 11.9% surge, reaching record levels of ₹41.6 trillion (SBI, 2026). Thus suggesting that our country is operating at Hybrid equilibrium making them coexist for different reasons (Shukla & Karim, 2026).

India has the most promising & successful retail digital payment ecosystem indicating we are capable to handle the digital interface but the official digital version of the rupee (Digital Rupee or e₹) never took off.

It indicates some hidden barriers public understanding regarding the difference between bank-intermediated digital money (UPI) & sovereign digital money (CBDC), usability friction & an unclear value proposition for the average consumer (Atodaria & Soni, 2026). The e-Rupee not just as a financial tool but as a "developmental layer" within the national infrastructure—as seen in the launch of CBDC-based food currency pilots (Press Information Bureau, 2026) India has the opportunity to lead the world.

## **FINTECH PRODUCTION ERA**

The global financial ecosystem incorporated the experimental innovation to operational implementation, marking what scholars describe as the production era of FinTech. Technologies such as artificial intelligence, blockchain & real-time payment systems are embedded within core financial infrastructure. The emergence of agentic AI, which enables autonomous financial decision-making, risk assessment & operational optimization. Thus, the cash paradox is a unique opportunity in digital era & Indian economic environment.

### **Digital Leadership & Structural Duality**

Our payment system runs on UPI & has achieved recognition globally enabling a seamless, real-time & low-cost transactions across diverse population segments. The coexistence of digital & physical cash persistence constitutes the Cash Paradox, challenging conventional assumptions about the transition toward a cashless economy. This study aims to- Analyze the structural & behavioral drivers of the Cash Paradox, Conceptualize the Hybrid Equilibrium between digital & physical currencies, Evaluate barriers to CBDC adoption in India & Propose a strategic framework to accelerate CBDC integration.

### **The Cash Paradox & Currency Demand**

One of the main reasons behind keeping physical cash includes- precautionary motives especially during periods of rapid technological shift or economic uncertainty, etc. A study by Awasthy et al. (2023) highlights that despite the rapid adoption of digital payments, cash demand persists due to precautionary & store-of-value motives, even as its transactional use declines siding with the classical Keynesian theory, where the precautionary motive drives

liquidity preference during periods of uncertainty. Secondly a huge part of Indian economy deals in unorganized commerce & rural markets, still rely on the tangibility & immediate settlement of physical cash. While the digital payment sector (UPI) offers ease & mainly removes the stress of keeping your purse secure, etc.

Although both of them are thriving but the sovereign digital alternative—the Central Bank Digital Currency (CBDC) or "Digital Rupee" is still stalled. As of the current reporting period in 2026, the CBDC remains at a nascent stage, accounting for a mere 0.02% of total currency in circulation (Reserve Bank of India [RBI], 2026) indicating a problem.

### EVOLUTION OF DIGITAL PAYMENTS IN INDIA

India is successfully adapting to the UPI. Our populations comfort in using UPI is indicated by the increasing use & dependency of users in digital currency. Thus, eventually we have substituted the need for cash concept from the minds of people. However, we can't say that our citizens are completely dependent on digital currency. Some people believe that digital payments influence spending patterns of the user. The high frequency of transactions is also there. It is also affected by the trust factors & our financial environment.

Indicator	FY24	FY25	FY26	Growth Trend
UPI Transactions Volume	High	Very High	Explosive	Fast
Currency in Circulation	Moderate	High	Very High	Moderate/ Slow
CBDC Adoption (%)	Negligible	0.01%	0.02%	Slow

**Source:** *Kawale & RBI Report.*

### CBDC: Conceptual Foundations & Global Trends

According to Priyadarshini & Kar (2022), CBDCs introduce complex considerations including monetary sovereignty, financial stability & developmental implications. Global literature (2024) further categorizes CBDCs based on many attributes ranging from - Access models (retail vs wholesale) to Technology (DLT vs centralized systems) to Design features (token-based vs account-based).

Dixit et al. (2025) employ the UTAUT3 framework to identify key drivers such as performance expectancy, effort expectancy, social influence & facilitating conditions. These studies emphasize that CBDCs are not merely technological innovations but represent a fundamental transformation in the nature of money & central banking. Similarly, Kaur et al. (2025) highlight that CBDC adoption is strongly influenced by: many factors, mainly, Perceived usefulness, Ease of use, Digital literacy & Trust in institutions. Central Bank Digital Currencies are designed to combine the trust & stability with the efficiency of digital transactions. However, global adoption remains still remains questionable.

There may be certain barriers which include- lack of awareness, friction at usability level & ultimately the biggest challenge is privacy & surveillance. Di Maggio et al. (2024) finds that increased CBDC adoption can lead to a substitution effect, reducing reliance on traditional bank deposits & cash holdings. The major concerns are intermediation issues, policy changes & liquidity shifts.

Based on the growing role of AI in the business world & bringing ease & sophistication in financial dealings at universal level the coexistence can't be declined & it is also suggested that instead of a cashless model the need of the hour is multilayered monetary system which can assist to handle the gap. Thus, one must focus on the Hybrid Equilibrium Model. It offers these distinct utility functions-

1. Digital Currency (Flow Utility): Optimized for speed, efficiency & high-frequency transactions
2. Physical Currency (Store Utility): Valued for tangibility, anonymity & reliability
3. The equilibrium arises when these utilities coexist without fully substituting each other.

**Fig-2:** Utilizing Agentic AI for autonomous fraud detection & real-time data quality management to ensure transparent reporting (aligned with NBA/NAAC standards).

Pillar	Focus Area	Goal
Usability	Invisible UX	Match UPI's frictionless experience
Regulation	Legislative Frameworks	Provide institutional certainty
Technology	AI-CBDC Nexus	Autonomous security & data quality

**Source:** *World Economic Forum (2021)*

### DRIVERS:

UPI the high growth payment mechanism exhibited growth in an exponential manner. It was enhanced by the usage of smart phones. It was also frequently observed in high frequency for the lower range of payment. This expansion is driven by interoperability, real-time settlement & minimal transaction costs, making digital payments highly efficient (Sahay et al., 2020). In contrast to it CBDC was used marginally. The asymmetric responses of people about its assimilation appears as a strange outcome. On one hand where digital payments & UPI dominate the people's choice in contrast to it the hostile approach or distrust of people towards CBDC is completely unimaginable or in an experimental phase.

#### 1. Behavioral Drivers:

At the core of the Cash Paradox lies a set of deeply embedded behavioral factors that continue to sustain the demand for physical currency. Among these, the precautionary motive emerges as a dominant driver. Rooted in classical monetary theory, the precautionary motive refers to the tendency of individuals to hold liquid assets as a safeguard against uncertainty. In the contemporary context, this translates into a preference for cash as a reliable, risk-free medium that does not depend on technological infrastructure.

Consumers perceive physical currency as a form of financial security. Unlike digital systems, which require electricity, internet connectivity & platform reliability, cash offers immediate liquidity without intermediary dependence. This independence becomes particularly valuable in situations of economic uncertainty, technological disruption, or systemic risk. As a result, even digitally active users maintain cash reserves as a hedge against unforeseen contingencies.

Behavior drivers the insecurity lingering in the eyes of the people regarding the monetary status in a country is the reason which is supported & rooted In the classical monetary theory. People consider it as a precaution & in order to safeguard themselves against any possible or unprecedented or unpredictable uncertainty they consider that a case A cash or a physical currency could help them to minimize the risk & handle the environment in a better way this idea where people consider currency not just as money but as a substitute of security reliability & dependence is what drives people against adopting the technological advancements & considering physical cash as the biggest security offered.

Sometimes people use this because of their long-standing habits, their dependence, their education, their financial literacy, their familiarity with the cash transactions, maybe their cultural preferences associated with the money forces them directly or indirectly to depend on cash any one of these attributes may affect the usage or preference of physical cash above the digital currency.

## 2. Structural Drivers

Indian economy is still significantly dependent upon cash there are multiple sectors & a lot of economic activity is going on. The sectors are spread across urban as well as rural area ranging from small to big industries. In most of the cases labour markets, smaller stores, unregistered enterprises, etc are observed to be completely dependent upon physical currency.

Often the commonly observed reason behind this is because they lack any formal documentation or do not deal with heavier end of technology. Sometimes people opt this option in order to enable hidden settlements, transaction fees or just to maintain their anonymity. Ultimately the biggest reason for accepting cash worldwide is its legal recognition. On the other hand there are certain currencies or digital finances which are still awaiting to be considered as a part of the economic structure of a country. All these factors contribute more or less to the economic architecture of countries, i.e., India which are associated with physical cash contributes to its preference in the transactions.

<b>Driver Type</b>	<b>Description</b>	<b>Impact Level</b>
Precautionary	Emergency liquidity preference	High
Informal Economy	Cash-based transactions	Very High
Trust Factor	Tangibility & reliability	High
Accessibility	Limited digital infrastructure in rural areas	Medium

**Source:** *Informal economy (cash-based transactions dominance) World Bank*

### Barriers:

Based on the contributions & Adaptation ideas, biggest barriers which were observed include-

#### 1. Awareness gap-

A significant portion of the Indian population does not hold a clear understanding of what CBDC represents & how it is different from the digital payment system or any kind of commercial bank money or UPI transactions. The confusion among the people & the limited amount of interest & the total lack of recognition among them is the reason people are not inclined opt for CBDC.

## 2. Redundancy-

UPI is considered as a fast low-cost transition, which is reliable & anonymous mode of money transfer. So, it fulfils a wide variety of requirements desired by the people. However, in comparison of UPI, CBDC does not hold any such USP which can differentiate it from the existing payment method & make it more desirable in the eyes of the user without any such clear-cut program or other advantage suggested by the user does not have any inclination towards choosing this mode of transaction above the other one.

## 3. Usability constraints-

UPI transactions are comparatively seamless & are way too easy that is why people consider them as user-friendly & convenient & adopting them becomes easier. However, in contrast BDC platforms often come up with some additional steps which are mainly associated with either fund loading or wallet creation or similar other aspects which create additional stress at the user's end leading to disinterest at the end of the user & it is also connected with inhibiting the friction less experience.

## CONCLUSION

The analysis clearly indicates that the reason for the failure of CBDC is the lack of awareness offered by the product. However, the adaptation to the multi-layered hybrid equilibrium model seems like a good idea to dominate the transactional efficiency required in terms of fulfilling the demands of Indian population. Innovative ideas are accepted by the people when they offer or fulfil certain desire or utility. However, understanding the hybrid equilibrium model is crucial for the policy makers to improve the financial system & make it more resilient in future. In order to offer a better solution & provide a better model they should address the issues reflected by the behavior, technology & structural barriers. After addressing all the mentioned prerequisites a better & broader financially ecosystem could be created successfully.

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