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Article

Transformation of the Digital Payment Ecosystem in India: A Case Study of Paytm

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Abstract

Paytm is a payment app in India providing e-wallet services; it is also the most prominent mobile e-commerce app in the world's third-largest economy. This article uses Paytm as a case study to better understand the global platform economy and its implications for social and economic inequities. We contextualize the emergence of Paytm by drawing attention to its relationship with India's developing digital infrastructure and marginalized populations—many of whom are part of the platform's user base. We use a political economy lens to investigate Paytm's market structure, stakeholders, innovations, and beneficiaries. Our research is guided by the question: What resources, infrastructures, and policies have given rise to India's digital payment ecosystem, and how have these contributed to economic and social inequities? Accordingly, we audited the international and Indian business press and Paytm's corporate communications from 2016 to 2020. Our analysis points to the tensions between private and public interests in the larger platform ecosystem, dispelling notions of platforms as neutral arbiters of market transactions. We argue that Paytm is socially beneficial to the extent that it reduces transaction costs and makes digital payments more accessible for marginalized populations; it is detrimental to the time that it jeopardizes user data and privacy while suppressing competition in the platform economy.

Keywords

digital wallet; financial inclusion; multi-sided market; network effects; platforms

Issue

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1. Introduction

1.1. Significance of the Research Problem

The International Telecommunication Union (2023) defines a “digital financial services ecosystem” as interoperability between consumers, businesses, and government with a regulatory framework for the digital financial services sector. This article uses Paytm, a fintech firm operating in India, as a case study to demonstrate the significance of digital intermediary platforms in financial services ecosystems. Paytm is a payment app that provides financial services such as automatic bill

payment, money transfers, and payment services (for example, travel and movie tickets). Paytm's mission statement declares its intention to bring half a billion people in India into the mainstream economy (Paytm Bank, 2020a). Digital intermediary platforms have the potential to play a significant role in curbing social and financial exclusion by facilitating the widespread adoption of digital financial services. Our case study explores how the regulatory frameworks adopted by the Government of India and digital financial intermediaries have approached social and financial inclusion. The Government of India demonetized all ₹500 and ₹1000 banknotes in November 2016, an unexpected

economic policy reform that forced a shift to digital payments (K. Singh et al., 2017). Focusing on Paytm allows us to scrutinize the problem of social and financial exclusion and how institutions have attempted to displace a cash-reliant economy with a platform ecosystem dominated by a handful of fintech firms. Using a political economy lens, we examine Paytm's growth phases. We focus on its internal governance to show how digital payments penetrated a market formerly characterized by cash transactions. Our analysis reveals how multi-stakeholder collaborations between the government, banks, and platform developers structured the current payment ecosystem. We argue that India's platform ecosystem has enriched platform owners by creating opportunities to develop multi-sided markets in a largely cashless economy.

1.2. Literature Review

1.2.1. Social and Financial Exclusion

We believe that social inclusion is strongly linked to financial inclusion. Digital financial services can improve marginalized individuals' lives by giving them access to the formal economy. The digital divide encompasses much more than a dearth of information and communications technologies (ICTs); it also signals a lack of affordability, digital literacy, information knowledge, and quality access to networks. Various scholars have analyzed digital inequality and identified illiteracy and a lack of technical knowledge as barriers to social inclusion (Anooja, 2015; Goswami, 2016). Understanding the challenges of marginalized populations and techniques to overcome the obstacles such as cost, literacy, and infrastructure is essential. The digital divide precludes the social inclusion of marginalized people and requires policymaking at the state level. In the case of India, Zabaliute (2020, p. 78) notes that "since its inception, an economic policy promising more clarity and regulation for all was absorbed into the existing social hierarchies, precarity and the unforeseen complexity of creative and unregularized economic activities that characterize urban India." A lack of education, technological savviness, digital literacy, and stable employment has resulted in financial insecurity and social inequity.

The informal financial practices of marginalized populations are prevalent despite having access to bank accounts and digital payments (Zabaliute, 2020). Financial inclusion means ensuring all individuals are integrated into the formal banking system and have equal opportunities to access financial services. A country's financial inclusion level is strongly linked to its level of social integration, whether it is similar or different from other countries (Ozili, 2019). Two crucial development agendas that aim to improve the well-being of individuals in society are social inclusion and financial inclusion (Chibba, 2009). According to Banga (2021), former CEO and current executive chairman of Mastercard, fin-

ancial exclusion refers to people's inability to utilize payment methods other than cash and to have an official credit record. This deprives marginalized people of access to the formal banking system and the larger fintech platform ecosystem. The lack of access to financial resources can negatively impact individual financial security and hamper efforts to alleviate poverty. Achieving financial inclusion will require public-private partnerships as it is unlikely that any single bank, government, a fintech firm, mobile network provider, or NGO can address the problem independently (Banga, 2021). Collaborative coordination between the public, private, and non-profit sectors is needed to create a financial ecosystem that works for the benefit of all people. The digital financial ecosystem is heavily reliant on private financial intermediaries. Phadke (2020) claims that almost 90% of digital financial transactions in India occur via non-banking institutions such as Google Pay, PhonePe, and Paytm. T. Singh (2020) takes note of the "high volume—low margin" marketing strategy that Paytm used to establish itself in the market. This gave Paytm an edge over competitors with higher transaction costs.

While digital intermediary platforms can provide people with access to financial resources, there is no guarantee that their presence alone will deliver more significant social and financial inclusion. For example, Ligon et al. (2019) observed substantial barriers to digital payment services in India despite efforts by the government to promote these systems. The authors surveyed over 1,000 merchants in Jaipur, India, and found little evidence to suggest that supply-side barriers explain low adoption rates. Instead, they discovered that demand-side factors may discourage the adoption of digital payment systems. Accordingly, they recommend that policies concentrate less on getting small-scale merchants to adopt digital payment systems and more on incentivizing consumers. Sinha et al. (2019) considered the demand-side factors impacting the adoption of digital payment services. The authors found that despite the initial wave of adoption following India's demonetization, usage and retention rates remained low due to consumer concerns about privacy, fraud, and the lack of legal protections.

Similarly, B. P. Singh et al. (2017) examine consumer perspectives on the quality of service in India. The authors asked 254 respondents to comment on a variety of quality factors. They found that despite widespread awareness of the benefits of digital payment systems—especially among younger people—there remain significant concerns about security, usefulness, and trust. Bagla and Sancheti (2018) also found significant gaps between consumer expectations and satisfaction with popular payment systems like Paytm. The researchers surveyed 313 respondents in Delhi and identified several factors influencing demand for digital wallet services, including cashback and reward programs, ease of use, money transfer services, security, and a lack of transaction fees. Subrahmanya and Puttanna

(2018) found that the persistence of consumer preference for physical currency slowed the adoption of digital payment services. The authors argued that despite a continued choice for physical cash, low demand indicated growth potential for digital payment services. The authors noted that the sudden decrease in available physical currency resulting from demonetization effectively increased the demand for digital payment services. However, the subsequent reintroduction of currency gave customers an alternative to digital payment, hampering the long-term effort to transition the economy to a cashless or less-cash society.

A growing body of literature has begun to take a more critical perspective on India's financial platform ecosystem. Chandrasekhar and Ghosh (2017) asserted that adopting a digital payment ecosystem may lead to the development of a market based primarily on rents or incomes derived from the ownership of assets, the costs of which are likely to fall disproportionately on poorer populations. The authors observed that the central bank typically bears the costs of cash payments, whereas the prices of digital payment services fall squarely on the backs of consumers. Once the digital payment ecosystem displaces cash transactions, considerable financial benefits will accrue to the firms providing financial services. Bose (2019) also highlighted the self-serving political aspects of India's demonetization efforts. Bose used a framework based on public choice theory, analyzing policy decisions through the conventional economic lens of self-interested agents seeking to maximize their utility. Bose argued that India's demonetization policy increased transaction costs while incentivizing the implementation of digital payment systems, irrespective of the public interest. Our case study contributes to this small but growing literature on Paytm by analyzing its function as a platform that facilitates a multi-sided market. Our analysis sheds light on Paytm's multi-sided market by identifying the platform's relevant stakeholders, including financial institutions, the government, foreign investors, neighbouring industries, merchants, consumers, and third-party developers. We seek to fill a gap in the existing literature by focusing on how these markets are part of a world system premised on global class stratification whereby platform owners and the state profit from workers who reside systemically and spatially in a core and periphery (Wallerstein, 1987). Consequently, we adopt a political economy approach to analyze the Paytm market, governance, and infrastructure. This study of the platform ecosystem is essential as India serves as a model for other countries in the Global South looking to implement digital payment services.

1.3. Methodology

We use a political economy lens to delve into Paytm, one of the beneficiaries of India's demonetization policy. Political economy helps us focus on real-world historical processes and institutional adjustments to antagonistic

social relations. Thus, our investigation considers who benefits from the digital services ecosystem and how the public interest has been impacted by demonetization. Using Paytm as a case study, we seek to answer the following questions: What resources, infrastructures, and policies have given rise to India's digital payment ecosystem? How have these contributed to financial and social inequities? Accordingly, we audited the international and Indian business press, as well as Paytm's corporate communications, for the period 2016 to 2022 to contextualize the platform's emergence within the larger political-economic landscape of India. Using the University of Toronto library website, we used the keywords "Paytm," "fintech," and "India" in our initial search query. This returned 114 articles, of which we selected 28 for analysis. These articles were selected based on their relevance to the topic and research question. We surveyed the business press and Paytm's corporate communications to (a) diagnose undesirable conditions and outcomes, (b) identify both market failures and public policy failures, and (c) provide a set of recommendations for policymakers (Weimer & Vining, 2017).

1.4. Context of Paytm Innovation: Changes in Financial Infrastructure and Policies

1.4.1. State Programs to Address Digital Inequality: Policy Imperatives Shaping the Rise of Paytm

Government intervention can ease digital inequalities by offering customized regulations and policies specific to a marginalized group. The Government of India promotes social and financial inclusion through economic transparency to ensure credit record building, prevent tax evasion, lower money laundering, and direct government services payments (Athique, 2019; Roy & Rai, 2017). In 2014 a branch of India's Ministry of Finance, the Department of Financial Services, initiated a social inclusion program to provide people living under the poverty line with better access to Direct-Benefit Transfer payments. It also offered qualified residents improved access to old-age pensions, disability allowances, and Below-Poverty Line (BPL) subsidies that could be deposited directly into their bank accounts. The Ministry of Electronics and Information Technology launched the Digital India Programme (<https://digitalindia.gov.in>) to boost digital infrastructure development in rural regions by bridging the digital divide between urban and rural populations. The government incentivized telecommunications companies to provide customers affordable network services and inexpensive mobile phones. In September 2016, India's leading mobile phone provider, Reliance Jio, launched 4G LTE networks offering nearly unlimited cellular data for about \$6 (CAD) a month (NDTV Profit Team, 2017). Non-branded phones have been readily available in India for over a decade. People of lower socioeconomic status favour them because they are significantly cheaper than name-brand phones yet

still have many of the same multimedia functions (Doron & Jeffrey, 2013, p. 99).

1.4.2. Financial Policies and Technical Innovations to Facilitate Digital Payments

The Reserve Bank of India (RBI), India's central bank, helped establish the National Payment Corporation of India (NPCI), a non-profit consortium of banks to oversee digital payment and settlement systems. Dhananjay and Suresh (2015) assert that the NPCI was created as a specialized organization to help ensure that electronic payment and settlement systems provide secure, efficient, and interoperable service consistent with international standards. The NPCI introduced the Unified Payments Interface (UPI) system to facilitate the transfer of money between the bank accounts of any two parties (i.e., inter-bank transfer): "UPI leverages high teledensity in India to make mobile phones as a primary payment device for consumers and merchants and to universalize digital payments in the country" (Gochhwal, 2017, p. 1175). Upon its launch in August 2016, UPI was an independent, standalone public platform that did not gather much initial interest from private firms providing mobile wallet services.

1.4.3. Demonetization and the Expansion of Paytm's User-Base

With this infrastructure in place, the Government of India demonetized all ₹500 and ₹1000 banknotes in November 2016. In a country where an estimated 98% of transactions were made with cash and most of the population lacked bank accounts, the overnight discontinuation of banknotes caused a severe cash shortage and an immediate shift to digital payment services (Faden, 2017). Before demonetization, many residents had no bank account or lacked the required identity documents to open a bank account (Agrawal, 2018). To cope with the after-effects of demonetization, citizens were forced to adopt the prescribed digital payment methods to pay bills, buy groceries, or purchase from street vendors. Bose (2019) notes that the resulting increase in bank deposits after demonetization reduced interest rates, benefiting both the banks and the corporate sector while boosting GDP in the long run. Others benefitting from India's demonetization policies include mobile data network providers, mobile wallet services, fintech, e-tailers, and other digital payment aggregators.

The demonetization created opportunities for emerging mobile wallets like Paytm, which quickly became India's most used digital payment system. Demonetization was implemented in November 2016 and, almost immediately, "Paytm's user base grew from 122 million in January 2016 to 218 million by March 2017" (Agrawal, 2018, p. 181). The largest e-wallet company in India, Paytm doubled its user base during demonetization (Mukherjee, 2019). Bose (2019, p. 41) notes

that Paytm's revenues from smaller towns grew from 2% to 20%.

2. Analysis of Paytm's Phases of Growth

Economists have recognized that business models based on platforms—systems that connect two or more groups of market interactants—require analytical treatments distinct from more conventional business models (Rochet & Tirole, 2003). This is because the demand of one group of interactants depends on the order of one or more of the other groups participating in a multi-sided market. Digital intermediary platforms often facilitate market arrangements in which multiple market actors are bound together as interdependent groups. Dijck et al. (2018, p. 4) use the term "platform society" to refer to "a society in which social and economic traffic is increasingly channelled by an (overwhelmingly corporate) global online platform ecosystem that is driven by algorithms and fueled by data." The authors draw attention to the relationship between the private benefit accruing to the owners and operators of platforms and the social value platforms generate.

2.1. Paytm's Emergence as a Mobile Wallet

Paytm originated as a firm offering prepaid mobile and DTH (direct-to-home) recharge services. In 2000, the founder of Paytm, Vijay Shekhar Sharma, started One97 Communication, which provided content management and value-added text message services (Jaiswal & Joshi, 2019). Sharma incubated Paytm ten years later under One97 Communication as a mobile recharge and bill payment platform. In 2014, Paytm ventured into mobile wallet services (K. Singh et al., 2017), and within two years of its launch, Paytm had 25 million users (Joshi et al., 2019). On the eve of implementing India's demonetization policy, Paytm was well ahead of its competitors, with 100 million users (Vikas & Kumar, 2018). Paytm was popular due to its various payment methods—the most important was its proprietary QR code-based payment acceptance solution, a boon for small merchants and street vendors.

To obtain a QR code, retailers had to register for a unique QR code and provide a mobile business number. The unique QR code could be pre-printed and displayed at shop counters and roadside stalls. The pre-printed QR code contained the merchant's account details and allowed them to receive payments without access to the Internet (Sahay, 2015). Customers could scan the merchant's QR code using their phones and enter the payment amount (Sahay, 2015). While this payment solution was already available in 2015, it became prevalent only after demonetization in 2016, especially among rural communities and small merchants. Vijay Shekar Sharma claimed that four out of seven Paytm customers are rural because these parts of India generally do not have the infrastructure to utilize credit/debit card services at the point of sale (Agrawal, 2018). Paytm's

service allowed these customers to use cheap mobile phone services as the primary authentication and payment method (Kumar et al., 2018). Thus, Paytm harnessed low-cost payment solutions to develop a market among lower-income and rural consumers. While other fintech firms offered the QR code system and RBI, Paytm competed by offering different payment solutions. As of 2018, the company claimed it had established the largest offline payments network in India, with over 8 million offline merchant partners accepting payments via Paytm QR (Moneycontrol.com, 2018).

2.2. Interoperability With UPI: Competing Interests of Public Authorities in the Payment Ecosystem

UPI enables every bank account owner in India to create a virtual payment address (VPA) or a unique UPI ID to transact through mobile phones without sharing bank account details (Gochhwal, 2017). UPI streamlines digital payments by cutting costs for debit card production, relying instead on a unique-payment ID available through mobile phones (Gochhwal, 2017). At the time of demonetization in 2016, UPI and its interoperable QR code were considered competition by Paytm. Paytm's mobile wallet charges customers a fee to transfer funds back to their bank accounts, making it difficult for consumers to purchase products outside the Paytm ecosystem. Conversely, UPI enabled cross-bank transactions at no extra cost (George et al., 2023).

In November 2017, RBI issued a circular instructing all PPIs to make their platforms interoperable through UPI, which meant adding UPI as a payment solution alongside wallet and debit/credit card services. Paytm immediately integrated UPI into its platform (Malik & Verma, 2017). Before this, a customer using the Paytm wallet would have been unable to pay a rival company (Gupta et al., 2017). UPI interoperability enabled merchants to select the platform of their choice and obtain a single QR code for payment acceptance. The interoperability of PPIs with UPI also reduced the hassle for merchants who had been obliged to register for various wallets to accommodate as many customer payment solutions as possible (Gupta et al., 2017). Gochhwal (2017, p. 1178) states: "UPI provides a standard set of APIs to enable transactions on UPI platform, thus enabling a fully interoperable system across all banks, financial institutions and payment systems without having silos and closed systems."

Nieborg and Poell (2018) use the term "complementors" to refer to the various institutional stakeholders in a platform. The authors assert that "infrastructural access to application programming interfaces (APIs) and software development kits (SDKs) is among the primary ways in which platforms control complementors" (pp. 4281–4282). UPI made API available for easy integration with wallet platforms. In January 2020, Paytm launched the "all-in-one QR," allowing merchants to accept payment through the Paytm wallet, UPI, and debit/credit cards with no additional charge ("Paytm

launches all-in-one," 2020). With this seamless payment solution, a small merchant or a microentrepreneur could fashion their business model around the Paytm integration system. On October 22, 2020, RBI also mandated that interoperable QR codes would be operated only by NCPI, Bharat QR, or UPI QR. The goal was to enhance digital payment's ease of use and efficiency ("RBI set to change," 2020).

Consequently, as Paytm expanded its service offerings, it could leverage the relationships among complementors to its advantage and force competitors out of the market. For example, UPI and SDK allowed Paytm to present itself as an alternative to the point of sale (PoS) devices retailers typically use to complete a transaction. Paytm CEO Sharma asserted that India needs more infrastructure to support physical card payments due to a dearth of card terminals (Agrawal, 2018). The rise of mobile payment solutions enabled by integrating APIs and SDKs allowed Paytm users to circumvent PoS machines. This was made possible by state intervention by the RBI and NPCI, which encouraged interoperability and standardization.

2.3. Paytm's Development Into a Versatile Fintech Platform

Digital platforms allow two or more distinct groups of market interactants to come together in a multi-sided market. Over the years, Paytm has developed a complex multi-sided market bringing together banks, retailers, financial institutions, third-party developers, and buyers (Kumar et al., 2018). Paytm offers the following payment acceptance solutions on its platform: (a) a mobile wallet, (b) debit/credit cards, and (c) a bank transfer service enabled by the UPI system. The integration of these payment systems makes Paytm a complex multi-sided platform. Banks, retailers, and consumers are among the most significant market actors in the Paytm system. Banks are the financial institutions responsible for making financial transfers through the UPI system; retailers are the merchants offering their customers Paytm as a payment solution; and consumers are the end-users utilizing the Paytm platform as a means of payment for goods and services. Paytm is the mediator bringing the three nodes together: banks, merchants, and consumers. Paytm controls the relationship between merchants and their customers and between banks and their customers (merchants and depositors). However, Paytm does not function as a neutral arbiter in these relationships. Instead, it provides various incentives to keep each group engaged with the platform.

In contrast to conventional mobile banking, the mobile wallet system offered by Paytm "is a niche method of conducting mobile payments with the capability of integrating customer [relationship] management (CRM) systems and marketing-related functions" (Kumar et al., 2018, p. 747). Paytm's mobile wallet is customized to users' needs, offering a more personalized experience.

Mobile wallets can deliver customized promotions and discounts tailored to individual consumers. For example, Paytm's Cashback program incentivizes consumers with cashback offers at select retailers: "The retailer integrates the loyalty-reward programs with the M-wallet system to streamline the value chain" (Kumar et al., 2018, p. 747). Conversely, the platform incentivizes retailers to integrate loyalty reward programs to promote their brand and expand their customer base.

Paytm generates revenue by collecting transaction fees from platform users, consumers, and retailers. The fee is not based on the type of user but on the payment category. Paytm does not charge users for wallet-to-wallet transfers, debit cards, or the UPI system. Transaction fees are only incurred if money is transferred from a mobile wallet to the bank or for credit card transactions over a specified monthly amount (roughly USD 150). Thus, the overall benefit of Paytm to consumers hinges on the longevity of these low transaction fees. Paytm may raise its fees if the market becomes uncompetitive. In such a situation, the government's refusal to enact price controls based on average-cost pricing or a fair rate of return could make the transition to digital payments less beneficial for firms, households, and society in the long term.

On the other hand, Paytm's retailer and consumer demands are interdependent. Raising transaction fees may risk collapsing the platform if either side abandons it. Platforms like Paytm must integrate digital payment solutions for all sides, reducing transaction costs and expanding the system's customer base and operational efficiencies. Paytm's large user base gives rise to significant network externalities. Srnicek (2016, p. 45) asserts: "The more numerous the users who use the platform, the more valuable that platform becomes for everyone else." Each side of the market contributes to the platform's increasing popularity, generating what is known as "cross-side network effects." This occurs when one side of the platform attracts additional users, generating value for the other (Abdelkafi et al., 2019). In the case of Paytm, this happens when retailers and consumers are attracted to the platform because of the increasing size of the reciprocal side. However, network effects may result in barriers to entry if a single firm captures a significant market share. In such a scenario, only the top firm captures the lion's share of the market's revenue. The resulting lack of competition may translate into a lack of service innovation, dwindling infrastructure investment, and higher consumer prices.

2.4. Capturing Users From the Grassroots Through Bridging Language Barriers

Paytm achieved critical mass in the user base for its platform in part by anticipating the demand for payment services among marginalized and local users who needed to be proficient in English. The firm made its platform more accessible by supporting vernacular languages.

In November 2016, at the time of demonetization, Paytm became the first mobile payment and commerce platform in India to offer multiple regional language interfaces ("Paytm unveils its multilingual interface," 2016). Along with English, the platform is available in ten different regional languages—Hindi, Tamil, Telugu, Gujarati, Marathi, Bengali, Kannada, Malayalam, Oriya, and Punjabi. This resulted "in a 5x traffic increase for the platform from smaller towns" ("Paytm crosses milestone," 2017). The company witnessed an enormous increase in digital payments adoption, especially in tier II & tier III cities (terms for smaller than metropolitan cities in India), which make up 50% of their total user base (Paytm Blog, 2018). Paytm credited the introduction of multilingual features for this growth in sales, adding that 25% of their users preferred using the Paytm app in their regional language (Verma, 2018). This gave the firm a competitive edge by making the platform more accessible to the core Indian market.

2.5. Maturing of Paytm as a Platform Infrastructure

Paytm has developed into a versatile platform infrastructure in which various products are offered in addition to the well-known wallet service. The different products on the Paytm platform can also be called "platform instances." Nieborg and Helmond (2018) use platform instances to investigate each component within a platform's infrastructure. Platform instances are individual components on a platform that can be operated as an exclusive commodity or as a part of a larger service package. In addition to providing payment solutions, Paytm offers e-commerce services, including Digital Gold, Paytm Payments Bank, and Paytm Mall platform instances. Paytm collaborated with MMTC-PAMP, a certified refinery for gold and silver in India, to offer Digital Gold, allowing users to purchase gold directly through the Paytm app ("How to buy gold on Paytm," 2019). Paytm Payments Bank offers savings accounts in collaboration with the RBI "with the aim of extending deposit and payments services to millions of unbanked and underbanked Indians" (Paytm Bank, 2020a, para. 1). It also offers a debit card by RBI and a money transfer service. Paytm Mall provides an online-to-offline (O-2-O) commerce platform that allows small merchants and retailers who lack an online presence to use the Paytm Mall for a fixed-seller fee (Thakur, 2020). Paytm Mall allows consumers to shop directly with sellers (B. P. Singh et al., 2017). Users can utilize these platform instances while also using Paytm payment solutions. Each platform instance adds another revenue stream to Paytm's business model.

3. Governance and Management of Paytm

3.1. Paytm Shareholders and Stakeholders

Several stakeholders have invested significant sums in the Paytm product platform. Before demonetization, Paytm's

parent company One97 Communications received investment from several sources. In 2011, One97 received \$10 million (USD) from the German enterprise software company SAP SE (Chanchani, 2011). Before demonetization, the Chinese e-commerce giant Alibaba (operating as Ant Financial Services Group) acquired a 25% stake in Paytm in a deal reportedly worth over \$500 million (“Alibaba enters India’s e-commerce space,” 2015). After demonetization, Paytm received \$1.4 billion from the Japanese internet conglomerate SoftBank (Chanchani & Variyar, 2017). Then, in 2018, Warren Buffet’s Berkshire Hathaway purchased a stake in Paytm worth around \$300 million (Choudhury, 2018). Moreover, in 2019, Paytm secured an additional \$1 billion from the American investment firm T. Rowe Price, giving it a valuation of approximately \$16 billion (Shrivastava, 2019).

Essential stakeholders include India’s telecom companies, banks, and retailers. India’s telecom industry benefitted from the initial increase in demand for digital payment services after demonetization since they provided the necessary mobile data services. Demonetization transformed mobile data in India from a luxury into a necessity. Banks are another major stakeholder. As previously discussed, the RBI introduced UPI as an interoperable platform providing further linkages among banks, customers, and third-party developers. Lastly, the major retailers and businesses that partner with Paytm are essential stakeholders.

3.2. Paytm Investments and Partnerships

Several different economic incentives drive the partnership choices made by Paytm. In 2014, Paytm partnered with Uber to provide a payment option for ridesharing across India, which included various services for Uber drivers “under the Uber Care program such as savings accounts, zero-fee debit cards and significant cashback at Indian Oil” (Paytm extends payment service,” 2020, para. 3). In 2015, Paytm entered another partnership with the “online booking portal for Indian Railways, which sells nearly 700,000 tickets a day and 25 million tickets a year” (Iyengar, 2019, para. 11). Paytm also partnered with Vodafone Idea, one of India’s largest telecoms, to launch a mobile recharge facility for bank account holders. Paytm has frequently partnered with foreign financial firms seeking a foothold in the Indian market. In 2019, Paytm partnered with Citigroup, the US banking giant, to expand its offerings with a cashback credit card that gives users 1% unlimited cashback for each transaction (Kelkar, 2019). Paytm Payments Bank partnered with MasterCard to issue virtual and physical debit cards (Paytm Bank, 2020b). These partnerships indicate Paytm’s desire to position itself as an infrastructural platform that provides infrastructural information services to other platforms and app developers (Dijck et al., 2018). If successful, Paytm will become the gatekeeper to India’s vast banking and financial services, mobile service, smartphones, and retail markets.

4. Challenges Faced by Paytm

4.1. Paytm’s Competitors

At the time of demonetization, Mobikwik and Free Charge were two other popular mobile wallets that co-existed with Paytm. While these firms provided similar services to Paytm, they were both dependent on the Internet, whereas Paytm offered offline transfer services using SMS text (Sain, 2016). Mobikwik also offers a cashback service, while Free Charge provides users with coupons from restaurants and movie theatres. Other competitors offering digital payment apps include PhonePe (owned by Walmart), Amazon Pay, and Google Pay (Gupta & Yadav, 2020). Digital payment apps such as Paytm, PhonePe, and Google Pay utilize UPI as the primary means of money transfer. Google Pay works only with UPI transactions, while PhonePe and Paytm also provide mobile wallet and debit/credit card services in addition to UPI.

Another major competitor is Facebook, which is WhatsApp’s parent brand. Facebook launched a trial version of WhatsApp digital payments in 2018. Facebook has collaborated with Reliance, which operates several competing services to Paytm, including Reliance Mall. Reliance is the parent brand for Jio Mobile, providing India’s lowest mobile data prices. *The Guardian* reported that “the Reliance–Facebook combination represents a Goliath-like opponent, especially given Reliance’s track record in decimating rivals when it entered the telecoms market with Jio Infocomm and cut-throat pricing” (Anand, 2020, para. 17). Facebook and Reliance plan to launch a digital payment service called JioMart, a mobile market platform on WhatsApp. This service would compete directly with Paytm Mall. Consequently, Paytm has expanded its financial service offerings to maintain its position as the top digital payment choice.

4.2. Paytm’s Strategies for Growth: Technological Innovation and Market Expansion

In addition to its current offerings, Paytm continually expands its business model to keep pace with the latest innovation trends and market developments. For example, Paytm recently launched an Android-based PoS to accommodate small and medium-sized enterprises. Paytm made the service available for Rs. 499 (approximately USD 8) as a low-cost payment acceptance solution (Shetty, 2020). The service would enable small businesses and delivery personnel to accept payments on the go. Paytm intends to distribute over 200,000 devices to accommodate “over 20 million transactions” monthly (Shetty, 2020, para. 4). Recently, Paytm introduced the Paytm subscription option, a subscription service allowing businesses to collect payments from customers using a variety of payment solutions like Paytm Wallet, UPI services, and cards (“Paytm makes it easy for businesses,” 2020). In addition, Paytm is beta testing a

social commerce app called My Store, an extension of its e-commerce service Paytm Mall, which will allow customers to sell items from their homes in much the same manner as eBay (Dash, 2020b). Paytm has also delved into travel services and streaming entertainment, perhaps in anticipation of competition with Amazon and Netflix (Mete, 2020).

In 2018, Paytm received approval from the capital market regulator Securities and Exchange Board of India (SEBI), allowing it to venture into stock brokerage (Biswas, 2020). Moreover, in March 2020, Paytm Insurance Broking Private Limited (PIBPL) received a license from India's Insurance Regulatory and Development Authority, allowing it to sell life and non-life insurance (Biswas, 2020). Paytm also acquired Raheja QBE General Insurance, a joint venture between Prism Johnson Ltd. and QBE Insurance Group, one of the largest insurers in Australia ("Paytm, Vijay Shekhar," 2020). Paytm's president, Amit Nayyar, stated that the firm's aim with this acquisition is to "create a tech-driven, multi-channel general insurance company with innovative and affordable insurance products" (M. Singh, 2020, para. 5). These are some ways that Paytm has responded to the shifting competitive landscape in India's digital payment ecosystem.

About Paytm's market strategy, Paytm founder and CEO Sharma stated: "Paytm follows a 3-3-3 philosophy. Three years for product-market fit, then three years for monetization pitch, then three years for profitability" (Dash, 2020b, para. 6). In the years since demonetization, Paytm has intended to establish itself as a leading financial service company (Dash, 2020b). The various expansions detailed in the previous section reflect the firm's ambitions. While remaining a financial service hub locally in India, Paytm intends to expand into foreign markets. To that end, Paytm has partnered with Softbank and Yahoo Japan to launch a mobile wallet service in Japan known as PayPay. PayPay's head of product development explained that they are replicating Paytm's business model and engaging with users in as many ways as possible (Dash, 2020a).

Moreover, Paytm's Sharma has expressed interest in expanding into US markets. US software giant Microsoft has reportedly considered injecting as much as \$100 million (USD) into Paytm ("Paytm and Microsoft to join hands," 2020; Shrivastava & Sharma, 2020). Consequently, the digital payment ecosystem in India will likely continue to be dominated by large multinational conglomerates and international investors.

5. Policy Recommendations and Conclusion

In this final section, we consider alternative digital financial infrastructure regulation approaches for Paytm and the State to balance private and public interests better. Paytm has emerged as a formidable fintech in various markets, including banking, insurance, credit card services, and online marketplaces, to name just a few. Its multi-sided market brings together banks, retailers, con-

sumers, and third-party developers. Paytm has achieved considerable network effects by connecting these interdependent groups on a single platform. Our discussion has highlighted the payment solutions integrated into the digital payment platform: the unique QR code allowing retailers to accept payment through digital credits and the UPI system allowing real-time money transfers from bank accounts and debit/credit cards. By providing APIs and SDKs to retailers, Paytm has facilitated offline payments using scannable QR codes. Paytm has also pursued product innovations like those mentioned above, portable, low-cost Android-based PoS systems. Paytm benefits its complementors and the public interest to the extent that it has reduced transaction costs through digitizing payments. It has been detrimental to the time it has suppressed competition in the market for infrastructural information services and downstream platform instances.

Here we offer some policy recommendations to ensure that consumers' interests are served in transitioning to a digital payments ecosystem. For lowering or eliminating friction, we note that Paytm currently charges users a 4–5% convenience fee for transferring money from their wallet to their bank account (Rawat, 2020). This likely inhibits users from utilizing their wallets freely. Fintech like Paytm should avoid levying these kinds of fees on consumers. Paytm could also incentivize users to store money in their wallets by paying interest on their accounts. When there is a failed transaction for which Paytm has already taken money from a user's bank account, the amount is not sent back to the depositor's account but instead stored in the wallet. The user must then utilize the funds or pay a convenience fee to return them to their bank account. Paytm should allow customers to transfer the funds back to the account where they originated free of charge. Users should not be penalized for a failed transaction.

In assessing the balance of interests in India's digital services ecosystem, we must consider the short-term social and financial inclusion that Paytm enables with various payment options against the long-term risks associated with monopoly. Paytm is one PPI in a marketplace dominated by large competitors with similar platform models, such as GooglePay, AmazonPay, and PhonePe. These firms offer multiple payment methods like Paytm through UPI, wallet, and credit/debit card services. These PPIs provide various incentives to buyers and retailers, such as cashback and rewards, to attract more customers. Paytm achieved network effects by introducing its QR code payment acceptance solution. However, these network effects also create significant barriers to market entry for emerging fintech in India's digital payment ecosystem. As Paytm increases its platform instances by venturing into new markets and service offerings, it may become increasingly difficult for smaller firms to compete.

For the same reason, India's digital payment ecosystem is already dominated by only a handful of

international fintech in addition to Paytm. We further note that India's Competition Act of 2002 includes provisions for abusing the dominant position. We believe the firm invites regulatory scrutiny from the Competition Commission of India to the extent that Paytm suppresses competition for infrastructural information services.

India's low penetration of smartphones and low technological proficiency remains significant hurdle for the emerging digital payments ecosystem. According to Statista, as of 2015, 18.21% of the overall population in India owned a smartphone—a number that is expected to rise to 36% by 2022 (Asher, 2020). Furthermore, as per Jayant Pai, Head of Marketing at PPFAS Mutual Fund, technical skills are a more significant obstacle for older, less-tech-savvy users (Dave, 2016, para. 4). Hence, Paytm still has a long way to go to reach users without a smartphone. To reach this segment of society, Paytm can implement a campaign of easy-to-understand text messages to provide its user base with technical support. Paytm also maintains its competitiveness by providing a multi-lingual platform to attract users and creating new platform instances like insurance, Paytm subscription, Digital Gold, Paytm Payment Banks, and Paytm Mall. Paytm can also provide offline payment options through text messages for users to pay vendors.

A digital financial services ecosystem could also benefit from government-mandated incentives for investment and tax benefits for adopting digital payments by individuals and firms. The government can further support the infrastructural development and dissemination of knowledge about digital payments and digital literacy in rural areas through community-level organizations and NGOs. The government should also work to strengthen policies for data security and legal protections for the right to privacy. Along these lines, the Government of India introduced the Personal Data Protection Bill in December 2019, which enacted the first cross-sectoral legal framework for data protection. Before, India did not have a formal data protection law or an agency to administer it. This bill acknowledges the growth of the digital economy and the need to expand the use of data as a critical means of communication between individuals and firms. The bill mandates that data be physically stored within the territory of India. According to Burman (2020), however, the bill must create an adequate regulatory framework to address market failures in the digital economy. Stricter State policies on data collection, storage, and usage would help firms like Paytm develop a digital payment ecosystem that works for private and public interests. The government can impose limitations on data collection, processing, and storage, ensuring that only the bare minimum of data is requested from users and made available only to relevant personnel, with restricted access and transparent criteria for eventual deletion. The promise of digital platforms to reduce transaction costs while bringing together new groups of interactants must be weighed against the market inefficiencies arising from a platform's

capacity to become the infrastructural nucleus of an economy's information services.

Future research on social and financial exclusion and the role of digital financial services intermediaries should continue scrutinizing platform policies that ostensibly serve marginalized populations. How everyday users engage with these technologies may shine additional light on the various stakeholder interests and underlying social antagonisms that give rise to fintech ecosystems.

Conflict of Interests

The authors declare no conflict of interest.

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