

world development report

2016 

BACKGROUND PAPER

## Digital Dividends

# Aadhaar: Digital Inclusion and Public Services in India

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# Aadhaar: Digital Inclusion and Public Services in India

Shweta S. Banerjee

December 2015

*Aadhaar*, India's program to provide a unique identity number for every resident, is the largest biometric identification program in the world. Launched in 2008, the program has created biometric identities for over 940 million people, and aims to create them for 1.2 billion people by June 2016. The program also aims to achieve social inclusion and more efficient public and private service delivery. Aadhaar has also started to be used for several public purposes, such as digitizing government subsidy flows (G2P [government-to-person] payments); financial services; recording attendance for government employees to reduce absenteeism; and issuance of passports, voter identity cards,<sup>1</sup> and other forms of ID. This paper documents Aadhaar and its design and use and examines the evidence based on secondary data and in-person interviews with key stakeholders.

## Sample of an Aadhaar Card



## Background

### *Why digital identity?*

The idea of a universal electronic ID was proposed by the Indian Department of Information Technology in 2006. The Unique Identification Authority of India (UIDAI) was established in 2008, and Nandan Nilekani, an Indian entrepreneur and politician, was appointed chairman. The organization was given cabinet status to give it political capital and the resources to implement a large-scale program the objective of which was to include all Indian residents in a single ID system housed in an electronic repository. The program was seen as an opportunity to provide an ID to

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<sup>1</sup> In 2014, the Chief Election Commissioner proposed that every voter ID have a UID number—a unique identification number—imprinted on it. On February 15, 2015, the Election Commission announced plans to implement the proposal. There are 10 crore (100 million) suspected duplicate voter ID cards in India that the commission hopes to weed out through this process. The commission is starting with the states of Andhra and Telangana; it is unlikely, however, that gains in inclusiveness will be apparent until the next general/state election, in 2019.

residents who previously did not have one, or who did not have an individual one. It was also seen as an opportunity to create a super identity—one that is more portable, traceable, and has little or no chance of being misused or stolen.

Many Indian residents today have several forms of identity for different purposes, such as a voter ID card, a ration card for accessing the public distribution system, a Permanent Account Number (PAN) card for tax registration, a driver's license, and a passport. The application and verification process for each of these IDs is different and procedurally complex. The government proposed creating a single biometric identification system that would be housed in and monitored by the UIDAI and that would allow a more accurate picture of Indian residents and their access to and use of public services.

Biometric identities were first used at scale in rural areas via smart cards by the government of Andhra Pradesh to disburse National Rural Employment Guarantee Act (NREGA) and pension payments from 2006 onward. While there is evidence to suggest that smart cards substantially reduced leakage (JPAL evaluation 2013), qualitative fieldwork has revealed certain discrepancies in documenting details of individual beneficiaries and their biometric data (Banerjee et al. 2013). Several leading researchers in India have argued that a smart-card-based biometric system would cost the government less and reduce some of the privacy concerns posed by a universal ID (Kapur 2014; Khera 2013). However, a counterpoint to this argument is that while the UIDAI is a tightly monitored repository, smart card biometrics are held by unregulated private providers, which raises even more concerns about privacy protection. The larger point is that India currently does not have a privacy law that can monitor the use of personal data stored not only by UIDAI but also by telecom providers, banks, health care systems, governments, and other private and public service providers.

### *Privacy Law and Supreme Court Judgment*

The UIDAI was established through an ordinance issued by the UPA<sup>2</sup> government rather than by a law enacted by the parliament, which would have strengthened its legitimacy considerably. There are no regulations in India on safeguards over and procedures for the collection, processing, storage, retention, access, disclosure, destruction, and anonymization of sensitive personal information by any service provider.

In October 2012, a commission headed by Justice Ajit Prakash Shah released its recommendations on the issue of privacy (Planning Commission of the Government of India 2012).<sup>3</sup> These recommendations will likely be the backbone of a formal law that may be introduced in parliament in 2016. The commission reviewed all Supreme Court cases related to privacy from 1955 onward. The right to privacy framework falls under Article 21 of the Indian constitution, which provides the “right to life and liberty” and the “right to be let alone.” According to the guidelines, “data has economic value, and global data flow generates value for the individual as data creator, and for

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<sup>2</sup> United Progressive Alliance (UPA) was a coalition government led by the Indian National Congress at the national level from 2004 until 2014.

<sup>3</sup> The report was submitted on October 16, 2012, by a group of experts established under the Planning Commission comprised of members of government and civil society and headed by Justice Ajit Prakash Shah. The report is a comprehensive analysis examining how legal issues on privacy have been handled in India, and also examines global examples of privacy laws.

businesses that collect and process such data” (AP Shah 2012: p4). Any proposed framework for privacy must be “technologically neutral and interoperable” by international standards and must apply equally to both the government and the private sector. The commission’s report lays out specific provisions and gaps in the National Identification Authority of India Bill. For example, the report recommends that the bill specify that individuals have the choice to opt in or out of providing their Aadhaar number to any agency, and that no service should be denied to an individual because they did not provide their number.

In 2012, a writ petition was filed by Justice K.S. Puttaswamy in the Supreme Court against the government for mandating Aadhaar for services.<sup>4</sup> The Supreme Court issued an “interim order”<sup>5</sup> that clarified that the UIDAI cannot share individual data with private or government entities without consent of the individual. For example, in a criminal investigation case in Goa, the state government requested biometric matching of a suspect, but the UIDAI refused the request in line with the Supreme Court order. Government and private providers can access the UID system on a real-time basis in the user’s presence but cannot access the database at any other time. This means that the UID system has to be accessed online. While this ensures protection of the database, it also becomes an issue in rural areas where connectivity might be problematic.

The other important feature of the Supreme Court’s interim order is that no service provider can make Aadhaar mandatory. Even if the user or end beneficiary does not have an Aadhaar card, he or she must be able to avail the particular service. This has had an impact on how user agencies like state governments or departments phrase their communication campaigns. For example, in 2013 the Delhi state government had made Aadhaar mandatory in order to be able to register a property lease or apply for a gas connection. Following the Supreme Court judgment, various service delivery campaigns are urging consumers to “choose” Aadhaar to be able to get your liquefied petroleum gas (LPG) benefit, instead of requiring it upfront (figure 1).

Even though the interim order of the Supreme Court has not affected the speed of enrollment, it has limited how many service providers can opt for Aadhaar-based platforms at this stage in states where enrollment is less than 50 percent. Within one year, the remaining Supreme Court hearings are likely to be completed and a final order issued.

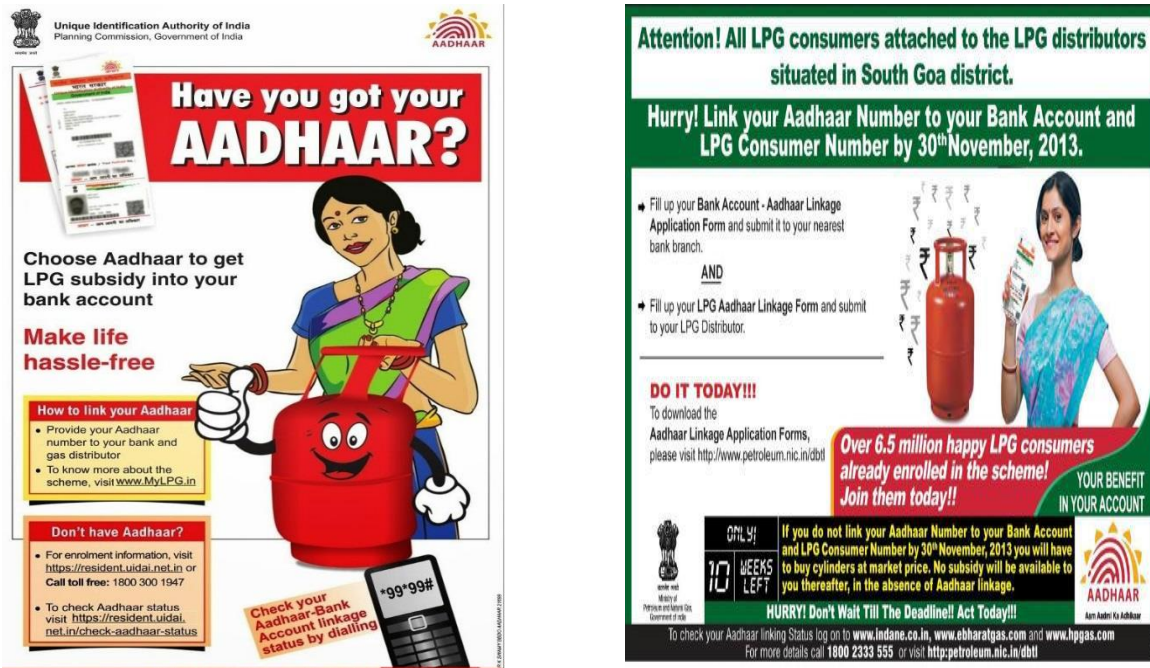
Technically, all individual data are currently housed by UIDAI in a central repository managed and supervised by UIDAI but operated by three private sector companies. As a security feature, no one company can have access to an individual’s entire set of information. Those data are not allowed to be shared with any public or private agency without consent of the individual. Once the individual links his or her UID number to a bank account, or to a government database for a welfare payment, then the government can check for duplicates via UIDAI by running the number through the system, or can make the payment when the individual authenticates at the point-of-sale machine. In other words, any government department can obtain the number of the individual but not have access to their biometric or any other information.

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<sup>4</sup> The Aadhaar Case, Center for Internet and Society, September 5, 2014; <http://cis-india.org/internet-governance/blog/the-aadhaar-case>.

<sup>5</sup> An interim order is a temporary judgment until final hearings are completed. The case was ongoing at the time this paper was being finalized.

Figure 1. Public advertisements from January 2015 (left) and October 2013 (right) comparing the language of choice versus compulsion in signing up for Aadhaar



### The UID system

The robustness of a UID system is gauged by the following three parameters: biometric failure to enroll, false rejection rate, and false acceptance rate. In 2012, the total biometric failure rate to enroll was 0.14 percent (Zelazny 2012); according to UIDAI, that rate remained the same in 2015. The false rejection rate in 2012 was 0.057 percent, which amounts to 570 cases per day at a rate of 1 million enrollments per day. This means that when the system reaches its full capacity at 1.2 billion, about 600,000 false Aadhaar cases might be present.

Zelazny (2012) provides a detailed description of the technology behind UID. He calculates that it costs Rs 40.62 (US\$0.79) to generate each number and describes how a technology middleware links to three separate biometric servers. The three service providers maintain their own database of proprietary fingerprint and iris image templates. “Each subsystem independently de-duplicates across the entire range of enrollment data, and maintains a complete gallery of all enrollments.” (p.10). Biometric data quality is measured through automated algorithms. The Government of India established a Standardization Testing and Quality Certification Directorate (STQC) under the Department of Information Technology to provide quality assurance. The entire test and certification process takes four to six weeks.

### UID Enrollment

By December 31, 2014, 731,274,773 Aadhaar numbers had been issued, of which 380,337,890 were for men, 350,893,281 were for women, and 43,602 were for transgender (table 1).

**Table 1 Aadhaar Generation Status, by State, as of December 31, 2014**

	<b>State Name</b>	<b>Aadhaar Generated</b>	<b>Total State Population</b>	<b>% of Population Provided Aadhaar</b>
01	Jammu and Kashmir	4,256,540	12,548,926	33
02	Himachal Pradesh	6,549,723	6,856,509	95
03	Punjab	24,917,359	27,704,356	90
04	Chandigarh	973,443	1,054,686	92.2
05	Uttarakhand	4,202,440	10,080,000	42
06	Haryana	20,277,087	25,350,000	80
07	Delhi	17,509,434	21,753,486	80
08	Rajasthan	44,203,070	68,621,012	64
09	Uttar Pradesh	69,871,773	199,581,477	35
10	Bihar	24,760,809	103,804,637	24
11	Sikkim	559,522	610,577	91
12	Arunachal Pradesh	64,382	1,382,611	5
13	Nagaland	837,883	1,980,602	42
14	Manipur	1,044,566	2,570,390	40
15	Mizoram	228,107	1,091,014	21
16	Tripura	3,280,903	3,671,032	89
17	Meghalaya	18,896	2,964,007	0.6
18	Assam	169,301	31,169,272	0.5
19	West Bengal	56,574,459	91,347,736	62
20	Jharkhand	27,062,585	32,988,134	82
21	Odisha	25,977,693	41,947,358	62
22	Chhattisgarh	11,149,074	25,545,198	43
23	Madhya Pradesh	47,990,428	72,597,565	66
24	Gujarat	37,317,859	60,439,692	62
25	Daman and Diu	176,852	242,911	73
26	Dadra and Nagar Haveli	229,175	342,853	67
27	Maharashtra	89,046,093	112,372,972	79
28	Andhra Pradesh	50,556,622	49,386,799 <sup>a</sup>	100
29	Karnataka	46,706,006	61,130,704	76
30	Goa	1,341,603	1,457,723	92
31	Lakshadweep	56,136	64,473	87
32	Kerala	31,260,297	33,387,677	94
33	Tamil Nadu	47,779,677	72,147,030	66
34	Puducherry	1,159,152	1,244,464	93
35	Andaman and Nicobar Islands	166,088	380,500	43
36	Telangana	32,999,741	35,193,978	94
	<b>Total</b>	<b>731,274,773</b>	<b>1,236,344,631</b>	<b>59</b>

Source: UIDAI, December 31, 2014.

Note: a. The number of Aadhaars issued is higher than the total state population because the population number is from the 2011 census. A new census is being conducted that will take into account any changes following the partition of the state in 2014.

## **State Differentiation, National Population Register, and the UID**

As table 1 shows, there are substantial differences across states in the speed and density of Aadhaar enrollment. The main reason for this is that when UIDAI was established, there was another competing program called National Population Register (NPR), housed in the Ministry of Home Affairs. NPR had started the process of collecting biometric details as part of a broader process to establish citizenship. Unlike Aadhaar, which requires only name, gender, date of birth, and address, the NPR process records education and family history of migration, and includes physical verification by an official. The purpose of the NPR was explicitly linked to national security and establishing citizenship.

In 2011, following a debate between the Ministry of Home Affairs and the Planning Commission<sup>6</sup> (the home of UIDAI), there was a division of states between each agency. Both departments would collect biometric data separately in different states. However, in 2014, following the general elections, UIDAI was allotted all states for enrollment, while the NPR process would continue alongside without collecting biometrics, but linking instead to the UID number. This should be kept in mind because in the list of states in table 1, the ones with low enrollment were allotted to UIDAI only in November 2014.

## **Aadhaar Applications in Public and Private Service Delivery**

### *Employee Absenteeism*

Using UID to check government employee absenteeism has resulted in employees spending on average 20 minutes more daily at their work desk (*Business Standard* 2015.) During the three months, the average “in-time” was 9:28 am and the average out-time was 5:46 pm. “Currently, ministries and departments of the government have a 9:00 am to 5:30 pm day, while attached or subordinate offices work from 9:30 am to 6:00 pm According to a government representative, the average presence of employees is expected to go up a further 15 to 20 minutes per day” (*Business Standard* 2015).

Three hundred eighty-seven central and some state governments are using Aadhaar authentication for (clocking in) employees. Over 900 biometric terminals have been deployed in government offices and almost 83,000 employees are using the authentication system.<sup>7</sup> There is a central record of every employee’s clocking in and clocking out time with each ministry. No research has evaluated the performance of any ministry so far, but a unanimous observation from senior-level bureaucrats was that this attendance system might reduce absenteeism but not necessarily have an effect on performance. Low performers are not likely to work harder because they are sitting at their desks.

### *Aadhaar and Financial Inclusion*

Interviews with a range of stakeholders in the financial sector indicate that the best value added of Aadhaar in financial services is its role in speeding up the “Know Your Customer” (KYC) process. India’s cumbersome KYC process provides little relief for the system, which is burdened with

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<sup>6</sup> The Planning Commission was restructured as the “Niti Ayog” (Policy Commission) in January 2015.

<sup>7</sup> Source: UIDAI data.



paper-heavy documentation that needs to be transported from branch office to head office for verification. For example, in an interview, the CEO of a provider called Invest India Micro Pensions Limited said that using eKYC—electronic Know Your Customer—reduced by 50 percent both the time taken for processing the documents, and costs. However, the regulator still wants hard paper copies of all applications, which makes the investment in going electronic redundant.

A similar point was made by the CEO of SEWA Housing Finance,<sup>8</sup> a new startup targeting low-income and informal workers with a particular focus on offering women low-value housing loans. Housing loans require even more bulky KYC than other forms of credit or financial products, and the long-term nature of a loan demands that information is stored for 10 to 15 years. This significantly adds to the cost of a loan. Even though the regulator does not accept electronic copies of the loans and requires manual storage of a hard copy of each file, the company wants to make sure they are Aadhaar enabled from day one. This is primarily because their target segments are often migrant workers, and Aadhaar provides a portable ID that could be used by the worker to repay amounts from her point of residence rather than only from Delhi or Mumbai, where she comes to work.

On January 27, 2011, the Reserve Bank of India issued a circular recommending that banks use eKYC to open “small accounts.” Small accounts are defined as an account in which the aggregate of all credits in a financial year does not exceed 100,000 rupees; the aggregate of all withdrawals and transfers in a month does not exceed 10,000 rupees; and the balance at any point of time does not exceed 50,000 rupees.

With the exception of a few banks, most have not made this procedure common use. As of December 31, 2014, the total number of bank accounts opened with eKYC was 3.8 million, and the number of transactions on these accounts in a year has been 6.3 million. On August 15, 2014, the Prime Minister launched Jan Dhan Yojana (Wealth for the people) a national financial inclusion scheme that aims to cover all excluded households with a bank account and a life insurance policy. Under this scheme, 3.3 million accounts have been opened using eKYC. According to UIDAI, 34 banks are currently using Aadhaar to open accounts with eKYC (table 2).

**Table 2 Number of Banks using eKYC**

Public Sector Banks	27
Private Sector Banks	5
Cooperatives and Regional Rural Banks	2

Source: UIDAI, December 31, 2014. <https://uidai.gov.in/>.

<sup>8</sup> The full name of the company is SEWA Grih Rin Limited. The company is an offshoot of the SEWA Bharat association, which started as an informal workers’ cooperative for women in Gujarat, led by Ela Bhatt.

## *Aadhaar and Government-to-Person Payments (G2P)*

Khera (2014) has argued that the value addition to Aadhaar in an electronic G2P system is minimal, in fact even unnecessary. In her view, payments can be routed through bank accounts without Aadhaar which is true. However, given that the Indian branch network is weak and the bulk of electronic payments also need to be made via agents in rural areas, rather than tightly supervised branches, the value add of Aadhaar is threefold: quick opening of accounts through eKYC (discussed above), real-time authentication when payment is disbursed, and enabling the user's G2P account to be interoperable across the banking network.

The Consultative Group to Assist the Poor (CGAP) in Washington DC, conducted in 2013 an extensive study on the electronic G2P ecosystem in Andhra Pradesh to understand why the 16 million accounts were not doing more than one transaction per month. In other words, why were the accounts not being used for any purpose other than receiving the payment? The government used biometric authentication through smart cards that were managed by several private providers.

Several factors were discovered: mandating full disbursement of government payments, lack of information about the use and means to operate the account, closed-loop systems that do not offer access to the core banking server, and the unavailability of G2P agents for financial services. Another major issue is the cost of delivery. The state government paid the banks Rs 2 for every Rs 100 disbursed, when it costs the bank between Rs 2.6 and Rs 2.9 per every 100 rupees disbursed. A separate national survey by CGAP on agents demonstrated that agents in rural areas are much more viable if they combine G2P and P2P (peer-to-peer) volumes. The study also explored the value addition of Aadhaar to the provider disbursing G2P payments on behalf of the government. Typically, the provider "value-chain" includes banks, banking correspondent companies, and agents.

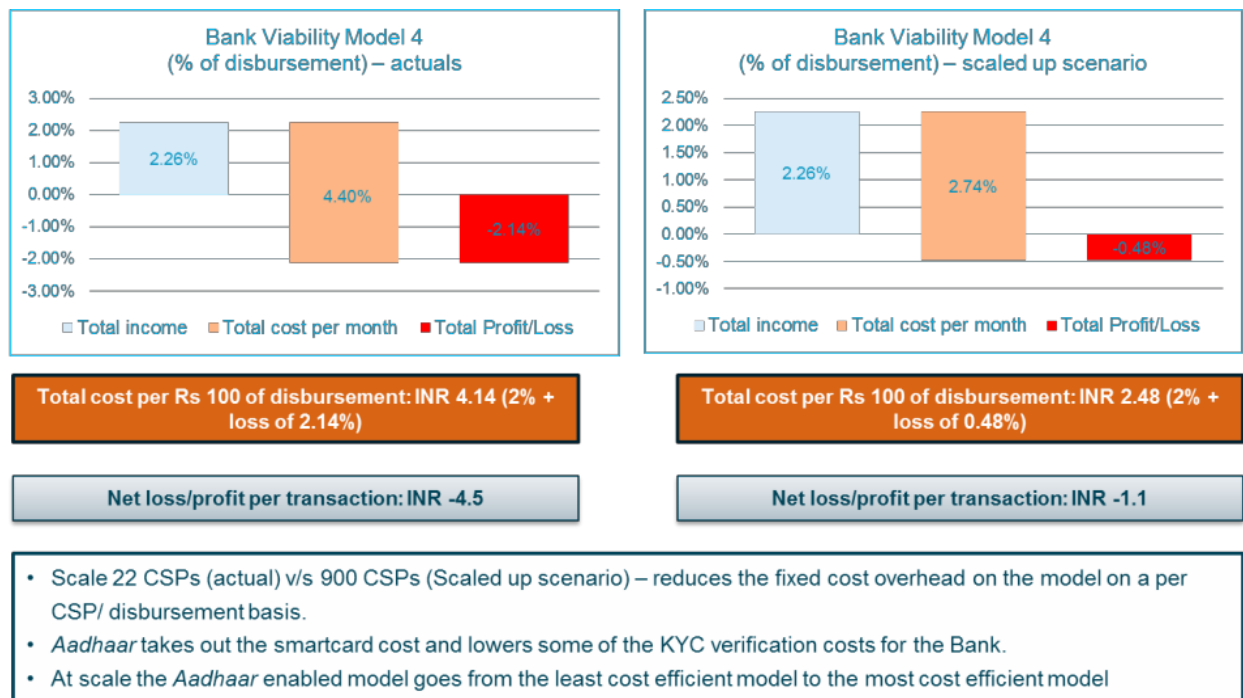
In January 2013, a pilot was launched in East Godavari district of Andhra Pradesh, involving 27,000 beneficiaries that used Aadhaar authentication instead of local biometric servers used by the Banking Correspondent companies. East Godavari district carried out the Aadhaar enrollment process efficiently by establishing permanent Aadhaar enrollment centers and carrying out extensive information campaigns for recipients. Best Finger Detection authentication helps reduce the time taken for repeated attempts at authentication.

CGAP found that if there are no connectivity issues, all transaction data in the Aadhaar-enabled system should be available through the National Payments Corporation of India (NPCI) switch, which can enable the bank and the state to monitor transactions in real time. The Aadhaar enrollment process has reduced leakages because it helps eliminate duplicate and ghost recipients. The enrollment cost is lower and, once Aadhaar has reached universal scale, there is a potential shift in the business case for providers, since they will save on the costs of smart cards and will not have to invest in locally held biometric databases.

The research was able to calculate that once Aadhaar is ubiquitous it would be the most cost-effective model—not taking into account the up-front investments required by government or the provider to become Aadhaar enabled. The costs are lower because there is no smart-card cost involved; typically the shelf life of a smart card is three years.

Finally, another advantage is that an Aadhaar-enabled payments platform could enable an interoperable agent network across the country that could potentially execute government payments but also offer other financial services to the poor. Currently, providers are offering closed-loop systems that can only disburse payments.

**Figure 2 Bank Viability With 2% Commission in Andhra Pradesh**



Source: Banerjee et al. 2013.

It must be noted, however, that the real value of Aadhaar assumes ubiquitous and reliable connectivity, while on the ground this reliability is patchy. Robust manual procedures, with due accountability, as well as a grievance redress system, has to accompany any electronic channel, with clear communication on how to use those levers for both users and agents (Banerjee 2015).

However, the financial services provider market has been lukewarm so far to becoming Aadhaar compliant. Banks, especially public sector banks, have been reluctant to deliver G2P payments. This is likely due to lack of clarity at the policy level and a weak business case. Among the private sector banks, Axis and ICICI have been delivering payments in some states, and G2P is part of their financial inclusion agenda. The Department of Posts is a major driver of payments and has, in several districts, digitized their payments using Aadhaar Payments Bridge and monitoring the delivery in real time. Nonbanks such as Airtel Money have undertaken pilots, such as in Orissa, which uses MPIN (Mobile Personal Identification Number) rather than Aadhaar authentication to disburse NREGA payments. However, issues around the business case for such services, such as the costs of becoming Aadhaar compliant, seem to be a deterrent for mobile network operators. Both Oxigen and Airtel have disbursed payments as banking correspondents for banks in pilot

districts. Among banking correspondent companies,<sup>9</sup> FINO<sup>10</sup> is currently the largest disburser of G2P payments, but they offer a closed-loop system, which is not as yet fully Aadhaar compliant.

### *Adilabad District Pilot*

The district of Adilabad, now in the state of Telangana, under the leadership of its Collector undertook several experiments in UID applications. On a pilot basis, the district of Adilabad in Andhra Pradesh opened 30,000 accounts via eKYC for their tribal population to transfer pensions and NREGA. Within 24 hours, beneficiaries had a functioning account through Axis Bank through which they received their payments. The other innovation was to supplement fingerprint readers with iris scanners. While fingerprint scanners are an issue with the elderly and laborers, the iris combined with the fingerprint provided a 98 percent authentication success rate.

Digital Life Certificates, or Jeevan Pramaan, is a biometric-enabled digital service for pensioners that uses the Aadhaar platform for the biometric authentication of pensioners. A successful authentication generates a Digital Life Certificate that gets stored in a Life Certificate Repository. The Indian Pension Disbursing Authority can access the certificate online. Currently, it is enabled for central government, defense, Employees' Provident Fund Organisation (EPFO), postal, railway, and telecom pensioners. The project is running across certain locations at Chandigarh, Delhi, and some other parts of the country. More than 22,000 Life Certificates have been generated so far.

### *Providing an identity to previously excluded populations*

Those segments of the population that have been previously excluded from an individual identity, thereby either reducing mobility or excluding them from rights and other social protection payments, include women, migrants, transgender individuals, sex workers, and tribal populations in remote areas. The UIDAI has adopted a wide approach to be as inclusive as possible in order to reach the remotest parts of the country. However, no evaluations have been done on the impact of inclusion in Aadhaar among marginalized populations.

The 2015 book by Govind Kelkar, Dev Nathan, E. Revathi, and Swati Sain Gupta, entitled *Aadhaar: Gender, Identity, and Development*, is the first book to systematically examine the impact of Aadhaar on women's lives using qualitative methods. According to Kelkar, women tend to have relational rather than individual identity, and Aadhaar introduces the process of shifting from relational to individualized personal identity. For example, a ration card, the most common form of identity, is typically issued to the whole household in the name of the male head of household. Even though the voter ID card, the other most common form of identity, is also widely prevalent and issued to women individually, economic entitlements continue to be governed by the underlying emphasis on a unique social or family-based identity. In Jharkhand, the research team found that land titles are in the name of men, not women, and women sometimes had to pay to obtain work under the employment guarantee (NREGA) scheme. Based on the focus group discussions that Kelkar and her team conducted, the study concluded that an Aadhaar number

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<sup>9</sup> Banking correspondent companies manage agent networks on behalf of banks, so that customers can access their bank accounts away from brick and mortar branches.

<sup>10</sup> FINO is a banking correspondent company, one of the largest in India, in terms of its agent presence and profitability.

provides women the opportunity to receive their cash transfers directly into their bank accounts, and helps them to apply for SIM cards, which gives them more mobility.

The Institute for Human Development found that more than half of the households surveyed across Bihar had at least one migrant worker. Migrant remittances accounted for more than one-third of consumption compared to just 3 percent from social protection transfers. Aadhaar can increase portability of both remittances and social transfers.

One could argue that the value added of Aadhaar in G2P is twofold: the first is in the targeting stage to exclude ghost beneficiaries, and the second is to help transfer money into the targeted individual's bank account. For example, an Aadhaar-based survey in Karnataka found that more than one-fourth of the LPG connections were counterfeit or duplicate connections.

### *Improving school teacher attendance*

Low teacher attendance, especially in rural areas, is a problem that plagues India's school system. Based on an interview with the Secretary of School Education of the Government of India, one can argue that biometric attendance has the potential to reduce this problem. However, poor connectivity and the prohibitive cost of installing biometric readers in every school while keeping those facilities secure across remote areas is a major challenge. Teachers are often absent from the village school because they teach privately; thus, there is no guarantee that recording their attendance is evidence that they have indeed taught at the school and not left after recording their entry.

### **Sustainability**

The UIDAI's annual budget is approximately Rs 2000 crores (US\$319 million). There are two ways for UIDAI to recover its costs: one is through the tax system, and the other is to charge the user directly. The National Institute for Public Finance and Policy (NIPFP) provided UIDAI with recommendations on cost recovery in which it was argued that charging the user directly is a more efficient way of recovering costs. This is an ongoing debate, however, since several stakeholders argue that pricing the services of UIDAI would mean that it would become a private good, which would increase the influence of "bulk purchasers" such as private bankers regarding how it functions.

An NIPFP cost-benefit analysis projects that given the benefits of applying Aadhaar, the government can receive a return of 52.85 percent over 10 years. The analysis takes into account the following costs: the cost of developing and maintaining the Aadhaar authentication infrastructure; the annual budget of UIDAI; the cost of integrating schemes, which includes the capital costs of point-of-sale terminals, and training of staff and registrars; and incentivizing the banking channel. The benefits of integrating Aadhaar within various schemes include reducing leakages in the National Rural Employment Guarantee (NREGA) scheme, the public distribution system; payments for teacher salaries, books, and uniforms; transferring fertilizer and LPG subsidies directly to farmers; and providing scholarships directly to students, payments to health workers, and maternity benefit payments.

## Conclusion

The evidence presented in this paper leads to the conclusion that Aadhaar has direct value in creating digital infrastructure through which social and financial transfers can take place. Its value as a form of identity implies that those who were previously marginalized can now be included in a number of welfare programs. However, the direct value in improving employee performance or teacher absenteeism is yet unclear. Aadhaar needs to become more ubiquitously accessible and relevant for urban and rural population, and the rich and the poor, to realize its full potential as a game-changing tool that can enhance transparency. Problems of connectivity and accessing the Aadhaar server for transactions remain and need to be addressed. A law on privacy protection is imperative and would enable the future of Aadhaar by making it more trustworthy and secure.

There is considerable room for empirically testing the impact of Aadhaar on the improvement of both public delivery and social inclusion. Views seem to converge particularly on the value of UID in it bringing greater “portability” or accessibility across the country, should an interoperable, well-connected banking network be in place. More research is needed on this, using economic and sociological analysis.

## Annex List of Interviews Conducted

1. Ashok P. Singh, Joint Secretary, Ministry of Finance
2. Babu Ahamed, Former District Collector Adilabad District, Government of Telangana
3. Gautam Bhardwaj, CEO, Invest India Micropensions Limited
4. Neeraj Mittal, Joint Secretary, Oil and Gas Ministry
5. Partha Dasgupta, Center for Policy Research, New Delhi
6. Piyush Peshwani, Ernst and Young
7. Rajesh Bansal, Assistant Director General, Unique Identification Authority of India, New Delhi
8. Sandhya Rani, Former Post Master General, Andhra Pradesh
9. Shamika Ravi, Brookings Institute, Delhi
10. Shruti Gonsalves, CEO, SEWA Grih Rin Limited
11. Suyash Rai, National Institute of Public Finance and Policy
12. Varad Pande, Former OSD, Ministry of Rural Development
13. Vrinda Swarup, Former Secretary, School Education, Ministry of Human Resource Development

*The author is grateful to the people mentioned above for their time. In addition, the author would like to thank Zahid Hasnain, Senior Economist, and Rinku Murgai, Lead Economist, World Bank India, for their guidance.*

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