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Results

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Randomized Evaluation

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8,000 households in 8 districts in Andhra Pradesh

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Building State Capacity: Evidence from Biometric Smartcards in India[†]

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Antipoverty programs in developing countries are often difficult to implement; in particular, many governments lack the capacity to deliver payments securely to targeted beneficiaries. We evaluate the impact of biometrically authenticated payments infrastructure ("Smartcards") on beneficiaries of employment (NREGS) and pension (SSP) programs in the Indian state of Andhra Pradesh, using a large-scale experiment that randomized the rollout of Smartcards over 157 subdistricts and 19 million people. We find that, while incompletely implemented, the new system delivered a faster, more predictable, and less corrupt NREGS payments process without adversely affecting program access. For each of these outcomes, treatment group distributions first-order stochastically dominated those of the control group. The investment was cost-effective, as time savings to NREGS beneficiaries alone were equal to the cost of the intervention, and there was also a significant reduction in the "leakage" of funds between the government and beneficiaries in both NREGS and SSP programs. Beneficiaries overwhelmingly preferred the new system for both programs. Overall, our results suggest that investing in secure payments infrastructure can significantly enhance "state capacity" to implement welfare programs in developing countries. (JEL H53, H55, I32, I38, J65)

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Academic Paper

The Impact of Smartcard Electronic Transfers on Public Distribution

In This Image
A photo taken during the Smartcards study in the southern Indian state of Andhra Pradesh. © 2011 Kshitij Batra

Abstract

Advances in payments technology have the potential to improve the efficiency of slow and corrupt public welfare programs. Researchers tested how Smartcards, which coupled electronic transfers with biometric authentication, affected the functioning of two government welfare schemes in India. They found that even though the new Smartcard system was not fully implemented, it resulted in a faster and less corrupt payments process without adversely affecting program access. Investing in Smartcards was cost-effective, and beneficiaries overwhelmingly approved the new payment system.

Policy Issue

State-sponsored welfare programs are often constrained by corruption and inefficiency. The problem is of particular concern in India, where by some measures, only 15 percent of spending on social programs actually reaches the intended beneficiaries. Such corruption strains state finances and reduces the potential impact of government programs. Transferring benefits through payment systems that use biometric authentication to verify recipients' identities may help address these challenges. Secure electronic transfers may reduce financial leakages, transaction costs, and time spent accessing payments. However, reducing one form of corruption may simply displace it into other areas, and switching to electronic payments may also limit participation if beneficiaries do not register for biometric cards, if they lose their cards, or if technical challenges prevent them from receiving payments.

Context of the Evaluation

In India, there is widespread interest in using new payments technologies to improve the performance of public welfare programs and increase financial inclusion. In 2009, the national government launched an ambitious initiative, called Aadhaar, to give all 1.2 billion residents unique, biometric IDs, and then make payments to beneficiaries of social programs via bank accounts linked to these IDs.

Some state governments have developed their own electronic transfer systems alongside the national identification project. In 2006 , the Government of Andhra Pradesh, in southeast India, started an initiative to shift towards using "Smartcards" to transfer government benefits to the poor. While the government intends to eventually use Smartcards for a wide range of programs, it piloted their use with two large social welfare schemes: the Mahatma Gandhi National Rural Employment Scheme (NREGS)—which guarantees rural households 100 days of paid employment per year—and Social Security Pensions (SSP)—which makes monthly payments to elderly, widowed, and disabled individuals. In 2010, facing several logistical challenges, the government decided to restart the program in eight districts where the Smartcards had yet to be rolled out. These eight districts, which are spread throughout the state, have a combined rural population of about 19 million people.

Details of the Intervention

Researchers used a randomized evaluation to assess the impact of Smartcards on leakages in NREGS and SSP, and the welfare of program beneficiaries. Researchers partnered with the Government of Andhra Pradesh to randomize the roll out of the program in the eight districts that had not yet received Smartcards in three waves over two years. The Smartcard program was introduced in 113 mandals (sub-districts) in the first wave, 195 mandals in the second wave, and the remaining 45 mandals in the third wave. The analysis compared the first wave to receive the program with the third wave of mandals, where Smartcards were not introduced until after the final survey.

The program introduced two major changes to the existing payment system: it required beneficiaries to biometrically authenticate their identity before collecting payments, and it delivered payments through a Customer Service Provider (CSP) in each village, rather than at a more distant post office. When beneficiaries enrolled in the Smartcard program, their fingerprints and a photograph were taken, and they were issued a bank account and a Smartcard, which contained a chip storing the biometric and bank account information.

In order to collect a payment, beneficiaries visited the local CSP, who was usually a secondary school-educated woman from a traditionally disadvantaged caste who resided in the village. The CSP kept a small device which could read the beneficiary's fingerprint and match it with the details stored in the Smartcard. If the match was successful, the CSP disbursed cash and the authentication device printed a receipt.

Results and Policy Lessons

Researchers found that the Smartcard program reduced the time it took beneficiaries to receive payments, reduced leakages, and increased beneficiary satisfaction, even though it was not fully implemented.

Take-up: After two years, about 81 percent of villages in the first wave of the program rollout had installed the Smartcard-based payment system for NREGS and 86 percent had adopted it for SSP. In villages where the new payments system was available, about 65 percent of payments were made to beneficiaries with Smartcards, meaning that just over 50 percent of all payments in treatment areas were made using the new system.

Payment time: In areas assigned to adopt the Smartcard payment system, the amount of time NREGS beneficiaries spent collecting payment fell by 21 minutes (a 19 percent reduction from 112 minutes). The system also reduced the lag between working on an NREGS project and collecting payment by about seven days (a 21 percent reduction from 34 days). There was no significant effect on the amount of time SSP beneficiaries waited to collect their payments, but unlike NREGS payments, these payments were delivered at the village-level prior to the adoption of Smartcards.

Leakages: NREGS recipients in areas assigned to receive the Smartcard system reported weekly earnings that were Rs. 35 higher (a 24 percent increase from Rs. 146). However, there were no major impacts on the amount the government spent on the NREGS program, suggesting a reduction in leakages. There was no significant impact on earnings for SSP beneficiaries, as these benefits were fixed, but there was a 1.8 percentage point reduction in the incidence of bribes demanded for disbursing payment (a 47 percent reduction from 3.8 percent).

Beneficiary satisfaction: In surveys, 84 percent of NREGS beneficiaries and 91 percent of SSP beneficiaries preferred Smartcards to the status quo. However, many recipients feared losing their Smartcards (53 percent of NREGS beneficiaries and 62 percent of SSP beneficiaries) or reported having problems with the authentication device (49 percent of NREGS beneficiaries and 59 percent of SSP beneficiaries).

Cost effectiveness: Researchers estimated the value of the time beneficiaries spent collecting payments and found that the value of time savings to beneficiaries (US$4.44 million) was approximately the same as the cost of the new system (US$4.25 million) for NREGS. Although the cost savings were less substantial for SSP (US$320,000, with system costs of US$1.85 million), these calculations suggest that the times savings to beneficiaries alone can sometimes justify the costs of implementing improved payments technologies. On top of these pure efficiency gains, there was an estimated $38.7 million reduction in annual leakage.

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