Chopra, Yakshup
Other Persons: Prabhala, Nagpurnanand; Tantri, Prasanna L.

Working Paper

Bank Accounts for the Unbanked : Evidence from a Big Bang Experiment

Bank Accounts For The Unbanked: Evidence from a Big Bang Experiment

Yakshup Chopra, Nagpurnanand Prabhala, and Prasanna Tantri*

August 19, 2018

*Chopra (yakshup.chopra@email.wustl.edu) is at Washington University, St Louis. Prabhala (nprabhala@rhsmith.umd.edu) is at University of Maryland, College Park, and Tantri (prasanna_tantri@isb.edu) is at Indian School of Business. We thank Viral Acharya, Sumit Agarwal, Smita Aggarwal, Shashwat Alok, Tarun Bajaj, Pawan Bakshi, Abhiman Das, Pulak Ghosh, Manuela Kristin Guenther, Deepali Pant Joshi, Leora Klapper, Surya Kolluri, Kristina Minnick, V. Anantha Nageswaran, Manju Puri, Raghuram Rajan, Kim Schoenholtz, and seminar participants at Bentley University, NYU, and Presidency University for suggestions and comments. We also gratefully acknowledge the many courtesies extended to us by bank officials running the PMJDY program. Mohan Ramanath and Venkatesh Ramamoorthy provided excellent research assistance. We retain responsibility for any errors that remain.

Bank Accounts For The Unbanked: Evidence from a Big Bang Experiment

Abstract

We provide empirical evidence from India's PMJDY program, a"big bang" supply shock that gives bank accounts to virtually all of its 280 million unbanked. Proprietary data from individual bank account statements shows that there is significant uptake, usage, usage growth, and balance accumulation in PMJDY accounts. Activity levels increase over time and converge towards those in non-PMJDY accounts although PMJDY account holders are poorer, unfamiliar with banking, and undergo no literacy training. The results suggest that the 2 billion unbanked around the world have unmet demand for banking or that banking supply can stimulate its own demand.

"If you build it, he will come." – Field Of Dreams, 1989 Film.

1 Introduction

We study "PMJDY," a large-scale financial inclusion program launched in India in August 2014. The PMJDY program is an economic intervention of ambitious scope. It aimed to completely eliminate financial exclusion from India by giving bank accounts to *all* its 280 million unbanked. The program easily achieved its target within 2 years.

We examine the uptake and usage of the newly opened PMJDY accounts using a novel dataset that tracks the actual transactional activity in the PMJDY accounts. The motivation for our analysis is straightforward. Data from World Bank indicate that over 2 billion individuals, representing 38.5% of adults in the world, are unbanked. An extensive body of research shows that these individuals benefit when brought into the formal financial system. Thus, why so many individuals continue to be unbanked and what interventions can help bring them into the financial system are important questions of academic and policy interest. Our study helps shed light on these issues.

A simple demand-supply foundation frames our empirical tests. Widespread financial exclusion may occur because there is no demand for formal banking services. For instance, individuals may not be aware of the benefits of bank accounts. Alternatively, exclusion can also reflect insufficient supply of banking services. Literacy interventions have been ineffective in stimulating demand (Cole, Sampson, and Zia (2011)), and as we will discuss later, decades of state-led supply interventions such as bank nationalization and bank branching regulations have still left India with one of the largest populations of the unbanked. Whether a "big bang" program such as PMJDY helps is the question we address.

The PMJDY is a shock in the supply of bank accounts to the unbanked. It is possible that banking may just not be salient for the unbanked, who face other

economic challenges as they are drawn from the lowest income strata around the poverty line. If so, we should see limited account activity even when the unbanked receive free accounts. If, however, the unbanked have demand for banking services, the PMJDY accounts should see uptake and usage. Uptake should be immediate if the demand is well defined. However, if usage requires learning by doing, diffusion patterns should resemble those seen in the technology adoption literature (Rogers (2003)). These ideas define our empirical tests.

We ask the following questions. First, how much activity do we see in PMJDY accounts? Second, how does the activity level change over time? Third, what *kind* of activity do we see in the new accounts? Do we see bread-and-butter uses such as cash deposits and withdrawals or usage for electronic payments? Finally, is there savings accumulation in the new accounts? If so, inclusion could trigger aggregate macroeconomic effects, by redirecting savings into banks, and possibly triggering a further virtuous growth cycle as (and if) benefits of financial inclusion are realized.

Our data comprises a random sample of 3,418 PMJDY accountholders from 4 branches of a large state-owned bank in India. The data come from the first PMJDY phase in August 2014. We obtain identity-masked bank statements that record transaction dates, account balances before and after transactions, and brief textual descriptions of the transactions. This type of granular data on actual account activity is relatively rare in the financial inclusion literature, in which usage measurement has had to rely on accountholder surveys. Our dataset is derived from audited bank records and thus we do not face hurdles such as missing data, unresponsiveness, or selectivity in responses faced by surveys.

We track account activity for roughly 7 quarters until October 24, 2016, a post-treatment window of close to 2 years. The window length is reasonable relative to the work in inclusion that we discuss later. The data made available to us also (coincidentally) is also about the maximum post-treatment window without the confounding effects of another major shock, India's demonetization experiment. On November 8,

2016 India unexpectedly declared all high denomination currency illegal for tender. As demonetization nudged individuals away from cash towards electronic payments (Figure 1), post-demonetization account activity mixes PMJDY and demonetization effects. Our sample period ends just before the demonetization shock.

We briefly describe the results next. The extensive margin is the initiation of account usage. About 70% of the account holders in our sample initiate usage, close to aggregate national statistics for accounts with non-zero balances reported at `http://pmjdy.gov.in`. The intensive margin is the extent to which PMJDY account holders use their accounts. Over 7 quarters, we observe 50,427 transactions for 3,418 PMJDY account holders. We consider active transactions such as cash deposits or ATM withdrawals that require active involvement of the account holder. Passive transactions include interest payments, bank charges, or government subsidy payments. Active transactions represent 41% of all transactions. By the end of the sample period, PMJDY account holders have an average of 1.12 transactions per quarter. The World Bank standard for active accounts is 1 transaction per *year*.

We use regressions to analyze the changes in account activity over time. The dependent variable is the number of active transactions until and including quarter q. The key right hand side variable is a dummy variable for the quarter q. Its regression coefficient β_q thus captures the average transactions in quarter q relative to prior quarters and the time series of coefficients β_q for $q = 1, 2, \cdots, 7$ reflects the account seasoning process. We recognize that usage varies substantially across individuals, for instance based on wealth, age, occupation, gender or physical distance from banks. We include account holder fixed effects to control for these unobservables. Across many specifications, we find that the coefficient estimates β_q increase with quarter q. That is, account activity increases with age.

Withdrawals using ATMs account for about 17% of total transactions and 42% of active transactions. These transactions increase significantly with age. Because ATMs are often not equipped to receive deposits and account holders prefer to use

tellers to deposit cash, cash deposits tend to be both time and transportation cost intensive. These transactions tend to decrease with age. We find a mild increase in the amount per deposit. Cash withdrawals at branches do not have significant trends. In our sample, account activity is driven by bread-and-butter uses reflecting normal banking usage. Account activity is related to but not exclusively driven by priming through government benefit transfers.

We next analyze account balances. While PMJDY accounts are provided for transactional purposes and transactions necessitate savings (Keynes (1936)), mental accounting and narrow framing theories (Thaler (1999)) suggest that accounts for one purpose may not be used for other purposes. Moreover, research suggests that savings occur when accounts have commitment features such as penalties for early withdrawals (Ashraf, Karlan, and Yin (2006), Gneezy, Meier, and Rey-Biel (2011)) although Dupas and Robinson (2013) show that even commitment-free accounts can result in savings as a by-product. Whether savings accumulate in PMJDY accounts is thus an empirical issue. We find evidence of significant savings growth in PMJDY accounts. The average balance more than doubles from INR 1,795 at the end of quarter 1 to INR 4,127 at the end of quarter 7.

As an experiment, the PMJDY program has attractive features. It is an exogenous intervention of significant economic reach, 100% of India's large large unbanked population of 280 million. We find evidence of positive outcomes, viz., uptake, usage, growth in usage, and balance accumulation. An empirical question that inevitably comes up is how to benchmark these results. The key difficulty comes from the program's vast scope. It intended to treat – and actually treated – *all* the unbanked population. What is a control in this setting, equivalently, what is the counterfactual for the treated if there were no PMJDY?

In our sample, the unbanked have been chronically excluded from formal finance for decades. Absent PMJDY, the plausible counterfactual is the continuation of this situation with no bank access, activity, or balances. The run rate for PMJDY

accounts reaches 1.12 transactions per *quarter*, different from zero, and 450% of the World Bank and industry dormancy standard of 1 transaction per year. The activity level is significant relative to the counterfactual of continuing exclusion.

One could also consider as counterfactuals programs with different designs, e.g., accounts bundled with automatic savings or spending restrictions. We cannot say much about outcomes under these hypotheticals as PMJDY is a simple no-frills account program. Another possibility is to consider non-PMJDY accounts opened in the normal course of business. While there are virtually none in our treatment period, we can access a sample of accounts opened in the year prior to PMJDY. These accounts are for individuals of substantially greater means. Thus, the baseline *levels* of activity are not comparable to those for PMJDY accounts but the time trends of the two can be compared to assess differences in the account seasoning process.

We have 2,611 non-PMJDY accounts with 47,055 transactions between September 2013 and November 2016. Our main finding is a difference in the seasoning process between PMJDY and non-PMJDY accounts. For instance, in quarter 2, the 3,418 PMJDY accounts see 2,427 transactions, which translates into 0.61 transactions per account versus 1.73 transactions per account for non-PMJDY accounts. In quarter 7, there are 1.12 transactions per PMJDY account compared to 1.72 transactions for non-PMJDY accounts. The transactions gap narrows by 43% from 1.12 to 0.60 transactions per quarter. Regression specifications confirm the convergence in usage. The findings suggest that the unbanked have latent demand for formal financial services that is gradually realized through a learning-by-doing process.

The rest of the paper is organized as follows. Section 2 reviews institutional background including India's banking system, the role of financial inclusion, and the PMJDY program. Section 3 reviews related literature. Section 4 discusses our sample. Section 5 discusses the specification and results. Section 6 concludes and suggests directions for future work.

2 Institutional Background

2.1 The Indian Banking System

After India's independence in 1947, its banking sector has seen three phases. In phase 1 from 1947 to 1969, private sector banks dominate. Phase 2 begins in 1969 when most of the banking sector was nationalized. A second wave of nationalizations occurred in 1980. Phase 3 begins in the mid-1990s when banking is reopened to new private banks after a balance of payments crisis led to economic liberalization. Private banks coexist with state-owned banks that collectively have about 70% of the banking market (Cole (2009), Demetriades and Luintel (1996)). Many state-owned banks are partially privatized and have minority non-government shareholders who hold stakes of between 20% and 45%. Other banks with low market shares include co-operative banks (Iyer and Puri (2012)) and regional rural banks.

The Indian state has long been concerned with issues related to inclusion. The perceived lack of inclusion was in fact the primary reason stated for the 1969 and 1980 bank nationalizations.[1] After the nationalizations, policies on inclusion continue, now through rules requring servicing of underbanked areas (Banerjee and Duflo (2014), Burgess and Pande (2005), Cole (2009)). Nevertheless, there is limited progress on inclusion. The World Bank's FINDEX database (Demirgüç-Kunt, Klapper, Singer, and Van Oudheusden (2015)) shows that over 250 million Indian adults do not have a savings bank account and that 43% of the accounts remain dormant. In OECD countries, the dormancy ratio is less than 5%. Surveys cite many reasons for not owning or using bank accounts. Besides not having money to fund accounts, other reasons include the lack of trust, the costs of operating accounts, and the inconvenient location of bank branches. Gunther (2016) discusses more recent evidence.

[1] See Ghosh (2015) for an extensive account of the bank nationalization process and the inclusion motivations underlying it. A 2013 speech by RBI Executive Director Dr. Joshi at `http://www.bis.org/review/r131030f.pdf` compactly summarizes inclusion efforts in the decades since nationalization.

2.2 The PMJDY Program

PMJDY – "Pradhan Mantri Jan Dhan Yojana," or Prime Minister's People Wealth Scheme – was announced on August 15, 2014 with no advance notice. Under PMJDY, each unbanked person was granted the right to one no-frills bank account. The scheme formally opened on August 28, 2014. The program initially sought to cover 80 million unbanked individuals within 5 months before India's "Republic Day" on January 26, 2015. Our sample comes from this initial period. This target was easily met but the scheme continued. By December 2016, around when our transactional activity dataset ends, 260 million new accounts were opened. The scheme remained open and discovered more unbanked individuals. As of July 25, 2018, there are 321.7 million PMJDY accounts with deposits of INR 800 billion (about US$ 12 billion).

The PMJDY program had clear objectives. One is to leverage the modern data, identity, and technology infrastructure (e.g., electronic payments) being put in place to drive inclusion. A second objective was to use bank accounts for transferring government benefits, so as to cut leakages in the delivery of these benefits. The aim to cover all unbanked may seem ambitious. But it was not entirely unrealistic due to the extensive branching networks of over 100,000 branches developed over several decades,[2] the migration of banks to digital core banking infrastructure,[3] and the government's ability to commandeer the relevant technical, managerial, and clerical resources of its state-owned banks, which together had a 70% market share in India.

The program also has a simple design. PMJDY accounts were no-frills accounts available to those who did not have a bank account as on August 15, 2014. The minimum required account balance was fixed at zero and there were no fees for maintaining the account. The program experienced strong push, with an extensive awareness campaign, a dedicated website that compiled and posted statistics, and top-level monitoring of progress that continues even in mid-2018. PMJDY account holders do

[2]See `http://dbie.rbi.org.in/DBIE/dbie.rbi?site=statistics`

[3]See, e.g., the address by RBI Deputy Governor Mr. R. Gandhi, available at `https://rbi.org.in/scripts/BS\_ViewBulletin.aspx?Id=16614`.

not receive direct financial incentives to open bank accounts. Beneficiaries are eligible for a debit card that facilitates electronic banking access, life insurance cover of INR 30,000 (about US$ 450), and accident cover of INR 100,000 (US$ 1,500) provided the debit card is used at least once in 90 days before claims.[4] The process of opening PMJDY accounts was simplified. Account opening could be through branch visits or agents called *Bank Mitras*. Banks could not refuse accounts to anybody producing the required identity requirements or attested declarations that they lack these documents (Demirgüç-Kunt, Klapper, Ansar, and Jagati (2017)).

3 Literature

Our analysis is relevant to research and policy issues in financial inclusion. Demirgüç-Kunt, Klapper, Singer, and Van Oudheusden (2015) note that over 2 billion adults, 39% of the world's adult population, are financially excluded. Exclusion is pronounced in developing countries. For instance, bank account ownership is nearly universal at 94% in high-income economies but only 66% of individuals in Sub-Saharan Africa, 54% in South Asia, and 86% in the Middle East do not have bank accounts. The account ownership gap is pronounced among the poorest people.[5] Inclusion matters as it lets individuals access products for transactions, savings, credit, and insurance, whose benefits are carefully documented in the received work.[6]

We make three remarks on the relevance of our work to the inclusion literature. The first, and perhaps the most important point, is that we analyze a fundamentally different type of intervention, a large scale, economy-wide program that aims

[4] Life insurance was available to accounts opened in the first wave that ended in January 2015.

[5] See `http://goo.gl/obfXaR`.

[6] Channels through which the unbanked benefit include overcoming time-inconsistent preferences (Ashraf, Karlan, and Yin (2006), Duflo, Kremer, and Robinson (2011)), developing data that can allow access to formal credit (Bruhn and Love (2014), Burgess and Pande (2005)), avoiding expensive debt from the informal sector (Aleem (1990), Carrell and Zinman (2014), Melzer (2011)), or accumulation of capital for healthcare and investment (Dupas and Robinson (2013), Dupas and Robinson (2014), Morduch (1995)). Banerjee and Duflo (2007) discuss the economic lives of the poor.

to eliminate inclusion in one shot. This analysis complements the field experiments used in the other studies in the area. We also note that field studies have had to rely on surveys to understand account usage. We introduce data on actual account activity. Finally, we provide granular evidence on the *intensive* margin. The industry and policy makers focus on dormancy, i.e., whether an account is used at all, or the extensive margin, as a metric of usage. There has been less focus on the intensive margin, or the levels of activity once usage starts, and its drivers, i.e., the types of activities that drive the intensive margin. We provide some evidence on these issues.

Research shows significant gaps in financial literacy so a question of interest is whether improving literacy can mitigate inclusion gaps. The findings on literacy interventions are pessimistic.[7] One issue is that literacy has many dimensions, e.g., the literacy relevant to managing liquidity and cash flows can be quite different from investment literacy on compound interest or risk and return, or that related to behavioral issues such as self-control. It is not clear what pieces should be taught or reinforced, what is teachable, to whom, at what moments, through what platform, and whether the effects last. In the PMJDY intervention, the unbanked are supplied accounts but not primed through literacy interventions. Nevertheless, there is uptake and use. Our findings suggest that learning by doing complements literacy and should also be considered as a tool to impart skills relevant to using financial services.

Technological progress is a critical driver of economic growth (Slow (1956), Romer (1990), Aghion and Howitt (1992)). Growth comes from generating new technologies and their adoption. Because the generation of new ideas is episodic, much of the technological progress comes from the adoption of new technology. The frictions that impede or aid adoption are thus of economic interest and have been studied in a number of industries.[8] A notable gap is evidence of the technology adoption in the

[7]See Duflo and Saez (2004), Ashraf, Karlan, and Yin (2006), Cole, Sampson, and Zia (2011), Carpena, Cole, Shapiro, and Zia (2011), Cole, Giné, Tobacman, Topalova, Townsend, and Vickery (2013), Karlan, McConnell, Mullainathan, and Zinman (2016)). Lusardi (2008) and Lusardi and Mitchell (2009) present evidence on financial literacy.

[8]Theoretical work includes Griliches (1957), Chari and Hopenhayn (1991), Jovanovic and Nyarko (1996), and Jovanovic and Lach (1997). Industry-specific studies of adoption include Conley and

finance industry.[9] Ours is a study in this area. Furthermore, we characterize adoption using transaction-level microdata, another gap pointed out in the literature (see, e.g., reviews by Hall and Khan (2003) and Comin and Mestieri (2014).)

4 Data

4.1 Aggregate PMJDY Data

We report in Table 1 the country wide aggregate data on the PMJDY scheme extracted from the program website `http://www.pmjdy.in`. Panel A reports data on the accounts opened in the initial phase from August 15, 2014 to January 31, 2015, a period in which 125.5 million accounts were opened. Of these, the share of public sector banks is 78.5%, while regional rural banks and private sector banks account for 17.4% and 4.2%, respectively. The high market share of public sector banks is not surprising given their larger networks especially in the geographic areas where the unbanked reside. When we classify accounts by the value of deposits outstanding rather than the number of accounts, public sector, regional rural, and private sector banks have shares of 77.9%, 15.2%, and 6.9%, respectively. The slightly greater market share in value for private banks is consistent with these banks having locations where wealthier customers reside.

The Indian Prime Minister's office tracks zero balance accounts. A relatively high 67.3% of the accounts have zero balance as of January 31, 2015. This number rapidly decreases, as we discuss below. In the initial phase, public sector banks and regional rural banks have greater proportions of zero balance accounts, 66.6% and

Udry (2010) and Bold, Kaizzi, Svensson, and Yanagizawa-Drott (Forthcoming) on agriculture, Dupas (2014), Skinner and Staiger (2015), and Chandra, Finkelstein, Sacarny, and Syverson (2016)) on health care, and Atkin, Chaudhry, Chaudry, Khandelwal, and Verhoogen (Forthcoming)) or Manuelli and Seshadri (2014) on manufacturing. See Comin and Mestieri (2014) for a review.

[9] As Frame and White (2004) note, "everybody talks about financial innovation, but (almost) nobody empirically tests hypotheses about it This is a version of a dry remark attributed to Mark Twain, "Everybody talks about the weather but nobody does anything about it."

73.1%, respectively, compared to private sector banks, whose zero balance accounts are 57.2% of all accounts opened.

Panel B of Table 1 reports cumulative statistics for both the first and second wave of PMJDY account openings until December 14, 2016. The number of accounts doubles to 259.8 million and the aggregate account balance increases more than 700-fold from about INR 1 billion in January 2015 to INR 741 billion as of December 14, 2016. Thus, wave 2 not only expands the number of accounts but more than proportionately increases account balances. The Panel B data show that the fraction of zero balance accounts decreases from 67% to 23.2% between 2015 and 2016. The decrease in zero balance accounts is particularly pronounced for public sector and regional rural banks, whose zero balance account shares drop from 66.6% and 73.1% to 23.4% and 20%, respectively. While the zero balance accounts in private sector banks also decrease, the change from 57.2% to 34.7% is less pronounced.

In 2016, the U.S. Bank Wells Fargo opened about 1.5 million accounts for customers without their consent, likely due to pressure to meet targets for account opening.[10] The PMJDY program exerted similar pressures on banks. The PMJDY was a signature initiative of India's prime minister and the government owned a large part of the banking sector. To what extent are PMJDY fictitious accounts such as those uncovered in the Wells Fargo scandal? The aggregate data provide two (admittedly rough) pointers that fake accounts do not dominate.

One indicator is the fraction of accounts that are seeded with Aadhaar, India's new unique identity card with robust biometrics backing it. Banks could open accounts with Aadhaar or less reliable forms of identification that are more vulnerable to manipulation. Table 1 shows that 55% of the accounts are Aadhaar-seeded. For state-owned banks subject to manipulation pressures, Aadhaar-seeded accounts have a higher market share, 56.8%, versus 43% for private banks and 49.2% for regional

[10]See, e.g., "Consumer Financial Protection Bureau Fines Wells Fargo $100 Million for Widespread Illegal Practice of Secretly Opening Unauthorized Accounts" at `http://goo.gl/kZHzBz`

rural banks. The more difficult to manipulate biometrics backed accounts are more prevalent at state owned banks. A second indicator is the positive correlation between bank account opening and account use data. If banks boost account totals, entities with more accounts should see greater inactivity. The data in Tables 2 and 3 and Figure 2 suggest the opposite. Banks opening more accounts see more activity.[11]

4.2 The PMJDY Bank Account Dataset

Our data are from a large state-owned bank in India. The bank provides us a random sample of PMJDY accounts from four randomly selected branches in four different administrative districts. We also access a random sample of non-PMJDY accounts opened within one year prior to August 2014 in the same district. Confidentiality restrictions prevent us from disclosing the identity of the bank and the location of the branches. The data provided to us consist of the transaction amount, a coded description of the transaction, and the balance after each transaction. A detailed description of the variables in an account statement is provided in Table 4. The data come from the audited statements used for bank reconciliation and reporting. Entries must tally with other controls such as cash balances on an hourly basis. Thus, our data are accurate and not subject to errors or missing observations.

Table 5 describes our sample. Panel A shows that the combined sample has 6,029 account holders who conduct 97,482 transactions between September 16, 2013 and November 2, 2016. The sample observations prior to August 2014 pertain to our control sample of non-PMJDY accounts. For the full sample, the mean (median) number of transactions equal 16.17 (10) in the first 7 quarters since opening. The average (median) transaction value is INR 6,620. In our sample, 1,347 accounts, or 22.34% of all accounts, remain inactive in the sample period.

Panel B summarizes data for PMJDY accounts. The PMJDY scheme was for-

[11] A cross-sectional regression, not reported here, gives similar results.

mally launched on August 28, 2014, which is the first date in the PMJDY sample. Our sample has 3,418 PMJDY accounts and 50,427 transactions. For non-PMJDY accounts reported in Panel C, the sample begins on September 16, 2013. There are 47,055 transactions executed by 2,611 unique savings account holders in this sample.

The mean transaction amount in PMJDY accounts equals INR 1,557, which is lower than the average of INR 12,142 for non-PMJDY accounts reported in Panel C.[12] These data suggest that PMJDY account holders are poorer. As we discuss earlier, the non-PMJDY sample is not intended as a control sample in the conventional sense. Rather, we obtain it to better understand the PMJDY account seasoning process, and use individual-level fixed effects to control for heterogeneity in the PMJDY and non-PMJDY population. The average PMJDY account holder in our sample executes 14.75 transactions in the first 7 quarters of account opening versus 18.02 transactions for the non-PMJDY accounts. 29.78% of the PMJDY accounts are inactive throughout the sample period compared to 12.6% for non-PMJDY accounts.

4.3 Transaction Data

A transaction is a field in one line in a bank account statement. Substrings in this field indicate the type of transaction involved. For instance, ATM cash withdrawals contain the sequence *ATM WDL*. Similar mnemonics characterize other transaction types, which we parse to identify the transaction type. Table 6 gives data on transaction types in our sample. ATM withdrawals account for 17.37% for PMJDY accounts and 21.42% of transactions for non-PMJDY accounts. Cash deposits or withdrawals are the next most frequent transactions, representing 17.76% (14.75%) for PMJDY (non-PMJDY) accounts. Conversations with the bank managers reveal that account holders are unfamiliar with and somewhat wary of banks and prefer to wait in line and deposit cash instead of using ATMs, even if ATMs are programmed to accept

[12] At the exchange rate of USD 1 = INR 68, the mean balances for PMJDY and non-PMJDY accounts equal about $23 and $178, respectively.

deposits, which they are often not.

Table 6 also shows that active transactions other than ATM withdrawals and cash transactions, deposits and withdrawals are infrequent. Transactions using checks are more likely in non-PMJDY accounts but are relatively rare for PMJDY accounts, perhaps reflecting the differences in financial sophistication in the two populations. There is very little usage of accounts for mobile payments or for POS (point of sale) charges both for PMJDY and non-PMJDY accounts. These statistics suggest that during our sample period, there are not economically meaningful shifts to a cashless economy. Instead, accounts are used to store and withdraw cash for onward use in economic transactions.

We define ACTIVE transactions as ones that require active account holder participation. Other transactions are passive. An important category of passive transactions includes direct benefit transfers from government program aimed at the poor. These are welfare and subsidy schemes such as that for LPG (liquefied petroleum gas used for cooking), old age pensions, student scholarships, and assistance for building a house. Funds released through these welfare schemes have often been subject to leakage.[13] One objective of opening PMJDY accounts was to reduce these leakages. Benefit transfers account for 21.60% (15.16%) of all transactions in PMJDY (non-PMJDY) schemes, reflecting that PMJDY account holders are poorer. The other passive transactions are interest payments and bank charges and "bulk credit" transactions. These include interest payments and charges such as mobile banking charges or ATM maintenance fees. Such transactions account for 34.70% (32.95%) for the PMJDY (non-PMJDY) transactions.

[13] A former prime minister of India, Rajiv Gandhi, once remarked that "...If [the] Central government releases one rupee for poor, only 10 paisa (i.e., 10%) reaches them." See, e.g., `http://zeenews.india.com/home/is-corruption-in-our-dna_725837.html`.

5 Results

5.1 Univariate Analysis

In Panel A of Table 7, we report data on activity levels in PMJDY accounts. Transactions are from quarters 1 through 7 after account opening. The total number of active transactions increases from 2,102 in the first quarter to 3,728 in quarter 7. The number of transactions per account per quarter increases from 0.61 in quarter 1 to 1.12 in quarter 7. Thus, by the end of quarter 7, the PMJDY account holder transacts once per quarter on average.

Panel B of Table 7 presents data for non-PMJDY accounts. While we sample 2,611 such accounts, the exact opening date of the account is available for only 1,475 of these accounts, which constitute our non-PMJDY sample in the regressions. Interestingly and in contrast to the PMJDY accounts, the number of active transactions decreases with age. The total number of transactions between quarter 1 and quarter 7 decreases from 3,143 to 2,254 and the number of active transactions per account per quarter declines from 2.13 in quarter 1 to 1.72 in quarter 7 for non-PMJDY accounts. Figures 4 and 5 plot these results. The differential pattern for PMJDY and non-PMJDY accounts suggests that usage differences between the two account shrink with age. We characterize this more formally using regressions.

We analyze the extensive margin, or the transition from no use to first use in Table 5. 1,018 out of 3,418 PMJDY accounts, or 29.8% of the accounts do not transition into positive use versus 329 out of 2,611, or 12.6% for non-PMJDY accounts. Figure 3, which plots the non-parametric Kaplan-Meier survival estimates for the event of the first active transaction, characterizes this difference more formally. The time-to-first-use shows small and persistent differences between PMJDY and non-PMJDY accounts. Thus, PMJDY accounts are *less* likely to start usage. Given that the PMJDY accounts are less likely to be used, the activity levels in Table 7 understate

the true convergence in usage of the account holders who actually transact.

The differences in extensive versus intensive margin provide a useful characterization of the barriers to financial inclusion. The unbanked poor targeted in PMJDY show significant static friction in beginning to use their accounts. However, once initial usage starts, PMJDY accounts display increased activity. The data are consistent with a learning-by-doing mechanism for technology adoption by the poor.

The data also speak to why literacy interventions do not necessarily improve inclusion, a puzzle noted by Cole, Sampson, and Zia (2011). The process of using accounts for transactions requires expense of a fixed amount of effort, whose benefits are perhaps ex-ante unclear to the unbanked. A different point is about what these benefits are and how they can be learnt. If the primary usage of accounts is transactional, the relevant literacy dimension is liquidity management. Account holders must learn that banks provide a safe storage technology and ready access when funds are needed. In determining required balances, individuals must forecast fluctuations in transactional cash demand, transaction costs associated with usage, stock-out costs, and develop trust in cash in bank relative to cash in hand.

Financial literacy for liquidity management is different from literacy for savings accumulation, which requires, is tested, and is delivered through training on interest rates and compounding (Cole, Sampson, and Zia (2011)). Different metrics of literacy may be necessary for different uses (Lusardi and Mitchell (2009)). A related question is how the skills can be delivered to the poor. Our evidence that there is significant takeup suggests that even without training, experiential learning that comes from actual use of bank accounts aids uptake.

5.2 Regression Specification

Our key focus is the uptake of banking services in new bank accounts. We estimate specifications in which the samples include all transactions up to and including quarter

q, $\forall q \geq 2$. We regress a transactional activity measure y_{ikq} on a dummy variable $\delta_{k,q}$ that takes the value 1 if the transaction is in the quarter q and zero otherwise.

$$y_{ikq} = \alpha + \gamma_i + \beta_{k,q}\delta_{k,q} + \varepsilon_{ikq} \qquad \forall \ q \leq n, \tag{1}$$

where k is PMJDY or non-PMJDY. The coefficient $\beta_{k,q}$ denotes the intensity of usage of accounts in quarter q relative to prior quarters. γ_i is an individual-level fixed effect that controls for unobservable heterogeneity of individuals. We estimate models separately for PMJDY and non-PMJDY accounts and also models with interactions of account age with the PMJDY dummy variable. For the PMJDY sample, we test whether the coefficient $\beta_{PMJDY,q}$ increases over time. For the sample with both PMJDY and non-PMJDY accounts, we test whether the difference $\beta_{k=PMJDY,q} - \beta_{k=non-PMJDY,q}$ increases over time. Such a finding would indicate increasing PMJDY activity relative to non-PMJDY accounts. The standard errors are clustered at account holder level and adjusted for heteroskedasticity.

The dependent variable in our preferred specification is the number of transactions in an account. We choose this variable rather than transaction value as it is more agnostic to the levels of wealth and income of account holders. For completeness, we display estimates of models with other dependent variables such as final account balances or type of transactions (e.g., ATM transactions or debit transactions). We initially estimate linear regressions and we later show estimates of Poisson models to account for the fact that transactions are count data as well as zero-inflated models that allow for excess mass at zero. We include a dummy variable for whether there is a government direct benefit transfer in the current or previous quarter.

5.3 Regression Evidence

Table 8 presents estimates of Equation (1). In Panel A, the dependent variable is the number of transactions per account while Panels B and C use value transacted per

account per quarter and value per transaction per account, respectively. To facilitate interpretation, observe that each row in the Table represents a coefficient from a separate estimation of Equation (1). For example, the row labeled "Quarter = 3" compares average activity in quarter 3 to all preceding quarters.

Our preferred specification is in Panel A of Table 8. The results in column (1) pertain to all PMJDY accounts. We find that the activity level of PMJDY accounts increases with age. For instance, in quarter 7, there are 0.226 more transactions than the average of prior quarters. We note that the model includes individual fixed effects. Thus, we control for time-invariant factors such as age, education, gender, personal financial circumstances or literacy, or geographic distances or transportation difficulties in accessing bank accounts that can explain usage as well as sources of unobserved heterogeneity. In columns (2) and (3), we analyze accounts receiving or not receiving government benefit transfers. Activity increases in both types of accounts.

We next compare the PMJDY and non-PMJDY estimates. Columns (4) to (6) in each panel of Table 8 report these results. Unlike the coefficients for PMJDY accounts, the non-PMJDY account coefficients are *negative*. That is, account usage in non-PMJDY accounts decreases over time, especially in accounts without direct government benefit transfers. Thus, the increasing trend in transactions in PMJDY accounts is not a generic feature of accounts opened in the normal course of business. We examine this hypothesis formally in difference-in-difference settings.

Panels B and C report activity measures by value. The PMJDY results in columns (1) to (3) display mixed significance but are directionally similar to those based on the number of transactions. For instance, in Panel B, the value transacted per account in quarter 7 exceeds the average for prior quarters by INR 1,910. For the same period, Panel C shows that the value per transaction increases by INR 281.

5.4 Difference in Difference Estimates

Table 9 presents the regression estimates of a difference in difference specification. We estimate Equation (1) for the combined sample of PMJDY and non-PMJDY accounts but with interaction terms in which the age in quarters is interacted with a PMJDY account dummy variable. To save space, we only report the coefficients of interest, viz., for the PMJDY-age interaction term. As in Table 8, we report results for all accounts and those receiving or not government assistance in columns 1, 4 and 7, columns 2, 5 and 8, and columns 3, 6 and 9, respectively.

The main results are in column (1). We find that the difference-in-difference coefficients are consistently positive and statistically significant. For instance, the coefficient for all transactions for the PMJDY accounts is 0.502 for quarter 2 and 0.977 for quarter 7. The evidence affirms the univariate statistics in which PMJDY activity increases over time. The results in columns (2) and (3) suggest that the government benefits transfer program does not drive the difference in difference results. In fact, column (3) suggests greater increase over time for accounts without benefit transfers.

The remaining results in columns (4) through (9) are for the value of all transactions and value per transaction. In contrast to the models with the number of transactions as the dependent variable, the value specifications do not show convergence between PMJDY and non-PMJDY accounts. Only 2 out of 36 coefficients are significant. This is unsurprising. The persistence in value differences likely reflect equally persistent income and wealth differences between PMJDY and non-PMJDY account holders.[14] In our view, the results reinforce why activity counts are probably better metrics of usage in the 2-year time horizon studied here.

[14]The difference is consistent with the univariate statistics in Table 5 where the average transaction size for PMJDY account holders is INR 1,649 versus INR 13,275 for non-PMJDY account holders, an 8X difference.

5.5 Deposits and Withdrawals

We next examine the types of transactions for which PMJDY accounts are used. We focus on 4 categories: withdrawals, deposits, ATM transactions, and cash deposits and withdrawals at branches. These represent the major categories of transactions in our sample. We start with deposits and withdrawals. If the PMJDY accounts are primarily safe savings vehicles, withdrawals are likely to happen only when there are unplanned expenditures or the event for which the funds were saved in the first place occurs. We would then expect to see an increase in deposit transactions with time but not withdrawals. On the other hand, if the account holders use the accounts as convenient transaction vehicles, withdrawals should increase with account age.[15]

Table 10 reports the estimates of Equation (1) for deposits and withdrawals for PMJDY and non-PMJDY accounts separately. The asymmetry between deposits and withdrawals is a dominant feature of PMJDY accounts. In Panel A, we find that the number of deposit transactions decrease with age but Panel B shows that the number of withdrawal transactions increase with age. Conversations with bank officials suggest that the results are best explained by the time costs of each type of transaction. For deposits, account holders tend to visit branches and wait in queues for service. ATMs are not used for deposits for three reasons. One, they require more sophistication. Two, not all ATMs accept deposits. Third, PMJDY account holders are relatively indigent and worry about machine malfunctions. Seeking redressal is time consuming. Moreover, a stock-out from temporary loss of cash is costly for the poor. Account holders thus accumulate cash balances and visit banks only after a threshold is crossed. Withdrawals are straightforward and executable at many ATMs, so they increase with time.

In Table 10, we find that non-PMJDY accounts also see decreases in the number

[15]Transactions costs can drive the results. However, 3 transactions per month are free for PMJDY account holders while the fourth transaction and beyond attracts a transaction fee of INR 10 per transaction, or 0.6% of the median transaction amount of INR 1,649 for PMJDY accounts in Table 5. The typical usage is far less than the threshold of 3 transactions per month.

of deposits but the coefficients tend to be more negative than for PMJDY accounts. For instance, in quarter 7, the PMJDY coefficient for deposits is -0.043 while the non-PMJDY coefficient is more than three times larger at -0.170. Transaction values are occasionally significant and have positive values for PMJDY accounts, while they tend to be negative and insignificant for non-PMJDY accounts. The Panel B results for withdrawals reveal similar differences. Withdrawal transactions increase for PMJDY accounts as they age but decrease for non-PMJDY accounts.

The formal difference in difference specifications are in Table 11. While both specifications show positive coefficients, the deposit coefficients are consistently positive while the withdrawal specifications are significant only towards the end of the sample period. In both cases, the specifications suggest greater activity in PMJDY accounts relative to non-PMJDY accounts.

5.6 ATM and In-Branch Transactions

We next estimate Equation (1) for ATM usage. The results are in Panel A of Table 12. We find that the usage of ATMs and value measures increase with account age for PMJDY account holders. For instance, PMJDY account holders have an average of 0.171 transactions more in quarter 7 relative to previous quarters. The *increase* in value per transaction ranges from INR 40 to INR 95 and INR 166 to INR 646 for value per quarter per account. The non-PMJDY accounts do not display these trends: none of the coefficients are significant. The data suggest that PMJDY but not non-PMJDY account holders increase ATM usage over time.

The increased usage of ATMs by PMJDY account holders is perhaps surprising. Demirgüç-Kunt, Klapper, Singer, and Van Oudheusden (2015) find that distance to the bank is one of the important reasons for lack of demand for formal financial services among the poor. ATMs help reduce this distance and hence, are likely to be used actively by the PMJDY account holders. On the other hand, using ATMs

requires some basic literacy and familiarity with handling machines. In addition, there is no live help available in ATMs, which may deter their use by PMJDY account holders. Yet, they use ATMs. The findings are consistent with the learning by doing by the poor in adopting basic technology applications relevant to banking.

Given the increased usage of ATMs with age, we expect the number of (non-ATM) cash deposit and withdrawal transactions to come down over time for PMJDY accounts. We report the results in Panel B of Table 12. The coefficients for the number of transactions are negative but not always statistically significant for PMJDY accounts and are insignificant economically and statistically in quarter 7. We find similar trends in non-PMJDY accounts although the results are now significant for 6 out of 7 quarters suggesting decreasing non-ATM transactions for non-PMJDY account holders. We also examine the value per quarter and value per transaction per quarter. Most coefficients are not significant. The greater usage of ATM transactions displaces non-ATM transactions only marginally for PMJDY account holders.

5.7 Account Balances

We examine the accumulation of balances in PMJDY accounts. Prior research (e.g., Rosenzweig and Wolpin (1993)) shows that the poor find it difficult to smooth consumption. Savings can help by allowing the poor to avoid consequences such as fire sales of productive assets. The literature establishes that the inability to save is not solely due to the lack of income. For instance, short term temptations and time inconsistent preferences lead to insufficient savings, which can be mitigated by savings technologies including those without withdrawal restrictions (Dupas and Robinson (2013, 2014)). Whether PMJDY accounts, which have no minimum balance requirements nor any restrictions on withdrawals, witness balance accumulation is thus an empirically interesting issue.[16]

[16]Withdrawals by check are free. There is charge of INR 10 per withdrawal after 3 free withdrawals. In the Demirgüç-Kunt, Klapper, Ansar, and Jagati (2017) survey, savings and sending or receiving money is the most common reason for opening PMJDY accounts.

As before, we estimate regression equation (1). The dependent variable in the specification for each quarter is the natural logarithm of the average of the account balance at the end of each month within a quarter. Table 13 reports the results. In column 1, the sample includes all PMJDY accounts and the results show that balances increase. For example, the coefficient reported in row 1, represents the difference in log account balance between quarter 2 and quarter 1 of an account's life. For instance, the account balance at the end of quarter 2 is about 29.2% more than the account balance as at the end of quarter 1. Figures 6 and 7 depict the account balance trends.

We separate accounts that receive government transfers and those that do not. Table 13 shows that the coefficient is always significant for PMJDY accounts receiving government benefits and the growth estimates range from 10.1% to 40.4%. For the PMJDY accounts not receiving government transfers, the coefficients are significant in quarter 1 and end of time period quarters 6 and 7, in which the coefficients reflect a 15.2% and 27% growth relative to 36.9% and 33.4% growth for accounts with a government transfer. We conclude that using accounts leads to balance accumulation.

Table 13 also analyzes balances in non-PMJDY accounts. These accounts show mixed results and less frequent significance. For instance, 4 out of 7 quarters have significant coefficients for accounts with government transfers, while 1 out of 7 are significant for accounts without such transfers. For a more formal analysis, we estimate a difference-in-difference regression as in Section 5.4. The dependent variable is log of average of account balance at the end of each month within a quarter. The results are reported in Table 14. As in Table 9, we report only the interaction term coefficients. PMJDY accounts display greater growth in balance accumulation relative to non-PMJDY accounts.

5.8 Poisson Model Estimates

The key dependent variable of interest in our study is the number of transactions. We estimate Poisson regressions in which the number of transactions n_q follows a Poisson distribution $Pr(n_q = k) = \frac{\lambda^k \exp^{-\lambda}}{k!}$ where $\lambda \equiv \lambda(q)$ denotes the transaction event rate per quarter (Cameron and Trivedi (2013)). We also include a model with zero inflation to correct for over-dispersion. Table 15 reports results of the baseline Poisson models. The dependent variable is the number of transactions per account in a given quarter. The independent variable of interest in all models is the age of an account, which we specify as the quarter number since opening, or one plus the greatest integer less than the number of days since opening divided by 90.

Specification (1) in Table 15 is estimated on PMJDY accounts alone. We find that the coefficient for age is positive, indicating that PMJDY account usage increases with age. Specification (2) adds the control for government benefit transfers. This is a dummy variable that takes the value 1 if the account holder has received a benefits transfer in the current and the previous quarter. Such transfers can induce usage through withdrawals. We find that the government benefits transfer itself has the expected positive coefficient and reduces the coefficient for age, which, however, remains significant.

Specification (3) in Table 15 expands the sample to include both PMJDY and non-PMJDY accounts. Of focal interest is the coefficient for the interaction term, viz., age $\times$ the PMJDY dummy variable, which captures the incremental activity change for PMJDY relative to non-PMJDY accounts as accounts age. We find that the interaction term has a positive and significant coefficient. Thus, as accounts age, activity in the PMJDY accounts increase more than it does for non-PMJDY accounts. Specification (4) in Table 15 shows the quarter-by-quarter coefficients for PMJDY accounts alone. These coefficients are positive and significant.

We next characterize the quantitative magnitudes of the Poisson regression results.

Given the coefficient estimates in Table 15, the incremental effect for PMJDY accounts without a government benefit transfer for quarter q is $-0.0492 \times q + 0.118 \times q$. The government benefit transfer increases this value by 0.443. We find that the estimated transaction intensity coefficient λ for PMJDY accounts exceeds that for non-PMJDY accounts by 0.0688 in quarter 1, and the differential increases to 0.4816 in quarter 7. If there is a government benefit transfer, the estimates for quarter 1 and quarter 7 are 0.5118 and 0.9246, respectively. These estimates represent the increase in the quarterly transaction rates.

Table 16 reports the Poisson estimates for deposits and withdrawals separately. The structure of the table parallels that in Table 15. The PMJDY-only samples in columns (1) and (2) show that deposits decrease with account age. Quarters with direct benefit transfers see less deposit activity but do not significantly alter the coefficient for account age. The quarter by quarter results in column (4) shows a similar decrease in account deposits over time. In column (3), we find that the coefficient for the interaction between age and PMJDY is positive. Thus, while both PMJDY and non-PMJDY accounts show fewer deposits over time, the decrease in deposit activity is more pronounced for the non-PMJDY accounts. Columns (5)-(8) deal with withdrawals. We find that withdrawals increase with account age even after controlling for quarters in which there is direct government benefits transfer and increase more for PMJDY accounts relative to non-PMJDY accounts. In terms of economic magnitudes, the transaction intensity for PMJDY accounts over non-PMJDY accounts equals 0.14 in quarter 1 and 1.01 in quarter 7, which increases to 0.76 and 1.63 transactions in periods when there is a direct benefits transfer.

Table 17 reports estimates of a zero-inflated Poisson model. The model accounts for over-dispersion relative to a standard Poisson model. It also helps differentiate between the extensive margin, or the probability of transitioning from no use to positive use, and the intensive margin, or the extent to which the account is used conditional on use. We specify two variables plausibly related to the probability of

zero inflation. One is whether the account is a PMJDY account. As seen in Table 5, the probability of zero balance accounts for PMJDY accounts is more than double the probability for non-PMJDY accounts. The second variable is whether there is a government benefit transfer in a quarter. Such transfers are likely to trigger account activity away from a dormant state.

We find that the extensive margin inflation instruments are significant. The PMJDY dummy variable has a positive coefficient and the government benefit transfer coefficient is negative. In particular, the positive sign for the PMJDY dummy variable indicates that the PMJDY accounts are less likely to migrate out of dormant state. The intensive margin results are in column (3) of Table 17. Curiously, government benefit transfers have a negative effect: they are likely to increase migration away from dormancy but not in increasing usage.

The negative coefficient for the PMJDY dummy indicates that the baseline usage of PMJDY accounts is lower. The key coefficient is for the age-PMJDY interaction variable. It is positive, indicating that PMJDY accounts experience increasing usage over time. As before, the Poisson coefficient estimates can be used to infer economic magnitudes. In quarter 1, the PMJDY accounts have mean transaction rates of 0.11 above non-PMJDY accounts, which increases to 0.78 transactions in quarter 7. If we include government benefit transfers, the coefficients are -0.12 and 0.55 in quarters 1 and 7, respectively.

5.9 Additional Discussion

Our results shed light on the adoption of formal banking by the unbanked. Adoption is not instantaneous. The positive coefficients for quarter 7 suggests that usage is continuing to increase nearly two years from account opening. This is not surprising. Individuals opening PMJDY accounts are relatively poor, historically excluded from the financial system, and are unfamiliar with the operation of bank accounts

or account benefits. In addition, as the survey evidence in Demirgüç-Kunt, Klapper, Ansar, and Jagati (2017) shows, individuals continue to harbor misperceptions that the accounts cost money. Thus, in our view, realized adoption rates probably understate potential usage. Further time series evidence can shed light on this issue, but a key impediment is that another shock, India's currency demonetization, takes place on November 8, 2016. This is just after the end of our sample period. In this sense, we have about as much time series duration as possible without the confounding effects of the second shock.

Agarwal et al. A contemporaneous study of PMJDY accounts by Agarwal, Alok, Ghosh, Ghosh, Piskorski, and Seru (2017) further underlines the importance of measuring activity over longer time periods. Their sample of 1.5 million accounts is wider than ours but is shorter as it spans about 3 quarters from account opening. Agarwal et al. find low activity in their narrower time period. For instance, 81% of customers do not make even one deposit, 87% do not make even one withdrawal, 66% receive no money, and 79% send no money in their sample. As they write, "... longer time series data is needed to evaluate the long-run validity of these facts." Our study addresses precisely this gap by providing evidence from a longer panel.

Validation in Survey Evidence Surveys of PMJDY account holders offer interesting external validation for some of our findings. CAFRAL, the research and learning arm of India's central bank RBI, conducted a survey of 313 PMJDY account holders (Aggarwal and Chandra (2015)). The survey finds that the dominant reason for opening PMJDY accounts is to deposit savings, which is cited by 52% of account holders. The next highest reason (23%) is to avail of insurance attached to the accounts, followed by the desire to avail of direct benefit transfers and subsidies (16%). These routine uses are what we find in our sample. Another survey conducted by Microsave (`http://goo.gl/Aj8Trb`) focuses on 4,859 account holders. 88% of accounts are opened through bank "mitra" agents, whose dominant offerings are accounts for savings (94%) or insurance (70%). 79% of respondents report using the

"Rupay" ATM card associated with PMJDY accounts. Using accounts for routine purposes is what we too find in our study.[17]

Heterogeneity We include account holder fixed effects to control for the heterogeneity in transactional activity across different demographics. In unreported results, we examine demographics along two dimensions, viz., age and gender. These are dimensions along which there are inclusion gaps (Demirgüç-Kunt, Klapper, Singer, and Van Oudheusden (2015), Gunther (2016)). We find that transactional activity is lower for accounts owned by women but both men-owned and women-owned accounts increase transactional activity over time. The median account holder age in our sample is close to 32 years. Both young and old individuals show increased account activity over time. The increase is more prominent for younger account holders suggesting that the young have greater take-up in the intensive margin sense. We also find that account balances increase across all demographic cuts.

Economic Outcomes Better financial systems are associated with economic growth (see, e.g., King and Levine (1993), Levine (1997), Rajan and Zingales (1998)). Thus, it is reasonable to ask whether a program like PMJDY, which improves financial access, is associated with positive economic outcomes such as employment, education, health, or investment. Significant short-run effects are perhaps implausible as we discuss below. Pinpointing longer-term effects (say over a few years) attributable to PMJDY is even more difficult. It is not just the passage of time but also the fact that the unbanked are economically less well off segments of the population targeted by many new government programs. In the short-term, one issue is that users take time to adopt banking technology, and as we show, the balances in PMJDY accounts accumulate only towards the end of the sample period. Economic effects are likely to take longer. There is also a practical issue pointed out by the bank staff we talked to. Bank branches are administratively overwhelmed by the sheer number of new accounts. The human capital and administrative capacity to increase lending

[17]We thank Smita Aggarwal and Pulak Ghosh for pointing us to these survey data.

to these individuals is very limited. Furthermore, extracting soft and hard credit-relevant information from the new accounts or accountholders requires time over which information accumulates and banks learn how to use it. Thus, in our view, the crucial first step is to assess whether the new accounts are used and how. The fact that they are used and for traditional purposes, suggests that access to formal banking is valuable to the unbanked. We leave further assessments as topics for future research.[18]

6 Conclusion

Data on financial inclusion indicate that over 2.5 billion individuals around the world lack a bank account, which represents the most basic form of access to the formal financial system. A question of economic and policy interest is whether the exclusion reflects the lack of demand for banking or that there is underlying demand but insufficient supply of banking. We provide new evidence on this question from an unanticipated big bang shock in the supply of banking services to the unbanked. In 2014, India announced the PMJDY program that aimed to supply bank accounts to virtually all its 260 million unbanked.

We obtain a sample of the newly opened PMJDY accounts and track transactional activity in these accounts. We also obtain a sample of non-PMJDY accounts opened around the same time to assess the differences between PMJDY and non-PMJDY accounts. We report three main findings. First, we find that while about 30% of PMJDY accounts remain unused, 70% of the accounts migrate out of dormancy into active use. Second, activity levels in PMJDY accounts increase over time, a pattern not necessarily seen in non-PMJDY accounts. In many specifications, activity increases in PMJDY accounts relative to non-PMJDY accounts. These findings are

[18]In our view, the sheer scale of the experiment opens up multiple strands of research, e.g., to exploit variations in populations, bank and branch capabilities, the political economy, or complementary interventions or new field experiments based on PMJDY accounts.

especially stark given that non-PMJDY accountholders in our sample appear to be much poorer and have transaction sizes that are one order of magnitude smaller. Finally, we find that the active accounts experience significant increases in cash balances. Government direct benefits transfer aids but does not fully explain usage. Overall, the data indicate that the unbanked learn by doing, and increase usage of accounts for transactions, liquidity management, and increasingly, balance accumulation.

Our study adds to the work on interventions aimed at enhancing inclusion. Conventional financial literacy interventions (e.g., Cole, Sampson, and Zia (2011)) have had limited efficacy in stimulating use. The PMJDY experiment has no explicit incentives or prior literacy interventions to encourage uptake. Yet, we find uptake and increasing activity. One interpretation, on the lines of Lusardi and Mitchell (2009), is that financial literacy is perhaps multi-faceted. Literacy relevant to savings accumulation is perhaps different from that for using bank accounts for transactions and liquidity management, which may be better understood through actual use.

We also find a difference between the extensive and the intensive margins. PMJDY accounts are less likely to move out of dormancy but once use begins, there is significant activity that increases over time. Our evidence is consistent with a learning by doing view of inclusion. Adopting a new product requires assessment of its benefits relative to adoption costs. Some of this knowledge can come only with experiential learning. Supply can create its own demand, perhaps by raising awareness of a latent demand, as the introductory quote cited in our study suggests.

Finally, our study focuses on a large economy-wide supply shock in the supply of banking. Micro-level evidence on these types of interventions is relatively rare. Our findings can help inform other countries that may consider similar interventions to improve inclusion.

References

Agarwal, Sumit, Shashwat Alok, Pulak Ghosh, Soumyakanti Ghosh, Tomasz Piskorski, and Amit Seru, 2017, Banking the unbanked: What Do 255 Million New Bank Accounts Reveal About Financial Access?, *Georgetown University Working Paper*.

Aggarwal, Smita, and Bhagvath Chandra, 2015, Survey of PMJDY Account Holders, *CAFRAL Working Paper*.

Aghion, Philippe, and Peter Howitt, 1992, A model of growth through creative destruction, *Econometrica* 60, 323–351.

Aleem, Irfan, 1990, Imperfect Information, Screening, and the Costs of Informal Lending: A Study of a Rural Credit Market in Pakistan, *World Bank Economic Review* 4, 329–349.

Ashraf, Nava, Dean Karlan, and Wesley Yin, 2006, Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines, *Quarterly Journal of Economics* pp. 635–672.

Atkin, D, A Chaudhry, S Chaudry, A Khandelwal, and E Verhoogen, Forthcoming, Technology spillovers among manufacturing firms: Evidence from pakistan, *Quarterly Journal of Economics*.

Banerjee, Abhijit, and Esther Duflo, 2007, The Economic Lives Of The Poor, *Journal of Economic Perspectives* 21, 141–168.

Banerjee, Abhijit, and Esther Duflo, 2014, Do Firms Want to Borrow More? Testing Credit Constraints Using a Directed Lending Program, *Review of Economic Studies* 81, 572–607.

Bold, Tessa, Kayuki Kaizzi, Jakob Svensson, and David Yanagizawa-Drott, Forthcoming, Lemon technologies and adoption: Measurement, theory and evidence from agricultural markets in uganda, *Quarterly Journal of Economics*.

Bruhn, Miriam, and Inessa Love, 2014, The Real Impact of Improved Access to Finance: Evidence from Mexico, *Journal of Finance* 69, 1347–1376.

Burgess, Robin, and Rohini Pande, 2005, Do Rural Banks Matter? Evidence from The Indian Social Banking Experiment, *American Economic Review* 95, 780–795.

Cameron, A Colin, and Pravin K Trivedi, 2013, Count Panel Data, *Oxford Handbook of Panel Data Econometrics (Oxford: Oxford University Press, 2013)*.

Carpena, Fenella, Shawn Allen Cole, Jeremy Shapiro, and Bilal Zia, 2011, Unpacking the Causal Chain of Financial Literacy, *World Bank Policy Research Working Paper No. 5798*.

Carrell, Scott, and Jonathan Zinman, 2014, In Harm's Way? Payday Loan Access and Military Personnel Performance, *Review of Financial Studies* 27, 2805–2840.

Chandra, Amitabh, Amy Finkelstein, Adam Sacarny, and Chad Syverson, 2016, Health care exceptionalism? performance and allocation in the us health care sector, *American Economic Review* 106, 2110–2144.

Chari, V, and Hugo Hopenhayn, 1991, Vintage human capital, growth, and the diffusion of new technology, *Econometrica* Journal of Political Economy, 1142–1165.

Cole, Shawn, 2009, Financial development, bank ownership, and growth: or, does quantity imply quality?, *Review of Economics and Statistics* 91, 33–51.

Cole, Shawn, Xavier Giné, Jeremy Tobacman, Petia Topalova, Robert Townsend, and James Vickery, 2013, Barriers to Household Risk Management: Evidence from India, *American Economic Journal: Applied Economics* 5, 104–135.

Cole, Shawn, Thomas Sampson, and Bilal Zia, 2011, Prices or knowledge? what drives demand for financial services in emerging markets?, *Journal of Finance* 66, 1933–1967.

Comin, Diego, and Marti Mestieri, 2014, Technology diffusion: Measurement, causes and consequences, *Handbook of Economic Growth* 2, 565–622.

Conley, T, and C Udry, 2010, Learning about a new technology: Pineapple in ghana, *American Economic Review* 100, 35–69.

Demetriades, Panicos O, and Kul B Luintel, 1996, Financial Development, Economic Growth and Banking Sector Controls: Evidence from India, *The Economic Journal* pp. 359–374.

Demirgüç-Kunt, Asli, Leora Klapper, Saniya Ansar, and Aditya Jagati, 2017, Making it Easier to Apply for a Bank Account: A Study of the Indian Market, *World Bank Working Paper*.

Demirgüç-Kunt, Asli, Leora F Klapper, Dorothe Singer, and Peter Van Oudheusden, 2015, The Global Findex Database 2014: Measuring Financial Inclusion around the World, *World Bank Policy Research Working Paper No. 7255*.

Duflo, Esther, Michael Kremer, and Jonathan Robinson, 2011, Nudging Farmers to Use Fertilizer: Theory and Experimental Evidence from Kenya, *American Economic Review* 101, 2350–2390.

Duflo, Esther, and Emmanuel Saez, 2004, Implications of Pension Plan Features, Information, and Social Interactions for Retirement Saving Decisions, *Pension Design and Structure: New Lessons from Behavioral Finance* pp. 137–153.

Dupas, Pascaline, 2014, Short-run subsidies and long-run adoption of new health products: Evidence from a field experiment, *Econometrica* 82, 197–228.

Dupas, Pascaline, and Jonathan Robinson, 2013, Savings constraints and microenterprise development: Evidence from a field experiment in Kenya, *American Economic Journal: Applied Economics* 5, 163–192.

Dupas, Pascaline, and Jonathan Robinson, 2014, Why Don't the Poor Save More? Evidence from Health Savings Experiments, *American Economic Review* 103, 1138–1171.

Frame, Scott, and Lawrence White, 2004, Empirical studies of financial innovation: Lots of talk, little action?, *Journal of Economic Literature* 42, 116–144.

Ghosh, D. N., 2015, No Regrets, *Rupa Publications*.

Gneezy, Uri, Stephan Meier, and Pedro Rey-Biel, 2011, When and Why Incentives (Don't) Work to Modify Behavior, *Journal of Economic Perspectives* 25, 191–209.

Griliches, Zvi, 1957, Hybrid corn: An exploration in the economics of technological change, *Econometrica* 25, 501–522.

Gunther, Manuela Kristin, 2016, The progress of financial inclusion in India: Insights from multiple waves of survey data, *CAFRAL Working Paper*.

Hall, Bronwyn, and Beethika Khan, 2003, Adoption of new technology, *NBER Working Paper 9730*.

Iyer, Rajkamal, and Manju Puri, 2012, Understanding Bank Runs: The Importance of Depositor-Bank Relationships and Networks, *American Economic Review* 102, 1414–1445.

Jovanovic, Boyan, and Saul Lach, 1997, Product innovation and the business cycle, *International Economic Review* 38, 3–22.

Jovanovic, Boyan, and Yaw Nyarko, 1996, Learning by doing and the choice of technology, *Econometrica* 64, 1299–1310.

Karlan, Dean, Margaret McConnell, Sendhil Mullainathan, and Jonathan Zinman, 2016, Getting to the Top of Mind: How Reminders Increase Saving, *Management Science* 62, 3393–3411.

Keynes, John Maynard, 1936, The General Theory of Employment, Interest and Money. London, 1936, *Keynes: The General Theory of Employment, Interest and Money 1936*.

King, Robert G, and Ross Levine, 1993, Finance and Growth: Schupmeter Might be Right, *Quarterly Journal of Economics* 108, 717–738.

Levine, Ross, 1997, Financial development and economic growth: views and agenda, *Journal of Economic Literature* pp. 688–726.

Lusardi, Annamaria, 2008, Financial Literacy: An Essential Tool for Informed Consumer Choice?, Discussion paper, National Bureau of Economic Research.

Lusardi, Annamaria, and Olivia S Mitchell, 2009, How Ordinary Consumers Make Complex Economic Decisions: Financial Literacy and Retirement Readiness, *CFS Working Paper No. 2010/11*.

Manuelli, Rodolfo, and Ananth Seshadri, 2014, Frictionless technology diffusion: The case of tractors, *American Economic Review* 104, 1368–1391.

Melzer, Brian T, 2011, The Real Costs of Credit Access: Evidence from the Payday Lending Market, *Quarterly Journal of Economics* 126, 517–555.

Morduch, Jonathan, 1995, Income Smoothing and Consumption Smoothing, *The Journal of Economic Perspectives* 9, 103–114.

Rajan, Raghuram G, and Luigi Zingales, 1998, Financial dependence and growth, *American Economic Review* 88, 559–586.

Rogers, Everett, 2003, *Diffusion of Innovations* (Free Press).

Romer, Paul, 1990, Endogenous technological change, *Journal of Political Economy* 98, 71–102.

Rosenzweig, Mark R, and Kenneth I Wolpin, 1993, Credit Market Constraints, Consumption Smoothing, and the Accumulation of Durable Production Assets in Low Income Countries: Investments in Bullocks in India, *Journal of Political Economy* 101, 223–244.

Skinner, Jonathan, and Douglas Staiger, 2015, Technology diffusion and productivity growth in health care, *The Review of Economics and Statistics* 95, 951–964.

Slow, Robert, 1956, A contribution to the theory of economic growth, *Quarterly Journal of Economics* 70, 65–94.

Thaler, Richard H, 1999, Mental Accounting Matters, *Journal of Behavioral Decision Making* 12, 183–206.

Table 1: Nationwide PMJDY Data : By Bank Type

Table 1 reports aggregate PMJDY data. Panel A reports data as of January 31, 2015 and Panel B reports data as of December 14, 2016. Columns (1)-(3) report the number of accounts, column (4) the number of Rupay cards, and column (5) the aggregate balance under the PMJDY scheme. Column (6) reports the proportion of accounts with zero balance. Columns (7)-(9) presents the proportions of te number of accounts, aggregate balance and zero balance accounts for each bank type. Column (10) reports the number of zero balance accounts. Column (11) reports the number of accounts that are Aadhaar seeded. Data are from the PMJDY website `http://www.pmjdy.gov.in`.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A: As of January 31 2015											
Bank Type	**# Accounts Rural**	**Urban**	**Total**	**# Rupay Cards**	**Balance Million**	**% with Zero Balance**	**Market Share #**	**Market Share INR**	**Market Share Zero Balance**	**# with Zero Balance**	**# Aadhaar Seeded**
Public Sector Bank	53.3	45.1	98.4	91.2	817.5	66.6%	78.46%	77.86%	77.59%	65.5	NA
Rural Regional Bank	18.5	3.3	21.8	15.0	159.9	73.1%	17.36%	15.23%	18.86%	15.9	NA
Private Banks	3.2	2.0	5.2	4.6	72.6	57.2%	4.17%	6.91%	3.55%	3.0	NA
Total	75.0	50.5	125.5	110.8	1050.0	67.3%				84.5	NA
Panel B: As of December 14, 2016											
Bank Type	**# Accounts Rural**	**Urban**	**Total**	**# Rupay Cards**	**Balance Billion**	**% with Zero Balance**	**Market Share #**	**Market Share INR**	**Market Share Zero Balance**	**# with Zero Balance**	**# Aadhaar Seeded**
Public Sector Bank	115.2	91.8	207	162.9	579.9	23.4%	79.68%	78.23%	80.36%	48.5	117.6
Regional Rural Bank	38	6.1	44.1	32.9	134.1	20.0%	16.97%	18.09%	14.65%	8.8	21.7
Private Banks	5.2	3.5	8.6	8.1	27.2	34.7%	3.31%	3.67%	4.94%	3.0	3.7
Total	158.4	101.4	259.8	204.0	741.2	23.2%				60.3	143

Table 2: Nationwide PMJDY Data : Public Sector Banks

Table 2 reports PMJDY data for public sector banks as of January 31, 2015. Columns (1)-(3) report the number of accounts, column (4) the number of Rupay cards issued, column (5), the aggregate balance under the PMJDY scheme. Column (6) reports the proportion of accounts with zero balance. In column (7)-(9), we report the market share of number of accounts, aggregate balance and zero balance accounts. Column (10) reports the number of zero balance accounts. Data are from the PMJDY website `http://pmjdy.gov.in`.

Banks	**# Accounts**			**# Rupay**	**Balance**	**% with Zero**	**Market**	**Market**	**Market Share**	**# with**
	Rural	**Urban**	**Total**	**Cards**	**Billion**	**Balance**	**Share #**	**Share INR**	**Zero Balance**	**Zero Balance**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Allahabad Bank	1.7	0.7	2.4	2.4	0.65	75.8%	2.45%	0.80%	2.79%	1.83
Andhra Bank	1.1	0.7	1.7	1.7	0.66	69.9%	1.74%	0.81%	1.83%	1.20
Bank of Baroda	2.8	3.9	6.7	6.5	6.41	52.3%	6.76%	7.84%	5.31%	3.48
Bank Of India	2.4	3.4	5.8	5.6	2.76	67.0%	5.87%	3.37%	5.91%	3.87
Bank of Maharastra	1.2	0.6	1.8	1.7	1.84	64.6%	1.79%	2.25%	1.74%	1.14
Bhartiya Mahila Bank	0.0	0.1	0.1	0.1	0.05	38.8%	0.06%	0.06%	0.03%	0.02
Canara Bank	4.1	2.0	6.0	6.0	7.38	41.0%	6.13%	9.03%	3.77%	2.47
Central bank of India	4.0	1.2	5.2	4.7	2.02	72.0%	5.31%	2.47%	5.74%	3.76
Corporation Bank	0.9	0.9	1.9	1.7	2.79	37.4%	1.89%	3.42%	1.06%	0.70
Dena Bank	1.5	0.8	2.3	2.2	1.39	68.9%	2.36%	1.71%	2.44%	1.60
IDBI	0.4	0.4	0.9	0.8	0.25	78.4%	0.87%	0.31%	1.03%	0.67
Indian bank	1.5	0.9	2.4	2.3	1.18	63.5%	2.47%	1.44%	2.36%	1.54
Indian Overseas Bank	1.0	1.9	2.8	2.7	0.13	85.0%	2.89%	0.15%	3.69%	2.42
Oriental Bank of Commerce	1.2	0.9	2.1	2.0	8.85	38.2%	2.12%	10.83%	1.22%	0.80
Punjab & Sind Bank	0.8	0.4	1.2	1.1	4.17	53.4%	1.21%	5.11%	0.97%	0.64
Punjab National Bank	5.8	1.4	7.2	6.3	7.77	77.5%	7.29%	9.50%	8.48%	5.56
State Bank of Bikaner and Jaipur	1.0	1.2	2.2	1.9	4.69	55.2%	2.25%	5.74%	1.87%	1.22
State Bank of Hyderabad	0.8	1.5	2.4	2.2	1.02	73.5%	2.41%	1.25%	2.66%	1.75
State Bank of India	10.5	15.3	25.8	22.9	7.38	78.9%	26.24%	9.03%	31.10%	20.38
State Bank of Mysore	0.6	0.2	0.8	0.7	0.03	95.0%	0.78%	0.04%	1.11%	0.73
State Bank of Patiala	0.4	0.7	1.1	1.0	2.32	69.4%	1.10%	2.84%	1.15%	0.75
State Bank of Travancore	0.0	0.3	0.3	0.3	1.24	12.4%	0.33%	1.52%	0.06%	0.04
Syndicate Bank	2.1	1.1	3.2	3.1	2.70	66.1%	3.27%	3.30%	3.25%	2.13
Uco Bank	1.9	1.9	3.8	3.4	3.99	58.4%	3.87%	4.88%	3.40%	2.23
Union Bank Of India	3.1	1.0	4.0	3.8	2.23	68.3%	4.11%	2.73%	4.22%	2.77
United Bank Of India	1.8	1.4	3.2	3.0	7.43	35.0%	3.25%	9.09%	1.71%	1.12
Vijaya Bank	0.7	0.5	1.2	1.1	0.39	63.1%	1.17%	0.48%	1.11%	0.73
Sub-Total	53.3	45.1	98.4	91.2	81.75	66.6%				65.54

Table 3: Nationwide PMJDY Data : Private Sector Banks

Table 2 reports PMJDY data for private sector banks as of January 31, 2015. Columns (1)-(3) report the number of accounts, column (4) the number of Rupay cards issued, column (5), the aggregate balance under the PMJDY scheme. Column (6) reports the proportion of accounts with zero balance. In column (7)-(9), we report the market share of number of accounts, aggregate balance and zero balance accounts. Column (10) reports the number of zero balance accounts. Data are from the PMJDY website `http://pmjdy.gov.in`.

Banks	**# Accounts**			**# Rupay Cards**	**Balance Billion**	**% with Zero Balance**	**Market Share #**	**Market Share INR**	**Market Share Zero Balance**	**# with Zero Balance**
	Rural	**Urban**	**Total**							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
City Union Bank Ltd	0.01	0.06	0.07	0.00	0.05	53.6%	1.33%	0.64%	1.24%	0.04
Federal Bank	0.18	0.05	0.23	0.22	0.95	54.4%	4.30%	13.14%	4.09%	0.12
HDFC Bank	0.17	0.77	0.94	0.94	3.51	61.7%	17.98%	48.33%	19.39%	0.58
ICICI	1.78	0.29	2.07	2.03	1.38	44.1%	39.50%	19.05%	30.45%	0.91
Indusind Bank	0.01	0.12	0.14	0.14	0.04	51.2%	2.65%	0.61%	2.37%	0.07
Jammu and Kashmir Bank	0.81	0.10	0.91	0.50	0.97	72.5%	17.38%	13.44%	22.03%	0.66
Karur Vaisya Bank	0.01	0.09	0.09	0.09	0.03	69.6%	1.77%	0.39%	2.15%	0.06
Kotak Mahindra Bank	0.05	0.05	0.10	0.09	0.03	85.0%	1.91%	0.43%	2.84%	0.09
Lakshmi Vilas Bank	0.02	0.05	0.06	0.02	0.01	39.3%	1.16%	0.20%	0.80%	0.02
Ratnakar Bank	0.06	0.03	0.09	0.09	0.01	56.8%	1.72%	0.15%	1.70%	0.05
South Indian Bank	0.02	0.08	0.10	0.05	0.06	50.8%	1.81%	0.81%	1.61%	0.05
Yes Bank	0.01	0.00	0.01	0.00	0.00	85.3%	0.17%	0.04%	0.25%	0.01
Sub-Total	3.23	2.01	5.24	4.59	7.26	57.2%				3.00

Table 4: Variable Descriptions

The variables used in the study are described below.

Variable	Description
Panel A: Variables in an Account Statement	
Customer Code (CIF)	11 digit number; customer identifier at bank level. Used to generate fixed effects
Date	Date of transaction.
Description	One line description of the transaction.
Debit/Credit	D or C; D if the transaction is a debit and C if the transaction is credit.
Amount	in INR; amount of transaction.
Balance	in INR; account balance after the transaction.
Panel B: Variables in Analysis	
PMJDY	Account Description; Accounts opened under Pradhan Mantri Jan Dhan Yojana.
non-PMJDY	Account Description; Accounts opened under Normal Savings Products.
Balance	in INR; Balance of the Account after each transaction.
Transaction per account	in count; Number of transactions made in a given period.
Value per Account	in INR; Total amount of transaction done in a given period.
Value per Transaction	in INR; Total amount of transaction done in a given period divided by its number of transaction.
Government Assisted Quarter	Dummy variable; 1 if the current and the previous quarter has a government transfer, otherwise 0.

Table 5: Sample Construction

Description	Value
A. All Accounts	
Period of observation	Sept 16, 2013 to November 2, 2016
Number of accounts	6,029
Total number of observations	97,482
Number of branches	4
Average number of transaction per account	16.17
Median number of transaction per account	10
Average size of transactions (in INR)	6,620
Number of zero balance accounts	1,347
B. PMJDY Accounts	
Period of observation	August 28, 2014 to October 24, 2016
Number of accounts	3,418
Number of observations	50,427
Average number of transaction per account	14.75
Median number of transaction per account	10
Average size of transactions (in INR)	1,557
Number of zero balance accounts	1,018
Mean (median) end of period balance in INR	1,795 (500)
C. non-PMJDY Accounts	
Period of observation	Sept 16, 2013 to November 2, 2016
Number of accounts	2,611
Number of observations	47,055
Average number of transaction per account	18.02
Median number of transaction per account	10
Average size of transactions (in INR)	12,142
Number of zero balance accounts	329
Mean (median) end of period balance in INR	4,127 (899)

Table 6: Distribution of transactions

Types of transactions in PMJDY and non-PMJDY accounts over first 7 quarters from account opening date.

Variable		All Accounts	PMJDY Accounts	non-PMJDY Accounts
Number of Transactions		97,508	50,427	47,081
Classification	Under each Classification			
Customer Activity		45.78%	41.30%	50.58%
	ATM	19.33%	17.37%	21.42%
	Cash (Deposit & Withdrawal)	16.31%	17.76%	14.75%
	Transactions through Cheque	2.63%	0.40%	5.02%
	Deposit Transfers	3.47%	3.12%	3.85%
	Withdrawal Transfers	0.98%	0.45%	1.54%
	Point of Sale (POS)	0.81%	0.51%	1.14%
	PMJJBY	0.30%	0.39%	0.21%
	PMSBY	0.50%	0.68%	0.31%
	Salary, Pension, TDS etc.	1.49%	0.74%	2.29%
	TDS	0.12%	0.18%	0.06%
	Insurance (incl ECS)	0.12%	0.07%	0.18%
	NPCI (excl LPG Subsidy)	0.15%	0.16%	0.13%
Charges on Banking Services		5.58%	4.64%	6.59%
	PIN Change or Re-issue	0.07%	0.09%	0.05%
	Maintenance Fees	0.10%	0.00%	0.20%
	Charges (SMS, CDM etc.)	4.18%	3.38%	5.05%
	Inter City Charges for Cheque	1.23%	1.17%	1.29%
Bulk Credit Transactions		18.49%	21.60%	15.16%
	LPG Subsidy	6.04%	7.41%	4.58%
	Other State Government Transfers	12.45%	14.19%	10.58%
Interest Payments		28.27%	30.06%	26.36%
Zero Balance Accounts		1.38%	2.02%	0.70%
Miscellaneous (unexplained)		0.49%	0.38%	0.62%

Table 7: Number of Transactions by account age in quarters : PMJDY Accounts

Table 7 reports the number of transactions in each quarter since account opening. For each transaction type, rows (1) - (3) report the number of transactions, number of transactions per account and the ratio of the number of the type of transaction to the total number of transactions in the quarter. In the last row of the Table, we report total transactions per account for a given quarter.

Panel A: PMJDY Accounts								
	Age (in Quarters)							
Variable	1	2	3	4	5	6	7	Total
Number of Accounts	3,418	3,418	3,418	3,418	3,360	3,338	3,321	3,418
Classification								
Active Transactions	2,102	2,427	2,912	3,086	3,031	3,540	3,728	20,826
	0.61	0.71	0.85	0.90	0.90	1.06	1.12	6.09
	43.95%	38.46%	37.71%	35.25%	44.61%	45.13%	45.36%	41.30%
Charges on Banking Services	614	1,055	115	107	141	155	152	2,339
	0.18	0.31	0.03	0.03	0.04	0.05	0.05	0.68
	12.84%	16.72%	1.49%	1.22%	2.08%	1.98%	1.85%	4.64%
Bulk Credit Transactions	410	1,237	1,858	1,400	1,675	2,061	2,253	10,894
	0.12	0.36	0.54	0.41	0.50	0.62	0.68	3.19
	8.57%	19.60%	24.06%	15.99%	24.65%	26.27%	27.42%	21.60%
Interest Payments	619	1,558	2,815	4,133	1,920	2,063	2,051	15,159
	0.18	0.46	0.82	1.21	0.57	0.62	0.62	4.44
	12.94%	24.69%	36.45%	47.21%	28.26%	26.30%	24.96%	30.06%

TABLE 7 (*continued*)

Panel B: non-PMJDY Accounts								
	Age (in Quarters)							
Variable	1	2	3	4	5	6	7	Total
Number of Accounts	1,475	1,475	1,475	1,475	1,418	1,329	1,309	1,475
Classification								
Active Transactions	3,143	2,552	2,535	2,650	2,442	2,465	2,254	18,041
	2.13	1.73	1.72	1.80	1.72	1.85	1.72	12.23
	65.96%	49.92%	56.97%	46.44%	57.42%	56.28%	55.90%	55.17%
Charges on Banking Services	235	806	248	306	233	305	304	2,437
	0.16	0.55	0.17	0.21	0.16	0.23	0.23	1.65
	4.93%	15.77%	5.57%	5.36%	5.48%	6.96%	7.54%	7.45%
Bulk Credit Transactions	249	640	579	688	560	681	584	3,981
	0.17	0.43	0.39	0.47	0.39	0.51	0.45	2.70
	5.23%	12.52%	13.01%	12.06%	13.17%	15.55%	14.48%	12.18%
Interest Payments	748	1,084	1,062	2,041	999	902	859	7,695
	0.51	0.73	0.72	1.38	0.70	0.68	0.66	5.22
	15.70%	21.21%	23.87%	35.77%	23.49%	20.59%	21.30%	23.53%

Table 8: Regressions Explaining Active Transactions

Table 8 reports OLS estimates of several regressions. The dependent variable in each regression is the number of transactions in quarter q or value of transactions or value per transaction. The explanatory variable of interest is a dummy variable that takes the value of 1 for transactions executed in q and zero otherwise. Each cell in the table is thus estimated from a separate regression and reports the regression coefficient, t-statistic, and # observations. In columns (1)-(3), the sample comprises PMJDY accounts. In column (4)-(6), the sample comprises non-PMJDY accounts. We report separate estimates for all accounts, accounts receiving government or agency bulk transfers, and accounts not receiving such transfers. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	PMJDY Accounts			non-PMJDY Accounts		
VARIABLES	All	Govt	No Govt	All	Govt	No Govt
	Panel A: Transactions per Account					
Quarter == 2	0.084**	0.045	0.106**	-0.420***	-0.443***	-0.408*
	(2.5732)	(0.8914)	(2.5226)	(-2.8826)	(-3.3337)	(-1.9428)
	6,952	2,778	4,174	2,950	1,116	1,834
Quarter == 3	0.159***	0.288***	0.089**	-0.310*	0.273	-0.611***
	(4.8704)	(5.3629)	(2.1893)	(-1.8672)	(1.6427)	(-2.5833)
	10,428	4,167	6,261	4,425	1,674	2,751
Quarter == 4	0.123***	0.113**	0.129***	-0.116	0.269**	-0.337*
	(3.4351)	(2.1592)	(2.6995)	(-0.9618)	(2.0639)	(-1.9334)
	13,904	5,556	8,348	5,900	2,232	3,668
Quarter == 5	0.066*	0.196***	-0.009	-0.267**	0.202	-0.508***
	(1.9331)	(3.0472)	(-0.2398)	(-2.3291)	(0.9998)	(-3.6649)
	17,322	6,887	10,435	7,318	2,737	4,581
Quarter == 6	0.187***	0.294***	0.125**	-0.185	0.401**	-0.511***
	(4.5453)	(4.3184)	(2.4091)	(-1.5661)	(1.9846)	(-3.5148)
	20,718	8,207	12,511	8,647	3,228	5,419
Quarter == 7	0.226***	0.310***	0.174***	-0.236**	-0.111	-0.307***
	(5.0929)	(4.3946)	(3.0506)	(-2.2167)	(-0.4579)	(-3.261)
	24,097	9,525	14,572	9,956	3,711	6,245

TABLE 8 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
	PMJDY Accounts			non-PMJDY Accounts		
VARIABLES	All	Govt	No Govt	All	Govt	No Govt
			Panel B: Value per Account			
Quarter == 2	1019	-567	1950*	27720	-5793	45043
	(1.1765)	(-0.3653)	(1.8944)	(0.6348)	(-0.917)	(0.6806)
	6,952	2,778	4,174	2,950	1,116	1,834
Quarter == 3	891	609	1042	-25411	62630	-70663*
	(1.5252)	(1.0017)	(1.2463)	(-0.7465)	(0.9857)	(-1.7736)
	10,428	4,167	6,261	4,425	1,674	2,751
Quarter == 4	-595*	-378	-720	-445	25690	-15450
	(-1.6698)	(-0.637)	(-1.6135)	(-0.0377)	(1.269)	(-1.0624)
	13,904	5,556	8,348	5,900	2,232	3,668
Quarter == 5	1091**	2710**	140	-13255	9140	-24751*
	(2.1388)	(2.3101)	(0.3298)	(-1.1273)	(0.3921)	(-1.8801)
	17,322	6,887	10,435	7,318	2,737	4,581
Quarter == 6	655*	722	616	-3693	27474	-21001*
	(1.8182)	(1.1174)	(1.4387)	(-0.35)	(1.3995)	(-1.7159)
	20,718	8,207	12,511	8,647	3,228	5,419
Quarter == 7	1910***	1313	2279***	-14804*	-21214	-11153
	(3.1379)	(1.3703)	(2.8961)	(-1.6902)	(-1.0709)	(-1.4175)
	24,097	9,525	14,572	9,956	3,711	6,245
			Panel C: Value per Transaction			
Quarter == 2	302*	262	326*	8662	-698	13500
	(1.8238)	(0.7995)	(1.8145)	(0.7985)	(-0.5632)	(0.8209)
	6,952	2,778	4,174	2,950	1,116	1,834
Quarter == 3	252*	82	343*	-6180	3389	-11099
	(1.8305)	(0.4405)	(1.8399)	(-1.0736)	(0.7111)	(-1.3268)
	10,428	4,167	6,261	4,425	1,674	2,751
Quarter == 4	-128	63	-238**	1050	2315	324
	(-1.5534)	(0.4161)	(-2.4624)	(0.664)	(1.109)	(0.1482)
	13,904	5,556	8,348	5,900	2,232	3,668
Quarter == 5	240**	429**	129	-222	4719	-2758**
	(2.2484)	(2.1186)	(1.0692)	(-0.1658)	(1.4973)	(-2.2751)
	17,322	6,887	10,435	7,318	2,737	4,581
Quarter == 6	123	227	63	48	2080	-1080
	(1.5275)	(1.633)	(0.6326)	(0.0401)	(0.9017)	(-0.7888)
	20,718	8,207	12,511	8,647	3,228	5,419
Quarter == 7	281**	440**	183	-732	-105	-1088
	(2.512)	(2.0475)	(1.4859)	(-1.1623)	(-0.1155)	(-1.2934)
	24,097	9,525	14,572	9,956	3,711	6,245

Table 9: Regressions For Combined Sample of PMJDY and non-PMJDY Accounts

Table 9 reports OLS estimates of regressions in which the dependent variable is the level of activity in a quarter for a bank account. The independent variable of interest is a dummy variable for quarter j, $j = 2, \cdots, 7$ that takes the value of 1 for a transaction executed in quarter j and zero otherwise, interacted with a dummy variable PMJDY that takes the value of 1 if the account is opened under PMJDY scheme and zero for non-PMJDY accounts. The individual quarter and PMJDY variables are included but their coefficients are not reported. The sample comprises all accounts with active transactions. In columns (1)-(3), we report transactions per account, in columns (4)-(6), the value per account and in columns (7)-(9), the value per transaction per account. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Transactions per Account			Value per Account			Value per Transaction		
Quarter == 2 & PMJDY	0.502***	0.482***	0.516**	-25,658	2,866	-43,093	-6,846	3,533	-13,174
	(3.537)	(3.720)	(2.404)	(-0.622)	(0.339)	(-0.652)	(-0.666)	(1.169)	(-0.802)
Quarter == 3 & PMJDY	0.639***	0.115	0.959***	10,741	-53,835	50,159*	3,038	77.67	4,855**
	(4.815)	(0.616)	(5.319)	(0.413)	(-0.998)	(1.942)	(1.350)	(0.0158)	(2.369)
Quarter == 4 & PMJDY	0.579***	-0.0203	0.959***	-6,049	-43,101	17,085	-2,355	-670.6	-3,335
	(4.249)	(-0.110)	(5.104)	(-0.235)	(-1.160)	(0.492)	(-0.632)	(-0.163)	(-0.612)
Quarter == 5 & PMJDY	0.727***	0.0660	1.107***	8,104	-31,049*	30,928	-1,119	-3,309	-26.01
	(4.835)	(0.253)	(6.086)	(0.355)	(-1.917)	(0.881)	(-0.304)	(-1.494)	(-0.00451)
Quarter == 6 & PMJDY	0.817***	-0.0696	1.345***	650.8	-52,701	32,634	-1,427	-1,906	-1,194
	(4.761)	(-0.243)	(6.341)	(0.0250)	(-1.532)	(0.900)	(-0.358)	(-0.461)	(-0.202)
Quarter == 7 & PMJDY	0.977***	0.441	1.296***	13,919	-9,081	28,051	-468.2	116.7	-874.3
	(6.549)	(1.536)	(7.830)	(0.678)	(-0.996)	(0.865)	(-0.127)	(0.0454)	(-0.153)
Observations	34,053	13,236	20,817	34,053	13,236	20,817	34,053	13,236	20,817
R-squared	0.568	0.653	0.507	0.434	0.503	0.409	0.404	0.600	0.388
Controls				Govt Assisted Quarter					
Fixed Effects				Account					
Government assisted A/c (Yes/no)	All	Yes	No	All	Yes	No	All	Yes	No

Table 10: Active Deposits and Withdrawals

Table 10 reports OLS estimates of regressions in which the dependent variable is the level of activity in a quarter for a bank account. In Panel A, we examine active deposits, while in Panel B, we examine active withdrawals. The independent variable of interest is a dummy variable for quarter j, $j = 2, \cdots, 7$ that takes the value of 1 for a transaction executed in quarter j and zero otherwise. Each cell in the table is thus estimated from a separate regression and reports the regression coefficient, t-statistic, and # observations. In columns (1)-(3), the sample comprises PMJDY accounts. In column (4)-(6), the sample comprises non-PMJDY accounts. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	PMJDY Acounts			non-PMJDY Accounts		
VARIABLES	Transactions per Account	Value per Account	Value per Transaction	Transactions per Account	Value per Account	Value per Transaction
	Panel A: Active Deposits					
Quarter == 2	-0.125***	390	303	-0.629***	3961	15003
	(-7.0635)	(0.8351)	(1.5092)	(-18.2242)	(0.1756)	(0.6851)
	6,952	6,952	6,952	2,950	2,950	2,950
Quarter == 3	-0.056***	256	203	-0.233***	-25148*	-17291
	(-3.8959)	(0.8395)	(1.1927)	(-8.8511)	(-1.8304)	(-1.3828)
	10,428	10,428	10,428	4,425	4,425	4,425
Quarter == 4	-0.070***	-448**	-199**	-0.189***	-4199	454
	(-5.765)	(-2.3533)	(-2.0593)	(-8.0787)	(-0.8242)	(0.1324)
	13,904	13,904	13,904	5,900	5,900	5,900
Quarter == 5	-0.026**	710**	354**	-0.176***	-7256	-5690
	(-2.126)	(2.5053)	(2.5385)	(-6.8268)	(-1.2847)	(-1.43)
	17,322	17,322	17,322	7,318	7,318	7,318
Quarter == 6	0.020	385*	157	-0.117***	-5983	-3352
	(1.4259)	(1.7631)	(1.3607)	(-4.0897)	(-1.3166)	(-0.9463)
	20,718	20,718	20,718	8,647	8,647	8,647
Quarter == 7	-0.043***	595*	377*	-0.170***	-5447*	-4962*
	(-3.3037)	(1.9225)	(1.807)	(-5.5931)	(-1.8644)	(-1.8326)
	24,097	24,097	24,097	9,956	9,956	9,956

TABLE 10 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
	PMJDY Acounts			non-PMJDY Accounts		
VARIABLES	Transactions per Account	Value per Account	Value per Transaction	Transactions per Account	Value per Account	Value per Transaction
Panel B: Active Withdrawals						
Quarter == 2	0.209***	629	179	0.208	23759	7228
	(9.5534)	(1.5036)	(1.0282)	(1.5077)	(1.0868)	(1.0003)
	6,952	6,952	6,952	2,950	2,950	2,950
Quarter == 3	0.216***	634**	203	-0.077	-263	-2873
	(9.1834)	(2.0878)	(1.5793)	(-0.4935)	(-0.0105)	(-0.7161)
	10,428	10,428	10,428	4,425	4,425	4,425
Quarter == 4	0.194***	-147	-118	0.072	3754	1352
	(6.7617)	(-0.7975)	(-1.393)	(0.6549)	(0.4384)	(1.0417)
	13,904	13,904	13,904	5,900	5,900	5,900
Quarter == 5	0.092***	381	40	-0.090	-5998	1601
	(3.4695)	(1.5634)	(0.4562)	(-0.8852)	(-0.7748)	(1.2928)
	17,322	17,322	17,322	7,318	7,318	7,318
Quarter == 6	0.167***	270	39	-0.068	2290	-194
	(5.2093)	(1.513)	(0.5222)	(-0.6619)	(0.2916)	(-0.2089)
	20,718	20,718	20,718	8,647	8,647	8,647
Quarter == 7	0.269***	1315***	325***	-0.066	-9357	365
	(7.2945)	(3.889)	(2.8521)	(-0.7756)	(-1.257)	(0.663)
	24,097	24,097	24,097	9,956	9,956	9,956

Table 11: Active Deposits and Withdrawals: PMJDY and non-PMJDY Accounts

Table 11 reports OLS estimates of regressions in which the dependent variable is the level of activity in a quarter for a bank account. In Panel A, we examine active deposits, while in Panel B, we examine active withdrawals. The independent variable of interest is a dummy variable for quarter j, $j = 2, \cdots, 7$ that takes the value of 1 for a transaction executed in quarter j and zero otherwise, interacted with a dummy variable PMJDY that takes the value of 1 if the account is opened under PMJDY scheme and zero for non-PMJDY accounts. The individual quarter and PMJDY variables are included but their coefficients are not reported. The sample comprises all accounts with active transactions. In columns (1)-(3), we report transactions per account, in columns (4)-(6), the value per account and in columns (7)-(9), the value per transaction per account. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Active Deposits			Active Withdrawals		
VARIABLES	Transactions per Account	Value per Account	Value per Transaction	Transactions per Account	Value per Account	Value per Transaction
Quarter == 2 & PMJDY	0.508***	-2,473	-13,295	-0.00626	-23,185	-6,019
	(13.63)	(-0.116)	(-0.644)	(-0.0472)	(-1.116)	(-0.871)
Quarter == 3 & PMJDY	0.433***	23,479**	10,334	0.206*	-12,738	37.40
	(11.16)	(2.234)	(1.449)	(1.775)	(-0.599)	(0.0191)
Quarter == 4 & PMJDY	0.433***	11,343	-1,286	0.146	-17,392	-3,510
	(10.84)	(0.882)	(-0.126)	(1.241)	(-1.044)	(-1.424)
Quarter == 5 & PMJDY	0.498***	16,864	5,255	0.229*	-8,760	-4,062*
	(12.00)	(1.257)	(0.512)	(1.752)	(-0.839)	(-1.700)
Quarter == 6 & PMJDY	0.516***	16,733	3,936	0.300**	-16,082	-2,636
	(11.09)	(1.242)	(0.377)	(2.025)	(-0.999)	(-0.964)
Quarter == 7 & PMJDY	0.528***	17,437	6,297	0.448***	-3,518	-2,833
	(11.04)	(1.422)	(0.611)	(3.734)	(-0.392)	(-1.170)
Observations	34,053	34,053	34,053	34,053	34,053	34,053
R-squared	0.570	0.401	0.414	0.531	0.461	0.405
Controls			Govt Assisted Quarter			
Fixed Effects			Account			
Government assisted A/c (Yes/no)			All			

Table 12: ATM and Branch Transactions

Table 12 reports OLS estimates of regressions in which the dependent variable is the level of activity in a quarter for a bank account. In Panel A, we examine ATM transactions, while in Panel B, we examine deposits and withdrawals at bank branches. The independent variable of interest is a dummy variable for quarter j, $j = 2, \cdots, 7$ that takes the value of 1 for a transaction executed in quarter j and zero otherwise. Each cell in the table is thus estimated from a separate regression and reports the regression coefficient, t-statistic, and # observations. In columns (1)-(3), the sample comprises PMJDY accounts. In column (4)-(6), the sample comprises non-PMJDY accounts. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	PMJDY Acounts			non-PMJDY Accounts		
VARIABLES	Transactions per Account	Value per Account	Value per Transaction	Transactions per Account	Value per Account	Value per Transaction
			Panel A: ATM			
Quarter == 2	0.173***	362***	95***	0.081	43	15
	(8.5935)	(4.633)	(5.4166)	(1.4597)	(0.1847)	(0.4124)
	6,952	6,952	6,952	2,950	2,950	2,950
Quarter == 3	0.101***	317***	87***	-0.006	275	29
	(5.1237)	(4.3077)	(5.0471)	(-0.1125)	(1.096)	(0.8506)
	10,428	10,428	10,428	4,425	4,425	4,425
Quarter == 4	0.131***	166***	40***	0.055	498**	73**
	(4.9255)	(2.764)	(2.6919)	(0.9928)	(1.9623)	(2.2083)
	13,904	13,904	13,904	5,900	5,900	5,900
Quarter == 5	0.083***	252***	53***	0.034	614**	32
	(3.4253)	(3.1759)	(2.862)	(0.5865)	(2.0922)	(0.9509)
	17,322	17,322	17,322	7,318	7,318	7,318
Quarter == 6	0.140***	365***	76***	-0.043	89	-22
	(4.6013)	(4.0981)	(3.9915)	(-0.5952)	(0.2533)	(-0.5823)
	20,718	20,718	20,718	8,647	8,647	8,647
Quarter == 7	0.171***	646***	69***	-0.100	274	25
	(5.3148)	(4.7565)	(3.9385)	(-1.3166)	(0.7419)	(0.6493)
	24,097	24,097	24,097	9,956	9,956	9,956

TABLE 12 (*continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
	PMJDY Acounts			non-PMJDY Accounts		
VARIABLES	Transactions per Account	Value per Account	Value per Transaction	Transactions per Account	Value per Account	Value per Transaction
Panel B: Cash (Deposit & Withdrawal)						
Quarter == 2	-0.096***	596	527***	-0.368***	-1477*	-590
	(-5.1875)	(1.4889)	(3.0856)	(-11.7791)	(-1.6872)	(-1.2965)
	6,952	6,952	6,952	2,950	2,950	2,950
Quarter == 3	-0.027*	345	272*	-0.202***	-722	-325
	(-1.7429)	(1.2065)	(1.7605)	(-8.7276)	(-0.8154)	(-0.9934)
	10,428	10,428	10,428	4,425	4,425	4,425
Quarter == 4	-0.033**	-351*	-220**	-0.072***	-154	177
	(-2.3654)	(-1.9028)	(-2.443)	(-3.2187)	(-0.2382)	(0.5837)
	13,904	13,904	13,904	5,900	5,900	5,900
Quarter == 5	-0.042***	324	182*	-0.116***	2168	1160
	(-3.1515)	(1.5601)	(1.7142)	(-5.7464)	(0.8848)	(0.972)
	17,322	17,322	17,322	7,318	7,318	7,318
Quarter == 6	-0.021	250	164	-0.071***	552	843
	(-1.5862)	(1.209)	(1.5941)	(-3.1776)	(0.6531)	(1.444)
	20,718	20,718	20,718	8,647	8,647	8,647
Quarter == 7	-0.012	744**	485***	-0.036	867	32
	(-0.9041)	(2.4039)	(3.634)	(-1.2957)	(1.3396)	(0.1217)
	24,097	24,097	24,097	9,956	9,956	9,956

Table 13: Account Balances

Table 13 reports OLS estimates of several regressions. The dependent variable in each regression is the natural logarithm of 1 plus the account balance in INR of an account at the end of quarter q. The explanatory variable of interest is a dummy variable that takes the value of 1 for quarter q and zero otherwise. Each cell in the table is thus estimated from a separate regression and reports the regression coefficient, t-statistic, and # observations. In columns (1)-(3), the sample comprises PMJDY accounts. In column (4)-(6), the sample comprises non-PMJDY accounts. We report separate estimates for all accounts, accounts receiving government or agency bulk transfers, and accounts not receiving such transfers. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	PMJDY Acounts			non-PMJDY Accounts		
VARIABLES	All	Govt	No Govt	All	Govt	No Govt
Quarter == 2	0.292***	0.404***	0.198**	0.163***	0.457***	-0.057
	(5.4745)	(5.6402)	(2.5619)	(3.4859)	(6.2535)	(-0.9626)
	2,268	1,214	1,054	2,162	1,022	1,140
Quarter == 3	0.134***	0.316***	-0.035	-0.040	0.041	-0.101*
	(3.1096)	(5.6554)	(-0.5423)	(-0.9672)	(0.6023)	(-1.8812)
	4,343	2,443	1,900	3,229	1,523	1,706
Quarter == 4	0.079**	0.101**	0.056	0.149***	0.281***	0.037
	(2.3013)	(2.3607)	(1.0214)	(3.5313)	(4.294)	(0.6879)
	6,426	3,590	2,836	4,277	2,020	2,257
Quarter == 5	0.091***	0.189***	-0.025	0.030	0.245***	-0.152***
	(2.8542)	(4.8637)	(-0.4812)	(0.7017)	(3.9129)	(-2.613)
	8,480	4,730	3,750	5,302	2,510	2,792
Quarter == 6	0.273***	0.369***	0.152***	0.052	0.173***	-0.062
	(8.9881)	(10.4678)	(2.9155)	(1.1815)	(2.8613)	(-0.9898)
	10,654	6,002	4,652	6,220	2,970	3,250
Quarter == 7	0.307***	0.334***	0.270***	-0.028	-0.006	-0.051
	(10.5038)	(9.7886)	(5.286)	(-0.6663)	(-0.1073)	(-0.7983)
	12,796	7,262	5,534	7,121	3,423	3,698

Table 14: Balances: PMJDY and non-PMJDY Accounts

Table 14 reports OLS estimates of regressions in which the dependent variable is the log of 1 plus the account balance in INR at the end of a quarter j. The independent variable of interest is a dummy variable for quarter j, $j = 2, \cdots, 7$ that takes the value of 1 for a transaction executed in quarter j and zero otherwise, interacted with a dummy variable PMJDY that takes the value of 1 if the account is opened under PMJDY scheme and zero for non-PMJDY accounts. The individual quarter and PMJDY variables are included but their coefficients are not reported. The sample comprises all accounts with active transactions. In columns (1)-(3), we report transactions per account, in columns (4)-(6), the value per account and in columns (7)-(9), the value per transaction per account. ***, **, and * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)
VARIABLES	Log(1+Balance)	Log(1+Balance)	Log(1+Balance)
Quarter == 2 & PMJDY	0.1507**	-0.0499	0.3351***
	(2.2779)	(-0.5582)	(3.3875)
Quarter == 3 & PMJDY	0.3158***	0.2521**	0.3501***
	(4.3302)	(2.4983)	(3.2801)
Quarter == 4 & PMJDY	0.1486*	-0.0524	0.3427***
	(1.9330)	(-0.4965)	(3.0545)
Quarter == 5 & PMJDY	0.2423***	-0.0265	0.4705***
	(3.0062)	(-0.2430)	(3.9575)
Quarter == 6 & PMJDY	0.4223***	0.2489**	0.5521***
	(5.0269)	(2.2343)	(4.3707)
Quarter == 7 & PMJDY	0.5885***	0.4525***	0.6904***
	(6.9883)	(4.0584)	(5.4024)
Observations	21,475	10,830	10,645
R-squared	0.8383	0.7187	0.8703
Controls		Govt Assisted Quarter	
Fixed Effects		Account	
Government assisted A/c	All	Yes	No

Table 15: Poisson Model: All Active Transactions

Table 15 reports estimates of Poisson regressions in which the dependent variable is the number of transactions per account in quarter q. The explanatory variable of interest in columns (1)-(2) is q and the sample comprises PMJDY accounts. In column (3), the sample includes PMJDY and non-PMJDY accounts and the variable of interest is the PMJDY account dummy variable interacted with quarter q. In column (4), we report estimates for PMJDY accounts alone but display the estimates for each quarter. We include account fixed effects and a control for whether there is a government transfer in the current or the previous quarter. ***,**,* represent statistical significance at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)
VARIABLES	Transactions per Account			
Age (in Quarters)	0.0915***	0.0708***	-0.0492***	
	(26.03)	(18.67)	(-12.70)	
Age (in Quarters) x PMJDY			0.118***	
			(22.67)	
Govt Assisted Quarter		0.403***	0.443***	0.400***
		(14.88)	(22.65)	(14.55)
Quarter == 2				0.113***
				(3.788)
Quarter == 3				0.249***
				(8.576)
Quarter == 4				0.270***
				(9.229)
Quarter == 5				0.250***
				(8.467)
Quarter == 6				0.402***
				(13.93)
Quarter == 7				0.477***
				(16.71)
Observations	14,938	14,938	22,309	14,938
Number of account	2,148	2,148	3,232	2,148
Accounts	PMJDY	PMJDY	All	PMJDY

Table 16: Poisson Model: By Transaction Type

Table 16 reports estimates of Poisson regressions. In columns (1)-(4), the dependent variable is the number of deposit transactions per account in quarter q. In columns (5)-(8), the dependent variable is the number of active withdrawals. The explanatory variable of interest in columns (1)-(2) and (5)-(6) is q and the sample comprises PMJDY accounts. In columns (3) and (7), the sample includes PMJDY and non-PMJDY accounts and the variable of interest is the PMJDY account dummy variable interacted with quarter q. In columns (4) and (8), we report estimates for PMJDY accounts alone but display the estimates for each quarter. We include account fixed effects and a control for whether there is a government transfer in the current or the previous quarter. ***,**,* represent statistical significance at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Transactions per Account							
	Active Deposits				Active Withdrawals			
Age (in Quarters)	-0.0641***	-0.0535***	-0.129***		0.178***	0.146***	-0.00853*	
	(-10.80)	(-8.565)	(-18.92)		(39.71)	(30.07)	(-1.793)	
Age (in Quarters) x PMJDY			0.0709***				0.153***	
			(7.924)				(23.46)	
Govt Assisted Quarter		-0.271***	-0.158***	-0.232***		0.597***	0.620***	0.529***
		(-5.168)	(-4.109)	(-4.431)		(17.90)	(26.30)	(15.51)
Quarter == 2				-0.355***				0.787***
				(-8.761)				(16.11)
Quarter == 3				-0.376***				1.034***
				(-9.084)				(21.87)
Quarter == 4				-0.522***				1.134***
				(-11.87)				(24.05)
Quarter == 5				-0.430***				1.068***
				(-9.984)				(22.46)
Quarter == 6				-0.279***				1.230***
				(-6.640)				(26.21)
Quarter == 7				-0.484***				1.399***
				(-10.95)				(30.23)
Observations	13,778	13,778	21,060	13,778	11,341	11,341	16,696	11,341
Number of account	1,982	1,982	3,052	1,982	1,627	1,627	2,406	1,627
Accounts	PMJDY	PMJDY	All	PMJDY	PMJDY	PMJDY	All	PMJDY

Table 17: Zero Inflated Poisson Model

The table reports estimates of a zero-inflated Poisson regression. The dependent variable is the number of transactions per account in a quarter q. In all columns, the instruments for zero inflation are whether an account is opened under PMJDY or not and a dummy variable for whether there is a government transfer in quarter q. In columns (1) and (2), the explanatory variable of interest for explaining the intensive margin, or the level of transactions conditional on non-zero use, is q. In column (3), we include q, a PMJDY dummy, and the interaction of q with PMJDY, which is the key variable of interest. ***,**,* represent statistical significance at 1%, 5% and 10% respectively.

	(1)	(2)	(3)
VARIABLES	Transactions per Account		
Age (in Quarters)	0.0705***	0.0860***	0.0860***
	(27.26)	(31.94)	(23.59)
PMJDY			-0.605***
			(-25.22)
Age (in Quarters) x PMJDY			0.0254***
			(4.917)
Govt Assisted Quarter		-0.252***	-0.234***
		(-18.91)	(-17.51)
Zero Inflation			
PMJDY	0.483***	0.558***	0.478***
	(18.94)	(20.96)	(17.96)
Govt Assisted Quarter		-1.714***	-1.731***
		(-45.64)	(-44.95)
Observations	34,053	34,053	34,053
Accounts		All	

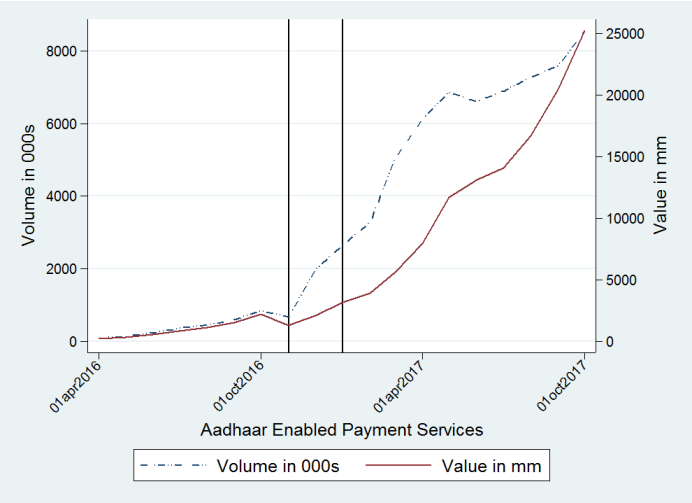

Figure 1: Interbank MicroATM Transactions Around India's Demonetization on 2016:11:08

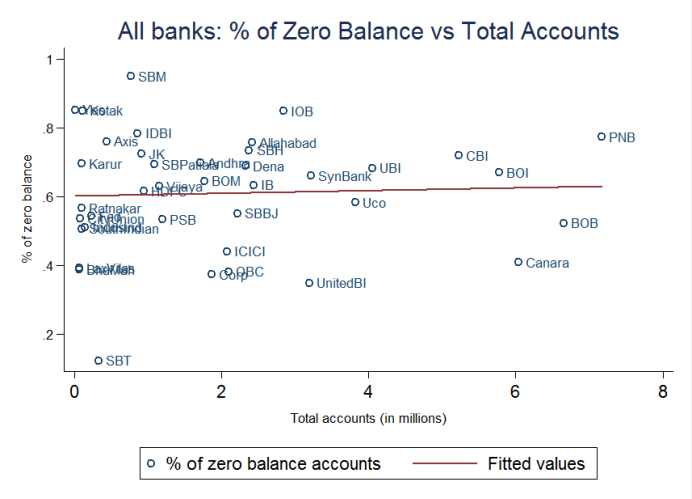

Figure 2: Percentage of zero balance versus total number of accounts opened

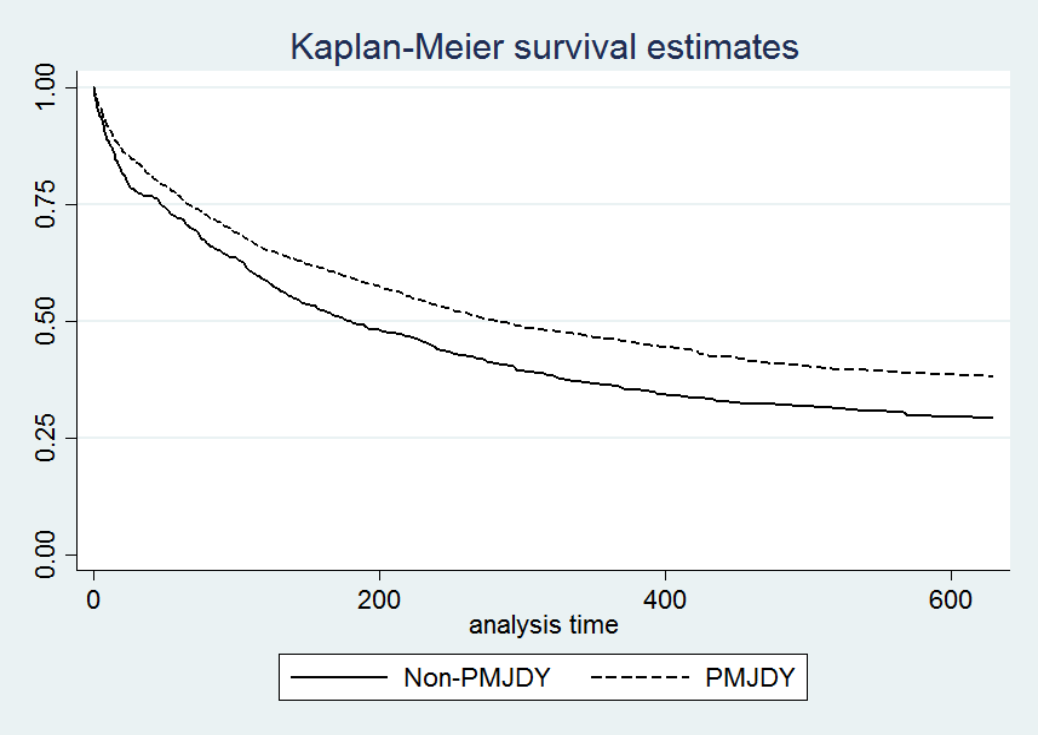

Figure 3: Kaplan Meier Survival Estimates for the hazard of account becoming active

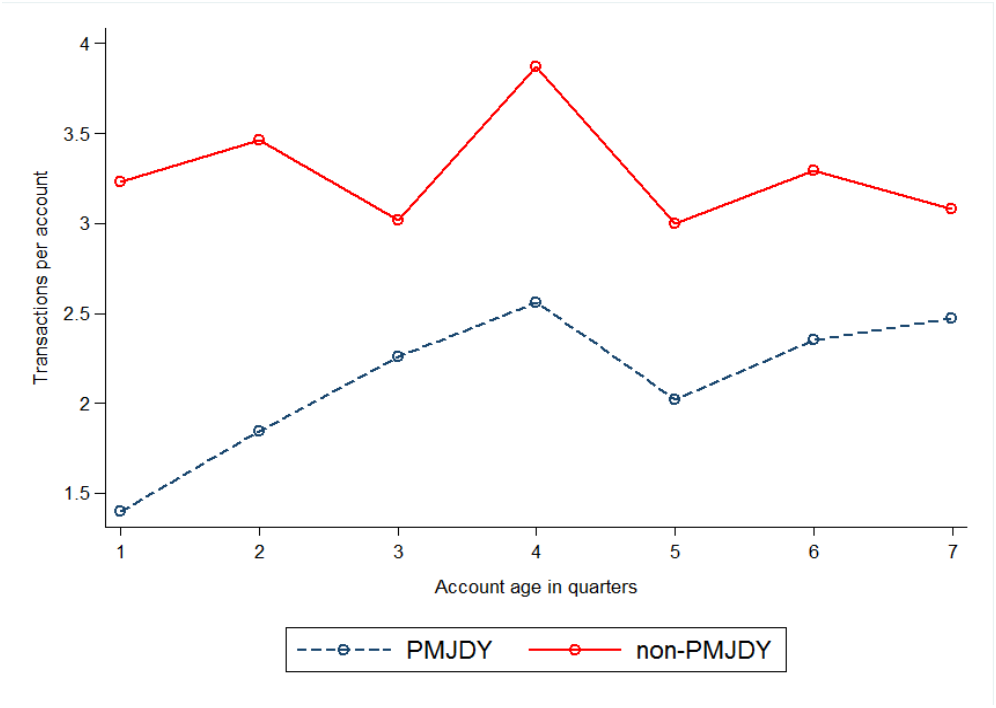

Figure 4: Ratio of total number of transactions to total number of accounts

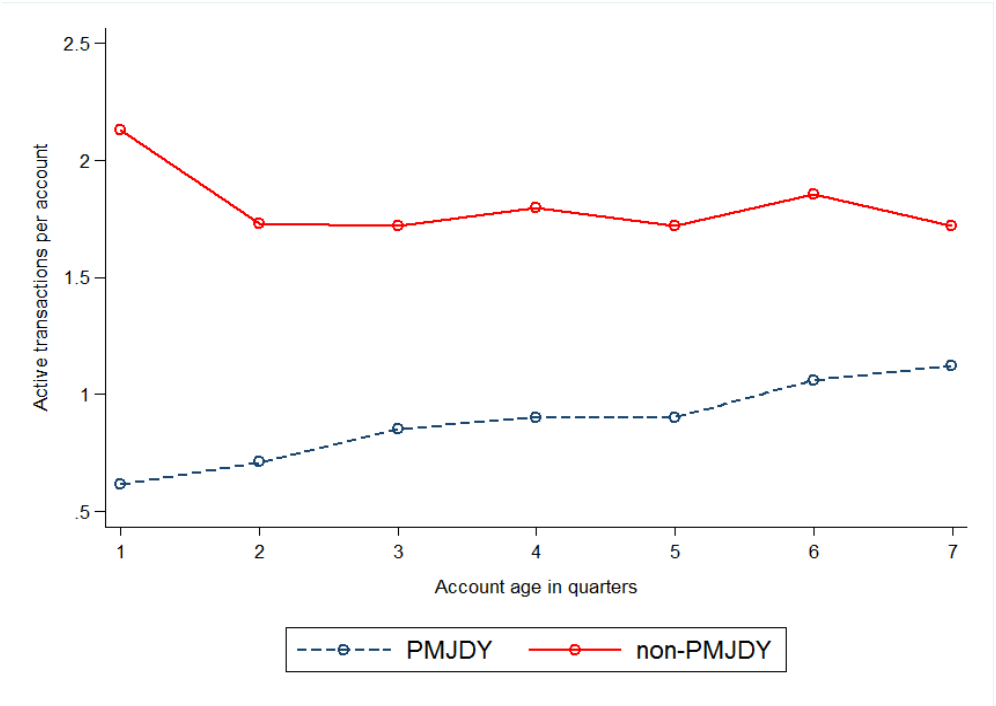

Figure 5: Ratio of total number of active transactions to total number of accounts

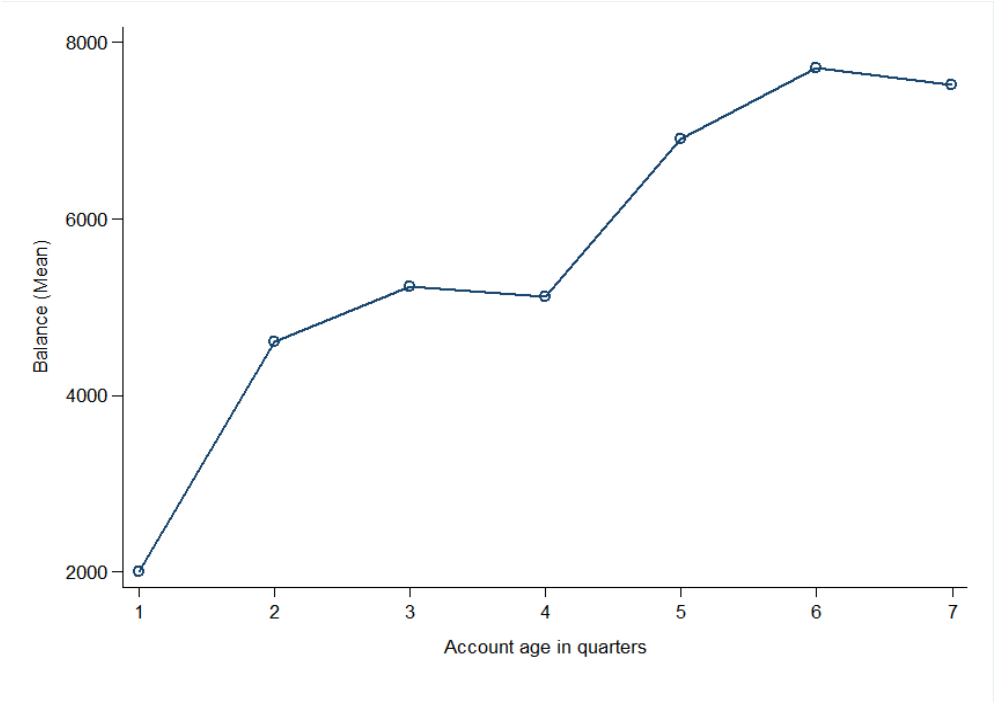

Figure 6: BALANCE: PMJDY

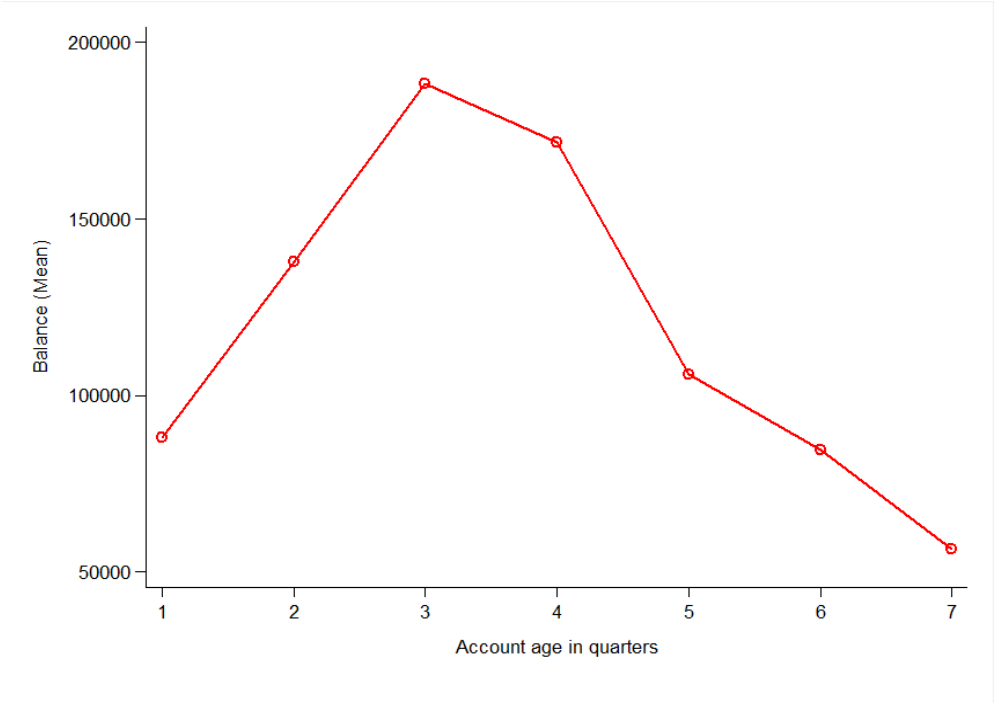

Figure 7: BALANCE: NON-PMJDY