

WHAT DO 250 MILLION NEW BANK ACCOUNTS TEACH US ABOUT FINANCIAL ACCESS?

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Background

- **Big Debate** – Impact of financial Markets on Consumer Welfare
 - Inefficiently Large and Complex in developed Markets => Adverse impact on welfare
 - In developing countries => Significant Push for financial Inclusion
 - Over 60 countries have adopted financial inclusion as a key reform agenda
 - Mentioned in 7 of the 17 new United Nations Sustainable Development Goals
 - G20 Financial Inclusion Action Plan
 - **Key Fact** (As of 2013): Two billion adults around the world lack financial access -> 450 in India

What do We know?

- Large Literature on positive links between Financial Development and Economic Growth
 - King and Levine 1995; Rajan and Zingales 1996; Black and Strahan 2002; and Jayaratne and Strahan 1996)
 - However, primarily focused on real effects for firms
 - Broader measures of financial development
 - Examines firm-level or macroeconomic outcomes
- **Scant evidence on expanding access to consumer finance on individual and broader economy**
 - Some work on expanding access to credit (Microfinance)
 - Less on access to formal banking services and traditional savings products
 - Dupas, Dean, Jonathan and Diego (2016), Chopra, Prabhala and Tantri (2017)
 - **Our paper takes a step in this direction**

What do We do? – Impact of JDY

- ***Impact Evaluation of The Largest Financial Inclusion Program in the world***
 - ***First***, we undertake a detailed micro-level evaluation exercise to assess the impact of the program on both the initial uptake (extensive margin) and subsequent usage (intensive margin) of banking services by the poor
 - ***Second***, we exploit the regional variation in program exposure to evaluate the role of expanding access to financial services on broader macro-economic outcomes such as GDP growth, lending, consumption expenditure, retail commodity prices and house prices
 - ***Third***, we want to shed some light on relative importance of various channels that could drive these effects
 - Availability of Capital vs Demand For Credit

The Pradhan Mantri Jan Dhan Yojna (JDY)

- Launched in India on August 14, 2014, the world's largest financial inclusion program with the aim to provide universal access to banking services
 1. universal access to banking facilities along with financial literacy programs to improve the understanding of financial products for effective use,
 2. provision of basic bank accounts such as zero-balance accounts with RuPay debit card and overdraft facility of INR 5,000 (USD 73) after six months of satisfactory transaction record,
 3. provision of insurance facilities such as accidental insurance cover of INR 1 lakh to all account holders and life insurance cover of INR 30,000 (USD 440) to those who have opened the account by January 26, 2015
 4. provision of mobile banking to conduct simple transactions such as transferring funds and checking balance and
 5. access to micro insurance and pension schemes in the second phase of the program.

The Pradhan Mantri Jan Dhan Yojna (JDY)

- Heated debate among policy makers on long-term impact
 - Limited uptake of similar initiatives in the past (“No-Frills” Account by RBI in 2005)
- As of November 2016, approximately 250 million accounts have been opened under this program attracting total deposits approximately Rs 456,000 million (\$7 billions), substantially expanding access to banking services
- Useful laboratory to study importance of access to basic financial products for the poor
 - Extensive Margin-Initial Uptake
 - Intensive Margin – Subsequent usage of banking services that includes a savings account, overdraft facilities, insurance benefits, debit card and mobile banking

Related Literature

➤ **Financial Inclusion**

- Theory: Aghion and Bolton (1997), Banerjee and Newman (1993)
- Empirical: Dupas et al (2016), Chopra et al (2017)

➤ **Financial Development and Growth**

- King and Levine 1995; Rajan and Zingales 1996; Black and Strahan 2002; and Jayaratne and Strahan 1996)

➤ **Impact Evaluation of large-scale programs on consumer credit on Mortgage**

- Mayer et al. 2014, Agarwal et al. 2015a, 2015b, 2016
- Johnson et al. 2006, Mian and Sufi 2010

Novel Contributions

➤ **Financial Inclusion**

- Extant literature uses survey instruments to measure access, usage and household outcomes (Johnson, Parker & Souleles-2006)
- This paper directly measures usage of banking services
- Extant literature has scant micro-level evidence on the usage of banking services by poor
 - Dupas (2016) – an RCT of 6000 accounts
- Our study provides evidence of poor households becoming more familiar with banking services over time and hence increased usage
- Consistent with learning => Real effects may manifest in the long-term

➤ **Financial Development and Growth**

- micro-level individual outcomes
- Broader regional impact on lending, GDP, consumption and investments

What do we find?

➤ Extensive Margin

➤ Huge Uptake

- 255 million new bank account openings in India (as of November 2016).
- About 77% of the new accounts maintain a positive balance and usage increases over time with inward and outward remittances being the most common transaction performed by the individuals.

➤ Intensive Margin

➤ SAD: Average usage is infrequent

- Happy: the usage patterns under the program gradually converge over time to those of similar households who had prior access to formal banking products.

➤ Consistent with learning

➤ Regional Outcomes

- increase in lending and defaults on new loans in regions with low ex-ante access to banking services.

➤ Consistent with meeting unmet demand for credit

- No effect on GDP and Inflation

Data

- **Proprietary Data from one of the largest Banks**
 1. **1.5 million JDY accounts** opened between August 2014 and May 2015
 2. **50 thousand non-JDY accounts** opened during the same sample period.
 3. **1 million pre-JDY accounts** opened between Jan 2014 to July 2014
- **Precise account level monthly information** on the average monthly balance; cash deposit transactions, cash withdrawal transactions, remittances and access to debit cards among other things.
- The data also contains a **rich set of demographics** about each individual, including age, gender, marital status, mobile ownership, education, occupation and district of residence

Data...

- All our data is aggregate at the account-month level. For instance, Cash Deposit Amount (Cash Withdrawal amount) is computed by summing over all deposit (Withdrawal) transactions by an individual in a month. Likewise, we aggregate over all monthly inward and outward remittance transaction for each account.
- Average monthly balance is the average of daily account balance in a month
- Supplement this dataset with district level data on GDP from Indicus Analytics, literacy rate and population from the latest Census of India (2011), aggregate district level lending data from the Reserve Bank of India (RBI), consumer price indices from the Ministry of Statistics and House price index from the National Housing Bank of India

Summary Statistics

Panel A: Pre Jan-Dhan Yojana Statistics

	(1)	(2)
	USD	INR
Minimum wage in Currency/day	1.3	89
Average wage in Currency/day data	3.7	256.52
Poverty Line (Avg monthly per capita expenditure) - Rural	12	816
Poverty Line (Avg monthly per capita expenditure) - Urban	15	1000
Balance of payments in Billions	15	1,000
Aggregate household deposits in the Indian Banking sector in Billions	110	7,500
Overall Banking assets In Trillion	1.7	115
India GDP per capita	1,431	97,500

Panel B: Jan-Dhan Yojana Progress Statistics

Number of accounts opened under JDY in Millions	255
Number of Debit Cards issues in Millions	190
Number of Individuals Provided Accident Insurance in Millions	93
Number of Individuals Provided Health Insurance in Millions	29
Total Deposits in JDY Accounts in INR (Millions)	456,000

Summary Statistics...

	Panel A: Cash Amounts								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	JDY Accounts			Non-JDY Accounts			Pre-JDY Accounts		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Average Monthly Balance	6656783	482	4913	216937	2729	13717	13239990	715	3832
Cash Deposit Amount	6656783	136	2049	216937	1707	13448	13239990	164	2145
Cash Withdrawal Amount	6656783	141	2591	216937	4666	24373	13239990	233	2828
Inward Remittance Amount	6656783	258	4046	216937	4413	32234	13239990	443	3939
Outward Remittance Amount	6656783	145	3862	216937	1320	23999	13239990	325	3138

	Panel B: Usage Dummy								
	JDY Accounts			Non-JDY Accounts			Pre-JDY Accounts		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
	Positive Balance Dummy	6656783	0.36	0.48	216937	0.94	0.24	13239990	0.47
Cash Deposit Dummy	6656783	0.04	0.2	216937	0.15	0.36	13239990	0.02	0.15
Cash Withdrawal Dummy	6656783	0.03	0.17	216937	0.38	0.49	13239990	0.04	0.19
Inward Remittance Dummy	6656783	0.12	0.33	216937	0.31	0.46	13239990	0.11	0.31
Inward Remittance Dummy	6656783	0.12	0.33	216937	0.31	0.46	13239990	0.07	0.26
Overall Usage Dummy	6656783	0.18	0.39	216937	0.6	0.49	13239990	0.07	0.26

Empirical Methodology

- Our first objective in this study is to provide micro-level evidence on the usage patterns of the bank accounts by the poor. **However, what counterfactual?**
- Moreover, given our experimental setup, we have banking transactions data for the treatment sample only after they are treated (account is opened)
- To circumvent this issue, we use a database of Non-JDY accounts opened since the commencement of the JDY program as our control sample
- Specifically, in these baseline tests, we focus on the periods up to 10 months after the commencement of Jan Dhan Yojna (JDY) (August (2014) to May (2015))
- Essentially, our test relies on comparing over time savings and usage patterns of our treatment sample relative to the control group

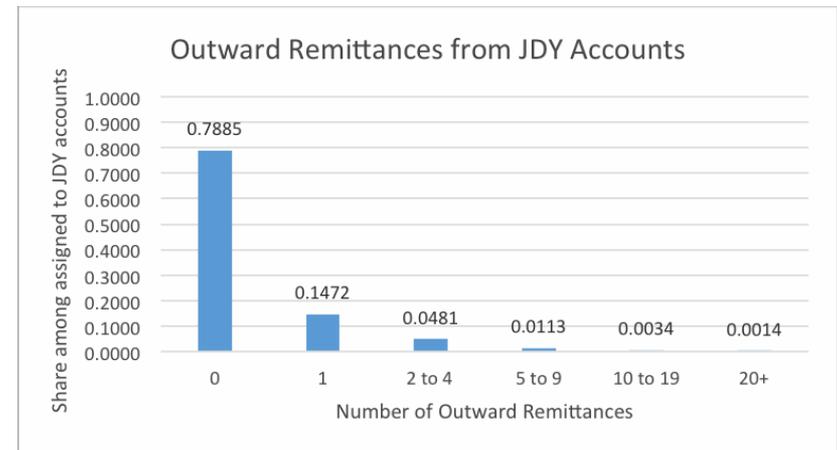
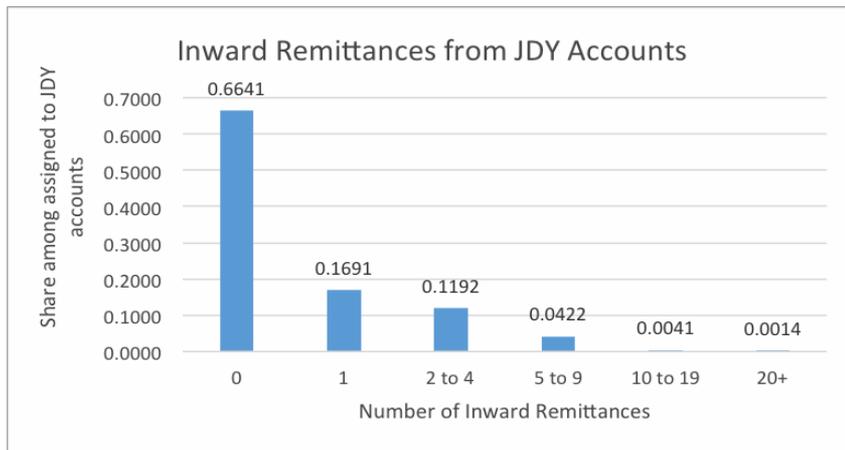
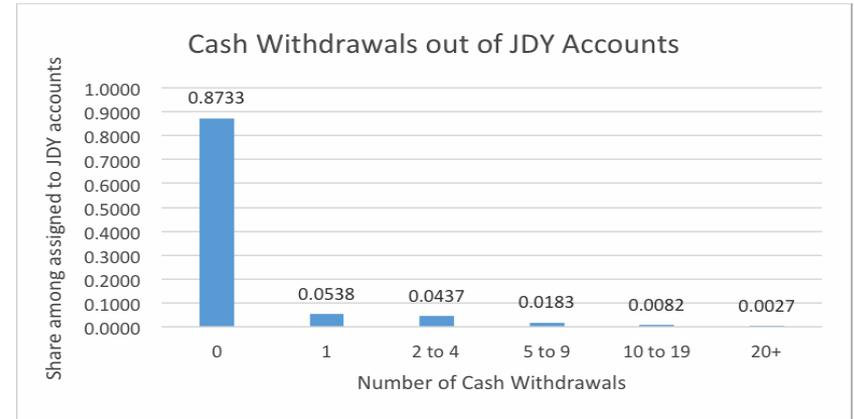
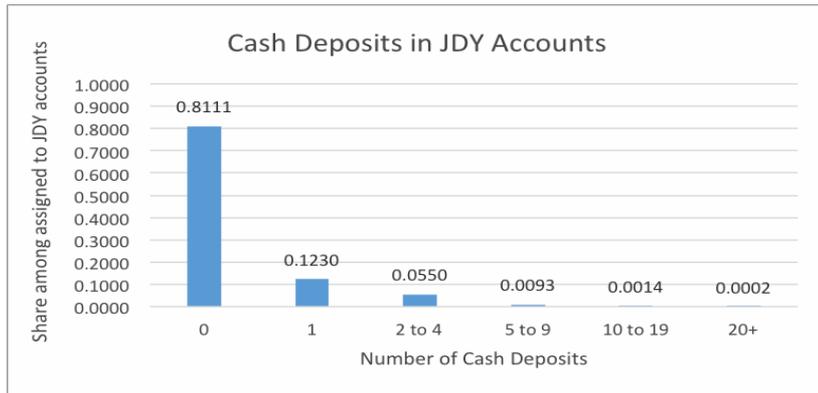
Empirical Methodology...

- We use the following regression specification to examine the usage patterns of JDY account holders:
 - $Y_{it} = \beta_0 + \beta_1 JDY_{it} + \beta_2 Age_{it} + \beta_3 JDY_{it} \times Age + X_{i,t} + \text{Account Opening Month}_t + \varepsilon_{it}$
- where the dependent variable, **Y_{it}** , is a **bank account related outcome variable** for individual i at time t (year-month). **JDY** is a **dummy variable** that identifies accounts opened under the JDY program.
 - β_1 captures the baseline time- invariant difference between JDY and non-JDY individuals.
- **Age is the number of months since account opening.**
 - β_2 captures the differences in account usage over time.
- **Coefficient of interest is β_3** , which captures the monthly change in outcome variables for the treatment group relative to the control group.
- **X_{it} is a vector of control variables** that includes account holder's age, sex, marital status and per capita GDP in the region. We also include account opening month fixed effects to control for potential seasonality

Program Reach (Extensive Margin)

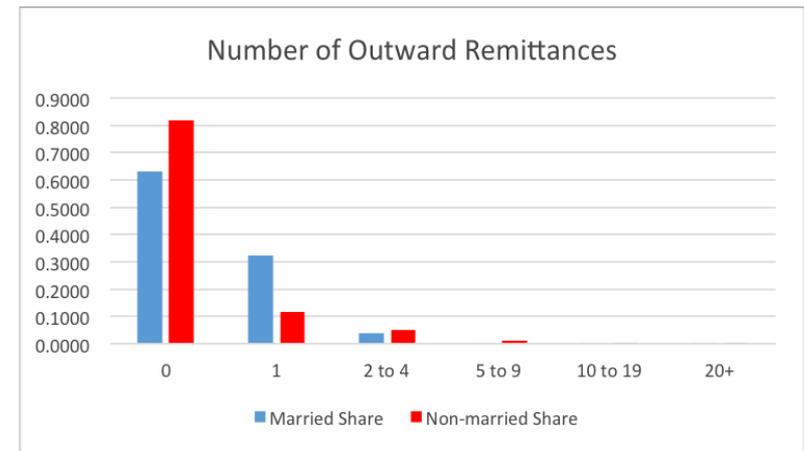
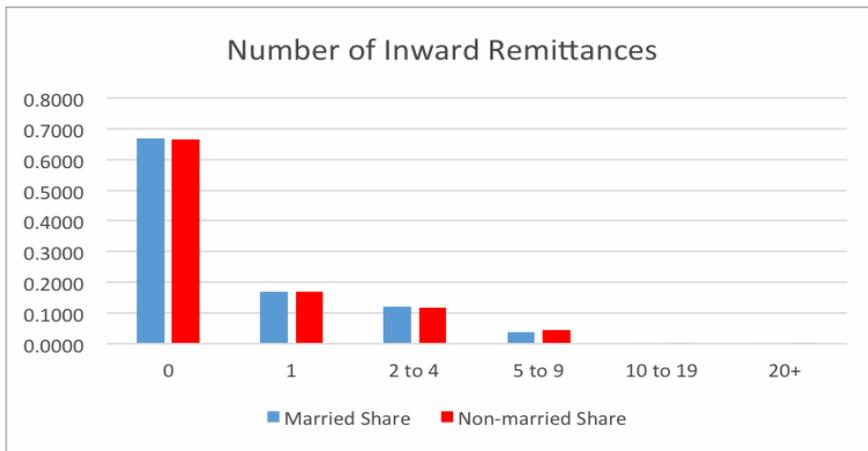
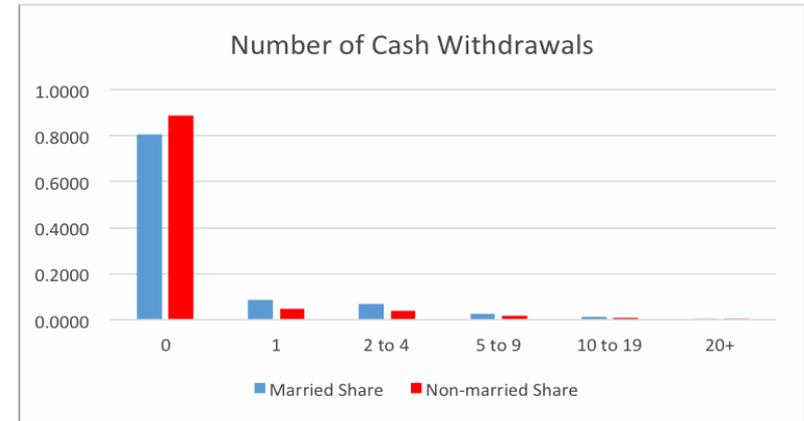
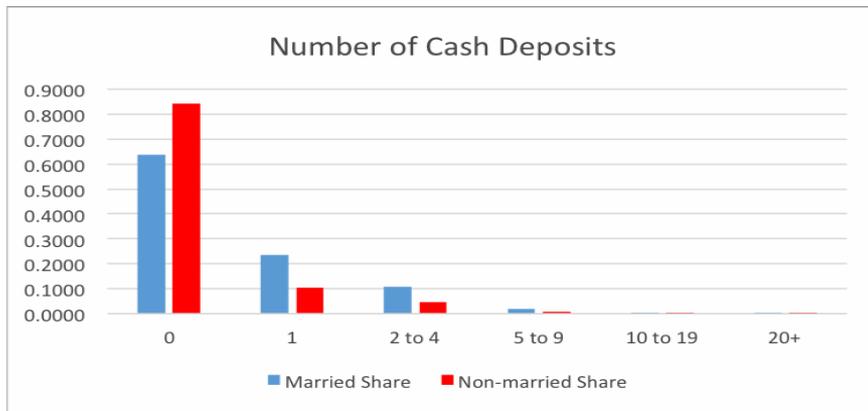
- Total no of accounts expanding at a monthly rate of 14%
 - 54 million (september 2014) to 255 millions (November 2016)
- Total no of debit cards expanding at a monthly rate of 35%
 - 19 million to 190 millions
- Fraction of accounts with positive balance have been growing over time
 - Highest for rural banks followed by state-owned banks and private banks
 - In our data on average 36% maintain some balance
 - This is higher (44%) for older (10 months) accounts – Comparably to national average for JDY at that time
 - Since then this fraction has gone upto 77%

Program Reach (Intensive Margin)



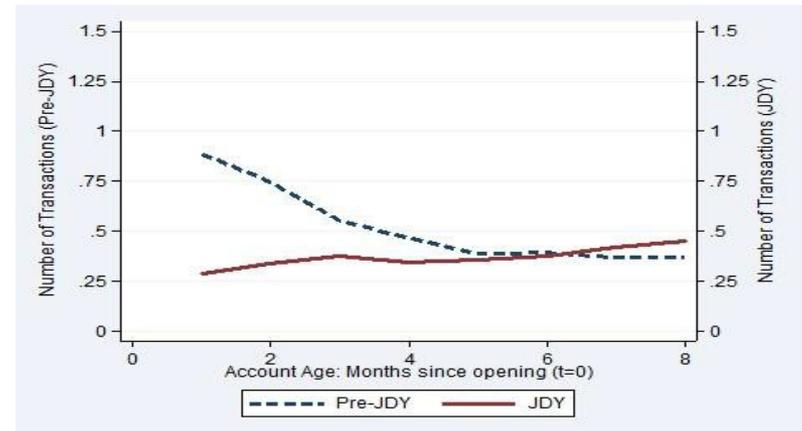
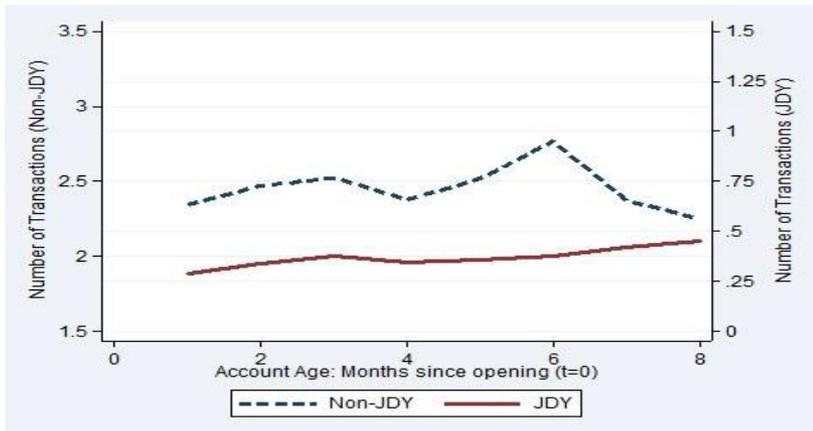
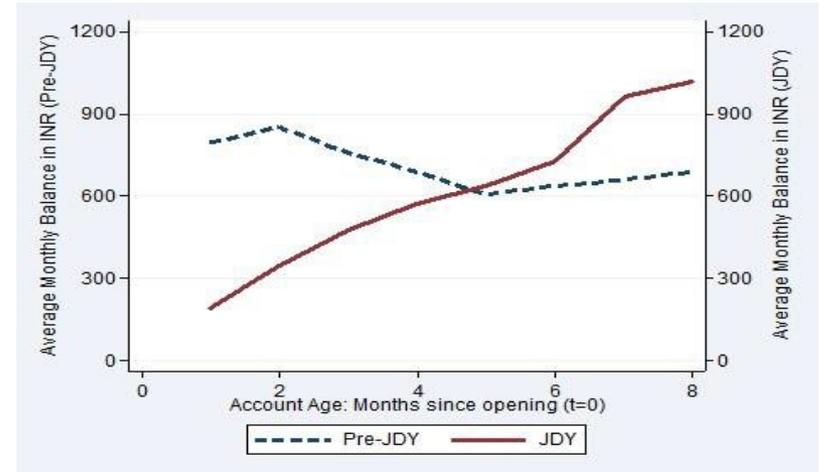
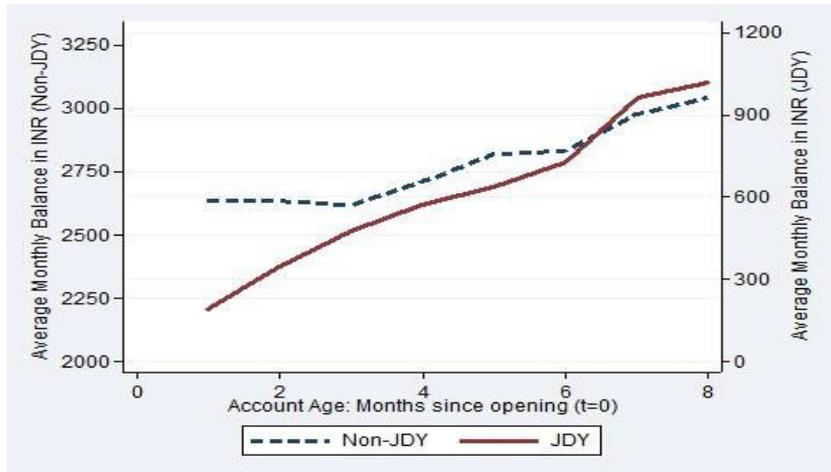
- Remittances are important for low-income individuals in India
- Workers migrate to other states

Program Reach (Intensive Margin-Heterogeneity)



- Frequency higher for married individuals
- Suggests heterogeneity in impact of financial inclusion

Account Usage increases over time



➤ Usage initially infrequent but gradually converge with time to those of similar

JDY Account Level Analysis (Account Balance)

$$Balance_{it} = \beta_0 + \beta_1 JDY_{it} + \beta_2 Age_{it} + \beta_3 JDY \times Age + X_{i,t} + Account\ Opening\ Date_{it} + \varepsilon_{it}$$

	Average Monthly Balance	Positive Balance Dummy	Positive Usage Dummy
	(1)	(2)	(3)
JDY	-2370.967*** (91.073)	-0.724*** (0.002)	-0.441*** (0.002)
Age of Account	46.776** (18.858)	0.005*** 0.000	-0.008*** (0.001)
Age of Account X JDY	57.791*** (18.773)	0.044*** 0.000	0.011*** (0.001)
N	6698136	6698136	6698136
R ²	0.007	0.079	0.046

- Relative to non-JDY sample, average monthly balance increases by **INR 58**
 - **12% monthly increase** in account balance
- **4% monthly growth** in fraction of **accounts maintaining positive balance**

Cash Deposits and Withdrawals

	Cash Deposit Amount	# Cash Deposit Transactions	Cash Deposit Dummy	Cash Withdrawal Amount	# Cash Withdrawal Transactions	Cash Withdrawal Dummy
	(1)	(2)	(3)	(4)	(5)	(6)
JDY	-1667.757*** (72.667)	-0.186*** (0.004)	-0.115*** (0.002)	-4819.868*** (135.149)	-1.214*** (0.015)	-0.375*** (0.003)
Age of Account	-32.856** (14.295)	-0.013*** (0.001)	-0.010*** 0.000	-77.230*** (29.457)	-0.005* (0.003)	-0.005*** (0.001)
Age of Account X JDY	38.371*** (14.411)	0.008*** (0.001)	0.005*** 0.000	103.159*** (29.452)	0.018*** (0.003)	0.012*** (0.001)
N	6698136	6698136	6698136	6698136	6698136	6698136
R ²	0.008	0.016	0.015	0.025	0.097	0.109

Regional Analysis

- We explore the impact of the JDY program on regional outcome variables such as bank lending, GDP growth, consumer expenditure, investment and inflation
- **The goal** from this exercise is to inform on the **effect of** large-scale financial inclusion programs such as **JDY**, on **broader set of economic outcomes**
- **The challenge** in using JDY as an experiment to infer its effect on the larger economy is that the effect may be **confounded by other contemporaneous macroeconomic policy changes** or time trends
- We circumvent this challenge by **exploiting regional heterogeneity in the level of financial inclusion just prior to the program**

Regional Analysis...

- We construct four ex-ante measures that capture different dimensions of financial inclusion
 1. Our first main measure is a proxy for bank-branch penetration and captures the **average number of adults serviced by one bank branch in an area** (Adults per Unit Bank Branch)
 2. Our second measure is **%age of state owned branches**
 3. Our third measure is the the fraction of households without bank accounts
 4. We also use a comprehensive district level measure of financial inclusion annually released by CRISIL which combines three critical parameters of basic financial services: branch penetration, deposit penetration, and credit penetration into one single metric in the form of an index
- **Higher value for all indicates lower degree of financial inclusion**

Regional Analysis...

- $y_i = \beta_0 + \beta_1 \text{ Exposure Measure} + \epsilon_i$
- Y_i is the **change in growth rate (Post-JDY minus Pre-JDY)** in outcome variables
- B_1 -> difference-in-differences treatment effects
 - Compares the change in outcome in areas with greater exposure to JDY relative to areas with less exposure

JDY Exposure and Program Intensity

$$y_i = \beta_0 + \beta_1 \text{ Exposure Measure} + \varepsilon_i$$

Panel A: Log(# of JDY Accounts)				
	(1)	(2)	(3)	(4)
Adults Per unit Bank Branch	0.573*** (0.098)			
% State-Owned Branches		0.357** (0.137)		
% Households Without Bank Accounts			0.410*** (0.122)	
Financial Inclusion Index				0.512*** (0.107)
N	32	32	32	32
R ²	0.929	0.874	0.888	0.913

- One standard deviation in adults per branch (50% increase relative to average) is associated with 57% absolute increase in number of accounts opened in a state

JDY Exposure and Program Intensity

Panel B: Log(Total JDY Deposits)				
	(1)	(2)	(3)	(4)
Adults Per unit Bank Branch	0.390*** (0.109)			
% State-Owned Branches		0.224** (0.131)		
% Households Without Bank Accounts			0.140*** (0.127)	
Financial Inclusion Index				0.315*** (0.115)
N	32	32	32	32
R ²	0.898	0.866	0.859	0.883

JDY & Bank Lending (Aggregate RBI DATA)

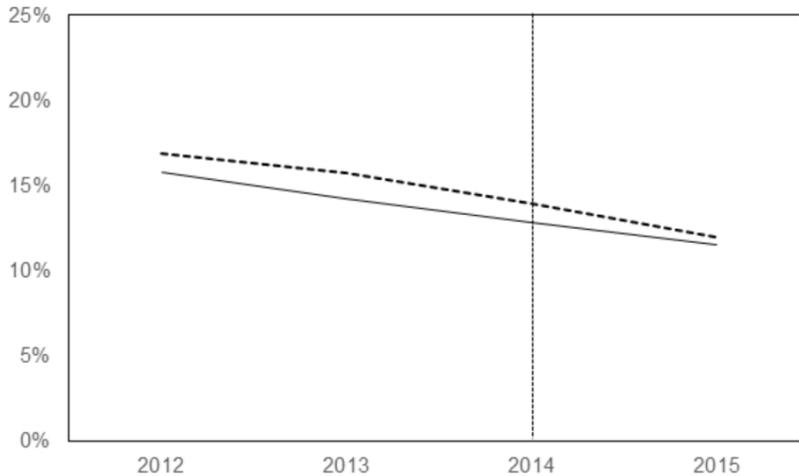
$$y_i = \beta_0 + \beta_1 \text{ Exposure Measure} + \varepsilon_i$$

	(1)	(2)	(3)	(4)
Adults Per unit Bank Branch	0.023*** (0.0045)			
% State-Owned Branches		0.026*** (0.0045)		
% Households Without Bank Accounts			0.011* (0.0046)	
Financial Inclusion Index				0.018*** (0.0045)
N	600	600	600	600
R ²	0.043	0.055	0.011	0.026

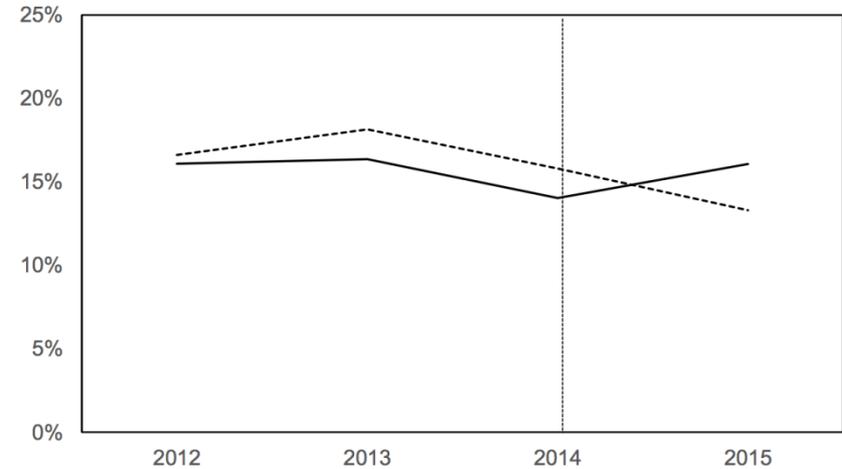
JDY & Bank Lending (Our DATA)

Panel A: Monthly Growth in Total Loan Amount				
	(1)	(2)	(3)	(4)
Adults Per unit Bank Branch	0.055*** (0.011)			
%age State-Owned Branches		0.032*** (0.011)		
%age Households Without Bank Accounts			0.031*** (0.011)	
Financial Inclusion Index				0.041*** (0.011)
N	600	600	600	600
R2	0.039	0.013	0.012	0.022

JDY & Bank Lending



(a) Deposit Growth Rate



(b) Lending Growth Rate

- The figure shows the bank deposit growth rates and bank lending growth rates in the more and less JDY exposed regions (based on the % of Households without Bank Accounts). **The more exposed group is represented by the solid line, and the less exposed group is represented by the dashed line**

Economic Significance and Interpretation

1. Capital Constraints: Banks now have additional capital through new deposits => Increased lending
 - Unlikely, The **INR 460,000 million deposited in these accounts represent a small fraction (0.06%) of the pre-JDY deposits** in the Indian banks
2. Demand Constraint: Unmet demand for credit
 - Pre-JDY => information asymmetry on demand and quality of consumers
 - Post-JDY => New set of customers in the banking system
 - **Our findings suggest that JDY may have allowed banks to meet the unmet demand for credit for some households that did not have prior access to formal banking products.**

JDY and Defaults

Panel A: Default Rate – 60-day delinquency

	(1)	(2)	(3)	(4)
Adults Per unit Bank Branch	0.004*** (0.001)			
%age State-Owned Branches		0.001 (0.001)		
%age Households Without Bank Accounts			0.004*** (0.001)	
Financial Inclusion Index				0.002* (0.001)
N	439	439	439	438
R2	0.030	0.003	0.026	0.006

Other Regional Outcomes

- No effect on
 1. GDP
 2. Some evidence on increase in debit card expenditure
 3. No effect on Inflation
 4. Positive albeit statistically insignificant correlation with investments

Contribution To Literature

- Unlike the prior literature, which relies on field experiments and financial inclusion interventions with limited breadth and scope, we study the largest financial inclusion program in the world that catered to over 250 million account holders. This allows us to document the implications of the program at the micro and macro level
- We rely on administrative data, which has no measurement error allowing us to precisely measure the effects of the program
- The panel nature of our data allows us to study the dynamics of household behavior in response to such programs.
- Apart from being able to document regional externalities of such programs, we can shed light on the mechanisms through which the effects of such programs manifest capital constraints vs. demand constraints channel

Concluding Remarks

- Our micro level analysis shows that though there is a large uptick in population that is banked, the **intensive margin changes were very small**. The INR 460,000 million deposited in these accounts represent a small fraction (0.06%) of the pre-JDY deposits in the Indian banks
- Examining account level data, we find that the overall usage in terms of frequency of banking transactions remains small.
 - The most common use of the bank accounts is for remittance transactions.
 - Married individuals are the heaviest user of these accounts. This suggests that **the direct benefits of the program in the short run will accrue primarily to married customers**
- With regards to time-series dynamics of usage patterns, we find evidence of learning behavior and increasing familiarity with banking services as the use of banking services by the poor grows over time.
 - This suggests that the direct benefits of the programs to the consumers are small in the short run.
 - However, real impact of these services would manifest over the long-term as more individuals gradually start using these services

Concluding Remarks

- At the **regional level** we find an increase in risky lending by banks, an increase in consumption expenditure, and a jump in both new investments and revival of previously stalled investments in regions with greater ex-ante exposure to JDY.
- Our paper has implications for the growing body of work in financial inclusion and for policy makers. 40% of the world's population is still unbanked and governments around the world have been thinking of implementing such programs (Indonesia, Malaysia, Philippines, Brazil etc.). Based on our results, the policy makers in these countries should anticipate that the micro level benefits will accrue with a delay. However, such programs may incur substantial benefits even in the short run by relaxing the demand constraints