Muted Ripples: Exploring the Effect of India's Demonetisation on Household Sentiments

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Abstract

On November 8, 2016, the Indian Government demonetised 86% of its currency in circulation, causing major disruptions to the country's largely cash-reliant population. However, the adverse effects of this macroeconomic shock on various economic indicators were not reflected in the subsequent electoral performance of the ruling party. Thus, in this paper, we examine whether demonetisation differentially affected the consumer sentiments of households in less financially included districts, as they are likely to be more cash-reliant. Using a difference-in-differences strategy within a linear probability model, we find that relative to households in the highest quintile, households in lower quintiles of financial inclusion were only marginally less likely to report worse personal finances and marginally more likely to report that they expect good economic conditions in the country following demonetisation. This suggests that Indian households did not significantly alter their sentiments regarding personal and national financial conditions in response to demonetisation.

Keywords: Indian Demonetisation, Consumer Sentiments, BJP Electoral Performance, Financial Inclusion Quintiles, Difference-in-Differences, Retrospective Voter Theory, CMIE, CRISIL

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1 Introduction

At the heart of the belief in a government "by the people" is the theory of retrospective voting - the idea that voters will hold incumbents accountable for policies directly attributable to them in subsequent elections (Key, 1966). However, in recent decades, violations of this theory have brought into question the (in)ability of the electorate to respond to adverse economic policies introduced by their government (Achen & Bartels, 2017) (Healy & Malhotra, 2009). In this paper, we explore why poor policy decisions may not always subsequently translate into the poor political performance of the ruling party in the context of the Indian government's demonetisation exercise in 2016.

Since it first came to power in 2014, the Bharatiya Janata Party's (BJP) tenure as India's ruling political party has been characterised by various shifts in the nation's economic policy. One such major macroeconomic reform was the Indian Prime Minister's televised announcement of demonstration on 8 November 2016, which made 86% of the country's currency in circulation redundant overnight. As the banking system struggled to adapt to the resulting cash shortage, the sudden withdrawal of India's two highest-denomination banknotes significantly disrupted the lives of its overwhelmingly cash-reliant population (Trachevski et al., 2019).

In its immediate aftermath, districts and households that were more exposed to this cash shortage experienced significant (albeit transitionary) declines in economic activity (Chodorow-Reich et al., 2020), income and expenditure (Karmaker & Narayanan, 2020). Despite these costs, the policy largely failed to achieve its stated goals of seizing undeclared and illegal wealth, increasing the tax base and digitising the financial system (Lahiri, 2020). As a result, the introduction of demonetisation has been widely regarded as an ill-advised move (Banerjee & Kala, 2017) (Tharoor, 2017).

Surprisingly, these opinions were not reflected in the performance of the BJP in subsequent elections. In fact, it claimed landslide victories in the Uttar Pradesh state election in 2017 (India Today, 2017) and the all-India general election in 2019 (Safi, 2019). Recent studies investigating this puzzle have found contradictory results. On one hand, (Khanna & Mukherjee, 2023) found that while voters in under-banked districts (who faced more severe cash shortages) had less favourable views of demonetisation and were less likely to vote for the BJP, those located in the party's historical strongholds were unresponsive in their voting behaviour. On the other hand, (Bhavnani & Copelovitch, 2020) found that voters in underbanked districts were less likely to punish the BJP in elections post-demonetisation, even while voters in districts with more bank branches reduced their support for the party. They also reject several explanations for this voting behaviour such as variation in media coverage, corruption and BJP's promises of agricultural debt relief. While previous work provides potential explanations for such violations of the retrospective voting theory in other contexts (Achen & Bartels, 2017) (Healy & Malhotra, 2009), the exact reasons why the difficulties faced by Indian voters in the hardest-hit regions post-demonetisation did not translate into negative electoral consequences remain a mystery.

A plausible explanation for this lack of electoral backlash could be found by examining the effect of demonetisation on the sentiments of Indian households regarding their personal finances and the economic conditions in the country, which has not been previously explored. Although all households were simultaneously exposed to demonetisation, it is possible to study the differential effects of this macroeconomic shock on the sentiments of households that were more exposed to its worst consequences, relative to those less exposed. One way to define each household's intensity of exposure is through the level of financial inclusion in their districts. Since less financially included districts were more cash-strapped in the months following demonetisation (Khanna & Mukherjee, 2023), the sentiments of households in these districts are more likely to have been adversely affected. However, if households perceived demonetisation to be a temporary shock, their sentiments may not have shifted or may have become optimistic (exhibiting mean reversion) (Cocco et al., 2020).

Thus, in this paper, we investigate the heterogeneous effects of the November 2016 demonetisation event on the sentiments of Indian households living in districts across five quintiles of financial inclusion. Since more than 99% of the demonetised currency was returned to the banking system by 30 June 2017 (Unnikrishnan, 2023), we explore the short-run impacts of demonetisation from September 2015 to June 2017. We measure changes in the perceptions of households using five consumer sentiment questions from the Aspirational India dataset developed by the Centre for Monitoring the Indian Economy (CMIE). To measure the intensity of exposure of households in this dataset, we create quintiles based on the district-level financial inclusion scores for the financial year preceding demonetisation, provided by Volume IV of CRISIL's Inclusix report (CRISIL, 2018). With this data, we employ a difference-in-differences strategy within a linear probability model to compare the effect of demonetisation on the within-household probability of reporting each response to the five consumer sentiment questions among households residing in districts belonging to lower quintiles of financial inclusion, relative to those in the highest (fifth) quintile.

We find that demonetisation only resulted in small, marginally significant changes in the sentiments of households in the least financially included districts, relative to those in the most financially included districts. Households in lower quintiles of financial inclusion were slightly less likely to report 'Worse' personal finances and slightly more likely to report that they expected 'Good' economic conditions in the country post-demonetisation, relative to households in the highest quintile. However, these effects only arise a few months after demonetisation. In the months immediately following its implementation, we find no significant effects across all four lower quintiles of financial inclusion. This occurs despite placing higher weights on the rural households in each district, as they are likely to have been worst affected by demonetisation. Overall, these results suggest that household perceptions did not shift significantly in response to demonetisation, even among households in the least financially included regions of the country.

These results suggest that demonetisation was a temporary disruption that, despite the costs it imposed on the economy as a whole, did not persist in the sentiments of Indian households. This supports the hypothesis that household sentiments exhibit mean-reversion in the aftermath of a negative earnings shock, instead of expecting further deterioration (Cocco et al., 2020). This may explain the lack of political backlash faced by the ruling party in subsequent elections and highlights the need for more political accountability that encourages voters to internalise the costs of such failed policies.

We begin by discussing the literature on India's demonetisation policy and the role played by consumer sentiments in Section 2. we describe the data used for this analysis in Section 3 and the empirical strategy employed in Section 4. Finally, we present our findings in Section 5 and conclude in Section 6 by discussing their implications.

2 Background and Literature

2.1 Context and Consequences of India's Demonetisation Shock

One winter morning in 2016, Indian citizens awoke to the news that nearly 86% of the country's cash in circulation had become worthless overnight. The previous evening, on the 8th of November, the Prime Minister had announced that the country's existing 500- and 1000-rupee notes would be made invalid by midnight, to be exchanged for newly issued 500- and 2000-rupee notes (Trachevski et al., 2019). Although the policy was introduced as a tool to tackle corruption, the sudden demonetisation of India's two highest-denomination banknotes caused nationwide disruptions.

The unexpected dip in the supply of banknotes combined with the slow rollout of their replacements caused a temporary cash squeeze that harmed some more than others. Districts that were hard hit due to a sharp fall in their currency supply experienced significant reductions in employment and output relative to less-exposed districts, highlighting the role played by cash in facilitating economic activity in India (Chodorow-Reich et al., 2020). This disparity in exposure to the adverse consequences of demonetisation persisted even at the household level. Households without bank accounts experienced declines in their income and expenditure in the immediate aftermath of the policy, relative to those with bank accounts (Karmaker & Narayanan, 2020). As a result, rural and informal sector households that were more cash-reliant bore the brunt of this policy's immediate adverse consequences.

However, evidence also suggests that these effects were mostly transient. The fall in district-level output and employment dissipated within two quarters (Chodorow-Reich et al., 2020), while household income and expenditure recovered by April 2017 (Karmaker & Narayanan, 2020). In fact, (Chanda & Cook, 2022) find that despite an initial decline from November to December 2016, poorer regions and households saw greater improvements in economic outcomes compared to richer regions and households in the 18 months following demonetisation. Regardless, (Bajaj & Damodaran, 2022) estimated that the welfare cost incurred by the Indian economy in the policy's immediate aftermath was equivalent to that of 21.9% inflation.

To make matters worse, the existing literature on demonetisation has concluded that it failed to achieve its main objectives. The government had claimed that the primary goals of demonetisation were to tackle corruption by eradicating undeclared wealth and eliminating counterfeit currency, accelerate the digitisation of the economy and broaden the tax base (Venkataramakrishnan, 2019). In his review of the evidence on demonetisation, (Lahiri, 2020) finds that the policy failed to seize undeclared wealth since almost all of the demonetised currency was returned to the central bank. Additionally, demonetisation had no significant impact on increasing the tax base relative to past trends, although recent research suggests that it increased tax compliance (Das et al., 2023). He finds a small positive effect on the digitisation of the economy, but this was limited to areas most equipped for this transition (Aggarwal et al., 2023).

Given demonetisation's limited success and its widespread, albeit transient, detrimental effects, it is reasonable to expect that the Indian Prime Minister and his party, the BJP, would have faced significant repercussions in subsequent elections. However, the reality was quite the opposite.

2.2 Lack of Political Backlash and The Role of Consumer Sentiments

Despite facing criticism from policymakers (Tharoor, 2017), economists (Banerjee & Kala, 2017) and international media (BBC, 2017), demonstration did not leave a scar on the political track record of the Indian Prime Minister (PM) and the Bharatiya Janata Party (BJP). The party won landslide victories in the Uttar Pradesh state elections in 2017 (India Today, 2017) and the all-India general election in 2019 (Safi, 2019). Surveys conducted in 2017 found that only 16% of respondents felt that demonstration was a wrong policy move (Khanna & Mukherjee, 2023), while 88% held favourable opinions of the PM (Stokes et al., 2017).

This violates the retrospective voter theory, which states that voters will reward or punish incumbent candidates for policies that are directly attributable to them in subsequent elections (Key, 1966). Demonstration was directly attributable to the PM and his party, given that he announced the move on national television, and the BJP gladly took credit for its implementation (The Hindu Business Line, 2017). If demonstration heterogeneously impacted people depending on their cash reliance, the worst affected voters should have reduced their support for the ruling party in future elections.

Investigating this puzzle, (Khanna & Mukherjee, 2023) found that while voters in underbanked districts had less favourable views of demonetisation, those located in areas historically aligned with the BJP were not less likely to vote for them. This supports the results of (Banerjee & Kala, 2017), who examined a sales shortfall in Uttar Pradesh's wholesale markets (a state historically aligned with the BJP) and found that a 100% decline in sales following demonetisation only resulted in a 1% decline in BJP's vote share in the closest constituency.

In contrast, (Bhavnani & Copelovitch, 2020) found that while well-banked districts reduced their support for the party in subsequent elections, under-banked districts failed to do so. They rule out several possible explanations such as information salience, voter myopia, promises of agricultural debt relief and geographic variations in media coverage, corruption, Hindu nationalism and digitisation of the local economy.

Previous work on violations of the retrospective voter theory in developed contexts has suggested that voters may have a limited understanding of how poor economic policies impact them (Achen & Bartels, 2017) or may incorrectly punish/reward incumbents for events outside their control (Healy & Malhotra, 2009). However, the literature studying the lack of political backlash faced by the BJP post-demonetisation is yet to provide conclusive answers.

One way to understand this phenomenon is to examine the impact of demonetisation on household sentiments. Using consumer sentiments from the British Household Panel Survey (similar to those used in this paper), (Cocco et al., 2020) found that households facing a negative earnings shock tend to expect future improvement (mean reversion) rather than further decline. If households viewed their post-demonetisation income declines as temporary, this could have resulted in a mean reversion in their sentiments, preventing them from electorally punishing the ruling party.

Thus, we attempt to address this gap in the literature on the political outcomes of demonetisation by studying the effects of the policy on the sentiments of households across varying levels of exposure, as defined by their district-level financial inclusion score.

3 Data Description

For our analysis, we rely on two primary data sources. For district-level measures of financial inclusion in the financial year preceding demonstration, we use Volume IV of CRISIL's Inclusix report. For data on the characteristics and sentiments of households in these districts, we use CMIE's Aspirational India dataset. We also include data on district-level average night lights for 2015 from the Socioeconomic High-resolution Rural-Urban Geographic Platform for India (SHRUG).

3.1 CRISIL Inclusix

Designed by CRISIL (Credit Rating Information Services of India Limited) - India's leading credit rating agency, the CRISIL Inclusix index measures the extent of financial inclusion in Indian districts on a scale from 0 to 100. It is computed based on the level of bank branch, credit, deposit and insurance penetration in each district. Data on these measures is obtained from the Reserve Bank of India (RBI), the MicroFinance Institutions Network (MFIN) and the Insurance Information Bureau of India (IIB). According to CRISIL, the effectiveness of this index is only limited by the quality of the data from these sources (CRISIL, 2018). However, the index does not currently include non-banking financial companies (NBFCs), health insurance and pension schemes. This implies that the Inclusix score could be a lower bound on each district's level of financial inclusion.

CRISIL has published annual volumes providing district-level financial inclusion scores for 2013, 2014, 2015 and 2016. Here, we use Volume IV of the CRISIL Inclusix report that provides district-level scores for the financial year ending in March 2016. This data allows us to study the effects of demonstration on the districts observed in the Aspirational India dataset across quintiles of their baseline financial inclusion score.

The 2016 CRISIL Inclusix report finds that financial inclusion in Indian districts has been rising since 2013. This is largely attributed to the introduction of the Pradhan Mantri Jan Dhan Yojana in 2014, which was a financial inclusion program enacted by the Indian government to expand access to banking services that led to the opening of over 300 million deposit accounts (CRISIL, 2018). This upward trend in financial inclusion may have persisted post-demonetisation. This trend would be a concern for this paper only if demonetisation accelerated financial inclusion such that districts belonging to lower quintiles of financial inclusion in the pre-period moved to higher quintiles immediately following demonetisation. In this case, the true 'intensity of treatment' experienced by households in these districts would be different from what we observe in the data, which could possibly bias our results. This concern is partly addressed by including month fixed effects in our specifications. However, we also examine the evidence on the effect of demonetisation on financial inclusion.

Although the post-demonetisation period witnessed a shift to a more formalised economy through an increase in the volume of digital transactions (Barik & Sharama, 2019), this effect was concentrated in areas that had the financial infrastructure required for the adoption of digital payment methods (Crouzet et al., 2023) (Aggarwal et al., 2023). Thus, it is unlikely that districts that were less integrated with the formal financial network at baseline became more digitised and formalised in response to demonetisation (Lahiri, 2020). Moreover, Shafi & Muhammed (2020) find that demonetisation had no significant effect on three parameters of financial inclusion - the number of new bank accounts, No Frills Accounts (NFA) and Rupay Debit Cards. Since these parameters contribute to the credit and deposit penetration in each district (measures included in the Inclusix score), this suggests that district-level financial inclusion may not have changed significantly in the immediate aftermath of demonetisation. Based on this evidence, we maintain the assumption that districts in our sample remain at their baseline financial inclusion quintiles during the period of interest (September 2015 - June 2017).

| Variable | Obs. | Districts | Households | Mean | Std. Dev. | Min | Max |
|----------------------------|-------------|-----------|------------|-------|-----------|------|------|
| CRISIL Inclusix Score 2016 | 732,282 | 428 | 161,609 | 64.21 | 18.36 | 19.6 | 100 |
| Quintile 1 | 86,339 | 86 | 18,214 | 34.35 | 4.55 | 19.6 | 40.6 |
| Quintile 2 | $128,\!534$ | 86 | $28,\!158$ | 47.01 | 3.08 | 41.3 | 51.7 |
| Quintile 3 | 168, 184 | 85 | 37,911 | 59.23 | 4.00 | 51.9 | 65 |
| Quintile 4 | $175,\!348$ | 87 | 38,789 | 72.52 | 3.82 | 65.2 | 78.5 |
| Quintile 5 | 173,877 | 84 | $38,\!537$ | 88.17 | 6.54 | 78.8 | 100 |

Table 1—Summary Statistics of Pre-Demonetisation Financial Inclusion Quintiles

Notes: This table provides summary statistics of the five quintiles of financial inclusion that we created based on the district-level pre-demonetisation financial inclusion score, defined on a scale from 0 to 100 (CRISIL Inclusix Score 2016). These quintiles are used to determine the extent to which households in each district were exposed to demonetisation, with households in lower quintiles being more exposed.

Table 1 describes the summary statistics of the quintiles of financial inclusion created using the 2016 CRISIL Inclusix score. By construction, the districts in our sample are evenly divided among the five quintiles. The total number of districts in our sample is limited to the ones observed in the household data (428), which is less than the total number of districts included in the 2016 CRISIL report (673). The minimum and maximum scores for each quintile are similar to the four categories of financial inclusion defined in this report. Using the all-India Inclusix score for 2013 (50.1) as a benchmark, the report splits Indian districts into the following categories of financial inclusion: low (scores less than 35), below average (scores between 35 and 50), above average (scores between 50.1 and 65) and high (scores greater than 65) (CRISIL, 2018). Based on this definition, Quintile 1 falls into the 'low' category, Quintile 2 is 'below average', Quintile 3 is 'above average' and Quintiles 4 and 5 belong to the 'high' category.

We use the data-driven definition of financial inclusion quintiles instead of the categories provided by the CRISIL report for two reasons. Firstly, since we are estimating the effects of demonetisation on the households observed in the Aspirational India dataset, it is more appropriate to create quintiles based on the scores of the districts in our sample, rather than relying on the predefined categories created for the entire set of Indian districts. Secondly, using CRISIL's definition would mean that 47.69% of observations fall in the 'high' financial inclusion category, while only 5.56% fall in the 'low' category. This definition would not allow us to estimate the full extent of the heterogeneous effects of demonetisation since we expect to see its biggest impacts among the least financially included districts. Using the broader, data-driven quintiles, 11.79% of observations fall in Quintile 1 ('low' financial inclusion) and 23.74% fall in Quintile 5 ('very high' financial inclusion) which is the reference group. While still not ideal, this definition allows us to pick up more variation in the effects of demonetisation on households in the least financially included districts relative to those in the most financially included districts.

A pattern that stands out from Table 1 is that the number of unique households in each quintile decreases when going from higher to lower quintiles of financial inclusion. As a result, the average household in this sample lives in a district with above-average levels of financial inclusion (mean financial inclusion score = 64.21). This implies that households from less financially included districts are under-represented in the Aspirational India dataset. This could be a consequence of the design of the CPHS survey from which the data is obtained. We describe this survey and address its limitations in the next section.

3.2 Aspirational India

Aspirational India is a proprietary dataset developed by the Centre for Monitoring Indian Economy (CMIE). It provides insights into the standard of living experienced by Indian households, as measured by their assets and liabilities, access to basic amenities and consumer sentiments (CMIE). This information is captured through CMIE's Consumer Pyramids Household Survey (CPHS), which is administered thrice a year in 4-month-long survey waves.

From this dataset, we create binary indicators for each response to the five consumer sentiment questions included in the survey. Originally designed by the University of Michigan for their Surveys of Consumers, these questions capture the households' perceptions of their financial well-being and that of the entire nation (University of Michigan). The questions and their responses are defined as follows:

- 1. Compared to a year ago, how is your family faring financially these days? (Better, Same or Worse)
- 2. A year from now, how do you think your family would be faring financially? (Better, Same or Worse)
- 3. How would you describe the financial and business conditions in our country over the next 12 months? (Good times, Uncertain times or Bad times)
- 4. How would you describe the financial and business conditions in our country over the next 5 years? (Continuously good times, Uncertain with ups and downs or Continuously bad times)
- Do you think that this is generally a good time to buy consumer durables like furniture, refrigerators, televisions, two-wheelers, cars, etc? (Good time, Same as other times or Bad time)

Each question measures a different aspect of the sentiments of households in India. The first two questions require households to reflect on the state of their finances while the third and fourth questions capture their expectations regarding the financial stability of the nation. The final question bridges both perspectives, as it reflects households' willingness to invest in durable goods at the time of the survey - a decision influenced by their financial condition and that of the broader economic environment around them. As a result, these questions allow me to observe how such perceptions may have shifted in response to demonetisation.

A major limitation of this dataset, however, is that it is not nationally representative. According to (Somanchi, 2021), CMIE employs an "unorthodox" survey design that involves sampling every n^{th} household (where *n* is a random number between 5 and 15) starting from the 'main street' or 'central circle' in each village until they reach their fixed quota of 16 households per village. Since, in India, better-off households are more likely to live near the village centre compared to marginalised ones, this survey design has resulted in the CPHS data under-representing poor households and being skewed towards urban, well-educated households. The author also highlights that this bias appears to increase over time. This may explain why fewer households are observed in less financially included districts in this dataset, as seen in Table 1.

This issue with CMIE's survey design is a matter of concern for this paper since we expect to see the largest effects of demonetisation on the sentiments of poor, rural households living in less financially included districts. If such households are under-represented in the data, our estimates would not capture the true heterogeneous effects of demonetisation. While we cannot address all its limitations, (Somanchi, 2021) suggests including household weights scaled by a non-response factor (both provided by CMIE) to adjust for the urban skew in the dataset, as they place higher weights on rural households. Thus, to ensure that our estimates are more representative of rural regions, we include survey weights in all our analyses.

Currently, CMIE has completed 31 waves of the CPHS, with Wave 1 beginning in January 2014. The consumer sentiment questions are included in the survey from September 2015 (Wave 6) onwards. However, we limit the period of our analysis to June 2017 for two reasons. Firstly, the Reserve Bank of India (RBI) stated that over 99% of the country's demonstrated currency had been returned to the banking system by 30 June 2017 (Unnikrishnan, 2023). This implies that any effects of demonstration on household sentiments would have dissipated by July 2017. Secondly, limiting our analysis to June 2017 avoids the effects of India's Goods and Services Tax (GST) reforms, which were implemented on 1 July 2017 (Ministry of Finance). GST was yet another historic macroeconomic policy change introduced by the Indian government to replace the old tax regime consisting of various central and state taxes with a unified tax system (Yadav, 2024). However, a recent study on the distributional impact of GST found that consumers with higher average monthly per capita consumption expenditure (MPCE) benefited the most from the new tax exemptions and that tax liability was only progressive up to the 20^{th} percentile of MPCE in urban areas (Mukherjee, 2024). These results imply that GST may have heterogeneously affected households' perceptions of personal and national financial conditions. As a result, including data from July 2017 onwards would mean that our estimates will capture the effects of both demonetisation and GST on household sentiments.

Thus, in order to isolate the short-run effect of the November 2016 demonetisation event on household sentiments, we restrict our analysis to only those households observed from September 2015 to June 2017. This creates an unbalanced panel of 161,609 Indian households observed once every four months over 22 months. We use the unbalanced panel to avoid potential self-selection issues that could arise from using a balanced panel since attrition is often non-random, which could bias our estimates (Somanchi, 2021).

In Figure 1, we depict the percentage of households in each month that report each response to the five consumer sentiment questions listed above, before and after demoneti-



(a) Family Finances Compared To A Year Ago

(b) Family Finances A Year Later



(c) Conditions In Country Over Next 12 (d) Conditions In Country Over Next 5 Months Years



(e) Is This A Good Time To Buy Consumer Durables

Figure 1. Consumer Sentiments (Sep 2015 - Jun 2017)

sation in November 2016. For all five questions, the majority of households in every month report that their family finances are the 'Same', that they expect economic conditions in the country to be 'Uncertain', and that this time is as good as any to buy consumer durables. However, these figures indicate that the percentage of households that report 'Worse' personal finances and 'Bad times' in the country increases slightly following demonetisation, while the percentage reporting 'Better' or 'Same' personal finances and 'Good times' in the country slightly falls. Thus, on average, the perceptions of some households in this dataset were marginally adversely affected following demonetisation.

While Figure 1 depicts how household sentiments evolve over time for the entire sample,

| Variable | Quintile 1 | Quintile 2 | Quintile 3 | Quintile 4 | Quintile 5 | Total |
|--|----------------|----------------|------------|------------|------------|-------|
| | (1) | (2) | (3) | (4) | (5) | (0) |
| | | | | | | |
| Family Finances Compared To A Year Ago | | | | | | |
| Better | 22.26 | 22.05 | 25.60 | 25.61 | 27.75 | 24.79 |
| Same | 63.95 | 63.27 | 61.46 | 61.09 | 62.60 | 62.38 |
| Worse | 13.79 | 14.68 | 12.94 | 13.30 | 9.65 | 12.82 |
| Family Finances A Year Later | | | | | | |
| Better | 25.16 | 21.00 | 24.28 | 24.39 | 26.05 | 24.20 |
| Same | 62.43 | 63.58 | 62.47 | 61.97 | 62.83 | 62.64 |
| Worse | 12.41 | 15.42 | 13.25 | 13.64 | 11.12 | 13.16 |
| Conditions in Country Over Next 12 Months | | | | | | |
| Good times | 30.20 | 28 78 | 29.75 | 30.39 | 30.85 | 30.00 |
| Uncertain times | 56.33 | 20.10 55.40 | 54.26 | 58.49 | 50.00 | 56 70 |
| Bad times | 13.46 | 15.82 | 15.98 | 11.11 | 10.02 | 13.30 |
| | | | | | | |
| Conditions in Country Over Next 5 Years | | | | | | |
| Continuously good times | 29.34 | 24.86 | 27.86 | 28.77 | 30.46 | 28.27 |
| Uncertain with ups and downs | 59.23 | 60.65 | 57.69 | 61.49 | 60.23 | 59.81 |
| Continuously bad times | 11.43 | 14.48 | 14.45 | 9.74 | 9.31 | 11.92 |
| Is This A Good Time To Buy Consumer Durables | | | | | | |
| Good time | 23.74 | 21.62 | 24 94 | 30.66 | 28 14 | 25.94 |
| Same as other times | 51 14 | 51.66 | 51 77 | 53.80 | 58 79 | 53.48 |
| Bad time | 95.11 95.11 | 26 71 | 23.20 | 15 55 | 13.07 | 20.57 |
| Dad time | 20.11 | 20.71 | 20.29 | 10.00 | 10.07 | 20.07 |

Table 2—Consumer Sentiments Across Financial Inclusion Quintiles

Notes: This table depicts the weighted percentage of observations in each quintile of the 2016 CRISIL Inclusix district-level financial inclusion score that report each response to the five consumer sentiment questions from September 2015 to June 2017. Household-level survey weights provided by CMIE are calculated according to (Somanchi, 2021).

Table 2 describes the weighted percentage of observations in each quintile of financial inclusion that report these sentiments from September 2015 to June 2017. Column (6) indicates that across all quintiles, most households report that their family finances remain the same, they expect good economic conditions in the country and that this time is as good as any to buy consumer durables. From columns (1) to (5) two complementary patterns emerge. First, the percentage of observations that provide positive responses ('Better', 'Good times' etc.) to these questions is lower in Quintile 1 than in Quintile 5. Second, the percentage of observations providing negative responses ('Worse', 'Bad times' etc.) is higher in Quintile 1 than in Quintile 5. Since these differences in sentiments can be attributed to other household-level factors such as whether a household resides in a rural area and the average income and education of its members, we examine the pre-demonetisation summary statistics of such characteristics across quintiles in Table 3.

Table 3 depicts that the average annual income bracket of households is lowest in Quintile 1 (Rs. 100,000 - Rs. 120,000) and increases up to Quintile 5 (Rs. 150,000 - Rs. 200,000).

 Table 3—Summary Statistics of Pre-Demonetisation Household Characteristics by

 Financial Inclusion Quintiles

| Quintile | Obs. | Income Group | Education Group | Age Group | Size Group | Rural |
|--|--|---|--|---|---|---|
| All Quintiles | 158,604 | 120,000 - 150,000 | Household of all literates | Grown-up - dominant | 4 Members | 0.66 |
| Quintile 1 Quintile 2 Quintile 3 Quintile 4 Quintile 5 | $18,115 \\ 27,502 \\ 36,892 \\ 38,154 \\ 37,941$ | 100,000 - 120,000 100,000 - 120,000 120,000 - 150,000 120,000 - 150,000 150,000 - 200,000 | Household of all literates Household of all literates Household of all literates Household of all literates Household of all illiterates | Other households of the young Other households of the young Grown-up - dominant Grown-up - dominant Grown-up - dominant | 5 Members 4 Members 4 Members 4 Members 4 Members | $\begin{array}{c} 0.88 \\ 0.78 \\ 0.63 \\ 0.58 \\ 0.47 \end{array}$ |

Notes: This table describes the weighted pre-demonetisation characteristics of households in the whole sample and across five quintiles of the 2016 CRISIL Inclusix district-level financial inclusion score. *Income Group* refers to the annual income bracket of each household (in rupees). *Education Group* refers to the education level of each household, measured by the average education level of all household members aged 25 or older. *Age Group* refers to the average age bracket of each household. *Size Group* refers to the number of members in each household. *Rural* indicates whether a household is located in a rural area. Household-level survey weights provided by CMIE are calculated according to (Somanchi, 2021).

The average education category for households is 'Household of all literates' for the lower four quintiles and 'Household of all illiterates' for the highest quintile. This implies that the lower quintiles of financial inclusion consist of more educated households. The average age category of households in the sample is 'Other households of the young' for the two lowest quintiles, which refers to households in which members below 25 years of age account for more than half of all members. The higher quintiles consist of 'Grown-up - dominant' households, which refers to households in which members between 26 and 60 years of age account for more than half of all members (CMIE, 2020). The average size of a household in this dataset is 5 members for the lowest quintile and 4 members for all subsequent quintiles. Finally, with the inclusion of household weights, 66% of all households are rural, ranging from 88% of households in Quintile 1 to 47% of households in Quintile 5. We include these pre-demonetisation household characteristics in all specifications to account for differential trends in sentiments associated with them.

3.3 District Night Lights

The overall level of economic activity in each district can also affect the sentiments of the households within its borders. While this is difficult to measure at the district level, existing literature has found that satellite data on night lights is a statistically significant proxy for economic activity at such narrow geographical levels (Asher et al., 2021). Moreover, (Chanda & Cook, 2022) find that districts belonging to lower quintiles of pre-demonetisation night lights witnessed differential effects post-demonetisation, relative to those in higher quintiles.

Thus, to account for the impact of district-level economic activity on household sentiments, we include data on the annual average night lights detected in each district in the year preceding demonstration (2015). This data is obtained from the Visible Infrared Imaging Radiometer Suite (VIIRS), made available by the Socioeconomic High-resolution Rural-Urban Geographic Platform for India (SHRUG).

 Table 4—Summary Statistics of Pre-Demonetisation District Night Lights by Financial Inclusion Quintiles

| Variable | Obs. | Districts | Households | Mean | Std. Dev. | Min | Max |
|----------------------------------|-------------|-----------|------------|------|-----------|------|-------|
| Annual Average Night Lights 2015 | 732,282 | 428 | 161,609 | 2.01 | 5.73 | 0.02 | 55.94 |
| Quintile 1 | 86,339 | 86 | 18,214 | 0.52 | 0.29 | 0.07 | 1.52 |
| Quintile 2 | $128,\!534$ | 86 | 28,158 | 0.70 | 0.41 | 0.05 | 1.88 |
| Quintile 3 | 168,184 | 85 | 37,911 | 1.53 | 3.62 | 0.13 | 29.29 |
| Quintile 4 | $175,\!348$ | 87 | 38,789 | 1.38 | 1.51 | 0.03 | 9.59 |
| Quintile 5 | 173,877 | 84 | 38,537 | 4.83 | 10.60 | 0.02 | 55.94 |

Notes: This table provides summary statistics of the district-level annual average night lights detected in 2015 for the entire sample and for each quintile of financial inclusion. Night lights are used as a proxy for the level of economic activity in the districts in each quintile in the year preceding demonetisation.

Table 4 describes the average annual night-lights detected in 2015 for districts across quintiles of financial inclusion. The night lights detected in each quintile increases when moving from lower to higher quintiles. This implies that the pre-demonetisation level of economic activity is lower in less financially included districts. Since households in these districts may have responded differently to demonstisation when compared to those in more developed districts, we include this measure of district-level night lights as a control variable in all our specifications.

4 Empirical Strategy

Since demonetisation was a macroeconomic shock, every household in India was simultaneously subjected to the 'treatment'. As a result, there are no 'control' households reporting counterfactual outcomes after demonetisation that can be used for a standard causal difference-in-differences analysis. However, cash-dependent households and districts were the worst affected by the sudden cash shortage caused by demonetisation. Thus, using a measure of cash reliance, it is possible to identify the relative effects of demonetisation on the sentiments of households experiencing different *intensities* of exposure to 'treatment'.

Previous work on the heterogeneous effects of demonetisation has used measures of cash reliance such as household-level bank account ownership (Karmaker & Narayanan, 2020), the number of bank branches in a district (Khanna & Mukherjee, 2023) (Bhavnani & Copelovitch, 2020) and district-level bank accounts per capita (Chanda & Cook, 2022). Here, we use the 2016 CRISIL Inclusix index which assesses the level of financial inclusion in Indian districts based on the availability of formal financial services such as credit, deposit and insurance in the financial year ending in March 2016 (CRISIL, 2018). Since households from less financially included districts are likely to be more cash-reliant, this index allows us to estimate how demonetisation differentially affected their sentiments relative to those from more financially included districts.

Based on their pre-demonetisation financial inclusion scores, we divide the districts observed in the household data into five quintiles. We then use a difference-in-differences approach to compare the within-household changes in sentiments post-demonetisation across quintiles of financial inclusion. Specifically, we compare households in districts within each of the lower four quintiles of financial inclusion to those in the highest (fifth) quintile. This closely replicates the strategy used by (Chanda & Cook, 2022) to estimate the redistributive effects of demonetisation across quintiles of pre-demonetisation district and household characteristics. The estimating equation for this empirical strategy is described in equation 1 below:

$$Y_{hdt} = \beta_0 + \sum_{q=1}^{4} \beta_q (Post_t * Quintile_d^q) + \beta'_X X_h + \beta_d N L_d + \gamma_h + \gamma_t + \epsilon_{hdt}$$
(1)

Here, Y_{hdt} represents binary indicators for each of the three responses to the five consumer sentiment questions described in Section 3.2. Every household 'h' (N = 161,609) in each district 'd' (N = 428) reports one of the three responses to each question in the month 't' in which it is surveyed. Although each household is interviewed once every 4 months, we use an unbalanced panel with 31,145 households observed in the first month (September 2015) and 33,770 households observed in the last month (June 2017). We include household (γ_h) and month (γ_t) fixed effects to ensure that we estimate within-household changes in sentiments and account for any time trends. We cluster standard errors at the district level since it is the level at which the treatment (financial inclusion) is defined.

The relative difference-in-differences estimates are obtained from the coefficients for the interaction terms $Post_t * Quintile_d^q$, where $Post_t$ is an indicator for the months following demonetisation (November 2016 - June 2017) and $Quintile_d^q$ are dummy variables for each of the four lower quintiles of financial inclusion (q = 1, 2, 3, 4). If household 'h' is from district 'd' belonging to the bottom 20% of the pre-demonetisation financial inclusion score, q = 1; if it belongs to the 20th-40th percentile of the score, q = 2 and so on. Since the household sentiments are coded as binary variables, this equation represents a linear probability model. Thus, these coefficients estimate the effect of demonetisation on the within-household probability of reporting each response to the five consumer sentiment questions for households in each of the lower four quintiles of financial inclusion, relative to those in the fifth quintile, which is the (omitted) reference group.

 X_h represents a vector of pre-demonetisation household characteristics, including an indicator for rural households, their size, age and education categories and their annual income bracket. We also include a control for the annual average night lights (NL_d) detected in 2015 in each district as a proxy for their baseline level of economic activity. Since these controls are time-invariant, We include them in our within-household estimations by interacting them with the $Post_t$ variable. This controls for any differential trends in sentiments correlated with these characteristics that could occur after demonetisation. Finally, we also present all the results from equation 1 with household weights to adjust for the urban skew in the household data. These relative difference-in-differences estimates for each of the four lower financial inclusion quintiles are depicted in Tables 5 to 9.

For causal difference-in-differences estimation, the assumption of parallel trends must be satisfied. This assumption states that in the absence of treatment, the difference between the outcomes for the 'treated' and 'control' groups must remain constant over time. In this context, all households are considered 'treated'. This implies that like the results of (Chanda & Cook, 2022), our estimates attempt to measure the *relative* effects of demonetisation on household sentiments across quintiles of financial inclusion and not its *causal* effect. Regardless, we check whether the financial inclusion quintiles defined in our sample are related to pre-trends in household sentiments using equation 2.

$$Y_{hdt} = \beta_0 + \sum_{q=1}^{4} \sum_{t=Sep2015}^{Jun2017} \beta_t^q (Month_t * Quintile_d^q) + \beta_X' X_h + \beta_d N L_d + \gamma_h + \gamma_t + \epsilon_{hdt}$$
(2)

With the same controls, fixed effects, clustering and weights used in equation 1, equation 2 estimates the month-wise effects of each of the four lower financial inclusion quintiles on household sentiments relative to the fifth quintile, taking October 2016 (the month before demonetisation) as the (omitted) base month. We present the results of this estimation through event study plots in Figures 2 to 4. While we only present the event studies for the significant coefficients in Tables 5 to 9 in Section 5, the remaining event study graphs are included in the Appendix (Section 8). We also check for pre-trends through a placebo test in Section 5.1, which replicates equation 1 for September 2015 to October 2016, with the (placebo) demonetisation event defined to occur in April 2016. The results of this test are depicted in Tables 10 to 14 in the Appendix.

5 Results and Discussion

In this section, we explore the heterogeneous effects of the November 2016 demonetisation event on the sentiments of Indian households across quintiles of financial inclusion, using a difference-in-differences strategy. Our estimates measure the effect of demonetisation on the within-household probability of reporting each response for households in each of the lower quintiles of financial inclusion relative to those in the highest (fifth) quintile, which is the (omitted) reference group. We present these effects with household weights in Tables 5 to 9 to account for the under-representation of rural households in our sample (Somanchi, 2021). Additionally, we observe how the weighted estimates evolve over time and check for pre-trends through event study graphs in Figures 2 to 4. Since our tables depict results for 15 outcome variables (3 responses to each of the 5 household sentiment questions) across 4 quintiles each, we only present the event studies for the significant weighted coefficients reported in the tables in this Section. We include the remaining weighted event studies in the Appendix (Section 8).

Table 5 depicts the effect of demonetisation on the question: "Compared to a year ago, how is your family faring financially these days?" The estimates in columns (1) to (3) indicate that demonetisation only significantly impacted perceptions of current family finances among households in the lowest quintile of financial inclusion. Specifically, a household in Quintile 1 became less likely to report that their family finances are worse by 5.1 percentage points (significant at the 10% level), relative to households in Quintile 5. To observe the evolution of this estimate over time and verify the absence of pre-trends, we present Quintile 1's event study plot for 'Worse' family finances compared to a year ago in Figure 2.

Figure 2 plots the month-wise effect of Quintile 1 (relative to Quintile 5) on the withinhousehold probability of reporting that their family finances are worse today than they were a year ago, taking October 2016 as the reference month. These estimates include the same controls, fixed effects, clustering and weights specified in column (3) of Table 5. This figure provides two main insights. Firstly, it verifies the absence of pre-trends by depicting that Quintile 1 has no significant effects on the probability of reporting worse current family finances relative to Quintile 5 in the pre-period. Secondly, it shows that the marginally significant decrease in the probability of reporting worse family finances post-demonetisation for Quintile 1 primarily arises in February 2017. In the months immediately after demonetisation (November 2016 - January 2017), there appears to be a small but insignificant increase in the probability of reporting worse family finances among Quintile 1 households. After the significant decline in February 2017, this probability becomes insignificant once again but appears to be on an upward trend.

| Family Finances Compared To A Year Ago | | | | | | |
|--|---|-----------------------|-------------------------|--|--|--|
| | Better | $\mathbf{Same}_{(2)}$ | Worse | | | |
| | (1) | (2) | (0) | | | |
| Post*Quintiles | | | | | | |
| Quintile 1 | $\begin{array}{c} 0.040 \\ (0.035) \end{array}$ | $0.011 \\ (0.041)$ | -0.051^{*} (0.027) | | | |
| Quintile 2 | $0.049 \\ (0.036)$ | -0.020 (0.035) | -0.030 (0.027) | | | |
| Quintile 3 | $0.039 \\ (0.035)$ | -0.009 (0.037) | -0.030 (0.024) | | | |
| Quintile 4 | $0.005 \\ (0.034)$ | -0.003 (0.033) | -0.002 (0.028) | | | |
| Controls | Υ | Υ | Υ | | | |
| Household FE | Υ | Y | Υ | | | |
| Month FE | Y | Y | Y | | | |
| Observations r2 | 724,134 0.371 | 724,134 0.347 | 724,134 0.354 | | | |

 Table 5—Effect of Demonetisation on Family Finances Compared To A Year Ago by

 Financial Inclusion Quintile

Notes: This table depicts the effect of demonetisation on the within-household probability of reporting each response (Better/Same/Worse) to "Compared to a year ago, how is your family faring financially these days?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications and calculated according to (Somanchi, 2021). Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1



Figure 2. Family Finances Compared To A Year Ago = Worse (Quintile 1)

Taken together, the weighted estimates depicted in Table 5 and Figure 2 suggest that demonetisation only had a small, marginally significant impact on negative perceptions regarding current family finances for households in the least financially included districts, relative to those in the most financially included districts. While these Quintile 1 households were less likely to report worse family finances compared to those in Quintile 5, this significant difference in sentiments only arose a few months after demonetisation. This implies that demonetisation did not immediately adversely affect less financially-included households' perceptions of their current family finances.

Table 6 tests whether demonetisation heterogeneously affected households' expectations regarding their future family finances across quintiles of financial inclusion. These estimates suggest that demonetisation only significantly impacted the probability of reporting 'Worse' future family finances among the three lower quintiles of financial inclusion, with Quintile 1 having the largest and most significant effect. Relative to Quintile 5, the within-household probability of reporting that family finances will be worse one year from now fell by 7 percentage points for Quintile 1 (significant at the 1% level), 4.5 percentage points for Quintile 2 (significant at the 10% level) and 4.8 percentage points for Quintile 3 (significant at the 5% level). We check for pre-trends and observe the evolution of these weighted estimates

| Family Finances A Year Later | | | | | | |
|--------------------------------------|---|--|---------------------------|--|--|--|
| | Better (1) | $\mathbf{Same}_{(2)}$ | Worse (3) | | | |
| Post*Quintiles | | | | | | |
| Quintile 1 | 0.022 (0.033) | 0.048 (0.035) | -0.070^{***} (0.025) | | | |
| Quintile 2 | 0.023 (0.031) | 0.022 (0.032) | -0.045^{*} (0.027) | | | |
| Quintile 3 | $\begin{array}{c} 0.034 \\ (0.033) \end{array}$ | $\begin{array}{c} 0.013 \ (0.035) \end{array}$ | -0.048^{**} (0.024) | | | |
| Quintile 4 | $0.015 \\ (0.030)$ | -0.013 (0.031) | -0.003 (0.030) | | | |
| Controls Household FE Month FE | Y Y Y | Y Y Y | Y Y Y | | | |
| Observations r2 | $724,134 \\ 0.371$ | 724,134 0.342 | $724,134 \\ 0.357$ | | | |

| Table 6—Effect of Demonetisation on | Family | Finances A | A Year | Later | by | Financial |
|-------------------------------------|---------|------------|--------|-------|----|-----------|
| Inclusi | on Quir | ntile | | | | |

Notes: This table depicts the effect of demonetisation on the within-household probability of reporting each response (Better/Same/Worse) to "A year from now, how do you think your family would be faring financially?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications and calculated according to (Somanchi, 2021). Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1 over time in Figure 3.

These figures confirm that pre-trends in sentiments are absent for Quintiles 1, 2 and 3 as the month-wise weighted estimates of the effect of these quintiles relative to Quintile 5 on the within-household probability of reporting 'Worse' future family finances are insignificant in the pre-period. In all three figures, however, it appears that the months immediately following demonetisation (November 2016 - January 2017) saw no significant effect on this probability. For Quintile 1, Figure 3(a) shows that the significant decline in the probability of reporting worse future family finances occurs in February 2017. For Quintile 2, Figure 3(b) suggests that while the month-wise effects on this probability post-demonetisation are insignificant, they appear to be trending downwards relative to the pre-period, which could explain the marginally significant negative estimate for Quintile 2 in column (3) of Table 6. For Quintile 3, Figure 3(c) shows that the significant negative effect on the probability of reporting worse future finances occurs in March 2017.

The results depicted in Table 6 and Figure 3 indicate that when asked about their expectations of family finances one year from now, households in lower quintiles of financial inclusion were significantly less likely to report that their future finances would be 'Worse' a few months after demonetisation. When combined with the estimates depicted in Table 5 and Figure 2, these results imply that less financially included households' perceptions of their personal finances were not significantly adversely affected by demonstration, relative to the most financially included households. This could mean that the difficulties faced by less financially included households in the immediate aftermath of demonstration were transitory, resulting in a mean-reversion in their perceptions of personal financial stability.

Although demonetisation may not have adversely affected less financially included households' sentiments regarding personal finances, it may have affected how they perceive the economic conditions in the country. Table 7 depicts the effect of demonetisation on responses to the question, "How would you describe the financial and business conditions in our country over the next 12 months?", across quintiles of financial inclusion. The weighted estimates suggest that only Quintile 2 households were significantly more likely to report 'Good times' by 6.3 percentage points (significant at the 10% level) relative to Quintile 5.

Figure 4 depicts the month-wise weighted coefficients for the within-household probability of expecting 'Good times' in the country for the next 12 months for Quintile 2 relative to Quintile 5. In the months preceding demonstration, these estimates are noisy and insignificant, indicating the absence of any pre-trends. In the post-period, the probability of reporting 'Good times' in Quintile 2 relative to Quintile 5 appears to be on an (insignificant) upward trend. The significant increase in this probability for Quintile 2 that is reported in column (4) of Table 7 mainly occurs in June 2017, when almost all of the demonstrated



Figure 3. Family Finances A Year Later = Worse (Quintiles 1 - 3)

| Conditions In Country Over Next 12 Months | | | | | |
|---|------------------------|---------------------|--------------------|--|--|
| | Good times (1) | Uncertain times (2) | Bad times (3) | | |
| ${\rm Post}^*{\rm Quintiles}$ | | | | | |
| Quintile 1 | $0.043 \\ (0.040)$ | -0.049 (0.041) | $0.006 \\ (0.026)$ | | |
| Quintile 2 | 0.063^{*} (0.038) | -0.053 (0.034) | -0.010 (0.025) | | |
| Quintile 3 | $0.054 \\ (0.036)$ | -0.053 (0.034) | -0.001 (0.020) | | |
| Quintile 4 | -0.008 (0.038) | -0.012 (0.032) | $0.020 \\ (0.022)$ | | |
| Controls Household FE Month FE | Y Y Y | Y Y Y | Y Y Y | | |
| Observations r2 | $724,134 \\ 0.378$ | $724,134 \\ 0.349$ | $724,134 \\ 0.383$ | | |

 Table 7—Effect of Demonetisation on Conditions In Country Over Next 12 Months by

 Financial Inclusion Quintile

Notes: This table depicts the effect of demonetisation on the withinhousehold probability of reporting each response (Good times/Uncertain times/Bad times) to "How would you describe the financial and business conditions in our country over the next 12 months?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications and calculated according to (Somanchi, 2021). Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1



Figure 4. Conditions In Country Over Next 12 Months = Good times (Quintile 2)

currency had been returned to the banking system (Unnikrishnan, 2023).

Together, the weighted estimates from Table 7 and Figure 4 indicate that demonetisation slightly improved the expectations of economic conditions in the country for the next 12 months for households in Quintile 2, relative to those in Quintile 5. This suggests that although their perceptions regarding personal finances did not improve or get worse, households in less financially included districts became slightly more optimistic about the medium-run financial conditions in the country following demonetisation, relative to those in the most financially included districts. Once again, this supports the hypothesis of a mean reversion in household sentiments following a negative earnings shock (Cocco et al., 2020).

To examine whether this optimism about the country's economic conditions persists for longer time periods, Table 8 depicts the effect of demonetisation on responses to the question, "How would you describe the financial and business conditions in our country over the next 5 years?", across financial inclusion quintiles. Here, the estimates are noisy and insignificant. This implies that despite their slight increase in optimism about the country's conditions over the next 12 months, demonetisation may not have affected how less financially included households perceived the country's long-run economic stability.

Finally, Table 9 examines how demonetisation affected less financially included house-

| Conditions In Country Over Next 5 Years | | | | | |
|---|---|---|----------------------------|--|--|
| | Continuously good times (1) | Uncertain with ups and downs (2) | Continuously bad times (3) | | |
| Post*Quintiles | | | | | |
| Quintile 1 | $0.025 \\ (0.042)$ | -0.033 (0.041) | 0.008 (0.027) | | |
| Quintile 2 | 0.021 (0.033) | -0.005 (0.031) | -0.015 (0.027) | | |
| Quintile 3 | $\begin{array}{c} 0.043 \\ (0.035) \end{array}$ | -0.049 (0.035) | $0.006 \\ (0.025)$ | | |
| Quintile 4 | -0.026 (0.036) | $\begin{array}{c} 0.012 \\ (0.032) \end{array}$ | 0.014 (0.022) | | |
| Controls Household FE Month FE | Y Y Y | Y Y Y | Y Y Y | | |
| Observations r2 | 724,134 0.391 | 724,134 0.359 | 724,134 0.402 | | |

Table 8—Effect of Demonetisation on Conditions In Country Over Next 5 Years by Financial Inclusion Quintile

Notes: This table depicts the effect of demonetisation on the within-household probability of reporting each response (Continuously good times/Uncertain with ups and downs/Continuously bad times) to "How would you describe the financial and business conditions in our country over the next 5 years?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications and calculated according to (Somanchi, 2021). Robust standard errors are clustered at the district level and reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1

holds' perceptions of whether this is a good time to purchase consumer durables, relative to the most financially included households. Once again, the weighted specifications provide noisy and insignificant coefficients. A plausible explanation for these estimates is that since households in less financially included districts did not perceive their personal finances to be significantly adversely affected by demonetisation, and given that they were only marginally more optimistic about the economic conditions in the country for the next 12 months, their beliefs about whether it is a good time to invest in consumer durables did not significantly shift after demonetisation.

Overall, these results indicate that despite its disastrous implementation, the November 2016 demonstration event did not lead to significant changes in Indian households' sentiments regarding their personal finances and the economic conditions in the country, even among households living in districts belonging to the lowest quintiles of financial inclusion.

| Is This A Good Time To Buy Consumer Durables | | | | | |
|--|--------------------|-------------------------|---|--|--|
| | Good time (1) | Same as other times (2) | Bad time (3) | | |
| ${\rm Post}^*{\rm Quintiles}$ | | | | | |
| Quintile 1 | -0.014 (0.034) | $0.007 \\ (0.040)$ | $0.008 \\ (0.035)$ | | |
| Quintile 2 | $0.005 \\ (0.029)$ | -0.020 (0.032) | $\begin{array}{c} 0.015 \\ (0.035) \end{array}$ | | |
| Quintile 3 | -0.008 (0.027) | -0.013 (0.035) | $\begin{array}{c} 0.021 \\ (0.032) \end{array}$ | | |
| Quintile 4 | -0.017 (0.030) | $0.015 \\ (0.031)$ | $\begin{array}{c} 0.002 \\ (0.032) \end{array}$ | | |
| Controls Household FE Month FE | Y Y Y | Y Y Y | Y Y Y | | |
| Observations r2 | 724,134 0.409 | 724,134 0.372 | 724,134 0.425 | | |

 Table 9—Effect of Demonetisation on Is This A Good Time To Buy Consumer Durables

 by Financial Inclusion Quintile

Notes: This table depicts the effect of demonetisation on the withinhousehold probability of reporting each response (Good time/Same as other times/Bad time) to "Do you think that this is generally a good time to buy consumer durables like furniture, refrigerators, televisions, two-wheelers, cars, etc?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, predemonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications and calculated according to (Somanchi, 2021). Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Despite placing higher weights on the worst affected (rural) households in these districts, we find that demonetisation only resulted in small, marginally significant changes in their sentiments relative to those in the most financially included districts. Our estimates suggest that

after demonetisation, households in lower quintiles of financial inclusion became slightly less likely to report worse family finances and slightly more likely to report that they expect good economic conditions in the country for the next 12 months relative to those in the highest quintile. However, these effects only arise a few months later, when the economic impacts of demonetisation in the worst affected districts had largely dissipated (Chodorow-Reich et al., 2020).

5.1 Placebo Test

To verify that these results correctly identify the relative effects of demonetisation in November 2016 and check for pre-trends in the relationship between financial inclusion quintiles and household sentiments, we conduct a placebo test on the weighted specifications that shifts the treatment to April 2016, which is mid-way through the pre-period (September 2015 - October 2016). We present the results of these tests in Tables 10 to 14 in the Appendix (Section 8).

The weighted estimates for the placebo effect of demonetisation (defined to occur in April 2016) on sentiments regarding households' personal finances are insignificant for all four lower quintiles (as shown in Tables 10 and 11). However, Tables 12 to 14 report some positive and significant coefficients for the 'Bad times' response to the questions regarding economic conditions in the country and whether this is a good time to purchase consumer durables. This suggests that households in lower quintiles were more likely to have negative sentiments regarding the financial conditions in the country before demonetisation, relative to those in the highest quintile. As a result, the estimates depicted in column (3) of Tables 7 to 9 may not be robust to pre-trends.

In light of this robustness check, we have focused the discussion of our results in the previous section on the marginally significant weighted estimates for 'Worse' personal finances and 'Good' expected economic conditions depicted in Tables 5 to 7, as they remain robust to the placebo test and confirm the absence of pre-trends in the event studies shown in Figures 2 to 4.

6 Conclusion

India's November 2016 demonstisation event was a rare natural experiment in monetary policy that had significant but temporary adverse consequences on its mostly cash-dependant economy. Despite its detrimental effects on several economic indicators, the ruling party responsible for the policy's introduction paid no political price in subsequent elections.

In this paper, we attempted to gain insight into this puzzle by examining how demonetisation heterogeneously affected the sentiments of Indian households depending on the severity of their exposure to the policy, as defined by their district-level financial inclusion quintile. We found that despite being worst affected, households in lower quintiles of financial inclusion were not more likely to report worse personal finances and were slightly more likely to expect good economic conditions in the country following demonstration, relative to households in the highest quintile. However, these effects only arose after the policy's negative economic impacts had dissipated.

These estimates provide an interesting insight into Indian households' perceptions of major economic shocks. Our results suggest that household sentiments did not significantly react to the difficulties they experienced following demonetisation, as they may have perceived it to be a temporary shock. This supports the results of (Cocco et al., 2020), who find that household sentiments exhibit mean-reversion following a temporary negative shock to their earnings. This lack of an immediate and persistent adverse impact on household sentiments may explain why the BJP did not face any political backlash in elections held after demonetisation.

This paper provides further evidence against the retrospective voter theory since it indicates that voters may not always punish/reward incumbents for policies directly attributable to them. This highlights the need for greater political accountability in democracies, such as through the presence of a free and independent media, to ensure that voters internalise the economy-wide costs of such ill-advised policies, even when they do not feel personally slighted. As populist leaders worldwide maintain their political popularity despite their poor economic performance, such mechanisms are vital to ensuring the efficient functioning of any democracy.

7 References

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8 Appendix

8.1 Event Studies



Figure 5. Family Finances Compared To A Year Ago = Better



Figure 6. Family Finances Compared To A Year Ago = Same



Figure 7. Family Finances Compared To A Year Ago = Worse



Figure 8. Family Finances A Year Later = Better



Figure 9. Family Finances A Year Later = Same



Figure 10. Family Finances A Year Later = Worse



Figure 11. Conditions In Country Over Next 12 Months = Good times



Figure 12. Conditions In Country Over Next 12 Months = Uncertain times



Figure 13. Conditions In Country Over Next 12 Months = Bad times



Figure 14. Conditions In Country Over Next 5 Years = Continuously good times



Figure 15. Conditions In Country Over Next 5 Years = Uncertain with ups and downs



Figure 16. Conditions In Country Over Next 5 Years = Continuously bad times



Figure 17. Is This A Good Time To Buy Consumer Durables = Good time



Figure 18. Is This A Good Time To Buy Consumer Durables = Same as other times



Figure 19. Is This A Good Time To Buy Consumer Durables = Bad time

8.2 Placebo Tests

| Family Finances Compared To A Year Ago | | | | | |
|--|---|-----------------------|---|--|--|
| | Better (1) | $\mathbf{Same}_{(2)}$ | Worse (3) | | |
| Post April 2016 [*] Quintiles | | | (-) | | |
| Quintile 1 | -0.025 (0.036) | 0.007 (0.039) | 0.018 (0.024) | | |
| Quintile 2 | -0.006 (0.034) | -0.023 (0.035) | $\begin{array}{c} 0.029 \\ (0.020) \end{array}$ | | |
| Quintile 3 | $0.003 \\ (0.031)$ | -0.001 (0.033) | -0.003 (0.018) | | |
| Quintile 4 | $\begin{array}{c} 0.010 \\ (0.033) \end{array}$ | -0.042 (0.037) | $\begin{array}{c} 0.032 \\ (0.024) \end{array}$ | | |
| Controls | Υ | Υ | Y | | |
| Household FE | Υ | Υ | Υ | | |
| Month FE | Υ | Υ | Υ | | |
| Household Weights | Υ | Υ | Y | | |
| Observations | 440,083 | 440,083 | 440,083 | | |
| r2 | 0.519 | 0.497 | 0.498 | | |

Table 10—Placebo Test for Family Finances Compared To A Year Ago by Financial Inclusion Quintile

Notes: This table depicts the placebo effect of demonetisation (defined to occur in April 2016) on the within-household probability of reporting each response (Better/Same/Worse) to "Compared to a year ago, how is your family faring financially these days?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications. Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

| Family Finances A Year Later | | | | | |
|--|------------------------------|-------------------------------|-------------------------------|--|--|
| | Better | Same | Worse | | |
| | (1) | (2) | (9) | | |
| Post April 2016 [*] Quintiles | | | | | |
| Quintile 1 | -0.052 | 0.023 | 0.029 | | |
| Quintile 2 | (0.000) -0.032 (0.025) | (0.003) (0.001) (0.028) | (0.013) (0.032) (0.021) | | |
| Quintile 3 | -0.010 (0.024) | -0.005 (0.026) | $0.015 \\ (0.018)$ | | |
| Quintile 4 | -0.023 (0.029) | -0.014 (0.031) | $0.037 \\ (0.023)$ | | |
| Controls | Y | Y | Y | | |
| Household FE | Υ | Υ | Y | | |
| Month FE | Υ | Υ | Υ | | |
| Household Weights | Y | Y | Y | | |
| Observations r2 | 440,083 0.519 | 440,083 0.493 | 440,083 0.502 | | |

Table 11—Placebo Test for Family Finances A Year Later by Financial Inclusion Quintile

Notes: This table depicts the placebo effect of demonetisation (defined to occur in April 2016) on the within-household probability of reporting each response (Better/Same/Worse) to "A year from now, how do you think your family would be faring financially?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications. Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

| Conditions In Country Over Next 12 Months | | | | | |
|---|--------------------|---------------------|--|--|--|
| | Good times (1) | Uncertain times (2) | Bad times (3) | | |
| Post April 2016 [*] Quintiles | | | | | |
| Quintile 1 | -0.045 (0.039) | 0.016 (0.037) | 0.030^{*} (0.018) | | |
| Quintile 2 | -0.021 (0.039) | -0.020 (0.041) | $\begin{array}{c} 0.041^{**} \\ (0.019) \end{array}$ | | |
| Quintile 3 | -0.005 (0.032) | $0.001 \\ (0.032)$ | $0.004 \\ (0.019)$ | | |
| Quintile 4 | -0.019 (0.042) | -0.013 (0.040) | 0.032^{*} (0.019) | | |
| Controls Household FE Month FE Household Weights | Y Y Y Y | Y Y Y Y | Y Y Y Y | | |
| Observations r2 | $440,083 \\ 0.524$ | 440,083 0.490 | 440,083 0.515 | | |

 Table 12—Placebo Test for Conditions In Country Over Next 12 Months by Financial Inclusion Quintile

Notes: This table depicts the placebo effect of demonetisation (defined to occur in April 2016) on the within-household probability of reporting each response (Good times/Uncertain times/Bad times) to "How would you describe the financial and business conditions in our country over the next 12 months?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications. Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

| Conditions In Country Over Next 5 Years | | | | | | |
|---|-------------------------------|---|--|--|--|--|
| | Continuously good times (1) | Uncertain with ups and downs | Continuously bad times (2) | | | |
| | (1) | (2) | (3) | | | |
| Post April 2016 [*] Quintiles | | | | | | |
| Quintile 1 | -0.042 (0.036) | $0.030 \\ (0.035)$ | 0.013 (0.018) | | | |
| Quintile 2 | -0.053 (0.033) | $\begin{array}{c} 0.011 \\ (0.034) \end{array}$ | 0.042^{*} (0.022) | | | |
| Quintile 3 | -0.012 (0.029) | $\begin{array}{c} 0.013 \\ (0.030) \end{array}$ | -0.001 (0.018) | | | |
| Quintile 4 | -0.031 (0.039) | -0.007 (0.039) | $\begin{array}{c} 0.038^{**} \\ (0.019) \end{array}$ | | | |
| Controls Household FE | Y Y | Y Y | Y Y | | | |
| Month FE Household Weights | Y Y | Y Y | Y Y | | | |
| Observations r2 | 440,083 0.534 | 440,083 0.503 | 440,083 0.531 | | | |

Table 13—Placebo Test for Conditions In Country Over Next 5 Years by FinancialInclusion Quintile

Notes: This table depicts the placebo effect of demonetisation (defined to occur in April 2016) on the within-household probability of reporting each response (Continuously good times/Uncertain with ups and downs/Continuously bad times) to "How would you describe the financial and business conditions in our country over the next 5 years?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications. Robust standard errors are clustered at the district level and reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1

| Is This A Good Time To Buy Consumer Durables | | | | | |
|---|---|---|--|--|--|
| | Good time (1) | Same as other times (2) | Bad time (3) | | |
| Post April 2016 [*] Quintiles | | | | | |
| Quintile 1 | -0.040 (0.034) | -0.017 (0.035) | 0.058^{**} (0.026) | | |
| Quintile 2 | -0.051 (0.033) | 0.021 (0.035) | $0.030 \\ (0.026)$ | | |
| Quintile 3 | -0.018 (0.029) | 0.011 (0.032) | $0.006 \\ (0.021)$ | | |
| Quintile 4 | $\begin{array}{c} 0.001 \\ (0.039) \end{array}$ | -0.023 (0.037) | $\begin{array}{c} 0.022\\ (0.025) \end{array}$ | | |
| Controls Household FE Month FE Household Weights | Y Y Y Y | Y Y Y Y | Y Y Y Y | | |
| Observations r2 | $\begin{array}{c} 440,\!083 \\ 0.543 \end{array}$ | $\begin{array}{c} 440,\!083 \\ 0.500 \end{array}$ | 440,083 0.538 | | |

 Table 14—Placebo Test for Is This A Good Time To Buy Consumer Durables by

 Financial Inclusion Quintile

Notes: This table depicts the placebo effect of demonetisation (defined to occur in April 2016) on the within-household probability of reporting each response (Good time/Same as other times/Bad time) to "Do you think that this is generally a good time to buy consumer durables like furniture, refrigerators, televisions, two-wheelers, cars, etc?" for each financial inclusion quintile, relative to the highest (fifth) quintile. Controls include an indicator for rural households, pre-demonetisation average household income, education, age and size category and district-level night lights. Household weights are included in all specifications. Robust standard errors are clustered at the district level and reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1