

Studying the Discourse on Economic Policies in India Using Mass Media, Social Media, and the Parliamentary Question Hour Data

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ABSTRACT

The parliament, media, and citizens, are key stakeholders in any democracy. We study their priorities pertaining to four economic policies in India - Demonetization, Aadhaar, GST, and Farmers' Protests - by examining the content of questions asked by politicians in the parliament, news articles published in the mass media, and data from social media. We find that the mass media covers stories about different constituencies (the poor, middle-class, corporates, etc.) but shows biases in terms of which constituencies it chooses to focus on for each policy. The parliament tends to focus on procedural aspects of the policies. We also find that the social media simply echoes the trends of whatever is emphasized more in the mass media, without much deviation in the attention placed by social media users on different issues. We further find out that instead of selecting issues of importance based on feedback from citizens, the parliamentarians mostly indulge in partisanship, and shape their questions based on party goals that change depending on whether their party is in power or not. Overall, we are able to use this analysis to comment on how representative and responsive the Indian democracy is to its citizens.

CCS CONCEPTS

• **Information systems** → **Information systems applications**; • **Social and professional topics** → *Computing / technology policy*; • **Applied computing** → *Computers in other domains*.

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KEYWORDS

Media bias, mass media data, social media data, parliamentary data, policy process, question hour, topic modelling, LDA

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1 INTRODUCTION

The parliament, media, and the citizens are some of the most important stakeholders in the democratic process. While the parliament is the key stakeholder in policy formulation, mass media is an important agency through which public opinion on these policies are formed and influenced. Finally, through social media, citizens can find a voice to convey their experiences and opinions about policies, and potentially even shape the discourse even in the media and parliament. Given these duties of the key stakeholders of democracy, we present in this paper a measurement study to understand the ways in which these stakeholders engage in the policy process, by examining the content in each of these spaces. For this purpose, we study four economic policies in India, namely, *Demonetization*, *Aadhaar*, *GST*, and *Farmers' Protest*.

Demonetization was a policy move where the government on 8 November, 2016 banned all INR 500 and INR 1000 banknotes with the motive to curtail the use of illicit and counterfeit cash used to fund illegal activity and terrorism. The move was widely criticized owing to multiple problems caused to common people due to sudden depletion of liquidity, irregularities in norms of exchanging old currency notes, cash exhaustion in ATMs, etc. [22]. The suddenness of the policy move also led to suffering on part of the farmers and daily wage earners due to shortage of cash among people, and

understaffed banks unable to dispense cash. *Aadhaar* is an initiative by the government to give every Indian resident a biometric-based unique identification number. The policy (or platform) has been criticized owing to lack of security and privacy in citizens' data collection and storage mechanisms, and also because of technology based failures that led to exclusion of several people from welfare benefits, allegedly with tragic consequences when entitlements to subsidized food items were denied to poor people [14]. GST is an indirect tax levied in India on the sale of goods and services. It is levied at each step of the production value-chain with an effort towards formalization of the industry and simplification of multiple types of taxes which preceded the GST regime. Since its implementation there have been intense debates though on its complexity and problems in implementation which have impacted the overall growth of the economy [11]. The *Farmers' Protests* event is based on a series of protests by farmers in India including the ones at Madhya Pradesh (Mandsaur protest) and Maharashtra (Kisan long march) demanding better prices for production of crops, loan waivers, and forest rights, among others [15]. The issue is highly active politically with significant involvement of different politicians and political parties. We select these economic policies for our analysis as they are some of the key policies implemented or taken forward by the current government, as reported in multiple media outlets and forums [10]. We answer the following research questions using the data corresponding to the three key stakeholders – parliamentary question hour data (QH), mass media articles, and social media posts of followers of news-sources on these policies:

- **RQ1:** Which aspects about the policies do the mass media, the social media community, and the QH data cover?
- **RQ2:** How do the statements/questions vary across the dominant political parties?

For the analysis of mass media data, we consider seven popular English dailies in India, namely, The Hindu (Hindu), Telegraph (TeleG), Indian Express (IE), New Indian Express (NIE), Deccan Herald (DecH), Times of India (ToI), and The Hindustan Times (HT). We consider all mainstream articles (excluding opinions and editorials) from these news-sources since 2011, and collect the article text. For the social media analysis, we consider the followers of all of these news-sources, and their latest 3000 tweets and retweets on the policies considered. Finally, we analyze data on the questions asked by elected members of the Parliament (MPs) during the parliamentary question hour on the various policies between 2013 and 2017.

We find that the coverage of the five constituencies of poor, middle class, corporate, informal sector, and government, varies in the data produced by the three key stakeholders of democracy, and that there is a lack of in-depth understanding of the issues of the poor. For less politicized policies, the mass media and the social media community are seen to provide insufficient attention to the poor, and the Parliament is seen to consistently cover procedural aspects and mechanics underlying a policy, rather than highlight concerns of different constituencies of citizens. We also find that the social media follower community of news-sources echo the trend of highlighting whatever aspects are covered in the mass media, with little variation in emphasis of its own. This finding is in sync with other studies like [7] where the authors find a positive correlation between the ranking or placement of an article on a website, and the probability with which it is shared by the website visitors. The tendency of social media users to share news from trusted sources (like the seven popular news-sources we considered) seems to be similar to this effect [5]. Discussions by the people on social media do not sufficiently recognize the issues that are of importance to educated and higher income consumers (as seen for GST where coverage of the issues related to middle class is less) who are the primary social media users, nor does it help highlight the issues of the poor. Our analysis also shows that the parliamentarians mostly are involved in partisanship on party lines [40], and shape their discussions based on their party goals that change over time depending on whether they are in power, or in the opposition.

2 RELATED WORK

In this section, we discuss the studies relevant to our work that span the three stakeholders of democracy, namely, the parliament, the mass media, and the social media.

Question Hour (Parliament): While the issue of parliamentary accountability is ridden with complexities, one way to contextualize the proceedings of the Question Hour (QH) in the Parliament is to understand the policy focus and interests of sitting MPs. The website of the Lok Sabha lays down the purpose of parliamentary questions as follows: *Through the Question Hour the Government is able to quickly feel the pulse of the nation and adapt its policies and actions accordingly. It is through parliamentary questions that the Government remains in touch with the people in as much as members are enabled thereby to ventilate the grievances of the public in administrative matters. Questions enable Ministries to gauge the popular reaction to their policy and administration. Questions bring to the notice of the Ministers many loopholes which otherwise would have gone unnoticed. Sometimes questions may lead to the appointment of a Commission, a Court of Enquiry or even Legislation when matters raised by Members*

are grave enough to agitate the public mind and are of wide public importance(Questions: Introduction)¹. There are a number of studies regarding parliamentary questions in democracies, which try to understand the incentives of asking a large number of questions on certain topics - whether they are linked to gender [8], caste [3], direct electoral links [9], experience or seniority [4], or constituency demographics [35]. Thus, parliamentary questions can be effectively studied by classifying data with respect to the area of concern being represented. The policy focus of questions form a proxy for understanding the actual priorities and concerns of MPs in the House. While the extant literature on parliamentary questions in India is focused on quantifying involvement of individual MPs, the analysis of the question content remains largely unexplored. Our work fits in this space by looking at the questions asked regarding different policies and their aspects, to see if it sufficiently represents the concerns of all sections of people.

Mass media: Mass media shapes public opinion by intentionally or inadvertently having bias in their selection, writing, and distribution of news, and for this reason they have often been called *gatekeepers* [33]. Scheufele et al. discuss the concepts of agenda setting, framing, and priming in mass media [36], which together play a significant role in influencing public opinion on socio-political issues. Oliver and Myers [25] write that the claim of the media being an objective and neutral communicator of events has been rejected by scholars of the media for quite some time now (e.g., Herman and Chomsky [19]). Instead the focus has now turned to understanding and revealing the biases inherent in the production of “news” [25]. For instance, scholars interested in studying patterns of protests have found that national media reports tend to be focused on large events that occur in central locations within urban areas [12] and which are “dramatic” in nature i.e., have some tension or conflict [25]. In addition to the spatial variation in media coverage, there is another set of organizational specific factors which are crucial for understanding what constitutes “news” - the funders and the audience. The content of newspapers also depends on how a newspaper generates its revenues and who constitutes its audience. If for example, a newspaper depends on government advertisements, it will be less likely to report events that show the government in an unfavorable light for the fear that its funding maybe cut. Revenue dependency coupled with the readership base further constrains what a newspaper calls “news”. If for instance, most of the readers of a particular newspaper live in urban areas and are interested in “local” news, then it does not make much sense for the newspaper to invest resources in building a rural information network to collect reliable information about

rural politics [12]. Overall newspapers are not a passive relay of what we call “news”. Instead, “news” is actively produced by newshouses and what makes something “newsworthy” is determined by disparate factors, which may vary between media houses. Significant research has been conducted in the area of bias detection in terms of the political ideology of news-sources, blogs, and political speeches using partisan tokens [16], bag of words [17], HMM based models [39], hierarchical topic modeling [24], and deep neural networks [20]. Unlike these studies, our work focuses on probing variation in coverage of issues, and the way it engages in the policy process by covering different aspects relevant to the policy.

Social media: The social media space is different from that of newspapers primarily with respect to the factors that have been discussed as crucial in the production of news or what makes something “newsworthy”, i.e., location, type of event, funding, audience. The role of these factors is attenuated in that theoretically, anyone with an account on any social media platform can produce “news” and more importantly for our purposes, leaders and people can directly communicate with each other. They can be based either in rural or urban areas (although there is a bias towards the latter due to divides in technology access), discuss any event (dramatic or not), there is no dependency on external funding and the audience is created depending on the content of messages. There are several metrics that have been used to measure what counts as “newsworthy” - number of followers or re-tweets on Twitter or the number of likes on Facebook or YouTube. Allegedly as anyone can participate in the making of “news” on social media some have referred to the use of such social media platforms as “liberation technology” [13] which could play a critical role in the emergence of a strong and robust civil society that holds the political class accountable. Furthermore, as the pressure towards democratization increases, it is also expected that political leaders will increasingly turn towards using social media [6, 27, 28, 30]. An example of this was witnessed during Narendra Modi’s campaign in the 2014 Lok Sabha election. Pal et al. show how Modi used social media to connect with younger voters and rebrand himself from a controversial personality to a tech savvy politician in tune with the aspirations of his constituents [26, 29]. The jury however is not out on this question on who does the social media give voice. Some have found social media platforms to exacerbate pre-existing biases and produce what is commonly referred to as “echo chambers” [2, 32] and others argue that social media tends to expose us to diverse sources of information and that this phenomenon of “echo chambers” is restricted to a small segment of the population [18]. Given that social media can play an important role in influencing and conveying public opinion, and that a majority of the population on social media is educated, we want to find out if the information seen on

¹<https://loksabha.nic.in/>

social media is more representative of citizen issues, and is different from mass media.

3 METHODOLOGY

In this section, we describe the method followed for data collection, aspect extraction, and analysis of mass media, social media, and QH data.

3.1 Collection of articles, tweets, and questions

We extract articles on a given policy event from our repository of media articles based on a set of manually selected keywords related to the event as shown in table 1 in the appendices. We collect tweets and retweets of all followers of a news-source handle, and extract the tweets corresponding to the policy events using the same set of keywords. We do this by first obtaining a list of all followers for every news-source, and then extracting their latest 3000 tweets (upper limit of tweets provided by Twitter for each follower) using the Tweepy API. Finally, these tweets are segregated into different policy events using the same set of keywords used to extract articles. We collect the question hour (QH) data from the website for Lok Sabha, and study the questions relevant to each policy event. The “Lok Sabha” is the term used to refer to the Lower House of the Indian Parliament.

3.2 Aspect extraction using LDA

Mass media: We use Latent Dirichlet Allocation (LDA) to identify different aspects within each event, similar to [41]. LDA is a statistical model that maps a set of documents to unobserved topics, which aids in clustering similar documents into topic clusters that can be manually examined and labeled. In our case, the documents refer to the media articles, which are mapped to different topic clusters, which we refer to as *aspects* henceforth. We obtained 16 aspects for *Demonetization*, 14 aspects for *Farmers’ Protest*, 11 aspects for *GST*, and 17 aspects for *Aadhaar* by merging some aspects together, and then named each aspect manually. Articles are mapped to aspects if LDA gives a probability of greater than 0.3 for the mapping. We used the best performing topic coherence measure as suggested in the paper by Roder et al. [34], in conjunction with the PyLDAVis package [38], to infer the optimal number of topic clusters to be specified for each policy event. To measure the accuracy of LDA aspect mapping, two authors randomly selected 200 articles from each event and assigned aspect names for each of those articles (from the aspects labeled after performing LDA) by reading the article text and coming to an agreement. We then checked if the manually assigned and the LDA-assigned aspects for the articles match with each other. The accuracies of mapping are 85% for *Demonetization*, 96% for *Aadhaar*, 81% for *GST* and 76% for *Farmers’ Protest*.

Social media: We map only those tweets that contain URLs of mass media articles to the aspects to which these articles belong, since tweets are concise and sometimes even grammatically incorrect, which makes it difficult to map them to specific aspects. Hence, the mass media URL carried by the tweet aids in mapping the tweet to one or more of the existing aspects as defined for mass media. Note that for each follower of a news-source, we also obtain tweets written by the user that may refer to one of other six news-sources as well, and thus we are able to observe actions related to any of the news-sources by the overall social media follower community of the news-sources. The number of tweets containing article URLs of the four events considered are 34521 for *Aadhaar*, 59489 for *Demonetization*, 38073 for *GST*, and 22820 for *Farmers’ Protest*, which constitute 8.7%, 4.8%, 3.3%, and 4.4% of the total number of tweets collected, respectively. We are looking into techniques to achieve a better tweet to aspect mapping heuristic currently.

QH data: We begin with identifying the questions about the four specific issues we have analyzed in this paper, namely, *Demonetization*, *Aadhaar*, *GST*, and *Farmers’ Protest*. This is done using the the same set of keywords as mentioned in table 1, which were used to extract articles from mass media. Next, we manually map each of these questions to an aspect already created for mass media data. This mapping is done by two annotators after coming to a mutual agreement on each mapping, enabling us to compare the QH and mass media data with each other, on the same aspects. Each question is asked by a single or a group of MPs, and thus we are able to understand the questions asked by political parties.

3.3 Mapping of aspects to constituencies

One of the goals of our work is to identify the alignment of a news-source in terms of some standard constituencies, in order to study the effect of *framing* in the mass media. We identify five constituencies: *poor*, who typically benefit from wealth distribution strategies; *middle class*, consumers who have disposable income, and benefit through tax breaks and lower prices; *corporate*, which include big corporates, formalization, economic growth, free-market policies, and minimum governance; *informal sector*, driven by small enterprises and aided by slow formalization of industries and trade, also including agriculture; and *government* in terms of pro/anti viewpoints towards the state. For each policy event, we map each aspect to these five constituencies based on whether the aspect supports or opposes or is not applicable to the particular constituency. For example, for *Demonetization*, the aspect on [*Queues at banks and ATMs*] is classified as pro-middle class because most articles on this aspect were negatively writing about the problems caused to the common people in getting cash at ATMs. The same aspect is classified

as anti-government because negative articles on this aspect were critical of the government's apathy and lack of foresightedness in handling the issue. Details of the mapping can be found in our supplementary material [1].

These five constituencies and the news-sources' alignment to them help us in studying the effect of framing in mass media. It is important to note that other kinds of constituencies can be added by identifying different frames. We chose the aforementioned frames because the specific economic policies considered in the paper are strongly related to these frames of content presentation and perception. The mapping of aspects to constituencies was done manually, until all authors came to an agreement on the mapping.

4 DATA

Mass media: To carry out our analysis, we have built a corpus of mass media data collected from the websites of seven leading national news dailies in India, which are known to have varying slants towards the five constituencies. Our data consists of 4 million news articles from 2011 to present, gathered on a daily basis from the following news-sources: *The Hindu*, *The Times of India (TOI)*, *Indian Express (IE)*, *The New Indian Express (NIE)*, *Telegraph (TeleG)*, *Deccan Herald (DecH)* and *Hindustan Times (HT)*, and online archives of the news-sources were used to build a corpus of news articles since 2011. We perform our analysis on 17849 articles on Demonetization (Nov 2016 to Jan 2017), 12809 articles on Aadhaar (2011 to 2017), 15756 articles on GST (Jan 2011 to June 2017), and 13840 articles of Farmers' Protest (Nov 2016 to Apr 2018). The periods for Demonetization and GST were identified around the immediate months when the policies came into effect. Aadhaar and agricultural issues have had long standing debates, and therefore a longer period of time was used for these topics.

Social media: Social media data is obtained for each policy event by extracting the last 3000 tweets of every follower of the official Twitter handles of the news-sources. The number of followers corresponding to each news-source are: TOI (11026374), HT (6299716), Hindu (4842234), IE (2742132), NIE (347148), TeleG (51884), and DecH (24896). Hereinafter, we refer to this set of followers of news-sources as the *social media community*. This community does not represent the entire user base of Twitter who talk about the policies considered. This method rather helps us find differences between the mass media and its social media community, in terms of whether or not topics covered more extensively in the mass media are also the ones on which the social media follower community resonates. The number of tweets for the events are 396499 for Aadhaar, 1236500 for Demonetization, 1147154 for GST, and 512457 for Farmers' Protest. We refer to this set of tweets as *TweetFol* throughout the paper.

Question hour: This study takes into consideration 135,460 questions raised during the period of 15th (2009 - 2014) and 16th (2014 - till date) Lok Sabha sessions of the Indian Parliament. All elected representatives have the right of raising questions in the Indian legislature – Members of Parliament (MPs) ask questions to ministers eliciting information regarding the status or conduct of specific policies concerning their respective ministries. The first hour of each day's parliamentary session is reserved for what is called the 'Question Hour'. As per the Rules of Procedure of the Lok Sabha, i.e., the lower House of the Indian Parliament, for each day, 250 questions are tabled on the floor of the house, which are selected by a random ballot. Of these 250 questions, 20 are marked for oral answers (starred questions), and 230 are marked for written answers (unstarred questions) by the authoring MPs. The complete data for these questions is available on the Lok Sabha's website for the last four Lok Sabha Assemblies (from the 13th to the 16th Lok Sabha), with over 60,000 questions asked in each Assembly. These questions have been raised by 925 Lok Sabha MPs in the course of the period of study. We finally obtain 351 questions for Demonetization, 89 questions for Aadhaar, 151 questions for GST, and 140 questions for Farmers' Protest in the entire QH data for 15th and 16th Lok Sabha.

5 RESULTS

(RQ1:) In this section, we analyze each policy separately, to understand the relative aspect coverage given by mass media, social media, and parliamentary question hour data to different aspects. Relative aspect coverage for an aspect a is defined as:

$$coverage(a) = \frac{count(e, a)}{\sum_{j \in A} count(e, j)} \quad (1)$$

where $coverage(a)$ is the relative coverage, A is the set of all aspects, and $count(e, a)$ defines the count of entries in all articles/tweets/questions belonging to aspect a . In case of mass media data, $count(e, a)$ refers to the total number of words in all articles belonging to aspect a . In case of social media data, $count(e, a)$ refers to the number of tweets on aspect a . Finally, for QH data, $count(e, a)$ refers to the number of questions asked on aspect a . Relative coverage is thus a measure of the attention provided by the stakeholders to each aspect or constituency, and serves as an indicator of the importance attached by different stakeholders to the various aspects and constituencies. The notion of relative coverage thus helps us study the *agenda setting* effect of mass media, w.r.t. the attention it provides to the various aspects of a policy. In figure 1, we show the distribution of aspect coverage for mass media, social media, and QH data. We present relative coverages provided to each constituency

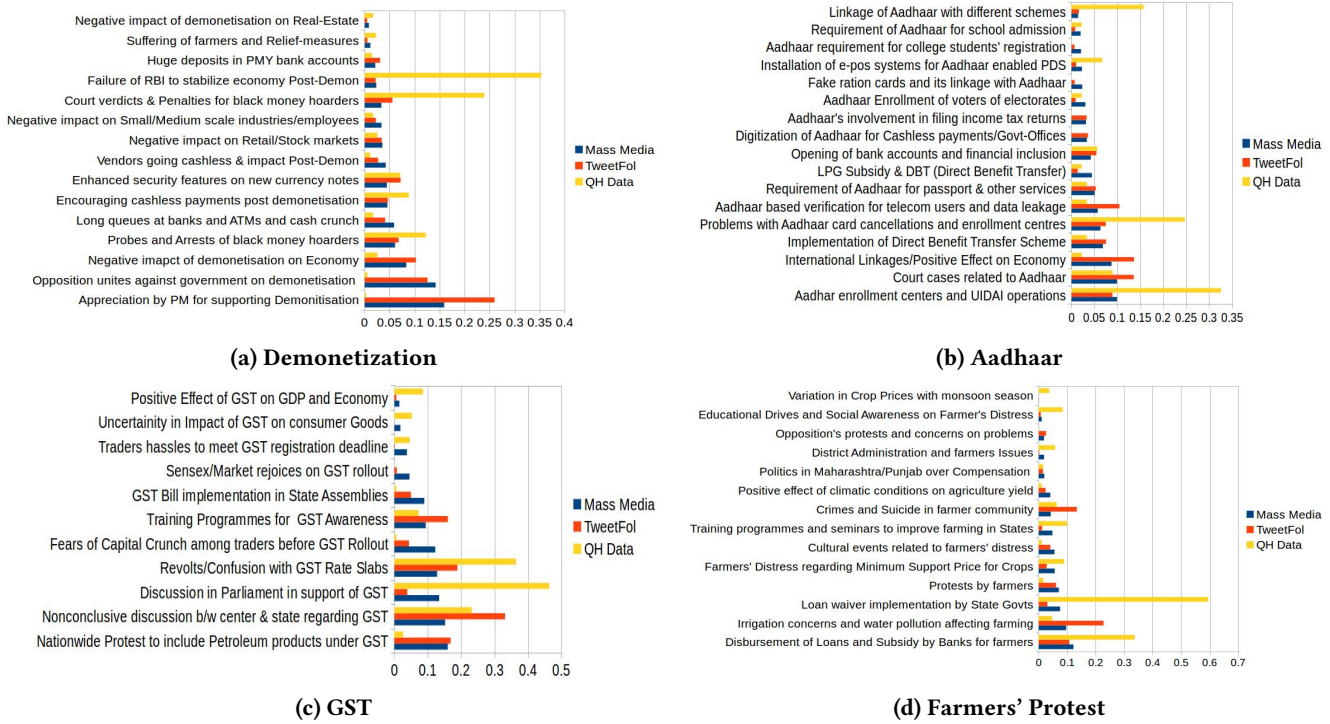


Figure 1: Relative aspect coverage of each policy by mass media, social media community, and QH data

by mass media, social media community, and QH data, for the four policies in figure 2.

5.1 Aspect coverage of the four policies in the mass media and the Parliament

Next, we present our analysis on each policy, to see which aspects get what coverage in mass media and QH data, and the implications of the trends observed.

Demonetization We find that the mass media provides high coverage to the government's narrative justifying Demonetization to the people, and the arguments about this justification between the government and the opposition. On the other hand, the QH data talks more about the mechanisms to realize the intended goals of the government (like curbing graft money and corruption), and to restore normalcy post implementation of the policy move.

The highest covered aspect in the mass media talks about the prime minister's statements on the policy, and his encouragement to the general public and the poor to support the policy move to fight black money and corruption. In this aspect, the articles cover the prime minister's expression of gratitude towards the poor and middle-class people for bearing the troubles post its implementation, and the benefits the policy would bring, like curbing the problems of black money, corruption, and terror funding, which would lead to

benefit of the people in the long term, thus justifying the government narrative behind the policy. The second highest covered aspect covers the opposition's comments and protests against Demonetization and the government narrative around it, and the prime minister's statements against the opposition for denouncing the move, calling the opposition parties anti-poor and anti-common man. This aspect includes articles that discuss the political debates around the move, and its benefits for the ruling party in garnering votes in the upcoming election. The articles in this aspect revolve around the political blame games, without much discussion of the actual issues related to these constituencies.

For QH data, we find that the highest covered aspect is quite different from that of mass media. QH data shows the highest coverage to [Failure of RBI to stabilize economy post Demonetization], which includes questions on issues like the menace of fake currency that circulated immediately after the move was announced and overall issues related to currency management. This aspect raised questions on restoring normalcy post implementation of the policy, and questions were asked to the ministries and the Reserve Bank of India (RBI) to elaborate the steps taken to control the spread of fake currency, the amount of fake currency confiscated at different locations, the results achieved from the steps taken,

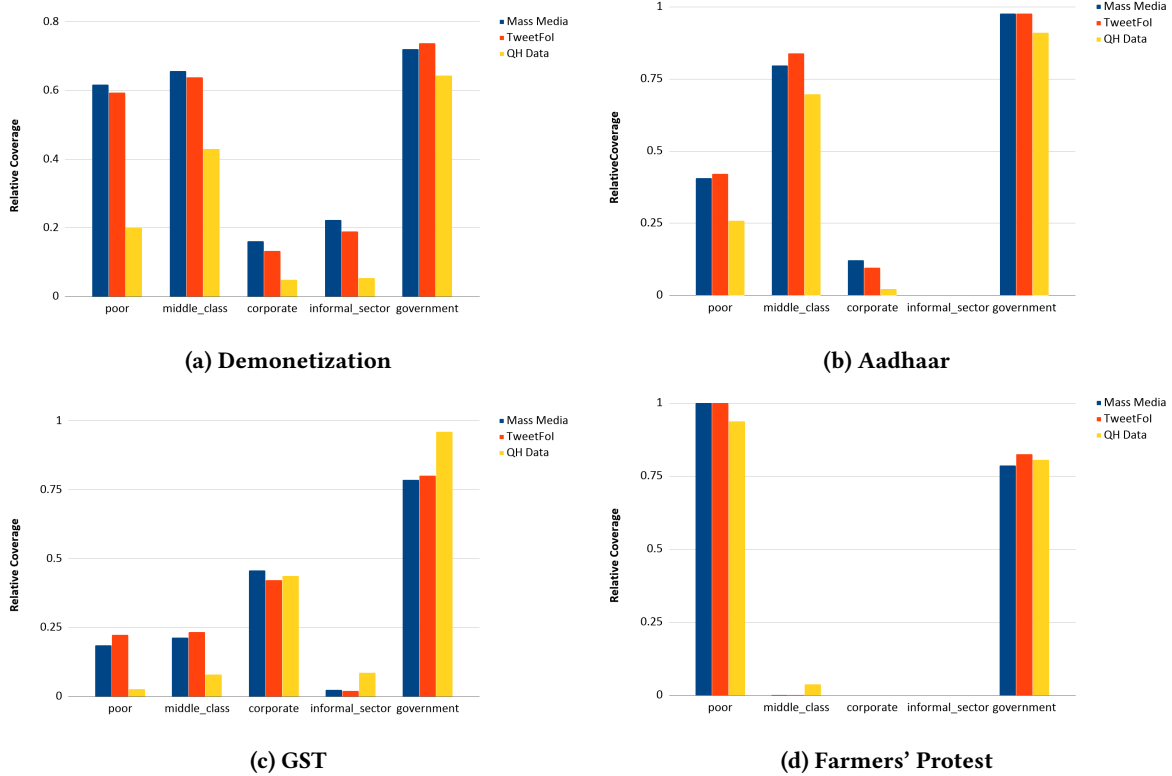


Figure 2: Relative coverage provided by mass media, social media community, and QH data to each constituency for the policies

and identification of the channels through which such malpractices are spread. The second highest covered aspect in QH data, [*Probes and arrests of black money hoarders*] covers questions on amount of black money seized, steps taken against the perpetrators, and the government's coordination with Switzerland to detect the graft money deposited in Swiss banks. This aspect primarily includes questions around the government's narrative behind the policy.

We thus see that the Parliament acts as a forum to provide feedback on the policy, and does ask relevant questions on improving the situation post its implementation. However, since Demonetization was a highly politicized issue, the mass media covers mostly the politics involved, and covers the state's narrative in support of the policy and the arguments arising from the opposition thereof. Thus, the reference to the poor and the middle class in mass media is only incidental, because the politicization of the issue included narratives and counter narratives built around these two constituencies. The government's narrative was that the policy would bring several benefits to the citizens, including curbing of black money, corruption, and terror funding. On the other hand, opposition's counter narrative was that the policy did not

result in the intended benefits, and rather led to sufferings caused to people due to shortage of cash, disruption in businesses, and adverse impact on the economy. This effect is also carried forward in the QH data. There rather exist a very few questions on the actual issues that affect the poor, middle class, and informal sector (e.g. long queues at ATMs leading to hassles of vendors and daily wage earners facing a lack of liquidity post Demonetization, and negative impact of the policy on small and medium scale industries/employees). Hence, although for this policy, the poor and middle class constituencies do get represented through politicization of the issue, this representation does not sufficiently address the genuine issues concerning them.

Aadhaar: From our analysis, we find that in Aadhaar, the mass media covers legal issues such as privacy and legitimacy of linking Aadhaar with welfare schemes, and practical issues with implementation, such as problems with enrollment centers. The QH data talks about the same issues as well. However, in both cases, there is more focus on issues of the middle class than of the poor. For example, the enrollment centers talked about are mostly cater to the middle class people in cities. The middle class constituency even

gets more attention in the legal discussion topics like privacy, than immediate issues to do with welfare scheme linkages. In fact, as reported in some sources [23], privacy concerns are not as important for the poor as a significant section of poor people like Aadhaar because it gives them an identity. Their problems primarily concern the implementation issues with the policy.

The highest covered aspect in Aadhaar by mass media talks about the court cases related to the policy – primarily on data security, right to privacy, and linking of Aadhaar to welfare schemes. This aspect discusses about the court cases on whether the right to privacy is a fundamental right, and the issues on leakage of citizens' data due to lack of planning and professionalism of the agencies appointed by the government to collect this data. The articles in this aspect directly mention the middle class citizens being one of the most affected constituencies. The number of articles related to the court cases on linkage of Aadhaar to different welfare schemes were much lesser compared to the cases on privacy issues. The second highest covered aspect in mass media discusses about the set up of Aadhaar enrollment centers at different cities, and technical issues related to implementation of different phases of the scheme by UIDAI. This aspect too primarily relates to the middle class residents, talking about steps taken by UIDAI to resolve the initial problems in Aadhaar registration faced by common people (like long queues at registration centers, problems in capture of biometric data, and shortage of UIDAI certified operators at registration centers), and the locations of enrollment centers set up.

For QH data, this is also the highest covered aspect, which covered questions dominantly around the UIDAI operations and implementation issues related to the Aadhaar scheme, especially on the inability of people to register for Aadhaar due to issues with biometrics during the different phases of Aadhaar implementation, and steps taken to deal with these problems. While this aspect also discusses issues like setting up of Aadhaar enrollment centers in metro cities, the questions and articles in this aspect do not specifically deal with the issues directly impacting the poor. The second highest covered aspect in QH data, [*Problems with Aadhaar card cancellations and enrollment centres*] discusses the steps taken by the government against the loopholes in the policy implementation. The issues discussed include cancellation of thousands of Aadhaar cards, the reasons behind cancellation, insufficient number of enrollment centers set up, the funds required by UIDAI to carry on its operations, and issuance of Aadhaar to illegal immigrants. This aspect again does not explicitly include questions on issues of the poor, and is more oriented towards the reprimands issued to the government owing to faults in implementation of the policy. In the mass media, aspects related to the middle class are covered 2.4x

more than coverage given to aspects relevant to the poor. This proportion is 1.8 for QH. This indicates a significantly higher coverage of issues of the middle class than that of the poor (figure 2).

We thus find that the QH data again includes technically detailed questions on the policy operations, and on improving its implementation. However, the focus is more on the middle class issues and not the poor. In mass media too the attention is more on informing the middle class citizens about the facilities for connecting them to the policy, the operations around policy implementation, and loopholes related to privacy of data. There is a conspicuous lack of attention to the issues impacting the poor directly. Thus, although Aadhaar is not an issue as highly politicized as Demonetization, it does not see a detailed study of the issues of the poor, either by the Parliament or by the mass media.

GST: We find that both the mass media and QH focus on operational issues of GST relevant to the small traders, and not on how the common people will get impacted. Therefore while in Demonetization a narrative was built on how it would benefit the poor and middle class, for GST there was no such attempt made by the politicians, and the mass media also did not see much coverage about such aspects.

The top aspect covered in mass media includes discussions on the protest by state politicians supporting inclusion of petroleum products under GST. The rationale behind this demand was that the price of petroleum products would reduce, if they come under the GST umbrella. This is an aspect relevant to the consumers directly. Other examples of issues related to consumers include rise in price of commodities and services because of more of them coming under the tax umbrella due to a push towards formalization, leading to informal enterprises dying out and making way for formal enterprises. However, these issues do not see much coverage from mass media. The second highest covered aspect in mass media discusses the implementation of the GST bill in different states, with significant amount of discussion revolving around the applicability of GST in Jammu and Kashmir, a state granted special status. This aspect does not relate to the issues of the middle class and the poor directly.

For QH data, we find that the top aspect is again different from the aspect covered most by mass media – [*Discussion in the Parliament in support of GST*], which includes questions regarding administrative issues regarding smooth passage of the GST bill. This aspect does not directly relate to the middle class and the poor, and involves technical discussions on the bill. The second highest covered aspect, [*Objections and confusions regarding GST rate slabs*] includes questions about applicability of GST to various sectors, and the parliamentarians asked most questions relevant to the small traders. Most questions relate to the different rates of GST

applied to different sectors of trade. This aspect does not directly connect to the middle class or the poor as well.

Therefore, as stated earlier, in GST the focus of the Parliament was primarily on the traders and companies, on push towards formalization, and not on how the poor and middle class consumers will be impacted because of GST. This trend provides an indication that GST was seen mostly by the government as a source of tax revenue through formalization, without much consideration given to the impact on the consumers [37]. This trend is also carried forward by mass media where the troubles faced by traders in registering for GST and political discussions on GST come among some of the top aspects covered. However, the mass media also gives highest coverage to the issue of bringing petroleum products under GST, which is directly relevant to the consumers. We also find that neither the mass media, nor the Parliament provides attention to the informal sector.

Farmers' Protest We find that in Farmers' Protest, both mass media and QH focus on loan waivers, with the mass media discussing about the reasons behind the poor farmers' debts, and structural changes required in the agricultural sector [31], while the QH discussing the mechanics of loan waivers and implementation of loan programmes by states.

[Disbursement of loans and subsidies to farmers by banks] is the highest covered aspect in mass media for Farmer's Protest, and talks about the loans provided to the farmers by banks, under various government schemes. In mass media, the second highest covered aspect is *[Irrigation concerns and water pollution affecting farming]*, which talks about the problems faced by farmers in irrigation, due to water pollution through industrial effluents.

The QH data shows highest coverage for the aspects *[Loan waiver implementation by state governments and oppositions' protests]* and *[Disbursement of loans and subsidies to farmers by banks]*. The questions asked in both of these aspects concern the technicalities around the implementation of different loan waiver schemes and the problems around them. However, unlike mass media, they do not sufficiently address the structural issues related to the agricultural scenario, or ask about the root causes behind the farmers' distress (like irrigation concerns and water pollution and issues with minimum support price of crops), or their solutions (like generating awareness on farmers' distress, and training programmes to improve farming through advanced and scientific methods).

Hence, although the mass media does cover the structural issues in agriculture, this trend is not carried forward in parliamentary discussions. The QH data shows the tendency of policy makers to achieve a quick remedy to problems of the farmers by supplying them loans through various loan schemes. However, we do not see sufficient attention given to the structural issues causing problems for the farmers or the

appropriate solutions to these issues. Thus, there exists a lack of detailed understanding of their issues and the structural changes required to address them in the Parliament.

5.2 Aspect coverage of the four policies in the social media community

Our method of analyzing social media data aims to check if the followers of news-sources on social media tweet some articles more than others, of what they read in the newspapers. A difference would indicate that the social media community of the news-sources does indeed have different preferences than what the mass media covers. From figure 1, we find that for all of the policies, the distribution of aspect coverage by social media community is very similar to that of mass media. This trend is also clear from the coverage provided by social media community to the different constituencies in figure 2. The cosine similarities between relative coverage distribution of aspects for mass media and social media are 0.96 for Demonetization, 0.95 for Aadhaar, 0.95 for GST, and 0.82 for Farmers' Protest. This similarity is quite high for all the policies, only for farmer protests does the social media community see a higher proportion of discussions about issues of low-income farmers. The social media community of news-sources is likely to be representative of a significant proportion of citizens who are educated and online, and we find that this section does not exhibit a substantially different voice than mass media.

5.3 Coverage of political parties

(RQ2:) In this section, we see how the coverage of aspects corresponding to the four policies varies across the two biggest political parties in the entire QH data. We present the coverage given to each aspect for each policy by the BJP (406 MPs considering LS'15 and 16) and INC (292 MPs considering LS'15 and 16) in figure 3. We find that INC tends to ask more questions in each policy, mostly around the procedural aspects and mechanics around the implementation of these policies. In the following subsections, we analyze each policy separately.

Demonetization: We find that a total of 205 questions on Demonetization by BJP, and 43 questions by INC. Looking at the relative coverage provided to aspects, we find that both of the parties provide nearly equal coverage for most of the aspects. The aspects *[Court verdicts related to Demonetization and penalties issued to black money hoarders]* (relative coverages: 0.17 by INC, and 0.12 by BJP), and *[Probes and arrests of black money hoarders]* (relative coverages: 0.28 by INC, and 0.18 by BJP) get significantly higher coverage by INC than BJP. This is expected as being in the current opposition, INC tends to often question the government's narrative of

fighting graft money and corruption. BJP provides significantly higher coverage than INC to the aspect [*Failure of RBI to stabilize economy post Demonetization* (relative coverages: 0.21 by INC, and 0.34 by BJP)]. This aspect focuses on the procedural issues around restoration of normalcy post implementation of the policy.

Aadhaar: We find a total of 72 questions by the ruling party BJP, and 57 questions by the opposition party INC. We find that the opposition INC provides significantly higher relative coverage than BJP for the aspects [*Court cases related to Aadhaar*] (relative coverages : 0.11 by INC, and 0.05 by BJP), dealing with the court cases on data security and privacy issues, and [*Problems with Aadhaar card cancellation and enrollment centres*] (relative coverages : 0.37 by INC, and 0.24 by BJP), which is critical of the policy for its procedural problems. The aspects for which the currently ruling party BJP provides a significantly higher coverage than INC is [*Linking of Aadhaar to various schemes*] (relative coverages : 0.12 by INC, and 0.23 by BJP) and [*Aadhaar enrollment centres and UIDAI operations*] (relative coverages : 0.19 by INC, and 0.26 by BJP). The questions asked in the former aspect focus primarily on the different schemes to which Aadhaar is linked, and the problems caused to people who are unable to link Aadhaar due to different reasons. The latter discusses about the procedural issues. The aspect [*Linking of Aadhaar to various schemes*] does talk about the immediate issues faced by the poor after implementation of the policy. However, other aspects relevant to the poor (like [*Installation of e-POS systems and Aadhaar enabled PDS*] and [*Opening of bank accounts for financial inclusion*]) receive insignificant coverage (figures 1 and 3) by both parties, when compared to the highest covered aspects, which are primarily relevant to the middle class.

GST: We find a total of 79 questions by the currently ruling party BJP, and 42 questions by the opposition party INC. INC provides significantly higher coverage to [*Objections and confusions with GST rate slabs*] (relative coverages : 0.24 by INC, and 0.18 by BJP), which talks about the applicability of GST and its rates w.r.t. different trade sectors, and [*Non-conclusive discussion between centre and states regarding GST*], which is a political aspect. We thus find that at the party level, INC is critical of the policy, being currently in the opposition, and one of the aspects that sees a significant difference in coverage between BJP and INC talks about the traders and companies that register for GST. Overall, we find that there is negligible coverage given to issues of the poor or the consumers by both of the parties.

Farmers' protest: We find a total of 224 questions by the ruling party BJP, and 166 questions by the opposition party INC. For this event, most of the aspects show nearly equal relative coverage both by BJP and INC. The only aspect where INC provides significantly more focus than BJP are

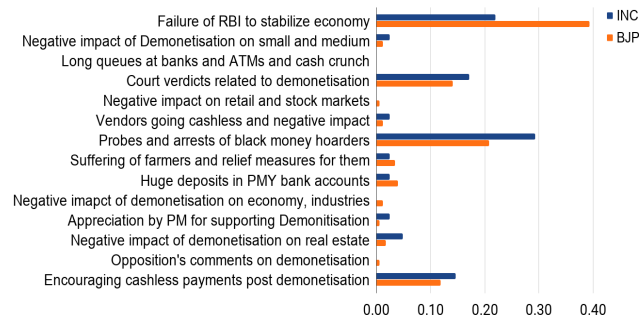
[*Disbursement of Loans and Subsidy by Banks for farmers*] (relative coverages: 0.24 by INC, and 0.15 by BJP). This aspect covers questions on problems in disbursements of loans, and does not cover the structural issues related to agriculture. BJP does provide significantly higher coverage than INC to structural issues like [*Farmers' distress regarding minimum support price of crops*]. However, the overall coverage of these aspects is negligible compared to the highest covered aspects, which do not relate to the structural issues.

We thus see that despite having a much smaller number of MPs compared to BJP considering both Lok Sabha terms, INC asks a significant number of questions on each policy. INC is seen to be questioning the policies, especially regarding the procedural aspects and mechanics around their implementation. It is also evident that except for Demonetization, aspects related to the poor and the middle class, some of which address their issues in-depth, do see a coverage from the political parties. However, their overall coverage is much smaller when compared to some of the highest covered aspects, which do not analyze the immediate problems of the poor in-depth or address them at all (for Aadhaar and Farmers' Protests), or the problems of the consumers (for GST).

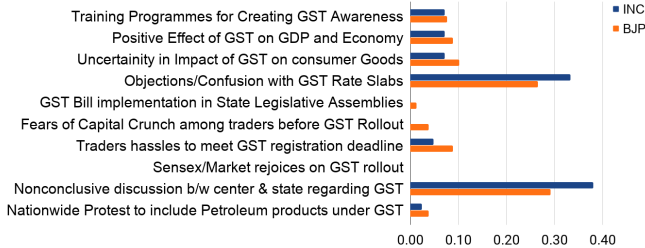
5.4 Analysis of Aadhaar over time

In this section, we analyze Aadhaar – since this is the only policy that spanned both of the governments – for the period of 2011 to 2014 when INC was in power, and post 2014 when BJP was in power for mass media. For QH data, we carry this analysis for the two terms of LS'15 (15th Lok Sabha from 2009-2014 when INC was in power) and LS'16 (16th Lok Sabha from 2014-till date when BJP is in power). We want to see if the trends that we observe in the previous sections are consistent over a period of time, and also whether the aspects that a party speaks dominantly on in the Parliament depends on its position (ruling or opposition).

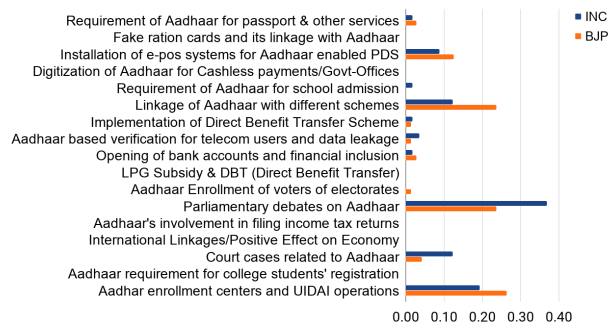
Mass media: We find that across time, mass media gives less attention to issues of the poor compared to the that of the middle class, and that during the initial years (2011 to 2014), when INC was in power and Aadhaar had just been launched, the mass media covered more aspects that informed its middle class readership about the details and procedures of the policy. Between 2014 and 2016, the mass media shifted its focus to the efforts of the ruling dispensation in making Aadhaar an identity for every citizen, and the technical advancements that it brought. Post 2016, media started focusing on problems with policy implementation, and the inconveniences of the citizens. We elaborate these observations next.



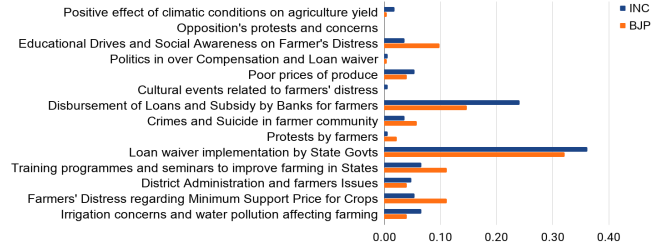
(a) Demonetization



(c) GST



(b) Aadhaar



(d) Farmers' Protest

Figure 3: Relative coverage of aspects provided by political parties in QH data for the four policies

Aspects covered by mass media during INC period (pre-2014): For mass media data, we find that the top two highest covered aspects are [Aadhaar enrollment centres and UIDAI operations] and [Implementation of direct benefit transfer scheme (DBT)]. The highest covered aspect is relevant to the middle class constituency, and informs the citizens about the enrollment centres and the steps taken by UIDAI to smoothen the registration process. The second aspect provides information to the citizens about the different districts in which DBT is launched, the number of beneficiaries, and the amount to be transferred, but does not cover the problems arising in DBT like lack of financial inclusion of the poor.

Aspects covered by mass media during BJP period (2014 to 2016): During the initial years of BJP in power, the top two highest covered aspects are [International collaborations and positive comments on economic growth] and [Requirement of Aadhaar for passport and other services]. The first aspect discusses about the advancement in digital technology exemplifying linkage of Aadhaar to basic services, and enhanced investments by MNCs, leading to economic growth of the country, reflecting the state's tech-deterministic attitude regarding Aadhaar implementation. This aspect is not linked to the issues of the middle class or the poor directly. The second aspect talks about the requirement of Aadhaar as an essential document for identification purposes, and is linked to the middle class.

Aspects covered by mass media during BJP period (post-2016): After 2016, the highest covered aspects in mass media till date are [Court cases related to Aadhaar], which primarily covers the cases related to privacy issues as discussed earlier, and [Aadhaar based verification of telecom users and data leakage], which covers issues related to re-verification of existing mobile subscribers through Aadhaar, and issues of leakage of citizens' data collected during Aadhaar registration. Both of these aspects are relevant to the middle class, and not directly to the poor. However, the mass media seems to provide more attention to the problems arising from the implementation of the scheme post 2016, and this attention seems to be towards the issues of the middle class as validated by [21].

QH data: For QH data, we see that although the representation of the poor has recently improved marginally over time, it is still insignificant given the significantly higher coverage provided to the other issues. There is also a clear indication of partisanship – any ruling party speaks more on the procedural aspects related to the policy, while the opposition chooses to identify its loopholes. We elaborate these observations next.

Aspects covered in QH data during INC period (LS'15): We find that the highest covered aspects in LS'15 are [Aadhaar enrollment centres and UIDAI operations] and [Problems with Aadhaar card cancellations and enrollment centres]. None of these aspects are relevant to the immediate issues of the

poor, and cover the procedural issues around the scheme. The aspects for which the then ruling party INC shows significantly higher coverage than BJP include [*Installation of e-POS systems and Aadhaar enabled PDS*] (relative coverage: 0.06 by INC), [*Linkage of Aadhaar with different schemes*] (relative coverages: 0.04 by BJP, and 0.09 by INC), and [*Aadhaar enrollment centres and UIDAI operations*] (relative coverages: 0.20 by BJP, and 0.23 by INC). These aspects relate to the issues of the poor and the middle class, respectively. BJP shows significantly higher coverage for [*Problems with Aadhaar card cancellations and enrollment centres*] (relative coverages: 0.60 by BJP, and 0.43 by INC), which includes questions around loopholes in Aadhaar implementation. This is expected as BJP during this time period was in the opposition.

Aspects covered in QH data during BJP period (LS'16): We find that the two highest covered aspects are [*Aadhaar enrollment centres and UIDAI operations*] and [*Linkage of Aadhaar with different schemes*]. Here, the second aspect covers questions on linkage of Aadhaar with different welfare schemes, and their problems relevant to the poor and the middle class.

We find that the ruling party BJP speaks significantly higher on [*Aadhaar enrollment centres and UIDAI operations*] (relative coverage: 0.30 by BJP), [*Linkage of Aadhaar with different schemes*] (relative coverages: 0.34 by BJP, and 0.30 by INC), [*Requirement of Aadhaar for passport and other services*] (relative coverage: 0.04 by BJP), and [*Opening of bank accounts and financial inclusion*] (relative coverage: 0.04 by BJP). INC, on the other hand, provides significantly higher coverage to [*Court cases related to Aadhaar*] (relative coverages: 0.30 by INC, and 0.02 by BJP), [*Problems with Aadhaar card cancellations and enrollment centres*] (relative coverages: 0.04 by BJP, and 0.10 by INC), and [*Aadhaar based verification of telecom users and data leakage*] (relative coverages: 0.02 by BJP, and 0.10 by INC). Not surprisingly, now that the INC was in opposition, it selected aspects that criticized the policy move on different fronts, while BJP chose to focus on the procedural aspects related to the policy.

6 DISCUSSION AND CONCLUSION

The results presented from our analysis of mass media, social media, and parliamentary question hour (QH) data shows the representation of five important constituencies. We find that the coverage of these constituencies in the data produced by these key stakeholders of democracy is not equitable, and that there is a deficiency in representation and understanding of the issues of the poor. The QH focuses on the mechanics and procedural aspects related to policies. In Demonetization, the focus is on procedures to restore normalcy and in cross-checking the narrative behind the policy. In Aadhaar, the focus is on the operations, with a greater tilt towards the middle class. In GST, the focus is entirely on the rates and

processes of relevance to the traders, and not the consumers. In Farmers' Protests, the focus is on the mechanics of loans and loan waivers, and not on the structural issues in agriculture. The ruling party tends to focus more on procedural aspects, while the opposition tends to focus on the problems in these procedures. However, the focus of the policy makers remains on procedures w.r.t. each policy. From our analysis of Aadhaar and Farmers' Protests therefore, we find that the Parliament is not getting to the depths of the issues relevant to the poor. In Aadhaar, even the media has not reached this depth. In Farmers' Protests, the mass media and the social media community both pay more attention to the structural problems in agriculture. However, this trend does not make its way prominently to the QH. Similarly in GST, there is inadequate attention paid to consumers in the Parliament, and to the informal sector in general. The focus of the Parliament seems to have been entirely driven by increasing tax revenues and to bring about greater formalization, without thinking much about the consumers or the informal sector. The mass media did provide some focus to the consumers, but also missed out on several pertinent issues. It also neglected the informal sector, which has been deeply impacted since its space is being taken over by increasing formalization of the industries. Demonetization did see more attention to issues of the poor and the middle class, but the media coverage was highly politicized around the narrative of Demonetization, and this was also carried forward in the QH.

Therefore, there seems to be an alignment between the mass media, its social media community, and the Parliament in terms of the constituencies on which they focus – the mass media and the social media community give more coverage to stories and experiences of the key constituencies, while the QH focuses on the mechanics and procedural aspects relevant to these constituencies. Which constituencies to focus on, however, seems to be driven by different agendas. Demonetization was political, and any associations to constituencies was made with a view of legitimizing or delegitimizing the policy. GST was fiscal, and mostly covered the corporate constituency. Aadhaar and Farmers' Protests were more about the people, but less about the poor (Aadhaar) or attention to deep understanding of the issues of the poor (Farmers' Protests). The social media community also does not offset this in any significant manner, which indicates the lack of interest or understanding even by the educated online population of issues that directly concern them. Except for Farmers' Protests, the social media community also does not show any interest or understanding of issues of the poor who are not online. When the different constituencies are indeed taken into account in the mass media and in the Parliament, it is in fact in a politicized manner (Demonetization). When issues are not politicized however, like with the other policies, our data shows that

democratic operations are not ideal. This does not bode well for a democratic country like India, because it shows that the representation is equitable neither in the media nor in the Parliament.

Appendices

Keywords (manually selected)
Demonetization: demonitisation, demonitization, denomination note, cash withdrawal, swipe machine, unaccounted money, withdrawal limit, pos machine, fake currency, digital payment, digital transaction, cash transaction, cashless economy, black money, cash crunch, currency switch, long queue, demonetised note, cashless transaction, note ban, currency switch
Aadhaar: aadhar, aadhaar, adhar, adharcard, aadharcard, aadhaarcard, uidai, aadhar card
GST: gst, goods and service tax, goods & services tax, gabbar singh tax, goods service tax, goods and services tax
Farmers' Protest: farm loan, crop loan, farmer suicide, debt waiver, waiver scheme, farming community, farmer agitation, plight farmer, distressed farmer, farmer issue, farmers protest, farmers' protest, agrarian crisis, agrarian unrest, farmers protests, farmers' protests, loan waivers, loan waiver, agriculture protest, farmers' march

Table 1: List of manually collected keywords used to extract articles (and tweets) corresponding to policy events

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