

# **Does transparency improve public program targeting? – Evidence from India's old-age social pension reforms**

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## **Abstract**

Public program targeting represents a strong challenge, notably in the context of many developing countries. Transparency in eligibility rules and regulation for the implementation of social programs could be an effective measure to reduce mistargeting. India's social pension reforms in the late 2000s, which is largely exogenous, provide the opportunity to examine the effect of increasing the transparency of eligibility criteria. Using two rounds of the India Human Development Survey along with extensive administrative information, we test whether increasing the transparency of eligibility criteria reduces the mistargeting of social pensions. Our results strongly confirm the relationship between transparency of eligibility criteria and targeting performance and are robust to different specifications of the transparency measure and the introduction of a tolerance band. Our paper establishes another channel of achieving better social program outcome through transparency in eligibility criteria in addition to transparency in delivery mechanism.

**Keywords:** Targeting, transparency, old-age pensions, poverty, India

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## 1. Introduction

In many developing countries, wide-spread corruption, local capture, and clientelism prevent the effective delivery of basic social services to the intended beneficiaries. Policy interventions raising the level of transparency have been widely shown to improve poor people's access to these services (Björkman & Svensson, 2009; Francken, Minten, & Swinnen, 2009; Olken, 2007; Peisakhin, 2012; Peisakhin & Pinto, 2010; Reinikka & Svensson, 2004, 2005, 2011). Owing to the lack of reliable income data, the identification of beneficiaries needs to rely on proxy means tests but how to design these proxy means tests and which criteria should be included remains a subject of ongoing debate.

India's old-age social pension reforms in the late 2000s provide us with the opportunity to directly test the relationship between transparency improvements and the targeting performance for the case of social pensions in India. The reforms that we focus on consist of a clearer definition of the eligibility criteria. At the national level, in 2007, the Central Government replaced the previously vague poverty-related criterion "destitution" (no further indication was given how this should be defined) by the need to belong to a "Below Poverty Line" (BPL)-card holding household. This BPL-card is also used for numerous other benefits such as food or fuel subsidies despite several criticisms of its beneficiary identification and allocation process (e.g. Alkire & Seth, 2013; Panda, 2014). Whether a household is in possession of a BPL-card or not is an easily observable criterion and leaves no room for interpretation. In addition, there are state pension schemes, with different eligibility criteria that also changed around the same period. We can thus explore variation over time and across states.

While our study will have implications for access to anti-poverty schemes in general, studying the functioning of old-age pensions systems is also relevant in itself: In many developing and emerging economies the age structure has started to change (United Nations, 2015), traditional family structures break down (Rajan & Kumar, 2003), and a large share of the elderly population is not yet covered by any contribution-based pension schemes of the formal sector (Sastry, 2004). Social pensions, i.e., pensions provided by governments to the elderly poor independent of prior contributions, have thus become increasingly relevant. Nevertheless, the literature on social pensions still remains scarce. In addition, the limited literature that does exist indicates that

mistargeting is an extremely wide-spread phenomenon – possibly even more than for other public programs (e.g. Asri & Asri, 2016; Kaushal, 2014).

In this paper, we analyze how the selection of beneficiaries can be improved and focus on the role of transparency improvements. One potential approach is to facilitate the selection of beneficiaries by making eligibility criteria more transparent and less complex. We focus therefore on the *verifiability of eligibility criteria* and analyze whether more transparent criteria are related to a better targeting performance of social pensions. As the reform of eligibility criteria varied in their specific implementation across states, we can test the relationship between the transparency of eligibility criteria and the targeting errors. We use two rounds of the India Human Development Survey (IHDS) along with extensive administrative information to examine the relationship between the change in eligibility criteria and the targeting error over time (before and after the reform). From a political-economy perspective, we are interested in assessing how the relevant politicians and administrative officers can be driven to respect a set of officially defined eligibility criteria as closely as possible. We hence define our criteria of exclusion and inclusion error along the lines of the regulations in official government documents. This is despite the fact that these regulations may not coincide with the approaches that researchers use to identify the deserving individuals, such as comparing consumption expenditures to poverty lines or using multi-dimensional poverty measures (e.g. Alkire & Seth, 2008, 2013).

The remainder of the paper proceeds as follows: Section 2 presents the literature, some theoretical considerations, and the hypotheses derived thereof. Section 3 introduces the Indian case study on old-age pensions and the related reform process. Section 4 presents data and methods followed by the empirical results in Section 5. Section 6 puts our findings in perspective using a measure of poverty that is independent of official targeting criteria. Section 7 concludes.

## **2. Literature and theoretical hypotheses**

This paper contributes directly to the literature on the role of transparency for the targeting performance of anti-poverty schemes. Most closely related to our study, Niehaus et al. (2013, p. 206) analyze how a proxy means test should be designed if the “implementing agent is corruptible”. Theoretically and empirically, they show that using more conditions to define eligibility for an anti-poverty scheme is likely to deteriorate the targeting performance. Intuitively their findings indicate that rule breaking becomes more likely if there are more rules that local

government official needs to follow for the allocation of benefits. The theoretical model and empirical application in Niehaus et al. applies also to the context of social pensions in India. In addition to the number of conditions that Niehaus et al. are focusing on, we take into account that eligibility conditions also differ substantially in their complexity and verifiability and assess the influence of transparency improvements for specific reforms of social pension eligibility in the late 2000s.

In line with Niehaus' et al. (2013) findings, Drèze and Khera (2010) show the importance of using eligibility criteria that are easy to follow and suggest replacing the existing complex approach used for the identification of BPL card holders by easily verifiable inclusion and exclusion criteria which allow individuals to state their eligibility based on one criterion such as "I am eligible because I am landless" or "I am not eligible because I own a car" (p.55). Drèze and Khera (2010) argue that this simplification will also help to facilitate participatory monitoring and to prevent fraud.

Increased transparency of eligibility criteria can be achieved by reducing the number and complexity of conditions as well as by applying criteria with high verifiability. Considering the verifiability of eligibility criteria is extremely important for the implementation of public anti-poverty programs in developing countries where data on income is scarce and due to high shares of informal sector employment inappropriate for measuring welfare of potential beneficiaries (Baker & Grosh, 1995).

From a theoretical perspective, we expect that increasing the transparency of eligibility criteria affects demand and supply sides of social pension targeting. Transparency improvements influence the behavior of local government officials in charge of selecting beneficiaries (supply side) and local citizens applying:

On the supply side, through the increase in transparency, the local government officials face increased costs of preferential treatment as the likelihood of being detected is higher and therefore targeting errors are expected to be reduced. Moreover, using more transparent eligibility criteria reduces the administrative burden of selecting beneficiaries and the chance of human error. The use of more transparent and simpler eligibility criteria also reduces the administrative costs of social protection schemes and thereby allows that at least in theory, these limited

resources can be used as transfers to the poor. Changing the rules of eligibility also changes the task assigned to the implementing government official (as pointed out by Niehaus et al. (2013)).

On the demand side, increasing the transparency of eligibility criteria facilitates the application for the eligible elderly individuals. Fewer and less complex conditions simplify the application process and make the outcome of the application more predictable. Given that the applicant submits all required documents, the chances of receiving the benefits are higher compared to a situation with less transparent criteria and higher discretionary power for the local government official. Transparency of eligibility criteria moreover facilitates that people are aware of their entitlements and helps individuals to scrutinize the selection of beneficiaries in public meetings improving their influence in the beneficiary selection.<sup>2</sup>

Based on these theoretical considerations related to the supply and demand side of targeting, we hypothesize that increasing the transparency of eligibility criteria reduces targeting errors.

### **3. Old-age social pensions in India**

In India, social pension schemes exist at the state and national level. Typically, in one state, social pensions are provided by the national government and by the state government separately. The national scheme called Indira Gandhi National Old Age Pensions Scheme (IGNOAPS) was introduced in 1995 with a central government contribution of 75 INR per month. Unlike social pensions in other developing countries like Nepal, Bolivia or South Africa that were paid out to all individuals above a certain age, social pensions in India are targeted only towards the poor (Palacios & Sluchynsky, 2006). The Ministry of Rural Development is in charge of the social pension scheme but the state governments are responsible for the implementation through *gram panchayats* (village councils) and municipalities. The 1998 guidelines of the National Social Assistance Programme (NSAP) state that “[the] Panchayats/Municipalities will be responsible for implementing the schemes [and] are expected to play an active role in the identification of beneficiaries” (Government of India, 1998, p.4). Panchayats and municipalities represent the smallest local governance unit in rural and urban India respectively.

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<sup>2</sup> In the Indian context, public meetings are supposed to be used for scrutinizing the list of beneficiaries for several anti-poverty schemes including old-age social pensions (see e.g. Besley, Pande, & Rao, 2005).

At the national level, the target group was 65 years old or older, and destitute defined as “having little or no regular means of subsistence from his/her own sources of income or through financial support from family members or other sources” (Government of India, 1995, p. 7). At the same time, there was a cap on the number of beneficiaries that effectively limited the number of the destitute to 50% of the elderly below the Tendulkar poverty line (Rajan, 2001, p. 613). While this implicitly shifts the eligibility threshold to the median of the distribution of monthly per capita household consumption expenditure of the elderly poor (Rajan, 2001, p. 613), who did and who did not belong to this group was unobservable in practice, and the vagueness of the 'destitution' criterion left ample discretionary power to local officials. In most of the states implementing the national social pension scheme IGNOAPS, the previously used destitution criterion was replaced by the requirement that beneficiaries live in households that hold a BPL card as described above.

At the state level, we also observe several reforms of eligibility criteria tending to reduce the complexity of eligibility criteria and increasing their verifiability. For instance, in Uttar Pradesh eligibility for the state social pension scheme was originally based on land holding in rural areas and individual income in urban areas, while after the reforms it was purely based on BPL card holding. All states in our sample have adopted the national reforms in the IGNOAPS scheme (i.e. the age limit to be 60 years and the household having a BPL card) over time, but there is substantial variation in the implementation of state-government-specific old-age social pension schemes. For instance, states such as Himachal Pradesh, Haryana, Odisha and Karnataka have introduced or amplified household income as one of the eligibility criteria in their state-run old-age pension schemes. However, all states examined followed IGNOAPS regarding the minimum-age criterion of 60 years. In some states, no criteria other than IGNOAPS criteria are used at all: Madhya Pradesh fully adopted all IGNOAPS criteria for its state-run scheme, while West Bengal only implements the IGNOAPS scheme and does not have a separate state-run social pension scheme. We present the specific eligibility criteria for both time periods of our analysis in Appendix 1.

## **4. Data and methods**

### **4.1 Generation of the data set**

For our analysis, we combine two data sets with information on (i) individuals, households and communities, and (ii) administrative regulations at the state level. For the individual- and community level data we rely on two waves of the India Human Development Survey (IHDS) in 2004-05 and 2011-12 that were conducted by the National Council of Applied Economic Research (NCAER) and University of Maryland (Desai, Vanneman and NCAER 2005; 2011), i.e., before and after the relevant reforms. We coded the data on administrative information based on government documents.

The IHDS is a nationally representative individual-level survey including a broad range of modules regarding demographics, health, public welfare programs, fertility, agriculture, employment, gender relations and women's status, beliefs, education, social networks, institutions, etc. related to individuals, households and communities. The survey covers 41,554 households in 1503 villages and 971 urban neighborhoods across India. Sampling was based on a stratified, multistage procedure in 2004-05 (IHDS-I) and households were re-interviewed in 2011-12 (IHDS-II) (Desai, Vanneman and NCAER 2005, 2012).

As we use individual-level fixed effects regression models to control for individual heterogeneity in our econometric analysis, and the data collection includes only two periods, our dataset is effectively reduced to just those individuals who were surveyed in both the rounds. In addition, given that our focus is on old-age pensions, we exclude all individuals that are more than ten years younger than the eligibility age. Finally, our dependent variable capturing the likelihood of targeting error at the individual level can only be identified for individuals in seven states for which sufficient information is available on state-level pension schemes (see Section 3). As a consequence, for our analysis the sample is reduced to 6,807 elderly individuals observed in both rounds of the survey within these seven states, i.e., to a total of 13,614 observations.

We combine the IHDS data with state-level administrative data on the specific social pension schemes drawn from a large number of government websites and reports and electoral data from the Lok Sabha (lower house of the Parliament) election reports of the Election Commission of India (we provide a table stating the data source for each variable in the Appendix 2). As a complement to quantitative data, we also collected qualitative information through interviews

with policy makers, ministerial officials, social activists and scholars specialized on social pensions for elderly. The information drawn from these interviews primarily refers to the administrative processes and was used for checking the collected administrative information. The interviews will not be analyzed directly in this paper, but they provided important background information that help in the interpretation of empirical results. We provide a list of interviews in Appendix 5.

## **4.2 Operationalization**

As we intend to measure a possible improvement in targeting, a natural choice for the dependent variable seems to be the targeting error. This error can refer both to unjustified exclusion or unjustified inclusion. Exclusion error is defined as the share of eligible individuals who are excluded, while inclusion error is defined as the share of ineligible individuals who are included. At the individual level, such shares can obviously not be computed, but we can observe whether a person is ‘wrongly excluded’ or ‘wrongly included’. We hence generate dummy variables to reflect the targeting error at the individual level.

As mentioned earlier, in contrast to most of the extant literature, we do not impose any external normative assessment of what is ‘wrong’. Rather, we consider the official criteria that public officials are supposed to follow, and try to match them as closely as possible with our data. In this sense, we focus on the procedural aspect of transparency rather than its substantive practice on the field. Since these criteria vary across states and over time, a person with the same characteristics could be wrongly excluded in one place (and/or one point of time), and rightly excluded in another. Along with the age criterion, we hence need to consider a number of variables in this context, related to consumption expenditure, income, BPL status, land holding, and/or residential status. The destitution criterion relevant primarily for the early implementation of IGNOAPS (and some state-level social pension schemes) is measured by per-capita consumption (net of social pension receipts) below the median consumption of the elderly poor (see Rajan, 2001, p. 613), whereby poverty is defined based on the Tendulkar poverty line (separately for rural and urban areas), and median consumption of the elderly is approximated by the per-capita consumption (net of old-age pensions) of the household in which they live. Since respondents to the IHDS do not distinguish between different social pension schemes, when eligibility criteria differ between IGNOAPS and the relevant state scheme, we consider that



anyone is rightly included if s/he receives the pension and fulfills the criteria for either of these schemes. In other words, a person recipient is considered as wrongly included only if he or she is eligible for neither of the schemes. In contrast, anyone who fulfills the criteria of either of the schemes but is not included, is considered as wrongly excluded.

Picking up the perspective of relevant politicians and administrative officers also leads to an additional consideration: For some of the relevant criteria, they may only be able to observe roughly and not exactly whether they are met. It thus appears appropriate to carry out the analysis with a tolerance band around the exact thresholds. This may also be useful because respondents to the survey (on which we rely to determine actual age and the degree of poverty) may not always give exact answers. For instance, they may provide their approximate, rather than their exact age. And finally, targeting error that only comes at the margins of given thresholds appears substantially much less relevant than misallocation to completely different, wealthy segments of the society. We thus complement the traditional computation of the error with an additional analysis allowing for a small error margin around the official threshold. Since methodologically, it is not possible to create a statistical error band around some arbitrary number, we instead construct a 95% confidence band around the cut-offs using the sampling distribution of the estimator of the corresponding percentile of the distribution. We use this tolerance band for the descriptive assessment of targeting errors and for the regression analysis.<sup>3</sup>

Computation becomes even more complex when we allow for a certain error margin, i.e., if we consider that minimal transgressions do not generate relevant efficiency losses and may be unavoidable since only major discrepancies are observable in practice. We assume that the lack of precision the public official has to cope with is reflected in the 95% confidence interval around the statistical estimator of the relevant criterion. The procedure implies that for each of the variables reflecting the different criteria, we need to define a tolerance band based on the upper and lower limits of the 95% confidence band around the corresponding random variable at the relevant cut-off point. As most of the underlying variables are continuous, the computational procedure is straightforward. For the BPL criterion, however, we need to first reconstruct the underlying asset distribution. We do so by estimating a probit model to obtain the probability of holding a BPL card. The explanatory variables of this model are derived from the 13-item census

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<sup>3</sup> A detailed description of the construction of the tolerance band is provided in the Appendix 3.

questionnaire used for the 2002 BPL assessment (Ministry of Rural Development, 2002). We then compute the 95% confidence interval around the mean prediction for those individuals who effectively possess a BPL card. The cut-offs for the errors with tolerance band then jointly consider the limits of the confidence interval and BPL card holding itself. For a detailed explanation of the construction of the cut-off points including tolerance bands, see Appendix 3.

Our main explanatory variable describes the change in the transparency of eligibility criteria over time. Based on the administrative information described above, we develop a state and time specific transparency score that captures how transparent, verifiable and complex the eligibility criteria are. In general, the transparency score increases if eligibility criteria are fewer in number, easy to verify and less complex to implement. However, we use three different specifications to incorporate different approaches of coding the transparency score.

The most sophisticated version of our transparency measure (Transparency C) considers all these three factors. After examining government regulations, we classify eligibility criteria into four categories: criteria specifying 1) destitution, 2) income, 3) land holding and 4) BPL card holding. Then we develop sub-category wise score for transparency. For example, if a state level regulation does not specify anything related to land based eligibility, score for this sub-category is 3. If it mentions a very clear and easily verifiable clause related to land based eligibility, the score is 2. If there are clauses and sub-clauses related to land based eligibility and these are hard to verify, the score is 1. We follow the same scoring scheme for each of the four sub-categories: destitute, income, land and BPL. Finally, we develop an overall transparency index based on weighted sum of transparency scores for all sub-categories. According to us, the weights should reflect the subjective importance of each of these sub-categories. The qualitative data that we collected during expert interviews (government officials, MPs, etc.) helped us to choose suitable weights and our overall transparency score captures this weighting scheme.

We further consider a number of control variables. Given that our dependent variables are based on thresholds the construction of which involves a number of possibly relevant controls, the latter may be endogenous. We thus distinguish between two sets of control variables – a first set, in which we exclude such potentially endogenous factors, and a second set in which we take them into account. The first set includes information on household size, widowhood, education and employment, access to media, urban or rural locality, and the share of the elderly, the share of

Muslims, and the share of Scheduled Castes, Scheduled Tribes and Other Backward Castes in the district and political variables. The complementary set of control variables additionally includes the working status of the elderly individual, an indicator of household assets, an indicator of landlessness, and further variables at district level, i.e., the Gini index, the overall share of Tendulkar poor (based on per-capita consumption net of old-age pensions), the share of literate adults, and the shares of households that express confidence in local government officials and state government.

### 4.3 Statistical methods

Our econometric analysis is based on fixed effects regressions with observations weighted using corresponding probability weights. Hausman tests clearly reject the alternative use of random effects. Since our dependent variables are binary, the use of a linear specification leads to a linear probability model. We use cluster-robust error terms in order to mitigate the resulting heteroscedasticity problems. Given that our time series is very short, the alternative use of probit with fixed effects suffers from an incidental parameter problem leading to biased coefficient estimates. Fixed effects (conditional) logit can be used in principle, but leads to a considerable loss of observations as only those observations with a changing status in the dependent variable will be considered. Our empirical model is

$$Y_{it} = \beta_0 + \beta_1 \text{Year}_{2012} + \beta_2 \text{TC}_{st} + \mathbf{x}'\boldsymbol{\gamma} + a_i + u_{it}$$

where  $Y_{it}$  is a binary variable capturing whether individual  $i$  is wrongly excluded (or wrongly included) in period  $t$ ,  $\text{Year}_{2012}$  is a period dummy,  $\text{TC}_{st}$  is transparency score for state  $s$  in period  $t$ ,  $a_i$  is individual fixed effect capturing unobserved heterogeneity and  $\mathbf{x}$  is a set of control variables. Our focus is on parameter  $\beta_2$ .

## 5. Results

We start by providing a general overview of the developments based on descriptive statistics. For presenting the empirical results, we stick to the balanced panel of observations also used later for the regression analysis to ensure comparability.

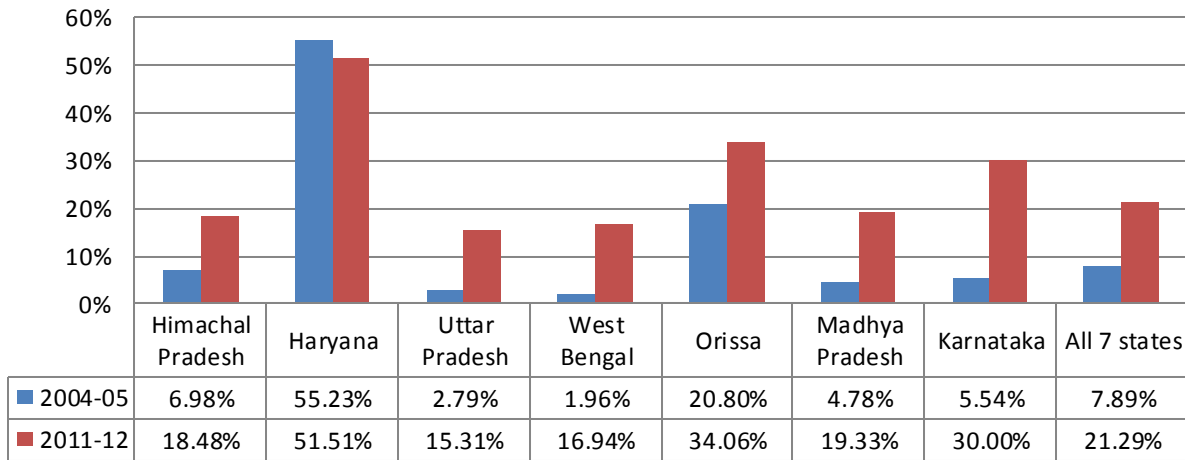
Figure 1 (a) presents social pension coverage, which reveals strong differences across states. In particular, in Haryana, coverage has always been much higher than in other states. These other

states, however, have increased their coverage considerably between the two periods of observation. This change in coverage is an important factor to keep in mind as it would change exclusion and inclusion errors even if pensions were allocated randomly. As the prevalence of poverty varies significantly between states, it appears useful, however, to compare the above values with the values if the sample is restricted to the elderly poor. Figure 1 (b) shows how the picture changes when we only consider the share of the elderly below the Tendulkar poverty line: All rates increase, but particularly so in West Bengal and Madhya Pradesh.

We now look at the exclusion error within each state, and how it evolved over time. Figure 2 shows the exclusion error using the sharp criteria in panel (a), and the tolerance band in panel (b). We observe that the exclusion error is extremely high, in 2004-05 in some states even close to 100%. In all states except Haryana where the pension coverage was highest in both time periods, the exclusion error in 2004-05 was above 75% and still above 60% in 2004-05. As we are considering the possibility of human error near to the thresholds, the exclusion error calculated with the tolerance band is slightly different but shows a similar pattern. In all states except Haryana, the exclusion error decreased substantially over time.

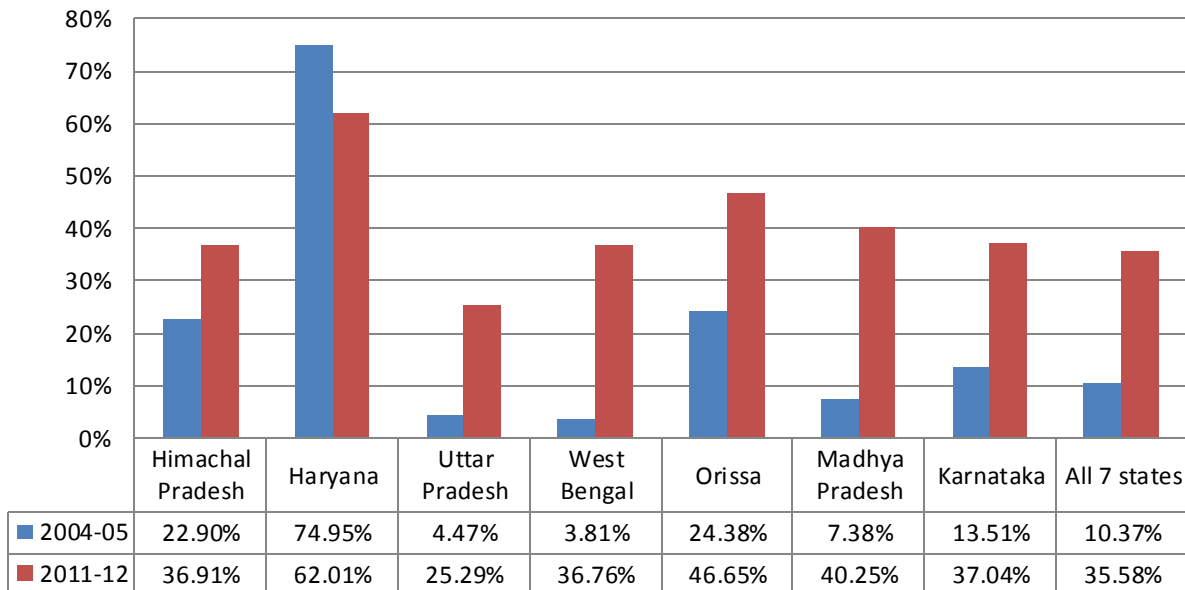
**Figure 1: Coverage**

(a) Social pension coverage of elderly, by state and year



Notes: Based on observations from balanced panel. The elderly population includes all individuals who are at least as old as the local eligible age.

(b) Social pension coverage of elderly poor, by state and year

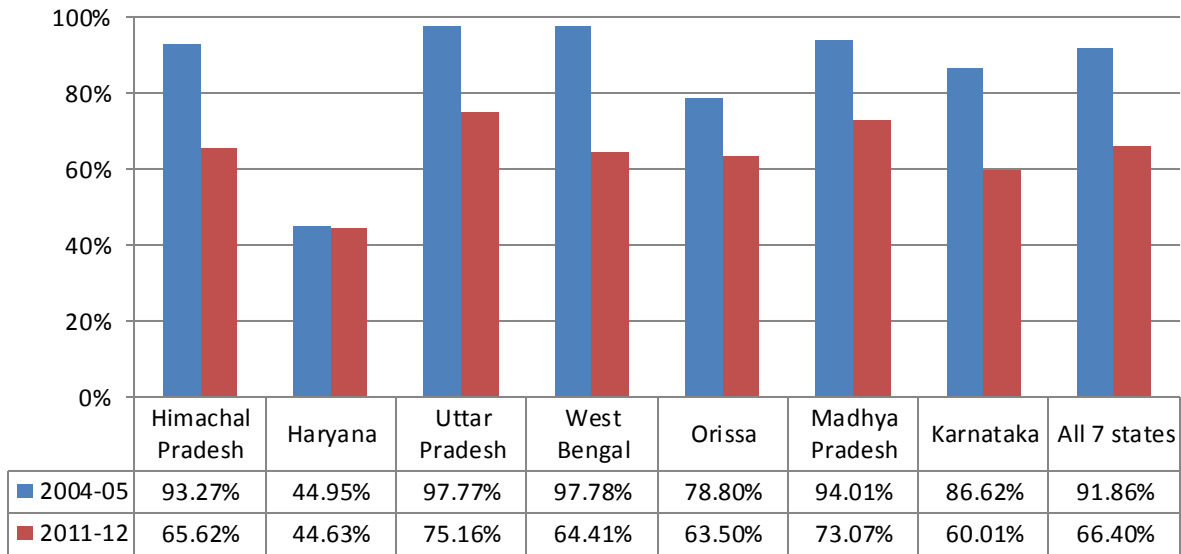


Notes: Based on observations from balanced panel. The elderly poor include all individuals who are at least as old as the local eligibility age with consumption expenditure net of social pension benefits received below the Tendulkar poverty line.

Source: IHDS I for 2004-05 and IHDSII for 2011-12.

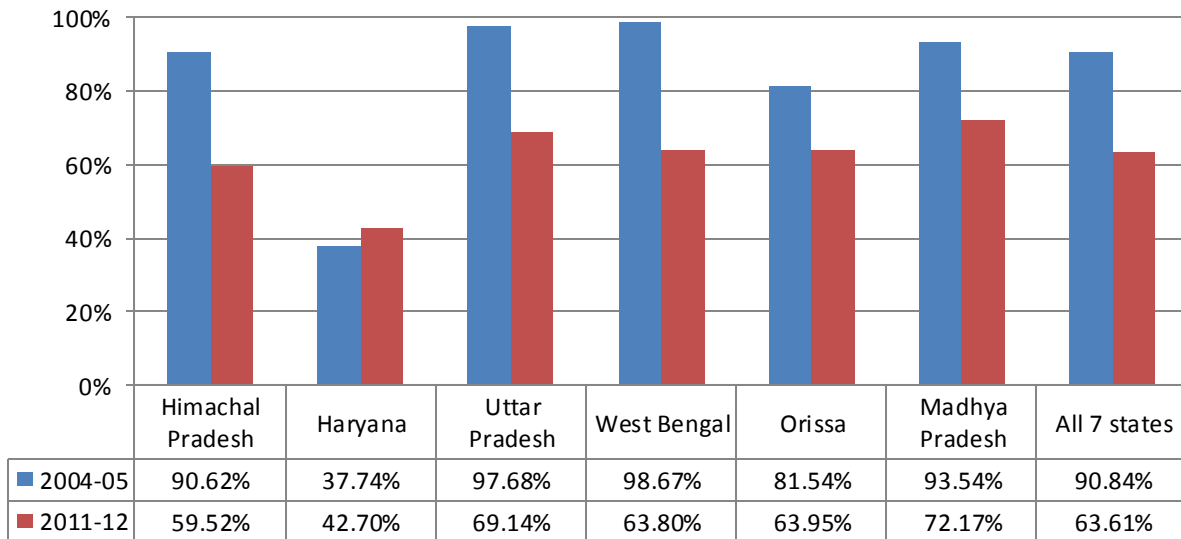
**Figure 2: Exclusion error**

(a) Based on sharp eligibility criteria



Source: IHDS I for 2004-05 and IHDSII for 2011-12.

(b) Based on criteria with tolerance band



Notes: This figure does not include any statistics for Karnataka as applying the tolerance band, slightly fewer individuals are counted as eligible and in the case of Karnataka there are 0 “included must” individuals in 2004-05.

Source: IHDS I for 2004-05 and IHDS II for 2011-12.

The calculation of inclusion errors needs to be considered with caution. Since it is defined as number of ineligible individuals receiving social pensions divided by the number of beneficiaries, the calculation for 2004-05 can be misleading as only very few individuals received social

pension benefits (see Table 1). Therefore, we focus on the exclusion error in our empirical analysis.

**Table 1: Number of beneficiaries and ineligible beneficiaries in 2004-5**

	Himachal Pradesh	Haryana	Uttar Pradesh	West Bengal	Orissa	Madhya Pradesh	Karnataka
Number of beneficiaries	32	250	26	6	69	33	23
Number of ineligible beneficiaries ('wrongly included')	4	62	8	1	30	6	9

Source: IHDS I.

The empirical results are in line with our expectations. The results below show that the transparency of eligibility criteria is associated with a lower likelihood of being wrongly excluded from social pension benefits. All specifications use individual fixed effects. In the first specification, we control only for the time dummy. In the second specification, we include all clean control variables and in the third specification, we include all control variables (including those that are potentially endogenous to social pension receipt). The chance of being wrongly excluded reduces by 3.5% in the model of clean controls and by 3.7% in the model of all controls if the transparency score increases by 1 unit (the transparency score ranges from 19 to 29). The results are robust to the different specification of the transparency measure and to the use of the tolerance band.<sup>4</sup>

<sup>4</sup> The results for transparency A and transparency B are similar and therefore presented in the Appendix 4.

**Table 2: Transparency of eligibility criteria and the likelihood of being wrongly excluded**

(a) Sharp eligibility criteria, transparency measure C

VARIABLES	(1) Wrongly excluded	(2) Wrongly excluded	(3) Wrongly excluded
Period	0.029** (0.016)	0.070*** (0.001)	0.014 (0.635)
Transparency C	-0.034*** (0.000)	-0.035*** (0.000)	-0.037*** (0.000)
Individual fixed effects	Yes	Yes	Yes
Household variables	No	Yes, clean controls	Yes, all controls
District characteristics	No	Yes, clean controls	Yes, all controls
Political variables	No	Yes, clean controls	Yes, all controls
Observations	13614	13614	13614
Number of id	6807	6807	6807
R-squared	0.076	0.086	0.091

(b) Using tolerance band, transparency measure C

VARIABLES	(1) Wrongly excluded with band	(2) Wrongly excluded with band	(3) Wrongly excluded with band
Period	0.063*** (0.000)	0.090*** (0.000)	0.033 (0.185)
Transparency C	-0.027*** (0.000)	-0.028*** (0.000)	-0.031*** (0.000)
Individual fixed effects	Yes	Yes	Yes
Household variables	No	Yes, clean controls	Yes, all controls
District characteristics	No	Yes, clean controls	Yes, all controls
Political variables	No	Yes, clean controls	Yes, all controls
Observations	13614	13614	13614
Number of id	6807	6807	6807
R-squared	0.062	0.073	0.082

Source: IHDS I for 2004-05 and IHDS II for 2011-12. Statistical significance is shown by \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$  with p-values in parenthesis.



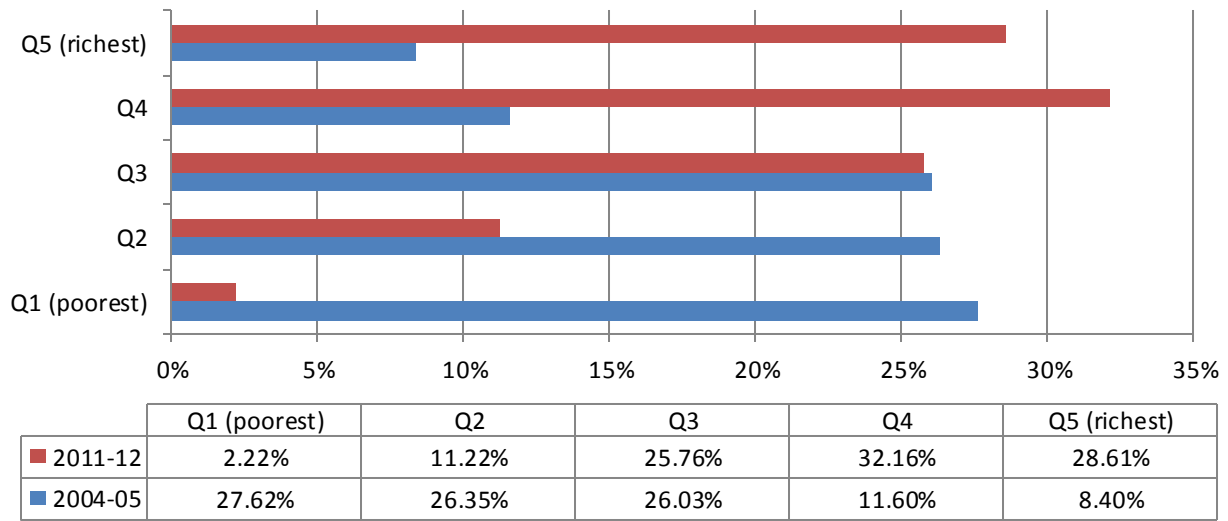
## 6. Discussion

From a distributional perspective, achieving lower targeting errors can only lead to a better allocation of benefits if the rules themselves are such that they enable the identification of the most vulnerable parts of the population. As explained above, the BPL criterion has been widely criticized in this respect. If better-off households rather than the poor possess BPL cards, then the above described changes in eligibility criteria will lead to greater access of the well-to-do elderly to the social pension benefits. Dutta (2010) as well as Asri and Asri (2016) suggest that this may be the case.

We examine this question by examining the consumption quintiles of the ‘wrongly excluded’ cases in the elderly population. Figure 3 shows the distribution of those considered as ‘wrongly excluded’ according to the official criteria before and after the reform. The graphical illustration confirms the misfit of the BPL criterion. About 60% of those considered as ‘wrongly excluded’ in the period after the reforms belong to the two highest consumption quintiles (29% to the highest and 32% to the second highest quintile). While they may be ‘wrongly excluded’ from an official perspective (as they fulfill the official criteria such as holding a BPL card), this exclusion appears clearly justified from a distributional perspective. On a positive note, the share of those wrongly excluded with very low consumption expenditures in the lowest quintile has gone down from 28% to 2% indicating a better inclusion of poor elderly among the beneficiaries.

Overall, the reformed eligibility criteria do not solve the problematic mismatch between official eligibility and actual poverty. While local government officials do a better job in allocation social pensions in line with official rules since the criteria have become more transparent, BPL card holding as one frequently used criterion suffers from significant targeting error itself. This remains a challenge that needs to be addressed in future reforms.

**Figure 3: Consumption quintiles of wrongly excluded**



Source: IHDS- I for 2004-05 and IHDS- II for 2011-12.

## 7. Conclusion

Public program targeting represents a strong challenge, notably in the context of many developing countries where corruption, clientelism and elite capture are high. In such contexts, social and political connectedness appears to be highly correlated to the benefits received. These problems must be expected to be even greater for programs like social pensions targeted to the elderly poor, who are generally less well-educated, less mobile and less vocal when it comes to claiming their rights. India's reform of its old-age pension system in the late 2000s provides the opportunity to examine the effect of the introduction of a large scale transparency improvement in this context. Given the variation in the reforms between states, we are able to assess whether (and to what extent) increasing the transparency of eligibility criteria helps to reduce the mistargeting of old-age social pensions. Our panel fixed effects regressions show indeed that the likelihood of being wrongly excluded reduces with more transparent eligibility criteria and our results are robust to different specifications and the inclusion of a tolerance band. However, BPL status as a particularly frequently used indicator to identify beneficiaries shows itself only a modest correlation with old-age poverty. This indicates that the current targeting approach (even if they were correctly applied in practice) cannot achieve its goal to identify the poor recipients. All in all, our results suggest that increasing the transparency of eligibility criteria can play an important role in reducing the under-coverage and leakage of social pension benefits. Yet,

reforms should not stop at this point. First substantial targeting error remains once the more transparent criteria have been introduced. Second, the criteria need to be well-defined in order to properly match the intended target group. Otherwise, there may be no formal targeting error, but nevertheless, the neediest individuals in the population are not reached. As currently debated among academicians and development practitioners, clear-cut exclusion criteria that manage to prevent clearly non-poor individuals from access anti-poverty benefits seem to be the best option for targeting of social pensions in India.

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**Appendix 1: Eligibility criteria in the seven states included in the analysis**

State	Name of scheme	Eligibility criteria 2004-05	Eligibility criteria 2011-12	Source of information
<b>Himachal Pradesh</b>	IGNOAPS	Age 65 years or above, destitute	Age 60 years or above, BPL card holding	Government of Himachal Pradesh (undated (a),(b),(c)),
	State Old Age Pension Scheme	Age 60 years or above, individual annual income $\leq$ Rs. 6000 and if the elderly has adult children their income should not exceed Rs. 11000	Age 60 years or above, individual does not have anyone to take care of him/her, individual annual income $\leq$ Rs. 9000 or total annual family income $\leq$ Rs. 15000 excluding his/her own income	
<b>Haryana</b>	IGNOAPS	Age 60 years or above, personal income from all sources together with spouse's income $\leq$ Rs. 50,000 per annum, domicile requirement	Age 60 years or above, BPL card holding	Government of Haryana (2006, 2011, undated(a),(b))
	Old Age Samman Allowance Scheme (since November 2005)	Scheme did not exist.	Age 60 years or above, personal income from all sources together with spouse's income $\leq$ Rs. 200,000 per annum for rural and urban areas	
<b>Uttar Pradesh</b>	IGNOAPS	Age 65 years or above, destitute, domicile requirement	Age 60 years or above, BPL card holding for rural areas, BPL or Antyodaya card holding for urban areas, resident of UP	Government of Uttar Pradesh (2010a,b,c, undated), Comptroller & Auditor General of India (2009)
	KISAN PENSION SCHEME (valid up to May 2007)	Age 60-64 years, land holding $\leq$ 3.25 acre for rural areas or individual income $<$ Rs. 12000 per annum for urban areas, domicile requirement	Scheme did not exist.	
	MAHAMAYA (valid during 2007-12)	Scheme did not exist.	Age 60 years or above, BPL card holding for rural areas, BPL or Antyodaya card holding for urban areas, domicile requirement	
<b>West Bengal</b>	IGNOAPS	Age 65 years or above, destitute	Age 60 years or above, BPL card holding	Government of West Bengal (undated)
<b>Madhya Pradesh</b>	IGNOAPS	Age 65 years or above, destitute	Age 60 years or above, BPL card holding	Government of Madhya Pradesh (undated (a),(b), (c))
	Samagra Social Security Pension Scheme	Age 60 or above, destitute	Age 60 years or above, BPL card or landless and destitute	
<b>Odisha</b>	IGNOAPS	Age 65 years or above, destitute	Age 60 years or above, BPL card holding	Government of Odisha

	Madhu Babu Pension Yojana (since 2008)	Scheme did not exist.	Age 65 years or above, destitute or Age 60 years or above and annual household income from all sources ≤ Rs. 24000, domicile requirement	(undated (a), (b), 2008)
<b>Karnataka</b>	IGNOAPS	Age 65 years or above, BPL card holding, annual income < Rs. 6000 per annum	Age 60 years or above, BPL card holding	Government of Karnataka (undated, ), Rajasekhar et al (2009), webindia123.com (2007), Chathukulam et al (2012)
	Sandhya Suraksha Yojana (since 2007)	Scheme did not exist.	Age 60 years or above, annual household income ≤ Rs 20000	

Notes: All listed conditions separated with commas are “and”-conditions. If they are “or”-conditions, we have specifically mentioned this.

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## Appendix 2: Variable description and sources

VARIABLES	2004-05		2011-12		Measurement level	Definition	Data source
	mean	se	mean	se			
Error excluded	0.367	0.011	0.296	0.008	Individual	Dummy equal to 1 if individual does not receive social pension but fulfills the locally relevant eligibility criteria	IHDS & administrative information
Error excluded band	0.221	0.01	0.205	0.007	Individual	Dummy equal to 1 if individual does not receive social pension but fulfills the locally relevant eligibility criteria using tolerance band	IHDS & administrative information
Error included	0.015	0.002	0.052	0.004	Individual	Dummy equal to 1 if individual receives social pension but does not fulfill the locally relevant eligibility criteria	IHDS & administrative information
Error included band	0.01	0.002	0.03	0.003	Individual	Dummy equal to 1 if individual receives social pension but does not fulfill the locally relevant eligibility criteria applying a tolerance band	IHDS & administrative information
Transparency A	1.244	0.007	3.249	0.018	State	Transparency score A taking into account the verifiability of eligibility criteria	Administrative information
Transparency B	1.139	0.004	3.249	0.018	State	Transparency score B taking into account the verifiability of eligibility criteria focusing on exclusion error as targeting problem	Administrative information
Transparency C	23.591	0.052	26.490	0.061	State	Transparency score C taking into account the number of eligibility criteria and their verifiability	Administrative information
Pension recipient	0.047	0.003	0.202	0.007	Individual	Dummy equal to 1 if individual receives social pension	IHDS
Age	62.49	0.167	69.34	0.168	Individual	Age of the individual	IHDS
Female	0.492	0.01	0.494	0.01	Individual	Dummy equal to 1 if individual is female	IHDS
Literate	0.379	0.01	0.381	0.009	Individual	Dummy equal to 1 if individual can read and write a sentence	IHDS
Widowed	0.245	0.009	0.363	0.009	Individual	Dummy equal to 1 if individual is widowed	IHDS
Working	0.611	0.01	0.328	0.01	Individual	Dummy equal to 1 if individual is working at least 240 hours per year	IHDS
BPL card					Household	Dummy equal to 1 if household holds a BPL card	IHDS

Household assets	10.708	0.103	12.93	0.116	Household	Number of household assets owned	IHDS
Landless	0.359	0.01	0.384	0.009	Household	Dummy equal to 1 household is landless	IHDS
Household maximum education	7.78	0.107	7.991	0.111	Household	Education level of the most educated person in the household	IHDS
Permanent job	0.105	0.006	0.339	0.01	Household	Dummy equal to 1 if any household member has a permanent job	IHDS
Newspaper	0.186	0.007	0.512	0.01	Household	Dummy equal to 1 if household members read newspaper	IHDS
TV	0.368	0.009	0.718	0.01	Household	Dummy equal to 1 if household members watch TV	IHDS
Household size	6.5	0.072	5.511	0.058	Household	Number of persons sharing one kitchen	IHDS
Urban	0.189	0.006	0.235	0.006	Household	Dummy equal to 1 if household lives in urban area	IHDS
Local government confidence	0.302	0.005	0.284	0.006	Village/block	Share of households having confidence in the local government	IHDS
State confidence	0.233	0.003	0.349	0.003	District	Share of households having confidence in the state government	IHDS
Share of elderly in population	0.086	0.001	0.11	0.001	District	Percentage of elderly population of total population	IHDS
Share of SC, ST, OBC in population	0.72	0.004	0.725	0.003	District	Percentage of SC, ST, OBC population of total population	IHDS
Share of Muslims in population	0.134	0.002	0.138	0.003	District	Percentage of Muslims of total population	IHDS
Share of literate adults in population	0.569	0.002	0.63	0.002	District	Percentage of literate adults among adult population	IHDS
Gini coefficient	0.347	0.001	0.337	0.001	District	Gini coefficient based on consumption expenditures adjusted for social pension benefits	IHDS
Head count ratio	0.344	0.003	0.164	0.002	District	Head count ratio estimated based on consumption expenditures adjusted for social pension benefits	IHDS
Local government connection	0.105	0.006	0.339	0.01	Household	Dummy equal to 1 if household has a direct connection to the local government	IHDS
Political competition (Herfindahl)	0.668	0.002	0.673	0.001	District	Political competition in the Lok Sabha constituency based on the Hirschman-Herfindahl concentration index	Statistical reports of 2004 and 2009 Lok Sabha Elections from Election Commission of India
Participation in public meeting	0.297	0.004	0.252	0.004	Village/block	Share of households participating in public meetings	IHDS
Number of observations	6807	6807					

Source: Authors' illustration, descriptive statistics based on IHDS-I for 2004-05 and IHDS-II for 2011-12.

### Appendix 3: Defining tolerance bands for eligibility criteria

Though the eligibility cut-offs for age, income, and land possession are clearly defined and unambiguous in official documents of the seven analyzed states, their implementation in reality is problematic because many of the rural elderly may not provide documentary proof of their eligibility. This leaves some type of subjective “margin of error” in deciding who should be (in)eligible for pensions. For example, if someone is 59 years old (cut-off 60 years) and applies for old-age pension without any documentary proof of her age, there is a chance of her being included. In comparison with someone who is much younger than the cut-off age, this case is clearly not a gross violation of eligibility criteria. One way of distinguishing these two cases is to construct a band around eligibility cut-offs. It is obvious that we cannot find any statistical error band around some arbitrary number. However, we may find the standard error of an estimator of the corresponding distributional parameter. To incorporate this “margin of error” we construct a 95% confidence band around the cutoffs using the sampling distribution of the estimator of the corresponding percentile of the distribution. The steps to find the band are given below.

**Age:** We find the percentage of the population who are below 60 years (or 65 years depending on year and state). Let this be  $x$  percent. Therefore, our age cut-off is  $x$ th percentile of the age distribution. We now find standard error and 95% confidence band of the estimate of  $x$ th percentile. We do this separately for each state in two periods. If someone is above the upper limit of this band, she is considered as ‘clearly eligible’ (i.e., must be included) in terms of age. If someone is below the lower limit, he is considered as ‘clearly ineligible’ (i.e., must be excluded). We follow the same method to find bands around income and land-holding criteria.

**Destitute:** The destitution criterion is not as objective as age or BPL criteria. However, we know that around 50% of the poor households are considered under different benefit schemes for the destitute. Therefore, we interpret the bottom-half of the poor as destitute. First, we convert nominal monthly per capita consumption expenditure (MPCE) to real using block specific poverty line deflators (Tendulkar poverty line). The consumption expenditure considered here is net of social pension receipts. Then we find the median of the real MPCE of the poor (Tendulkar). Finally, the standard error and 95% confidence band around the median are found separately for each state in two periods.

**BPL:** Below Poverty Line (BPL) cards are distributed based on a census carried out by the Government of India in 2002. This census assessed several socio-economic conditions of the poor households including asset holding, housing, clothing, sanitation, education, occupation, employment, and indebtedness and migration status. We first estimate a Probit model of BPL card holding status based on the above socio economic conditions using IHDS survey data for 2012. This model is estimated separately for each state. We then find the cut-off for the positive outcome based on the mean of the propensity scores of the BPL card holders in each state separately. The standard error of the estimated mean is used to construct the 95% confidence band around the cut-off.

Since this is only an approximation, it may happen that an actual BPL card holder does not fall into this interval. To ensure that the band is not more restrictive than the original indicator, we consider both criteria jointly to define who is clearly eligible or ineligible: A person is considered as ‘clearly eligible’ (must be included) if he does hold a BPL card *and* has an asset-based propensity of holding a BPL card greater than the upper limit of the confidence band. At the same time, a person is considered as ‘clearly ineligible’ (must be excluded) if she does not hold a BPL card *and* has an asset-based propensity of holding a BPL card smaller than the lower limit of the confidence band.

## Appendix 4: Complementary regression tables using alternative transparency measures

(a) Sharp eligibility criteria, transparency measure A

VARIABLES	(1) Wrongly excluded	(2) Wrongly excluded	(3) Wrongly excluded
Period	0.238*** (0.000)	0.275*** (0.000)	0.223*** (0.000)
Transparency A	-0.153*** (0.000)	-0.156*** (0.000)	-0.170*** (0.000)
Individual fixed effects	Yes	Yes	Yes
Household variables	No	Yes, clean controls	Yes, all controls
District characteristics	No	Yes, clean controls	Yes, all controls
Political variables	No	Yes, clean controls	Yes, all controls
Observations	13614	13614	13614
Number of id	6807	6807	6807
R-squared	0.084	0.095	0.107

(b) Using tolerance band, transparency measure A

VARIABLES	(1) Wrongly excluded with band	(2) Wrongly excluded with band	(3) Wrongly excluded with band
Period	0.253*** (0.000)	0.281*** (0.000)	0.224*** (0.000)
Transparency A	-0.135*** (0.000)	-0.138*** (0.000)	-0.159*** (0.000)
Individual fixed effects	Yes	Yes	Yes
Household variables	No	Yes, clean controls	Yes, all controls
District characteristics	No	Yes, clean controls	Yes, all controls
Political variables	No	Yes, clean controls	Yes, all controls
Observations	13614	13614	13614
Number of id	6807	6807	6807
R-squared	0.086	0.095	0.102

Source: IHDS I for 2004-05 and IHDS II for 2011-12. Statistical significance is shown by \*\*\*  $p < 0.01$  with p-values in parenthesis.

## (c) Sharp eligibility criteria, transparency measure B

VARIABLES	(1) Wrongly excluded	(2) Wrongly excluded	(3) Wrongly excluded
Period	0.246*** (0.000)	0.269*** (0.000)	0.232*** (0.000)
Transparency B	-0.149*** (0.000)	-0.148*** (0.000)	-0.164*** (0.000)
Individual fixed effects	Yes	Yes	Yes
Household variables	No	Yes, clean controls	Yes, all controls
District characteristics	No	Yes, clean controls	Yes, all controls
Political variables	No	Yes, clean controls	Yes, all controls
Observations	13614	13614	13614
Number of id	6807	6807	6807
R-squared	0.082	0.091	0.100

## (d) Using tolerance band, transparency measure B

VARIABLES	(1) Wrongly excluded with band	(2) Wrongly excluded with band	(3) Wrongly excluded with band
Period	0.273*** (0.000)	0.287*** (0.000)	0.237*** (0.000)
Transparency B	-0.137*** (0.000)	-0.137*** (0.000)	-0.158*** (0.000)
Individual fixed effects	Yes	Yes	Yes
Household variables	No	Yes, clean controls	Yes, all controls
District characteristics	No	Yes, clean controls	Yes, all controls
Political variables	No	Yes, clean controls	Yes, all controls
Observations	13614	13614	13614
Number of id	6807	6807	6807
R-squared	0.087	0.096	0.110

Source: IHDS I for 2004-05 and IHDS II for 2011-12. Statistical significance is shown by \*\*\*  $p < 0.01$  with p-values in parenthesis.

**Appendix 5: List of interviews conducted in Delhi, March - April 2016**

<b>Name</b>	<b>Designation</b>	<b>Date</b>
Mr Ladu Kishore Swain	Member of Parliament, Aska, Orissa (Party: Biju Janata Dal)	16 March 2016
Mr Konda Vishweshwar Reddy	Member of Parliament, Chelvella, Telangana (Party: Telangana Rashtra Samiti)	21 March 2016
Mr Udit Raj	Member of Parliament, North West Delhi, Delhi (Party: Bharatiya Janata Party)	21 March 2016
Mr Jagdambika Pal	Member of Parliament, Domariyaganj, Uttar Pradesh (Party: Bharatiya Janata Party)	22 March 2016
Mr Nikhil Dey	Social Activist, Mazdoor Kisan Shakti Sangathan, Rajasthan	28 March 2016
Prof Arvind Panagariya	Vice-Chairman, National Institute for Transforming India (former Planning Commission), New Delhi	28 March 2016
Dr Ashok K. Jain	Adviser, Rural Development, National Institute for Transforming India (former Planning Commission), New Delhi	28 March 2016
Dr Rinku Murgai	Economist, World Bank, New Delhi	12 April 2016