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## Targeting of social transfers: Are India's elderly poor left behind?

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**ADB Working Paper Series**

**TARGETING OF SOCIAL TRANSFERS:  
ARE INDIA'S ELDERLY POOR  
LEFT BEHIND?**

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**Abstract**

Whether social transfers should be targeted or universal is an unsolved debate that is particularly relevant for the implementation of social protection schemes in developing countries. While the limited availability of public resources encourages targeting, the difficulty in identifying the poor promotes a universal allocation of benefits. To address this question, this study examines the targeting performance of, and access to, a social welfare scheme for an increasingly vulnerable group – India's elderly poor. The results show that during a time period of social pension reforms, exclusion and inclusion errors were successfully reduced but exclusion of the elderly poor continues to be extremely high. Comparing the existing targeting approach to a random allocation, I show that the benefits of targeting are limited. The reforms aimed at increasing the transparency of social pension allocation were indeed achieved, such that possession of the Below Poverty Line ration card has become the primary determinant of access to social pensions. However, this focus on the ration card has its own weaknesses. Nonpoor individuals exploit the unwarranted possession of this ration card and results indicate that after the reforms individuals with direct connections to local government officials are more likely to access social pension benefits. The current targeting approach seems to be beneficial for well-connected and well-informed individuals while many poor elderly lacking connections or information lag behind.

**Keywords:** targeting, social pensions, old-age poverty, India

**JEL Classification:** D6, J18, I30, I38, H55

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# 1. INTRODUCTION

Demographic change, a persistently large informal sector and weakening family support for the elderly have important implications for old-age poverty in developing countries. Multi-generational household models that traditionally provided support for the elderly are becoming less widespread due to declining fertility and migration (James 2011). In contrast to the small minority of formal sector workers that benefit from comprehensive social protection and old-age income security, it is predicted that the vast majority of informal sector workers will face increased risks of old-age poverty in the near future given their lack of social protection coverage (e.g. Lloyd-Sherlock 2000). Implemented as cash transfers, social pensions are aimed at mitigating old-age poverty faced by elderly individuals who lack social protection coverage (Holzmann and Hinz 2005). To improve the old-age income security of the elderly poor, in 1995, the Indian government introduced the National Old Age Pension Scheme (Government of India 1995).<sup>1</sup>

The effectiveness of social pensions in terms of old-age poverty reduction depends essentially on whether they reach the elderly poor or not. However, the targeting performance remains an under-researched topic in India. Existing studies do not focus on the targeting performance and suffer from different limitations. Dutta, Howes and Murgai (2010) and Gupta (2013) analyzed the implementation of social pensions in a descriptive manner for only a few selected states. Chopra and Pudduserry (2014) and Garroway (2013) based their analysis on cross-sectional data sources and could not rule out omitted variable bias. The latest study by Kaushal (2014) used repeated cross-sectional data for the whole of India but lacked data on receipt of social pension and needed to approximate beneficiary status. Research on social pensions in other countries (e.g. Brazil and South Africa) has made the importance of social pensions for reducing poverty evident. The impact of social pensions is not restricted to the well-being of direct beneficiaries; other household members seem to benefit as well from the transfer (e.g. Duflo 2000; Edmonds, Mammen, and Miller 2005; Lloyd-Sherlock 2006).

Unlike the existing literature, I focus in this paper on the targeting performance of social pensions to answer the question of whether social pensions reach the elderly poor. A better understanding of this question is a substantial prerequisite for analyzing the effectiveness of social pensions in India and other developing countries with similar institutions that might face similar targeting challenges. I first assess the targeting performance by quantifying the share of elderly poor receiving social pensions (coverage), the share of elderly poor not receiving social pensions (exclusion error), and the share of nontargeted individuals receiving social pensions (inclusion error). Second, I analyze who receives social pensions and examine which factors affect access to social pensions and how these factors have changed over time. Finally, I compare the relevant factors for poor and nonpoor individuals.

To address limitations in the targeting and coverage of social pensions, the Government of India introduced social pension reforms in 2007. The results of this paper suggest that from 2004–05 to 2011–12, these reforms contributed to a reduction of the exclusion and inclusion error but both targeting errors continue to be very high and the benefits from targeting compared to a hypothetical random allocation of social pensions appear to be negligible for the exclusion error but relevant for the inclusion

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<sup>1</sup> While this national social pension scheme was introduced in the mid-nineties, several Indian states had previously implemented social pensions on the state level.

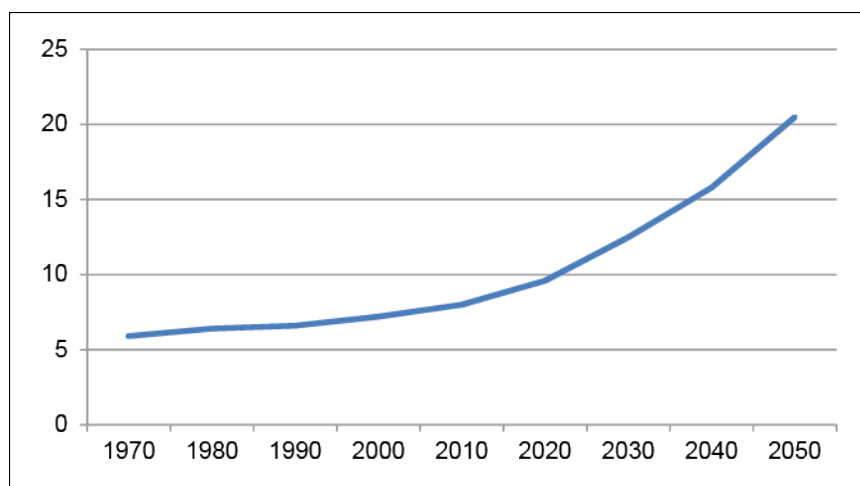
error. Even though the allocation of social pensions has shifted towards the Below Poverty Line (BPL) card as a more observable criterion, in line with existing literature, this criterion itself is too weakly implemented to achieve effective targeting of the poor. The holding of a BPL card is used by both poor and nonpoor individuals to access social pensions and individuals who have direct connections with the local government have a higher chance of receiving the benefits.

The remainder of the paper is structured as follows: Section 2 provides the background information on the implementation of social pensions in India and summarizes existing literature in this field. Section 3 presents the theoretical framework by describing the targeting challenges and how social pension reforms in the Indian context are related to them. Section 4 describes the data and explains the methodology. In section 5, I present the results from descriptive statistics and regression analysis before concluding in section 6.

## 2. BACKGROUND: SOCIAL PENSIONS IN INDIA

The need for an effective social pension scheme in India has been reinforced by progressing demographic change interlinked with weakening family support. Over the last few decades, life expectancy has been increasing and fertility rates have been falling. Both developments together cause a continuously increasing old-age dependency ratio. As illustrated in Figure 1, while the current old-age dependency ratio is 8.6%, it is expected to rise to 20.5% in 2050 (United Nations 2015). The fact that more than 90% of the labor force is working in the informal sector implies that the vast majority of elderly people lack all the safety nets from which formal sector workers benefit (Sastry 2004). Many of them also lack adequate savings and their well-being in old age depends essentially on governmental support beyond the support that their families can provide.

**Figure 1: India's Old-Age Dependency Ratio, 1970–2050 (%)**



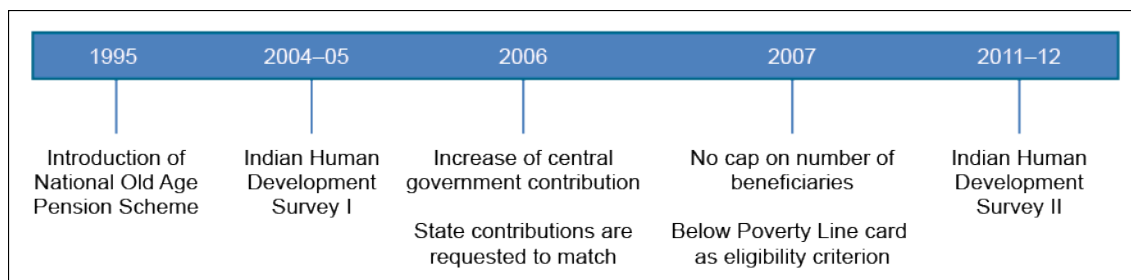
The old-age dependency ratio is defined as the number of elderly individuals (65 years and older) divided by the number of working-age individuals (15–64 years).

Source: Author's illustration; data from United Nations 2015.

The Indian government recognized the need for social pensions and introduced the National Old Age Pension Scheme in 1995 (Government of India 1995). The Ministry of Rural Development is in charge of the social pension scheme but the state governments are responsible for the implementation through panchayats<sup>2</sup> and municipalities, as stated in the guidelines from 1995: “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 1995, 4). In addition to the eligibility age, the original guidelines of the Government of India stated that “the applicant must be a destitute in the sense of 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, 5). In relation to the targeting performance it is important to note that sanctioning of social pension benefits is done “on demand,” i.e. individuals need to file an application with the local administrative authorities.

On the national level, the social pension reforms in India were aimed at increasing both the amount of social pension and the coverage. In 2006, the central government contribution to the amount of social pension was increased from 75 INR to 200 INR and the central government requested all state governments to match the central government contribution (Government of India 2006).<sup>3</sup> In 2007, the central government removed the cap on the number of beneficiaries and recommended using the BPL card as an eligibility criterion in addition to age (Government of India 2007). Hence, from 2004–05 to 2011–12 the targeting mechanism of the national social pension scheme changed substantially. Instead of instructing local government officials to select the destitute elderly as beneficiaries, since 2007, they are supposed to use a more concrete criterion, the BPL card, for targeting.<sup>4</sup> The timeline in Figure 2 gives an overview of the reforms and the IHDS data collection periods.

**Figure 2: Timeline of National Social Pension Reforms and India Human Development Survey (IHDS) Data Collection**



Source: Author's illustration.

<sup>2</sup> Panchayats (i.e. village councils) and municipalities represent the smallest local governance unit in rural and urban India, respectively.

<sup>3</sup> In terms of purchasing power parity, 75 INR corresponded to 6.65 international USD in 2005 and 200 INR corresponded to 12.5 international USD in 2012 (World Bank 2016).

<sup>4</sup> Identification of households and allocation of BPL cards was based on a 13-item census questionnaire measuring the socioeconomic well-being of the household (Ram, Mohanty and Ram 2009).



Similarly to the national-level social pension reforms, state governments also increasingly introduced the holding of a BPL card as an eligibility criterion for state-level social pension schemes. I observe that in many cases the unclear destitution criterion was replaced by the BPL card holding criterion (see Asri et al. 2016).<sup>5</sup> Hence, by law the relevance of holding a BPL card to access social pensions has increased. In India it is also commonly used for access to other social protection schemes such as heavily subsidized health insurance, housing or food, despite strong criticism of its allocation, which often neglects poorer households and allows nonpoor households to access benefits (Alkire and Seth 2013; Ram, Mohanty, and Ram 2009).

Previous literature on the targeting performance of social pensions in India is limited. In the case of Rajasthan, Dutta (2008) reports evidence of undercoverage, high transaction costs of the application process, and not strictly enforced eligibility criteria. She further emphasizes that using BPL cards as an eligibility criterion would worsen rather than strengthen the targeting of social pensions. This is in line with Ajwad (2007) who found for Uttar Pradesh that in 2004–05, 70% of individuals from the poorest quintile did not possess any BPL or Antyodaya card (for the poorest families in the country), while 13% of the richest quintile possessed one of the two ration cards. Similarly, Ram, Mohanty and Ram (2009) show that 40% of the BPL cards are possessed by nonpoor households in India, and many deprived households do not hold a BPL card. Given the switch from the destitution criterion to the BPL card criterion, the targeting performance of social pensions in India is directly interlinked with the targeting performance of BPL cards. To date, there has been no comprehensive assessment of the targeting performance of social pensions in India and the existing knowledge relies on a few studies that assessed the targeting performance of BPL cards, or focused on specific states to examine the implementation of social pensions.

### 3. THEORETICAL FRAMEWORK

After briefly summarizing the theoretical literature on the targeting challenge in general, I describe the theoretical expectations regarding the effect of the social pension reforms on the targeting performance of social pension benefits in the Indian context.

#### 3.1 The Targeting Challenge

The theoretical motivation behind targeting is clear: Allocating public resources only to those in need improves the effectiveness of poverty alleviation measures and keeps public spending low (Coady, Grosh, and Hoddinott 2004). The targeting of social protection schemes gained particular importance in the phase of macroeconomic and structural adjustments when governments had to reduce public expenditures. However, targeting itself can be very costly, especially in developing countries where data availability is limited and administration weak (Besley and Kanbur 1990). Based on the various challenges that targeting is exposed to; even the strongest supporters of targeting agree that it is impossible to achieve precise targeting. Information gaps, missing data, misreporting, and corruption lead to exclusion and inclusion errors in practice. These problems tend to be even more severe in developing countries that need effective poverty alleviation most (Dutrey, 2007).

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<sup>5</sup> This is based on state-level eligibility criteria for state-level social pension schemes retrieved from different state government documents and websites. Taking into account this background information is important as IHDS data only include information on whether an individual receives a social pension and it is not possible to differentiate between the national and the state social pension scheme.

In general, high exclusion errors and/or inclusion errors reduce the impact of an anti-poverty scheme (Slater et al. 2009). Exclusion error corresponds to the share of individuals in the target population not being covered by the social protection scheme and inclusion error is defined as the share of beneficiaries not belonging to the target population. In other words, the exclusion error stands for targeted individuals not receiving the benefits they are entitled to and the inclusion error implies that resources are absorbed by nontargeted individuals (Coady, Grosh and Hoddinott 2004). As shown in the table below, an individual is wrongly excluded from an anti-poverty program if she/he is poor and does not receive the benefits and wrongly included if she is nonpoor and receives the benefits that are targeted towards the poor.<sup>6</sup>

**Table 1: Exclusion and Inclusion Error**

	Welfare Status of Individual	
	Poor	Nonpoor
Individual does not receive benefits from anti-poverty program	Exclusion error	Successful targeting
Individual receives benefits from anti-poverty program	Successful targeting	Inclusion error

Source: Adapted from Coady et al. 2004, 10.

Following Coady, Grosh and Hoddinott (2004, 10), these two commonly used measures of mistargeting are quantified as follows. The indicator for the exclusion error is the number of poor individuals who are excluded from the program ( $N_{p,o}$ ) divided by the number of poor individuals ( $N_p$ ):

$$\text{Exclusion error} = \frac{N_{p,o}}{N_p} \quad (1)$$

The indicator for the inclusion error is the number of beneficiaries of the anti-poverty program who are classified as nonpoor divided ( $N_{np,i}$ ) by the number of beneficiaries ( $N_i$ ):

$$\text{Inclusion error} = \frac{N_{np,i}}{N_i} \quad (2)$$

Considering the existing knowledge on the targeting challenge, this study will shed light on how the described social pension reforms affected the targeting performance of India's social pension scheme.

### 3.2 Theoretical Expectations

The welfare effects of social pensions are at the maximum when elderly poor (targeted individuals) receive social pensions and nonpoor elderly or individuals who are younger than the eligibility age (nontargeted individuals) do not. In practice, however, exclusion error and inclusion error exist for multiple reasons. Elderly poor do not receive social pensions they are entitled to and elderly nonpoor or individuals who are younger than

<sup>6</sup> This section describes exclusion and inclusion errors of anti-poverty schemes in general. Therefore, I do not take into account the age criterion here, which is relevant for social pensions. The methodology section below explains specifically for social pensions how I consider the age and poverty status of the individuals to measure exclusion and inclusion error.

the eligibility age receive the benefits. Existing literature suggests that the poorest elderly face the biggest difficulties in accessing social pensions. They are more likely to lack awareness regarding social pension schemes as well as the capabilities and documents required during the application process. Their application transaction costs might also be substantially higher if they lack experience in dealing with local governments and/or if they live in remote areas (Mujahid, Pannirselvam, and Doge 2008). In the following I describe the theoretical expectations first for the targeting performance at the aggregate level and second for the role of different factors at the individual level.

### 3.2.1 Targeting Performance

To tackle the targeting issues, the first reform removed the cap on the number of beneficiaries in 2007 and the second reform redefined the eligibility criteria by giving more weight to holding a BPL card for accessing social pension benefits.

By removing the cap on the number of beneficiaries, the first reform increased the availability of social pensions and is therefore expected to increase the coverage of the elderly poor, to reduce the exclusion error and to reduce the inclusion error. The indicators of the targeting performance did not only improve because of the increased availability of social pensions but also because the existence of the cap on the number of beneficiaries was advantageous for better informed or better connected elderly individuals who were able to apply for social pension benefits before the cap on the number of beneficiaries was reached. This advantage in terms of timing of the application for a social pension has been in principle eliminated with the removal of the cap on the number of beneficiaries.<sup>7</sup>

The effect of redefining the eligibility criteria and giving more weight to holding a BPL card is rather ambiguous. On the one hand, choosing one single indicator for eligibility facilitates the application procedure for applicants and the selection for local government officials. Therefore the targeting performance could be improved, i.e. coverage of the elderly poor increases and exclusion and inclusion error reduce. On the other hand, BPL cards themselves have been criticized for being weakly targeted (see, for example, Alkire and Seth 2013). If the previously used destitution criterion were better targeted towards the poor than BPL cards, we would expect to observe a deterioration of the targeting performance. However, if, despite the limitations in their allocation, BPL cards were better allocated towards the poor than the previously used destitution criterion, we would expect to observe an improvement of the targeting performance. Introducing BPL ration cards as an eligibility criterion would only lead to an improvement of targeting of social pensions if these cards were better targeted towards the poor than the local governments' selection based on the "old" destitution criterion. Given these opposing theoretical expectations, the question of whether the introduction of this reform improved the targeting performance can only be answered empirically. These expectations are examined in the descriptive part of the empirical analysis.

### 3.2.2 Individual-level Factors

At the individual level, examined in the regression analysis, targeting problems directly influence who obtains access to social pensions and who does not. The theoretical expectations regarding the factors determining individual-level access to social

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<sup>7</sup> "In principle" means here that officially there is no cap on the number of beneficiaries anymore but we cannot rule out any shortage of resources at the subnational level due to the required transfers from the national government to the state government.

pensions are therefore based on the scarce existing literature on the targeting weaknesses of social pensions in India and also influenced by research on the relevance of social capital for access to public benefits in developing countries. Given the described difficulties in targeting which are particularly widespread in a developing country context, I expect that access to social pensions does not only depend on an individual's eligibility. For obtaining relevant information and receiving social pensions, contacts and embeddedness in a local network also matter.

First, I expect that an individual's eligibility as determined by age and poverty status – destitution before 2007 and holding a BPL card after – is positively associated with the likelihood of accessing social pensions. Before the reform, proxies for destitution such as the ownership of household assets or land holding might have been used to determine the destitution of elderly people. After the reform, I expect to observe an increased importance of holding a BPL card. This expectation is entirely based on official documents (Government of India 2007) and should be evident in the regression results if state and local governments followed the modified eligibility criteria.

Second, I anticipate that direct connections to local government officials can influence the selection of beneficiaries and speed up the granting of social pensions. This concern about preferential treatment depending on political connections has already been raised over the last few decades. Drèze and Sen (1989, 107) emphasized that political influence is likely to determine the allocation of funds by local governments across the poor and the nonpoor. In particular, the decentralization of the administration of anti-poverty transfers with local governments receiving greater responsibilities was accompanied by elite capture of public funds (Kochar 2008). Recently, Panda (2015) showed the relevance of political connections for accessing BPL cards in the Indian context, which reinforces the expectations that connections to local governments also play a role in other social benefits such as social pensions.

Third, I expect that membership of social organizations and participation in public meetings affect access to social pensions. Regular participation in public meetings can play an important role in disseminating awareness related to social pension benefits and I therefore expect that participating in public meetings is positively associated with social pension coverage. Similarly, membership of social organizations such as self-help groups, caste associations or women's groups can help to acquire awareness and capabilities relevant for social pension access.

## 4. DATA AND METHODOLOGY

### 4.1 The India Human Development Survey

The IHDS was conducted by the National Council of Applied Economic Research and University of Maryland (Desai et al. 2007, 2015). This nationally representative individual-level panel survey data set surveyed 41,554 households (215,753 individuals) in 1503 villages and 971 urban neighborhoods across India using a stratified, multistage sampling procedure in 2004–05 and reinterviewed households in 2011–12.<sup>8</sup> The survey is spread over all the states and union territories of India except Andaman and Nicobar Islands and Lakshadweep, which together account for less than 0.05% of India's population. The IHDS includes a broad range of economic

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<sup>8</sup> For 2004–05, the survey covers 26,734 households (143,374 individuals) in rural areas and 14,820 households (72,380 individuals) in urban areas. For 2011–12, the survey covers 27,579 rural households (135,118 individuals) and 14,573 urban households (69,450 individuals) (Desai et al. 2015).

development question modules regarding demographics, health, public welfare programs, fertility, agriculture, employment, gender relations and women's status, beliefs, education, social networks, institutions, etc. at both individual and household level (Desai et al. 2007). From IHDS data, I use information on *social pension receipt*, eligibility of the individual (*age, land holding, household assets, BPL card*), *local government connection*, participation in *public meeting* and membership of *social organization*. I control for labor market participation, education, mass media usage, gender, household size, number of adults living in the household, urban areas, caste belonging, and religion. The complete list of variables and their definitions is shown in Appendix 1. As the IHDS is the first national panel data set covering multiple topics and collected before and after the major reforms in 2006 and 2007, it is the most suitable data set for the analysis of social pension targeting in India.

In the empirical analysis, I focus on individuals in the relevant age group and exclude children and adults who are much younger than the eligibility age. Based on descriptive statistics from the IHDS showing that the eligibility cutoff is not strictly enforced in practice (Appendix 3), I use a sample of individuals who are at most 10 years younger than the state-level eligibility age for a social pension.<sup>9</sup> Moreover, for assessing the changes in relevant factors over time, it is essential for the regression analysis that individuals are surveyed twice. To ensure comparability between the descriptive statistics and empirical estimations, I present the entire empirical analysis for a balanced panel.

## 4.2 Methodology

The empirical analysis is divided into two parts. I first describe the methodology for analyzing the targeting performance at an aggregate level and afterwards proceed to describing the regression analysis focusing on individual-level factors associated with the likelihood of obtaining social pension benefits.

### 4.2.1 Analysis of Targeting Performance

The descriptive analysis of the targeting performance is based on the calculation of three commonly used measures for assessing the targeting performance: coverage of targeted individuals, exclusion error, and inclusion error. Based on the official objective to alleviate poverty among the elderly poor, targeted individuals are at least as old as the eligibility age and poor. Hence, the coverage of targeted individuals is the number of targeted individuals receiving social pensions divided by the number of targeted individuals. The exclusion error is defined as the ratio of the number of targeted individuals (i.e. at least as old as the eligibility age and poor) not receiving social pensions to the number of targeted individuals. The inclusion error is the number of nontargeted individuals (i.e. either younger than the eligibility age or nonpoor) receiving social pensions divided by the number of beneficiaries.

To define poverty, I focus on asset ownership. Following Filmer and Pritchett (2001), I use a principal component analysis to obtain a weighted asset index of durable assets including ownership of a TV, mobile phone, bicycle, motorbike, electric fan, and fridge, along with toilet type, floor type, and water access type.<sup>10</sup> This produces an asset index varying from -3.758 to 3.567 with a mean value of 0. The asset index is strongly positively correlated with consumption expenditures per capita. I use "the 40th percentile as a poverty line," i.e. an individual is counted as poor if she lives in a

<sup>9</sup> The eligibility ages across India are shown in Appendix 2.

<sup>10</sup> The weights obtained from the principal component analysis are presented in the appendix.

household whose asset ownership index is lower than the 40<sup>th</sup> percentile in the asset index distribution (Booyesen et al. 2008) – this is clearly an arbitrary choice but, as the authors argue, it corresponds to other poverty lines arbitrarily set by the World Bank. To take into account the fact that living standards differ between states, rural and urban India, and over time, the distribution is stratified by state, urban residence, and year of data collection. Based on this definition of asset poverty, an individual is wrongly excluded if she is asset poor, older than the eligibility age, and does not receive a social pension. An individual is wrongly included if she is asset nonpoor or younger than the eligibility age (or both) and receives a social pension.

Focusing on asset poverty instead of consumption poverty is preferable here as we evaluate the targeting performance *ex post* and cannot rule out behavioral reactions to receiving a social pension that would directly affect the consumption expenditures. Since some elderly people in the data set are already receiving social pensions, we cannot count them as wrongly included if their consumption expenditures are just above the poverty line. Their consumption expenditures might have been pushed above the poverty line by the receipt of a social pension and in the absence of receiving a social pension the consumption expenditures would have been lower than the poverty line and hence the individual counted as correctly included. One potential approach would be to simply subtract the received social pension amount from the consumption expenditures to approximate the value of the consumption expenditures if the individual had not received a social pension. However, this subtraction would be based on two misleading assumptions. First, we would have to assume that social pension income is either entirely pooled with other household income or entirely consumed by the elderly person. Second, simply subtracting the received social pension amount would neglect any behavioral reactions taking place in response to the receipt of a social pension. For instance, the social pension income might allow the elderly to reduce their labor market participation, which would lower their consumption expenditures but also reduce their daily consumption need. Both assumptions seem to be problematic. Durable asset poverty in contrast is a stable indicator of the financial well-being of a household unlikely to be affected by the receipt of a social pension as the benefits are very low, ranging from 200 INR to 1000 INR and primarily spent on consumption and not on durable assets (e.g. HelpAge International 2009).

Another advantage of using assets instead of consumption expenditures is of practical relevance for the design of welfare schemes. Compared to income or consumption expenditures, which cannot be easily measured in a developing country context, durable assets can be easily observed by government officials and would enable a relatively simple identification of the poor.

Considering the high costs of targeting and the limited availability of resources in developing countries, I compare the targeting errors of social pensions to the targeting errors of a hypothetical random allocation of social pension benefits (e.g. Besley and Kanbur 1990). This is helpful in understanding the benefits of the existing targeting approach and comparing it to a much cheaper alternative – the random allocation of social pensions. The difference between the targeting error under random allocation and the actual targeting error indicates the benefits of targeting social pensions towards the poor instead of distributing social pensions randomly to individuals.

#### 4.2.2 Analysis of Factors related to Access to Social Pensions

To understand which factors affect access to social pensions, I estimate a linear probability model (LPM) with the baseline specification presented below. For all specifications, the dependent variable is *social pension receipt* and the variables of interest reflect eligibility for receiving a social pension (age, household assets, land holding, and BPL card) and social capital (local government connection, public meeting, and social organization). I exploit the panel data structure of the data to estimate an LPM with individual fixed effects. This approach removes the omitted variable bias related to unobserved time-invariant individual characteristics that the cross-sectional regressions are suffering from. I use interaction terms between the time dummy and variables of interest to assess how factors changed over time. Finally, I am interested in understanding whether the factors of interest, namely eligibility and indicators of social capital, play a different role for poor and nonpoor households. To test this empirically, I employ triple interactions of the time dummy, the variables of interest, and a dummy for being poor in terms of asset ownership.

##### Equation 1: Baseline Specification

$$\begin{aligned} \text{Social pension receipt}_{it} = & \beta_0 + \beta_1 \text{Age}_{it} + \beta_2 \text{Assets}_{it} + \beta_3 \text{Land}_{it} \\ & + \beta_4 \text{BPL card}_{it} + \beta_5 \text{Local government connection}_{it} \\ & + \beta_6 \text{Public meeting}_{it} + \beta_7 \text{Social organization}_{it} + \beta_8 \text{After}_t \\ & + \gamma X_{it} + a_i + u_{it} \end{aligned}$$

In line with the objectives of this study, the LPM is particularly suitable for the estimation of marginal effects in fixed-effects regression models (Angrist and Pischke 2009; Wooldridge 2002) and for examining changes over time with interaction terms (Ai and Norton 2003). I present robust standard errors that are adjusted for the conditional heteroscedasticity in the estimation of LPM (Wooldridge 2002).

The empirical analysis of individual-level factors related to social pension access suffers from two limitations that should be taken into account before we proceed to the interpretation of the results:

First, people could lie about receiving a social pension and holding a BPL card if they are aware of not being eligible for either of these. Since the surveyors of the IHDS clearly explained the research purpose of the survey, it is rather unlikely that individuals had any motivation to lie about these aspects. However, a minor social desirability bias cannot be ruled out. The potential measurement error in the independent variable could cause an attenuation bias and the measurement error in the dependent variable could reduce the statistical power of the estimations. Hence, our results should be considered lower-bound estimates.

Second, while *local government connection* and *BPL card* holding are incorporated in the regression analysis as two independent factors associated with receiving a social pension, in reality holding a *BPL card* is also influenced by having a *local government connection*. The factors influencing holding a BPL card are certainly important for the effectiveness of several welfare schemes in India and need to be examined to obtain a deeper understanding of the targeting problems of social welfare schemes in India. An in-depth analysis of the factors determining BPL card allocation needs to be conducted for a representative sample of all Indian households and not just for a sample of the elderly poor. This goes beyond the focus of the paper and is therefore left for future research.

## 5. RESULTS

### 5.1 Descriptive Statistics

The sample of analysis includes all elderly people who are at most 10 years below the eligibility age and have been surveyed twice by the IHDS (balanced panel). The summary statistics are shown in Table 2 separately for 2004–05 and 2011–12.<sup>11</sup> The share of elderly people receiving a *social pension* increased from 5.3% in 2004–05 to 24.4% in 2011–12. With regard to the independent variables of interest indicating eligibility for social pensions, I observe that the average age increased from 61.8 years to 68.7 years corresponding to the time between the two survey rounds and the share of elderly individuals living in households that hold BPL cards increased from 33.5% to 40.6%. Ownership of assets increased from 12.8 to 15.3 assets on average while the size of land holding declined from 2.4 acres to 2.0 acres on average. These are both factors that might have been used to assess the poverty status of social pension applicants prior to the social pension reforms; however, the destitution criterion provided by the national government lacks any further specification. As regards the independent variables of interest indicating social capital in different forms, the share of elderly people living in households that are directly connected with local government officials increased substantially from 11.0% to 28.3%. Participation in public meetings stayed stable (30.3% to 31.4%) and membership in social organizations increased from 35.3% to 39.2%.

In terms of the control variables, I observe that watching TV and reading newspapers has become less common (potentially driven by access to other media at the household level). Other covariates developed as expected. The education levels of the elderly stayed at the same level (3 years of education on average), while the household highest education levels increased slightly from 8.3 to 8.5 years. Directly related to the well-being of elderly individuals, it should be noted that from 2004–05 to 2011–12, the labor force participation of the elderly in the sample (defined as having worked at least 240 hours in the last year) declined from 55.9% to 33.6%.<sup>12</sup> This reduction in labor force participation seems to be primarily driven by the higher age of the individuals in the sample. Moreover, the share of elderly individuals living in households in which at least one person has a permanent job slightly increased from 14.5% to 17.5%. I also control for village-level variables indicating development in the village (*share of electrified households*), collaboration between villagers (*families collaborate*), and the absence of conflicts (*peaceful village*). All these three indicators measured at the village level have improved over time with higher shares of households having electricity, higher shares of households reporting that families help each other to solve local problems, and higher shares of households reporting that people get along well with each other.

The variable *asset poor* at the bottom of the table indicates whether an individual lives in an asset-poor household based on the methodology described before. Since we set the poverty line at the 40th percentile of the full IHDS sample, by construction the shares of elderly individuals living in poor households in 2005 and 2012 are also close to 40%.

<sup>11</sup> For simplicity, I use the term “elderly” even though the sample includes individuals who are at most 10 years below the local eligibility age for social pensions.

<sup>12</sup> This also confirms that we cannot rule out the existence of behavioral responses to the receipt of a social pension as described in the methodology section motivating the focus on asset poverty instead of consumption poverty.





**Table 2: Summary Statistics**

	IHDS 2004–05				IHDS 2011–12				Variable Category
	mean	sd	min	max	mean	sd	min	max	
Social pension	0.053	0.225	0	1	0.244	0.430	0	1	Dependent variable and independent variables of interest
Age	61.819	7.537	45	100	68.680	8.284	45	99	
BPL card	0.335	0.472	0	1	0.406	0.491	0	1	
Household assets	12.825	6.266	0	30	15.343	6.352	0	30	
Land holding	2.413	5.699	0	200	2.010	6.924	0	400	
Local government connection	0.110	0.313	0	1	0.283	0.450	0	1	
Public meeting	0.303	0.460	0	1	0.314	0.464	0	1	
Social organization	0.353	0.478	0	1	0.392	0.488	0	1	
Watching TV	0.344	0.475	0	1	0.256	0.436	0	1	
Reading newspaper	0.853	0.354	0	1	0.659	0.474	0	1	
Education	3.072	4.326	0	15	3.021	4.306	0	15	
Highest adult education in household	8.297	5.093	0	15	8.497	5.139	0	15	
Working	0.559	0.496	0	1	0.336	0.472	0	1	Control variables
Permanent job in household	0.145	0.352	0	1	0.175	0.380	0	1	
Families collaborate	0.596	0.491	0	1	0.739	0.439	0	1	
Peaceful village	0.543	0.498	0	1	0.599	0.490	0	1	
Share of electrified households	0.760	0.298	0	1	0.881	0.202	0	1	
Head of household	0.506	0.500	0	1	0.520	0.500	0	1	
Widow	0.238	0.426	0	1	0.359	0.480	0	1	
Household size	6.139	3.290	1	38	5.407	2.956	1	30	
Urban	0.270	0.444	0	1	0.296	0.456	0	1	Time-invariant characteristics
Other backward castes	0.405	0.491	0	1	0.412	0.492	0	1	
Scheduled castes	0.181	0.385	0	1	0.184	0.387	0	1	
Scheduled tribes	0.061	0.240	0	1	0.062	0.241	0	1	
Female	0.514	0.500	0	1	0.517	0.500	0	1	
Hindu	0.823	0.382	0	1	0.828	0.378	0	1	Asset poverty measure
Muslim	0.096	0.295	0	1	0.097	0.296	0	1	
Asset poor	0.403	0.491	0	1	0.421	0.494	0	1	
Observations	14,952				14,952				

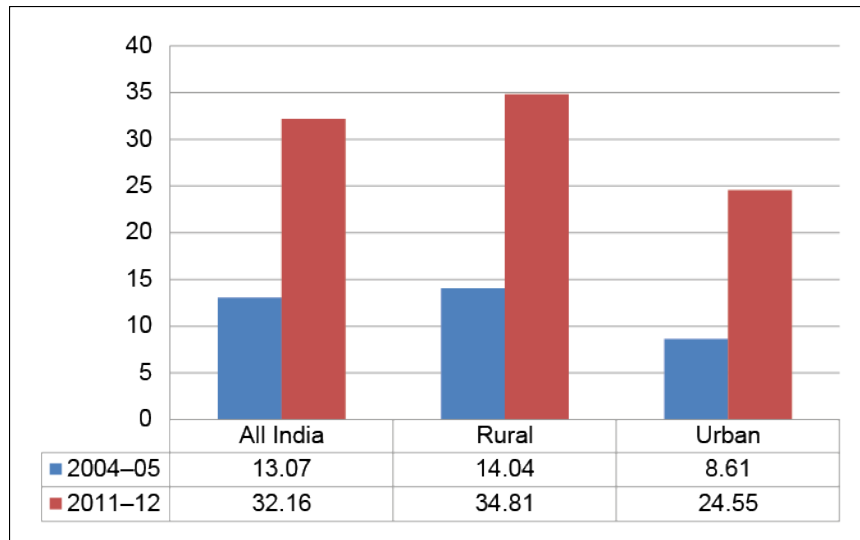
IHDS = India Human Development Survey, sd = standard deviation, BPL = Below Poverty Line.

The sample is restricted to individuals at most 10 years younger than the eligibility age. For the definitions of all variables see Appendix 1. The variables social pension, age, education, working, head of household, widow, and female are measured at the individual level; the other variables are measured at the household level.

Source: Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.

In line with the summary statistics that showed that a larger share of elderly individuals received social pension benefits in 2011–12, Figure 3 shows that the social pension coverage of the elderly poor improved substantially over time. The share of elderly poor receiving social pensions increased from 13.07% to 32.16% overall; the improvement was similar for rural and urban areas but rural areas already had slightly higher coverage of the elderly poor in 2004–05.

**Figure 3: Coverage of Targeted Individuals (%)**



Targeted individuals are at least as old as the eligibility age and poor. Poverty is measured by asset ownership.

Figures account for sampling weights.

Source: Author's illustration based on IHDS I for 2004-05 and IHDS II for 2011-12.

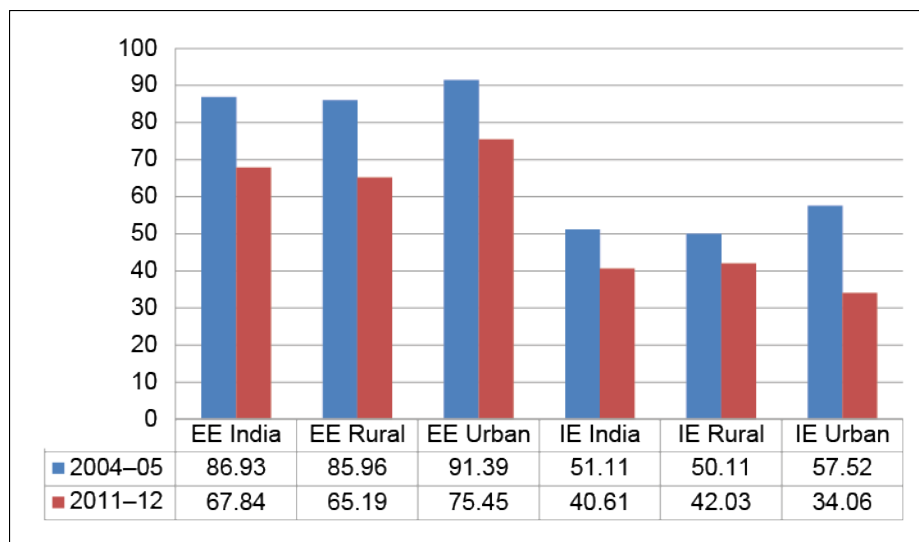
With regard to the targeting errors, the empirical results show that even though both targeting errors have been reduced over time, the remaining targeting errors after more than 13 years of implementing the scheme continue to be very high with large shares of individuals being wrongly excluded and large shares of individuals being wrongly included. There was a considerable reduction of the exclusion error by almost 20 percentage points from 2004-05 to 2011-12, but still about 68% of the elderly poor do not receive social pension benefit. The inclusion error also reduced substantially from 51% to 40% but two fifths of the beneficiaries are still wrongly included in 2011-12, i.e. either nonpoor or too young. The patterns are similar for rural and urban India but for 2011-12 we observe substantially higher exclusion errors in rural India than in urban India and substantially higher inclusion errors in urban India than in rural India. Overall, both errors continue to be very high. Two thirds of the elderly poor continue to be left out (exclusion error) and two fifths of the beneficiaries are either nonpoor or younger than the eligibility age or both and receive social pension benefits (inclusion error).

Since these targeting errors appear to be very high, it is relevant to assess how the targeting of social pensions in India performs in comparison to a hypothetical random allocation of social pension benefits. As illustrated in the second part of Figure 4, in 2004-05 the real exclusion error was only 7 percentage points lower than the exclusion error under random allocation. This nominal benefit of targeting increased only slightly over time to a difference of 9 percentage points in 2011-12. For the inclusion error, I observe an opposite development at the national level. The benefits of targeting reduced from 30 percentage points in 2004-05 to only 16 percentage points in 2011-12. In terms of wrongly excluding the poor elderly from the scheme, the targeting performance improved slightly over time as the difference between the targeting error under random allocation and the real targeting error slightly increased. However, in terms of including nontargeted individuals, the targeting performance deteriorated as the difference between the targeting error under random allocation and the real

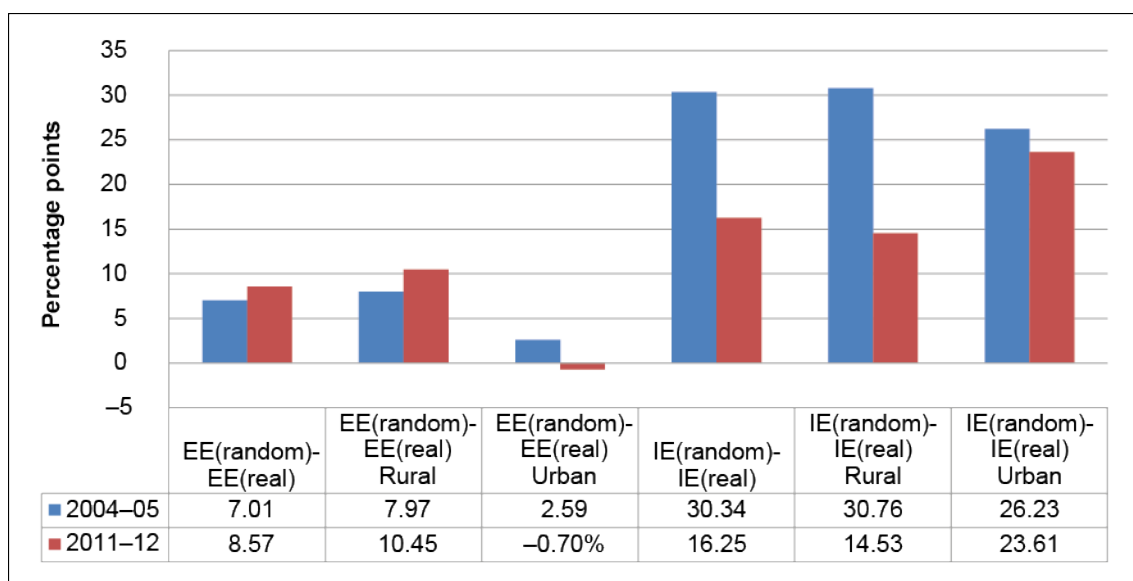
targeting error decreased. Overall, this comparison shows that despite the social pension reforms, the benefits from targeting compared to random allocation seem to be very small in terms of wrong exclusion and relatively small in terms of wrong inclusion. This raises the question of whether the benefits from targeting of social pensions are larger than the costs of targeting. This will be an important question for future research requiring data on the costs of targeting.

**Figure 4: Targeting Errors**  
(%)

**(a) Development of exclusion error (EE) and inclusion error (IE) from 2004–05 to 2011–12**



**(b) Compared to random allocation of social pension benefits**



Figures account for sampling weights.

Source: Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.

## 5.2 Regression Results

Below I present the results from the LPM estimations in different specifications. All regression models include all control variables, time fixed effects, and individual fixed effects. Table 3 shows the regression results introducing the social capital variables separately and in the last specification jointly. Since the coefficients are very close to each other in size, the preferred specification is the last one, which includes all the independent variables of interest.

Keeping all other factors constant, obtaining access to social pensions in 2011–12 is 10.8 percentage points more likely than in 2004–05. This difference is significant at the 1% level and seems to be primarily attributable to the removal of the cap on the number of beneficiaries. Further, being 10 years older increases the likelihood of receiving social pensions by 4.8 percentage points and holding a BPL card by 6.6 percentage points. Both coefficients are significant at the 1% level. Given that the average predicted value of access to social pensions is 13.8%, the size of the coefficients is also economically significant.

**Table 3: Panel Analysis of Access to Social Pensions**

Variables	Linear Probability Model with Individual Fixed Effects: 2004–05 to 2011–12			
	(1)	(2)	(3)	(4)
After	0.1078*** (0.010)	0.1113*** (0.010)	0.1113*** (0.010)	0.1077*** (0.010)
Age	0.0048*** (0.001)	0.0048*** (0.001)	0.0048*** (0.001)	0.0048*** (0.001)
BPL card	0.0660*** (0.009)	0.0660*** (0.009)	0.0660*** (0.009)	0.0660*** (0.009)
Household assets	0.0005 (0.001)	0.0005 (0.001)	0.0005 (0.001)	0.0004 (0.001)
Land holding	0.0005 (0.001)	0.0005 (0.001)	0.0005 (0.001)	0.0005 (0.001)
Local government connection	0.0231** (0.009)			0.0231** (0.010)
Public meeting		0.0034 (0.008)		–0.0004 (0.009)
Social organization			0.0015 (0.008)	0.0008 (0.008)
Observations	29,904	29,904	29,904	29,904
Number of id	14,952	14,952	14,952	14,952
Avg. prediction of Y	0.138	0.138	0.138	0.138
Share of predicted values in [0;1]	84%	84%	84%	84%
Adjusted within R-squared	0.203	0.202	0.202	0.203

BPL = Below Poverty Line. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

The dependent variable is *social pension receipt*. Regressions account for sampling weights. Cluster-robust standard errors are shown in parentheses. All control variables are included.

Source: Author's estimations based on IHDS I for 2004–05 and IHDS II for 2011–12.

With respect to the social capital variables, the panel regression results support only the theoretical expectation regarding the relevance of connections to the local government for access to social pension benefits. Living in a household that reports direct connections to the local government is associated with a 2.3 percentage points higher chance of receiving social pensions (significant at the 5% level). Participation in public meetings and membership of social organizations are not associated with receiving a social pension.

Asset ownership and land holding, two relevant proxies for assessing medium- to long-term poverty, are not significantly related to access to social pensions despite the scheme's official objective to target the elderly poor. In the fixed-effects regressions presented here, these effects vanish, potentially because most households who were poor in 2004–05 also remained poor in the second period and hence the effect is soaked up by the individual fixed effects.

These results provide a first impression of the relevant factors but do not indicate how these factors have changed over time in response to the described reforms in 2006–07. To test whether the relevance of BPL card holding, local government connection, participation in public meetings, and membership in social organizations changed from 2004–05 to 2011–12, I include interaction terms of the dummy variable *after* and these variables of interest in the regression. Table 4 presents the marginal effects for each time period resulting from the regression including all variables of interest and their interaction terms as well as all control variables and individual fixed effects.<sup>13</sup> In line with the changed national eligibility guidelines, *BPL card* holding substantially gained importance. In 2011–2012, an individual who holds a BPL card has *ceteris paribus* a 16.2 percentage points higher chance of obtaining access to social pensions, indicating that the centrally reformed eligibility criterion was implemented by the state governments in panchayats and municipalities. During the considered time period, the BPL card became the most important determinant of access to social pensions and is significant at the 1% level. As described before, prior to the reform, local government officials were requested to select individuals for the national social pension scheme based on the destitution criteria and I observe that holding a *BPL card* in 2004–05 was negatively associated with social pension access. Potentially, individuals holding a BPL card were able to access other anti-poverty schemes (such as subsidized food or public works programs) and were considered less destitute than those who did not even have a BPL card.

My expectation regarding the relevance of connections with the local government is supported by the empirical analysis. The results in Table 4 show that having direct connections with local government officials gained importance over time. For 2004–05, I do not observe any significant effect of connections to the local government on the likelihood of receiving social pensions. However in 2011–12, being connected to the local government increases the likelihood of receiving social pensions by 3.2 percentage points (significant at the 1% level).

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<sup>13</sup> The regression results are shown in Appendix 4. For readability, I present directly the marginal effects here. The marginal effect for the time period after the reform is the linear combination of the coefficient of the independent variable of interest and of the coefficient of the interaction term of the independent variable of interest and the time dummy.

**Table 4: Access to Social Pensions—Marginal Effects before and After the Reform**

	(1) BPL	(2) Local Government Connection	(3) Public Meeting	(4) Social Organization
Before	−0.0355*** (0.002)	0.0077 (0.647)	−0.0128 (0.281)	−0.0101 (0.318)
After	0.1622*** (0.000)	0.0317*** (0.009)	0.0081 (0.470)	0.0093 (0.348)

P-values are shown in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: Author's estimations based on IHDS I for 2004–05 and IHDS II for 2011–12.

These results potentially mask heterogeneity in the factors playing a role for elderly individuals from poor and nonpoor households. To examine the heterogeneity between these two groups for access to social pension benefits before and after the reform, I include the triple interaction terms of the time dummy, the variables of interest, and the dummy for living in an asset-poor household. This approach is preferable to using a dummy variable for being poor based on consumption expenditures and the Tendulkar poverty line, which are directly impacted by the social pension income.<sup>14</sup> The variable *asset poor* is equal to 1 if the household's asset ownership is lower than the asset poverty line described above.

**Table 5: Heterogeneous Marginal Effects for Asset-Poor and Asset-Nonpoor Individuals**

Period	Variable	Asset Poor	Asset Nonpoor	P-value of Difference
Before	BPL card	−0.0087	−0.0460***	0.0868
After	BPL card	0.1499***	0.1557***	0.7876
Before	Local government connection	0.0001	0.0075	0.7644
After	Local government connection	0.0291	0.0362***	0.7818
Before	Public meeting	0.0222	−0.0371***	0.0041
After	Public meeting	0.0131	0.0107	0.9194
Before	Social organization	−0.0177	−0.0061	0.8479
After	Social organization	0.0253	0.0051	0.3266

BPL = Below Poverty Line.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Source: Author's estimations based on IHDS I for 2004–05 and IHDS II for 2011–12.

Before the reforms, the negative and significant coefficient of BPL card holding that I observe for the full sample is driven by the individuals living in asset-nonpoor households. I only observe the negative association between BPL card holding and social pension receipt in 2004–05 for the individuals living in asset-nonpoor households and not for individuals living in asset-poor households. After the reform, BPL card holding is relevant for individuals living in asset-poor and asset-nonpoor households. For individuals living in asset-poor households, holding a BPL card is associated with a 14.9 percentage points higher likelihood of receiving social pensions. For individuals from asset-nonpoor households it is even associated with a 15.6 percentage points

<sup>14</sup> The full regression tables are presented in Appendix 5.

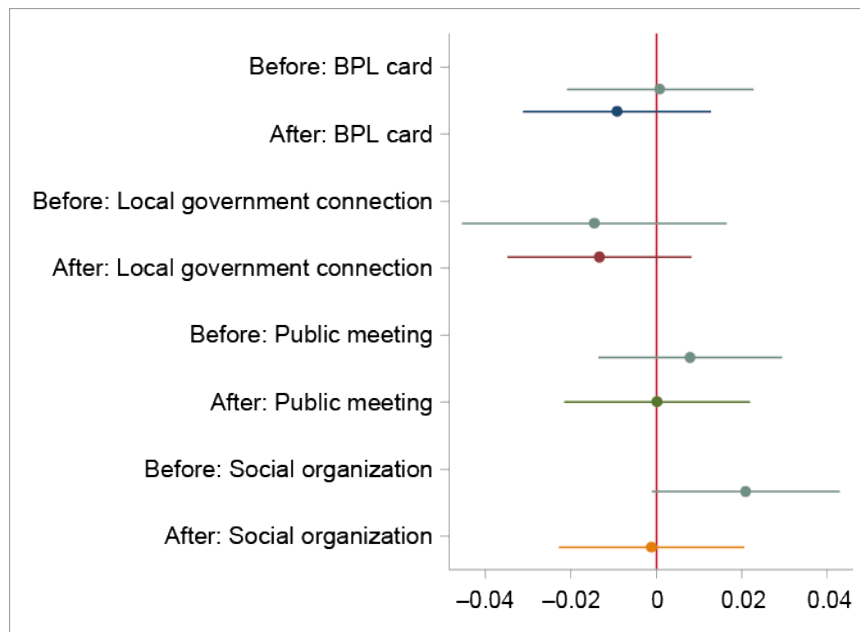
higher likelihood of receiving social pensions. This result strongly indicates that nonpoor individuals exploit the unwarranted possession of BPL cards to obtain social pension benefits. For the other factors, I do not observe significant differences between the two groups. However, the effect of local government connections on social pension receipt seems to be primarily driven by individuals living in asset-nonpoor households.

### 5.3 Robustness

The increased coverage could lead to a simultaneity bias if the dependent variable and the independent variables of interest increased independently driven by some unobservable factors. I am particularly concerned by the relatively strong increase observed for the dependent variable *social pension* receipt and the independent variables *BPL card* holding and *local government connection*. This spurious correlation could be the only reason for observing that BPL card holding and connections to local government officials became more important for access to social pension benefits from 2004–05 to 2011–12 as described in the previous section.

To address this concern, I conduct a placebo check. I randomly assign social pension receipt in both time periods to the individuals in the sample of analysis to mimic the coverage expansion that took place from 2004–05 to 2011–12. In this random allocation, I take into account the number of beneficiaries in 2004–05 and in 2011–12, and how many individuals received social pensions in both rounds. I also account for the fact that in the Indian social pension system, individuals who start to receive a social pension in one period typically continue receiving it in the next period independently of their poverty status.

**Figure 5: Placebo Check**



BPL = Below Poverty Line.

Source: Author's illustration and estimation based on IHDS I for 2004–05 and IHDS II for 2011–12.



Given this random allocation, I run the same regressions again and use *random pension recipient* as the dependent variable. Under random allocation, the positive and significant effects of political connections and BPL card holding that I observed before for the second time period completely disappear and thereby the placebo test confirms that the previously found relationship between these two variables of interest and the dependent variable were not caused by a spurious correlation between the left-hand-side variable and the right-hand-side variables. The results of the placebo check are visualized below.

## 6. CONCLUSION

This study aimed to examine the targeting performance of social pensions in India and to answer the question of who receives social pension benefits. The descriptive statistics show that from 2004–05 to 2011–12, a time period encompassing important social pension reforms, the targeting of social pensions improved but both targeting errors continued to be very high. The exclusion error reduced substantially from 87% to 68% and the inclusion error reduced from 51% to 41%. This development indicates a general improvement of the targeting performance but also shows that a major share of resources continues to be absorbed by nontargeted individuals who are either nonpoor or younger than the retirement age. The reduction of the exclusion error seems to be primarily achieved through the removal of the cap on the number of beneficiaries allowing elderly individuals to apply any time and increasing their chances of obtaining access to social pension benefits. Nevertheless, the persistently high targeting errors indicate that social pension reforms in the past have not been successful in facilitating access for the majority of the elderly poor. In particular, the low benefits of targeting apparent – when comparing the targeting errors under random allocation – to actual targeting errors imply that there is an urgent need to reconsider the targeting of social pension benefits in India due to the obvious difficulties in identifying the elderly poor for the scheme. For the ongoing debate on targeting versus universalizing social pension benefits, future research that manages to compare the costs to the benefits of targeting will be particularly informative.

As intended by the reforms, the results show that holding a BPL ration card has become the primary determinant of access to social pensions. However, this result also holds for nonpoor individuals who exploit the unwarranted possession of a BPL ration card to obtain social pension benefits. The results further indicate that after the reforms, connections to local government officials do indeed facilitate access to social pension benefits. This result in combination with the insight that weakly targeted BPL cards enable nonpoor individuals to access social pension benefits makes it evident how challenging targeting in India has been since the introduction of targeted anti-poverty schemes and continues to be despite the described reform efforts.

Although with the reforms of the national social pension scheme in 2007 the allocation of social pensions has shifted towards a more observable criterion, the BPL card, this criterion itself is too weakly implemented to achieve effective targeting of the poor. This indicates the deeply rooted targeting problem of ration cards in India. Hence, using the allocation of ration cards as a tool to allocate benefits of a social protection scheme implies a transfer of the targeting weaknesses of ration cards to the social pension scheme. The results directly support the existing literature, which recommends a reform of the allocation of BPL cards and suggests alternative targeting approaches for social pensions such as the use of clear exclusion criteria that at least prevent clearly nonpoor elderly people from accessing social benefits targeted at the poor and facilitate access to social pensions for the elderly poor.

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## APPENDIX 1: LIST OF VARIABLES

Variable	Definition
Social pension	Dummy variable equal to 1 if individual receives social pension and 0 otherwise
After	Dummy variable equal to 1 if data was collected after the reform, i.e. in 2011–12, 0 otherwise
BPL card	Dummy variable equal to 1 if individual is entitled to benefits through the ration card, 0 otherwise, i.e. for individuals who are not entitled to BPL benefits
Age	Age of the individual
Household assets	Asset index for number of assets owned by household from 0 to 30
Land holding	Land holding in acres
Local government connection	Dummy variable equal to 1 if somebody from the household or close to the household is a local government official, 0 otherwise
Public meeting	Dummy variable equal to 1 if individual belongs to a household that participates regularly in public meetings and 0 otherwise.
Social organization	Dummy variable equal to 1 if individual belongs to a household that is member in a social organization, 0 otherwise
Watching TV	Dummy variable equal to 1 if individual belongs to a household watching TV regularly
Reading newspaper	Dummy variable equal to 1 if individual belongs to a household reading newspaper regularly, 0 otherwise
Education	Completed years of schooling
Highest adult education in household	Completed years of schooling of the most educated household member
Working	Dummy variable equal to 1 if individual works more than 240 hours per year, 0 otherwise
Permanent job in household	Dummy variable equal to 1 if anybody in the household has a permanent job
Families collaborate	Dummy variable equal to 1 if individual lives in a household that reports that families collaborate to solve local problems, 0 otherwise
Peaceful village	Dummy variable equal to 1 if individual lives in a household that reports that people in the village/block in general get along well with each other, 0 otherwise
Share of electrified households	Share of electrified households in village or block
Head of household	Dummy variable equal to 1 if individual is head of household, 0 otherwise
Widow	Dummy variable equal to 1 if individual is widowed, 0 otherwise
Household size	Number of individuals living in the household
Urban	Dummy variable equal to 1 if individual lives in a household in urban areas, 0 otherwise
Scheduled tribes	Dummy variable equal to 1 if individual lives in a household belonging to scheduled tribes, 0 otherwise
Scheduled castes	Dummy variable equal to 1 if individual lives in a household belonging to scheduled castes, 0 otherwise
Other backward castes	Dummy variable equal to 1 if individual lives in a household belonging to other backward castes, 0 otherwise
Female	Dummy variable equal to 1 if individual is female, 0 otherwise
Hindu	Dummy variable equal to 1 if individual lives in a Hindu household, 0 otherwise
Muslim	Dummy variable equal to 1 if individual lives in a Muslim household, 0 otherwise
COPC	Monthly consumption expenditure per capita
COPC adj	Monthly consumption expenditure per capita adjusted
Asset poor	Dummy variable equal to 1 if individual belongs to a household in the lowest asset ownership quartile, 0 otherwise

COPC = Consumption per capita.

## APPENDIX 2: STATE-WISE ELIGIBILITY AGES FOR SOCIAL PENSIONS

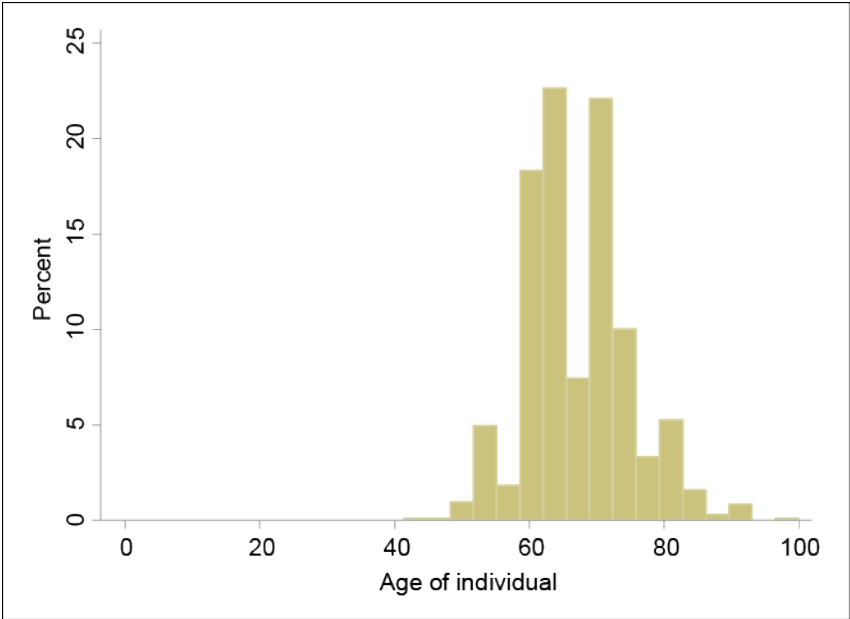
State	2004–05	2011–12
Himachal Pradesh	65	60
Punjab	60 (f), 65 (m)	60
Chandigarh	65	60
Uttarakhand	65	60
Haryana	65	60
Delhi	60	60
Rajasthan	55 (f), 58 (m)	55 (f), 58 (m)
Uttar Pradesh	65	60
Bihar	60	60
Sikkim	65	60
Nagaland	65	60
Manipur	60 (f), 65 (m)	60
Mizoram	60 (f), 65 (m)	60
Tripura	65	60
Meghalaya	60 (f), 65 (m)	60
Assam	60 (f), 65 (m)	60
West Bengal	65	60
Jharkhand	65	60
Odisha	65	60
Chattisgarh	65	60
Madhya Pradesh	65	60
Gujarat	60	60
Daman and Diu	60	60
D and N Haveli	65	60
Maharashtra	60 (f), 65 (m)	60
Andhra Pradesh	65	60
Karnataka	60 (f), 65 (m)	60
Goa	60	60
Lakshadweep	60	60
Kerala	65	60
Tamil Nadu	65	60
Pondicherry	60	60
Andaman Islands	60	60

Notes: m: male, f: female.

Source: Kaushal 2014 and Government of India 2011.

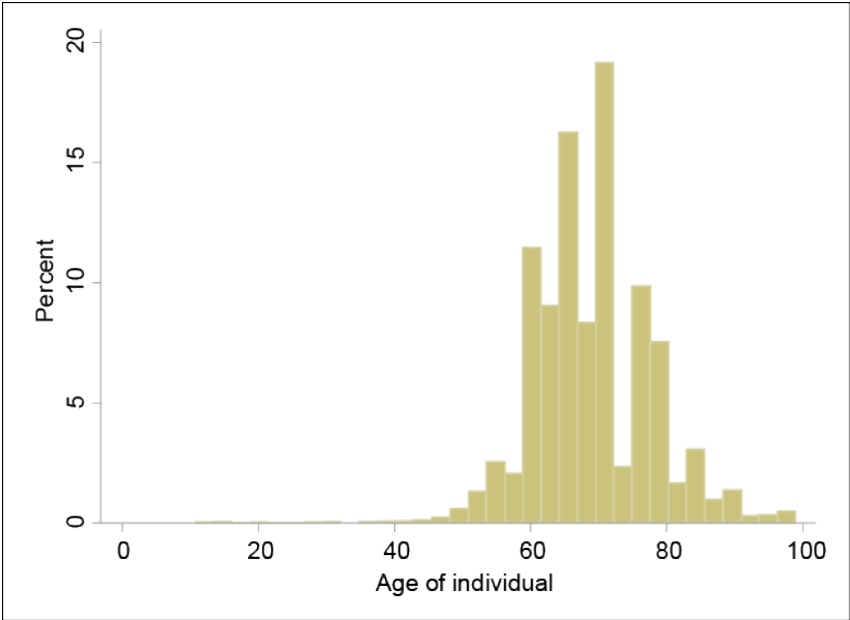
**APPENDIX 3: AGE DISTRIBUTION OF SOCIAL PENSION BENEFICIARIES**

**(a) 2004–05**



Source: Author's illustration based on IHDS I for 2004–05.

**(b) 2011–12**



Source: Author's illustration based on IHDS II for 2011–12.

## APPENDIX 4: HOW DID THE FACTORS CHANGE OVER TIME?

Variables	Linear Probability Model with Individual Fixed Effects 2004–05 to 2011–12
BPL card	–0.0355*** (0.012)
After X BPL card	0.1977*** (0.013)
Local government connection	0.0077 (0.017)
After X local government connection	0.0240 (0.021)
Public meeting	–0.0128 (0.012)
After X public meeting	0.0209 (0.016)
Social organization	–0.0101 (0.010)
After X social organization	0.0193 (0.013)
Observations	29,904
Number of id	14,952
Weighted avg. prediction of Y	0.138
Share of predicted values in [0;1]	85%
Adjusted within R-squared	0.234

BPL = Below Poverty Line.

The dependent variable is *social pension receipt*. Regressions account for sampling weights. Cluster-robust standard errors are shown in parentheses. All control variables are included.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Author's estimations based on IHDS I for 2004–05 and IHDS II for 2011–12.

## APPENDIX 5: HETEROGENEITY ANALYSIS FOR ASSET-POOR AND ASSET-NONPOOR INDIVIDUALS

Variables	Linear Probability Model with Individual Fixed Effects 2004–05 to 2011–12
BPL card	–0.0460*** (0.014)
BPL card X after	0.2017*** (0.018)
BPL card X asset poor	0.0373* (0.022)
BPL card X after X asset poor	–0.0430 (0.029)
Local government connection	0.0075 (0.019)
Local government connection X after	0.0287 (0.024)
Local government connection X asset poor	–0.0074 (0.037)
Local government connection X after X asset poor	0.0003 (0.047)
Public meeting	–0.0371*** (0.013)
Public meeting X after	0.0477*** (0.018)
Public meeting X asset poor	0.0592** (0.025)
Public meeting X after X asset poor	–0.0568* (0.034)
Social organization	–0.0061 (0.012)
Social organization X after	0.0111 (0.016)
Social organization X asset poor	–0.0117 (0.021)
Social organization X after X asset poor	0.0319 (0.030)
Observations	29,904
Number of id	14,952
Weighted avg. prediction of Y	0.138
Share of predicted values in [0;1]	85%
Adjusted within R-squared	0.237

BPL = Below Poverty Line.

The dependent variable is *social pension receipt*. Regressions account for sampling weights. Cluster-robust standard errors are shown in parentheses. All control variables are included.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Author's estimations based on IHDS I for 2004–05 and IHDS II for 2011–12.