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Targeting of social transfers: Are India's poor older people left behind?

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ABSTRACT

Whether social transfers should be targeted or universal is an unsolved debate particularly relevant for the implementation of social protection schemes in developing countries. While the limited availability of public resources encourages targeting, the difficulty to identify 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 poor older people. The results show that during a time period of social pension reforms, exclusion and inclusion errors were successfully reduced but the exclusion of poor older people 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 indeed made the Below Poverty Line ration card the most important determinant of access to social pensions for older people. However, this focus on the ration card promoted by the national government has its own weaknesses. Non-poor older people exploit the unwarranted possession of this ration card and results suggest 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 older individuals while many poor older people typically lacking these connections lag behind.

1. Introduction

Accelerating demographic change, a persistently large informal sector and weakening family support for the older people have important implications for old-age poverty in developing countries. Multi-generational household models that traditionally provided support to older people are diminishing due to migration and declining fertility (James, 2011). In contrast to the small minority of formal sector workers that benefit from comprehensive social protection and old-age income security, the vast majority of informal sector workers is predicted to 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 aim to mitigate old-age poverty faced by individuals who lack social protection coverage (Holzmann & Hinz, 2005). To improve the old-age income security of the poor, in 1995, the Indian government introduced the National Old Age Pension Scheme (Government of India, 1995).[1]

The National Old Age Pension Scheme targeted towards poor older people belongs to the National Social Assistance Programme which supports vulnerable groups through various social assistance schemes (Government of India, 1995). Motivated by the increasing risks of old-age poverty in the presence of demographic change and widespread informal sector employment, I focus on evaluating the targeting performance of the social pension scheme for poor older people.[2]

The effectiveness of social pensions in terms of old-age poverty reduction depends essentially on whether social pensions reach the poor older people 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 a few selected states. Chopra and Puddussery (2014) assess the implementation of social pensions but focus in their analysis only on benefciairies and hence cannot assess the targeting performance. The latest study by Kaushal (2014) used repeated

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[1] While this national social pension scheme for older people was introduced in 1995, several Indian states had previously implemented social pension schemes (see Asri et al. (2017) for further information). One outstanding example is Rajasthan where a state social pension scheme was already provided since 1974 to poor women aged 55 years and older and to poor men aged 58 years and older (Dutta, 2008).

[2] The term social pension is commonly used for cash transfers to different vulnerable groups including widows, disabled individuals and older people. Given this paper's focus on older people's access to social transfers, I focus on the receipt of the social pension targeted towards the older poor people.

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cross-sectional data for all of India but lacked data on social pension receipt and needed to approximate beneficiary status. Research on social pensions in other countries including Brazil and South Africa has made the importance of social pensions for poverty reduction evident. The impact of social pensions is not restricted to the well-being of direct beneficiaries; other household members and especially grandchildren seem to benefit as well from the cash transfer (e.g. Duflo, 2000; Edmonds, Mammen, & Miller, 2005; Lloyd-Sherlock, 2006).

This paper contributes to the existing literature in two ways: First, improving our understanding of whether social pensions reach the poor older people is an important prerequisite for analyzing the effectiveness of social pensions in India and other developing countries with similar institutions and similar targeting challenges. Second, methodologically I contribute to existing targeting studies by comparing indicators of the targeting performance to a hypothetical random allocation of social pensions. Moreover, in examining the relevant factors affecting access to social pension benefits, the availability of panel data allows me to minimize potential omitted variable bias and a placebo test shows that the identified factors are indeed relevant and not just driven by spurious correlations.

To address limitations in targeting and coverage of social pensions, the central government introduced social pension reforms in 2007. The results of this study indicate that from 2004–05 to 2011–12, these national level reforms contributed to a reduction of the exclusion and inclusion error but both targeting errors continue to be very high. Comparing the actual allocation of social pensions to a hypothetical random allocation, the results suggest that the benefits from targeting are relatively small for the exclusion error and relevant but decreasing over time for the inclusion error. Even though the allocation of social pensions has moved towards the Below Poverty Line (BPL) card as a more observable criterion, this criterion itself is too weakly implemented to achieve effective targeting of the poor. BPL card holding is relevant for individuals from both asset poor and asset non-poor households to access social pensions and individuals who have direct connections with the local government have higher chances to receive the benefits.

The remainder of the paper is structured as follows: Section 2 provides 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 challenge and how social pension reforms in the Indian context are related to it. Section 4 describes the data and explains the methodology. In Section 5, I present the results from the empirical analysis before concluding in Section 6.

2. Background: The need for social pensions in India and national reforms

The need for an effective social pension scheme for poor polder people in India has been reinforced by progressing demographic change. As presented in Fig. 1, for the time period of 2010 to 2050, India's population aged 60 years and older is expected to triple (from 96 million to 316 million) while India's population of individuals aged younger than 60 years is expected to grow only by 18 percent in the same time period (from 1.134 billion to 1.342 billion). After 2050, the United Nations World Populations Prospects (2017) even predict a decrease in the absolute size of the population younger than 60 years of age while the population aged 60 years and above is expected to continue growing. The fact that India's population is ageing is also reflected in the relative shares of the population groups (see Fig. 2): While the share of India's population aged 60 years and older is predicted to continue increasing in the next decades, the opposite is the case for the share of India's population aged younger than 60 years (United Nations, 2017).

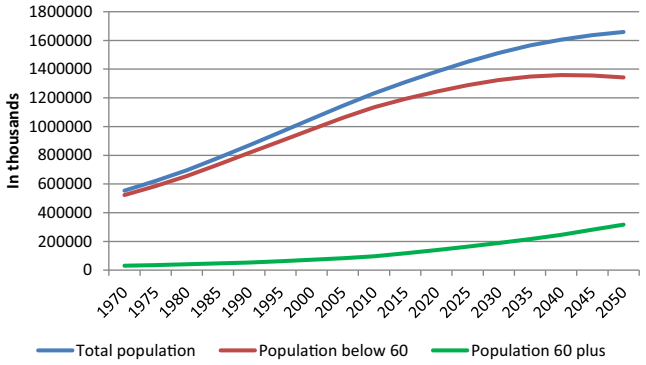


Fig. 1. Absolute development of population below 60 and 60 plus. *Source:* Author's illustration, data from United Nations (2017).

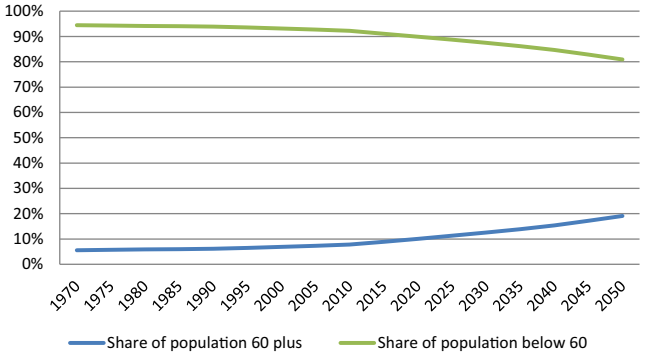


Fig. 2. Relative shares of India's population below 60 and older than 60 years of age. *Source:* Author's illustration, data from United Nations (2017).

The fact that more than 90 percent of the labor force is working in the informal sector implies that the vast majority of older people lacks social protection in old-age from which only a small minority of formal sector workers benefit (ILO, 2018). Given widespread poverty, 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.

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 (i.e. village councils) in rural areas and municipalities in urban areas, 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, 1998, p. 4). In addition to the eligibility age of 65 years as stipulated by the national government, the original guidelines 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, 1998, p. 7).[3] If criteria to determine destitution were already in place, state governments could use those criteria to identify beneficiaries but

[3] According to national guidelines, the entitlement to receive a social pension is independent of the spouse's entitlement (Government of India, 1995, 2014). However, before 2007 when the destitution criterion was stipulated by the national government, an individual would be considered as ineligible if his/her spouse would have sufficient financial means to support him/her. Subject to review by the national government, state governments could however link entitlements of spouses for their state level pension schemes. As Dutta reports, in the context of Rajasthan, the social pension amount received by an older person depended on whether his/her spouse already received a social pension (Dutta, 2008).

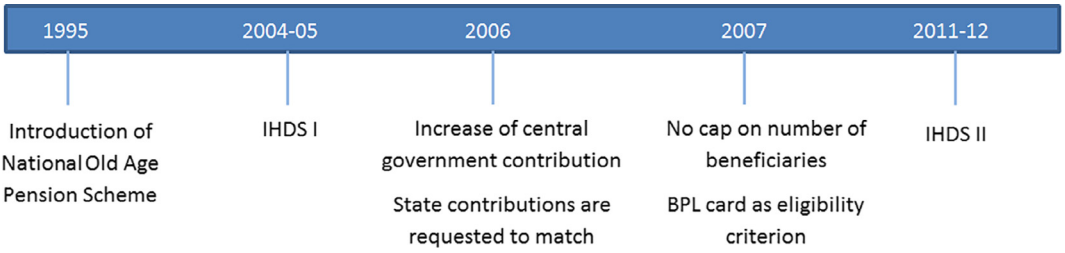


Fig. 3. Timeline of national social pension reforms and IHDS data collection. *Source:* Author's illustration based on Government of India (1995, 2007).

the national government had "the right to review these criteria and suggest appropriate revised criteria" (Government of India, 1995, p. 7). Several states (Punjab, Manipur, Mizoram, Meghalaya, Assam, Maharashtra and Karnataka) used their own resources to extend social pension coverage to poor women aged 60 years and older. Rajasthan even provided social pensions to poor women aged 55 years and older and to men 58 years and older (see Appendix 2). In 2011, the national government followed this trend and reduced the eligibility age to 60 years as per national guidelines (Government of India, 2011).

At the national level, the social pension reforms in India aimed at increasing the social pension amount as well as the coverage. In 2006, the central government contribution to the social pension amount 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). In terms of purchasing power parity (PPP), 75 INR correspond to 6.8 international USD in 2005 and 200 INR correspond to 12.5 international USD in 2012 (World Bank, 2016). As described in more detail in Kaushal (2014), even several years after the reform in 2011–12 many state governments do not match the central government contribution. Even if they do, the total social pension amount remains typically substantially below the Indian poverty line being on average 447 INR (ca. 40.4 international USD) in rural India and 579 INR (52.4 international USD) in urban India in 2004–05 and 816 INR (51.0 international USD) in rural India and 1000 INR (62.4 international USD) in urban India in 2011–12 (Reserve Bank of India, 2013). As shown by HelpAge International in a database on social pensions, compared to other countries that have means-tested targeted social pension schemes, social pension amounts in India are very low. For instance South Africa's old-age grant is about 107 international USD in terms of PPP and Brazil's social pension amount is about 300 international USD in terms of PPP (HelpAge International, 2018).

In 2007, the central government officially removed the cap on the number of beneficiaries and recommended to use the BPL card as eligibility criterion in addition to age (Government of India, 2007). Even though the nationally proposed policy was to universalize social pensions within the BPL category, in reality, financial allocations were insufficient to cover all older people living in BPL card holding households (Dutta et al., 2010, p. 65).

Hence, from 2004–05 to 2011–12 the targeting approach for social pensions stipulated by the central government changed - instead of instructing local government officials to select the destitute older people as beneficiaries, since 2007, they are supposed to use a more concrete criterion, the BPL card, for targeting. Prior to 2007, the criteria for identifying "destitute" individuals were largely chosen by the state governments. While some might have used BPL card holding already then, after 2007 BPL card holding became a mandatory criterion for access to benefits from the national old-age pension scheme. The timeline in Fig. 3 gives an overview of the relevant national reforms as documented in official government documents and the India Human Development Survey (IHDS) data collection periods.

Following the national level social pension reforms, during the considered time period 2004–05 to 2011–12 state governments also increasingly introduced BPL card holding as eligibility criterion for state level social pension schemes. In several major states the destitution criterion was replaced by the BPL card holding criterion (see Asri, Michaelowa, Panda, and Paul (2017) for detailed information on the state level eligibility criteria in 7 major states).[4] Hence, the relevance of holding a BPL card to access social pensions has also increased in terms of state level regulations.

In India, the BPL card is also commonly used for access to other social protection schemes despite strong criticism of its allocation which often neglects poorer households and allows non-poor households to access benefits (Alkire & Seth, 2013; Khera & Drèze, 2010; Ram, Mohanty, & Ram, 2009). The Ministry of Rural Development provides guidelines for the identification of "Below Poverty Line" households to the state governments. Until now, four BPL censuses have taken place in 1992, 1997, 2002 and 2011 using each a different methodology and different proxy indicators (Ram et al., 2009).[5] Based on different surveys capturing the allocation outcomes of the first three censuses, researchers have made the targeting problems of BPL cards evident: "[N]early half of all poor households in rural India did not have a BPL card around 2005" (Drèze & Khera, 2017, p. 557). Beyond the methodological issues of each BPL census, there is a more general discontent with the distribution of BPL cards. In particular, it has been criticized and empirically shown that BPL card allocation is politically influenced implying that better connected households (typically not the poor) benefit more (Aman & Agrarwal, 2014; Jhabvala & Standing, 2010; Panda, 2015; Ram et al., 2009).

Previous literature on the targeting performance of social pensions in India is limited. In the case of Rajasthan, Dutta (2008) reports evidence of under-coverage, high transaction costs of the application process, and not strictly enforced eligibility criteria. She further emphasizes that using BPL cards as eligibility criterion would rather worsen than strengthen the targeting of social pensions. This is in line with Ajwad (2007) who found for Uttar Pradesh in 2004–05 that 70 percent of individuals from the poorest quintile did not possess any BPL or Antyodaya card (for the poorest

[4] 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 includes 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.

[5] While the BPL census in 1992 focused on household's annual income, the BPL census in 1997 first identified non-poor households with exclusion criteria related to housing quality and ownership of land and durable assets. Those households fulfilling one of the exclusion criteria were then surveyed regarding their consumption expenditures in the last 30 days. If the household's consumption was below the consumption poverty line, the household was categorized as poor and as non-poor otherwise. In 2002, an expert group "recommended a score-based ranking of each household" indicating the quality of life. The overall score ranged from 0 to 52 with 0–4 points in 13 categories and the state governments decided about the cut-off points (Ram et al., 2009, p. 67). The 2011 census was based on automatic inclusion, exclusion criteria and on a seven points based deprivation ranking (Government of India, 2011).

families in the country), while 13 percent of the richest quintile possessed one of the two ration cards. Similarly, Ram et al. (2009, p. 67) show that 40 percent of the BPL cards are possessed by non-poor households in India, and many deprived households do not hold a BPL card. Given the move from the destitution criterion towards 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 few studies which assessed the targeting performance of BPL cards, or focused on specific states to examine the implementation of social pensions.

Related to the targeting performance of social pensions, it is important to note that filing an application for a social pension at the local administrative authorities is a requirement for sanctioning of social pensions. Based on a series of surveys focused on the evaluation of public entitlements in several states, Drèze and Khera (2014, 2017) describe the application process as very bureaucratic and slow requiring several documents as well as long waiting times.

3. Theoretical framework

After briefly summarizing the theoretical literature on the targeting challenge in general, I describe the theoretical expectations on 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, & Hoddinott, 2004a; Sen, 1992). Targeting of social protection schemes gained particular importance during macroeconomic and structural adjustments when governments had to reduce public expenditures (White, 2017). However, targeting itself can be very costly especially in developing countries where data availability is limited and administration weak (Besley & Kanbur, 1990). Based on the various challenges that targeting is exposed to; even the strongest supporters 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 (Coady, Grosh, & Hoddinott, 2004b).

High exclusion errors and/or inclusion errors reduce the impact of any anti-poverty scheme (Slater, Farrington, Samson, & Akter, 2009). In general, 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 non-targeted individuals (Coady et al., 2004a). As shown in Table 1, an individual is wrongly excluded from an anti-poverty program if she is poor and does not receive the benefits and wrongly included if she is non-poor and receives the benefits that are targeted towards the poor.[6]

[6] 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 age and poverty status of the individuals to measure exclusion and inclusion error.

Table 1
Exclusion and inclusion error.

	Welfare status of individual	
	Poor	Non-Poor
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. (2004a, p. 10).

Following Coady et al. (2004a, p. 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):

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

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

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

This study will shed light on how the described social pension reforms affected the targeting performance of India's social pension scheme by measuring the exclusion and the inclusion error. Whether the exclusion error or the inclusion error is more important to judge the overall targeting performance of an anti-poverty program is not obvious and a researcher's perspective evaluating the targeting performance may differ from a policy-makers perspective designing a targeted welfare scheme. Given major financial constraints for the provision of anti-poverty programs particularly in developing countries, policy-makers traditionally focused on keeping the inclusion error low by using narrowly defined eligibility criteria to keep the costs of the anti-poverty intervention low (Cornia & Stewart, 1993). In this context, exclusion errors did not receive much attention because the limited financial resources implied that only some of the poor could benefit from the intervention. In the last decades, more governments have moved towards a human rights-based approach. Based on this way of thinking, an exclusion error implies that an individual is deprived of her rights and therefore the mitigation of errors of exclusion have received much more attention by policy-makers (Drèze & Khera, 2017). From a researcher's perspective, it needs to be taken into account that exclusion and inclusion errors are strongly interlinked when resources for anti-poverty schemes are limited and hence both are important for the evaluation of the targeting performance (Coady et al., 2004a).

3.2. Theoretical expectations

The welfare effects of social pensions are at the maximum when poor older people (targeted individuals) receive social pensions and non-poor older people or individuals who are younger than the eligibility age (non-targeted individuals) do not. However, exclusion error and inclusion error exist for multiple reasons. Existing literature suggests that the poorest older people face the biggest difficulties in accessing social pensions. They are more likely to lack awareness as well as capabilities and documents required during the application process. Their transaction costs for application might also be substantially higher if they lack experience of dealing with local governments and/or if they live in remote areas (Mujahid, Pannirselvam, & Doge, 2008). Those who

are aware of the social benefits, better connected to local government bodies and capable to deal with the application procedures might be more likely to obtain access. In the following, I describe first the theoretical expectations 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 of national guidelines for the social pension scheme officially removed the cap on the number of beneficiaries in 2007 and the second reform redefined the eligibility criteria by giving more weight to BPL card holding for accessing social pension benefits.

By removing the cap on the number of beneficiaries (at least officially), the first reform increased the availability of social pensions and is therefore expected to increase the coverage of the poor older people, and to reduce the exclusion and inclusion errors. The indicators of the targeting performance do not only improve because of the increased availability of social pensions but also because the prior rationing of social pension benefits was implicitly advantageous for better informed or better connected 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 social pension has been in principle eliminated with the official removal of the cap on the number of beneficiaries. In principle means that officially there is no cap on the number of beneficiaries anymore but I cannot rule out any shortage of financial resources at the national or subnational level.

The effect of redefining the eligibility criteria and giving more weight to BPL card holding 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. Consequently, the targeting performance could be improved i.e. coverage of the poor older people increases and exclusion and inclusion error decrease. On the other hand, BPL cards themselves have been criticized for being weakly targeted (e.g. Alkire & Seth, 2013). If the previously stipulated destitution criterion was better targeted towards the poor than BPL cards, I would expect to observe a deterioration of the targeting performance. However, if, despite of the limitations in their allocation, BPL cards were better allocated towards the poor than the previously used destitution criterion, I would expect to observe an improvement of the targeting performance. Thus, introducing BPL ration cards as 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 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 on the factors determining individual level access to social pensions are therefore based on the scarcely 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 particular difficulties in targeting prevalent 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 or documents during the application phase and finally receiving social pensions, contacts and embeddedness in a local network also matter.

First, I expect that individual's eligibility determined by age and poverty status – destitution before 2007 and increasingly BPL card holding after – is positively associated with the likelihood to access 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 the older person. After the reform, I expect to observe an increased importance of BPL card holding. This expectation is entirely based on the official documents (Government of India, 2007) and should be evident in the regression results if state and local governments followed the nationally modified eligibility criteria.

Second, I anticipate that direct connections to local government officials can influence the selection of beneficiaries and expedite the granting of social pensions. This concern of preferential treatment depending on political connections has been raised already for the last decades. Drèze and Sen (1989, p. 107) emphasized that political influence is likely to determine the allocation of funds by local governments across the poor and the non-poor. Particularly 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 for 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 spreading awareness related to welfare schemes and I therefore expect that participating in public meetings as well as membership in social organizations can help to acquire information on social pensions.

4. Data and methodology

4.1. The India Human Development Survey

The IHDS was conducted by the National Council of Applied Economic Research and the University of Maryland (Desai et al., 2007, 2015). This nationally representative individual-level panel dataset 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. The survey is spread over all the states and union territories of India except Andaman & Nicobar Islands and Lakshadweep which together account for less than 0.05% of India's population. The IHDS includes a broad range of economic 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, 2015). From IHDS data, I use information on receipt of social pension for older people, eligibility of the individual (age, land holding, household assets and BPL card holding), local government connection, participation in public meeting and membership in a social organization. I control for working status, any permanent employment in the household, literacy, education, mass media usage, household size, number of adults living in the household, urban area, belonging to scheduled castes (SC), scheduled tribes (ST) or other backward castes (OBC), and village level development indicators. The complete list of variables and their definitions is shown in Appendix 1. As 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.

Apart from these factors explaining the choice of the data set, a relevant limitation is that IHDS data does not indicate whether the individual receives the social pension from the national government or from the state government. This data limitation does not affect the analysis of who receives social pensions but constrains the policy implications of the results making it impossible to relate targeting errors either to the state level or to the national level social pension scheme.

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 IHDS showing that the eligibility cutoff is not strictly enforced in practice (Appendix 3), I use a sample of individuals who are at maximum 10 years younger than the state level eligibility age for social pension (see Appendix 2 for state level eligibility ages).[7] 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 older people, 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 and the number of targeted individuals. The inclusion error is the number of non-targeted individuals (i.e. either younger than the eligibility age or non-poor or both) receiving social pensions divided by the number of beneficiaries.

To measure 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 TV, mobile phone, bicycle, motorbike, electric fan, fridge, toilet type, floor type and water access type. This produces an asset index varying from -3.48 to 3.55 with a mean value of 0. The asset index is strongly positively correlated with consumption expenditures per capita. Following Booysen, van der Berg, Burger, von Maltitz, and du Rand, (2008, p. 1118), I use the 40th percentile as a poverty line i.e. an individual is counted as poor if she lives in a household whose asset ownership index is lower than the 40th percentile in the asset index distribution. To take into account 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 non-poor or younger than the eligibility age (or both) and receives a social pension.

Focusing on asset poverty instead of consumption poverty is preferable here since I evaluate the targeting performance retrospectively and cannot rule out behavioral reactions to social pension receipt that would directly affect consumption expenditure. Since a certain share of older people in the data set is already receiving social pensions, I cannot simply 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 social pension receipt and in the absence of the social pension receipt their consumption expenditures would have been lower than the poverty line and hence the individual would have been considered as correctly included. A 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 the social pension. However, this subtraction would be based on two misleading assumptions. First, I would need to assume that either social pension income is entirely pooled with other household income or entirely consumed by the older person. Second, simply subtracting the received social pension amount would neglect any behavioral reactions taking place in response to the social pension receipt. For instance the social pension income might allow older individuals 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. Ownership of durable assets in contrast is a more stable indicator of financial wellbeing of a household that is unlikely to be affected by social pension receipt as the benefits are very low ranging from 200 INR to 1000 INR and primarily spent for consumption and not for 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 (or even recalled) in a developing country context, durable assets can be easily observed by government officials and would enable a relatively simple identification of the poor.

Regardless of whether the measures are based on consumption expenditure or asset ownership, they suffer from the limitation that by being measured at the household level they neglect intra-household inequalities. Older individuals might be disadvantaged in their households and hence in the empirical analysis older poor people living in non-poor households may be wrongly considered as non-poor despite of their individual need for social pension benefits.

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. This is helpful to understand the benefits of the existing targeting approach and to compare 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. This hypothetical random allocation of social pension benefits allows me to address the concern that the sheer expansion of

[7] Age misreporting is a typical problem in surveys in developing countries. It has been shown in the existing literature that misreporting is related to literacy in the Indian context (Agrawal & Khanduja, 2015). Therefore, misreporting age could be more common and particularly severe among the most vulnerable individuals. As this study focuses on the question whether the poor older people are left behind in terms of access to social pensions, I decide against dropping these observations. However, I obtain very similar results, if I drop observations with an extremely misreported age and also if I apply a complicated correction procedure.

social pension coverage influences the size of the targeting errors by taking into account the social pension coverage in both years. Hence, given the coverage of social pensions in one year, I compare the targeting error under actual allocation to the targeting error under hypothetical random allocation of social pensions.

Theoretically, if social pensions were allocated randomly, expanding the coverage would imply that the exclusion error would decrease while the inclusion error would increase. However, this is not the only factor playing a role here. In addition, from 2004–05 to 2011–12 the number of targeted individuals increased since the eligibility age was reduced in most states. The increase in the number of targeted individuals affects both errors in the opposite direction. Ceteris paribus, the increase in the number of targeted individuals would lead to an increase in the exclusion error and a decrease in the inclusion error. Given these two opposing forces, the development of the targeting errors under random allocation remains an empirical question.

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 social pension receipt (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 regressions with individual fixed effects. This approach minimizes the omitted variable bias related to unobserved time-invariant individual characteristics that cross-sectional regressions are suffering from.[8] 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 asset poor and asset non-poor 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. All control variables as described above are included. To account for changes over time, I am including a dummy variable for the later time period 2011–12 which also addresses the concern that the results might be partially driven by the expansion of social pension coverage from 2004–05 to 2011–12.

Eq. (1): Baseline specification

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

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 & Pischke, 2009; Wooldridge, 2002) and for examining changes over time with interaction terms (Ai & Norton, 2003). I present robust standard errors that are adjusted for the 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 proceeding to the interpretation of the results:

First, people could lie about social pension receipt and BPL card holding if they were aware of not being eligible for receiving social pensions or holding a BPL card. Since the IHDS surveyors clearly explained the research purpose of the survey, it is rather unlikely that individuals had any motivation to lie about these aspects in front of a surveyor visiting their households. 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 reduces the statistical power of the estimations. Hence, my results should be considered as lower-bound estimates.

Second, while local government connection and BPL card holding are incorporated in the regression analysis as two independent factors associated with social pension receipt, in reality holding a BPL card is also influenced by having a local government connection. The factors influencing BPL card holding 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 performance. 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 older people. This goes beyond the focus of the paper and is therefore left for future research.

5. Results

5.1. Descriptive statistics

The sample used for the analysis is only restricted by the age of the individuals and therefore includes beneficiaries and non-beneficiaries of social pensions. It consists of all older people who are at maximum 10 years below the eligibility age and surveyed twice by IHDS (balanced panel). The summary statistics are shown in Table 2 separately for 2004–05 and 2011–12.[9] The share of older people receiving a social pension increased from 4.2 percent in 2004–05 to 17.8 percent in 2011–12. Concerning the independent variables of interest indicating eligibility for social pensions, the figures indicate that the average age for the individuals in the sample has increased from 61.1 years to 68.0 years, corresponding to the time between the two survey rounds, and the share of older individuals living in households that hold BPL cards increased from 33.7 percent to 40.9 percent.[10]

Ownership of assets increased from 12.9 to 15.5 assets on average out of 30 assets while the size of land holding declined from 2.4 acres to 2.0 acres on average. These are both indicators of wealth that states might have used to assess the poverty status of social pension applicants prior to the national social pension reforms. Since the destitution criterion provided by the national government lacked any further specifications, state governments were able to identify beneficiaries based on criteria in place.

Concerning the independent variables of interest indicating social capital in different forms, the share of older people living in households that are directly connected with the local government officials has increased substantially from 11.7 percent to 28.7 percent. Participation in public meetings stayed stable (30.9

[8] Since the inclusion of individual fixed effects accounts for all time-invariant individual level heterogeneity, it also automatically includes the place of residence i.e. fixed effects at a higher level (i.e. district fixed effect or state level fixed effects) are automatically accounted for.

[9] For simplicity, I use the term older people even though the sample includes individuals who are at maximum 10 years below the local eligibility age for social pensions.

[10] Among social pension beneficiaries, the share of individuals living in BPL card holding households is much higher. In 2004–05, 47.6 percent of the social pension beneficiaries have a BPL card which increased to 68.5 percent of beneficiaries having a BPL card in 2011–12 (Desai et al., 2007, 2015).

Table 2
Summary statistics.

	IHDS 2004–05				IHDS 2011–12				Variable category
	mean	sd	min	max	mean	sd	min	max	
Social pension	0.042	0.200	0	1	0.178	0.383	0	1	Dependent variable and
Age	61.089	7.771	45	100	68.009	8.462	45	99	independent variables of interest
BPL card	0.337	0.473	0	1	0.409	0.492	0	1	
Household assets	12.890	6.252	0	30	15.472	6.300	0	30	
Land holding	2.440	5.971	0	200	2.024	6.856	0	400	
Local government connection	0.117	0.321	0	1	0.287	0.453	0	1	
Public meeting	0.309	0.462	0	1	0.313	0.464	0	1	
Social organization	0.370	0.483	0	1	0.402	0.490	0	1	
Watching TV	0.478	0.500	0	1	0.557	0.497	0	1	Control variables
Reading newspaper	0.261	0.439	0	1	0.250	0.433	0	1	
Literate	0.431	0.495	0	1	0.426	0.494	0	1	
Education	3.152	4.370	0	15	3.095	4.342	0	15	
Highest adult education in household	8.415	5.059	0	15	8.626	5.095	0	15	
Working	0.565	0.496	0	1	0.344	0.475	0	1	
Permanent job in household	0.150	0.357	0	1	0.178	0.382	0	1	
Electrification rate	0.770	0.289	0	1	0.882	0.202	0	1	
Village collaboration rate	0.584	0.318	0	1	0.732	0.254	0	1	
Peaceful village rate	0.533	0.357	0	1	0.597	0.340	0	1	
Head of household	0.493	0.500	0	1	0.507	0.500	0	1	
Widow	0.234	0.423	0	1	0.354	0.478	0	1	
Household size	6.133	3.252	1	38	5.449	2.944	1	30	
Number of adults	3.779	1.654	1	18	3.692	1.636	1	18	
Urban	0.279	0.449	0	1	0.303	0.460	0	1	
Other backward castes	0.408	0.491	0	1	0.412	0.492	0	1	
Scheduled castes	0.176	0.381	0	1	0.179	0.383	0	1	
Scheduled tribes	0.064	0.245	0	1	0.066	0.248	0	1	
Female	0.536	0.499	0	1	0.536	0.499	0	1	Time-invariant
Hindu	0.824	0.381	0	1	0.829	0.377	0	1	characteristics
Muslim	0.095	0.293	0	1	0.096	0.294	0	1	
Asset poor	0.393	0.488	0	1	0.411	0.492	0	1	Asset poverty measure
Observations	15,185				15,185				

The sample is restricted to individuals at maximum 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 except for *village collaboration rate*, *peaceful village rate* and *electrification rate* which are measured at the level of the primary sampling unit (village in rural areas and neighborhoods in urban areas).
Source: Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.

percent to 31.3 percent) and membership in social organizations increased from 37.0 percent to 40.2 percent.

All covariates developed over time as expected. Watching TV has become more common (from 47.8 percent to 55.7 percent), reading newspaper stayed stable (from 26.1 percent to 25.0 percent) and education levels of the older people stayed unsurprisingly at the same level with 3.1 years of education on average in 2004–05 and 2011–12. Directly related to the well-being of older individuals, the share of individuals working (defined as having worked at least 240 h in the last year) declined from 56.5 percent in 2004–05 to 34.4 percent in 2011–12.[11] This reduction seems to be primarily driven by the higher age of individuals in the sample. Moreover, the share of older individuals living in households in which at least one person has a permanent job, slightly increased from 15.0 percent to 17.8 percent. I also control for village level variables indicating development in the village (electrification rate), collaboration between villagers (village collaboration rate) and absence of conflicts (peaceful village rate). All these three indicators measured at the village level have improved over time with a higher share of households having electricity (from 77.0 percent to 88.2 percent), a higher share of households reporting that families help each other to solve local problems (from 58.4 percent to 73.2 percent) and a slightly higher share of households reporting that people get well along with each other (from 53.3 percent to 59.7 percent).

The variable asset poor in the bottom of the table indicates whether an individual lives in an asset poor household based on the methodology described before. Since I set the poverty line at the 40th percentile of the full IHDS sample, by construction the shares of older individuals living in poor households in 2004–05 and 2011–12 are also close to 40 percent.

The summary statistics are aligned with my theoretical expectation that the poor older people might face greater difficulties in accessing social pensions because they lack capabilities such as literacy or basic education levels required during the application process. The education levels of older people are in general quite low with on average 3.1 years of schooling and a literacy rate of 42.9 percent. However these mean values mask important heterogeneities. Poor older people (i.e. living in an asset poor household) have on average only 1.6 years of completed education and a literacy rate of only 28.3 percent, making interactions with the bureaucracy much more difficult to handle (Desai et al., 2007, 2015).

Difficulties with the application procedures in particular with long waiting times or travel to administrative institutions may be particularly problematic for older people with limited mobility. In 2004–05 only 7.4 percent of the individuals have difficulties with activities of daily living (ADL) and 3.5 percent have difficulties with walking. However, directly related to the increased age in 2011–12, these shares rise to 30.1 percent and 22.3 percent respectively. These statistics indicate that a substantial share of older people in the sample is constrained in their mobility in 2011–12. The constrained mobility is particularly problematic for older people living in poor households that typically lack vehicles or financial resources to pay for transportation required during the application process (Desai et al., 2007, 2015).

In line with the summary statistics that showed a larger share of the older individuals receiving social pension benefits in

[11] This also confirms that I cannot rule out the existence of behavioral responses to the social pension receipt as described in the methodology section reasoning the focus on asset poverty instead of consumption poverty.

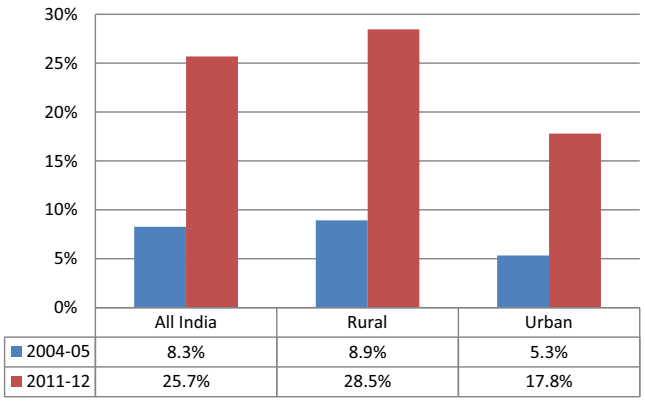


Fig. 4. Coverage of targeted individuals. Targeted individuals are at least as old as the eligibility age and poor. Poverty is measured by asset ownership. Figures account for sampling weights. *Source:* Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.

2011–12, Fig. 4 shows that the social pension coverage of the poor older people improved substantially over time. In the sample of analysis, the share of poor older people receiving social pensions increased from 8 percent to 26 percent overall, the improvement was similar for rural and urban areas but rural areas already had a higher coverage of the poor older people in 2004–05.

Regarding the targeting errors, the empirical results show that even though both targeting errors have been reduced over time, the targeting errors after more than 15 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 has been a considerable reduction of the exclusion error by 17 percentage points from 2004–05 to 2011–12, but still 74 percent of the poor older people do not receive the social pension benefit. The inclusion error was also reduced from 57 percent to 41 percent but two-fifths of the beneficiaries are still wrongly included in 2011–12, i.e. they are either non-poor or too young or both. The general pattern is similar for rural and urban India. Overall, both errors continue to be very high. Almost three quarters of the poor older people continue to be left out (exclusion error) and two fifths of the beneficiaries are either non-poor or younger than the eligibility age or both and receive social pension benefits (inclusion error).

Since these targeting errors appear to be very high, I proceed 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 Fig. 5, in 2004–05 the real exclusion error was only 4 percentage points lower than the exclusion error under random allocation and this difference increased only to 8 percentage points in 2011–12.

For the inclusion error, I observe a different development. In contrast to the small but positive change in terms of exclusion error, the benefits of targeting decreased in terms of the inclusion error, from 26 percentage points in 2004–05 to 19 percentage points in 2011–12 (at national level). Overall, these results show that despite of the social pension reforms, the benefits from targeting compared to the random allocation seem to be very small. This raises the question 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 in the Indian context Fig. 5.

The weak performance of the actual targeting of social pensions compared to the hypothetical random allocation of social pensions seems to be also related to the weak targeting performance of BPL cards in particular in the second time period. The correlation between being asset poor and holding a BPL card is only 0.21.[12] The dissonance between BPL card holding and poverty has been shown in several previous studies as described above. In particular, Mishra and Kar (2017) show in a recently published paper that BPL card holding does not reflect asset poverty in the context of Odisha.

5.2. Regression results

Below I present the results from the LPM estimations in different specifications. All regression specifications 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. The coefficients are very close to each other in size. I describe in the following the results from the last specification.

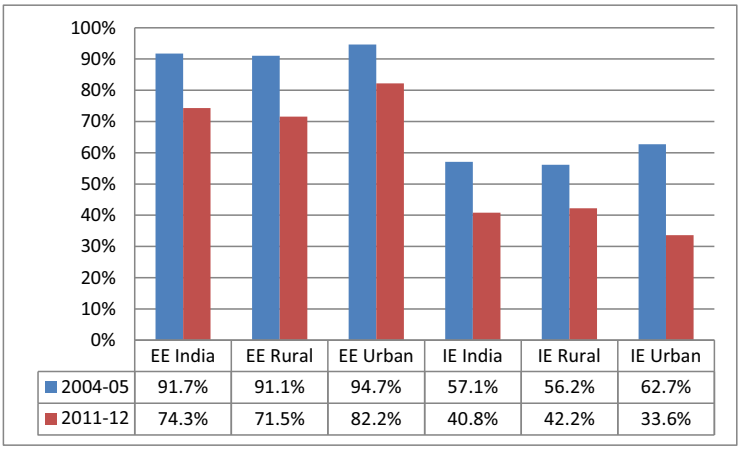
Keeping all other factors constant, the coefficient of the dummy for the period after the reform estimates the change in the likelihood of receiving a social pension in year 2011–12 relative to year 2004–05. Obtaining access to social pension in 2011–12 is 10.6 percentage points more likely than in 2004–05. This difference is significant at the 1 percent level and seems to be primarily attributable to the expansion of the coverage. As an individual becomes older, the likelihood of receiving a social pension increases with each year by 0.3 percentage points (significant at the 5 percent level) and holding a BPL card increases the likelihood to receive a social pension by 6.7 percentage points (significant at the 1 percent level). Household assets are weakly negatively associated with access to social pensions.

Regarding the social capital variables, the panel regression results support the theoretical expectation on the relevance of connections to the local government for access to social pension benefits. If an individual lives in a household that has direct connections to the local government, the likelihood to receive social pensions increases by 1.9 percentage points (significant at the 5 percent level). Participation in public meetings and taking up memberships in social organizations are not significantly associated with social pension receipt. Given the average predicted value of social pension receipt being 10.2 percent, the size of the coefficients is also economically significant Table 3.

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. 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. To test whether the relevance of the variables of interest namely 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 for 2011–12 (indicating the period after the reforms), and these variables of interest in the regression. In line with the changed national eligibility guidelines, BPL card holding becomes substantially more important for access to social pensions after the reform. In 2011–2012, for an individual who lives in a household that holds a BPL card, the likelihood of receiving a social pension increases by 15.3 percentage points indicating that the centrally reformed eligibility criterion was implemented (at least to some extent) by the state governments in panchayats and municipalities. At the time of the 2011–12 survey, the BPL card had become the most important determinant of access to social

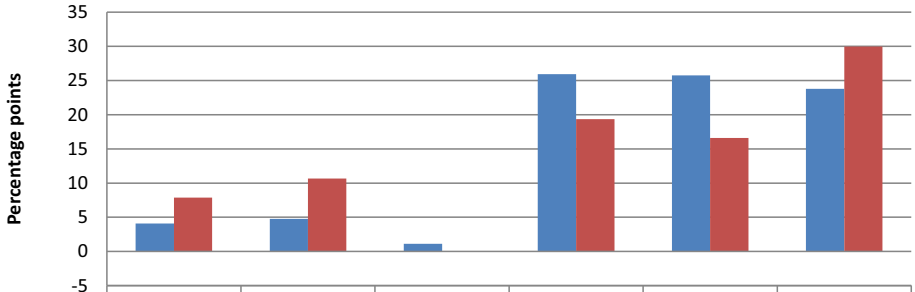
[12] The examination of the targeting performance for rural and urban India masks important differences between the states in terms of targeting performance. I therefore also show the development of the targeting errors for India's major states in Appendix D.

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



	EE India	EE Rural	EE Urban	IE India	IE Rural	IE Urban
2004-05	91.7%	91.1%	94.7%	57.1%	56.2%	62.7%
2011-12	74.3%	71.5%	82.2%	40.8%	42.2%	33.6%

(b) Compared to random allocation of social pension benefits



	EE(random)-EE(real)	EE(random)-EE(real) Rural	EE(random)-EE(real) Urban	IE(random)-IE(real)	IE(random)-IE(real) Rural	IE(random)-IE(real) Urban
2004-05	4.09	4.75	1.13	25.93	25.77	23.79
2011-12	7.87	10.67	-0.05	19.34	16.60	29.98

Fig. 5. Targeting errors. Random targeting errors are based on 1000 simulations. Figures account for sampling weights. *Source:* Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.

pensions, is significant at the 1 percent level (Table 4).

In contrast to that, prior to the reform, local government officials were requested to select individuals for the national social pension scheme based on the destitution criterion. Accordingly the results show that if an individual lives in a household that holds a BPL card in 2004–05, his or her likelihood of gaining access to social pensions is reduced by 3.0 percentage points (significant at the 1 percent level). One potential explanation for the negative coefficient in the time period before the reform could be that individuals who have a BPL card are able to access other anti-poverty schemes (such as subsidized food or public works program) and are therefore considered as less destitute by local government officials than those who do not even have a BPL card. Especially in the context of rationed provision of social pensions prior to 2007, it could be the case that benefitting from other schemes already through the BPL card makes accessing social pension benefits less likely during the time period when the vague destitution criterion was described by the national government as eligibility criterion.

My expectation for the relevance of connections with the local government is supported by the empirical analysis. As shown in Table 4 direct connections with local government officials gained importance over time. In 2004–05 the relevant coefficient is insignificant but the estimation of the marginal effects for 2011–12 indicates that living in a household that has a connection to the local government is associated with a 2.1 percent points higher likelihood of receiving social pensions (significant at the 10 percent level).

These results potentially mask heterogeneity in the factors playing a role for older people from poor and non-poor households. To examine the heterogeneity between these two groups for access to social pension benefits before and after the reform, I include triple interaction terms of the time dummy, the variables of interest and the dummy for living in an asset poor household. As explained before, this approach is preferable to using a dummy variable for being poor based on comparing consumption expenditures to the Tendulkar poverty line since the latter are directly affected by the social pension income. The variable asset poor is equal to 1 if the household's asset ownership is lower than the asset poverty line explained above Table 4.

As shown in Table 5, 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 non-poor households. I do not observe the negative association between BPL card holding and social pension for individuals living in asset poor households. After the reform, BPL card holding is relevant for individuals living in asset poor and asset non-poor households. For individuals living in asset poor households, BPL card holding is associated with a 13.1 percentage points' higher likelihood of receiving social pensions (significant at the 1 percent level). For individuals from asset non-poor households it is similarly associ-

Table 3
Panel analysis of access to social pensions.

	Linear probability model with individual fixed effects: 2004–05 to 2011–12			
Variables	(1)	(2)	(3)	(4)
After	0.106***	0.109***	0.109***	0.106***
	(0.010)	(0.010)	(0.010)	(0.010)
Age	0.003**	0.003**	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
BPL card	0.067***	0.068***	0.067***	0.067***
	(0.008)	(0.008)	(0.008)	(0.008)
Household assets	−0.002*	−0.002*	−0.002*	−0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Land holding	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Local government connection	0.019**			0.019**
	(0.008)			(0.009)
Public meeting		0.004		0.001
		(0.007)		(0.008)
Social organization			−0.006	−0.006
			(0.007)	(0.007)
Observations	30,370	30,370	30,370	30,370
Number of id	15,185	15,185	15,185	15,185
Avg. prediction of Y	0.102	0.102	0.102	0.102
Share of predicted values in [0;1]	85%	85%	85%	85%
Adjusted within R-squared	0.133	0.132	0.132	0.133

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

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	−0.030***	0.010	−0.004	−0.000
	(0.004)	(0.482)	(0.717)	(0.978)
After	0.153***	0.021*	0.005	−0.014
	(0.000)	(0.062)	(0.653)	(0.104)

For readability, I present marginal effects. The full regression tables are presented in Appendix 5.
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.

Table 5
Heterogeneous marginal effects for asset poor and asset non-poor individuals.

Period	Variable	Asset poor	Asset non-poor	P-value of difference
Before	BPL card	−0.009	−0.032**	0.256
After	BPL card	0.131***	0.142***	0.572
Before	Local government connection	0.008	0.006	0.907
After	Local government connection	0.018	0.025**	0.782
Before	Public meeting	0.007	−0.013	0.260
After	Public meeting	0.020	−0.002	0.322
Before	Social organization	−0.005	−0.0016	0.938
After	Social organization	−0.011	−0.008	0.889

For readability, I directly present marginal effects. The full regression tables are presented in Appendix 6.
***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.

ated with a 14.2 percentage points' higher likelihood of receiving social pensions (significant at the 1 percent level). This result strongly suggests that non-poor individuals exploit the unwarranted possession of BPL cards to obtain social pension benefits. Further, the effect of local government connections on social pension receipt seems to be primarily driven by individuals living in asset non-poor households who are also in general more likely to have better connections to the local government. The effect of 2.5 percentage points is significant at the 5 percent level for individuals from non-poor households and insignificant for individuals from poor households.

5.3. Robustness

The increased coverage could lead to a simultaneity bias if both 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 increasing from 4.2 percent to 17.8 percent and the independent variables BPL card holding increasing from 33.7 percent to 40.9 percent and local government connection increasing from 11.7 percent to 28.7 percent. This spurious correlation could be the only reason for observing that BPL card holding and connections to local government officials have become 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 test (Fig. 6). In 100 simulations, 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, 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 independent of changes in their poverty status (as subsequent checks of the poverty status do not seem to take place).

Given this random allocation, I run the above regressions again in 100 simulations and use random pension receipt as dependent variable. Under random allocation, the positive and significant effects of political connections and BPL card holding, which I observed for the period after the reforms in all specifications, completely disappear. Thus the placebo test confirms that the previously found relationships between these two variables of interest and the dependent variable are indeed relevant and not only caused by a spurious correlation between the left hand side variable and the right hand side variables. The results of the placebo test are visualized below showing the average of the estimated coefficients of the variables of interest and their 95 percent confidence intervals Fig. 6.

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 national social pension reforms, the targeting of social pensions improved but both targeting errors continue to be very high. The exclusion error reduced substantially from 92 percent to 74 percent and the inclusion error from 57 percent to 41 percent. This development indicates an improvement of the targeting performance but also shows that a major share of resources continues to be absorbed by non-targeted individuals who are either non-poor or younger than the retirement age (or both). The reduction of the exclusion error seems to be primarily achieved through the expanded coverage allowing older individuals to apply any time and increasing their chances to obtain 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 poor older people. Particularly, the low benefits of targeting apparent when comparing the targeting errors under random allocation to actual targeting errors imply that there is urgent need to reconsider the targeting of social pension benefits in India due to the obvious difficulties in identifying poor older people. For the ongoing debate on targeting versus universalizing social pension benefits, future research that achieves to compare the costs of targeting 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 holds also for non-poor 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 indeed facilitate access to social pension benefits. This result in combination with the insight that weakly targeted BPL cards enable

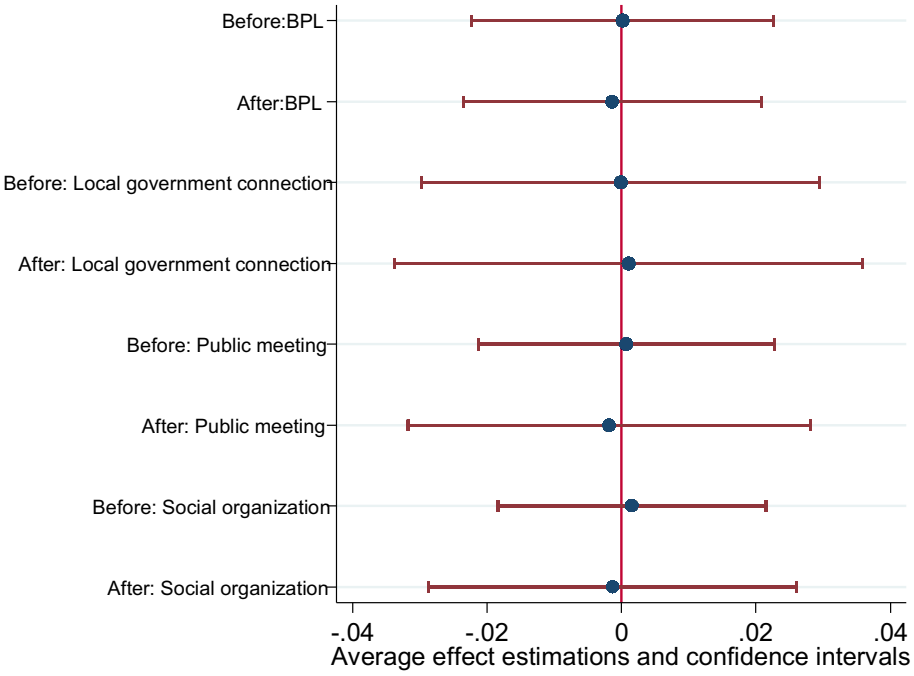


Fig. 6. Placebo test. *Source:* Author's illustration and estimation based on IHDS I for 2004–05 and IHDS II for 2011–12.

non-poor individuals to access social pension benefits makes 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. There are at least two important reasons explaining why using BPL cards for targeting turns out to be ineffective. First, there is a cap on the number of BPL cards being making it likely that more disadvantaged households are left out and second, the lists of BPL card holding households are outdated in many (if not most) Indian states (Hirway, 2003; Khera & Drèze, 2010). The results presented in this paper hence illustrate 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.

Universalization of social pensions to provide basic income support to all older people and potentially greater support to the most vulnerable older people appears to be the most desirable option (see for example Drèze & Khera, 2017, p. 557). However, universalization of social pensions in the near future does not seem to be a financially feasible option because of India's very limited tax base – only 1 percent of the Indian population pays taxes (Ghatak, 2017). Increasing the eligibility age (for example to 70 years) to enhance affordability would imply discrimination against poor older people who have lower life expectancies due to their physically demanding jobs and constrained health care access compared to older non-poor people.

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 non-poor older people from accessing social benefits targeted at the poor and facilitate access to social pensions for the poor older people. The simplification of criteria would help to increase the awareness of entitlements, facilitate application procedures and make monitoring of beneficiary selection easier. Different to previously used scores summing up different dimensions of economic well-being, these inclusion and exclusion criteria would be easily verifiable and even directly observable within a village or the smallest administrative unit. Several of the suggested criteria are also captured in secondary data sources (such as census data) and would allow the detection of "gross cheating" for instance at the panchayat level (Khera & Drèze, 2010, p. 61). The 2011 Socio Economic Caste Census with its focus on relatively simple and verifiable inclusion and exclusion criteria was already an important step in the suggested direction (Alkire & Seth, 2013).

This study is not without limitations and some important open questions remain for future research: First, even though the improved coverage and the increased relevance of BPL card holding for access to social pensions correspond to the objectives of the social pension reforms by the central government in 2007, I am unable to clearly attribute these changes to the efforts of the central government. IHDS lacks information on whether individuals receive benefits from the national scheme or from the state scheme and the observed improvements might have also been influenced by the efforts of state governments to expand or better target social pension benefits. Analyzing the factors behind the differential targeting performance of state schemes and national schemes running in parallel in several states can yield relevant insights to improve the targeting performance of social pensions (or other schemes). Second, taking intra-household inequality into consideration, the targeting performance of India's social pension scheme should be ideally evaluated at the individual level. Even in relatively well-off households, due to intra-household inequality, poor older people might suffer from deprivation. Since current eligibility criteria are commonly measured at the household level, they face immense barriers in accessing social pension benefits. Understanding how individual level targeting could work in the context of developing countries would be an important milestone for future research and policy-advice. Given the described data limitations, this study provides a relevant groundwork for future research on the targeting performance of social pensions. Ideally, using primary data collection tailored to evaluate the targeting performance, more concrete conclusions can be drawn and policy implications made.

Finally, the effectiveness of social pensions in the Indian context might be additionally constrained by the inadequately low amounts in several states. Future research that exploits the variation in social pension amounts jointly with the variation in the targeting performance across Indian states would contribute to understanding to what extent the effectiveness in reducing old-age poverty does not only vary with the targeting performance but also with the adequacy of the social pension amount.

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A. Appendix

Appendix 1: List of variables

Variable	Definition
Social pension	Dummy variable equal to 1 if individual receives social pension for older people, 0 otherwise
After	Dummy variable equal to 1 if data was collected in 2011–12 after the national social pension reforms, 0 otherwise
BPL card	Dummy variable equal to 1 if individual is entitled to benefits through the ration card (either BPL or Antyodaya), 0 otherwise

A. Appendix (*continued*)

Variable	Definition
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, 0 otherwise
Reading newspaper	Dummy variable equal to 1 if individual belongs to a household reading newspaper regularly, 0 otherwise
Literate	Dummy variable equal to 1 if individual can read and write, 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 h per year, 0 otherwise
Permanent job in household	Dummy variable equal to 1 if anybody in the household has a permanent job, 0 otherwise
Collaboration rate	Share of households in the village/block reporting that families collaborate to solve local problems
Peaceful village rate	Share of households in the village/block reporting that people in the village/block in general get well along with each other
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
Number of adults	Number of adults 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
Asset poor	Dummy variable equal to 1 if individual belongs to a household whose asset ownership is lower than the 40th percentile in the asset index distribution, 0 otherwise

Appendix 2: State wise eligibility ages for social pensions

State	2004–05	2011–12
Jammu and Kashmir	65	60
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
Arunachal Pradesh	60	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

(*continued on next page*)

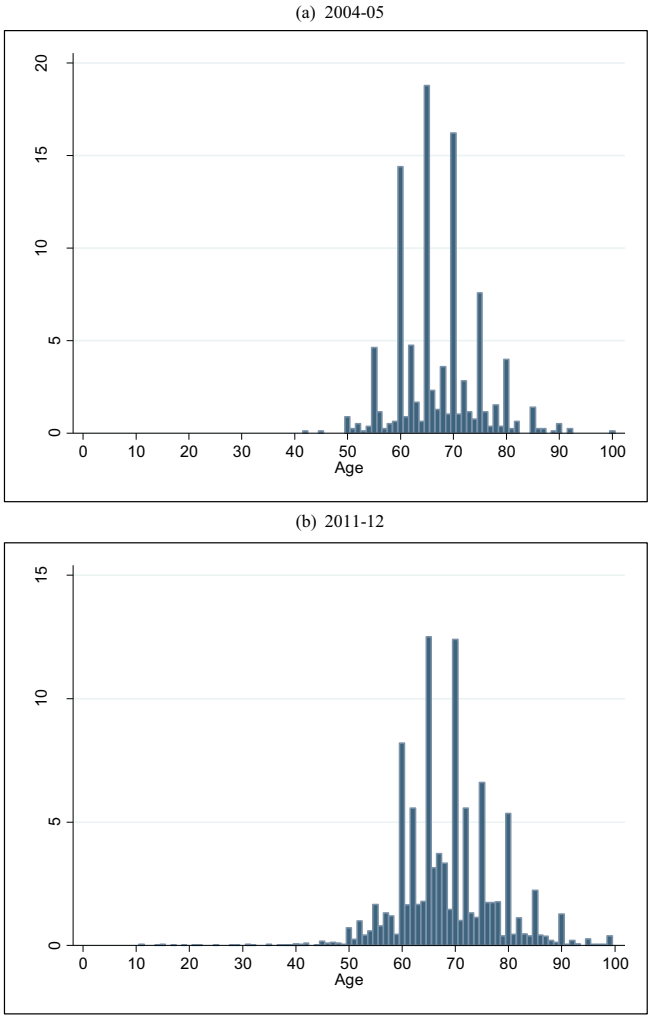
A. Appendix (*continued*)

State	2004–05	2011–12
West Bengal	65	60
Jharkhand	65	60
Odisha	65	60
Chhattisgarh	65	60
Madhya Pradesh	65	60
Gujarat	60	60
Daman & Diu	60	60
D & 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

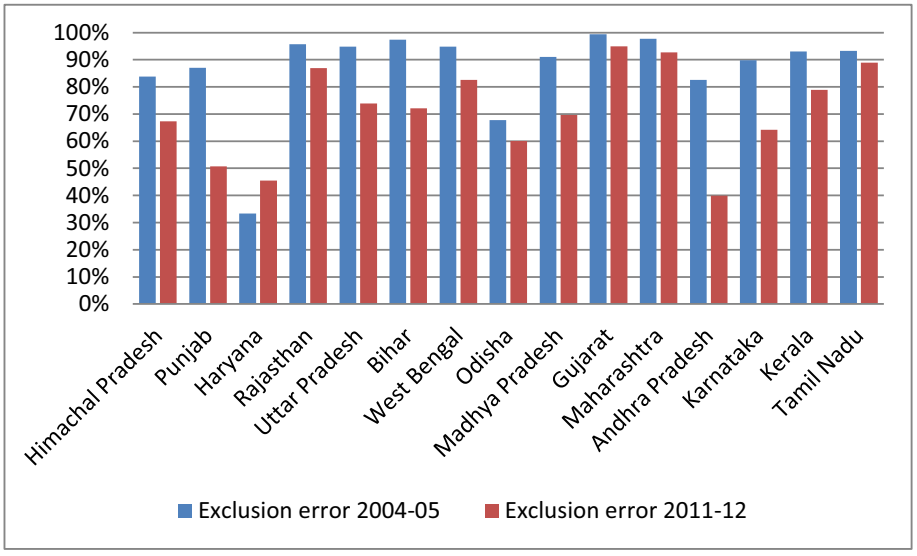
Source: Kaushal (2014) and Government of India (2011).

Appendix 3: Age distribution of social pension beneficiaries

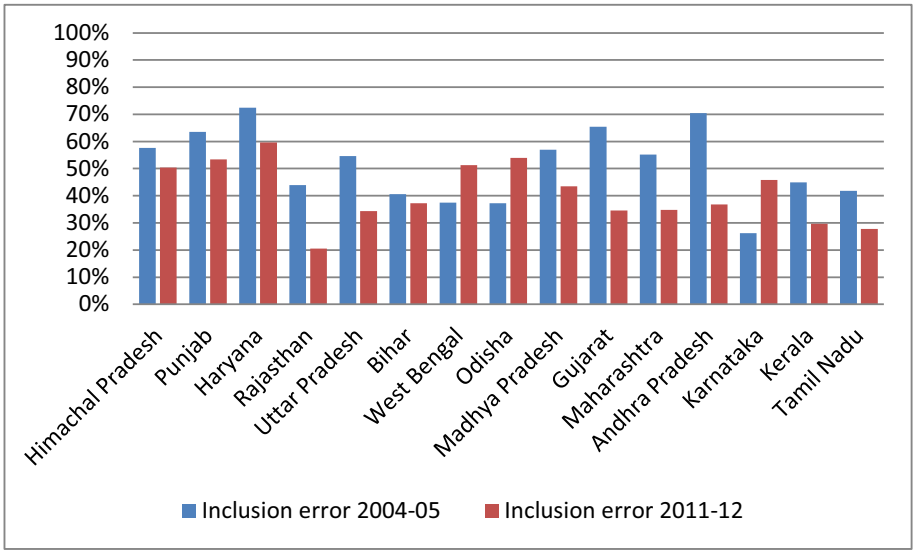


Source: Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.

Appendix 4: Targeting errors in India's major states



All states with at least 500 observations per round in the sample. Figures account for sampling weights.
Source: Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.



All states with at least 500 observations per round in the sample. Figures account for sampling weights.
Source: Author's illustration based on IHDS I for 2004–05 and IHDS II for 2011–12.

Appendix 5: How did the factors change over time?

Variables	Linear probability model with individual fixed effects 2004–05 to 2011–12
BPL card	−0.030***
	(0.010)
After X BPL card	0.182***
	(0.012)
Local government connection	0.010
	(0.014)
After X local government connection	0.010
	(0.018)
Public meeting	−0.004
	(0.011)
After X public meeting	0.008

(*continued on next page*)

A. Appendix (*continued*)

Variables	Linear probability model with individual fixed effects 2004–05 to 2011–12
	(0.014)
Social organization	−0.000
	(0.009)
After X social organization	−0.014
	(0.012)
Observations	30,370
Number of id	15,185
Weighted avg. prediction of Y	0.102
Share of predicted values in [0;1]	90%
Adjusted within R-squared	0.166

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

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

$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix 6: Heterogeneity analysis for asset poor and asset non-poor individuals

Variables	Linear probability model with individual fixed effects 2004–05 to 2011–12
BPL card	−0.032**
	(0.013)
BPL card X after	0.175***
	(0.016)
BPL card X asset poor	0.023
	(0.021)
BPL card X after X asset poor	−0.035
	(0.027)
Local government connection	0.006
	(0.015)
Local government connection X after	0.018
	(0.019)
Local government connection X asset poor	0.002
	(0.032)
Local government connection X after X asset poor	−0.008
	(0.040)
Public meeting	−0.013
	(0.011)
Public meeting X after	0.011
	(0.015)
Public meeting X asset poor	0.020
	(0.023)
Public meeting X after X asset poor	0.002
	(0.031)
Social organization	−0.002
	(0.010)
Social organization X after	−0.006
	(0.013)
Social organization X asset poor	−0.004
	(0.019)
Social organization X after X asset poor	0.001
	(0.027)
Observations	30,370
Number of id	15,185
Weighted avg. prediction of Y	0.102
Share of predicted values in [0;1]	89%
Adjusted within R-squared	0.169

The dependent variable is *social pension receipt*. Regressions account for sampling weights. Cluster-robust standard errors are shown in parentheses. All described 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 B. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.worlddev.2018.11.001.

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