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Targeting of Social Protection in 11 Ethiopian Villages

Elsa Valli

Office of Research - Innocenti Working Paper
WP 2018-15 | October 2018

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For readers wishing to cite this document, we suggest the following form:
Elsa Valli. Targeting of social protection in 11 Ethiopian villages, *Innocenti Working Paper 2018-15*, UNICEF Office of Research, Florence.

eISSN: 2520-6796

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TARGETING OF SOCIAL PROTECTION IN 11 ETHIOPIAN VILLAGES

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ABSTRACT

Social protection in Ethiopia is primarily allocated through community-based targeting. The few studies that have analysed the efficacy of aid targeting in Ethiopia have revealed targeting biases in regard to demography, geography and political affiliations. With the introduction in Ethiopia in 2005 of the Productive Safety Net Programme (PSNP), a major social protection programme, various administrative guidelines were introduced (and subsequently periodically revised) with the aim of improving targeting. This paper uses data from the last two rounds of the Ethiopian Rural Household Survey to investigate whether PSNP implementation resulted in changes in both targeting determinants and amount received for public works (a component of PSNP) and emergency aid between 2004 and 2009 in 11 rural villages. In general, public works appear to have been allocated on the basis of observable poverty-related characteristics, and emergency aid according to household demographics. In addition, the results suggest that, for both public works and emergency aid beneficiaries, political connections were significant in determining the receipt of aid in 2004 but that this was no longer the case by 2009, indicating an improvement in the channelling of social protection to its intended target groups. However, a household's experience of recent shocks was found to bear no relationship to receipt of support, which suggests that a more flexible and shock-responsive implementation could improve targeting for transitory needs.

KEYWORDS

Ethiopia, social protection, targeting, political connections

ACKNOWLEDGEMENTS

The author would like to thank Richard Tol (University of Sussex, UK), Amber Peterman and Valeria Groppo (UNICEF Innocenti), and Lisa-Marie Ouedraogo and Rémy Pigois (UNICEF Ethiopia Country Office) for their input, and is grateful for the comments received during the CSAE (Centre for the Study of African Economies) Conference 2017. The author declares no conflict of interest. The views expressed in this article are those of the author and do not reflect the policies or views of affiliated institutions.

CONTENTS

1. INTRODUCTION

One of the core challenges in operationalizing effective poverty reduction programming is ensuring that investments reach the intended populations. Both the credibility and effectiveness of development efforts are undermined when resources fail to reach the people most in need. To address this issue, programmes are increasingly required to engage in monitoring and evaluation efforts, including to demonstrate that poor communities and households actually benefit (Van Domelen, 2007). An important obstacle to reaching those most in need is the high costs that can be involved in obtaining accurate information on their comparative deprivations. 'Targeting' is the mechanism used for "identifying households or individuals who are defined as eligible for resource transfers and simultaneously screening out those who are defined as ineligible" (Sabates-Wheeler, Hurrell and Devereux, 2015). The choice of targeting method, which in practice is often a combination of various methods (i.e. proxy means testing; geographical, categorical or community-based targeting), is made according to a programme's objectives, although this choice is constrained by the trade-off between the accuracy[1] and costs associated with each method.

In contrast to Latin America, the methods used in sub-Saharan Africa to identify beneficiaries for cash transfers often rely upon some degree of community involvement (Handa et al., 2012). Administrative and logistical constraints coupled with high costs dictate that methods applied in Latin America (i.e. means tests) are challenging to implement in the African context (Robertson et al., 2014). In resource-poor settings, the use of community-based targeting (CBT) to decentralize the identification and selection of beneficiaries is one cost-effective and accurate solution that has been suggested. The advantages associated with CBT stem both from local agents having greater familiarity with the community, which allows them to more accurately identify poor households, and from households being less likely to be able to hide information about their welfare situation from local agents. In addition, CBT fosters community ownership and empowerment. Finally, since poverty and vulnerability are likely to differ across contexts, allowing local agents to customize the criteria used to identify the poor can further improve the targeting (Alderman, 2002; Yamauchi, 2010). A number of studies highlight various potential disadvantages of this approach, however, most of which are linked to the risks of elite capture, and rent-seeking behaviour and patronage from local leaders (Conning and Kevane, 2002; Alatas et al., 2012; Handa et al., 2012).

Academics and practitioners are still debating which targeting method is best to use in developing countries in terms of accuracy and costs (social and political as well as financial). Another targeting method widely used in sub-Saharan Africa is proxy means testing (PMT). Empirically, only a few studies have been able to compare CBT and PMT directly: some studies find that local agents involved in CBT provide additional information that can refine targeting beyond what is possible with PMT (Alderman, 2002; Galasso and Ravallion, 2005); others find that neither method clearly outperforms the other in terms of accuracy, or that PMT performs only slightly better than CBT (Alatas et al., 2012; Karlan and Thuysbaert, 2013; Pop, 2015; Stoeffler, Mills and del Ninno, 2016). Targeting based on community knowledge, however, typically results in higher levels of satisfaction and greater perceived legitimacy of the process among recipients (Alatas et al., 2012; Pop, 2015).[2] Relatively few studies have investigated the relationship between the political economy of transfers and targeting performance: a couple of studies look at this relationship in general (Alatas et al.,

1 Watkins (2008) defines targeting accuracy as "the extent to which a targeting scheme correctly selects participants in the scheme and deselects non-participants."

2 For instance, Alatas et al. (2012) find in Indonesia that PMT produces a lower error rate overall (although CBT slightly outperforms PMT when focusing on the very poorest households within the poor category). CBT instead produces a higher level of satisfaction among communities.

2012; Conning and Kevane, 2002), and a couple focus on Ethiopia specifically (Broussard, Dercon and Somanathan, 2014; Caeyers and Dercon, 2012). No studies have examined changes in targeting performance over time. This paper fills a gap by providing evidence on the relationship between targeting performance and a change in social protection implementation guidelines.

In recent decades, Ethiopia has become one of the most heavily supported aid recipient countries in the world, driven by its incidence of severe and recurrent droughts and famines, which threaten the physical survival of millions of people (Cabot Venton et al., 2012).[3] For the approximately 80 per cent of the national labour force who depend on agriculture and animal husbandry, the crop failures and livestock deaths that result from droughts can be devastating (Central Intelligence Agency, 2017; Van Domelen and Coll-Black, 2012). Emergency aid appeals have major drawbacks, however, as their results are often unpredictable and subject to delays, which translates into the loss of livelihoods, physical/human capital and/or household assets, and an inability to address chronic poverty (World Bank, 2009). In 2003, the Government of Ethiopia began to consult with its main development partners with the aim of developing both a more effective solution to address the immediate needs of food insecure households, and a sustainable and long-term vision to enable households to graduate from emergency systems (Van Domelen and Coll-Black, 2012).

The Productive Safety Net Programme (PSNP) is the flagship government social protection instrument established in response to these concerns. In sub-Saharan Africa, only South Africa has a safety net programme larger than PSNP; among low-income countries globally, PSNP is second in size only to the safety net programme of Bangladesh (World Bank, 2015). At its peak, in 2010, PSNP reached more than 7.9 million people,[4] about 10 per cent of Ethiopia's population, living in 290 chronically food insecure rural *woredas* (districts) – a figure that amounts to over 40 per cent of the country's *woredas* (World Bank, 2016). The programme's stated objective is to reduce poverty by assuring food consumption and preventing asset depletion for chronically food insecure households, while stimulating markets, improving services and rehabilitating natural resources (Ethiopian Ministry of Agriculture and Rural Development, 2006). PSNP builds on previous aid interventions in terms of its structure, distribution modalities and intervention typologies. The main components of PSNP are public works and direct support interventions. While the former replaces the previous food-for-work and employment generation schemes,[5] maintaining the principle of supporting vulnerable households by providing work on community projects during the agricultural slack season, the latter provides cash or food support directly to households in which no members have the ability to work. The overall system relies heavily on local agents, including for the targeting, which is community-based. Emergency aid[6] remains in place, but only as an intervention during times of crisis, including drought or flooding. Eligibility for social protection, whether in the form of a safety net (i.e. PSNP) or emergency aid,[7] is determined by a combination of two targeting methods: geographical targeting

3 Since 2000, major droughts have occurred on a frequent basis (2003; 2005; 2008; 2011; 2013; 2015–2016. Drought affected 12.6 million people in 2003; 6.4 million people in 2008; and 10.2 million people in 2016 (the worst drought since 2000) (Cabot Venton et al., 2012; World Food Programme, 2016). According to Organisation for Economic Co-operation and Development (2016a; 2016b) figures, Ethiopia was Africa's fourth greatest recipient of aid in the 1990s, moving to second place in the 2000s and to first place in the current decade. Globally, Ethiopia was the tenth greatest recipient of aid in the 1990s, moving to fifth place in the 2000s and third place in the current decade.

4 The number of beneficiaries has decreased over the life of the programme; the graduation of beneficiaries meant that, by 2015, PSNP was reaching 5.2 million people (World Bank, 2016).

5 Food-for-work and employment generation schemes were essentially very similar, both providing aid in exchange for work on projects to build public assets. The main difference between the two is that food-for-work schemes were implemented on a relatively small scale with the aim of achieving development objectives, while employment generation schemes were implemented in emergency contexts (Sharp, 1998).

6 The terms 'emergency aid', 'food aid' and 'free food distributions' are used here interchangeably, as is common in the literature.

7 In the context of this study, social protection is inclusive of both safety net and emergency aid responses. This is in line with the World Bank definition of social protection, which includes policies and programmes designed to help individuals and societies to manage risk and volatility and protect them from poverty and destitution (World Bank, 2012).

and CBT. Following its federal administrative structure, the federal and regional governments first select appropriate *woredas* to receive support and assign to each district an amount to be disbursed. Individual beneficiary households are then selected at the lowest administrative level, by *kebele* (representing several villages at the lowest administrative level in Ethiopia) committees comprising local administrators and community leaders.

In principle, political power in Ethiopia derives from 'free and fair' elections, although evidence exists of electoral manipulation and use of threats (Pausewang and Aalen, 2002). There are typically links between the leadership of each administrative level (federal, regional and subregional), and the current political administration has been in power for more than two decades. To avoid repression and being excluded from accessing benefits and local services, households tend to vote for the ruling party, particularly in rural areas. There is a perception that receipt of support from the government is likely to be influenced by a household's connections with the local administrators. Political connections can, in principle, influence the distribution of social support by various means that are not easy to observe. For example, social support may be influenced by improved information flows, either by households better signalling their needs to administrators or by administrators providing better information on social support programmes to households. More problematic is the influence of 'elite capture' or favouritism, whereby political connections result in less deserving populations accessing benefits due to their preferential treatment (Caeyers and Dercon, 2012).

A number of measures have been gradually introduced since PSNP was launched, with the aim of improving transparency and accountability of the beneficiary selection process. These measures include public endorsement of the list of beneficiaries, and grievance procedures for addressing concerns. The present study assesses whether such government efforts to improve monitoring and transparency have been effective. In particular, the panel nature of the Ethiopian Rural Household Survey (ERHS) is exploited, with data from the last two rounds of the survey (2004 and 2009) used to compare targeting performance over time. The analysis is restricted to 11 villages that received either public works (before or during the PSNP) or emergency aid – the two major social protection programmes in Ethiopia – to capture the intra-village allocation of social protection support.[8]

The findings suggest that, between 2004 and 2009, there was an improvement in the targeting of public works, both in the selection process used and in the amount of support received. By 2009, beneficiaries' selection took a more means-based approach and was no longer dependent on political connections. Although the data do not allow for investigation of the reasons behind this improvement, the timing of the implementation of PSNP and the related efforts to improve transparency of the selection process leads one to speculate that the programme and its refinements were a key factor. Targeting of emergency aid, in contrast, does not seem to show such clear-cut improvement between 2004 and 2009. While the findings reveal that political connections no longer determined emergency aid allocation by 2009, vulnerability was found to be a significant determinant only when the analysis was restricted to villages that received both emergency aid and PSNP support.

Since the data used for the analysis are representative neither at the national level nor at the programme level, the results cannot be interpreted as being representative of the targeting of social protection for the entire country. The results of this study are broadly in line with the limited related

8 The direct support component of PSNP is excluded from this analysis since it is not directly comparable to the forms of social protection in place before PSNP was implemented.

literature: for instance, Ravallion (2000) reports within-province improvement in targeting of the temporary employment programme Trabajar II after Argentina's central government provided a set of rules on implementation and targeting together with a larger budget.

The paper proceeds as follows. Section 2 gives an overview of aid in Ethiopia and delineates the system used to distribute aid as well as the criteria used for targeting social protection beneficiaries in Ethiopia. Section 3 summarizes the available literature on targeting, focusing on the targeting of social protection in Ethiopia. Section 4 describes the data employed in this study and presents summary statistics. Section 5 explains the models used to identify the differences in targeting performance across the two survey rounds. Section 6 presents and interprets the main results and section 7 details the robustness checks that were conducted. Section 8 summarizes the conclusions of the study.

2. TARGETING OF SOCIAL PROTECTION PROGRAMMES IN ETHIOPIA

For over 20 years, emergency aid was the main means to ensure the survival of hundreds of thousands of poor households in Ethiopia in the face of widespread food insecurity and famine. Such was the severity of the situation, the Government of Ethiopia had to launch international emergency appeals for assistance on an annual basis. The aid received was channelled to meet the consumption needs of food insecure households, irrespective of the type of insecurity they faced: for some households, food insecurity was temporary and driven by a specific shock (e.g., drought); other households lived in a chronic condition of extreme poverty. The emergency appeals requested international support particularly in times of severe drought, which manifest in the country with alarming frequency and affect millions of people. Ethiopia is estimated to have received 700,000 metric tons of food aid per year from the mid-1980s to the early 2000s, corresponding to roughly 20 per cent of all food aid deliveries to sub-Saharan Africa during this period (Van Domelen and Coll-Black, 2012). Despite the consistency of this support, however, operations were unpredictable, and food aid was deemed ineffective in reducing chronic poverty.

By the end of the 1980s, the rationale for the food assistance had gradually expanded from famine relief to 'rehabilitation'. In 1993, a new strategy outlined in the National Policy on Disaster Prevention Management mandated the move from free food distributions towards providing relief food to able-bodied persons in exchange for labour on public or community development works (through workfare programmes known as employment generation schemes [EGSs]), with only those unable to work entitled to free food (Sharp, 1998). Initially, it was expected that only 20 per cent of food aid would be disbursed as free food, with the remaining 80 per cent delivered through EGSs. In practice, however, EGSs in most locations degenerated into free food distributions, mainly as a consequence of the lack of non-food budgetary support provided to local administrations to implement workfare programmes (World Bank, 2005). Partly as a result of such operational issues, emergency aid remained the principal component of social protection throughout the early 2000s.

By 2000, however, it had become increasingly clear that the emergency aid system was unsustainable and of limited effectiveness.[9] The crises of 1999–2000 and 2002–2003, caused by

9 Few studies have investigated the impact of aid programmes in Ethiopia. Gilligan and Hoddinott (2007) analyse whether aid distributed following the 2002–2003 drought had a persistent effect on consumption, food security and asset holdings. Positive impacts are found in consumption growth for both food-for-work and free food distribution beneficiaries. In addition, by differentiating the analysis by household welfare distribution, food-for-work appeared to have a stronger effect on households belonging to higher levels of the welfare distribution, while free food distributions were found to have a stronger impact among poorer households. Amare and Asfaw (2012) estimate the impact on poverty and

severe and widespread droughts – during which 10 million and 14 million individuals respectively required support – proved that there was an urgent need to reform the emergency aid system (Van Domelen and Coll-Black, 2012). In 2003, the Government of Ethiopia began to consult with its main development partners with the aim of developing both a more effective solution to address the immediate needs of food insecure households, and a sustainable and long-term vision to enable households to graduate from emergency systems. The Food Security Programme was devised as a result, and its main pillars subsequently combined to create the Productive Safety Net Programme (PSNP), launched in 2005.

As previously discussed, PSNP has two main components – public works and direct support – both paid either in cash (the method of payment preferred by the Government and by donors), by payment-in-kind, or as a mixture of the two, depending on location and time of year. The main component, public works, aims to cover 80 per cent of the total beneficiaries and originally paid 6 Ethiopian Birr per day (increased in line with inflation to 8 Ethiopian Birr in 2008 and to 10 Ethiopian Birr in 2010) for work on labour-intensive community infrastructure projects during the agricultural slack season (those months involving little or no farming activity).[10] Direct support targets labour-constrained households with payments based on the daily wage for public works. Each PSNP household member is entitled to receive a transfer equivalent to payment for between 5 and 15 days of work per month, based on the aforementioned daily wage, for a period of six months (Van Domelen and Coll-Black, 2012). A household may remain a PSNP beneficiary until its 'graduation' from the programme, which is defined as when the household becomes food secure.[11]

Despite its focus on chronic food insecurity, PSNP also takes transitory needs into account. Firstly, an annual re-targeting was devised to correct for inclusion and exclusion errors in order to respond to changes in the relative circumstances of households. Secondly, a contingency budget of 20 per cent is added to the programme budget to support additional households that might become chronically food insecure and to respond to transitory needs deriving from shocks. Finally, the emergency response system continues to cover food insecurity in non-PSNP *woredas*.

Eligibility for PSNP is determined in three steps, in line with the federal administrative structure of the Government of Ethiopia. The federal and regional governments first use historical data to select the chronically food insecure *woredas* for receipt of the programme: a *woreda* that has received food aid for the preceding three years or more is classified as food insecure (Ethiopian Ministry of Agriculture and Rural Development, 2006). In turn, the *woredas* allocate funds to *kebeles*, assigning funds to PSNP quotas defined on the basis of the number of eligible households indicated in a *kebele*. Finally, individual beneficiary households are selected using CBT.

At each step, the main responsibility for targeting falls to specially constituted 'food security task forces'. The Woreda Food Security Task Force is responsible for adapting the beneficiary selection criteria of the general national guidelines to the local context, and for training the Kebele Food Security Task Force. In turn, the Kebele Food Security Task Force is charged with establishing a

inequality of the same two aid programmes over the same period. They find that food-for-work had a positive and significant effect on the poverty head count index, but no significant effect on either the poverty gap or severity index. Free food distributions, in contrast, had a positive and significant impact on all three poverty measures.

10 The original government rate for public works was set at 3kg of grain per day. However, it was never calculated if this corresponded to a below-market wage, mainly due to the difficulty in attributing a realistic value to a local wage rate in food insecure areas where work is scarce or wholly unavailable at the relevant time of year. The PSNP daily payment is the same as the pre-PSNP public works payment (Van Dolemen and Coll-Black, 2012).

11 "A household has graduated when, in the absence of receiving PSNP transfers, it can meet its food needs for all 12 months and is able to withstand modest shocks" (Food Security Coordination Bureau, 2007).

Community Food Security Task Force in each village and with training them on targeting procedures. Community Food Security Task Forces are ultimately responsible for the eligibility screening of households for PSNP and for compiling the lists of beneficiaries. Each Community Food Security Task Force comprises: representatives of the relevant Kebele Food Security Task Force; a local agent; two or three elected female representatives; two or three elected male representatives; an elected youth representative; and an elected representative of the elderly.

As stated in the PSNP Programme Implementation Manual, eligibility for participation in PSNP is restricted to the chronically food insecure households residing in PSNP *kebeles*. A chronically food insecure household may be: (1) a household that has faced continuous food shortages (usually lasting three months or more) in the last three years and which has received food assistance prior to the launch of PSNP; (2) a household that suddenly becomes more vulnerable as a result of a severe loss of assets and which is unable to support itself; or (3) a household without family support or other means of social protection and support (Ethiopian Ministry of Agriculture and Rural Development, 2006). Households that meet these preliminary criteria are further examined by the Community Food Security Task Force, which refines the selection of beneficiaries on the basis of the following additional characteristics: household assets (landholdings, quality of land, food stocks on hand, etc.); income from non-agricultural activities; and support or remittances from relatives or others. This selection process is conducted annually to continually update the list of households most in need. Each year, the Community Food Security Task Force uses as its starting point the latest list of aid beneficiaries, and updates this list according to the refined beneficiary selection criteria. Beneficiary households are assigned to either public works or direct support based on the work ability of household members.

Several aspects of PSNP targeting are very similar to the targeting of emergency relief, including in terms of institutional structure, the key role of community representatives, the division of public works and unconditional support according to ability to work, and criteria for the selection of beneficiary households. The PSNP Programme Implementation Manual recommends building the food security task forces on the back of existing disaster preparedness committees; PSNP *woredas* are by definition those which have previously received food aid and so should have such committees in place (Ethiopian Ministry of Agriculture and Rural Development, 2006). Notwithstanding the many advantages of exploiting a pre-existing set-up to operationalize PSNP, some weaknesses observed in the first years of PSNP implementation were issues that had also arisen in previous programmes. Examples include the tendency to spread or dilute transfers among a greater number of households than those officially targeted; variation in the interpretation of guidelines; and the tendency in some locations to favour households with connections to the local administration (Jayne et al., 2001; Sharp, 1998; Sharp, Brown and Teshome, 2006).

Efforts have been made since PSNP was first implemented to improve the transparency and community ownership of the programme. A number of measures were introduced with the aim of improving transparency, accuracy and accountability in the targeting process. For example, since 2007, grievance procedures have been separate to the targeting process, with all grievances addressed by Kebele Appeal Committees established for this purpose (World Bank, 2009). In addition, during the annual re-targeting process, the proposed list of beneficiaries is displayed in public for at least a week; following its endorsement at a general meeting of the village residents, the list is finalized and passed to the Kebele Food Security Task Force for verification (Van Domelen and Coll-Black, 2012). Training of local agents and *kebele* officials was also developed and implemented, in a bid to increase knowledge of the programme's objectives and procedures. Similarly, the motivation

for introducing 'client cards' was "reducing the risk of rotation and improving the security of the transfer mechanism by ensuring client attendance during payments" (Ethiopian Ministry of Agriculture and Rural Development, 2010). Assessment studies related to these and other operational issues are periodically conducted to monitor the level of implementation of all PSNP procedures (see, for example, World Bank, 2009). The above reforms were among the main changes made to the PSNP Programme Implementation Manual as a measure to improve the fairness and transparency of targeting.

3. LITERATURE ON TARGETING EFFECTIVENESS

Means testing, PMT, geographical targeting, categorical targeting, and CBT are among the most common methods of targeting. Targeting methods are selected according to a programme's objectives and are often used in combination. For instance, Kenya's Cash Transfer for Orphans and Vulnerable Children programme first uses geographical targeting to select the poorest districts, and then applies categorical targeting to select households caring for orphans, and a CBT component by which the community identifies the poorest households with orphans. PSNP itself applies a mix of geographical targeting and CBT.

A targeting method can be assessed against different dimensions, for example, its inclusion and exclusion errors, whether these occur due to faults in design or in implementation (Sabates-Wheeler et al., 2015). There is no consensus in the literature on metrics for assessing the superiority of one method over another. Coady, Grosh and Hoddinott (2004) suggest the ratio of the value of transfers provided to the poor to the (relative) size of the poor in the population as a potential metric to compare across targeting methods. Ravallion (2009), however, casts doubt on the external validity of cross-programme comparisons based on these measures. Most authors (Hoddinott, 1999; Besley and Kanbur, 1990) use the poverty headcount or poverty gap to assess errors of inclusion and exclusion.

Various advantages and disadvantages are acknowledged in relation to CBT. On the one hand, CBT draws on a greater body of information and this is locally adapted, so takes into account the local culture and conditions. Furthermore, it is typically associated with lower administration costs and with higher levels of satisfaction and greater perceived legitimacy of the process among beneficiaries. On the other hand, CBT is associated with the potential risks of elite capture and rent-seeking behaviours (Alatas et al., 2012; Conning and Kevane, 2002). The use of CBT in conjunction with other targeting methods is examined in three African countries implementing cash transfers: Malawi, Kenya and Mozambique (Handa et al., 2012). The authors found that in these contexts targeting was effective at reaching the poorest households, and this success is attributed to the hybrid methodology applied (CBT plus demographic criteria in Malawi and Mozambique; CBT and PMT in Kenya). Sabates-Wheeler et al. (2015) exploit the randomization of targeting methods in a cash transfer in Kenya to directly compare three methods of targeting: CBT and two categorical targeting methods based on demographics (households with high dependency ratios, and households with members older than 55 years of age). They find that CBT performed better in identifying the poorest households and was also more likely to be perceived by communities as fair. Some weaknesses were also identified, however, especially in relation to local elite capture. The increased use of CBT is also a consequence of the criticisms increasingly focused on other widely used methods such as PMT. For instance, PMT can in fact produce extremely high error rates,[12] particularly in contexts of

12 For instance, in Brazil and Ecuador, conditional cash transfers targeted through PMT excluded 45 per cent and 33 per cent of poor households respectively (Devereux et al., 2017). In Indonesia, 93 per cent of the poorest 5 per cent of households were excluded from the Program Keluarga

widespread poverty and with low coverage by design, potentially causing negative consequences for the communities involved, as the tensions and disputes that may result can affect social cohesion (Kidd and Wylde, 2011; Kidd, Gelders and Bailey-Athias, 2017).

In Ethiopia, researchers and policymakers began to take a serious interest in the targeting of social protection at the close of the millennium due to concerns about the country's continued dependence on food aid coupled with demands for greater accountability of aid distribution. A first stream of literature published around the year 2000 concentrated on assessing targeting effectiveness in terms of errors of inclusion and exclusion, at both the household and community levels (Clay, Molla and Habtewold, 1999; Jayne et al., 2001; Jayne et al., 2002). All of these studies found great variation in emergency aid allocations across regions, which cannot be explained by observable characteristics such as mean income per capita or mean rainfall (Clay et al., 1999). For example, while Tigray has historically been prone to droughts and food deficits, aid allocation to the region was found to be disproportionately high, which the authors hypothesized as being due to Ethiopia's ruling party coming from this region. Despite some evidence of means-based targeting at *woreda* and at household level, the main determinant of the geographical allocation of food aid was past aid allocation. Neither chronic needs nor weather shocks seem to account for such rigidity in food aid distribution (Jayne et al., 2002). These findings appear to support speculation that the Government of Ethiopia used food aid to transfer resources to favoured regions. In other words, allocation at the *woreda* level was decided following negotiations between the Government and local administrative staff on grounds other than effective needs (Jayne et al., 2001; Ferriere and Suwa-Eisenmann, 2014). Within *woredas*, it was found that households were targeted partly according to their income level, although the targeting of food aid was generally more effective than the targeting of food-for-work schemes. The distribution of both types of aid was significantly explained by the past allocation of aid, and, in addition, disproportionately high numbers of female and elderly heads of household were targeted for food aid (Clay et al., 1999).

More recently, Coll-Black et al. (2011) assessed targeting effectiveness within the context of the first phase of PSNP (2005–2008) using the results of a survey directed at local officials in PSNP *woredas*. While great variation in the allocation of PSNP assistance across regions was found, with some regions prioritizing poverty and others focusing mainly on labour supply endowments and demographic characteristics, overall there is evidence of means-based targeting within public works. Poverty was the most common criterion for targeting households reported by officials, while food insecurity was less important. Other characteristics that were reported as important in targeting households for public works were: low asset holdings (land and livestock), large number of household members, large number of elderly or orphaned household members, and incidence of drought. In targeting households for direct support, higher priority was given to households with a limited labour supply, especially where the head of household or primary income earner was elderly, disabled or in ill health. Less variation across regions was found in the context of direct support compared to public works. To compare the targeting effectiveness of PSNP with that of other social protection programmes, Coll-Black et al. compiled the Coady-Grosh-Hoddinott (CGH) indicator for different deciles of the income distribution. The CGH score is 1.69 for the poorest deciles; 1.46 for the bottom two deciles; and 1.26 for the bottom four deciles. A comparison of these figures with the CGH score of 1.25 reported in Coady et al. (2004) as the international average for social protection programmes shows that PSNP performs better and demonstrates a more progressive targeting.[13]

Harapan conditional cash transfer (Alatas et al., 2016). Among the poorest 26 per cent of households in northern Kenya, 62 per cent were excluded from the Hunger Safety Net Programme (Silva-Leander and Merttens, 2016).

13 A CGH value equal to 1 refers to a neutral targeting in which everyone would receive the transfer; a value higher than 1 indicates a progressive

In the Ethiopian context, there is also empirical evidence that points to political connections playing an important role in aid allocation more generally. Broussard et al. (2014) focus on food aid allocation (excluding food-for-work schemes) to explore the linkages between political connections, self-reported measures of power[14] and the probability of receiving food aid; they find strong and positive relationships, especially for richer households. They also investigate whether households received more aid in the years in which they needed it most. Some of the findings are in line with targeting criteria, although it also emerges that, on average, households seem to receive more support in years when they are less in need. Caeyers and Dercon (2012) further examine the allocation of both emergency aid and public works by extending the analysis to explore horizontal and vertical political connections in the period following the severe drought that hit Ethiopia in 2002–2003. They also find that political connections play an important role in the allocation of emergency aid, though they do not find that the same is true for food-for-work schemes. Caeyers and Dercon divide the analysis into two periods: immediately after the drought, at the peak of the crisis, and a year on from the end of the drought. It was found that during the first period especially, targeting was based only slightly on economic needs and mostly on political connections; however, targeting effectiveness appears to have improved by the following period. In contrast, no observable characteristics seem to determine the quantity of emergency aid distributed, and political connections appear to be the most important determinant of the targeting of food-for-work schemes.

As there is no consensus in the literature on standardized metrics for assessing the superiority of any given targeting method over another, the merits of the various approaches continue to be debated in poverty programming across diverse settings (Coady et al., 2004; Ravallion, 2009). Most researchers use poverty rates and lines to calculate targeting errors, and multivariate analysis to identify the determinants of selection for a programme. The analysis for the present study applies both approaches to assess changes in targeting performance over time.

4. DATA AND DESCRIPTIVE STATISTICS

The data set used for this study is the ERHS, a longitudinal household data set collected by the International Food Policy Research Institute in collaboration with Addis Ababa University and the Centre for the Study of African Economies, University of Oxford. The data were collected in seven rounds from 1994 to 2009 in 15 rural villages across different agro-ecological areas in Ethiopia's four main regions (Amhara, Oromia, the Southern Nations, Nationalities and Peoples [SNNP] region and Tigray) and within different woredas, giving a sample of 1,477 households in total. This analysis uses the data from the last two rounds (2004 and 2009) of the survey, as the aim is to compare targeting effectiveness before and during PSNP implementation (which began in 2005). Incomparability precludes the inclusion of previous rounds of the survey.[15]

The analysis considers both receipt and amount received for two types of support: emergency aid and public works. For this analysis, details of the amount of emergency aid come from the questionnaire section on off-farm income, and the figure is derived by summing the value of all cash

targeting.

14 Broussard et al. (2014) use the first six rounds of ERHS. From round three (1995), they use questions relating to the involvement of a household in the local administration and its membership of other local organizations. From round six (2004), they use the self-reported perception of power in the village.

15 In the first four rounds, questions on support are asked with reference only to the previous four months, whereas the last three rounds collect information on support over the previous 12 months, making it impossible to compare total aid received in a given year. In addition, in the last two rounds, households were asked to state how many months they had suffered food insecurity. The author prefers using this variable as a proxy for vulnerability rather than traditional consumption, as explained in more detail later in this paper.

and/or food gifts from government and/or non-governmental organizations received by a household in the 12 months prior to the interview.[16] The public works variable is constructed by combining information from two questionnaire sections: from a section entirely dedicated to public works, the amount of payments received by each household member in the 12 months prior the interview is summed; a second section contains the off-farm income, which enables consideration of public works provided by government and/or non-governmental organizations.

As previously stated, this analysis considers only those villages that received emergency aid or public works; following Broussard et al. (2014), such villages are defined as those with at least 10 households reporting receipt of support. Since intra-village support allocation is explored, the sample is restricted to include villages only in rounds in which they actually received support. The public works sample includes 740 households, with a total of 1,121 household-round observations[17] across 9 villages in 2004 (villages per region: Amhara, 2; Oromia, 2; SNNP region, 3; Tigray, 2) and across 6 villages in 2009 (Amhara, 1; Oromia, 2; SNNP region, 1; Tigray, 2). The emergency aid sample includes 880 households, giving a total of 1,363 household-round observations across 8 villages in 2004 (Amhara, 2; Oromia, 2; SNNP region, 2; Tigray, 2) and 9 villages in 2009 (Amhara, 2; Oromia, 2; SNNP region, 3; Tigray, 2) (for more details, see *Table A1*).

As discussed in section three, there are two layers of targeting: the first involving targeting of *woredas* by the federal and regional governments; the second involving targeting of beneficiary households within selected villages. Although the small number of villages in the sample makes it difficult to fully assess the effectiveness of targeting at the *woreda* level, it is still possible to see if there are average differences between villages that received support and those that did not. The poverty head count ratio is reported by village type and survey year (see *Table 1*). Overall, the average village poverty rate is 39 per cent in 2004. In 2009, the average poverty rate dramatically increases to 58 per cent.[18] During both periods, it appears that villages receiving support are worse off than those not receiving any. In 2004, 34 per cent of households in villages not targeted for aid were living below the poverty line, while in villages that received support of any type (public works only or both types of support) the figures were much higher (45 per cent and 42 per cent respectively). The difference in poverty rates is even more striking in 2009. Villages that received both types of support and villages that received emergency aid only registered average poverty head count ratios as high as 74 per cent and 72 per cent respectively. In villages that received public works only, 52 per cent of households were living below the poverty line, more than double the proportion of such households (25 per cent) in villages not in receipt of any type of support. These figures seem to suggest appropriate targeting from the federal government, and an improvement on the findings from analysis conducted using national data for the previous decade (Clay et al., 1999). Given the limited number of villages included in this sample, however, these findings cannot be generalized for Ethiopia as a whole. As a point of

16 Among households reporting the receipt of emergency aid, 12 per cent claimed to have also received direct support. This figure does not seem to be reliable, as PSNP woredas should not also receive emergency aid, only additional support in times of crisis. It may be that households confused emergency aid with the direct support component of PSNP. This does not present a major issue for this analysis as the targeting criteria for emergency aid and direct support should be similar, especially in regard to vulnerability.

17 Because villages are included in the analysis only in years in which they receive support (i.e. not all villages are included in both years), not all households are part of the analysis in both rounds.

18 The poverty rate in 2004 is in line with the national figures for rural areas reported by the government (Ethiopia Ministry of Finance and Development [MOFED], 2012). There are no official statistics for 2009. The closest available statistics refer to 2010–2011 and report 30 per cent of households as being below the poverty line (MOFED, 2012). Despite the lack of comparable rates for 2009, it is highly unlikely that the ERHS figures reflect those at the national level. As Dercon et al. (2012) show, the mean consumption growth in the ERHS villages does not track the real GDP per capita growth, which is positive over this period. The authors attribute this divergence from national trends to two main factors. Firstly, several villages in two regions (SNNP region and Tigray) experienced severe localized droughts that caused considerable income losses. Secondly, data collection for the 2009 survey round was carried out approximately six months after the 2008 harvest and in the aftermath of rapid food price rises that year. The 2009 wave may have taken place just at the point where food stocks had run low. Since most ERHS households are net food purchasers, it is possible that they may have intentionally reduced food consumption during this period of high food prices.

comparison, to better understand the variation in village-level poverty rates and receipt of support, participation rates by poverty status are reported, with data disaggregated by village and averaged across the two rounds (see *Table A1*).

Table 1. Poverty headcount ratio (HCR) by village support type and survey year

	Total		Public works only		Emergency aid only		Both types of aid		None	
	N	HCR	N	HCR	N	HCR	N	HCR	N	HCR
2004	15	0.39	1	0.45	0	-	8	0.42	6	0.34
2009	15	0.58	2	0.52	5	0.72	4	0.74	4	0.25

Note: Poverty rates are calculated at the household level using net-of-aid consumption in adult equivalent units. The poverty line used here is the one provided by Dercon and Krishnan (2003), which is obtained using the cost-of-basic-needs approach, as it is constructed using the cost of a bundle of food items that would provide 2,300 kcal per adult per day for each survey site. The non-food component, estimated using an Engel-curve regression, which in this case is quite low at around 17 per cent, is then added to obtain the total daily poverty line per adult. The poverty line constructed by the Central Statistical Agency (CSA) of Ethiopia is very similar to the one used here. In 1995, the ERHS poverty line was set at 50 Ethiopian Birr per adult per month, while the CSA poverty line was set at 47.6 Ethiopian Birr per adult per month.

The vulnerability of the villages under analysis helps to explain the high proportion of beneficiaries in this sample, with 74 per cent of households receiving at least one type of support in 2004 and 63 per cent in 2009 (see *Table 2*). The high proportion of beneficiaries in both years is explained by the fact that both 2003 and 2008 were years of severe drought, requiring large-scale emergency aid responses.[19] The main difference that occurs between the two survey years is that the proportion of households receiving both types of support drops dramatically – from 25 per cent in 2004 to 6 per cent in 2009 – largely because of improvements to targeting since PSNP implementation began, as beneficiary households are not supposed to receive both types of support.

Table 2. Proportion of beneficiaries in sample villages by support type and survey year

	Total no. of households	Public works only (%)	Emergency aid only (%)	Both types of aid (%)	None (%)
2004	1,218	0.29	0.20	0.25	0.26
2009	1,178	0.20	0.37	0.06	0.37

Note: Figures include only villages that received either public works (n=9 in 2004; n=6 in 2009) or food aid (n=8 in 2004; n=9 in 2009).

Descriptive information on beneficiary targeting at the household level is presented next. The criteria used by village leaders to select beneficiary households to receive emergency aid in 2004 are available from the community survey. Ranked from the most to least frequently reported, these criteria are: people unable to work; elderly people; poor people; landless families; large families; people with limited livestock; and female-headed households (not shown). The 2009 questionnaire did not include such a section on criteria, but these seem to have been similar across the two survey waves, according to general guidelines and studies on the targeting of PSNP (Sharp et al., 2006). Beneficiary status is reported by survey round and by poverty (see *Table 3*). Two main observations emerge from this table. Firstly, the fraction of non-poor households receiving support is quite high,

19 Ethiopia received US$804 million (2003) and US$886 million (2008) to cope with the severe droughts (Development Initiatives, 2010).

pointing to targeting errors. For instance, 55 per cent of non-poor households in 2004 and 36 per cent of such households in 2009 participated in public works. It should be noted that the poverty line applied is quite low, however, which may explain why so many 'non-poor' are targeted. In terms of the amount of support received, poor households do receive higher quantities of support on average, in both years and for both types of support. The second important observation concerns the difference in targeting between 2004 and 2009. In 2004, the proportion of poor and non-poor households among the beneficiaries of public works or emergency aid is very similar; in 2009, the proportion of beneficiaries among non-poor households is much lower, suggesting an improvement in targeting. There is a caveat to these figures, however. Poverty rates here are calculated using net-of-aid consumption, which is not an accurate counterfactual for household consumption in the absence of aid support, since it ignores the behavioural response to aid. These descriptive statistics should therefore only be considered as indicative of differences between beneficiary and non-beneficiary households.[20]

20 The same caveat applies to figures reported in *Table 1.*

Table 3. Poverty and aid targeting by survey round and type of support

		Participation						Amount					
	Poverty rate	Public works			Emergency aid			Public works			Emergency aid		
	Full sample	All	Poor	Non-poor	All	Poor	Non-poor	All	Poor	Non-poor	All	Poor	Non-poor
2004	0.43	0.54	0.54	0.55	0.49	0.50	0.48	2.23	2.78	1.83	1.23	1.38	1.12
2009	0.70	0.51	0.57	0.36	0.49	0.54	0.34	4.99	5.58	4.01	1.04	1.21	0.67
Total	0.58	0.53	0.56	0.50	0.49	0.53	0.43	3.36	4.19	2.51	1.13	1.27	0.94

Note: Poverty rates are calculated at household level and include only villages that received public works or emergency aid. Villages are included only for the years in which they received aid (public works: n=9 in 2004; n=6 in 2009; emergency aid: n=8 in 2004; n=9 in 2009). Poverty rates are calculated by using net-of-aid consumption in adult equivalent units. The amount is reported monthly and calculated per capita in real terms (in Ethiopian Birr) only for households that received aid. The number of households included in the analysis are as follows: for public works: 686 households in 2004 and 418 households in 2009 (total=1,104); for emergency aid: 626 households in 2004 and 720 households in 2009 (total=1,346).

Figure 1 shows a similar trend: the left-hand panels show the probability of receiving public works (top) and the amount of support per capita received by aid beneficiaries (bottom) by percentiles of net-of-aid consumption per capita; the right-hand panels show the same for emergency aid. In terms of accessing the programmes, both top graphs show an improvement for public works and for emergency aid. In 2004, targeting seems to be independent of need, as the line for both types of support is almost horizontal. There is not such a clear-cut improvement to be seen in terms of amount received. For public works, the average amount received in 2009 is higher than that received in 2004, while the distribution is similar across the two years. For emergency aid, the amounts received across the two years are similar, but there are some signs of improvement at the higher percentiles of the consumption distribution. In 2004, the beneficiaries in the upper part of the distribution receive more than those in the middle; by 2009, those in the lower part of the distribution receive more than those in the higher percentiles.

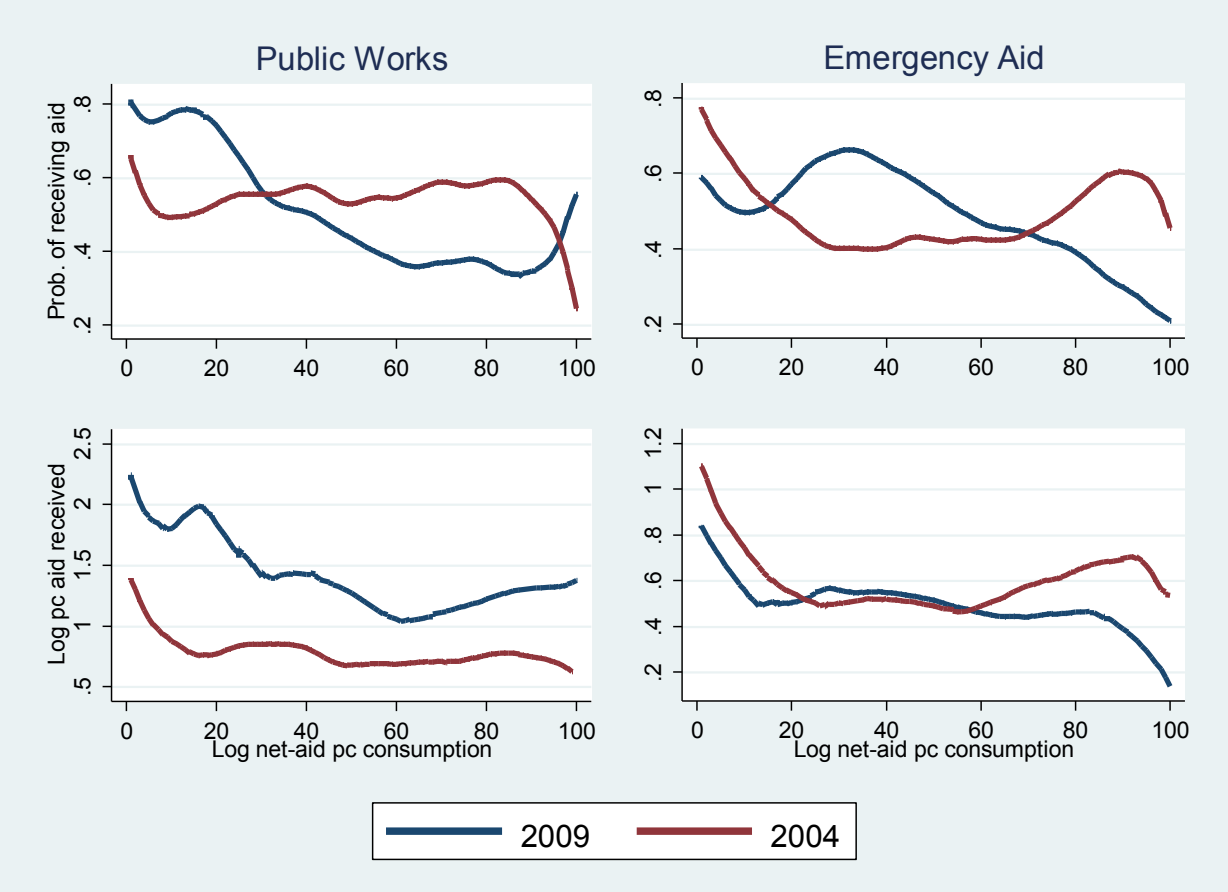

Figure 1. Public works and emergency aid targeting by year and by net-of-aid consumption

Note: Consumption is the net of aid consumption per capita in real terms and in logs. Reported lines represent locally weighted scatter-plot smoothing, obtained with a bandwidth of 0.3. Graphs for public works include only villages that received public works (n=9 in 2004; n=6 in 2009); graphs for emergency aid include only villages that received emergency aid (n=8 in 2004; n=9 in 2009). Top panels include all households: for villages in receipt of public works, n=686 in 2004 and n=425 in 2009; for villages in receipt of emergency aid, n=626 in 2004 and n=737 in 2009. Bottom panels include only beneficiary households: for public works, n=373 in 2004 and n=215 in 2009; for emergency aid, n=307 in 2004 and n=360 in 2009.

As alluded to earlier, however, consumption is not an ideal measure of need. Firstly, it is based on a very limited period of recall (the last seven days). Secondly, in cases where support is given to better-off households (as shown by previous studies), net-of-aid consumption might provide a distorted picture of initial welfare conditions. Furthermore, if targeting errors occur, it could provide a distorted representation of the initial level of consumption. For example, were better-off households to receive high amounts of aid, the net-of-aid consumption might incorrectly portray these households as being especially in need. A preferred measure of need is household assets, represented by livestock holdings per capita for the 12 months prior to interview (reflecting wealth holdings before receipt of aid). The use of livestock as a proxy for assets is justified in this context also because of the importance of livestock to the livelihoods of Ethiopian households and to the overall economy.[21] Figure 2 shows the probability of receiving aid (top panels) and the amount of aid received by aid

21 Ethiopia has the largest livestock population of all African countries. Livestock contributes 12 per cent to the country's total GDP (Endalew and Ayalew, 2016) and more than 45 per cent to its agricultural GDP (IGAD Centre for Pastoral Areas and Livestock Development, 2013).

beneficiaries (bottom panels) by livestock holdings per capita percentiles. The figure appears to show an improvement in targeting for both public works and emergency aid between 2004 and 2009.

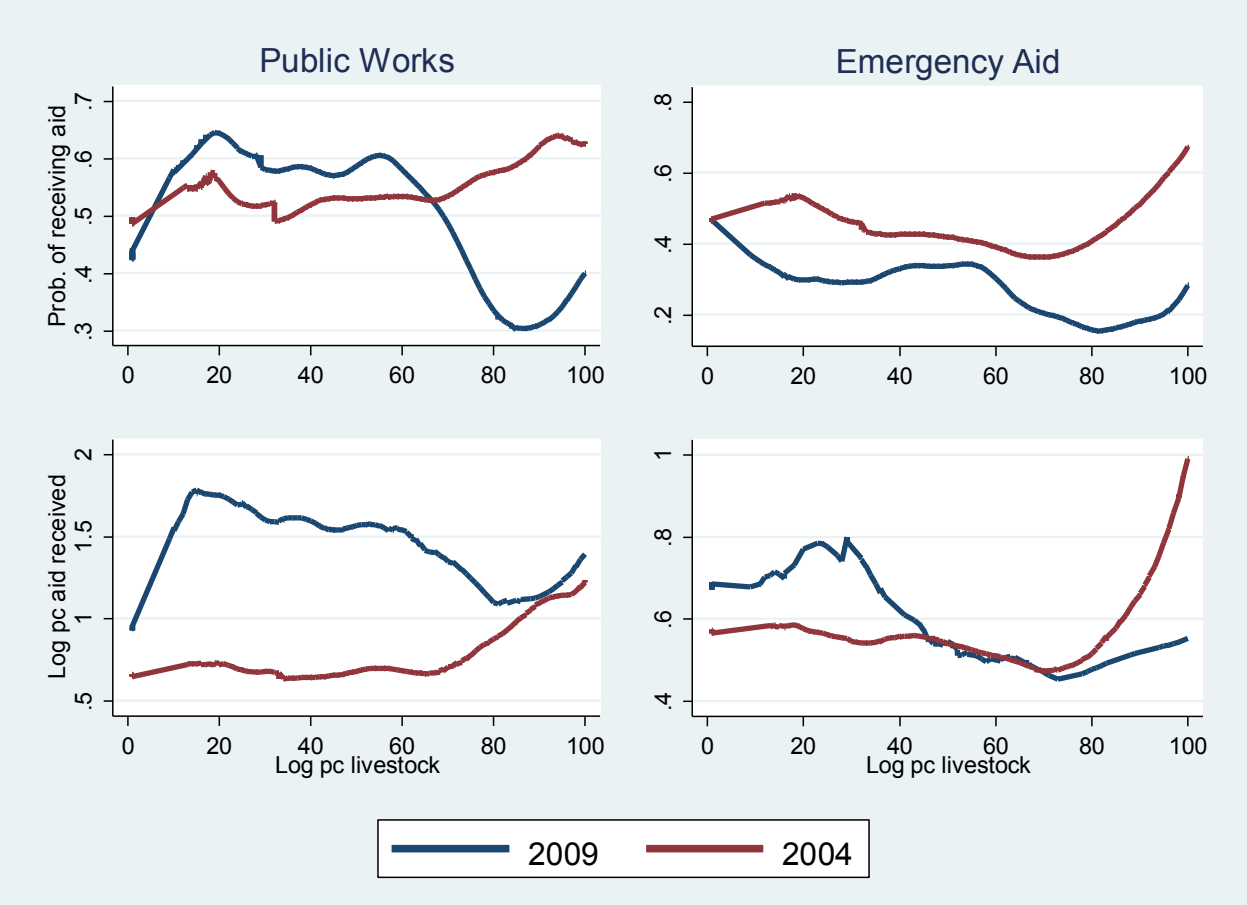

Figure 2. Public works and emergency aid targeting by year and by livestock holdings

Note: Livestock is the lagged livestock value per capita expressed in real terms and in logs. Reported lines represent locally weighted scatter-plot smoothing, obtained with a bandwidth of 0.4. Graphs for public works include only villages that received public works (n=9 in 2004; n=6 in 2009); graphs for emergency aid include only villages that received emergency aid (n=8 in 2004; n=9 in 2009). Top panels include all households: for villages in receipt of public works, n=686 in 2004 and n=425 in 2009; for villages in receipt of emergency aid, n=626 in 2004 and n=737 in 2009. Bottom panels include only beneficiary households: for public works, n=373 in 2004 and n=215 in 2009; for emergency aid, n=307 in 2004 and n=360 in 2009.

Selected statistics relating to the characteristics of beneficiary and non-beneficiary households in the sample villages receiving public works or emergency aid are presented for each of the two survey rounds (see *Table 4*). The reported variables represent the characteristics based on which targeting should be implemented – overall household wealth, food insecurity and demographics – as well as a household's political connections. Demographic variables are: household size (log); proportion of elderly members (defined as members ≥ 65 years); and a dummy variable that describes whether or not the head of household is female. A variable to capture the human capital of the head of household, proxied by a dummy variable that takes the value of 1 if she/he has completed primary school, is included. In this context, this variable might serve as a proxy for wealth or income earning potential, and also for the ability to enforce access to support. Assets are proxied by the lagged livestock value per capita (log) 12 months prior to the interview. The lagged value of livestock is used

as it better reflects the economic situation of households prior to the distribution of aid and therefore provides a better picture of the wealth situation before any targeting had taken place. Although lagged livestock values may be determined in part by past aid, this should not affect the results as the selection of beneficiaries occurs on an annual basis through the re-targeting process.

Unlike other studies on targeting in Ethiopia (Broussard et al., 2014; Jayne et al., 2001; Jayne et al., 2002), the present analysis uses a direct indicator of food insecurity as the measure of need and vulnerability, rather than net-of-aid consumption (or income). As previously mentioned, net-of-aid consumption is not a valid counterfactual to household consumption in the absence of aid support, since this measure ignores the behavioural response of the household to aid. In addition, since a focus of this study is the amount of support distributed to households, this indicator might conceal the real pattern of aid distribution, especially if more aid is given to relatively better-off households, as has been shown in the literature (Broussard et al., 2014; Clay et al., 1999). Instead, the indicator used as a proxy for need and vulnerability is food insecurity, proxied by the number of months during the previous 12 months in which a household has had problems satisfying its food needs; food insecurity is also one of the indicators for targeting. Political connections are proxied by a dummy variable, which equals 1 if a household has a relative or friend who holds an official position in the *kebele* or elsewhere.[22] All positions in the *kebele* are 'political' as the political leadership makes such appointments (Caeyers and Dercon, 2012). This indicator was collected only in 2004 and not in 2009; it is assumed here, as in other papers (see, for example, Broussard et al., 2014), that political connections do not change over time. This is because although elections are held every five years – the last one relevant to this study took place in 2008 – the *kebele* council and the various committees mainly comprise community members and are characterized by a lower turnover compared to higher and more formal political positions (Yilmaz and Venugopal, 2008). The work inability score is an average score based on the answers given to five questions concerning a head of household's ability to carry out various everyday tasks.[23] Each question has four possible answers ranging from performs the task easily (value 1) to unable to perform the task at all (value 4). The average score across the five questions provides an index of inability to work, with values ranging from 1 to 4, with 1 representing the full ability to work and 4 the complete inability to work.

22 Political connections do not merely reflect the economic status of households as proxied by livestock and landholding. Estimates of the correlates to political affiliations based on a linear probability model are presented in the appendix (see Table A2). Political affiliations also correlate positively with heads of household who have at least completed primary education, and negatively with female heads of household.

23 The questions were: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning?

Table 4. Characteristics of households by beneficiary status

	2004			2009		
	Non-beneficiary	Beneficiary	Difference	Non-beneficiary	Beneficiary	Difference
	(1a)	(1b)	(1a) - (1b)	(2a)	(2b)	(2a) - (2b)
	Mean	Mean		Mean	Mean	
Panel A: Public works						
Head of household completed primary education	0.14	0.14	0.00	0.16	0.13	-0.03
Female head of household	0.36	0.28	-0.08**	0.37	0.46	0.09**
Age of head of household (years)	51.3	48.01	-3.29***	54.29	50.23	-4.06***
Work inability score of head of household	1.46	1.24	-0.22***	1.62	1.38	-0.24***
Household size	5.41	5.94	0.53**	5.5	5.75	0.25
Share of elderly (members > 65 years)	0.10	0.04	-0.06***	0.12	0.05	-0.08***
Livestock (per capita in Ethiopian Birr)	307.25	362.27	55.03*	350.67	217.47	-133.20***
Food insecurity (number of months in last 12 months)	2.89	3.6	0.72***	3.45	4.58	1.13***
Political connections	0.32	0.46	0.13***	0.32	0.33	0.01
N	313	373		207	211	
Panel B: Emergency aid						
Head of household completed primary education	0.13	0.12	-0.01	0.24	0.21	-0.03
Female head of household	0.33	0.33	0.00	0.34	0.33	-0.01
Age of head of household (years)	49.08	51.55	2.48**	50.15	55.02	4.87***
Work inability score of head of household	1.27	1.47	0.20***	1.38	1.53	0.15**
Household size	5.98	5.5	-0.47**	5.97	5.66	-0.31
Share of elderly (members > 65 years)	0.05	0.09	0.05***	0.06	0.13	0.08***
Livestock (per capita in Ethiopian Birr)	311.34	362.29	50.95*	324.74	172.06	-152.67***
Food insecurity (number of months in last 12 months)	3.11	3.49	0.38**	3.36	4.14	0.79***
Political connections	0.38	0.45	0.08**	0.4	0.43	0.02
	319	307		370	350	

Note: Figures include only villages that received either public works (n=9 in 2004; n=6 in 2009) or emergency aid (n=8 in 2004; n=9 in 2009).

In 2004, the main differences between public works beneficiaries and non-beneficiaries reveal some alignment between the targeting and implementation guidelines. For instance, strong labour supply characteristics (lower share of elderly; younger heads of household; heads of household with a lower work inability score) and food insecurity are statistically higher among beneficiary households. Yet, at the same time, greater household assets and political connections are also statistically higher among beneficiary households than non-beneficiary households.

As expected, the differences in the demographic characteristics of emergency aid beneficiaries and non-beneficiaries move in the opposite direction to those for public works beneficiaries and non-beneficiaries, particularly for labour supply variables. Heads of household are significantly older in households targeted for emergency aid than in non-targeted households, and they also have higher work inability scores. Emergency aid beneficiary households are smaller and have a higher share of elderly members than non-beneficiary households. In relation to wealth and well-being, and similar to the situation for public works, emergency aid beneficiary households have, on average, faced more months of food insecurity and have statistically smaller livestock holdings. In contrast, political connections are again statistically higher for beneficiary households.

The characteristics of beneficiary and non-beneficiary households and their differences in 2009 are reported (see last three columns, *Table 4*). There are striking differences between the 2004 and 2009 significance levels of the beneficiary and non-beneficiary groups, particularly for livestock holdings and political connections. The difference in livestock holdings between beneficiary and non-beneficiary households in 2004 is statistically significant and positive, while in 2009 the difference remains statistically significant but is now negative. This means that in 2004, targeted households typically held higher numbers of livestock than non-targeted households, while in 2009 the complete opposite is found. The political connections of beneficiaries and non-beneficiaries are, in contrast, statistically different in 2004, but not in 2009. These differences in livestock holdings and political connections follow a similar pattern for public works and for emergency aid targeting. These initial figures suggest an improvement in the targeting of the two social protection programmes along some lines. These are just descriptive statistics, however, so can only provide tentative hints as to the shape of targeting patterns over time.

5. EMPIRICAL STRATEGY AND MODEL SPECIFICATION

The same modelling approach, including choice of covariates, is used to estimate the targeting effectiveness of public works and emergency aid. For each social protection programme, two sets of outcomes are estimated: the probability of benefiting from the programme, and the amount of support received, as a function of observable household background characteristics. These include characteristics from the official implementation guidelines (which are subsequently interpreted for the local context by village officials) as well as other variables expected to play a role in the aid distribution process. The following equation is estimated for household *i* in village *j* at time *t*:

$$Y_{ijt} = f(X_{ijt}, Z_{ij}, v_{jt}) \qquad (1)$$

where X_{ijt} is a vector of household characteristics (e.g., household assets and demographics), Z_{ijt} includes variables that represent households' political connections, and v_{jt} controls for unobservable time-varying village fixed effects (see section four for definitions of variables).

The official implementation guidelines directly recommend targeting those households that have experienced a serious loss of assets as a consequence of shocks; however, the main model used here does not include shock indicators. Several specifications were run that included a number of shocks (death of head of household; illness of head of household or other members; shocks related to livestock or crops and harvest, drought, among others) as well as additional covariates (including size of the *iddir* [24] to which the household belongs, and number of people the household can rely on in times of need). However, given that none of these shocks appear to correlate with the receipt of aid, they are omitted from the main analyses (the results are reported instead in *Table A3*).

As the aim of this study is to assess targeting effectiveness and compare targeting in 2004 and in 2009, and because the political connections indicator is time invariant, a pooled model was first run. This was followed by the running of a fully interacted model between all the covariates and the dummy variable for 2009 to look for critical differences in the implementation of targeting. The following specification is estimated for this latter model:

$$Y_{ijt} = \beta_0 + \beta_1 X_{ijt} + \beta_2 Z_{ij} + \beta_3 (X_{ijt} * t_1) + \beta_4 (Z_{ij} * t_1) + v_{jt} + \varepsilon_{ijt} \quad (2)$$

Ordinary least squares estimation of the parameters of this model is straightforward, but statistical inference must be used to control for the likely correlation of the error E_{ijt} over time for any given household. For short panels, it is possible to obtain cluster-robust standard errors that cluster on the household under the assumptions that errors are independent across households and that $N \rightarrow \infty$. The second equation (above) was estimated using probit modelling separately for participation in public works and for receiving emergency aid.

Aid was further investigated by considering, as dependent variables, the amounts of support received. For public works, three different dimensions were considered: (1) the monthly average value of the total food and cash payments received over the previous 12 months in real terms, in logged Ethiopian Birr; (2) the number of days any household member worked on public works projects in the past 12 months, in logs; and (3) the logged daily wage for the same period. For emergency aid, the only relevant data available relate to the total payments (cash and food) received in the previous 12 months in Ethiopian Birr. This second set of equations was estimated using the Tobit model to account for participation in public works or receipt of emergency aid.[25]

6. RESULTS

6.1 Public works

Estimation results for public works are given below, with column 1 presenting the marginal effects of covariates of interest on the probability of participating in public works in 2004 and 2009 (pooled model), and column 2 reporting the marginal effects for the fully interacted model (see *Table 5*). The coefficients from the non-interacted model show the probability of accessing public works in 2004; once interacted with the dummy variable for 2009, these coefficients reflect any comparative differences following the introduction of PSNP. To understand the overall effect of each determinant in 2009, the coefficients of the non-interacted and interacted variables must be summed. The

24 The *iddir* is a funeral society. Members pay a regular contribution to the society, and in return it will pay for the cost of the funeral of a member and any of her/his close relatives.

25 A number of criticisms are made of the Tobit model, largely because of the restrictions it imposes on how relationships are modelled (constraining the signs of the covariates to align with a probit model) and its normality assumption. To satisfy the normality assumption, amounts in Ethiopian Birr are transformed into natural logarithms. The robustness of this approach is discussed later in this paper.

overall effect for 2009 is reported in column 3. Overall, the results from the pooled model show that participation in public works is determined by labour supply characteristics (share of elderly household members; work inability score of head of household), wealth, vulnerability and political connections. The coefficient of wealth, proxied by the lagged livestock value per capita, is negative and statistically significant, suggesting that increases in wealth are negatively correlated with the probability of accessing public works. Food insecurity is positively correlated with the probability of accessing public works. All results are in line with official guidelines, which are based on food insecurity and means-based criteria. However, the political connections variable is also statistically significant – though only at the 10 per cent level – and positive, indicating that having a relative or friend who holds an official position in the local administration (or elsewhere) increases a household's probability of participating in public works.

Table 5. Determinants of participation in and amount received for public works (2004–2009)

	Participation (last 12 months)			Amount received (monthly, logged Ethiopian Birr)		
	(Pooled)	(Interacted)	(Overall)	(Pooled)	(Interacted)	(Overall)
	(1)	(2)	(3)	(4)	(5)	(6)
Household size log	0.082	0.103*		0.332**	0.302**	
	(0.050)	(0.055)		(0.141)	(0.142)	
Share of elderly (members > 65 years)	-0.762***	-0.618***		-2.389***	-1.794***	
	(0.133)	(0.150)		(0.500)	(0.440)	
Female head of household (d)	-0.03	-0.081*		-0.08	-0.246***	
	(0.039)	(0.044)		(0.097)	(0.095)	
Head of household completed primary education (d)	-0.065	-0.076		-0.113	-0.152	
	(0.048)	(0.055)		(0.124)	(0.119)	
Work inability score of head of household	-0.070**	-0.064*		-0.180*	-0.132	
	(0.031)	(0.034)		(0.095)	(0.092)	
Livestock log (per capita in Ethiopian Birr)	-0.024***	-0.008		-0.060**	-0.008	
	(0.009)	(0.009)		(0.024)	(0.023)	
Food insecurity (number of months in last 12 months)	0.020***	0.032***		0.056***	0.075***	
	(0.007)	(0.010)		(0.020)	(0.021)	
Political connections (d)	0.061*	0.081**		0.156	0.173*	
	(0.037)	(0.039)		(0.098)	(0.099)	
Year 2009 (d)	-0.169*	0.242		-0.281	0.542	
	(0.089)	(0.215)		(0.298)	(0.652)	
Year 2009 * Household size log		-0.065	0.037		0.027	0.327
		(0.079)	(0.097)		(0.351)	(0.343)

Year 2009 * Share of elderly household members		-0.119	-0.739***		-1.032	-2.711***
		(0.194)	(0.248)		(0.951)	(0.959)
Year 2009 * Female head of household (d)		0.099*	0.019		0.520*	0.217
		(0.058)	(0.075)		(0.287)	(0.242)
Year 2009 * Head of household completed primary education (d)		0.049	-0.026		0.218	0.042
		(0.076)	(0.096)		(0.374)	(0.335)
Year 2009 * Work inability score of head of household		0.001	-0.062		-0.12	-0.239
		(0.043)	(0.056)		(0.216)	(0.213)
Year 2009 * Livestock log		-0.032**	-0.040**		-0.183***	-0.170***
		(0.014)	(0.017)		(0.062)	(0.061)
Year 2009 * Food insecurity		-0.024**	0.007		-0.068	0.015
		(0.011)	(0.015)		(0.048)	(0.049)
Year 2009 * Political connections (d)		-0.063	0.017		-0.114	0.072
		(0.054)	(0.067)		(0.242)	(0.241)
Village – year Fixed Effects	Yes	Yes		Yes	Yes	
Pseudo R-squared	0.181	0.194		0.111	0.117	
Observations	1104	1104		1104	1104	

Note: Amount expressed in real terms. Work inability score is an index based on five questions: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning? Food insecurity refers to the number of months during which a household had problems satisfying its food needs. Political connections is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the *kebele*. Participation is estimated using a probit model; amount is estimated using the Tobit model. Reported coefficients refer to marginal effects for both models. Standard errors are clustered at the household level. Significance levels: * 10%; ** 5%; *** 1%.

Columns 2 and 3 indicate no clear pattern of improvement in means-based targeting between 2004 and 2009. On the one hand, there is an improvement related to the ownership of livestock (for which the 2009 overall effect is negative and statistically significant, and higher in absolute value than the coefficient from the pooled model); on the other hand, food insecurity is no longer a statistically significant predictor in 2009. For livestock holdings specifically, when evaluated at the mean value of all other characteristics, the probability of households at the 25th, 75th and 95th percentiles of lagged livestock value in 2009 being targeted for public works is 58 per cent, 52 per cent and 50 per cent respectively. Notwithstanding the improvement on 2004, it is worth noting that the probability of the richest households accessing public works is still 50 per cent, while a significant proportion of worse-off households do not benefit from the programme. Food insecurity had a significant effect on the probability of accessing public works in 2004, but this was no longer the case in 2009. In 2004, keeping all other variables constant, an additional month of food insecurity on average increases the probability of accessing public works by 3.2 percentage points.

The results show that political connections, which play an important role in the allocation of public works in 2004, no longer matter in 2009. The interacted coefficient is negative (showing an improvement on 2004), although it is not statistically significant (and nor is the overall effect). In 2004, households that have a relative or friend who holds an official position, including within the local administration, are 8.1 percentage points more likely to be selected for public works than households without such affiliations. The magnitude of this effect may not seem particularly large, but when compared to other variables that are significant in determining targeting, its importance becomes more apparent. For instance, an increase of one month in the period of food insecurity faced by a household increases the probability of accessing public works by 3.2 percentage points. This implies that, ceteris paribus, a household with political connections has the same probability of accessing public works as one without political connections that has experienced an additional two and a half months of food insecurity.

Variables that capture labour supply characteristics also show a different pattern between 2004 and 2009, and this moves in the direction of fairer access to public works. While in 2004 the coefficient on female-headed households is negative and statistically significant, by 2009 the overall effect is no longer significant. Instead, the coefficient of the interacted variable is significant and positive, showing that female-headed households were more likely to be targeted in 2009 than in 2004. Again, this is in line with PSNP implementation guidelines, which foresee a number of gender-specific arrangements being put in place in an effort to make PSNP as inclusive as possible. In 2004, female-headed households are 8.1 percentage points less likely to access public works than male-headed households, while in 2009 the net effect of female-headed households is no longer significant. Work inability of the head of household is negatively correlated with accessing public works in 2004, and no difference is seen in 2009 (the net effect is also not statistically significant).

Household size is positively correlated with the probability of accessing public works in 2004, but this is no longer the case by 2009. This also seems to be an improvement, since previous studies show that public works were assigned in the past on the basis of labour supply surplus, independently of household need (Clay et al., 1999). The share of elderly household members is a significant variable in both 2004 and 2009. An increase in the proportion of elderly members in a household is associated with a decrease in the probability of accessing public works; this in line with the guidelines, which set an age limit for participation in public works.

As well as assessing the probability of accessing public works, the amount of aid received in return for public works is investigated by examining the monthly aid receipts (on average 2.43 in 2004 and 3.9 in 2009), number of days assigned to public works (1.57 in 2004 and 1.72 in 2009), and daily wage rates (3.47 in 2004 and 4.89 in 2009); all figures are expressed as logged values (see *Table A4*). (For results for monthly payment, see columns 4 to 6, Table 5; for number of days and daily wage rates, see *Table A5*.) The amount of aid received is expected to be even more susceptible to political influence than participation in public works, as the quantities of aid distributed are difficult to monitor. However, the results for all three outcomes suggest broadly similar conclusions to those for participation.

6.2 Emergency aid

The probability of receiving emergency aid and the determinants of the amount of aid received are presented below (see *Table 6*). The pooled model shows that targeting of emergency aid is fairly means-based, although political connections also play a role. Households with fewer members able

to work (namely households with a higher proportion of elderly members and a head of household with a higher work inability score) are more likely to receive emergency aid. Moreover, higher levels of livestock holdings are associated with a lower probability of accessing emergency aid.

The interacted model (column 2) gives similar results to the pooled model, with significant determinants of the receipt of emergency aid in 2004 mostly relating to constrained labour supply characteristics, as well as to household political connections. A one-point increase in the work inability score (which ranges from 1 to 4) increases the probability of receiving emergency aid by 6 percentage points. Similar to the findings for public works, having political connections increases a household's probability of receiving emergency aid, by 7 percentage points. None of the coefficients of the variables interacting with the dummy variable for 2009 are significant, suggesting no major difference in targeting procedures between 2004 and 2009, and also indicating that targeting in 2009 is based on none of the variables included in the model (column 3).

Table 6. Determinants of receipt of emergency aid and amount received (2004–2009)

	Beneficiary (last 12 months)			Amount received (monthly, logged Ethiopian Birr)		
	(Pooled)	(Interacted)	(Overall)	(Pooled)	(Interacted)	(Overall)
	(1)	(2)	(3)	(4)	(5)	(6)
Household size log	-0.021	-0.029		0.018	0.016	
	(0.043)	(0.061)		(0.107)	(0.140)	
Share of elderly (members > 65 years)	0.373***	0.325**		0.684***	0.566*	
	(0.106)	(0.161)		(0.207)	(0.304)	
Female head of household (d)	-0.013	-0.033		-0.03	-0.056	
	(0.036)	(0.047)		(0.087)	(0.107)	
Head of household completed primary education (d)	0.01	0.011		0.009	-0.017	
	(0.042)	(0.060)		(0.102)	(0.142)	
Work inability score of head of household	0.078***	0.060*		0.221***	0.158**	
	(0.024)	(0.035)		(0.055)	(0.072)	
Livestock log (per capita in Ethiopian Birr)	-0.013*	-0.012		-0.035*	-0.021	
	(0.008)	(0.010)		(0.018)	(0.023)	
Food insecurity (number of months in last 12 months)	0.002	0.005		0.003	0.013	
	(0.007)	(0.010)		(0.017)	(0.023)	
Political connections (d)	0.078**	0.069*		0.149*	0.161	
	(0.030)	(0.042)		(0.078)	(0.101)	
Year 2009 (d)	0.108	0.043		0.444**	0.131	
	(0.075)	(0.208)		(0.225)	(0.707)	
Year 2009 * Household size log		0.014	-0.015		-0.068	-0.052
		(0.068)	(0.091)		(0.155)	(0.201)

Year 2009 * Share of elderly household members		0.042	0.366		0.367	0.933**
		(0.184)	(0.244)		(0.286)	(0.417)
Year 2009 * Female head of household (d)		0.032	-0.001		0.095	0.039
		(0.056)	(0.074)		(0.120)	(0.161)
Year 2009 * Head of household completed primary education (d)		0.003	0.015		-0.124	-0.142
		(0.061)	(0.086)		(0.144)	(0.202)
Year 2009 * Work inability score of head of household		0.023	0.083		0.168**	0.326***
		(0.041)	(0.054)		(0.078)	(0.106)
Year 2009 * Livestock log		-0.002	-0.014		0.018	-0.003
		(0.012)	(0.016)		(0.024)	(0.033)
Year 2009 * Food insecurity		-0.003	0.001		0.001	0.014
		(0.010)	(0.014)		(0.020)	(0.030)
Year 2009 * Political connections (d)		0.009	0.078		-0.053	0.109
		(0.047)	(0.063)		(0.098)	(0.141)
Village – year Fixed Effects	Yes	Yes		Yes	Yes	
Pseudo R-squared	0.176	0.177		0.087	0.132	
Observations	1346	1346		1346	1346	

Note: Amount expressed in real terms. Work inability score is an index based on five questions: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning? Food insecurity refers to the number of months during which a household had problems satisfying its food needs. Political connections is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the kebele. Participation is estimated using a probit model; amount is estimated using the Tobit model. Reported coefficients refer to marginal effects for both models. Standard errors are clustered at the household level. Significance levels: * 10%; ** 5%; *** 1%.

The results relating to the amount of emergency aid received are fairly encouraging, as it seems that work endowments are the main determinants of amounts. Both in 2004 and in 2009, higher levels of emergency aid are given to households with higher proportions of elderly members and to households in which the head of household has a higher work inability score (the figures for 2009 show an incremental increase in the role played by these variables). Political connections do not appear to play a role in the amount of aid distributed.

7. ROBUSTNESS TESTS

One concern regarding the main results is the possibility that the aid distribution process itself influences political connections. In particular it might be that people who had received support in the past subsequently came to know local administrators as part of the programme process. If this were the case, political connections and aid might be determined simultaneously, or even reflect reverse causality. Results for the selection of beneficiaries for public works and emergency aid are

presented with a variable added that captures the receipt of aid in the past (see *Table A6*).[26] Past aid is generally a significant determinant in the receipt of aid, with higher levels of significance in 2009 than in 2004. The overall coefficients (not reported in Table A6) for past aid in 2009 are 0.169 and 0.143 for public works and emergency aid respectively, both of which are significant at the 5 per cent level. For public works, in particular, there is a large difference compared to the findings for 2004 (where the coefficient on past aid is insignificant). The role of past aid is unsurprising since official targeting rules state that past aid should be used to determine current eligibility. On the other hand, past aid might be related to unobserved omitted variables, in which case including this variable may improve the power of the model. Importantly, the inclusion of past aid does not modify the coefficients in any of the models. The only variable that slightly changes is political connections in the fully interacted model for emergency aid where the coefficient is no longer significant, although the difference with the model without the inclusion of the past aid variable is quite small. These results overall reinforce the validity of the main model.

As shown in section 5, in both 2004 and 2009 there are households that receive both types of support. This might raise concerns about the reported estimates if the participation (amount received) in public works influences the beneficiary status (amount received) for emergency aid, or vice versa. To explore this possibility, a bivariate probit model and a seemingly unrelated regression linear probability model were run, for participation equations and amount of support received, where appropriate for functional form. When errors are correlated across equations for a specific individual but uncorrelated across individuals, such a system of linear equations can be used to exploit the cross-correlation of the errors to improve estimation efficiency. Also reported elsewhere in this paper are the determinants of the probability of participating in public works and receiving emergency aid (see *Table A7* and *Table A*8). The two forms of support are negatively correlated (-0.062) at the 10 per cent significance level, which is a first indication that the bivariate probit is an appropriate choice of model. When testing whether is equal to zero, the null hypothesis is rejected,[27] suggesting that a bivariate probit may be the superior model.

The results of this robustness test for public works do not substantially differ from those obtained through the main modelling exercise (see *Table 5*). For emergency aid, however, estimates from the bivariate probit and the seemingly unrelated regression linear probability model present some differences. These are found in the interacted coefficients and in the overall results for 2009. In particular, the magnitude and the sign of most coefficients changes, with two particular variables becoming highly statistically significant by 2009 (the share of elderly household members and the work inability score are positively associated with the probability of accessing emergency aid). It is important to note that the comparability of this robustness test to the main analysis may be limited, as the test includes only villages that received both public works and emergency aid in either survey round. However, its results may suggest that, in PSNP villages, the additional support provided by emergency aid in response to weather shocks is directed to those households that face labour constraints and are thus less able to cope with shocks. Another possible interpretation of the robustness test results is that households reporting receipt of emergency aid may in fact receive direct support (the other main component of PSNP). In either case, however, these results suggest that support is directed to vulnerable and labour-constrained households.

26 The past aid variables are dummy variables constructed (using previous rounds of the survey, going back as far as round 3 in 1995) on the basis of whether households participated in public works in the past and whether they received emergency aid in the past (since 1995). The author also tried applying a broader definition of past aid by considering the receipt of any kind of aid in the past, and achieved consistent results.

27 The likelihood-ratio test gives values equal to 14.935 and 15.603 respectively for the model without interactions and for the fully interacted model, with a corresponding p-value of 0.000 in both cases.

8. CONCLUSION

Ethiopia continues to rely on aid transfers for the subsistence of a large part of its population. Targeting of social protection schemes, whether in form of emergency aid or public works, is community-based. Guidelines provided by the federal government on how to select beneficiaries focus on the dimensions of poverty and food insecurity. Prior to the introduction of PSNP, the lack of clarity around the criteria to use for beneficiary selection and the poor monitoring of targeting processes had often raised concerns about whether targeting enabled aid to reach those most in need. In addition, anecdotal evidence suggested the potential for elite capture and rent-seeking behaviours, given the power wielded by *kebele* leaders and local officials over beneficiary selection (Alatas et al., 2012; Conning and Kevane, 2002). A few empirical studies have confirmed such anecdotal evidence, corroborating the finding that political connections influence aid distribution in the Ethiopian context (Broussard et al., 2014; Caeyers and Dercon, 2012).

The main contribution of this study stems from it being the first to focus on changes in targeting over time. In particular, the study investigates whether targeting of the two major social protection programmes in Ethiopia – public works and emergency aid – has improved since PSNP was introduced in 2005. Using data from the last two rounds of the ERHS – one conducted in 2004, just before PSNP was implemented, and the other carried out in 2009, following a few years of its implementation – the differences in targeting are directly compared, with a focus on three main variables that capture food insecurity, poverty and political connections. Over the course of PSNP implementation, a number of changes were introduced to targeting operations to improve transparency and accountability. The results for 2004 are fairly consistent with previous studies (Gilligan and Hoddinott, 2007; Caeyers and Dercon, 2012) that found political connections to be particularly influential in the selection of beneficiaries for both public works and emergency aid. However, evidence is found of an overall improvement in targeting by 2009, especially for public works. In particular, wealth is a strong negative predictor of targeting in 2009, while political connections no longer appear to play a role. For emergency aid, the findings show similarly encouraging trends in relation to the influence of political connections, but other indicators related to household demographics (share of elderly household members, work inability of the head of household) are also no longer significant. These factors do become significant, however, when the sample is restricted to villages that receive both public works and emergency aid, suggesting that public works have influenced the targeting of emergency aid. It may be that the improvements in beneficiary selection brought about by PSNP in turn affected the overall system of aid distribution in any given village.

It is worth mentioning a number of limitations that this paper was unable to address. Firstly, the results are representative of neither PSNP operating districts nor emergency aid areas. Although the ERHS was sampled to be representative of agro-ecological zones, the survey does not necessarily represent the national population of Ethiopia. Furthermore, as other studies (qualitative as well as quantitative) have shown, there is great variation in how beneficiaries are selected. Table A1 also supports this finding of inter-village heterogeneity, though the small sample size does not allow for further analysis of this variation, for example, by regional patterns. In addition, the main findings pertain only to the situation up until 2009, and more recent data are needed to shed light on targeting progress made since then.

Targeting continues to be a heavily debated and critical component of any aid or poverty related programme, particularly in settings where poverty levels are high and large segments of the population struggle to meet their daily subsistence needs (Devereux et al., 2017; Ellis, 2012). Because of its political nature and its links to the public acceptance of programming – as well as the role it plays in ultimately responding successfully to poverty objectives – targeting must be informed by evidence. It is likely that the 'best' targeting formula for a programme will vary depending on, among other things, its programme objectives and time frame as well as the administrative and monitoring capacity in the relevant setting. While this paper reveals improvements in targeting following the introduction of PSNP, targeting using a combination of CBT and one or more other targeting methods (e.g., categorical targeting based on demographics) has also proved successful, as research from other African countries has shown (Handa et al., 2012). Creating more specific and clear criteria for identifying eligible groups would reduce the possibility of elite capture and increase both the transparency of the process and its perceived fairness among community members.[28] In addition, small changes can be made to targeting operations to decrease the potential drawbacks associated with CBT. For example, measures can be implemented to improve information sharing and monitoring, and to address grievances. As more programmes implement short-term, shock-responsive schemes and as programmes are scaled up in development settings, innovations in technology and more complex programme designs are needed. Such improvements can help to ensure that social protection reaches those people who are most in need, both to protect the most vulnerable populations and to break the cycle of inter-generational transmission of poverty.

28 The more recent phase of PSNP is also going in this direction, including as it does specific provision of PSNP support for pregnant and lactating women, and for malnourished children.

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APPENDIX

Table A 1. Poverty rate, share of aid beneficiaries and amount of aid received by village

			Share of aid beneficiaries						Amount of aid received					
		Poverty rate	Public works			Emergency aid			Public works			Emergency aid		
Region	Village name		All	Poor	Non-poor	All	Poor	Non-poor	All	Poor	Non-poor	All	Poor	Non-poor
Tigray	Haresaw	0.69	0.55	0.56	0.54	0.43	0.5	0.29	7.15	8.19	4.77	3.2	3.35	2.52
Tigray	Geblen	0.72	0.63	0.66	0.56	0.57	0.62	0.44	8.88	10.02	5.19	4.85	4.66	5.53
Amhara	Dinki	0.57	0.26	0.22	0.32	0.58	0.61	0.54	0.36	0.36	0.37	1.26	0.85	1.92
Amhara	Yetemen	0.19	0.00	0.00	0.00	0.01	0.00	0.01	-	-	-	-	-	-
Amhara	Shumsha	0.36	0.44	0.47	0.43	0.39	0.3	0.45	5.75	7.95	4.27	1.66	1.7	1.65
Oromia	Sirbana Godeti	0.07	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
Oromia	Adele Keke	0.43	0.31	0.35	0.27	0.19	0.19	0.19	5.15	4.9	5.36	2.44	2.44	2.43
Oromia	Korodegaga	0.54	0.77	0.82	0.71	0.41	0.45	0.37	10.89	10.87	10.92	3.55	3.54	3.58
Oromia	Trirufe Ketchema	0.39	0	0	0	0.15	0.23	0.09	-	-	-	0.97	0.96	1
SNNP region	Imdibir	0.62	0	0	0	0.01	0	0.02	-	-	-	-	-	-
SNNP region	Aze Deboa	0.52	0.36	0.24	0.49	0.39	0.43	0.35	0.15	0.09	0.18	1.16	1.33	0.94
SNNP region	Adado	0.71	0	0	0	0.46	0.48	0.41	-	-	-	1.75	1.61	2.25
SNNP region	Gara Godo	0.65	0.13	0.07	0.23	0.41	0.47	0.3	2.28	4.31	1.26	1.22	1.26	1.12
SNNP region	Doma	0.59	0.34	0.32	0.36	0.06	0.06	0.06	6.04	6.54	5.33	-	-	-
Amhara	Debre Birhan Milki	0.19	0	0	0	0.02	0.02	0.02	-	-	-	-	-	-
	Total	0.47	0.24	0.28	0.21	0.47	0.51	0.41	6.65	7.94	5.07	2.23	2.26	2.18

Note: Amount of aid received is the average of all those households that received aid in any village. Figures are averaged across the two survey rounds (2004 and 2009).

Table A 2. Correlates of political connections

	Political connections	
	2004	2009
Net-of-aid consumption log (per capita)	0.040*	0.016
	(0.022)	(0.026)
Head of household completed primary education (d)	0.107**	0.099**
	(0.042)	(0.045)
Female head of household (d)	-0.129***	-0.088***
	(0.024)	(0.024)
Age of head of household	0.000	0.001
	(0.001)	(0.001)
Household size log	0.040	0.052
	(0.055)	(0.058)
Share of elderly (members > 65 years)	-0.045	0.082
	(0.095)	(0.088)
Share of children (members < 15 years)	0.093	0.218**
	(0.096)	(0.083)
Livestock log (per capita in Ethiopian Birr)	0.017**	0.019**
	(0.007)	(0.009)
Land log (per capita)	0.074	0.051
	(0.069)	(0.079)
Constant	0.080	-0.005
	(0.119)	(0.125)
Village – year Fixed Effects	Yes	Yes
Adjusted R-squared	0.092	0.085
Observations	1262	1263

Note: Dependent variable is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the kebele in 2004. Linear probability model. Standard errors are clustered at the village level. Significance levels: * 10%; ** 5%; *** 1%.

Table A 3. Determinants of aid receipt with additional covariates

	Public works		Emergency aid	
	(Pooled)	(Interacted)	(Pooled)	(Interacted)
	(1)	(2)	(3)	(4)
Household size log	0.062	0.094*	-0.021	-0.026
	(0.045)	(0.056)	(0.037)	(0.063)
Share of elderly (members > 65 years)	-0.583***	-0.542***	0.308***	0.336**
	(0.083)	(0.110)	(0.080)	(0.143)
Female head of household (d)	-0.022	-0.072*	-0.001	-0.024
	(0.033)	(0.042)	(0.031)	(0.047)
Head of household completed primary education (d)	-0.056	-0.057	0.024	0.026
	(0.043)	(0.054)	(0.035)	(0.061)
Work inability score of head of household	-0.061**	-0.058*	0.066***	0.051
	(0.027)	(0.034)	(0.021)	(0.034)
Livestock log (per capita in Ethiopian Birr)	-0.023***	-0.01	-0.011*	-0.011
	(0.008)	(0.009)	(0.007)	(0.011)
Food insecurity (number of months in last 12 months)	0.017***	0.028***	0.003	0.005
	(0.006)	(0.009)	(0.006)	(0.010)
Political connections (d)	0.052*	0.077**	0.065**	0.077*
	(0.031)	(0.038)	(0.026)	(0.042)
Year 2009 (d)	-0.169*	0.175	0.138*	0.01
	(0.090)	(0.225)	(0.078)	(0.200)
No. of people to rely on in case of need	0.002	0.002	-0.001	-0.005**
	(0.002)	(0.002)	(0.001)	(0.002)
Iddir size	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Drought (d)	-0.038	-0.027	-0.034	-0.042
	(0.035)	(0.040)	(0.034)	(0.045)
Loss of crop (d)	-0.05	-0.033	0.033	0.007
	(0.042)	(0.049)	(0.033)	(0.054)
Livestock shock (d)	-0.019	-0.004	0.009	0.024
	(0.043)	(0.055)	(0.047)	(0.067)
Household member died (d)	0.000	-0.011	0.000	0.011
	(0.035)	(0.035)	(0.033)	(0.036)
Household member ill (d)	-0.051	-0.069	0.075**	0.058
	(0.037)	(0.047)	(0.033)	(0.056)
Year 2009 * Household size log		-0.071		0.015
		(0.088)		(0.081)
Year 2009 * Share of elderly household members		-0.115		-0.053
		(0.165)		(0.192)
Year 2009 * Female head of household (d)		0.103		0.056
		(0.065)		(0.066)

Year 2009 * Head of household completed primary education (d)		0.009		-0.001
		(0.086)		(0.071)
Year 2009 * Work inability score of head of household		-0.006		0.027
		(0.048)		(0.048)
Year 2009 * Livestock log		-0.033**		-0.001
		(0.016)		(0.013)
Year 2009 * Food insecurity		-0.025**		-0.004
		(0.013)		(0.012)
Year 2009 * Political connections (d)		-0.068		-0.018
		(0.059)		(0.053)
Year 2009 * No. of people to rely on		0.001		0.005**
		(0.003)		(0.003)
Year 2009 * *Iddir* size		0.000		0.000
		(0.000)		(0.000)
Year 2009 * Drought (d)		0.006		0.033
		(0.080)		(0.071)
Year 2009 * Loss of crop (d)		-0.055		0.046
		(0.094)		(0.069)
Year 2009 * Livestock shock (d)		-0.03		-0.026
		(0.084)		(0.089)
Year 2009 * Household member died (d)		0.221**		-0.092
		(0.110)		(0.088)
Year 2009 * Household member ill (d)		0.058		0.035
		(0.074)		(0.073)
Constant	0.492***	0.341**	0.279***	0.348**
	(0.121)	(0.140)	(0.105)	(0.154)
Adjusted R-squared	0.209	0.215	0.204	0.199
Observations	1082	1082	1321	1321

Note: Work inability score is an index based on five questions: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning? Food insecurity refers to the number of months during which a household had problems satisfying its food needs. Political connections is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the kebele. The iddir is a funeral society to which members pay a regular contribution, and iddir size is used here as a proxy for social connections. Aid receipt is estimated through linear probability models. Standard errors are clustered at the household level. Significance levels: * 10%; ** 5%; *** 1%.

Table A 4. Aid payments, summary statistics

	N	Monthly payments	Daily wage	No. days
		Mean	Mean	Mean
Public works				
2004	373	2.43	1.57	3.47
2009	215	3.9	1.72	4.89
Emergency aid				
2004	307	2.2		
2009	360	1.93		

Note: Figures are restricted to households that received aid.

Table A 5. Determinants of days worked and daily wage rate for public works (2004–2009)

	No. of days (past 12 months, logged)			Daily wage rate (Ethiopian Birr, logged)		
	(Pooled)	(Interacted)	(Overall)	(Pooled)	(Interacted)	(Overall)
	(1)	(2)	(3)	(4)	(5)	(6)
Household size log	0.344*	0.374*		0.083	0.072	
	(0.181)	(0.205)		(0.063)	(0.083)	
Share of elderly (members > 65 years)	-3.108***	-2.389***		-1.045***	-1.004***	
	(0.671)	(0.603)		(0.238)	(0.268)	
Female head of household (d)	-0.130	-0.356***		-0.014	-0.110*	
	(0.126)	(0.136)		(0.046)	(0.059)	
Head of household completed primary education (d)	-0.191	-0.262		-0.073	-0.099	
	(0.158)	(0.169)		(0.056)	(0.071)	
Work inability score of head of household	-0.240*	-0.225*		-0.095**	-0.104*	
	(0.126)	(0.132)		(0.044)	(0.054)	
Livestock log (per capita in Ethiopian Birr)	-0.083**	-0.024		-0.029**	-0.005	
	(0.033)	(0.033)		(0.011)	(0.013)	
Food insecurity (number of months in last 12 months)	0.069***	0.099***		0.021**	0.039***	
	(0.026)	(0.031)		(0.009)	(0.012)	
Political connections (d)	0.162	0.239*		0.096**	0.146**	
	(0.124)	(0.141)		(0.047)	(0.061)	
Year 2009 (d)	-0.417	0.707		-0.245**	0.066	
	(0.365)	(0.910)		(0.116)	(0.349)	
Year 2009 * Household size log		-0.078	0.295		0.083	0.156
		(0.449)	(0.494)		(0.162)	(0.182)
Year 2009 * Share of elderly household members		-1.92	-4.309***		-0.319	-1.323***

		(1.212)	(1.355)		(0.434)	(0.510)
Year 2009 * Female head of household (d)		0.631*	0.275		0.236*	0.126
		(0.366)	(0.390)		(0.134)	(0.147)
Year 2009 * Head of household completed primary education (d)		0.288	0.26		0.071	-0.028
		(0.466)	(0.496)		(0.167)	(0.182)
Year 2009 * Work inability score of head of household		-0.057	-0.282		-0.005	-0.109
		(0.265)	(0.297)		(0.101)	(0.115)
Year 2009 * Livestock log		-0.210***	-0.234***		-0.086***	-0.091***
		(0.078)	(0.085)		(0.028)	(0.031)
Year 2009 * Food insecurity		-0.082	0.017		-0.036*	0.003
		(0.061)	(0.068)		(0.021)	(0.025)
Year 2009 * Political connections (d)		-0.275	-0.035		-0.137	0.008
		(0.293)	(0.325)		(0.109)	(0.125)
Village – year Fixed Effects	Yes	Yes		Yes	Yes	
Pseudo R-squared	0.075	0.081		0.143	0.150	
Observations	1086	1086		1086	1086	

Note: Work inability score is an index based on five questions: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning? Food insecurity refers to the number of months during which a household had problems satisfying its food needs. Political connections is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the kebele. The models are estimated using the Tobit model. Reported coefficients refer to marginal effects. Standard errors are clustered at the household level. Significance levels: * 10%; ** 5%; *** 1%.

Table A 6. Determinants of receipt of public works and emergency aid (2004–2009) including controls for past aid

	Public works		Emergency aid	
	(Pooled)	(Interacted)	(Pooled)	(Interacted)
	(1)	(2)	(3)	(4)
Household size log	0.076	0.100*	-0.017	-0.029
	(0.049)	(0.055)	(0.043)	(0.061)
Share of elderly (members > 65 years)	-0.748***	-0.614***	0.363***	0.319**
	(0.131)	(0.151)	(0.107)	(0.160)
Female head of household (d)	-0.025	-0.079*	-0.015	-0.033
	(0.038)	(0.045)	(0.036)	(0.048)
Head of household completed primary education (d)	-0.06	-0.073	0.013	0.013
	(0.047)	(0.056)	(0.042)	(0.060)
Work inability score of head of household	-0.068**	-0.064*	0.080***	0.056
	(0.030)	(0.034)	(0.024)	(0.035)
Livestock log (per capita in Ethiopian Birr)	-0.024***	-0.007	-0.013	-0.011
	-0.009	-0.009	-0.008	(0.010)

Food insecurity (number of months in last 12 months)	0.021***	0.032***	-0.000	0.004
	(0.007)	(0.010)	(0.007)	(0.010)
Political connections (d)	0.058	0.080**	0.070**	0.064
	(0.036)	(0.039)	(0.031)	(0.042)
Year 2009 (d)	-0.184**	0.111	0.077	0.006
	(0.089)	(0.226)	(0.081)	(0.216)
Past Aid (d)	0.105**	0.046	0.149***	0.139**
	(0.045)	(0.051)	(0.045)	(0.056)
Year 2009 * Household size log		-0.062		0.018
		(0.083)		(0.067)
Year 2009 * Share of elderly household members		-0.106		0.029
		(0.203)		(0.178)
Year 2009 * Female head of household (d)		0.107*		0.028
		(0.063)		(0.055)
Year 2009 * Head of household completed primary education (d)		0.046		0.005
		(0.080)		(0.061)
Year 2009 * Work inability score of head of household		0.012		0.029
		(0.046)		(0.039)
Year 2009 * Livestock log		-0.035**		-0.002
		(0.015)		(0.011)
Year 2009 * Food insecurity		-0.025**		-0.006
		(0.011)		(0.010)
Year 2009 * Political connections (d)		-0.071		0.003
		(0.057)		(0.046)
Year 2009 * Past aid (d)		0.119*		0.007
		(0.071)		(0.064)
Village – year Fixed Effects	Yes	Yes	Yes	Yes
Pseudo R-squared	0.186	0.199	0.183	0.184
Observations	1104	1104	1346	1346

Note: Work inability score is an index based on five questions: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning? Food insecurity refers to the number of months during which a household had problems satisfying its food needs. Political connections is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the kebele. Participation is estimated using a probit model. Reported coefficients refer to marginal effects. Standard errors are clustered at the household level. Significance levels: * 10%; ** 5%; *** 1%.

Table A 7. Determinants of participation in public works (2009–2004)

	LPM			SUR LPM			Bivariate probit		
	(Pooled)	(Interacted)	(Overall)	(Pooled)	(Interacted)	(Overall)	(Pooled)	(Interacted)	(Overall)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Household size log	0.066	0.094*		0.073	0.076		0.096*	0.086	
	(0.043)	(0.054)		(0.046)	(0.054)		(0.058)	(0.059)	
Share of elderly (members > 65 years)	-0.569***	-0.533***		-0.581***	-0.560***		-0.789***	-0.640***	
	(0.083)	(0.109)		(0.093)	(0.117)		(0.140)	(0.149)	
Female head of household (d)	-0.023	-0.074*		-0.012	-0.075*		-0.015	-0.079*	
	(0.033)	(0.041)		(0.035)	(0.042)		(0.044)	(0.046)	
Head of household completed primary education (d)	-0.052	-0.068		-0.043	-0.082		-0.061	-0.097*	
	(0.042)	(0.054)		(0.047)	(0.057)		(0.057)	(0.059)	
Work inability score of head of household	-0.065**	-0.065**		-0.063**	-0.063*		-0.069**	-0.062*	
	(0.026)	(0.033)		(0.029)	(0.033)		(0.035)	(0.034)	
Livestock log (per capita in Ethiopian Birr)	-0.021***	-0.007		-0.025***	-0.014		-0.031***	-0.015	
	(0.008)	(0.009)		(0.008)	(0.009)		(0.010)	(0.010)	
Food insecurity (number of months in last 12 months)	0.017***	0.028***		0.017***	0.027***		0.022**	0.030***	
	(0.006)	(0.008)		(0.007)	(0.009)		(0.009)	(0.010)	
Political connections (d)	0.049	0.070*		0.081**	0.092**		0.105***	0.107***	
	(0.030)	(0.037)		(0.033)	(0.037)		(0.041)	(0.040)	
Year 2009 (d)	-0.152*	0.222		-0.098	0.105		-0.200*	0.023	
	(0.087)	(0.215)		(0.069)	(0.253)		(0.103)	(0.263)	
Year 2009 * Household size log		-0.072	0.023		-0.008	0.068		-0.004	0.082
		(0.088)	(0.103)		(0.104)	(0.117)		(0.098)	(0.101)
Year 2009 * Share of elderly household members		-0.082	-0.615***		-0.041	-0.601***		-0.093	-0.718***
		(0.166)	(0.199)		(0.196)	(0.228)		(0.222)	(0.238)
Year 2009 * Female head of household (d)		0.111*	0.036		0.161**	0.086		0.157**	0.052
		(0.063)	(0.075)		(0.067)	(0.079)		(0.066)	(0.073)
Year 2009 * Head of household completed primary education (d)		0.051	-0.017		0.134	0.052		0.132	0.012
		(0.085)	(0.100)		(0.109)	(0.124)		(0.092)	(0.098)
Year 2009 * Work inability score of head of household		-0.006	-0.07		-0.008	-0.071		0.004	-0.059
		(0.047)	(0.057)		(0.057)	(0.066)		(0.051)	(0.054)
Year 2009 * Livestock log		-0.036**	-0.043**		-0.030*	-0.044**		-0.028	-0.039**
		(0.015)	(0.017)		(0.017)	(0.019)		(0.018)	(0.018)
Year 2009 * Food insecurity		-0.023*	0.006		-0.021	0.006		-0.026*	0.009
		(0.012)	(0.015)		(0.014)	(0.017)		(0.015)	(0.016)
Year 2009 * Political connections (d)		-0.059	0.011		-0.039	0.053		-0.051	0.064
		(0.059)	(0.069)		(0.064)	(0.074)		(0.067)	(0.068)

Village – year Fixed Effects	Yes	Yes		Yes	Yes		Yes	Yes	
Adjusted/pseudo R-squared	0.208	0.215		0.239	0.251				
Observations	1104	1104		923	923		923	923	

Note: Work inability score is an index based on five questions: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning? Food insecurity refers to the number of months during which a household had problems satisfying its food needs. Political connections is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the kebele. LPM: linear probability model. SUR LPM: seemingly unrelated regression linear probability model. LPM includes villages that received public works only. SUR LPM and bivariate probit are restricted to villages that received both public works and emergency aid. Standard errors are clustered at household level. Significance levels: * 10%; ** 5%; *** 1%.

Table A 8. Determinants of receipt of emergency aid (2004–2009)

	LPM			SUR LPM			Bivariate probit		
	(Pooled)	(Interacted)	(Overall)	(Pooled)	(Interacted)	(Net)	(Pooled)	(Interacted)	(Overall)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Household size log	-0.017	-0.03		-0.041	-0.03		-0.015	-0.029	
	(0.037)	(0.061)		(0.048)	(0.064)		(0.020)	(0.061)	
Share of elderly (members > 65 years)	0.288***	0.309**		0.413***	0.309**		0.199**	0.328**	
	(0.080)	(0.142)		(0.102)	(0.144)		(0.092)	(0.163)	
Female head of household (d)	-0.011	-0.031		-0.011	-0.031		-0.004	-0.034	
	(0.030)	(0.046)		(0.034)	(0.046)		(0.015)	(0.047)	
Head of household completed primary education (d)	0.016	0.01		-0.017	0.01		-0.009	0.011	
	(0.035)	(0.060)		(0.045)	(0.059)		(0.018)	(0.060)	
Work inability score of head of household	0.070***	0.058*		0.096***	0.058*		0.042**	0.060*	
	(0.020)	(0.033)		(0.025)	(0.031)		(0.018)	(0.035)	
Livestock log (per capita in Ethiopian Birr)	-0.012*	-0.012		-0.01	-0.012		-0.004	-0.012	
	(0.007)	(0.010)		(0.009)	(0.011)		(0.004)	(0.010)	
Food insecurity (number of months in last 12 months)	0.002	0.004		-0.001	0.004		-0.001	0.005	
	(0.006)	(0.009)		(0.007)	(0.009)		(0.003)	(0.010)	
Political connections (d)	0.066**	0.070*		0.068**	0.070*		0.028	0.070*	
	(0.026)	(0.041)		(0.032)	(0.042)		(0.018)	(0.042)	
Year 2009 (d)	0.11	0.047		-0.633***	-0.772***		-0.282***	-1.048***	
	(0.075)	(0.192)		(0.074)	(0.246)		(0.072)	(0.325)	
Year 2009 * Household size log		0.024	-0.006		-0.033	-0.063		-0.028	-0.056
		(0.078)	(0.098)		(0.104)	(0.122)		(0.091)	(0.107)
Year 2009 * Share of elderly household members		-0.035	-0.274		0.209	0.518**		0.497*	0.813**

		(0.189)	(0.237)		(0.202)	(0.248)		(0.258)	(0.323)
Year 2009 * Female head of household (d)		0.038	0.007		0.062	0.031		0.083	0.047
		(0.063)	(0.078)		(0.076)	(0.089)		(0.073)	(0.085)
Year 2009 * Head of household completed primary education (d)		0.012	0.023		-0.083	-0.073		-0.102	-0.089
		(0.070)	(0.092)		(0.078)	(0.098)		(0.081)	(0.100)
Year 2009 * Work inability score of head of household		0.022	0.08		0.114**	0.172***		0.123**	0.180***
		(0.047)	(0.057)		(0.049)	(0.058)		(0.048)	(0.059)
Year 2009 * Livestock log		-0.001	-0.012		0.014	0.002		0.014	0.002
		(0.013)	(0.017)		(0.016)	(0.019)		(0.015)	(0.018)
Year 2009 * Food insecurity		-0.004	0.001		-0.012	-0.007		-0.008	-0.004
		(0.012)	(0.015)		(0.014)	(0.017)		(0.012)	(0.014)
Year 2009 * Political connections (d)		-0.008	0.062		-0.017	0.052		-0.006	0.064
		(0.052)	(0.067)		(0.065)	(0.077)		(0.060)	(0.072)
Village – year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/pseudo R-squared	0.202	0.198		0.201	0.214				
Observations	1346	1346		923	923		923	923	

Note: Work inability score is an index based on five questions: Can this person: (1) stand up after sitting down?; (2) sweep the floor?; (3) walk for 5 kilometres?; (4) carry 20 litres of water for 20 metres?; and (5) hoe a field for a morning? Food insecurity refers to the number of months during which a household had problems satisfying its food needs. Political connections is a dummy variable equal to 1 if a household has a relative or friend who holds an official position in the kebele. LPM: linear probability model. SUR LPM: seemingly unrelated regression linear probability model. LPM includes villages that received emergency aid only. SUR LPM and bivariate probit are restricted to villages that received both public works and emergency aid. Standard errors are clustered at the household level. Significance levels: * 10%; ** 5%; *** 1%.

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