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Old-age pensions and female labour supply in India

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Abstract: Whether cash transfers have unintended behavioural effects on the recipient household's labour supply is of considerable policy interest. We examine the 'intent to treat effect' of the Indira Gandhi National Old-Age Pension Scheme on prime-age women's labour supply decisions in India, where female labour force participation continues to decline over time. We find that having a pension-eligible individual in the household increases the probability of working by 3.2 percentage points for women aged 20–50, with the effect stronger for urban women. The effect is particularly strong if the pension-eligible individual is female. We provide suggestive evidence that this positive effect results from the income effect of the scheme, leading to reduced labour supply by the elderly, allowing them to provide greater childcare support. The increase in women's labour force participation is mostly in flexible employment, e.g. self-employment and agricultural and non-agricultural wage employment, and is particularly evident for poorer households.

Key words: childcare, employment, income effect, labour supply, pension, women

JEL classification: I38, J22, O15

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1 Introduction

In recent years, and especially with the onset of the coronavirus pandemic, there has been an unprecedented increase in cash transfer programmes in the development world.[1] These programmes have been shown to reduce poverty (Fiszbein and Schady 2009) and to improve educational outcomes (Glewwe and Olinto 2004) and access to health services (Attanasio et al. 2005). However, a common concern about such programmes is that they tend to discourage work (Banerjee et al. 2017). In this paper, we examine the labour supply response of prime-age women (20–50 years old) in India to the receipt of a conditional cash transfer programme—the Indira Gandhi National Old-Age Pension Scheme (IGNOAPS), a non-contributary social pension targeted to the elderly poor in the country.

The focus on the female labour supply response to a cash transfer to someone in the family is particularly relevant in the Indian case, as India has one of the lowest female labour force participation rates in the world (World Bank 2019). The participation rate of women in the age group 25–55 in India declined from 51 per cent in 1984 to 39 per cent in 2011–12 (Sarkar et al. 2019). While there is no consensus on the reasons for this decline (see Dubey et al. 2017), the fall in female labour supply has been attributed in part to the 'income effect' of rising household incomes in the period of rapid growth in India, leading women to withdraw from the labour force, substituting leisure for work (Klasen and Pieters 2015; Neff et al. 2012). Since IGNOAPS is an exogenous increase in household income when a member of the family reaches pensionable age (and when the household meets other criteria of IGNOAPS eligibility), the labour supply response of women of working age to the receipt of IGNOAPS by one of the family members provides an ideal context in which to study whether increases in exogenous household incomes do lead to the withdrawal of women from the labour force.

From a theoretical perspective, it is unclear how the labour supply of prime-age women may change when there is a receipt of a cash transfer such as old-age pension in the family. If households pool income, prime-age adults who share resources with the elderly may reduce their labour supply or withdraw from the labour market (Ardington et al. 2009). On the other hand, the receipt of the pension may relax credit constraints in the household, allowing some members of the household to start a new non-farm business. It could also lead to the withdrawal of the elderly from the labour market, allowing them to take care of young children in the family. This may allow prime-age mothers to enter the labour force, as the childcare constraint is alleviated for them. Therefore, whether prime-age women withdraw from the labour force or not in the event of household pension receipt is an empirical question.

[1] As of 8 May 2020, a total of 171 countries (12 more since the previous week) had planned, introduced, or adapted 801 social protection measures in response to COVID-19 (see Gentilini et al. 2020).

The empirical evidence on the female labour supply response to household pension receipt is mixed. Most of the evidence is drawn from the well-studied South African old-age pension programme (see Case and Deaton 1998 and Duflo 2003 for further details). There is some evidence that the effect of female pension income on the labour supply of South African women is positive (Posel et al. 2006). However, Abel (2019) has found an adverse effect of the social pension on the employment outcomes of prime-age adults in South Africa. In the case of India, the literature on IGNOAPS has evaluated the impact of the social pension on elderly and near-elderly labour supply (Kaushal, 2014) and household labour supply (Unnikrishnan and Imai, 2020), but has given less attention to prime-age women's labour force participation. Sarkar et al. (2019) empirically investigates the entry to and exit from the labour market in India of women aged 25–55, but the prime focus of their paper was not the social pension programme.

For this research, we use the panel data from the India Human Development Survey (2004–05 and 2011–12; see Desai et al. 2005, 2012). Similarly to Sarkar et al. (2019), we track a particular cohort of women in 2004–05 and 2011–12. We consider women who were 20 years and older in 2004–05 and track their socioeconomic and labour market movement in 2011–12. We empirically investigate the effect of a household gaining an eligible pension individual on the 'extensive margin' of labour force participation of younger women in India.

Our findings suggest that having a pension-eligible individual in the household increases the probability of younger women's participation in paid economic activity by 3.2 percentage points. We find the effect to be stronger in urban areas than in rural areas. However, there are variations by gender: having a female pension-eligible individual in the household increases the probability of women working by 5.2 percentage points, compared with no significant effect when the pensioner is male. We explore one key mechanism by which IGNOAPS may have a positive effect on female labour supply through the income effect leading to reduction in labour supply by the elderly, allowing them to provide childcare support for the women in the family. We find that the pension-eligible individual reduces their labour supply by 5.2 percentage points. Further, we find that for households that have gained a child in the 2011–12 rounds, having a pension-eligible person in the household increases the employment status of women by five percentage points. This provides suggestive evidence that pension eligibility relaxes the childcare constraint faced by younger women and facilitates their working. We also find evidence of women increasing their participation in occupations that provide flexible employment terms, suggesting that the increased female labour supply is more predominantly in vulnerable employment rather than in better-paid and secure jobs. Finally, we show that the increase in female labour supply due to IGNOAPS receipt is particularly evident for women in households in the bottom 20 per cent of the asset distribution, and that there is no significant effect for women in households in the top 20 per cent of the asset distribution.

We discuss the old-age pension programme—IGNOAPS—in Section 2. The conceptual framework and the literature on social assistance programmes are discussed in Section 3. Section 4 provides a description of the data and variables used; Section 5 provides the methodological framework and Section 6 presents the results. Section 7 concludes.

2 Indira Gandhi National Old-Age Pension Scheme

The central government of India introduced the National Social Assistance Programme (NSAP) in 1995. The National Old-Age Pension Programme is a component under the NSAP. The objective of the programme is to provide a safety net to the vulnerable sections of society. In the initial phase, the programme focused on those who were 65 years and older and were destitute and

the recipients received 75 Indian national rupees (INR) per month. The programme underwent a series of changes, including a change in the eligibility criterion and age eligibility threshold. In 2007, the programme eligibility criterion changed from focusing on destitution to include anyone belonging to a Below Poverty Line (BPL) household. The pension amount provided was revised from INR75 to INR200. The programme was renamed the Indira Gandhi National Old-Age Pension Scheme. In 2011, the age eligibility threshold was lowered from 65 to 60 years (Ministry of Rural Development 2007, 2012). The total number of programme recipients increased from 6.7 million in 2002–03 to 22.98 million in 2014–15 (OGD Platform India 2016). At present, the programme is a central-state-funded programme. The central government makes a uniform contribution to the programme, and state governments are expected to top up the centrally funded pension amount. There are inter-state variations in the pension amount provided and the programme eligibility criterion used (see Kaushal 2014 for a detailed discussion on IGNOAPS). To ensure that we have uniform pension eligibility criteria in our analysis, we have used the eligibility measure used by the central government after the recent changes. We identify an individual to be IGNOAPS-eligible if the person is aged 60 or older and belongs to a BPL or ultra-poor household.

3 Conceptual framework and literature review

The effect of cash transfer on labour supply can be explained through static labour choice theory. Unconditional cash transfer programmes in the form of an old-age pension increase the income of the household. The income effect increases the consumption of the household. The theory argues that the programme recipient chooses to spend their time between work and leisure, and both are normal goods. Given that leisure is a normal good, then with the arrival of a non-labour income the individual will reduce the amount of time spent on work; this is also known as the negative income effect (Bastagli, 2010; Leibbrandt et al. 2013). Since poor households/individuals constitute the recipients of social-assistance programmes, the rate of substitution of leisure to income is low (Fiszbein and Schady 2009). The arrival of old-age pension income can also reduce other income flows in the form of remittances to the household (Cox and Jimenez 1990), which implies that households/individuals will not alter their labour supply. Cash transfers smooth the consumption need and ease other credit constraints, but can continue to incentivise labour market participation (Basu et al. 2010).[2]

A social pension can also disincentivise job-search for the younger members of the household. Evidence shows that receipt of an old-age pension encourages the migration of other distant family members (Hoces de la Guardia et al. 2011; Leibbrandt et al. 2013). However, it is also possible that the pension facilitates the migration of younger family members in search of better job opportunities (Ardington et al. 2009). Since the cash transfer programme pushes up the reservation wages of other household members, it can also enable them to switch from informal to formal sector jobs (Skoufias and Di Maro 2008). The overall effect of the pension on the labour market participation of household members is ambiguous (Alzua et al. 2013; Maluccio and Flores 2005).

The effect of the South African old-age pension programme, an unconditional cash transfer programme targeted to the elderly poor, offers insights on the possible labour supply behaviour. The pension provides a reliable source of income in the South African context, and this influences the labour market behaviour of other household members. Evidence indicates that pension

[2] These arguments are summarised in Daidone et al. (2019), who provide a rich discussion on the relationship between cash transfer and labour supply.

induces both in- and out-migration of prime-age adults in the household (Sienaert 2008). The pension provides a stable source of income to the household, and this stimulates the migration of other household members (Ardington et al. 2009). However, Bertrand et al. (2003) find that having a pension-eligible person in the household reduces both the extensive (participation) and intensive (hours worked) labour supply margins of the prime-age adults (16–50 years old) in the household. The study excluded migrants from its count of household members. Posel et al. (2006) find that once migrants are included as household members, the negative effect on labour supply largely subsides. Abel (2019) estimates the effect of the change in the number of pensioners in the household on the employment status of prime-age adults in South Africa. The study confirms the income effects, whereby pension reduces the work participation of prime-age adults. The study also dismisses the hypothesis of childcare support provided by the older adult. Employed mothers are less likely to lose their jobs when the household loses the pensioner. Also, the unemployed mother did not change employment status if the household gained a pensioner. However, in the case of Mexico, evidence suggests no negative effects on the labour supply of other adult members who co-reside with the pension recipient (Galiani et al. 2016). Therefore, the empirical findings on the impact of old-age pension receipt on labour supply are mixed.

Cash transfer programmes can also facilitate employment transition. Poor individuals often have credit constraints to start their own small business. Baird et al. (2018) suggest that the provision of non-labour income will loosen credit constraints, and can enable individuals to start their own business. Unconditional cash transfer programmes also allow individuals to switch to formal jobs. The Child Support Grant, an unconditional cash transfer programme targeted at children, improved the likelihood of mothers being employed in the formal sector in South Africa (Tondini 2017). In response to an asset transfer programme implemented for the ultra-poor in Bangladesh, Misha et al. (2019) find that in the short-term, participants switch from relatively less productive occupations to more productive occupations.[3]

The existing evidence on the effect of old-age pension receipt on female labour supply is largely focused on South Africa. In the case of India, empirical evidence is scarce on the effect of old-age pension receipt on female labour supply. There is evidence on the effect of old-age pension receipt on elderly employment (Kaushal 2014) and household labour supply (Unnikrishnan and Imai 2020). Kaushal (2014) finds a small negative effect of the programme on elderly employment, and the effect on household labour supply is also negative (Unnikrishnan and Imai 2020). Neither of these studies documents the unintended labour supply effect of old-age pension receipt on prime-age women's labour supply, which is the contribution of this paper The effect on women's labour market participation of having a pensioner in the household can be positive or negative. If the presence of a pensioner provides additional time for women to work, then the effect of pension receipt on women's labour market participation is positive. But it is also likely that the presence of an old-age pensioner increases the care responsibilities for women and thus reduces their likelihood of working. However, this needs to be empirically tested.

[3] The effect of transfers on labour supply is not limited to unconditional cash transfer programmes but equally applies to conditional cash transfer programmes. Since the focus of this paper is on the effect of an unconditional cash transfer programme, we do not discuss the literature on the labour supply effects of conditional cash transfer programmes here.

4 Data and variables used

We have used the India Human Development Survey (IHDS) released in 2004–05 and 2011–12 (Desai et al. 2005, 2012). The IHDS is a panel dataset both at a household level and individual level. For the empirical analysis, we have focused on women who are in the 20–50 age cohort. Women who were aged 20–50 in 2004–05 and the same cohort in 2011–12 were tracked.

A description of the variables used is presented in Table 1, and Table 2 provides descriptive statistics on the key variables used in this paper.

Table 1: Description of the key variables

Variables	Description
Individual-level characteristics	
Work participation	The dependent variable takes the value 1 if the prime-age woman (20–50 years old) works. IHDS records an individual as working only if the person works at least 240 hours a year; if the person has contributed less than 240 hours, they are classified as not working.
Pension-eligible individual	Dummy variable that takes the value 1 if the household includes someone who is 60 years or older; furthermore, the household should be a BPL or Antyodaya card (ultra-poor) household.
Wife of the household head	Takes the value 1 if the woman is the wife of the household head
Educated	Takes the value 1 if the individual has completed any units of education
If the prime-age woman has completed graduation	Takes the value 1 if the individual has graduated college
Married	Takes the value 1 if the person is married and 0 otherwise
Age cohorts	
Age 21–25	Respondent belongs to the 21–25 age group
Age 26–30	Respondent belongs to the 26–30 age group
Age 31–35	Respondent belongs to the 31–35 age group
Age 36–40	Respondent belongs to the 36–40 age group
Age 41–45	Respondent belongs to the 41–45 age group
Household-level characteristics	
Child within five years of age	Number of children in the household who are aged 0–5
Number of children in the household	Number of children in the household (0–14 years of age)
Place of residence: Urban area	If the place of residence is an urban or rural area (1/0)
Caste: Scheduled caste or tribe	If the household head belongs to a scheduled caste or tribe or not
Religion: Muslim	If the household head is a Muslim or not
Number of adults in the household	Number of adults in the household
Other welfare programmes received by the household	Number of other welfare programmes received by the household

Access to electricity	If the household has access to electricity (1/0)
Woman has access to TV	If the woman in the household has access to TV (1/0)
Woman has access to radio	If the woman in the household has access to radio (1/0)
Sectors of employment	
Work in non-agriculture	Dummy variable taking the value 1 if the respondent works in non-agriculture wage labour
Works as agricultural wage labourer	Takes the value 1 if the respondent works in agricultural wage labour
Works in own business	If the respondent is engaged in the family business or not (1/0)
Works in salaried employment	If the respondent works for a salary (1/0)

Source: authors' elaboration.

Table 2: Summary statistics

	2004–05			2011–12		
	Pension eligible (N = 6,235)	Pension non-eligible (N = 39,007)	F-stat	Pension eligible (N = 8,913)	Pension non-eligible (N = 36,319)	F-stat
Outcome variables						
Working in own business	0.030	0.031	0.03	0.05	0.05	0.06
Working as agricultural wage labourer	0.179	0.122	122.9***	0.17	0.13	115.19***
Works in salaried employment	0.026	0.042	51.48***	0.04	0.06	54.83***
Work in non-agriculture	0.042	0.039	1.11	0.13	0.11	24.34***
Work participation	0.536	0.514	11.08**	0.49	0.49	1.04
Household characteristics						
Child within five years of age	0.452	0.458	0.63	0.34	0.32	17.21***
Number of children in the household	1.923	1.983	5.91*	1.51	1.50	0.02
Place of residence: Urban area	0.199	0.319	461.28***	0.22	0.35	640.34***
Caste: Scheduled caste or tribe	0.355	0.263	203.84***	0.36	0.26	344.29***
Religion: Muslim	0.092	0.115	31.3***	0.10	0.12	28.49***
Number of adults in the household	3.877	3.319	629.12***	3.70	3.23	613.79***
Other welfare programmes received by the household	0.038	0.015	80.22***	0.09	0.05	217.77***
Access to electricity	0.739	0.795	86.18***	0.87	0.89	47.39***
Women has access to TV	0.611	0.716	246.68***	0.72	0.82	375.9***
Women has access to radio	0.370	0.419	54.49***	0.17	0.22	137.72***
Individual characteristics						
Wife of household head	0.473	0.639	603.7***	0.50	0.67	877.04***
Prime-age women: educated	0.370	0.495	358.8***	0.32	0.52	1,312.72***

If the prime-age women has completed graduation	0.011	0.043	368.75***	0.01	0.05	632.23***
Married	0.753	0.846	256.6***	0.64	0.77	529.82***
Age cohorts						
Age 21–25	0.118	0.140	23.49***	0.00	0.00	0
Age 26–30	0.126	0.152	34.26***	0.09	0.11	48.45***
Age 31–35	0.106	0.141	68.34***	0.11	0.16	141.79***
Age 36–40	0.085	0.142	207.5***	0.09	0.15	306.55***
Age 41–45	0.054	0.107	273.05***	0.07	0.16	625.38***

Note: * p<0.05, ** p<0.01, *** p<0.001.

Source: authors' calculations based on IHDS data (Desai et al. 2005, 2012).

IHDS considers someone to have participated in work if they have worked for at least 240 hours or more in a given year.[4] We measure female labour force participation at the extensive margin, where we construct a dummy variable that takes the value 1 if the person has worked for at least 240 hours or more a year; otherwise it takes the value 0. To see whether there are differences in observable characteristics at the household and individual levels, we divide the sample based on pension eligibility and non-eligibility for the 2004–05 and 2011–12 rounds. We define an eligible pension individual as someone who is 60 years or older and belongs to a BPL or ultra-poor (Antyodaya card) household.[5] This variable has been constructed at the household level. In the 2004–05 rounds, 17 per cent of pension-eligible individuals were engaged for agricultural wages compared with 12 per cent of non-pension-eligible individuals. Similarly, 3 per cent of the women worked in salaried employment, compared with 4 per cent of pension-non-eligible people. We do not find any significant differences in the means of women employed in the business sector in both rounds. Nearly, 54 per cent of women residing in pension-eligible households were employed compared with 51 per cent of women in pension-non-eligible households in the 2004–05 rounds. We find statistically significant differences in the means of the outcome variables reported in the pension-eligible and non-eligible categories.

We also find significant differences in the household and individual characteristics between eligible and non-eligible households in both rounds. At means, we find pension-eligible households on average are poor (this is the criteria for pension eligibility), as they have low levels of access to electricity and to mass media (TV and radio). This finding remains consistent across both rounds. Pension-eligible households on average make up a larger proportion of scheduled caste and scheduled tribe households compared with non-pension-eligible households. On average, there are very small differences in the number of children and in the presence of a child who is aged 0–5 between eligible and non-eligible households. As expected, households which are eligible for IGNOAPS have a higher proportion of elderly persons and tend to receive more welfare programmes in both rounds. Pension-non-eligible households on average tend to live more in urban areas. The ratio of household heads belonging to the Muslim religion has not changed between the two rounds.

[4] This definition also maintains comparability with the definition employed in National Survey Sample Office (NSSO) employment surveys that consider subsidiary work status (worked more than 30 days) to compute employment rates.

[5] The program eligibility criterion was that the pension-eligible individual was someone who was 65 or older and destitute. In 2011–12, the eligibility age was reduced to 60 and the income criteria changed to include those belonging to a BPL or ultra-poor household. For the sake of consistency, we have used the recent programme eligibility criterion.

Examining the individual characteristics, IGNOAPS-non-eligible households have a large percentage of women who are educated and have graduated college. We also find that women residing in non-pension-eligible households are on average more likely to be married and to be the spouse of the household head. We have also presented the proportion of women in various age cohorts in both rounds. Since we are using panel data, women who were in the 21–25 age cohort in the 2004–05 rounds had moved to a higher age cohort by 2011–12. This implies that there are no women in the 21–25 group in 2011–12. The F-stat provided suggests that there are differences in the proportion of women reported under various age cohorts between eligible and non-eligible groups.

5 Methodology

5.1 Sample selection

We have used programme eligibility as a key independent variable instead of actual beneficiaries. The issue of selection bias motivates this decision. IHDS records information on the actual beneficiaries receiving IGNOAPS. IGNOAPS is a self-selecting programme, as new recipients are required to submit applications to be considered as beneficiaries (Ministry of Rural Development 2014). This leads to self-selection issues, as some eligible individuals choose to apply for the programme and others do not. There could be two reasons for the programme-eligible to not apply. The first is that they voluntarily choose not to apply for the programme, in which case sample selection is not a concern. The second reason is that there could be information asymmetry about the programme, resulting in eligible individuals being prevented from applying through not having the required knowledge about the programme, and this at the later stage nullifies or reduce their chances of being a programme recipient (Micklewright et al. 2004). In this case, those who report having received IGNOAPS form a non-random representation of the sample, resulting in selection bias. It is not to possible to observe in the dataset the reasons behind IGNOAPS non-participation. To circumvent the issue of the correlation between unobserved characteristics and participation in IGNOAPS, we use programme eligibility as the key independent variable instead of actual participation.[6] Since the independent variable is pension eligibility rather than pension receipt, the estimated programme effect is the 'intent to treat effect' of the old-age pension programme (Bloom 1984; Schatz et al. 2012). The limitation of estimating the intent to treat effects is that the estimated programme effect is an upper-bound estimate. Further, to avoid attrition bias in the panel data, we have incorporated inverse probability weights in the regression estimates (Baulch and Quisumbing 2011).

5.2 Employment outcome

We use a linear probability model to estimate the effects of having a pension-eligible person in the household on the labour market outcome of prime-age women. The analysis is done on women who are in the 20–50 age group. Since we use panel data here, with a seven-year difference between the two rounds, women who are aged 44 and older in 2004–05 are over 50 in 2011–12. Women who are over 50 in either of the rounds are excluded from the analysis. Also, there are inter-state variations in IGNOAPS implementation. Rajasthan provides the programme to women who are 55 years old (Kaushal 2014). Including women who are more than 50 years old in the estimation can contaminate the effect of pension receipt on female labour supply for two reasons. The first is that we would be likely to include the labour supply of the pensioners. The second is the pension

[6] This is also common to other studies on the effects of pensions on labour supply; see Ardington et al. (2007).

anticipation effect: since households can foresee the arrival of a pension, they may start altering their labour supply behaviour in expectation of it.

Our main empirical specification is as follows:

$$Y_{iht} = \beta_0 + \beta_1 X_{1,ht} + \beta_2 X_{2,ht} + \beta_3 X_{3,it} + u_t \quad (1)$$

The outcome variable Y is the labour market participation of individual i in household h in period t, which is 2004–05 and 2011–12. The dependent variable is a dummy variable that takes the value 1 if the woman is working, 0 if not. The estimated effect of household h having a pension-eligible person is captured by the coefficient β_1. X_2 is the vector of household-level characteristics and X_3 is the vector of individual-level characteristics that are controlled for in the specification.

Household-specific characteristics include the number of children in the household, place of residence (urban or not), whether the household belongs to the scheduled castes or tribes, whether the household head is Muslim, whether the household includes a child who is five years of age or younger, other welfare programmes received by the household, whether the household has access to electricity, and whether women in the household have access to TV or radio. Individual characteristics include the respondent's age cohort, the educational level of the woman, the relationship status with the household head, and the marital status of the woman. The choice of control variables reflects the literature on women's participation in employment (see Dubey et al. 2017).

The available evidence indicates that household-level variables such household wealth, caste, presence of children in the household, religion, and norms play an important role in determining women's choice to work in India (Chaudhary and Verick 2014). We have proxied household wealth with access to electricity and to different forms of mass media. Further, we have also controlled for religion, caste group, presence of children, and number of other welfare programmes received by the household in the models. Other standard determinants of women's employment status, including age, marital status, relationship status with the household head, and education have been incorporated in the specifications. State fixed factors account for differences in norms and the employment opportunities available across India.

We have also estimated different versions of Equation 1, where we have altered the outcome variable to types of employment. These are: (a) working in non-agriculture sector for wages, (b) working in a small business run by the household (self-employment), (c) working as an agricultural wage labourer, and (d) working as a salaried employee. This is useful to explore if having a pension-eligible person in households also shifts prime-age women's sector of employment. Self-employment and agricultural wage employment represent more vulnerable employment for women compared with salaried employment (ILO 2018).

5.3 Elderly employment status and childcare constraint

We explore a key mechanism by which IGNOAPS may affect female labour supply—that is, through relaxing the childcare constraint for women as the elderly reduce their labour supply and stay at home. The labour-leisure model predicts that with the arrival of a non-labour pension income, the pensioner may reduce their labour supply (Borjas 2008). This is known as the income effect. In Equation 2 we estimate the employment status of the pension-eligible individual (1/0) and this is denoted by Y_1 . The employment status of the pension-eligible individual is collinear to IGNOAPS eligibility (X_1). Therefore, we have used the literacy status of the elderly as a predictor of pension eligibility. The variable takes the value 1 if the individual is illiterate; otherwise, it takes the value 0. Of our sample of pension-eligible individuals, 74.59 per cent are illiterate (see Kaushal

2014, who has also used education status as a predictor for receiving IGNOAPS in India). The estimating equation for elderly labour supply is:

$$Y_{1it} = \alpha_0 + \alpha_1 elderly\ in\ the\ household\ is\ illiterate_{it} + \alpha_2 X_{2,ht} + \alpha_3 X_{3,it} + u_t \quad (2)$$

The coefficient α_1 captures the effect of the elderly person being illiterate on employment status. Our interest is in examining the possibility of the elderly reducing their labour supply when they are eligible for a pension, and therefore being available for childcare support in the family. We have also controlled for certain household-specific characteristics, including place of residence, number of other persons living in the household, number of adults in the household, caste (if the household head belongs to a scheduled caste or tribe), access to electricity, and the highest level of education in the household. And we have controlled for individual-specific characteristics such as the marital status of the elderly person. Since it is possible to have more than one elderly person in the household, we have limited the empirical exercise to households where there is a single pension-eligible person.

We also examine the role of IGNOAPS in alleviating childcare constraints directly by looking at what happens to female labour supply when the household gains a child in 2011–12. To do this we undertake the empirical analysis on the subsample of households that have gained a child in the 2011–12 rounds. The subsample analysis here ensures that we examine the impact of pension eligibility on comparable households (those that have gained a child). In Equation 3 below, Y_i is the employment outcome of prime-age women. $\delta_1$is the coefficient that captures the effect of the household gaining a new pension-eligible person in the 2011–12 rounds. We have controlled for all of the household-specific characteristics (δ_2) and individual-specific characteristics (δ_3) that are identical to those in Equation 1.

$$Y_{it} = \delta_0 + \delta_1 new\ pension\ eligible\ person\ in\ 2011\ round_{ht} + \delta_2 X_{2,ht} + \delta_3 X_{3,it} + u_t \quad (3)$$

In our sub-sample, we have excluded all the pension-eligible persons from the 2004–05 round and have retained information on the pension-eligible individual only in 2011–12 rounds. The inclusion of pension-eligible individuals only in the 2011–12 rounds gauges the effect of gaining a new pensioner on the subsample households. Equation 3 signifies the impact of gaining a new pensioner, especially for those households that have also gained a child after controlling household and individual factors.[7]

6 Results

The results from the estimated Equation 1 are reported in Panel A of Table 3. The detailed results on the control variable are reported in Appendix 1. The results in Panel A of Table 3 suggest that having a pension-eligible person in the household increases the probability of prime-age women in the household working by 3.2 percentage points. The control variables included in the model

[7] To further test the robustness of the results, we estimated the intent to treat effects of the programme for the 2004–05 and 2011–12 rounds separately. Our findings remain consistent: having a pension-eligible person in the household increases women's prospect of working by 3 percentage points in 2004–05 and by 3.8 percentage points in 2011–12.

(see Appendix 1) display the usual signs.[8] There are also other extensions of the results reported in Table 3. We have estimated the effect of the gender of the pension-eligible individual on the employment outcomes of women in Panel B. Other subsample estimations reported in Panel C further disaggregate the pension effects based on the place of residence.

Table 3: Effect of pension eligibility on prime-age women's labour market outcomes

Dependent variable:	Work participation of prime-age women	
Panel A: whole sample		
Pension-eligible individual	0.0321***	
	(0.00)	
Control variables	Yes	
State fixed factors	Yes	
time	Yes	
Number of observations	62,881	
F-stat	536.8	
R-square	0.25	
Subsample analysis		
Panel B	Men	Women
Pension-eligible individual	0.0028	0.0517***
	(0.00)	(0.00)
Control variables	Yes	Yes
State fixed factors	Yes	Yes
Time	Yes	Yes
Number of observations	59,771	60,501
F-stat	519.8	519.1
R-square	0.257	0.256
Panel C	Urban	Rural
Pension-eligible individual	0.0641***	0.0331***
	(0.01)	(0.00)
Control variables	Yes	Yes

[8] If the prime-age woman is the wife of the household head, this positively affects her probability of working. Women in higher age cohorts are more likely to work, and having graduated college also increases the probability of working. However, using a broad definition of education (educated or not) reduces the probability of working as it fails to take into account the various (primary, secondary, higher) levels of education. Similarly, having a child aged 0–5 in the household reduces the probability of working, but when we broaden the definition of children (to 0–14 years of age) this positively affects the probability of working. Residing in an urban area reduces the probability of working. Households with a larger number of adults have higher earning capacity and this reduces the likelihood of women working. Similarly, access to electricity and TV denotes wealth and this reduces the probability of women working. If the household receives a large number of welfare programmes this increases the likelihood of working, as social welfare programmes in India are means-tested. Being married and belonging to the Muslim religion reduce women's probability of working. Belonging to a scheduled caste or tribe increases the probability of participating in the labour market.

State fixed factors	Yes	Yes
Time	Yes	Yes
Number of observations	20,088	42,793
F-stat	214.3	224.2
R-square	0.156	0.0858

Notes: standard errors in parentheses; * p<0.05, ** p<0.01, *** p<0.001. In Panel A, the control variables are wife of household head, prime-age women: educated, if the prime aged women has completed graduation, child within five years of age, number of children in the household, place of residence: urban area, scheduled caste or tribe, married, Muslim, number of adults in the household, other welfare programmes received by the household, access to electricity, women has access to TV, women has access to radio, age cohorts (21–25, 26–30, 31–35, 36–40, and 41–45), state fixed effects, and time. The control variables are the same in Panel B, except that instead of the state fixed effects we included region dummies, with south of India as the benchmark and comparing other regions with it (the south of India has a higher level of development and human development than the rest of India). The control variables in Panel C are again the same as in Panel A, except that we exclude the information on male pension-eligible persons for the results on women and on female pension-eligible persons for the results on men.

Source: authors' calculations based on IHDS data (Desai et al. 2005, 2012).

The results in Panel B (men) are the estimated effect of having a male pension-eligible person in the household on women's employment status. We do not find a statistically significant effect in this respect. However, if the pension-eligible person is a woman, this increases the probability of women in the household aged 20–50 working by 5.17 percentage points. This finding supports the hypothesis that pension provided to grandmothers encourages prime-age women's work participation. The results in Panel C suggest that pension receipt has a positive effect on the work participation of women in both rural and urban areas. However, in urban areas the effect of pension receipt is stronger: 6.4 percentage points compared with 3.3 percentage points in rural areas.

We next examine one key mechanism by which pension receipt may increase female labour supply—the alleviation of the childcare constraint. We first assess whether IGNOAPS reduces elderly labour supply through an income effect by estimating Equation 2. The dependent variable is the labour market participation of the pension-eligible person, taking the value 1 if the elderly person works, 0 otherwise. The key independent variable is the education status of the elderly person, which takes the value 1 if the person is illiterate, 0 otherwise. We estimate the results on those households that have only a single pension-eligible person. The results reported in Panel A of Table 4 indicate that pension eligibility—which is proxied with educational status (being illiterate)—reduces the probability of an elderly person working by 5.28 percentage points. This result suggests the presence of the income effect, and that with the arrival of old-age pension, older people do reduce their labour supply.

We next test for the childcare constraint directly by estimating Equation 3. The empirical estimation of Equation 3 is reported in Panel B of Table 4. Here, we estimate the effect of a household gaining a pension-eligible person in the 2011–12 rounds on the labour market participation of women. We estimate Equation 3 on households that have gained a child who is aged 0–5 in the 2011–12 rounds. We have excluded the pension-eligible person in the 2004–05 rounds so that the 2004–05 rounds can be considered as a baseline. The coefficient 'new pension-eligible individual in 2011 × time' estimates the interacted effect of a household gaining a pension-eligible person in the 2011–12 rounds on the subsample of households that have also gained a child aged 0–5 in the 2011–12 rounds. There is a relatively small number of households for which this is the case, and this reflected in the small sample size. The results in Panel B suggest that the probability of women in this subsample working increases by 5.6 percentage points if the household gains a pension-eligible person.

We also estimate the effect of gaining a new pension-eligible individual on the subsample of households that lost a child between the rounds (Panel C in Table 4). Losing a child is not necessarily equivalent to the death of the child; it could also mean that the child does not live in that particular household anymore. The positive effect of pension eligibility persists: the probability of women working increases by 5.06 percentage points. The positive effect of pension eligibility is stronger here. However, the effect of having a pensioner in the household is stronger in those that gained a child than those that lost a child. The fact that the positive effect of IGNOAPS on female labour supply is evident even when the household loses a child suggests that there may be other channels beyond childcare through which the elderly support women's participation in the labour market. For example, daily support received to manage domestic chores could be an additional source through which the elderly support younger women.

Table 4: Income effect and childcare constraints

Dependent variable	Elderly working	
	Panel A: Income effect	
Elderly person is illiterate	−0.0528*** (0.015)	
Control variables	Yes	
State fixed factors	Yes	
Number of observations	10,438	
F-stat	63.6	
R-square	0.187	
Dependent variable	Work participation of prime-age women	Work participation of prime-age women
	Panel B Subsample: Gained a child in 2011–12 rounds	*Panel C* Subsample: Lost a child between the rounds
New pension-eligible individual in 2011 × time	0.0506** (0.0169)	0.0347*** (0.007)
Control variables	Yes	Yes
State fixed factors	Yes	Yes
Number of observations	3,344	16,271
F-stat	157.4	79.2
R-square	0.232	0.19

Notes: standard errors in parentheses; * p<0.05, ** p<0.01, *** p<0.001. In Panel A, control variables included: place of residence: urban area, scheduled caste or tribe, number of adults in the household, access to electricity, if the elderly person is married, number of persons living in the household, and highest level of education in the household. In Panels B and C, control variables included: wife of household head, prime-age women: educated, if the prime-age women has completed graduation, number of children in the household, place of residence: urban area, scheduled caste or tribe, married, Muslim, number of adults in the household, other welfare programmes received by the household, access to electricity, woman has access to TV, woman has access to radio, and age cohorts (26–30, 31–35, 36–40, and 41–45).

Source: authors' calculations based on IHDS data (Desai et al. 2005, 2012).

We further explore the sectors in which women increase their participation in employment. The results shown in Table 5 suggest that women increase participation in business by one percentage points, in non-agricultural wage labour by 2.1 percentage points, and in agricultural wage labour by 3.9 percentage points. However, the effect of pension eligibility on transition to the salaried sector is insignificant. This finding suggests that prime-age women in pension-recipient households move towards informal/flexible employment rather than the salaried sector.

Table 5: Effect of pension eligibility on employment transition

Dependent variable	Work participation in non-agricultural wage employment	Work participation in business	Work participation in agricultural wage	Work participation in salary
Pension-eligible individual	0.0214*** (0.00)	0.00999** (0.00)	0.0393*** (0.00)	0.0023 (0.00)
Control variables	Yes	Yes	Yes	Yes
State fixed factors	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes
Number of observations	62,880	62,847	62,880	
				62,880
F-stat	94.07	18.61	308.4	55.81
R-square	0.132	0.028	0.259	0.124

Notes: standard errors in parentheses; * p<0.05, ** p<0.01, *** p<0.001. Control variables include: wife of household head, prime-age women: educated, if the prime-age women has completed graduation, child within five years of age, number of children in the household, place of residence: urban area, scheduled caste or tribe, married, Muslim, number of adults in the household, other welfare programmes received by the household, access to electricity, woman has access to TV, woman has access to radio, and age cohorts (21–25, 26–30, 31–35, 36–40, 41–45).

Source: authors' calculations based on IHDS data (Desai et al. 2005, 2012).

In Table 6, we explore the effect of having a pension-eligible person in the household for those that are in the bottom 20 per cent of the asset distribution. We also estimate the effect of having a pension-eligible person for those in the top 20 per cent of the asset distribution. Assets reflect the long-term wellbeing of the household (Swaminathan et al. 2012). They also reflect the resilience of the household in coping with adverse shocks (Quisumbing 2008). For women belonging to the bottom 20 per cent of the asset distribution, having a pension-eligible person in the household increases their probability of working (2.15 percentage points). We do not find any effect of pension receipt on prime-age women's labour market participation if the household belongs to the top 20 per cent of the asset distribution.

Table 6: Effect of pension eligibility on the poor

	Bottom 20% of asset distribution	Top 20% of asset distribution
Dependent variable	Women working	Women working
Pension-eligible individual	0.0215**	0.0189
	(0.00)	(0.02)
Control variables	Yes	Yes
Regional fixed factors	Yes	Yes
Time	Yes	Yes
Number of observations	15,375	10,101
F-stat	79.61	139
R-square	0.102	0.188

Notes: standard errors in parentheses; * p<0.05, ** p<0.01, *** p<0.001. Control variables: see Table 5 notes.

Source: authors' calculations based on IHDS data (Desai et al. 2005, 2012).

7 Conclusions

This paper examines the effect of being eligible for the Indira Gandhi National Old-Age Pension programme in India on the labour market participation of prime-age women in the same household in India. We estimate the effect of pension eligibility instead of actual participation in IGNOAPS to avoid selection bias. The estimated effect here is thus the intent to treat effect, rather than the actual effect, of the programme. Our results show that the labour market participation of the prime-age women increases by 3.2 percentage points when they have a pension-eligible person in the household. We also find stronger positive effects when the pension-eligible person is a woman than when the person is a man. We also find strong effects on women's participation in the labour market in both rural and urban areas. However, we do not find any evidence on women shifting to salaried employment.

We explore the possible channels of transmission by examining the income effects and childcare support provided by the pension-eligible person. The findings suggest that pension-eligible individuals reduce their labour market participation by 5.2 percentage points, which confirms the income effect. With the increased time-availability, the elderly may provide childcare support that increases the labour market participation of prime-age women. The empirical results suggest that having a pension-eligible person in the household increases the probability of prime-age women working by five percentage points for the subsample of households that gain a child aged 0–5. We also find that the positive effect of IGNOAPS eligibility on female labour supply is particularly evident for poorer women (that is, women living in households in the bottom 20 per cent of the asset distribution), with no significant effect for women in non-poor households (those in the top 20 per cent of the asset distribution).

From a policy perspective, the findings suggest a positive spillover effect of pension receipt by a member of the household on the labour market behaviour of women in the household. The favourable effect on women's labour market participation, especially for poorer women, highlights the positive indirect effects of the old-age pension programme in India, especially in a context where women's labour force participation rates are low, relative to those of other developing

countries. The overall results confirm the redistributive nature of cash transfer programmes, with the potential to improve women's economic empowerment (via employment), which is essential for a long-term poverty alleviation strategy (Woolard and Leibbrandt 2013).

There are two limitations to this study. The first is that we estimate the intent to treat (programme eligibility) effect of the programme. Not everyone who is programme-eligible will receive a pension through the programme. Therefore, the estimated effects here are upper-bound estimates. Second, due to data limitations, we could not explore the extent to elderly support in managing domestic chores might explain the estimated increase in female labour supply when there is a pension-eligible individual in the household. Further research is needed to understand the mechanisms by which the receipt of the old-age pension in the household may alleviate the childcare constraint for working-age women, allowing them to participate in the labour force.

References

Abel, M. (2019). 'Unintended Labor Supply Effects of Cash Transfer Programs: New Evidence from South Africa's Pension'. *Journal of African Economies*, 28(5): 558–81. https://doi.org/10.1093/jae/ejz009

Alzúa, M.L., G. Cruces, and L. Ripani (2013). 'Welfare Programs and Labor Supply in Developing Countries: Experimental Evidence from Latin America'. *Journal of Population Economics*, 26(4): 1255–84. https://doi.org/10.1007/s00148-012-0458-0

Ardington, C., A. Case, and V. Hosegood (2009). 'Labor Supply Responses to Large Social Transfers: Longitudinal Evidence from South Africa'. *American Economic Journal: Applied Economics*, 1(1): 22–48. https://doi.org/10.1257/app.1.1.22

Attanasio, O., L.C. Gómez, P. Heredia, and M. Vera-Hernández (2005). 'The Short-Term Impact of a Conditional Cash Subsidy on Child Health and Nutrition in Colombia'. Report Summary: Familias 03. London: Centre for the Evaluation of Development Policies (EDePo), Institute for Fiscal Studies.

Baird, S., M. McKenzie, and B. Özler (2018). 'The Effects of Cash Transfers on Adult Labor Market Outcomes'. *IZA Journal of Development and Migration*, 8: Article 22. https://doi.org/10.1186/s40176-018-0131-9

Banerjee, A.V., R. Hanna, G.E. Kreindler, and B.A. Olken (2017). 'Debunking the Stereotype of the Lazy Welfare Recipient: Evidence from Cash Transfer Programs'. *The World Bank Research Observer*, 32(2): 155–84. https://doi.org/10.1093/wbro/lkx002

Baulch, B., and A. Quisumbing (2011). 'Testing and Adjusting for Attrition in Household Panel Data'. CPRC Toolkit Note. London: Chronic Poverty Research Centre.

Basu, K., S. Das, and B. Dutta (2010). 'Child Labor and Household Wealth: Theory and Empirical Evidence of an Inverted-U'. *Journal of Development Economics*, 91(1): 8–14. https://doi.org/10.1016/j.jdeveco.2009.01.006

Bastagli, F. (2010). 'Poverty, Inequality and Public Cash Transfers: Lessons from Latin America'. Background paper for the European Report on Development (ERD) 2010 on Social Protection for Inclusive Development. Florence: European University Institute.

Bertrand, M., S. Mullainathan and D. Miller (2003). 'Public Policy and Extended Families: Evidence from Pensions in South Africa'. *The World Bank Economic Review*, 17(1): 27–50. https://doi.org/10.1093/wber/lhg014

Bloom, H.S. (1984). 'Accounting for No-Shows in Experimental Evaluation Designs'. *Evaluation Review*, 8(2): 225–46. https://doi.org/10.1177%2F0193841X8400800205

Borjas, G.J. (2008). *Labor Economics*. New York: McGraw-Hill/Irwin.

Case, A., and A. Deaton (1998). 'Large Cash Transfers to the Elderly in South Africa'. *The Economic Journal*, 108(450): 1330–61. https://doi.org/10.1111/1468-0297.00345

Chaudhary, R., and S. Verick (2014). *Female Labour Force Participation in India and Beyond*. New Delhi: International Labour Organization.

Cox, D., and E. Jimenez (1990). 'Achieving Social Objectives through Private Transfers: A Review'. *The World Bank Research Observer*, 5(2): 205–18. https://doi.org/10.1093/wbro/5.2.205

Daidone, S., B. Davis, S. Handa, and P. Winters (2019). 'The Household and Individual-Level Productive Impacts of Cash Transfer Programs in Sub-Saharan Africa'. *American Journal of Agricultural Economics*, 101(5): 1401–31. https://doi.org/10.1093/ajae/aay113

Desai, S., R. Vanneman, and National Council of Applied Economic Research, New Delhi (2005). 'India Human Development Survey (IHDS), 2005'. ICPSR22626-v8. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [distributor]. http://doi.org/10.3886/ICPSR22626.v8.

Desai, S., R. Vanneman, and National Council of Applied Economic Research, New Delhi (2012). 'India Human Development Survey-II (IHDS-II), 2011–12'. ICPSR36151-v2. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [distributor]. http://doi.org/10.3886/ICPSR36151.v2

Dubey, A., W. Olsen, and K. Sen (2017). 'The Decline in the Labour Force Participation of Rural Women in India: Taking a Long-Run View'. *The Indian Journal of Labour Economics*, 60(4): 589–612. https://doi.org/10.1007/s41027-017-0085-0

Duflo, E. (2003). 'Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa'. *The World Bank Economic Review*, 17(1): 1–25. https://doi.org/10.1093/wber/lhg013

Misha, F.A., W.A. Raza, J. Ara, and E. van de Poel (2019). 'How Far Does a Big Push Really Push? Long-Term Effects of an Asset Transfer Program on Employment Trajectories'. *Economic Development and Cultural Change*, 68(1): 41–62. https://doi.org/10.1086/700556

Fiszbein, A. and N.R. Schady (2009). *Conditional Cash Transfers: Reducing Present and Future Poverty*. Washington, DC: World Bank. https://doi.org/10.1596/978-0-8213-7352-1

Galiani, S., P. Gertler, and R. Bando (2016). 'Non-Contributory Pensions'. *Labour Economics*, 38: 47–58. https://doi.org/10.1016/j.labeco.2015.11.003

Gentilini, U., M. Almenfi, I. Orton, and P. Dale (2020). 'Social Protection and Jobs Responses to COVID-19'. Washington, DC: World Bank. Available at: http://documents.worldbank.org/curated/en/448321588971503966/pdf/Social-Protection-and-Jobs-Responses-to-COVID-19-A-Real-Time-Review-of-Country-Measures-May-8–2020.pdf (accessed 1 July 2020).

Glewwe, P., and P. Olinto (2004). 'Evaluating the Impact of Conditional Cash Transfers on Schooling: An Experimental Analysis of Honduras' PRAF Program'. Unpublished manuscript, University of Minnesota.

Hoces de la Guardia, F., A. Hojman, and O. Larrañaga (2011). 'Evaluating the Chile Solidario Program: Results using the Chile Solidario Panel and the Administrative Databases'. *Estudios de Economía*, 38(1): 129–68. https://doi.org/10.4067/S0718-52862011000100006

ILO (2018). *Women and Men in the Informal Economy: A Statistical Picture* (third edition). Geneva: International Labour Organization (ILO).

Kaushal, N. (2014). 'How Public Pension Affects Elderly Labor Supply and Well-Being: Evidence from India'. *World Development*, 56: 214–25. https://doi.org/10.1016/j.worlddev.2013.10.029

Klasen, S., and J. Pieters (2015). 'What Explains the Stagnation of Female Labor Force Participation in Urban India?' *The World Bank Economic Review*, 29(3): 449–78. https://doi.org/10.1093/wber/lhv003

Leibbrandt, M., K. Lilenstein, C. Shenker, and I. Woolard (2013). 'The Influence of Social Transfers on Labour Supply: A South African and International Review'. Working Paper 112. Cape Town: Southern Africa Labour and Development Research Unit (SALDRU), University of Cape Town.

Micklewright, J., A. Coudouel, and S. Marnie (2004). 'Targeting and Self-Targeting in a New Social Assistance Scheme'. IZA Discussion Paper 1112. Bonn: Institute of the Study of Labor (IZA).

Maluccio, J., and R. Flores (2005). 'Impact Evaluation of a Conditional Cash Transfer Program: The Nicaraguan Red de Protección Social'. FCND (Food Consumption and Nutrition Division) Discussion Paper. Washington, DC: International Food Policy Research Institute (IFPRI).

Ministry of Rural Development (2007). 'Modification of the Eligibility Criteria for Central Assistance under the National Old Age Pension Scheme (NOAPS) as part of the National Social Assistance Programme (NSAP)'. 24 September. Available at: http://www.nsap.nic.in/Guidelines/modifications%202007.pdf (accessed 1 July 2020).

Ministry of Rural Development (2012). 'Guidelines for Central Assistance under the Indira Gandhi National Old Age Pension Scheme (IGNOAPS)'. 8 November. Available at: http://www.nsap.nic.in/Guidelines/aps.pdf (accessed 1 July 2020).

Ministry of Rural Development (2014). 'Revised of Guidelines for the Schemes under National Social Assistance Programme (NSAP)'. 13 March. Available at: http://nsap.nic.in/Guidelines/Revised_guidelines.pdf (accessed 1 July 2020).

Neff, D.F., K. Sen, and V. Kling (2012). 'The Puzzling Decline in Rural Women's Labor Force Participation in India: A Reexamination'. Working Paper 196. Hamburg: GIGA (German Institute of Global and Area Studies) Research Unit. https://doi.org/10.2139/ssrn.2143122

OGD Platform India (2016). 'Expenditure and Beneficiaries under NSAP from 2002–3 to 2014–15'. Open Government Data (OGD) Platform India. Available at: https://data.gov.in/catalog/expenditure-and-beneficiaries-under-nsap (accessed 1 July 2020).

Posel, D., J.A. Fairburn, and F. Lund (2006). 'Labour Migration and Households: A Reconsideration of the Effects of the Social Pension on Labour Supply in South Africa'. *Economic modelling*, 23(5): 836–53. https://doi.org/10.1016/j.econmod.2005.10.010

Quisumbing, A.R. (2008). 'The Dynamics of Poverty in Rural Bangladesh: Determinants of Poverty Reduction'. CPRC-IFPRI Brief 2. Manchester: Chronic Poverty Research Centre (CPRC), University of Manchester.

Sarkar, S., S. Sahoo, and S. Klasen (2019). 'Employment Transitions of Women in India: A Panel Analysis'. *World Development*, 115: 291–309. https://doi.org/10.1016/j.worlddev.2018.12.003

Schatz, E., X. Gómez-Olivé, M. Ralston, J. Menken, and S. Tollman (2012). 'The Impact of Pensions on Health and Wellbeing in Rural South Africa: Does Gender Matter?' *Social Science & Medicine*, 75(10): 1864–73. https://doi.org/10.1016/j.socscimed.2012.07.004

Sienaert, A. (2008). 'The Labour Supply Effects of the South African State Old Age Pension: Theory, Evidence and Implications'. Working Paper 20. Cape Town: SALDRU, University of Cape Town.

Skoufias, E. and V. Di Maro (2008). 'Conditional Cash Transfers, Adult Work Incentives, and Poverty'. *The Journal of Development Studies*, 44(7): 935–60. https://doi.org/10.1080/00220380802150730

Swaminathan, H., R. Lahoti, and J.Y. Suchitra (2012). 'Gender Asset and Wealth Gaps: Evidence from Karnataka'. *Economic and Political Weekly*, 47(35): 59–67

Tondini, A. (2017). 'The Impact of Unconditional Cash Transfers on Informality: Evidence from South Africa's Child Support Grant'. Working Paper. Paris: Paris School of Economics.

Unnikrishnan, V., and K.S. Imai (2020). 'Does the Old-Age Pension Scheme Improve Household Welfare? Evidence from India'. *World Development*, 134: 105017. https://doi.org/10.1016/j.worlddev.2020.105017

Woolard, I., and M. Leibbrandt (2013). 'The Evolution and Impact of Unconditional Cash Transfers in South Africa'. In C.P. Sepulveda, A. Harrison, and J.Y. Lin (eds), *Development Challenges in a Post-Crisis World*. Washington, DC: International Bank for Reconstruction and Development/World Bank..

World Bank (2019). 'Working for Women in India'. 8 March. Available at: https://www.worldbank.org/en/news/feature/2019/03/08/working-for-women-in-india (accessed 1 July 2020).

Appendix

Table A1: Overall results with control variables

Dependent variable	Work participation of prime-age women
Pension-eligible individual	0.0321***
	(0.00)
Wife of the household head	0.0323***
	(0.00)
Age cohorts	
Age 21–25	−0.0951***
	(0.00)
Age 26–30	−0.0140*
	(0.00)
Age 31–35	0.0126*
	(0.00)
Age 36–40	0.0356***
	(0.00)
Age 41–45	0.0377***
	(0.00)
Prime-age women: educated	−0.0982***
	(0.00)
If prime-age woman has completed graduation	0.0599***
	(0.00)
Child within five years of age	−0.0347***
	(0.00)
Number of children in the household	0.0102***
	(0.00)
Place of residence: Urban area	−0.304***
	(0.00)
Caste: Scheduled caste or tribe	0.0241***
	(0.00)
Married	−0.0576***
	(0.00)
Religion: Muslim	−0.0998***
	(0.00)

Number of adults in the household	−0.0205***
	(0.00)
other welfare programmes received by the household	0.0410***
	(0.00)
Access to electricity	−0.0514***
	(0.00)
Women have access to TV	−0.0292***
	(0.00)
Women have access to radio	0.000939
	(0.00)
State fixed factors	Yes
Time	Yes
Number of observations	62,881
F-stat	536.8
R-square	0.255

Notes: robust standard errors in parentheses; * p<0.05, ** p<0.01, *** p<0.001.

Source: authors' calculations based on IHDS data (Desai et al. 2005, 2012).