Welfare policy and labour market outcomes among persons with disabilities (PwDs) in India: Evidence from the NSS 76th Round

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Abstract

India is the host of one of the largest population of persons with disabilities (PwDs) in the world. However, a large section of this population has been unable to access opportunities for economic and social progress, despite the enactment of the RPWD Act, 2016, the country's most ambitious disability rights legislation to date. This study attempts to analyse the impact of the Indian government's two primary welfare policies – the disability certificate and a cash transfer (the pension) - on employment outcomes for PwDs. Logistic regression results show that having a certificate with percentage of disability less than 60%, raises the probability of employment by 17%. As the extent of disability rises above 60%, the probability of being employed declines. However, the largest effect size is seen for a narrow set of registered salaried jobs. The effect of the pension is analyzed through a propensity score matching technique for each state, keeping out of pocket (OOP) disability expenses as the outcome, and pension as the treatment. The results reveal negative and significant treatment effects (ATT) of the pension on OOP disability expenses. Interpreting OOP expenses as an indicator of the 'conversion handicap' faced by PwDs (Sen, 2004), we argue that cash transfers can also indirectly reduce the barriers to employment.

1. Introduction

According to the 2011 census, India is the host of highest number of disabled with 2.21% of the entire population being impaired with one or more disabilities. World Bank have stated that disabled "…are more likely to experience adverse socioeconomic outcomes such as less education, poorer health outcomes, lower levels of employment, and higher poverty rates." (WB, 2011) In order to ensure support to the disabled, the government of India, since early 1990s, had rolled out several welfare schemes, with the intention to 'rehabilitate' the disabled. Aim of the rehabilitation programme was to create equal opportunities for the disabled to access education, get access to jobs and also avail health care benefits. The aim of

this study is to understand the role of government welfare policies in ensuring economic development of the disabled population through employability of the disabled. Here we focus particularly on two key policy instrument – disability certificates and the disability pension/cash transfer.

Recent empirical work in development economics, especially on group-specific development outcomes in India, has established the real effects of affirmative action on the welfare of marginalized or underrepresented groups. Similar measures have been enacted for the persons with disabilities (PwDs) in India, based on the same arguments for protections/entitlements awarded to other marginalized groups. This issue touches on the concerns analysed by a large body of literature, on whether welfare benefits act as a disincentive for employment (Charles, 2003; Jones et al., 2018; Meyer and Mok, 2019). In the specific context of disability, studies have focused on the effect of disability welfatre policies like the US Disability Insurance programme (Frutos and Castello, 2015). However, there is little evidence on the interaction of disability and welfare policy, and its effects on employment outcomes in India.

Sen (2004) explains that, access to income and standard of living equivalent to a non-disabled person is constrained with two types of 'handicaps'. The first is the 'earning handicap' which refers to the hindrance in accessing jobs and retaining them. Often lack of other job opportunities may lead them to availing jobs of lower remuneration and poor workplace environment. On top of that, a significant share of the earnings goes to expenditure in medical and other disability related expenses, which shrinks their access to other benefits and inter alia standard of living. This second aspect is considered as 'conversion handicap', as a disabled person needs extra spending to convert his income into a good life (Raut et al 2014). However, depending on type and extent of disability, and social factors such as social group, and gender, there might be differential impact of the two handicaps among the disabled.

It has been extensively argued in the literature that disability led incapability to access employment has pushed many Indian households to a downward spiral of poverty (Raut.et al, 2014; Ebb & Harris-White, 2001). Besides, employment becomes a major agency for disabled to regain their acceptance and status in the society affected by the stigma and conservatism associated with disability (Ebb & Harris-White, 2001). Although the importance of employment for the disabled cannot be understated, it has been highlighted elsewhere that potential adverse reaction from co-workers disincentivises employers to hire

disabled people and many disabled also feel reserved to apply for jobs due to this threat of regressive attitude from the other workers (Shenoy, 2011). Another set of literature argues that disability reduces the productivity of the disabled people making them less likely to get employed. However, a lot depends on the type of disability and the nature of the work demanded from them (Baldwin & Johnson, 1994). Further, a lack of disabled friendly infrastructure and the environment have been pointed out as additional barriers to employment (Mitra & Sambamoorti, 2006).

In India, the disability certificate is the flagship policy intervention for the disabled, allowing them to access benefits such as reservations in employment and education. In light of the concerns related to employment faced by the disabled, this paper analyses the impact of disability certificates on the employment status of the disabled. A persistent body of literature in developed countries argues that unemployment benefits or cash transfer scheme might act as a deterrent to search for jobs (Charles, 2003; Frutos and Castello, 2015; Meyer and Mok, 2019). As a second exercise in this study, we test the impact of disability pension on the OOP disability expenses of PwDs. This is indirectly linked to employment, as such expenses raise the reservation wage required.

Logistic regression results show that having a certificate with percentage of disability less than 60%, raises the probability of employment by 17%. As the extent of disability rises above 60%, the probability of being employed declines. However, the largest effect size is seen for a narrow set of registered salaried jobs. The effect of the pension is analyzed through a propensity score matching technique for each state, keeping out of pocket (OOP) disability expenses as the outcome, and pension as the treatment. The results reveal negative and significant treatment effects (ATT) of the pension on OOP disability expenses for 8 states, with insignificant effects for other states.

The rest of the paper proceeds as follows. Section 2 outlines the background of disability welfare policy in India. Section 3 describes the dataset and variables used in the study. Section 4 presents descriptive statistics on disability, employment and access to welfare policies. Section 5 provides the empirical strategy adopted and the results. Section 6 concludes with a discussion and further work to be done.

2. Setting

2.1. Disability Policies in India

There is a history of nearly four decades of several disability rights movements, demanding the rights of PwDs as equal citizens, both globally and nationally (Jha, 2016; Mehrotra, 2011). The initial policy measures taken by the government of India were the formation of Rehabilitation Council of India, 1986 and the introduction of Mental Health Act, 1987. These approaches were predominantly focused on medical interventions and construction of special programmes for rehabilitation of persons with disabilities; effectively segregating the disabled from the mainstream.

A revolutionary change towards the attitude came in 1992 with UN recognizing disability as a human rights issue along with a medical issue, in view of the widespread discrimination faced by the disabled in access education, employment and welfare. Although Articles 15 and 16 of the Indian Constitution prevents discrimination in the matter of access to employment and public facilities with respect to religion, caste, sex, race and place of birth; formal recognition of discrimination against disabled only came in 1995 through the enactment of Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act (PDA). Following the 1995 Act, disability advocacy groups organized under one umbrella with a shared, coherent set of demands. The approach of the PDA had predominantly two aspects. First was the medical approach of early detection and curation of the disease, creation of training institutions and rehabilitation centers for the disabled. The second approach was towards creating affirmative action and welfare policies to ensure non-discriminatory access in educational and employment institutions. For the first time, 3% of positions in government jobs and educational institutions were reserved for the disabled.

The UN Conventions on the Rights of Persons with Disabilities (UNCRPD, 2006) gave a stronger push to the forefront developmental and rights-based approach towards disability policy. The UN convention emphasized that persons with disabilities are ‘subjects of rights’ and not ‘objects of charity’; outlining a paradigm shift in understanding the disabled as active participants in the development process rather than passive recipients of welfare measures. Since then, the policy recommendation has taken a second shift towards inclusion of the disabled within the educational and work institutions, by making the socio-economic and structural adaptation of the institutions to meet the needs of the disabled rather than only medically treating and training the disabled. With ratification of the UNCRPD (2006) in 2008 in India, the amendment of RPWD Act (1995), and introduction of RPWD Act, (2016).

Two key features of the RPWD Act 2016 were the increase in position reserved for PwDs in government employment and educational institutions. The act increased the reservation in the government educational institutions from 3% to 5%; and 3% to 4% reservation in public sector jobs. It also entailed the creation of establishment of central and state advisory boards with an increased devolution of power and responsibilities to central and state authorities to implement and regulate the disability policies.

Both the central and the state commissioners, with the help from the advisory bodies, are also required to maintain a grievance redressal mechanism for the disabled. However, as far as implementing the policies in private sector is concerned, the role of the government is unclear, and most of the obligations are left at the 'good will' of the private agent (liaison officer) to get it realised (Trilegal, 2017).

2.2. Disability Certificate and Pension

In other countries (such as the US), definitions of disability hinge on whether the person has the ability to 'earn a living'. The criterion for classifying a person as 'disabled' is based on performance, not the structural/physical characteristics of the person (Haveman and Wolfe, 1984). In India, a person with disability (PwD) is legally recognized via the disability certificate, which is also a register of the degree of disability which the person has. Reservation and other cash transfer benefits are restricted to PwDs with a percentage of disability of at-least equal to 40%[3] and for the central government sponsored scheme[4], it is 80% and above. This eligibility criteria, concurrent on a certain percentage of disability, indirectly makes acquiring disability certificate a necessary requirement to access the benefits. The process to acquire the disability certificate is predominantly on the basis of a medical model, where a person receives a certificate of disability after an examination by the state governments' medical authorities[5] The criteria and the procedure to acquire the disability certificate is solely determined by the central government. State governments are given the responsibilities to issue the certificate after conducting the health check-ups in accordance with the predetermined criteria and procedures. However, any cash transfer

[3] 'Benchmark disability' is the official term for a percentage of disability above 40%, also synonymous with possessing a certificate.

[4] The centrally organised cash transfer scheme in India is the Indira Gandhi National Disability Pension Scheme (IGNDPS), operated by the central Ministry of Rural Development under the National Social Assistance Programme (NSAP). It provides a monthly transfer of ₹400 to those with more than 80% disability and/or multiple disabilities, conditional to other, more restrictive criteria. Table 6 compares the details of each scheme.

[5] Ironically the procedures to get certificates are inadequately accommodating, as explained in section "Discussion".

schemes in India are a part of the concurrent list. In the context of the disabled, the state governments enjoy a freedom in formulating their own welfare programmes in parallel to the central government. The second most highlighted welfare programme for the disabled, after reservation, is the cash transfer scheme- disability pension.

Pensions in India refer to contributory social protection schemes as well as cash transfer schemes operated for elderly, widows and the disabled. Unlike many countries such as the United States (Haveman and Wolfe, 1984) and Spain (Frutos and Castello, 2015), India does not have a contributory insurance or pension programme for disabled. The RPWD Act created a national and state fund for providing financial support to the PwDs through disability pensions. There are mainly two types of pensions which are functioning today. First is the Indira Gandhi National Disability Pension (IGNDP), provided by the central government. State governments provide separate disability pensions, heterogenous in eligibility criteria and associated benefits. However, these schemes do not adhere to a uniform benchmark of any minimum income that is to be guaranteed to disabled individuals or households. A summary of the major pension scheme for selected few states is provided in the table 1 bellow. This table does not focus on providing a comprehensive coverage of different state sponsored pension schemes in India, rather it emphasises on the diversity in the terms and conditions and the support amount across states.

Table 1: Details of selected state pension schemes

State	Number of Schemes	Disability Type	Eligibility Criteria	Pension Amount
Uttar-Pradesh	2	Leprosy	All	2500
		All	BPL	500
Maharashtra	2	All, >40%	Age <65	600
		All, >40%	Income <21000 per month	900
Bihar	1	All	No Criteria	400
Rajasthan	4	All, >40%	Age <55 (women) <58(men	750
		All, >40%	Age>55 (women), >58 (men)	1000
		All, >40%	Age>75yrs	1250
		Leprosy	All age	1500
Tamil Nadu	2	Mental/intellectual	If Not Employed	1500
		All		1000
Karnataka	2	All	Income<6000	400
		Disability>75%	Income<6000	1000
Odisha	3	Above 40%	Age 79 and below	300
		Above 40%	Age 80 and above	500
		Above 60%	Age 80 and above	700
Chhattisgarh	1	Above 80%	BPL	500

3. Data and variables

The empirical analysis is based on the data from the National Sample Survey 76th Round (2018), a nationally representative sample survey of people with disabilities conducted by the Indian government's ministry of Statistics & Programme Implementation (MOSPI). It was the largest survey of PwDs undertaken in India, covering 1,18,152 households across all states. It is the first official survey of the disabled in accordance with the updated taxonomy of disabilities as laid out in the landmark 2016 RPWD Act. For those with disability certificates, the type and extent of disability is diagnosed by a medical professional, and is officially recognized by the government. For those without certificates, the NSS 76 prescribed operational guidelines for enumerators to identify the type, but not the *extent*, of disabilities.[6]

A stated, one objective of the study is to measure the impact of the disability certificate on employment. With this aim in hand, we employed a simple logit regression model where the dependent variable is employment status. This study defines employment according to the conventions of the NSS's classification of the Usual Principal Activity Status (UPAS), which considers a person as employed if they are engaged in any income generating activity which is their principal activity according to the majority time criterion[7] during the reference year. The NSS classification offers a wealth of other information, which is obscured if we treat employment as a catch-all arrangement for all the different types of work individuals can perform.

NSS classifies employment status of an individual broadly into three categories; self-employed, salaried and casual employment. Adding to previous studies, (Mitra and Sambamoorthy, 2006) our approach tries to account for the quality and the formality of jobs; recognizing that simply being 'employed' is not necessarily an indicator of social or economic development. Almost every protection assured to workers through labour laws and regulations are only applicable to salaried jobs. For those employed in salaried jobs, the data also identifies whether social security such as sick leave, provident fund and health insurance is provided by the employer (NCEUS, 2007). The following analysis thus breaks employment into three categories: self-employed or employed in non-salaried jobs, salaried

[6] See NSS 76 report, page A-21.

[7] The activity status on which a person spent relatively longer time during the 365 days preceding the date of survey

employment and jobs with salary and social security benefits.

Our first policy variable of interest is the disability certificate. The NSS collects information on whether the PwD possesses a disability certificate. It provides further information on the percentage of disability for those who have the certificate. Our second policy under scrutiny is the disability pension. Although the pension is not a support programme for employment, it indirectly impacts the opportunity to get employed. NSS collects information on whether a person has a pension of any type or not. So, a person in this study is considered to be registered under a pension scheme if she is getting either of any state sponsored schemes or that of central government or both.

To analyse the impact of pension on schemes, we used disability expenditure as a variable in our analysis. The NSS collects information on out-of-pocket (OOP) expenses relating to disability. It covers medical expenditure which includes doctor's fee, medicines, diagnostic tests, physiotherapy, and non-medical expenses comprising of other incidental charges incurred for treatment such as transport, and lodging charges. In our study we considered only the usual monthly expenditure (medical and non-medical) on disability as a share of total household consumption expenditure. This indicates the added burden which the disabled have to incur exclusively for their disability. As argued earlier, a higher proportion of income that must be allocated for disability expenditure might raise the reservation wage (Sen, 2004). It can be argued that a cash transfer such as the pension can reduce the burden of OOP expenses on disability and ease the access to jobs for the disabled by reducing their reservation wage.

Other variables which might influence the probability of getting employed are the type of disability, and accessibility to public transports and buildings. The survey records whether the PwDs accessed public buildings (educational institution, workplace) and public transportation during the last 365 days. We have also considered other covariates which affect employment status including age, years of education, social group, gender, region. The next section gives descriptive statistics.

4. Descriptive statistics

67% of PwDs are in the working age population of 15 to 65 years, but only 28% of them are employed. 36% of PwDs explicitly reported disability as the reason for being out of work. Agriculture is the most common source of employment, comprising 61% of the total rural sector jobs. This is likely because using family labour is the prevalent in agriculture in India,

constituting a form of self-employment (Chowdhury 2011). Service sector jobs are the dominant form of urban employment, where 62% urban disabled workers are engaged. Manufacturing sector jobs are also mostly concentrated in urban regions, constituting around 22%. The largest employing sector for males is retail, sales of food, beverages and tobacco; and manufacture of textiles and garments for women. 63% of rural and 43% of urban PwDs are engaged in self-employment activities. Further, 26% of the rural disabled and 21% of the urban disabled are engaged in casual jobs, often sporadic and with payment on an hourly or piece rate basis (Breman, 2019). Both self-employed and casual jobs are part of India's large informal sector, outside the purview of government regulations, and lacking job, income and social security measures. 34% of urban PwDs are employed in salaried jobs, compared to only 9.5% in rural areas.

However, these figure masks wide variations. Table 2 summarises the employment rate of the working age population, aggregated into broad categories of disability by the NSS (from the 21 types listed in the RPWD Act): visual, hearing, locomotor, speech, mental, intellectual and multiple disabilities.

Table 1: **Employment Rate across Types of Disability for Working Age Population (15 to 65)**

Type of Disability	Employment Rate (%)
Locomotor Disability	56.92
Multiple Disability	18.43
Hearing Disability	11.42
Visual Disability	5.22
Speech and Language Disability	5.19
Mental and Intellectual Disability	3.13
All	28.01

Source: Author's calculations from NSS 76TH Round (2017-18) unit level data

Those with locomotor disabilities have the highest employment rates at 56%, while only 3.1% of those with mental and intellectual disabilities are employed. People with locomotor and visual disabilities are primarily engaged in retail activities, more reliant on communication-oriented rather than manual tasks (Ebb & Harris-White, 2001). Workers with hearing, speech, mental and intellectual disabilities are mainly employed in the construction sector.

The disability certificate is a necessary requirement to access any welfare schemes and benefits for PwDs, including affirmative action and disability pensions. According to the NSS 76th round (2017-18), only 29% of the sample had certificates, with females (24%)

lagging behind males (32%). People with certificates were found to be more likely to get employed (27%) than those without certificates (19%). Figure 1 bellow depicts the percentage of PwDs employed across the different degree of disability[8] for male and female separately. It can be observed that as the percentage of disability increased, the share of employed reduces. Further, the figure also portrays that the employment potentialities are hugely influenced by the gender of the PwDs across all degrees of disability. This intersection of disability and gender-related inequities makes disabled women perhaps the most marginalized and overlooked group (Das and Agnihotri, 1999). The disability rights movement in India are accused of propping up the demands of mainly middle-class men (Ghai 2002). Even among the non-disabled, female labour force participation in India is among the lowest in the world. This is compounded by the additional discrimination faced due to disability (Baldwin and Johnson, 1995).

These factors combine to produce an abysmal state of employment among female disabled, far worse than the already low male employment rates. As explained by Mehrotra (2004), in many cases women are believed to be 'dependent' on the male 'breadwinner' of the house. This attitude gets reflected whereas the convention dictating that women would not need to do job, spares them from this burden of social shaming. These factors likely result in a much lower participation of women in the labour market at 10% in comparison to 43% for males with disabilities. However, as far as unemployment rate is concerned, both male and female are not showing any differences which is around 4%. This might reflect that very few of the disabled are actively searching for jobs when they are not employed.

[8] Because the survey was not only limited to those with at-least 40% disability, it may be possible that some of those without certificates, have less than 40% disability, and are not eligible for certificates. Any person suffering with disabilities is eligible to apply for a disability certificate. However, when the medical board does disability evaluation — the certificate is issued only to those who fulfill any of the following criteria: Person must have minimum 35% mental handicap or disability. Person must have an orthopedic disability of minimum 40%. In case of deaf people, the disability percentage must be between 90 % & 100 % Visual impairment has to be more than 90%.

Figure 1: Employment Rates by percentage of disability across gender

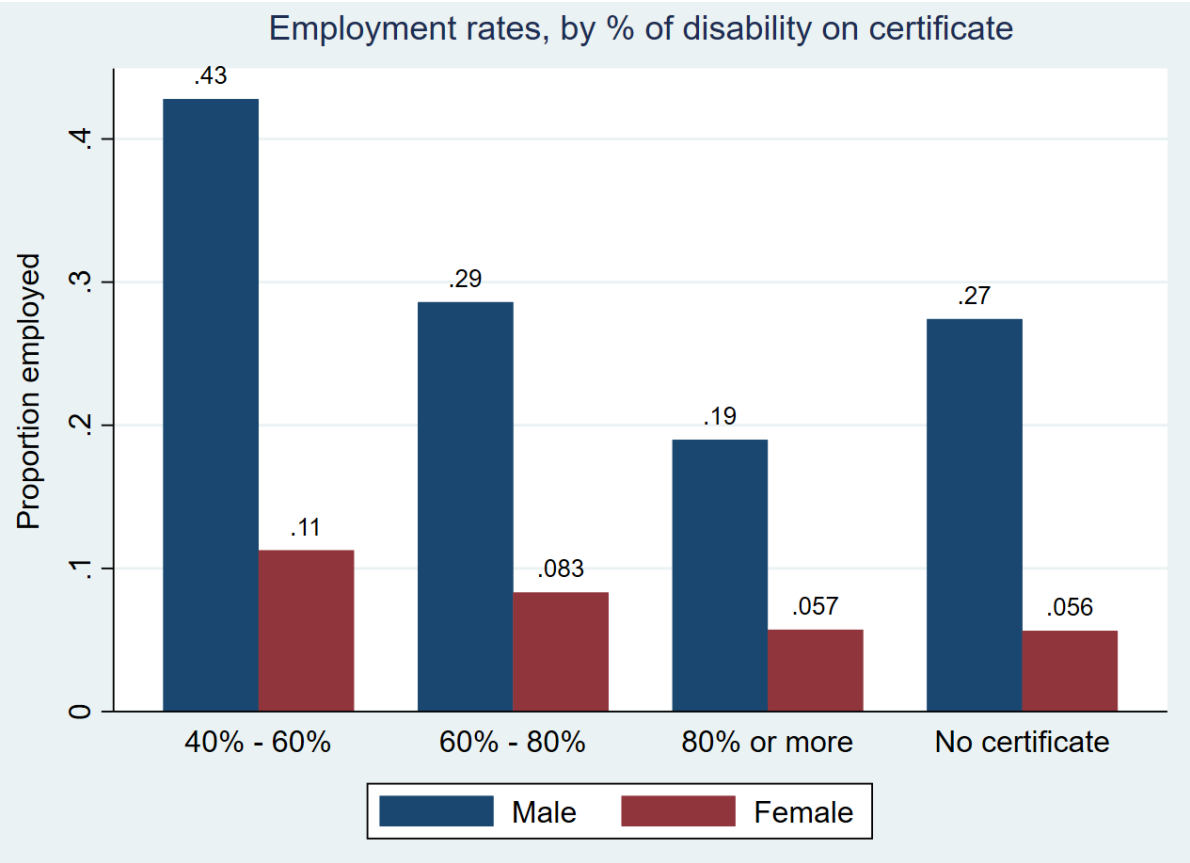

Table 2 below compares the characteristics of PwDs across certificate holders and non-holders. The proportion of certificate holders differ among the different types of disability. Table 2 also reflects that certificate holders are more likely to get employed, be it salaried or any other jobs. Also, certificate holders have on average, higher years of education than the non-certificate holders.

Table 2: Summary statistics, by certificate status

	Certificate	No certificate	Pension	All
Age*	33.6	48.3	37.1	44.2
Years of education*	6.3	4.5	5.1	4.9
MPCE*	2325.7	2248.9	2102.9	2245.1
% Female	34.7%	45.2%	38.2%	42.4%
Social Group				
% Hindu (General)	21.4%	19.4%	15.5%	19.3%
% Muslims	15.0%	13.9%	12.7%	14.0%
% OBC	34.5%	35.5%	42.9%	36.2%
% SC	19.3%	19.6%	21.2%	19.8%
% ST	9.8%	11.6%	7.8%	10.8%
% Expenditure on Disability (of MPCE)	8.3%	12.7%	6.2%	11.1%
Type of Disability				
Other	1.6%	2.4%	0.4%	2.0%
Hearing	4.5%	11.7%	3.3%	9.3%
Intellectual Disability	7.3%	4.6%	9.0%	5.6%
Locomotor	43.5%	40.0%	42.4%	40.9%
Mental Illness	2.3%	4.2%	1.9%	3.6%
Multiple	27.4%	21.7%	29.0%	23.7%
Speech & Language	5.3%	5.4%	4.9%	5.3%
Visual	8.1%	10.0%	9.0%	9.6%
% employed	25.2%	17.5%	22.2%	19.5%
% employed in salaried job	6.5%	2.0%	2.9%	3.0%
% Married	41.6%	49.1%	42.1%	46.9%
% In Rural area	67.0%	69.8%	76.6%	70.1%
% In Urban area	33.0%	30.2%	23.4%	29.9%
Access to public services				
Transport	65.4%	53.8%	64.6%	57.2%
Buildings	51.3%	39.6%	50.2%	43.1%
Observations	74141	19655	12963	106759

Note: * Figures are mean values. Source: NSS 76th round, unit level data

Overall, 13% of the PwDs registered to have access to some type of disability pension. Among the certificate holders, 40% availed any disability pensions. In general, those availing disability pensions have the lowest MPCE as well as share of disability expenditure out of their total MPCE. For those availing pensions, at the end of the process is a relatively small amount of money, of limited utility for the relatively well-off. There are many pension schemes which demands percentage of disability higher than that of benchmark disability along with many other income and age criteria. This means that availing pensions is not a valid option for many who are recognized as disabled by the government and acknowledged with the certificate. However, even among those with extent of disability 80% and above), 53% do not receive any disability pension, indicating that more stringent eligibility criteria

might not be the only reason for such low availability of pensions. The sole national disability pension scheme, IGNDPS is restricted to rural regions only'. This is perhaps explaining why share of pension holders are higher in the rural region (77%) than the urban areas (23%).

5. Empirical analysis

5.1 The impact of disability certification status on employment

As a disability certificate is a prerequisite to get reservation in the job market for the disabled, here we first test whether having the disability certificate is ensuring a higher chance to get employed or not, by using a logit regression model at the individual level. The model specification is given in equation 1.

$$Likelihood\ (\mathrm{E}) = logit(d,x) \qquad (1)$$

Here E is the dummy variable, which takes the value of 1 when a person is employed, otherwise it is 0. d is the vector of disability-specific covariates which would likely affect the ability of individuals to seek and function in employment. This includes indicator variables for the type of disability, the categorical variable disability status, accessibility to public buildings and transports, and the monthly expenditure on disability, as a proportion of monthly consumption expenditure. x is the set of control variables which also influences the probability of getting employed. Earlier work has managed to settle on a consensus regarding a reasonable set of controls that might affect LFPR in India, including age, education, social group, religion, sex and place of residence (rural/urban). We have also estimated two more models with salaried and secured salaried jobs as dependent variables, all other specifications remaining same.

Table 3: Logit regression

	All Employment	Salaried	Secure salaried
Certificate Status			
40% - 60%	0.165***	0.242***	0.462***
	(0.03)	(0.06)	(0.09)
60% - 80%	-0.278***	0.170*	0.432***
	(0.04)	(0.08)	(0.11)
80% or more	-0.495***	0.050	0.408*
	(0.05)	(0.12)	(0.17)
Prop. disability exp. (of MPCE)	-1.674***	0.386*	0.738**
	(0.07)	(0.16)	(0.23)

Type of Disability			
Hearing	0.396***	0.035	0.208
	(0.09)	(0.18)	(0.31)
Intellectual Disability	-1.891***	0.018	0.445
	(0.11)	(0.31)	(0.58)
Locomotor	-0.306***	0.423**	0.651*
	(0.08)	(0.16)	(0.27)
Mental Illness	-1.262***	-0.212	0.077
	(0.10)	(0.25)	(0.41)
Multiple	-0.634***	0.473**	0.721**
	(0.08)	(0.17)	(0.28)
Speech & Language	0.076	0.135	0.150
	(0.10)	(0.20)	(0.36)
Visual	-0.952***	0.123	0.588
	(0.10)	(0.20)	(0.31)
Category			
ST	0.289***	-0.150	0.289
	(0.05)	(0.11)	(0.17)
SC	0.111**	0.070	0.318**
	(0.04)	(0.08)	(0.11)
OBC	0.124***	-0.077	0.047
	(0.03)	(0.07)	(0.10)
Male	2.017***	-0.597***	-0.585***
	(0.03)	(0.07)	(0.10)
Accessibility			
Transport	0.929***	-0.158	-0.282*
	(0.04)	(0.09)	(0.13)
Building	0.497***	0.645***	1.062***
	(0.03)	(0.07)	(0.12)
Age	0.035***	-0.000	0.049***
	(0.00)	(0.00)	(0.00)
Years of education	0.053***	0.167***	0.293***
	(0.00)	(0.01)	(0.01)
Urban area	-0.133***	1.262***	1.077***
	(0.03)	(0.05)	(0.08)
Constant	-4.471***	-3.054***	-7.870***
	(0.15)	(0.31)	(0.46)
State Dummy	Y	Y	Y
Observations	45370	13529	13527

Robust standard errors in parentheses.

The main variable of interest is the disability certificate. The first model shows that compared to PwDs without certificates, those certified as being 40-60% disabled are 27% more likely to be employed. Those with 60-80% disability are 17% less likely to be employed compared to those without a certificate, while those with 80% and higher disability have a 40% lower

probability of employment. When focusing exclusively on the second model, we observe that among the employed persons with disability, those with certificate are more likely to get a salaried job in comparison to those without any certificate, irrespective of the degree of disability. From the third model we can also conclude that disability certificate also ensures secured salaried jobs for persons with any degree of disability. These results suggest that disability certificate is being able to offset the disadvantage of higher degrees of disability, however it is limited to a narrow category of employment in India: overall, 19.5% of PwDs are employed, but only a meager 3% nationwide are employed in salaried jobs.

Comparing across the type of disability, we can observe that the persons with hearing disability are most likely to get a job and those with visual disability are the least likely. Among those who are employed, only those with locomotor and multiple disability are found to get salaried and secured salaried jobs. In all the three models we observe that as age and years of education increases, the probability of being employed increases. Compared to general/upper castes, belonging to a protected group considerably increases the probability of being employed; however, for secure salaried employment, the positive sign is seen only for PwDs belonging to Scheduled Castes. Overall, males are more likely to be employed than females with a disability. However, among the employed, women are more likely to get salaried and secured salaried jobs than disabled males. Employment also depends crucially on how accessible a person's environment is. If a person reported that they were able to access public transportation, raises the probability of employment, while being able to access public buildings also raises the probability of being employed, but by a smaller amount.

The above regression shows that the probability of being employed drops with higher proportion of out-of-pocket expenditure on disability, for most types of employment. However, the disability certificate is only a marker of eligibility for receiving benefits, and is not a policy intended to directly support consumption expenditure. The disability pensions are the main income support policy in India for the disabled, in recognition of the severe challenges they face in getting employed and earning an adequate income. Interpreting the OOP expenditure on disability as an example of the 'conversion handicap' (Sen, 2004), a disability pension can be seen as an intervention to counteract this extra economic burden on PwDs. This is illustrtated by the fact that at the central level (and for several states), the pension is only available to those below particular income thresholds. In other words, it can be argued that cash transfer schemes indirectly impact employment via reducing the

disability expenditure.

With the aim to understand the impact of pension on disability expenditure, we resort to a propensity score matching estimation. Unlike many other 'interventions', disability cannot be randomly assigned by the researcher, and usable natural experiments are rare (fortunately). In this context, matching is a popular method to study the economics of disability (Jones and McVicar 2020; Frutos and Castello, 2015). The purpose of matching estimators is to minimize the variation rising from 'extraneous variables'. By constructing similar or 'balanced' comparison (treatment/control) groups, matching provides a more flexible method than regression to estimate the average treatment effects of a policy intervention (Huntington-Klein, 2021). In the following analysis, our population of interest is confined to those who have disability certificates. Here the treated groups are those who have either a state sponsored pension or the central government's pension or both. The control group are those who do not have any pension at all, but possess a certificate. The impact of pension on disability expenditure can be captured by matching pairs of observations in the two groups.

5.2 Does the pension reduce the 'conversion handicap' in employment?

To ensure comparability between the treated (people with pensions) and untreated groups (people without pensions), the observations in the two groups must be matched across all characteristics which influence the likelihood of availing a pension. This is necessary to satisfy the Conditional Independence Assumption (CIA), which states that 'potential outcomes for the units of the intervention are independent of treatment assignment, after *conditioning on observables*.'. However, the CIA also posits that there are no significant unobserved differences between the treatment and control groups (Rosenbaum and Rubin, 1983). This demand is more difficult to satisfy, and any matching exercise is always vulnerable to the impact of unobservables. However, by conditioning on a wide range of relevant observable characteristics as given below, we minimize the impact of most, if not all, potential confounders. (Cunningham, 2019). We thus match on attributes which influence the probability of getting a pension, consisting of variables indicating education, consumption expenditure, social group, accessibility, type and extent of disability, age, gender and location (rural/urban).

The first step is to conduct a logit regression of the treatment variable (pension) on the selected observable characteristics. The predicted value of the logit model provides the

propensity score of the individual receiving a pension. Each individual is matched to its 'nearest neighbour' with the most similar propensity score. Using Stata's PSMATCH2 command, we specify a 1:1 NN- matching with replacement, only for observations on common support (Abadie and Imbens, 2006). After matching, we check the balance tables, testing for statistically significant differences in the covariates between the treated and untreated groups. The effect of the pension in reducing OOP disability expenditure is calculated from the difference in the mean value between the treated and control groups, with the estimated effect being the Average Treatment Effect on the Treated (ATT).[9]

Because of the legislative autonomy enjoyed by states in disability policy, state-wise pension schemes vary widely in terms of the amount of the pension and the eligibility criteria – age, type and extent of disability and the household income of the potential recipient. Considering the substantial variation in pension schemes across states, we restrict matches for any individual with a pension to others only within the same state, i.e. observations are exactly matched on state. This ensures that there are no 'hidden variations' in the treatment unobserved to the researcher, and individuals are not actually receiving different interventions taken as identical (Rubin 1980). This goes towards satisfying one major requirement of the Stable Unit Treatment Value Assumption (SUTVA) (see Discussion). The results of the PSM estimation for eight states are given in table 4 below.

[9] "The ATE (Average treatment effect) is of more interest if every treatment potentially might be offered to every subject, whereas the ATT is preferable when patient's characteristics are more likely to determine the treatment received." (Benedetto et al 2018)

Table 4. Propensity Score Matching: Results

State	Mean Treatment (1)	Mean Control (2)	ATT (1-2)	Observations (On Support)
Uttar Pradesh[a]	0.038	0.056	-0.017** (0.012)	2062
Maharashtra	0.056	0.078	-0.022*** (0.016)	2221
Bihar[a]	0.022	0.038	-0.015*** (0.009)	1613
Rajasthan	0.031	0.052	-0.02* (0.014)	988
Tamil Nadu	0.040	0.058	-0.018** (0.01)	1728
Karnataka	0.073	0.13	-0.06*** (0.018)	1447
Odisha	0.072	0.096	-0.024** (0.015)	1167
Chhattisgarh	0.015	0.051	-0.036*** (0.02)	439

Note: 'a' means that all people with 'other' disabilities are not considered, as there are no people in this category receiving pensions. Robust standard error in parentheses.

Because of the data-greedy nature of the matching process, we restricted our analysis to states with more than 1000 total individuals surveyed. We run the analysis for other states. but the coefficients are insignificant. We observe that for all these states, mean disability expenditure is lower for pension holders. The largest negative effect on OOP expenditure is seen for Chhattisgarh, followed by Odisha.

Discussion and Conclusion

The previous section showed that disability certificates are likely to have a strong effect on employment outcomes for PwDs. Further, though we do not attempt to measure the direct impact of the disability pension on employment, the PSM results show that the pensions does succeed in reducing OOP expenses on disability. Interpreted as a measure of the conversion handicap faced by a disabled person, the pension has the potential to lower the barriers to finding acceptable employment. However, unlike other policies and interventions, the disability certificate is not available in a door-to-door fashion like, say, vaccinations. The onus is on the disabled individual to seek them out. Where awareness is very low, NGOs act as intermediaries to deliver government welfare by organizing certificate camps.

Most people without the disability certificate have a degree of disability lower than the

benchmark disability level, but could also reflect governance and institutional failures, where PwDs are wrongly excluded despite having the requisite percentage of disability. Several issues faced by PwDs emerged in a series of qualitative phone interviews conducted in rural Bihar, in association with the Office of the State Commissioner of PwDs. PwDs, especially in rural areas, raised concerns about inaccessible public health centers (the government health centres which issues the certificate) and lack of awareness about procedures to claim the certificate (Raj. et al, 2020).

Several aspects of the empirical approach need to be refined. Propensity score matching is always vulnerable to unobservable factors which are affect whether PwDs receive pensions. Though we have tried to mitigate this by accounting for all major socioeconomic attributes in the matching process, selection on unobservables cannot be ruled out. The PSM results need to be confirmed through two robustness checks.

Firstly, one shortcoming of the data is that the specific scheme/source of the pension – central or state government - is not recorded. The sample for the state-level PSM needs to be restricted to those with less than 80% disability. This necessary excludes PwDs receiving the national IGNDPS pension, and allows comparison of the 'pure' effects of state-specific pensions. Secondly, to guard against violations of the Stable Unit Treatment Value Assumption (SUTVA), i.e. a subject's potential outcomes (OOP disability expenses) should not be affected by the treatment assignment of other subjects. For this, we need to restrict the analysis to households with only one disabled person, so that certificate/pension status of family members does not spill over onto other household members.

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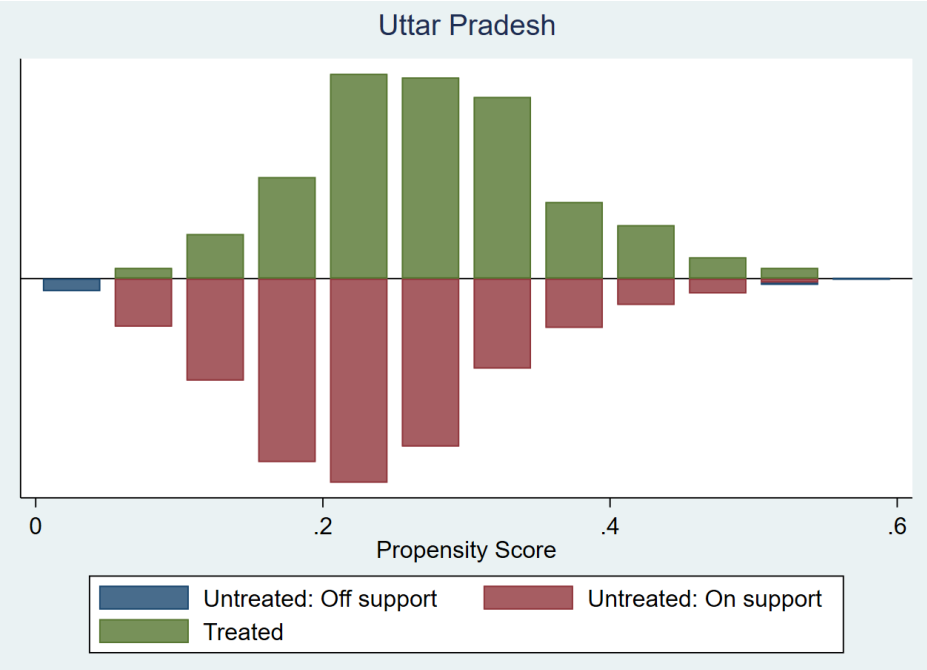
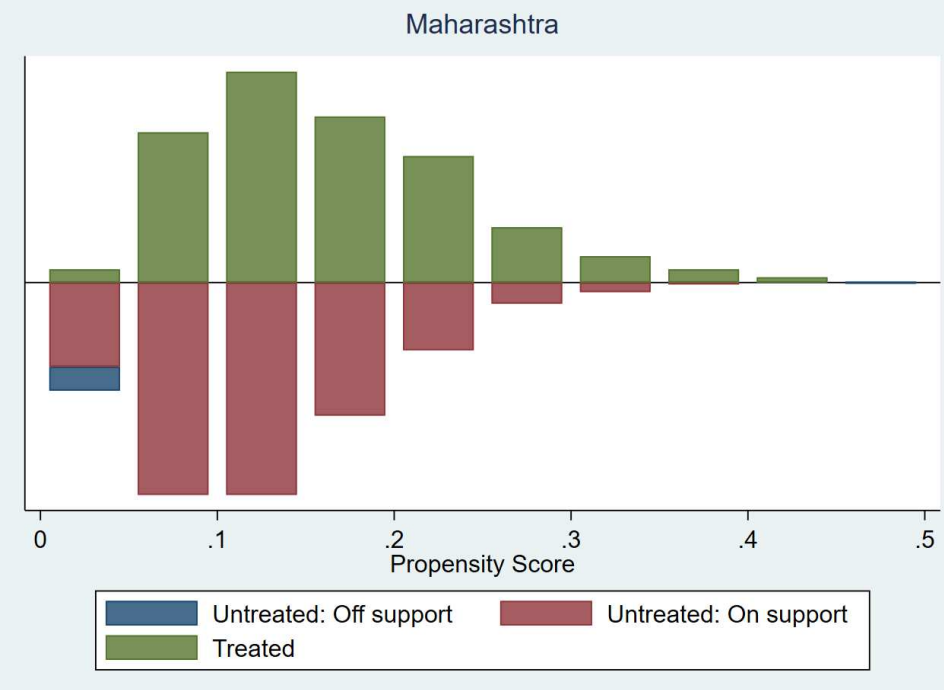
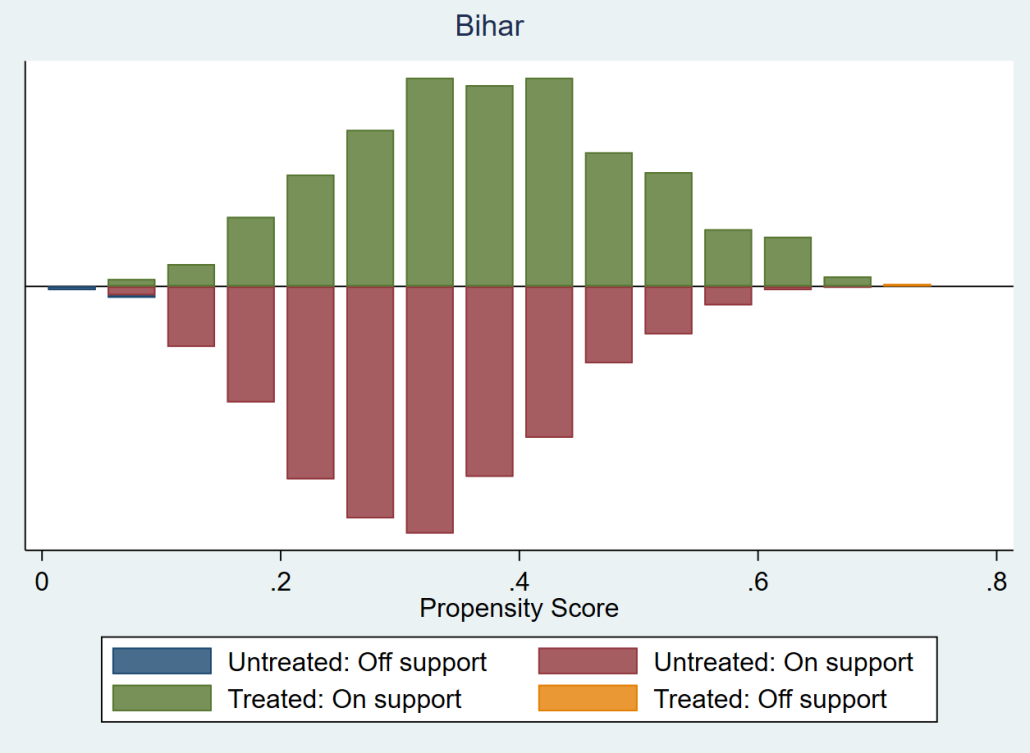
APPENDIX

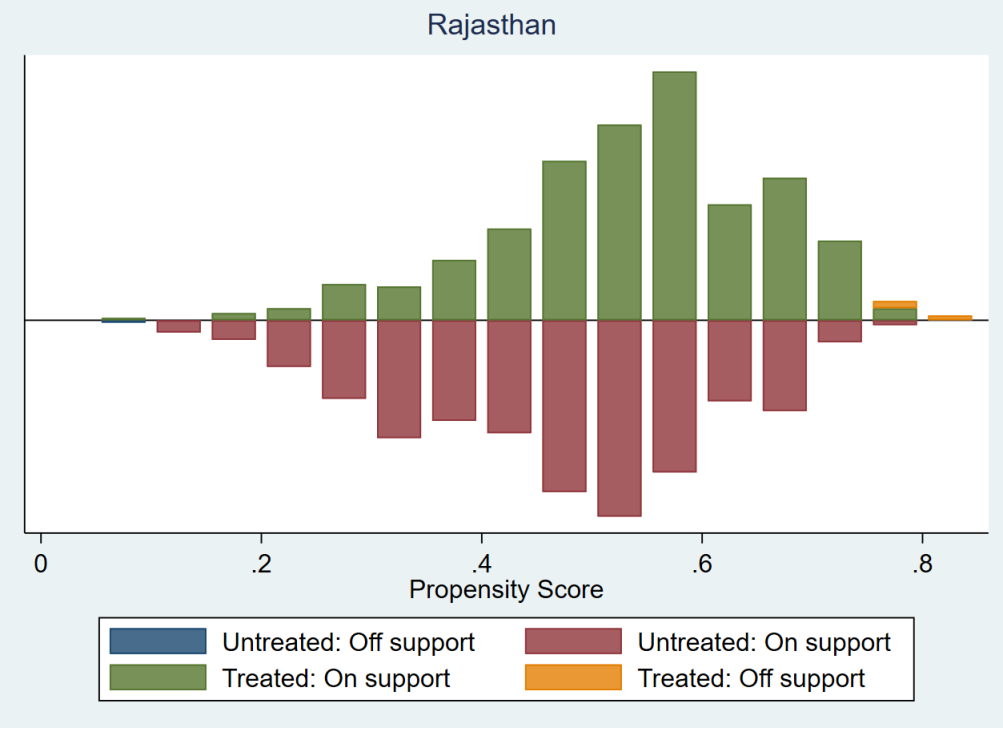
A1. PSM diagnostics: Balance Plots

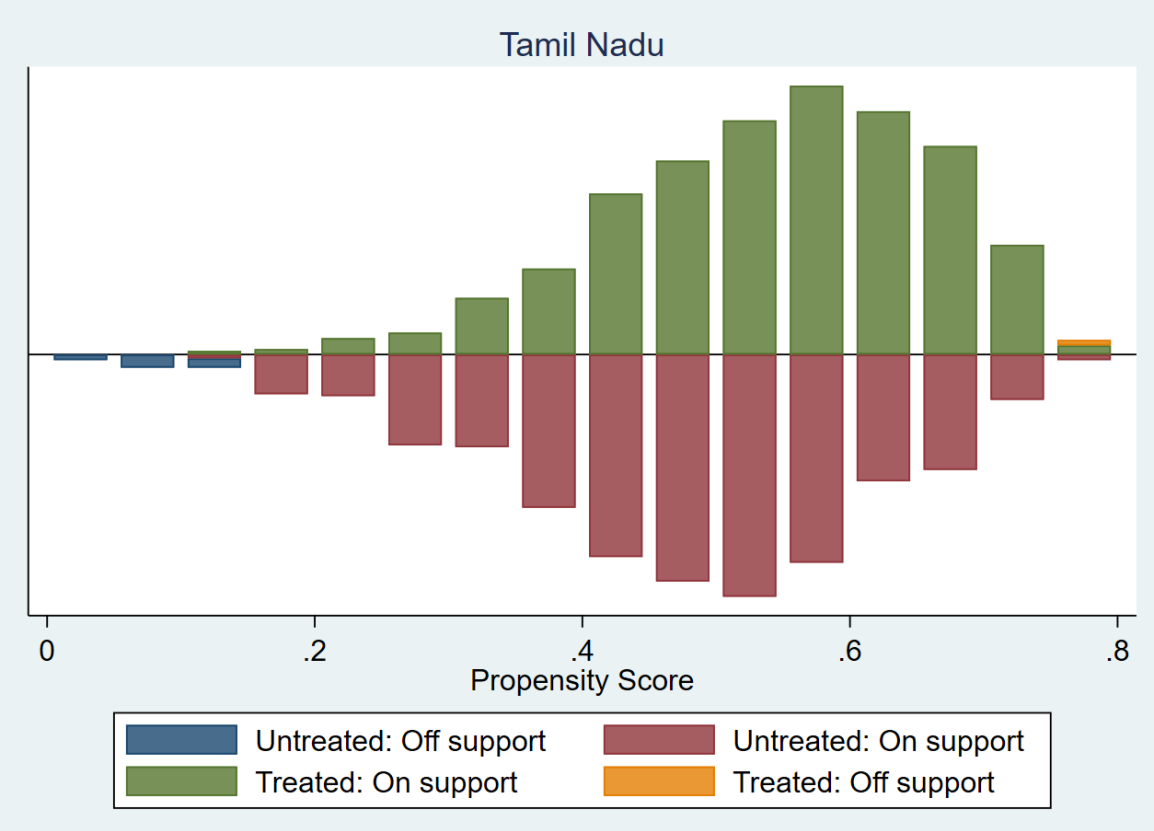
The following figures depict the common support graphs for PSM estimations for the 8 selected states. Covariate balance tables are available on request.

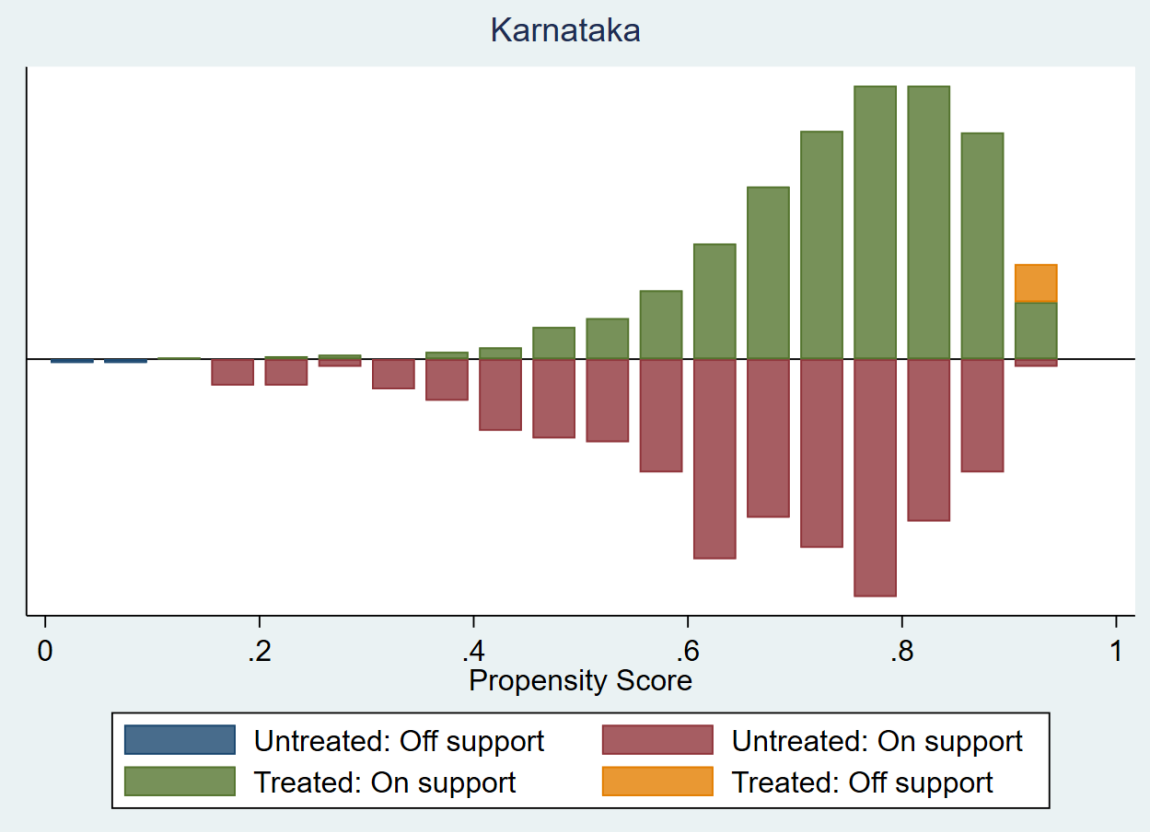


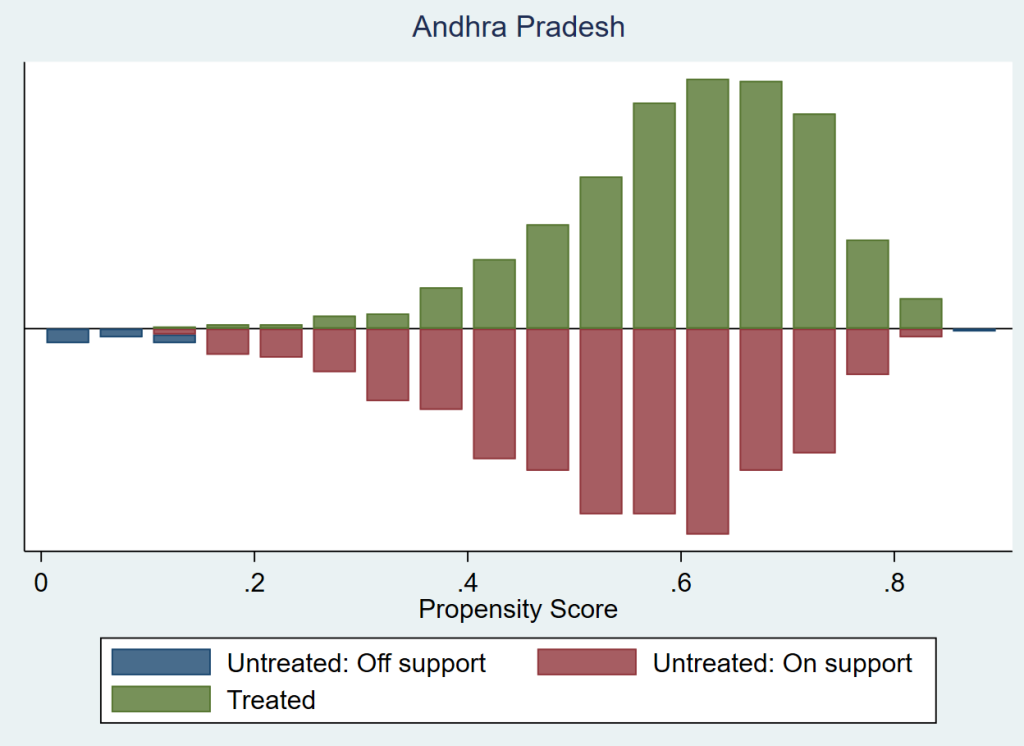


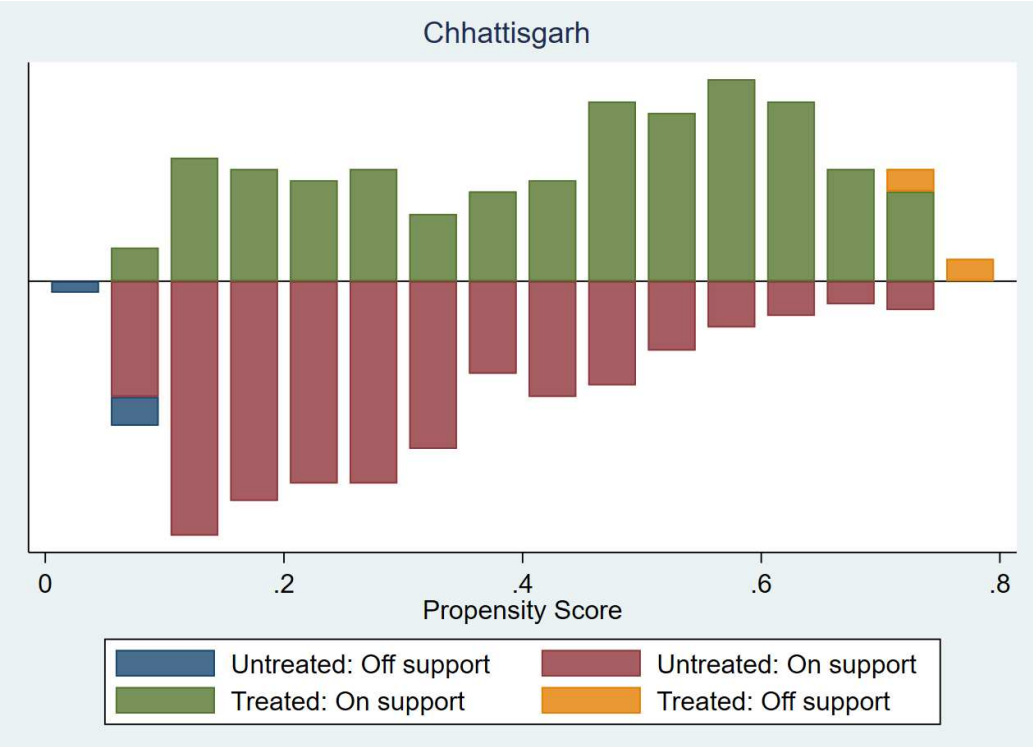

Bihar
0
.2
.4
.6
.8
Propensity Score
Untreated: Off support
Untreated: On support
Treated: On support
Treated: Off support


Rajasthan
0
.2
.4
.6
.8
Propensity Score
Untreated: Off support
Untreated: On support
Treated: On support
Treated: Off support


Tamil Nadu
0
.2
.4
.6
.8
Propensity Score
Untreated: Off support
Untreated: On support
Treated: On support
Treated: Off support


Karnataka
0
.2
.4
.6
.8
1
Propensity Score
Untreated: Off support
Untreated: On support
Treated: On support
Treated: Off support


Andhra Pradesh
0
.2
.4
.6
.8
Propensity Score
Untreated: Off support
Untreated: On support
Treated


Chhattisgarh
0
.2
.4
.6
.8
Propensity Score
Untreated: Off support
Untreated: On support
Treated: On support
Treated: Off support