

Online Appendix

Guaranteed Employment in Rural India: Intra-Household Labor and Resource Allocation Consequences

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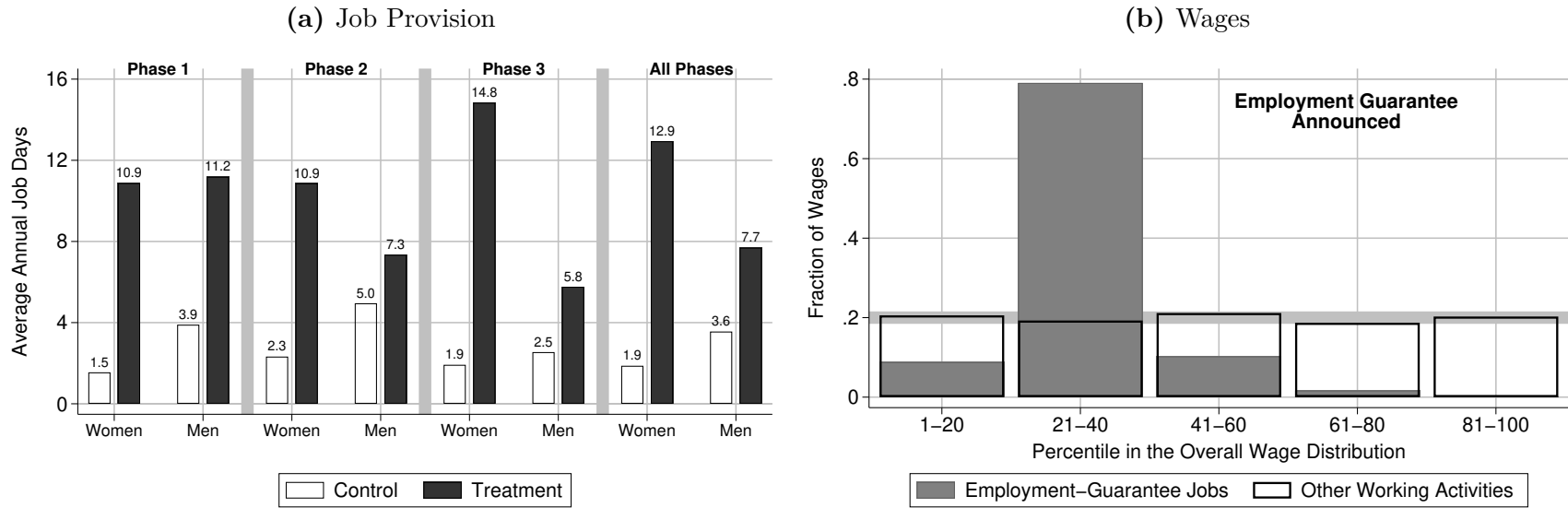
Appendix 1. Summary Statistics and Additional Description of Data

Table A.1. Summary Statistics: Consumption Samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Panel a. Full Sample		Panel b. Rural Sample							
			2004-2005			2011-2012			Diff-in-Diff	
	<i>Urban</i>	<i>Rural</i>	<i>Control</i>	<i>Treat</i>	<i>Diff</i>	<i>Control</i>	<i>Treat</i>	<i>Diff</i>	(8)-(5)	<i>p</i> -value
Household-level										
<i>Head's Age</i>										
HE-NSS	43.00	42.74	42.75	42.19	-0.56	43.46	42.78	-0.68	-0.118	0.965
IHDS	43.03	42.64	39.06	39.21	0.14	46.15	46.29	0.15	0.003	0.996
<i>Spouse's Age</i>										
HE-NSS	37.76	37.79	37.68	37.35	-0.33	38.60	38.22	-0.38	-0.050	0.984
IHDS	37.55	37.51	33.88	34.45	0.57	40.85	41.36	0.51	-0.062	0.994
<i>Disadvantaged</i>										
HE-NSS	0.56	0.75	0.71	0.84	0.13	0.74	0.86	0.13	-0.003	0.982
IHDS	0.52	0.69	0.65	0.81	0.16	0.65	0.81	0.16	0.004	0.998
<i>Head's Literacy</i>										
HE-NSS	0.85	0.62	0.62	0.56	-0.07	0.68	0.64	-0.04	0.028	0.989
IHDS	0.87	0.69	0.71	0.66	-0.05	0.70	0.67	-0.03	0.024	0.997
District-level										
<i>Autumn Crops</i>										
HE-NSS		554.22	490.70	374.12	-116.58	969.39	444.21	-525.17	-408.590	0.008
IHDS		721.73	755.71	261.90	-493.81	991.94	373.57	-618.36	-124.553	0.989
<i>Winter Crops</i>										
HE-NSS		332.00	328.62	209.75	-118.88	480.68	330.14	-150.54	-31.666	0.997
IHDS		353.09	326.44	191.21	-135.24	467.05	281.27	-185.78	-50.542	0.993
State-level										
<i>Rain</i>										
HE-NSS	1.25	1.29	1.39	0.91	-0.48	1.37	1.03	-0.33	0.142	0.982
IHDS	1.35	1.33	1.43	1.16	-0.26	1.38	1.07	-0.32	-0.055	0.989
Observations										
HE-NSS	119,199	208,162	39,933	13,915		30,823	10,639			
IHDS	13,732	32,598	11,310	4,989		11,310	4,989			

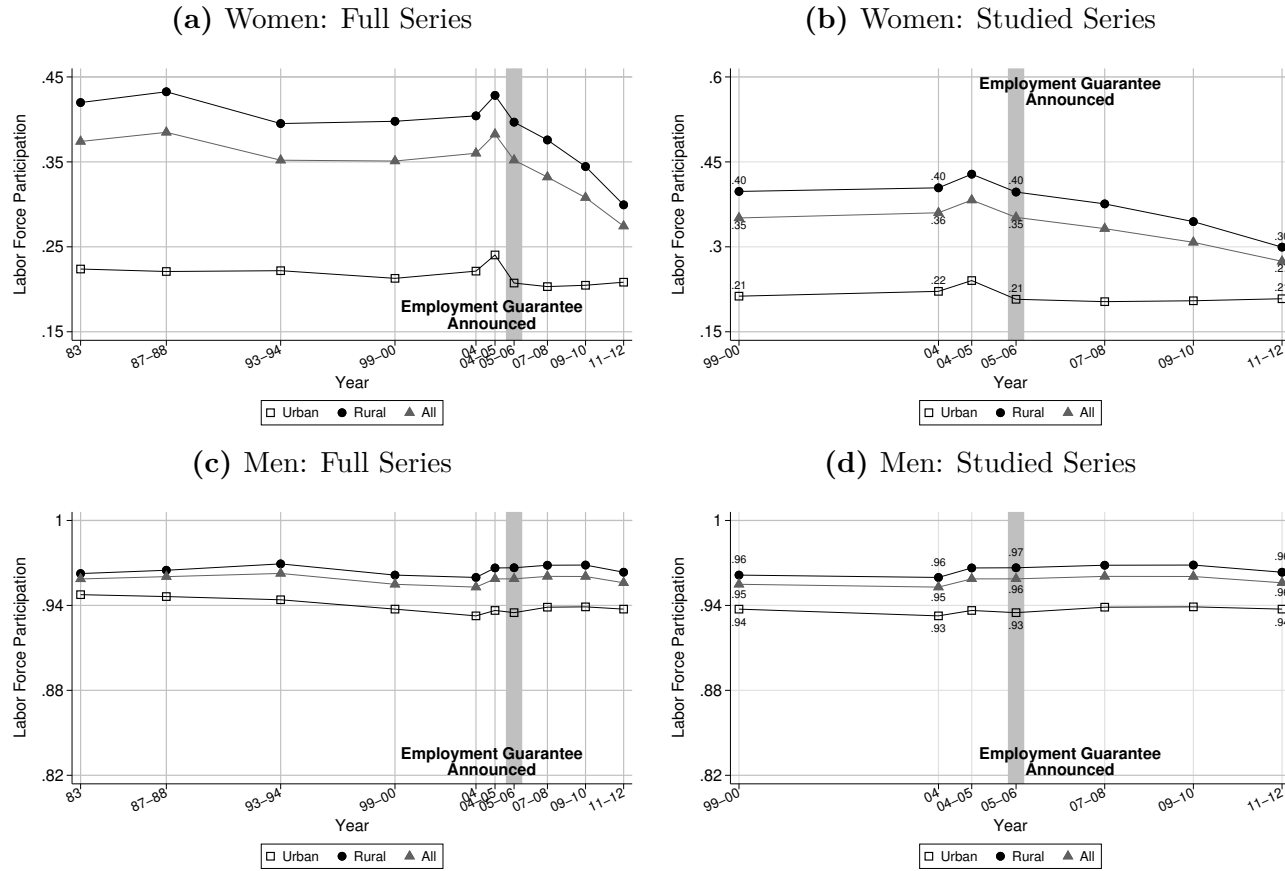
Note: Panel a. displays the average or number of observations for the consumption samples described in Table 1. Panel b. is analogous in format to Panel a. except that it limits the sample to rural households for the years in the label and corresponding group of states (Control/Treat). Column (10) displays the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0. **Variable definitions:** Disadvantaged: Adivasi and Dalit (“scheduled castes and scheduled tribes”) or “other backward classes.” All other households are non-disadvantaged in my classification. Married: currently married, as opposed to single (never married), divorced, or widowed. Autumn-crop production: Kharif crop yields in thousands of bushels per acre. Winter-crop production: Rabi crop yields in thousands of bushels per acre. Monsoon rain: monsoon rain in liters per square meter. Control/Treat: belonging to either the control or treatment states defined in Section 3.

Figure A.1. Employment Guarantee: Provision and Wages



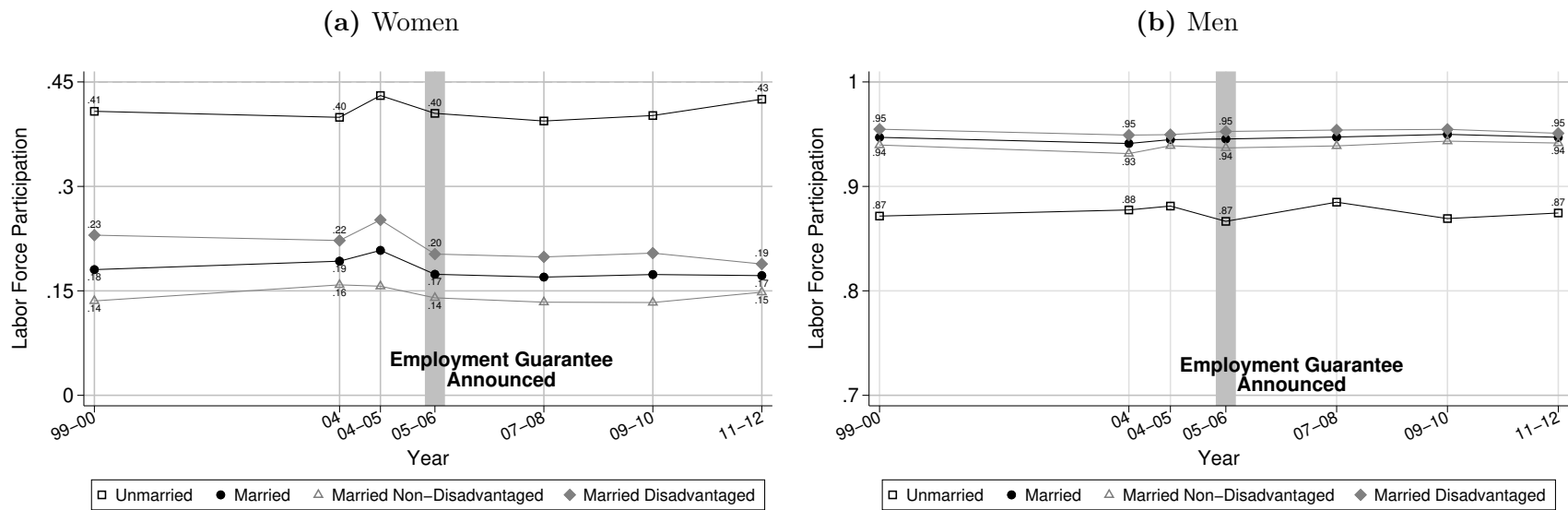
Note: Panel (a) displays the average annual days worked in employment-guarantee jobs (individuals who do no work in employment-guarantee jobs are assigned 0 days). It displays the average by district-level implementation phase and state treatment status. The calculations are based on the 2011-2012 rural observations of the IHDS labor-market sample described in Section 2.1. Panel (b) is based on the 2011-2012 rural male observations of the IHDS labor-market sample described in Section 2.1. It plots the fraction of wages that fall into each of the quintiles of the overall distribution.

Figure A.2. (Raw) Labor Force Participation in India, Extended and Studied Timeframes



Note: Panel (a) displays the fraction of women who participated in the labor force during the twelve months prior to the interview conducted in the survey round corresponding to the year in the horizontal axis for the labeled sector. The calculations include married and unmarried (never married, separated, divorced, or widowed) women who were between 25 and 64 years old during the corresponding year. Panel (b) to (d) are analogous in format for the samples labeled. **Sample:** EU-NSS labor-market sample (full series, including non-geocoded) for Panels (a) and (c) and EU-NSS labor-market initial sample for Panels (b) and (d).

Figure A.3. (Raw) Urban Labor Force Participation in India

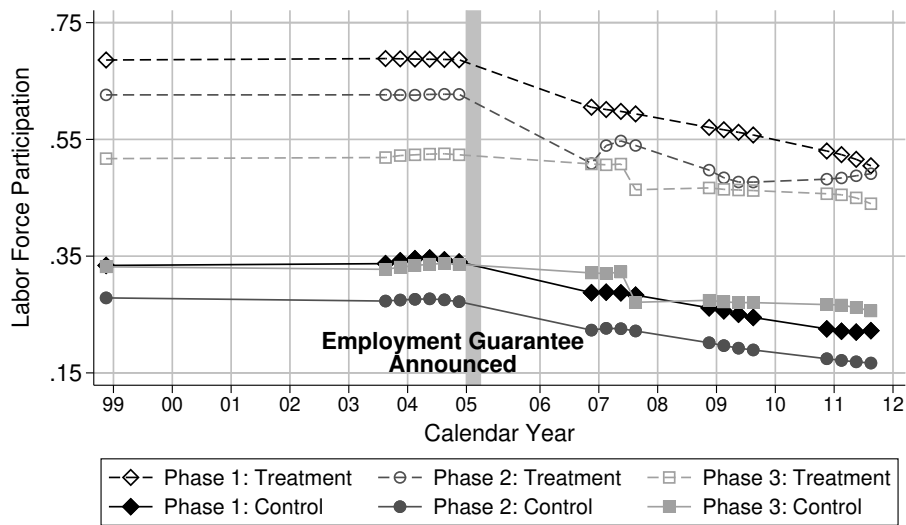


Note: Panels (a) and (b) are analogous in format to Panels (c) and (d) of Figure 2 for urban married individuals. **Sample:** Urban subsample of the EU-NSS labor-market initial sample.

Appendix 2. Labor Force Participation and the Employment Guarantee

A2.1 Quarterly Labor Force Participation of Rural Married Women

Figure A.4. Labor Force Participation of Rural Married Women by District Phase and State Treatment Status



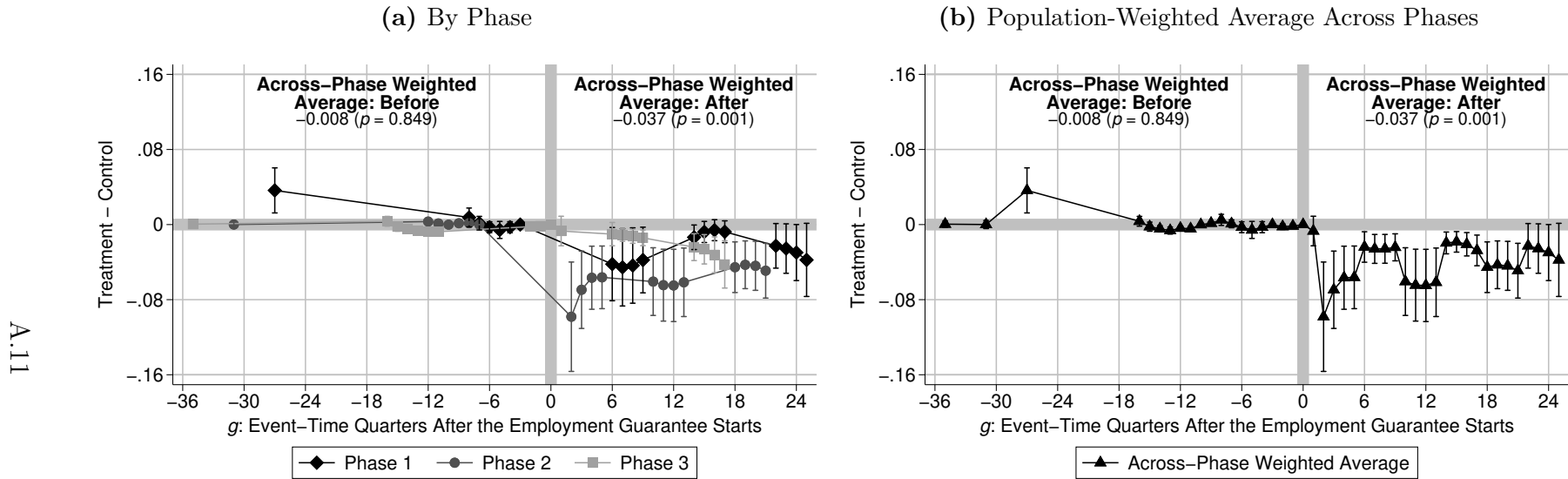
Note: This figure displays the labor force participation rate of rural married women by district-level implementation phase and state-level treatment status. The rates are displayed for each observed calendar-year quarter. **Sample:** Rural married female subsample of the EU-NSS labor-market working sample.

A2.2 Alternative Specifications for the Main Event Study

The data of the EU-NSS are nationally representative for each observed period. The event-study evidence displayed throughout the paper is quarterly to enhance visualization of the trend break before and after the implementation of the employment guarantee. Since the survey sampling is not designed for quarterly representativity, the quarterly averages are imprecise by construction. To address this issue, I use linear regression to predict the quarterly averages, using cross-sectional averages as predictors. The inference for these quarterly averages accounts for this prediction: in each bootstrap resample used to construct the jackknifed wild bootstrapped confidence intervals, the prediction is re-estimated. This adjustment improves visual clarity while preserving the underlying trends. Importantly, it does not affect the main results in Table 3, which rely on binning periods before and after implementation. The confidence intervals displayed reflect the sampling variation inherent in this computation.¹

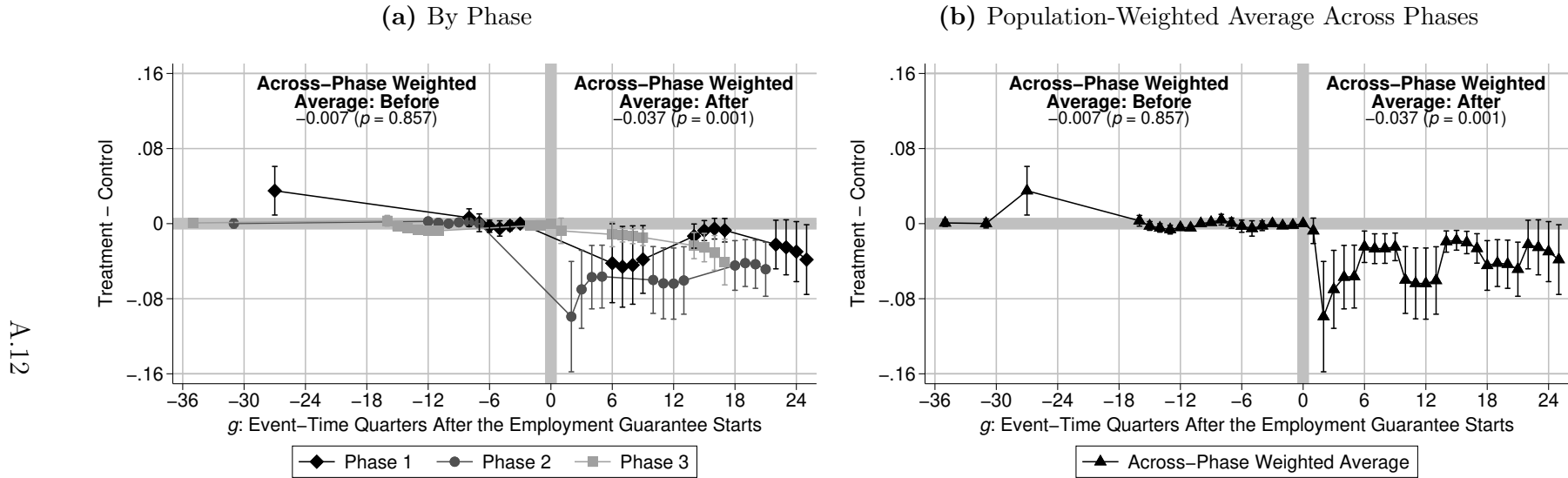
¹I follow the same procedure when analyzing marriage and consumption. By the same argument, the main results on consumption (Appendix Table A.5) and marriage (Appendix Table A.4) are not impacted by this procedure.

Figure A.5. Labor Force Participation of Rural Married Women and the Employment Guarantee, Main Event Study (District Fixed Effects)



Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2), including district fixed effects. The estimates displayed are the (conditional) quarterly labor force participation rate in Phase- p districts located in treatment states minus the analogous rate for Phase- p districts located in control states. These treatment-control differences are relative to the difference in the closest quarter before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. **Sample:** Rural married female subsample of the EU-NSS labor-market working sample.

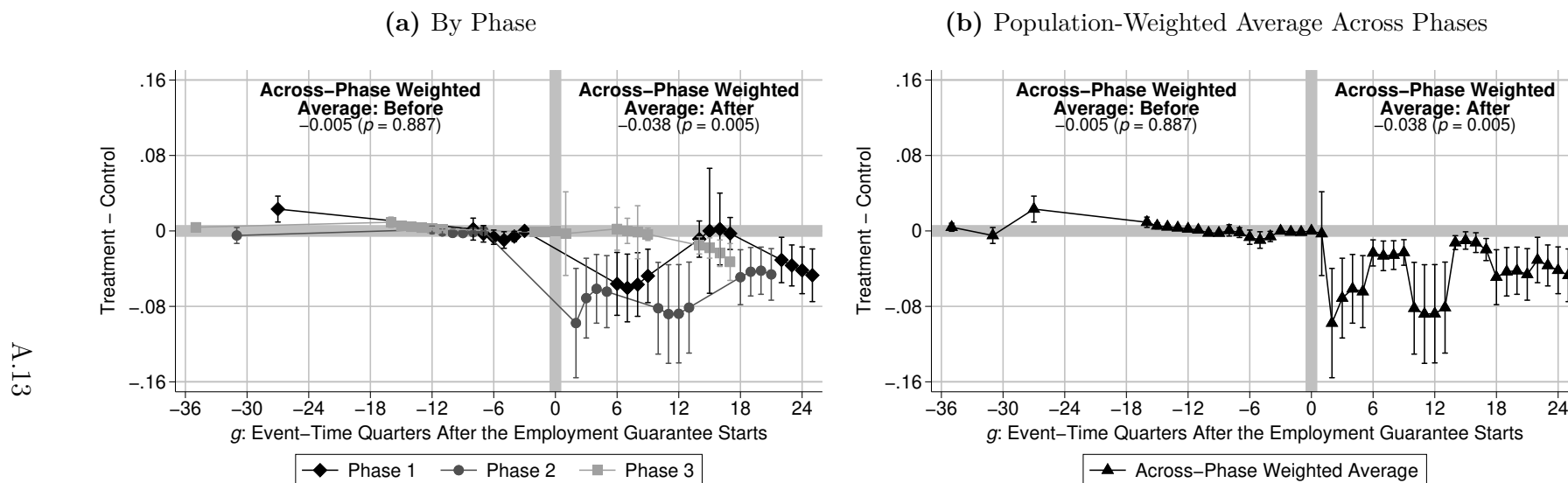
Figure A.6. Labor Force Participation of Rural Married Women and the Employment Guarantee, Main Event Study (District and Age Fixed Effects)



A.12

Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2), including district and age fixed effects. The estimates displayed are the (conditional) quarterly labor force participation rate in Phase- p districts located in treatment states minus the analogous rate for Phase- p districts located in control states. These treatment-control differences are relative to the difference in the closest quarter before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. **Sample:** Rural married female subsample of the EU-NSS labor-market working sample.

Figure A.7. Labor Force Participation of Rural Married Women and the Employment Guarantee, Main Event Study (District and Age Fixed Effects and Controls)



Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2), including district and age fixed effects, as well as the district-level and state-level controls in Table 2 (entered into the equation linearly). The estimates displayed are the (conditional) quarterly labor force participation rate in Phase- p districts located in treatment states minus the analogous rate for Phase- p districts located in control states. These treatment-control differences are relative to the difference in the closest quarter before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. **Sample:** Rural married female subsample of the EU-NSS labor-market working sample.

A2.3 Results Using Samples with a Balanced Number of Districts

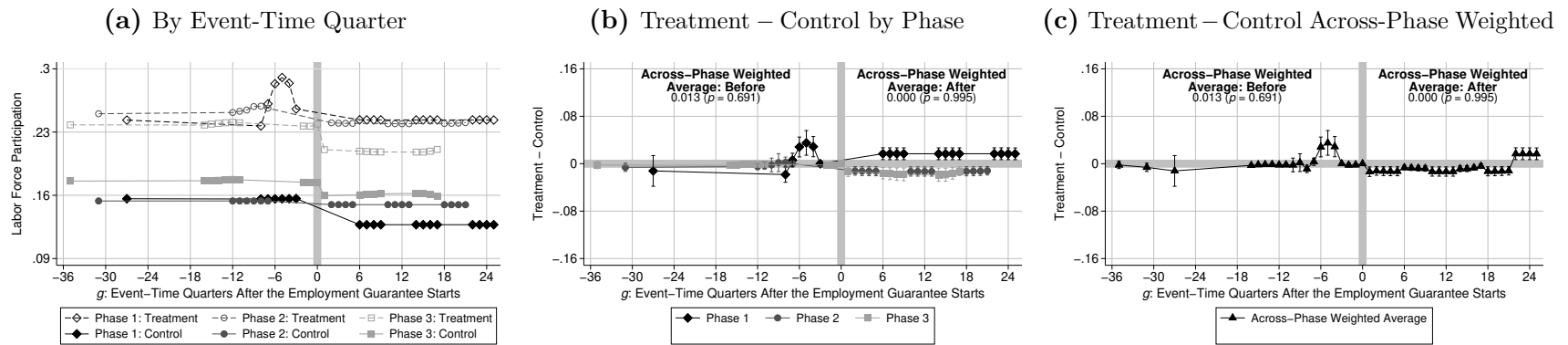
Table A.2. Labor Force Participation of Rural Married Women and Men and the Employment Guarantee, Estimates of the Average Treatment on the Treated Using Samples with a Balanced Number of Districts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel a. Data: EU-NSS; Year Span: 1999-2000 to 2011-2012; Estimator: WDiD</i>								
	Women				Men			
Fixed Effects	Dist	Dist, Age	Dist, Age	Dist, Age, Spouse Age	Dist	Dist, Age	Dist, Age	Dist, Age, Spouse Age
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Estimate (<i>p</i> -value)	-0.030 (0.003)	-0.029 (0.002)	-0.022 (0.002)	-0.023 (0.005)	-0.001 (0.865)	-0.002 (0.761)	-0.001 (0.874)	-0.001 (0.893)
Baseline Treatment Mean	0.639	0.639	0.639	0.639	0.976	0.976	0.976	0.976
Observations	234,503	234,503	216,981	216,894	233,187	233,187	215,900	215,862
<i>Panel b. Data: IHDS; Year Span: 2004-2005 and 2011-2012; Estimator: DiD</i>								
	Women				Men			
Fixed Effects	Indv	Indv, Age	Indv, Age	Indv, Age, Spouse Age	Indv	Indv, Age	Indv, Age	Indv, Age, Spouse Age
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Estimate (<i>p</i> -value)	-0.037 (0.071)	-0.034 (0.035)	-0.042 (0.098)	-0.039 (0.127)	-0.004 (0.672)	-0.005 (0.671)	-0.003 (0.713)	-0.004 (0.589)
Baseline Treatment Mean	0.677	0.677	0.675	0.675	0.963	0.963	0.962	0.962
Observations	13,375	13,375	13,154	13,142	16,328	16,328	16,078	16,050

Note: Column (1) of Panel a. displays details from the estimation of the aggregate average treatment on the treated based on Equation (4) (i.e., on the WDiD estimator) for rural married women. The required estimates of the average treatment on the treated for each phase are based on Equation (2). Columns (2) to (4) are analogous in format to Column (1). Their only difference is the inclusion of additional fixed effects or controls. The controls are the district-level and state-level controls in Table 2 (entered into the equation linearly). Columns (5) to (8) are analogous in format to Columns (1) to (4) for rural married men. Panel b. is analogous in format to Panel a. The estimate of the aggregate average treatment on the treated is based on Equation (5) (i.e., on the DiD estimator). Panel b. is based on longitudinal data rather than repeated cross-sections. It thus replaces district (Dist) with individual (Indv) fixed effects. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Rural married female (left) and male (right) subsamples of the EU-NSS (Panel a.) and IHDS (Panel b.) labor-market working samples. An additional delimitation relative to Table 3 is imposed in the EU-NSS subsamples: individuals are only included if they belong to districts observed in six out of the seven rounds of the EU-NSS. This delimitation allows describing results for an underlying balanced panel of 323 districts that includes the great majority of the EU-NSS working subsample used in Table 3. A similar delimitation based on seven rounds is impractical because very few districts, and, thus, individuals, would be observed.

A2.4 Placebo Samples

Figure A.8. (Raw) Labor Force Participation of Urban Married Women by District Phase and State Treatment Status



Note: Panels (a) to (c) are analogous in format to Panels (a) to (c) of Figure 3 for urban married women. **Sample:** Urban married female subsample of the EU-NSS labor-market working sample.

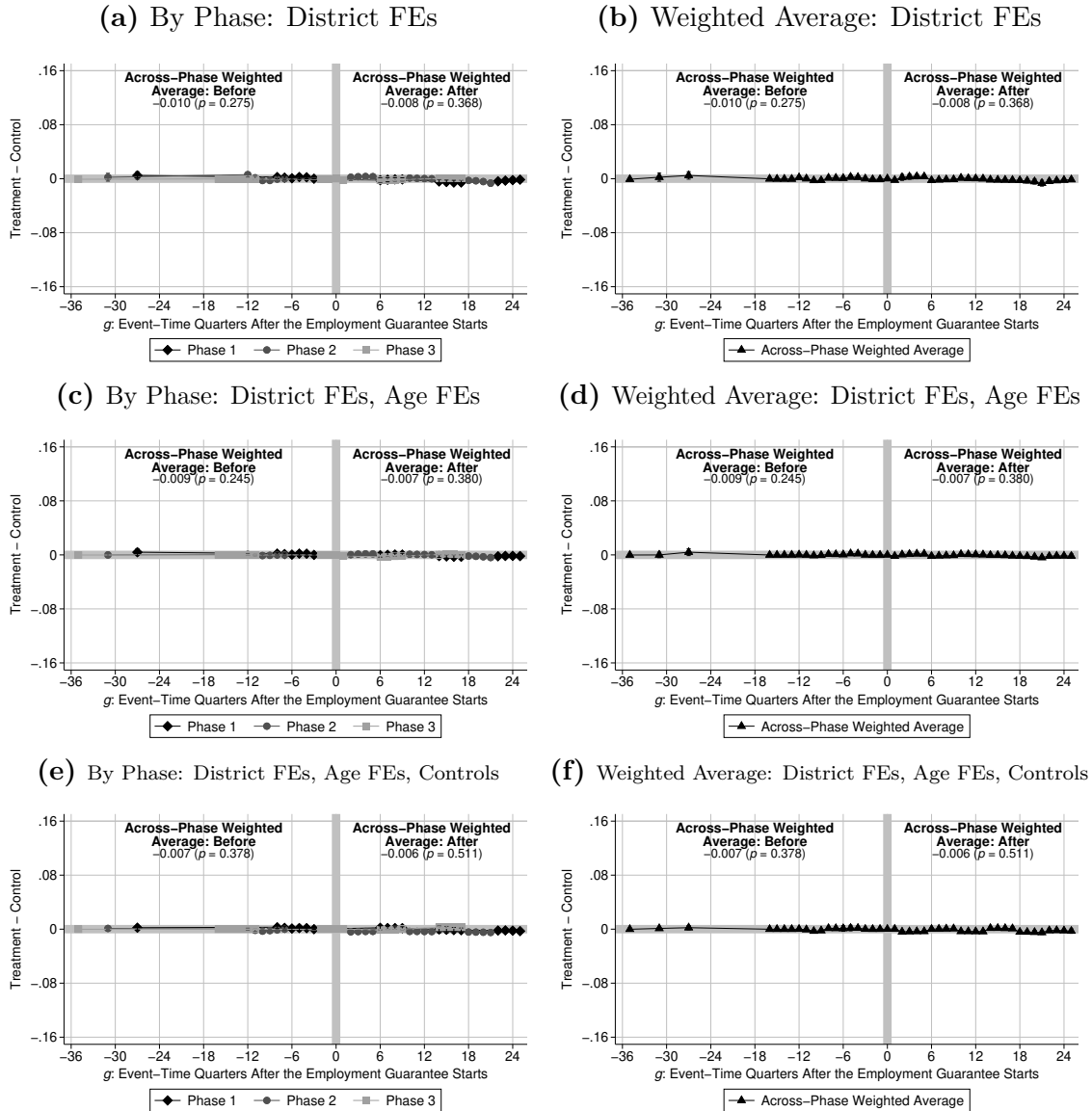
Table A.3. Labor Force Participation of Women in Placebo Samples and the Employment Guarantee, Estimates of the Average Treatment on the Treated

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel a. Data: EU-NSS; Year Span: 1999-2000 to 2011-2012; Estimator: WDiD</i>								
	Urban				Rural Non-Disadvantaged			
Fixed Effects	Dist	Dist, Age	Dist, Age	Dist, Age, Spouse Age	Dist	Dist, Age	Dist, Age	Dist, Age, Spouse Age
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Estimate (<i>p</i> -value)	-0.006 (0.785)	-0.006 (0.755)	-0.014 (0.503)	-0.013 (0.505)	0.027 (0.657)	0.026 (0.665)	0.021 (0.742)	0.020 (0.753)
Baseline Control Mean	0.166	0.166	0.166	0.166	0.225	0.225	0.223	0.223
Observations	181,046	181,046	157,353	157,324	98,261	98,261	93,906	93,879
<i>Panel b. Data: IHDS; Year Span: 2004-2005 and 2011-2012; Estimator: DiD</i>								
	Urban				Rural Non-Disadvantaged			
Fixed Effects	Indv	Indv, Age	Indv, Age	Indv, Age, Spouse Age	Indv	Indv, Age	Indv, Age	Indv, Age, Spouse Age
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Estimate (<i>p</i> -value)	0.026 (0.525)	0.026 (0.564)	0.010 (0.773)	0.010 (0.793)	-0.010 (0.901)	-0.004 (0.957)	0.006 (0.944)	0.000 (0.999)
Baseline Control Mean	0.295	0.295	0.298	0.299	0.451	0.451	0.436	0.436
Observations	6,257	6,257	6,064	6,059	3,587	3,587	3,544	3,540

Note: Column (1) of Panel a. displays details from the estimation of the aggregate average treatment on the treated based on Equation (4) (i.e., on the WDiD estimator) for urban married women. The required estimates of the average treatment on the treated for each phase are based on Equation (2). Columns (2) to (4) are analogous in format to Column (1). Their only difference is the inclusion of additional fixed effects or controls. The controls are the district-level and state-level controls in Table 2 (entered into the equation linearly). Columns (5) to (8) are analogous in format to Columns (1) to (4) for rural non-disadvantaged married women. Panel b. is analogous in format to Panel a. The estimate of the aggregate average treatment on the treated is based on Equation (5) (i.e., on the DiD estimator). Panel b. is based on longitudinal data rather than repeated cross-sections. It thus replaces district (Dist) with individual (Indv) fixed effects. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Urban married female (left) and rural non-disadvantaged married (right) subsamples of the EU-NSS (Panel a.) and IHDS (Panel b.) labor-market working samples.

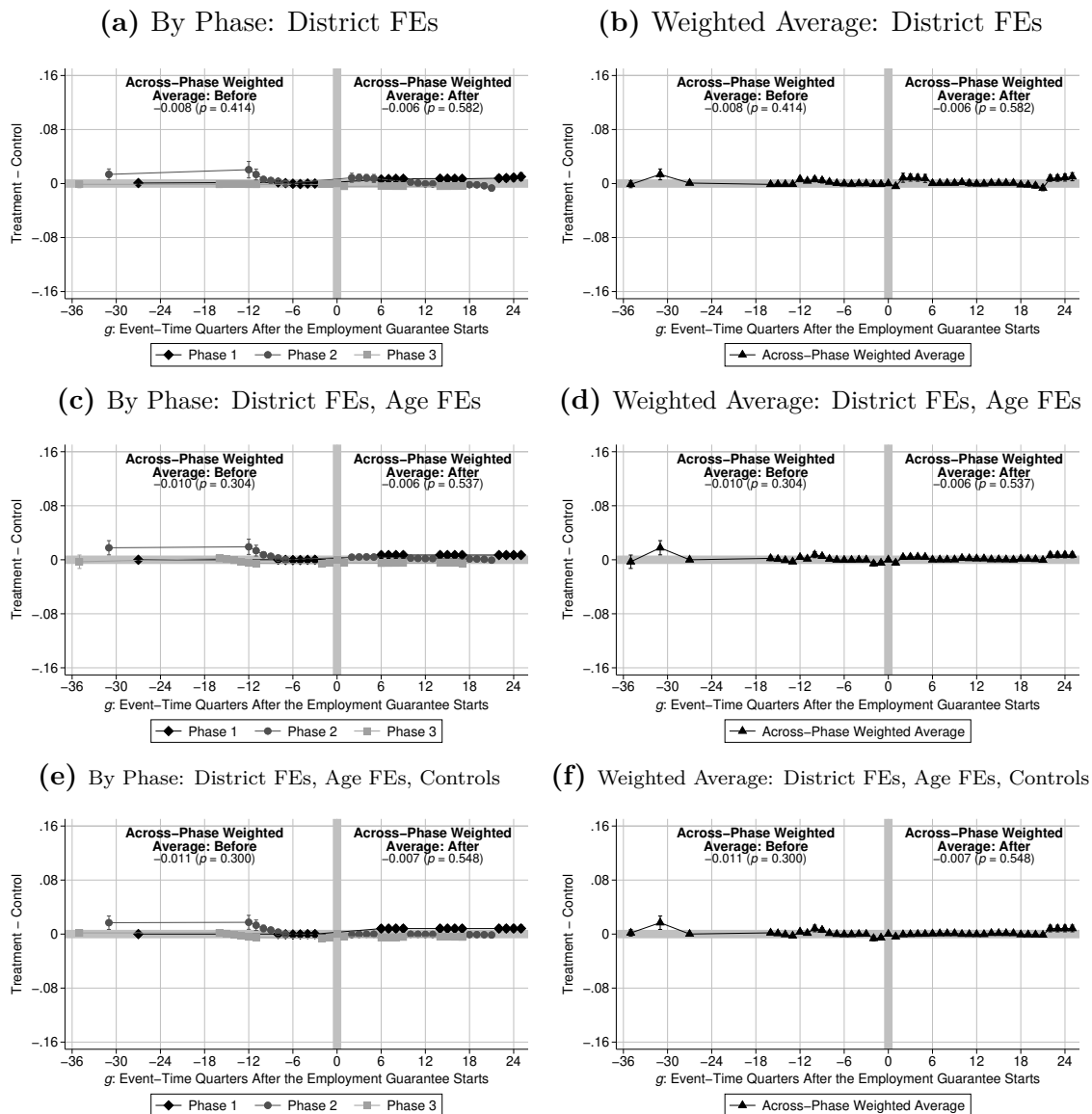
Appendix 3. Marriage and the Employment Guarantee

Figure A.9. Marital Status of Rural Women and the Employment Guarantee, Event Studies



Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2), including district fixed effects and using married (i.e., currently married, as opposed to single, divorced, or widowed) as the dependent variable. The estimates displayed are the (conditional) quarterly marriage rate in Phase- p districts located in treatment states minus the analogous rate for Phase- p districts located in control states. These treatment-control differences are relative to the difference in the closest quarter before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. The remaining panels are analogous in format for the specifications labeled. Controls are the district-level and state-level controls in Table 2 (entered into the equation linearly). **Sample:** Rural female subsample of the EU-NSS labor-market working sample.

Figure A.10. Marital Status of Rural Men and the Employment Guarantee, Event Studies



Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2), including district fixed effects and using married (i.e., currently married, as opposed to single, divorced, or widowed) as the dependent variable. The estimates displayed are the (conditional) quarterly marriage rate in Phase- p districts located in treatment states minus the analogous rate for Phase- p districts located in control states. These treatment-control differences are relative to the difference in the closest quarter before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. The remaining panels are analogous in format for the specifications labeled. Controls are the district-level and state-level controls in Table 2 (entered into the equation linearly). **Sample:** Rural male subsample of the EU-NSS labor-market working sample.

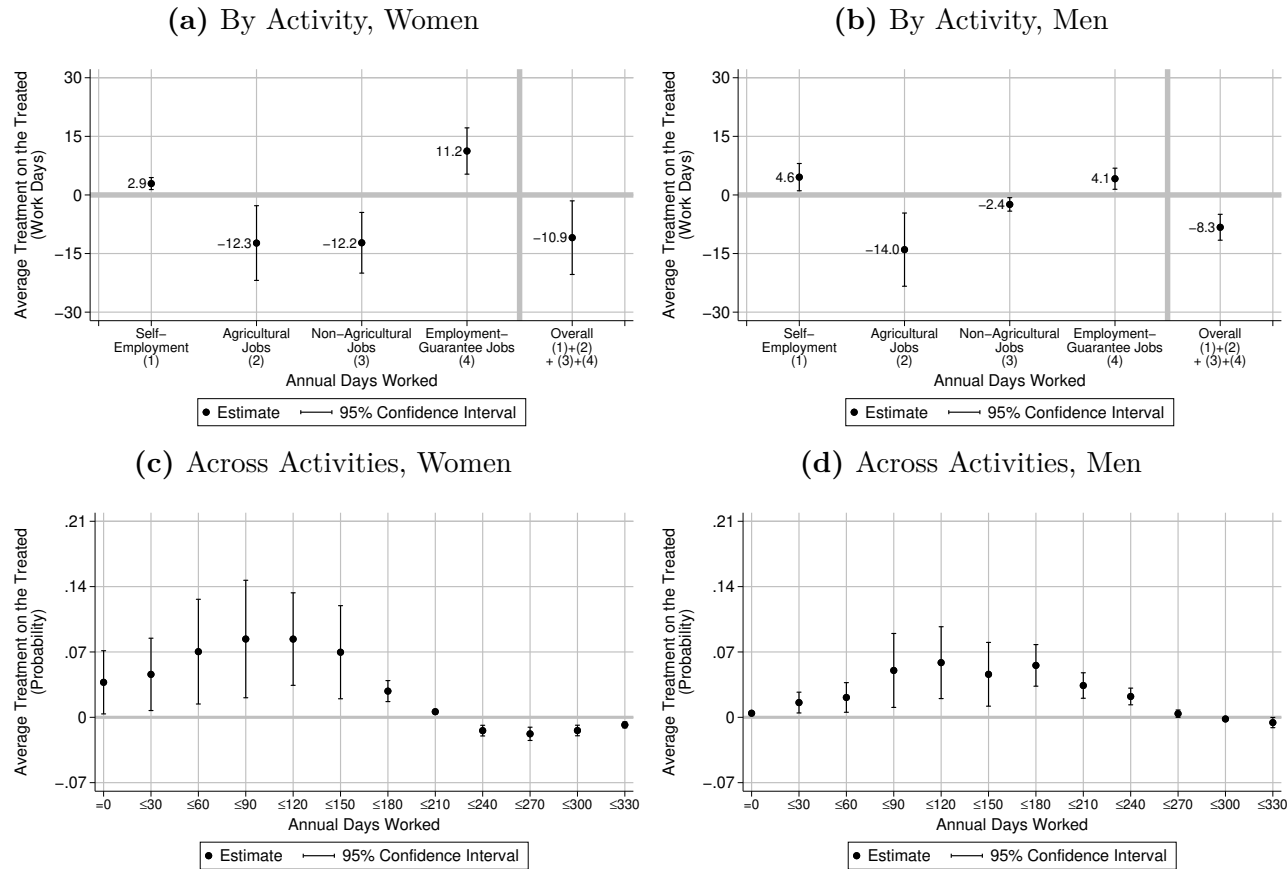
Table A.4. Marital Status of Rural Women and Men and the Employment Guarantee, Estimates of the Average Treatment on the Treated

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel a. Data: EU-NSS; Year Span: 1999-2000 to 2011-2012; Estimator: WDiD</i>						
	Women			Men		
Fixed Effects	Dist	Dist, Age	Dist, Age	Dist	Dist, Age	Dist, Age
Controls	No	No	Yes	No	No	Yes
Estimate	-0.008	-0.007	-0.006	-0.006	-0.006	-0.007
(<i>p</i> -value)	(0.368)	(0.380)	(0.511)	(0.582)	(0.537)	(0.548)
Baseline Treatment Mean	0.865	0.865	0.865	0.911	0.911	0.912
Observations	380,775	380,775	342,417	376,896	376,896	337,896
<i>Panel b. Data: IHDS; Year Span: 2004-2005 and 2011-2012; Estimator: DiD</i>						
	Women			Men		
Fixed Effects	Indv	Indv, Age	Indv, Age	Indv	Indv, Age	Indv, Age
Controls	No	No	Yes	No	No	Yes
Estimate	0.000	-0.001	0.001	0.001	-0.005	-0.006
(<i>p</i> -value)	(0.965)	(0.887)	(0.887)	(0.975)	(0.797)	(0.777)
Baseline Treatment Mean	0.875	0.875	0.875	0.900	0.900	0.900
Observations	16,829	16,829	16,556	18,514	18,514	18,234

Note: Column (1) of Panel a. displays details from the estimation of the aggregate average treatment on the treated based on Equation (4) (i.e., on the WDiD estimator) for rural women, using married (i.e., currently married, as opposed to single, divorced, or widowed) as the dependent variable. The required estimates of the average treatment on the treated for each phase are based on Equation (2). Columns (2) and (3) are analogous in format to Column (1). Their only difference is the inclusion of additional fixed effects or controls. The controls are the district-level and state-level controls in Table 2 (entered into the equation linearly). Columns (4) to (6) are analogous in format to Columns (1) to (3) for rural men. Panel b. is analogous in format to Panel a. The estimate of the aggregate average treatment on the treated is based on Equation (5) (i.e., on the DiD estimator). Panel b. is based on longitudinal data rather than repeated cross-sections. It thus replaces district (Dist) with individual (Indv) fixed effects. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Rural female (left) and male (right) subsamples of the EU-NSS (Panel a.) and IHDS (Panel b.) labor-market working samples.

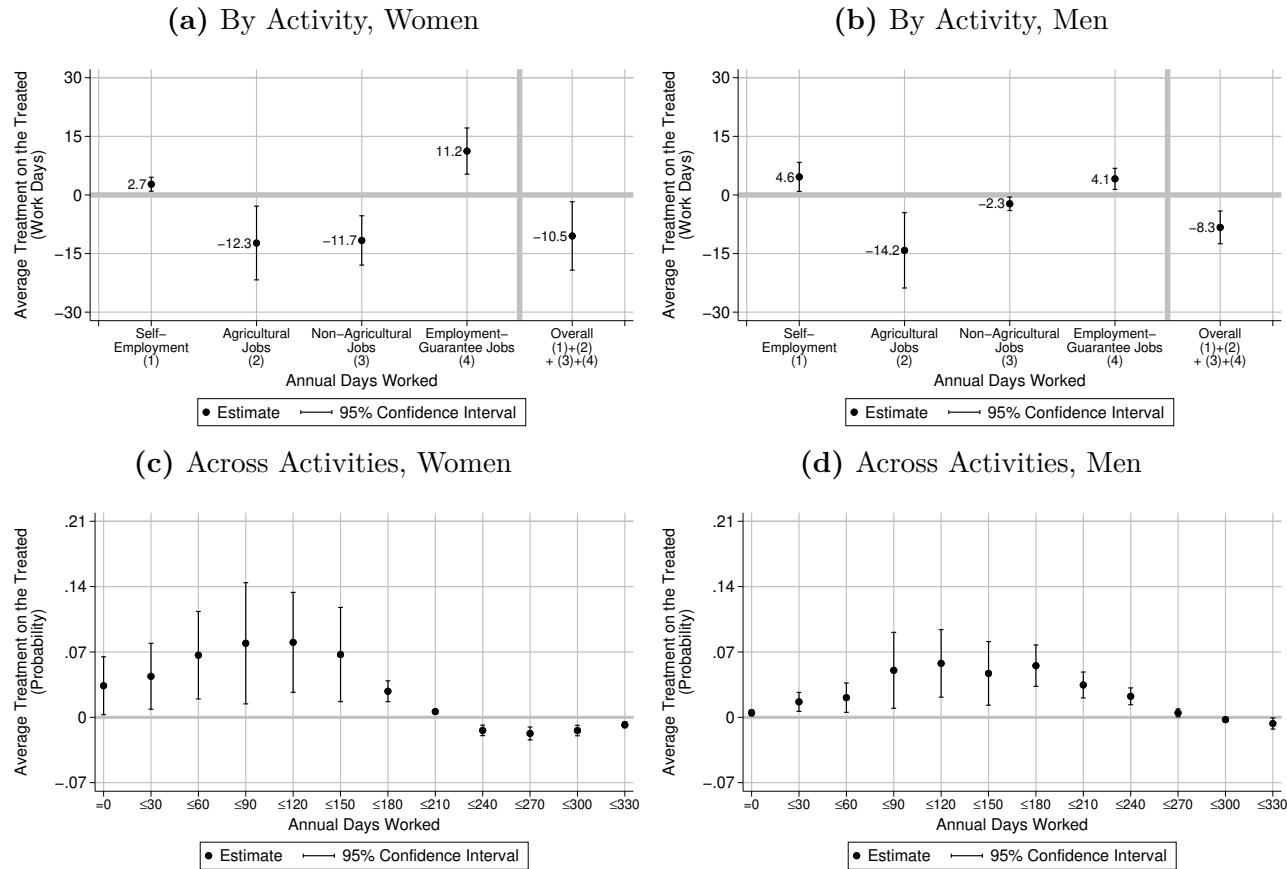
Appendix 4. Annual Days Worked and the Employment Guarantee

Figure A.11. Annual Days Worked and the Employment Guarantee, Individual Fixed Effects



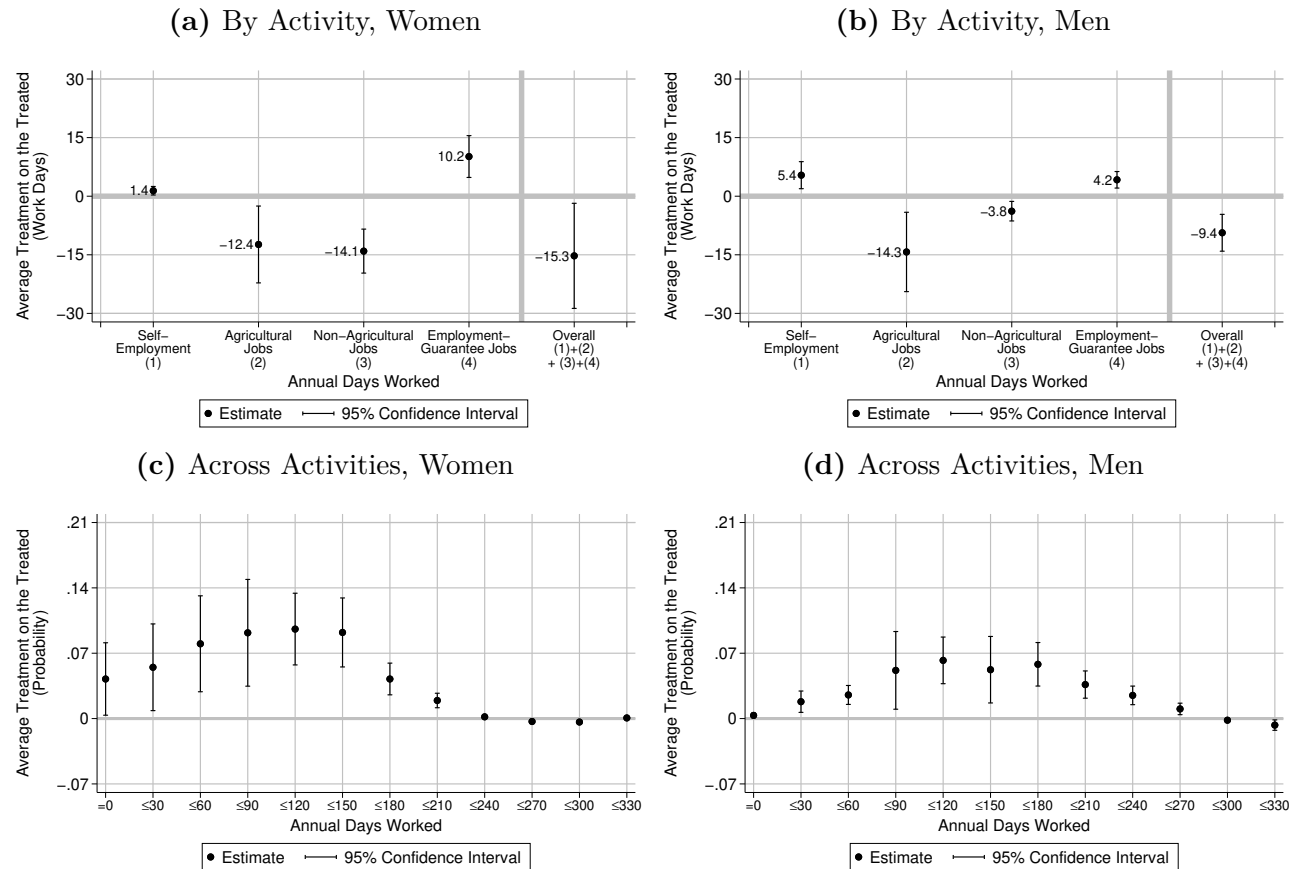
Note: Panels (a) and (c) display estimates of the aggregate average treatment on the treated for rural married women based on Equation (5) for each of the dependent variables labeled in the horizontal axes. Days worked are measured annually. Individuals who do not work in a certain category are assigned 0 days (i.e., days worked are not conditional on participation). The specification of Equation (5) includes individual fixed effects. The confidence intervals are based on the jackknifed wild-bootstrapped distribution clustered at the state level. Panels (b) and (d) are analogous in format to Panels (a) and (c) for rural married men. **Sample:** Rural married female (a and c) and male (b and d) subsamples of the IHDS labor-market sample.

Figure A.12. Annual Days Worked and the Employment Guarantee, Individual and Age Fixed Effects



Note: Panels (a) and (c) display estimates of the aggregate average treatment on the treated for rural married women based on Equation (5) for each of the dependent variables labeled in the horizontal axes. Days worked are measured annually. Individuals who do not work in a certain category are assigned 0 days (i.e., days worked are not conditional on participation). The specification of Equation (5) includes individual and age fixed effects. The confidence intervals are based on the jackknifed wild-bootstrapped distribution clustered at the state level. Panels (b) and (d) are analogous in format to Panels (a) and (c) for rural married men. **Sample:** Rural married female (a and c) and male (b and d) subsamples of the IHDS labor-market sample.

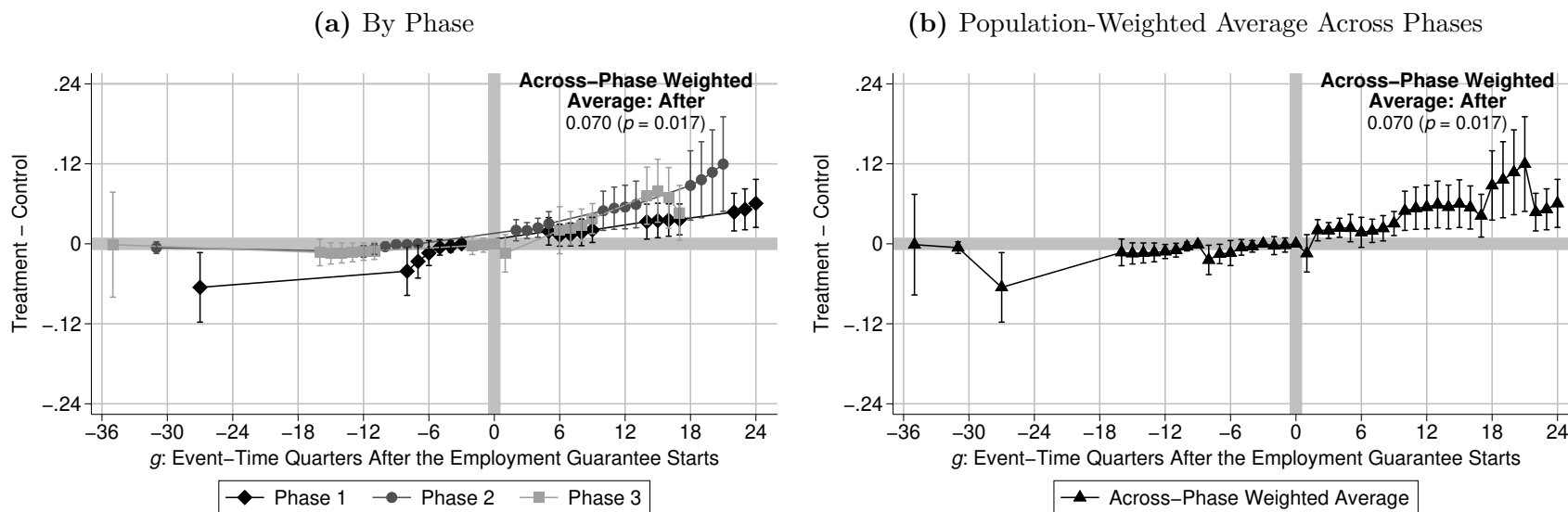
Figure A.13. Annual Days Worked and the Employment Guarantee, Individual and Age Fixed Effects and Controls



Note: Panels (a) and (c) display estimates of the aggregate average treatment on the treated for rural married women based on Equation (5) for each of the dependent variables labeled in the horizontal axes. Days worked are measured annually. Individuals who do not work in a certain category are assigned 0 days (i.e., days worked are not conditional on participation). The specification of Equation (5) includes individual and age fixed effects, as well as the district-level and state-level controls in Table 2 (entered into the equation linearly). The confidence intervals are based on the jackknifed wild-bootstrapped distribution clustered at the state level. Panels (b) and (d) are analogous in format to Panels (a) and (c) for rural married men. **Sample:** Rural married female (a and c) and male (b and d) subsamples of the IHDS labor-market sample.

Appendix 5. Consumption, Savings, and the Employment Guarantee

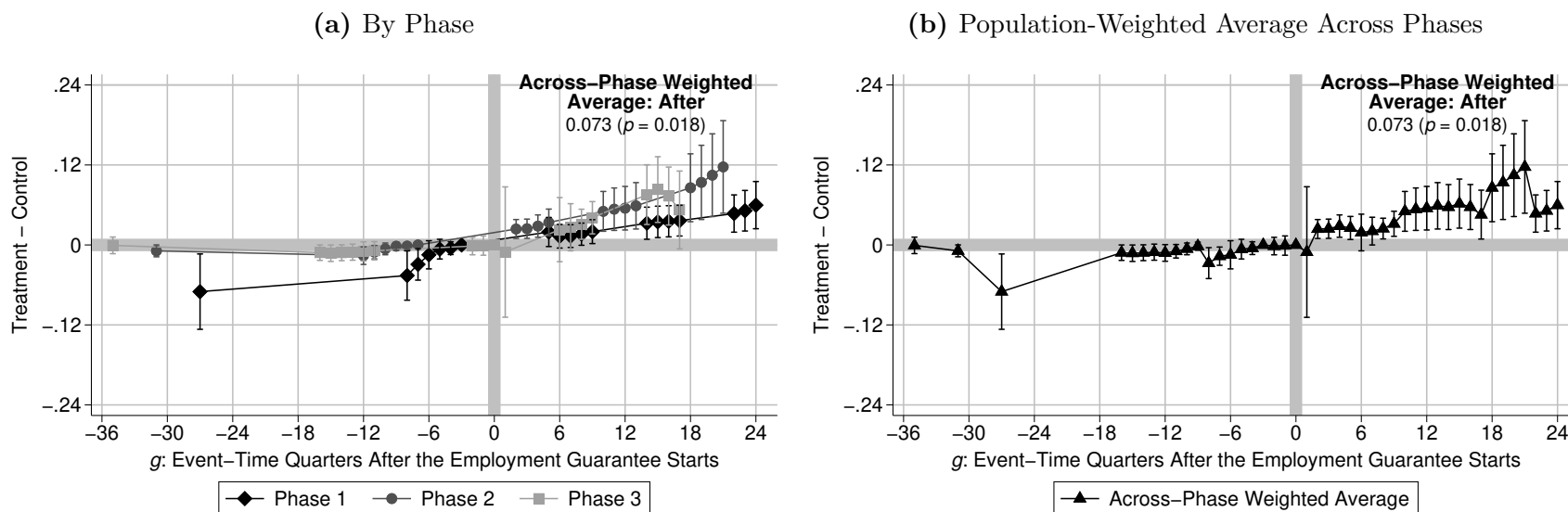
Figure A.14. Log of Household Consumption per Capita of Rural Households and the Employment Guarantee, Main Event Study (District Fixed Effects)



A.28

Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2) using log household consumption as the dependent variable and including district fixed effects. The estimates displayed are the quarterly (conditional) average in Phase- p districts located in treatment states minus the analogous average in Phase- p districts located in control states. These treatment-control differences are relative to the treatment-control difference in the closest period to 0 before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. **Sample:** Rural subsample of the HE-NSS consumption sample.

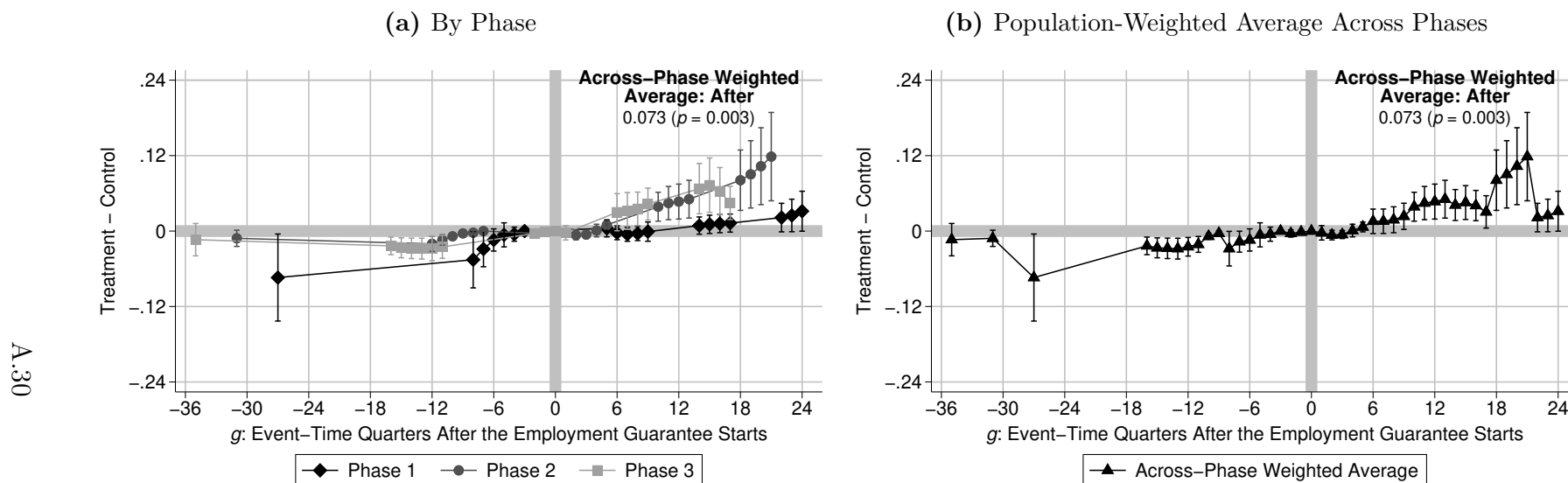
Figure A.15. Log of Household Consumption per Capita of Rural Households and the Employment Guarantee, Main Event Study (District and Household-Head Age Fixed Effects)



A.29

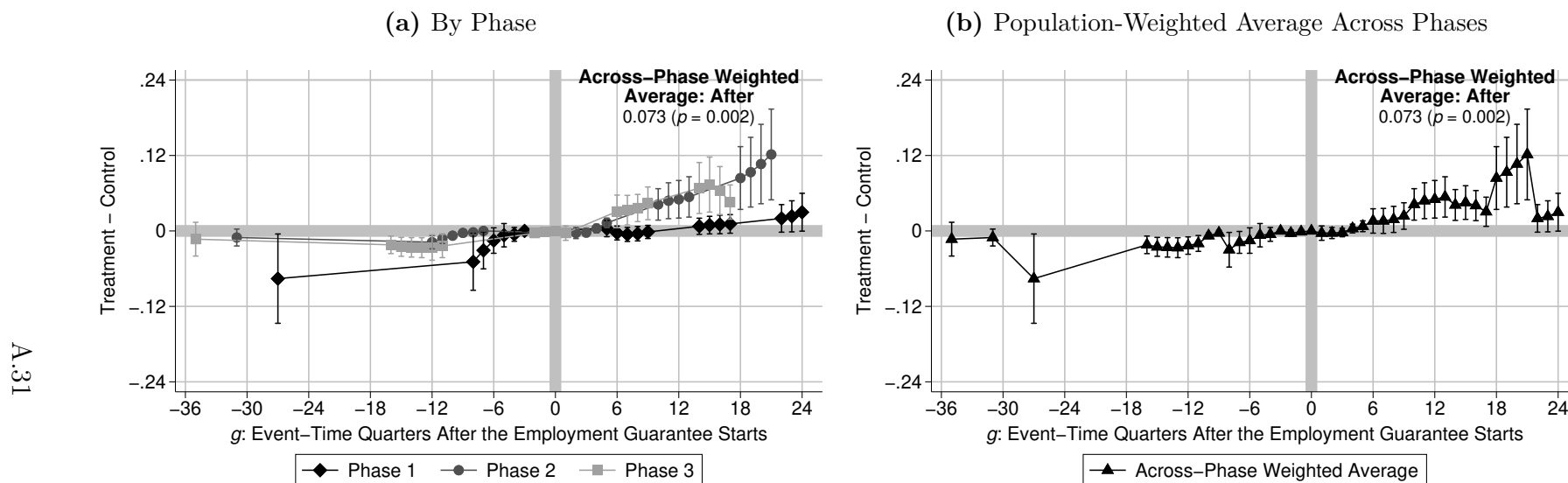
Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2) using log household consumption as the dependent variable and including district and (household-head) age fixed effects. The estimates displayed are the quarterly (conditional) average in Phase- p districts located in treatment states minus the analogous average in Phase- p districts located in control states. These treatment-control differences are relative to the treatment-control difference in the closest period to 0 before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. **Sample:** Rural subsample of the HE-NSS consumption sample.

Figure A.16. Log of Household Consumption per Capita of Rural Households and the Employment Guarantee, Main Event Study (District and Household-Head Age Fixed Effects and Controls)



Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2) using log household consumption as the dependent variable and including district and (household-head) age fixed effects, as well as the district-level and state-level controls in Table 2 (entered into the equation linearly). The estimates displayed are the quarterly (conditional) average in Phase- p districts located in treatment states minus the analogous average in Phase- p districts located in control states. These treatment-control differences are relative to the treatment-control difference in the closest period to 0 before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. **Sample:** Rural subsample of the HE-NSS consumption sample.

Figure A.17. Log of Household Consumption per Capita of Rural Households and the Employment Guarantee, Main Event Study (District, Household-Head Age, and Spouse-Age, Fixed Effects and Controls)



A.31

Note: Panel (a) displays estimates of γ_g^p for each quarter g and phase p based on Equation (2) using log household consumption as the dependent variable and including district, (household-head) age, and spouse-age fixed effects, as well as the district-level and state-level controls in Table 2 (entered into the equation linearly). The estimates displayed are the quarterly (conditional) average in Phase- p districts located in treatment states minus the analogous average in Phase- p districts located in control states. These treatment-control differences are relative to the treatment-control difference in the closest period to 0 before implementation (reference period). The treatment-control difference in the reference period is thus set to 0 and appears in the plot without a confidence interval. Panel (b) displays the population-weighted average of the γ_g^p estimates in Panel (a) based on Equation (3). Both panels display the 95% confidence interval based on the jackknifed wild-bootstrapped distribution clustered at the state level for each treatment-control difference. Both panels display the average weighted treatment-control difference across phases before and after implementation, relative to the reference period, based on Equation (4). The jackknifed wild bootstrapped p -value clustered at the state level associated with the null hypothesis of 0 accompanies each of these differences. **Sample:** Rural subsample of the HE-NSS consumption sample.

Table A.5. Log of Household Consumption per Capita of Rural Households and the Employment Guarantee, Estimates of the Average Treatment on the Treated

	(1)	(2)	(3)	(4)
<i>Panel a. Data: HE-NSS; Year Span: 1999-2000 to 2011-2012; Estimator: WDiD</i>				
Fixed Effects	Dist	Dist, Age	Dist, Age	Dist, Age, Spouse Age
Controls	No	No	Yes	Yes
Estimate	0.070	0.073	0.073	0.073
(<i>p</i> -value)	(0.017)	(0.018)	(0.003)	(0.002)
Baseline Treatment Mean (Levels)	244.705	244.705	243.637	243.637
Observations	208,162	208,162	186,670	186,670
<i>Panel b. Data: IHDS; Year Span: 2004-2005 and 2011-2012; Estimator: DiD</i>				
Fixed Effects	Indv	Indv, Age	Indv, Age	Indv, Age, Spouse Age
Controls	No	No	Yes	Yes
Estimate	0.073	0.078	0.056	0.055
(<i>p</i> -value)	(0.005)	(0.006)	(0.021)	(0.014)
Baseline Treatment Mean (Levels)	495.237	495.237	492.882	492.882
Observations	16,285	16,285	16,036	16,036

Note: Column (1) of Panel a. displays details from the estimation of the aggregate average treatment on the treated based on Equation (4) (i.e., on the WDiD estimator) for rural households. The required estimates of the average treatment on the treated for each phase are based on Equation (2). Columns (2) to (4) are analogous in format to Column (1). Their only difference is the inclusion of additional fixed effects or controls. The controls are the district-level and state-level controls in Table 2 (entered into the equation linearly). Panel b. is analogous in format to Panel a. The estimate of the aggregate average treatment on the treated is based on Equation (5) (i.e., on the DiD estimator). Panel b. is based on longitudinal data rather than repeated cross-sections. It thus replaces district (Dist) with individual or household-head (Indv) fixed effects. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Rural subsample of the HE-NSS (Panel a.) and IHDS (Panel b.) consumption samples.

Table A.6. Savings and Assets of Rural Households and the Employment Guarantee, Estimates of the Average Treatment on the Treated

	(1)	(2)	(3)	(4)
<i>Panel a. Outcome: Household Savings; Data: IHDS; Year Span: 2004-2005 and 2011-2012; Estimator: DiD</i>				
Fixed Effects	Indv	Indv, Age	Indv, Age	Indv, Age, Spouse Age
Controls	No	No	Yes	Yes
Estimate	-100.913	-113.257	-79.394	-99.614
(<i>p</i> -value)	(0.002)	(0.002)	(0.001)	(0.000)
Baseline Treatment Mean	204.888	204.888	237.504	237.504
Observations	16,285	16,285	16,036	16,036
<i>Panel b. Outcome: Household Livestock Ownership; Data: IHDS; Year Span: 2004-2005 and 2011-2012; Estimator: DiD</i>				
Fixed Effects	Indv	Indv, Age	Indv, Age	Indv, Age, Spouse Age
Controls	No	No	Yes	Yes
Estimate	-0.004	-0.004	-0.012	-0.010
(<i>p</i> -value)	(0.007)	(0.006)	(0.000)	(0.000)
Baseline Treatment Mean	0.649	0.649	0.654	0.654
Observations	16,299	16,299	16,050	16,050

Note: Column (1) of Panel a. displays details from the estimation of the aggregate average treatment on the treated for household savings (monthly 2018 PPP dollars), based on Equation (5). The estimation is based on longitudinal data. It thus includes male household head (Indv) fixed effects in the specification of Equation (5). Columns (2) to (4) are analogous in format to Column (1). Their only difference is the inclusion of different fixed effects or controls, which is indicated in the column labels. Panel b. is analogous in format to Panel a. for an indicator of household livestock ownership. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Rural subsample of the IHDS consumption sample.

Appendix 6. Female Well-Being and the Employment Guarantee

Table A.7. Female Well-Being and the Employment Guarantee, Individual Fixed Effects

	(1)	(2)	(3)
	<i>Independence Index</i>	<i>Body-Mass Index</i>	<i>Height (Meters)</i>
Panel a. Rural Married Women			
Estimate	-0.317	-0.339	0.010
(<i>p</i> -value)	(0.019)	(0.001)	(0.013)
Baseline Treatment Mean	0.103	20.887	1.515
Observations	6,064	8,877	8,877
Panel b. Non-Disadvantaged Married Women			
Estimate	-0.167	-0.121	-0.003
(<i>p</i> -value)	(0.532)	(0.680)	(0.547)
Baseline Treatment Mean	0.295	22.474	1.531
Observations	2,688	4,102	4,102
Panel c. Urban Married Women			
Estimate	-0.263	-0.004	0.004
(<i>p</i> -value)	(0.609)	(0.984)	(0.656)
Baseline Treatment Mean	0.345	22.839	1.523
Observations	3,212	4,318	4,318

Note: Panel a. displays details from the estimation of the aggregate average treatment on the treated for rural married women based on Equation (5) using the dependent variable indicated in the column, including individual fixed effects. Panels b. and c. are analogous in format to Panel a. for non-disadvantaged and urban married women. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Subsamples of the IHDS female well-being sample indicated in the label.

Table A.8. Female Well-Being and the Employment Guarantee, Individual and Age Fixed Effects

	(1)	(2)	(3)
	<i>Independence Index</i>	<i>Body-Mass Index</i>	<i>Height (Meters)</i>
Panel a. Rural Married Women			
Estimate	-0.309	-0.368	0.010
(<i>p</i> -value)	(0.016)	(0.002)	(0.008)
Baseline Treatment Mean	0.103	20.887	1.515
Observations	6,064	8,877	8,877
Panel b. Non-Disadvantaged Married Women			
Estimate	-0.168	-0.107	-0.003
(<i>p</i> -value)	(0.527)	(0.713)	(0.474)
Baseline Treatment Mean	0.295	22.474	1.531
Observations	2,688	4,102	4,102
Panel c. Urban Married Women			
Estimate	-0.256	-0.024	0.005
(<i>p</i> -value)	(0.609)	(0.916)	(0.610)
Baseline Treatment Mean	0.345	22.839	1.523
Observations	3,212	4,318	4,318

Note: Panel a. displays details from the estimation of the aggregate average treatment on the treated for rural married women based on Equation (5) using the dependent variable indicated in the column, including individual and age fixed effects. Panels b. and c. are analogous in format to Panel a. for non-disadvantaged and urban married women. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Subsamples of the IHDS female well-being sample indicated in the label.

Table A.9. Female Well-Being and the Employment Guarantee, Individual and Age Fixed Effects and Controls

	(1)	(2)	(3)
	<i>Independence Index</i>	<i>Body-Mass Index</i>	<i>Height (Meters)</i>
Panel a. Rural Married Women			
Estimate	-0.288	-0.372	0.012
(<i>p</i> -value)	(0.022)	(0.004)	(0.006)
Baseline Treatment Mean	0.114	20.853	1.515
Observations	5,962	8,722	8,722
Panel b. Non-Disadvantaged Married Women			
Estimate	-0.168	-0.052	-0.005
(<i>p</i> -value)	(0.535)	(0.874)	(0.423)
Baseline Treatment Mean	0.289	22.332	1.531
Observations	2,626	4,021	4,021
Panel c. Urban Married Women			
Estimate	-0.112	0.019	0.002
(<i>p</i> -value)	(0.724)	(0.927)	(0.839)
Baseline Treatment Mean	0.336	22.812	1.523
Observations	3,114	4,188	4,188

Note: Panel a. displays details from the estimation of the aggregate average treatment on the treated for rural married women based on Equation (5) using the dependent variable indicated in the column, including individual and age fixed effects and the district-level and state-level controls in Table 2 (entered into the equation linearly). Panels b. and c. are analogous in format to Panel a. for non-disadvantaged and urban married women. For each estimate, the state-clustered jackknifed wild-bootstrapped *p*-value associated with the null hypothesis of 0 is displayed in parentheses. **Sample:** Subsamples of the IHDS female well-being sample indicated in the label.

Appendix 7. Details on Comparison to Other Studies

Replication of a Common Strategy in the Literature. Azam (2011) estimates a basic difference-in-difference model (two-period, two-treatment-status regimes) using rounds 2004-2005 and 2007-2008 of the EU-NSS. I reuse the notation in Equation (5) to write his model:

$$y_{ig} = \tau_{2007-2008} + \tau_d + \gamma_{2007-2008} \cdot \mathbf{1}[i \text{ lives in a Phase-1 or Phase-2 district}]_i \cdot \mathbf{1}[g = 2007-2008]_g + \varepsilon_{ig}, \quad (\text{A.1})$$

where $g = 2004-2005$ (before the employment guarantee) or $g = 2007-2008$ (after) and τ_d is a district fixed effect. In his empirical strategy, individuals who reside in Phase-1 or Phase-2 districts are the treatment group; individuals who reside in Phase-3 districts are the control group. He argues that this strategy is plausible because the employment guarantee was not in place in 2004-2005. In 2007-2008, he argues, it was in place only in Phase-1 and Phase-2 districts.² He uses a sample of rural women of any marital status who were between 18 and 60 years old at the time of the survey.

I replicate the estimate of $\gamma_{2007-2008}$ in Azam (2011) using the EU-NSS labor-market working sample described in Section 2. I delimit the sample to the rounds of the EU-NSS and age profile that he uses. The estimation details are in Column (1) of Appendix Table A.10. I obtain a point estimate identical to his. The estimation does not include national representativity weights. Column (2) is identical to Column (1) except that it uses national representativity weights. The point estimate halves to 1.2. I cannot reject the null hypothesis that it is 0 when using standard significance levels. Column (3) shows that focusing on married women barely changes the point estimate of $\gamma_{2007-2008}$.

The empirical strategy in Azam (2011) can only identify the short-term impact of the employment guarantee; its control group ends up being treated after 2007-2008. An impact estimate of 0 should be obtained when changing the after-treatment period in Equation (A.1) from 2007-2008 to 2011-2012. The null hypothesis $\gamma_{2011-2012} = 0$ should hold when estimating

$$y_{ig} = \tau_{2011-2012} + \tau_d + \gamma_{2011-2012} \cdot \mathbf{1}[i \text{ lives in a Phase-1 or Phase-2 district}]_i \cdot \mathbf{1}[g = 2011-2012]_g + \tilde{\gamma}_{2011-2012} \cdot \mathbf{1}[i \text{ lives in treatment state}]_i \cdot \mathbf{1}[g = 2011-2012]_g + \varepsilon_{ig}, \quad (\text{A.2})$$

²This argument has a caveat. Some of the control-group individuals surveyed in 2007-2008 were already potentially affected by the employment guarantee. In the EU-NSS labor-market sample, 14.8% of the households in Phase-3 districts were surveyed in May of 2008 or later in 2008 in the round 2007-2008.

Table A.10. Empirical Comparison to a Common Strategy in Previous Studies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Female Labor Force Participation										log Daily Wage (Males)
$\gamma_{2007-2008}$	0.024 (0.014)	0.012 (0.015)	0.013 (0.017)								
$\gamma_{2011-2012}$				-0.048 (0.019)	-0.033 (0.009)	-0.005 (0.014)	-0.006 (0.013)	-0.006 (0.013)	-0.002 (0.015)		
$\tilde{\gamma}_{2011-2012}$								-0.022 (0.014)	-0.021 (0.014)	-0.042 (0.022)	-0.014 (0.134)
Observations	201,546	201,546	164,269	124,741	131,290	15,758	15,758	15,758	13,777	13,154	14,639
Weights	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Individuals FEs	×	×	×	×	×	×	✓	✓	✓	✓	✓
District FEs	✓	✓	✓	✓	✓	✓	×	×	×	×	×
Age FEs	×	×	×	×	✓	✓	✓	✓	✓	✓	✓
Controls, Literature	✓	✓	✓	✓	×	×	×	×	×	×	×
Controls, This Paper	×	×	×	×	✓	✓	✓	✓	✓	✓	✓
Sample States	All	All	Married All	Married All	Married All	Married All	Married All	Married All	Married Subset*	Married All	Married All
Age Range	18 to 60	18 to 60	18 to 60	18 to 60	18 to 60	18 to 60	18 to 60	18 to 60	18 to 60	25 to 64	25 to 64
Data Set	EU-NSS	EU-NSS	EU-NSS	EU-NSS	EU-NSS	IHDS	IHDS	IHDS	IHDS	IHDS	IHDS
Years in Sample	2004-05 & 2007-08	2004-05 & 2007-08	2004-05 & 2007-08	2004-05 & 2011-12	2004-05 & 2011-12	2004-05 & 2011-12	2004-05 & 2011-12	2004-05 & 2011-12	2004-05 & 2011-12	2004-05 & 2011-12	2004-05 & 2011-12

Note: Column (1) displays details from the estimation of the aggregate average treatment on the treated for female labor force participation based on Equation (A.1). The number of observations, use of weights, specification of ν_i , sample, age range of individuals in the sample, data set, and calendar-year coverage are indicated in the rows. Columns (2) and (3) are analogous in format to Column (1). They differ in the details as indicated in the table. Columns (4) to (10) are analogous in format to Column (1). They are based on Equation (A.2). Coefficient estimates left blank are set to 0. In Column (9), observations from the state of Maharashtra and small territories are not considered. Column (11) is analogous in format to Column (10) for the log daily wage of rural married men. Controls, Literature: controls in Azam (2011) (literacy, caste, age, age squared). Controls, This Paper: controls used throughout this paper. The standard errors (in parentheses) are clustered at the district level in Columns (1) to (9) to make the comparison consistent with the literature. The results and standard errors are directly reproduced from the analysis in this paper in Columns (10) and (11), where clustering is at the state level. **Sample:** Subsample of rural women of the EU-NSS and IHDS labor-market working sample (female labor force participation) and subsamples of rural men of the IHDS labor-market sample (wage).

while imposing the null hypothesis $\tilde{\gamma}_{2011-2012} = 0$. I present the corresponding estimates of $\gamma_{2011-2012}$ in Columns (4) and (5). These columns only differ in that the former uses the controls in Azam (2011) and the latter uses the controls in this paper. I reject the null hypothesis $\gamma_{2011-2012} = 0$ and thus bring in the IHDS labor-market sample for additional exploration. Columns (6) and (7) present estimates of this same specification based on this sample. I fail to reject the null hypothesis $\gamma_{2011-2012} = 0$. I conclude that there is no overall consistent support for rejecting this hypothesis.

I then consider estimating Equation (A.2) without restricting $\gamma_{2011-2012}$ or $\tilde{\gamma}_{2011-2012}$. Such a specification nests my specification of the treatment and control groups and the specification of the treatment and controls groups in Azam (2011). Only the coefficient associated with my specification of the treatment and control groups should differ from 0 when considering a longer time span. Otherwise, it could be that the estimates in Section 4 spuriously pick up a relationship between female labor force participation and the employment guarantee that is wiped out when accounting for the treatment-control specification in Azam (2011). To be clear, the model in Equation (5) is equivalent to the model in Equation (A.2) when imposing $\gamma_{2011-2012} = 0$. Therefore, $\tilde{\gamma}_{2011-2012}$ is one of the two estimators of the employment-guarantee impact that I use throughout the paper. Column (8) presents estimates of this specification. The estimate of $\gamma_{2011-2012}$ is essentially 0. The estimate of $\tilde{\gamma}_{2011-2012}$ is qualitatively consistent with the evidence in Section 4. The same holds true in Column (9), where I drop observations from the state of Maharashtra and relatively small territories. Azam (2011) suggests dropping these observations given the pre-existence of employment-guarantee programs in the former state and a small number of observations for the latter territories. Column (10) shows that, once delimiting the sample to the age range that I use throughout the paper and imposing $\gamma_{2011-2012} = 0$, the estimate of $\tilde{\gamma}_{2011-2012}$ grows in magnitude and precision.

Impact on Wages. Section 7 discusses potential sources of sample selection when analyzing rural wages. Imbert and Papp (2015) do not consider either of the sources of selection discussed in Section 7. Their main result is based on the identification strategy in Azam (2011). Their initial sample consists of 356,636 women and men who report either being employed in public or private works (including casual work), unemployed, or out of the labor force. They observe casual-work daily wages (daily earnings from casual work) for 64,167 individuals. This subset of individuals composes the subsample for their analysis of casual-work wages.

I circumvent the first selection issue by only considering rural married men, the majority of men in India. Most of them work. Selectively observing their wages is a secondary concern.

Indeed, Imbert and Papp (2015) document that the impact that they find on wages is driven by male wages. I circumvent the second selection issue by analyzing the wage across all working activities, which is essentially observed for all of them. If the employment guarantee has an economically and statistically significant impact on casual-work wages, this should translate into an impact on overall rural wages. Column (11), which uses the same strategy as Column (10), summarizes the results from my analysis, and Section 7 provides discussion.

Appendix References

- Azam, M. (2011). The impact of Indian job guarantee scheme on labor market outcomes: Evidence from a natural experiment. *SSRN Electronic Journal*.
- Imbert, C. and J. Papp (2015). Labor market effects of social programs: Evidence from India's employment guarantee. *American Economic Journal: Applied Economics* 7(2), 233–263.