

Supplemental Appendix

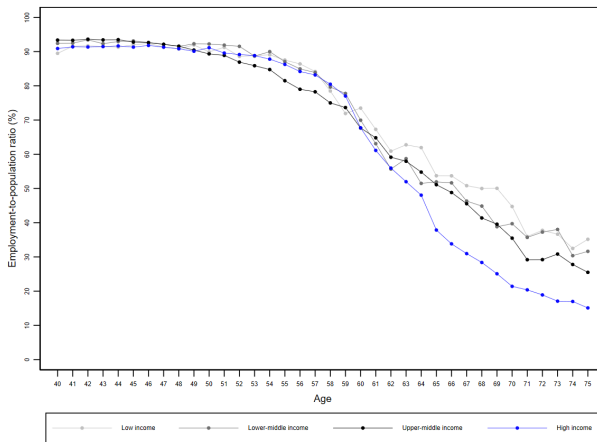
The Role of Pension Systems in Retirement across Development

Mariano Bosch Paola Rojas

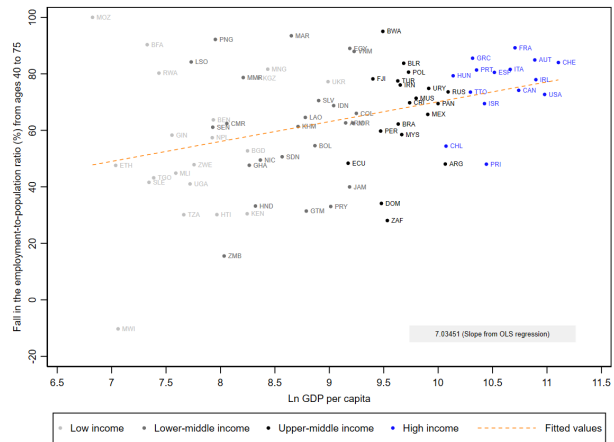
A. Figures

Figure A1: Male employment-to-population ratio (%) by education and country income group

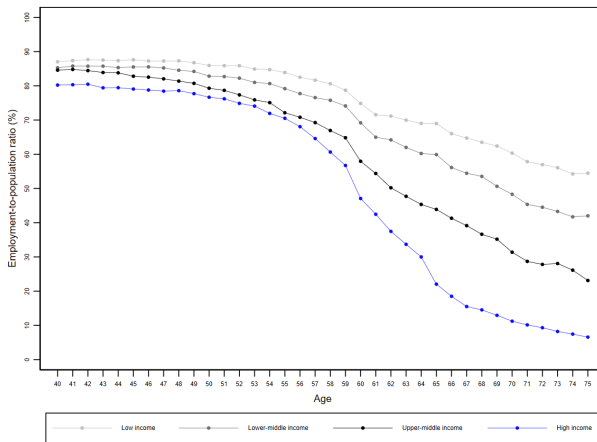
Panel A: Male employment age profiles by country income group (University graduates)



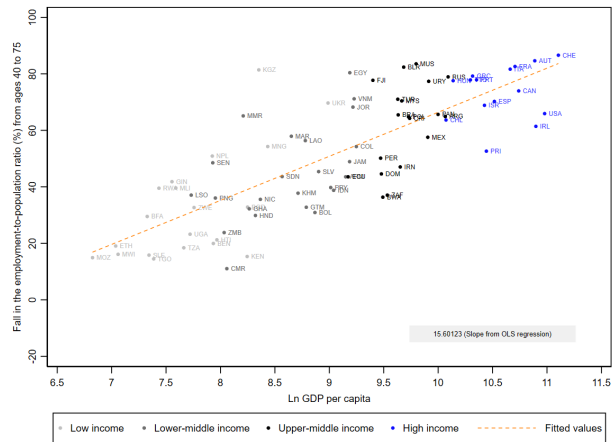
Panel B: Male employment decline (ages 40–75) vs. Ln GDP per capita (University graduates)



Panel C: Male employment age profiles by country income group (Non-university graduates)



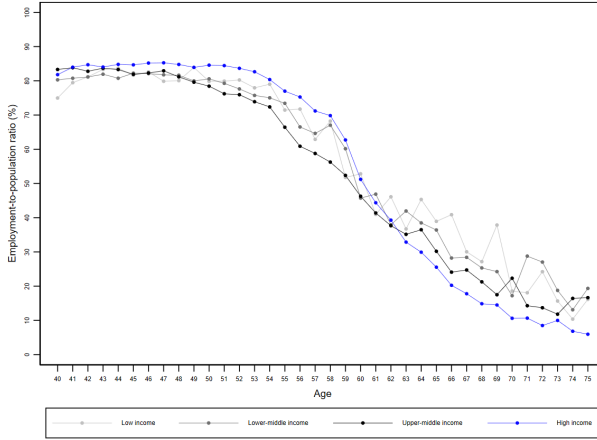
Panel D: Male employment decline (ages 40–75) vs. Ln GDP per capita (Non-university graduates)



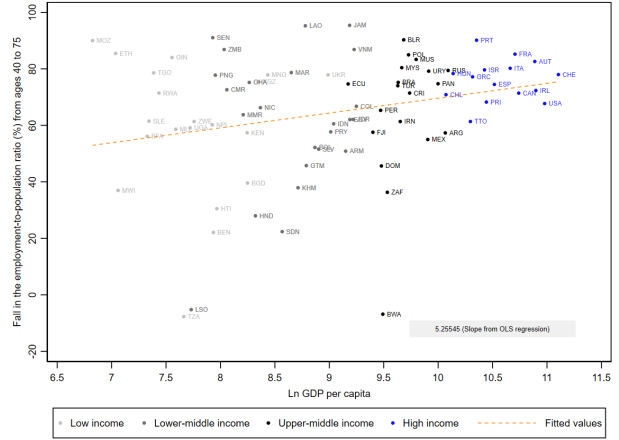
Notes: Panels B and D plot the relationship between the natural logarithm of GDP per capita and the total decline in employment between ages 40 and 75. In the scatterplots, employment data at age 75 were unavailable for three countries—Jordan (2004), Russia (2010), and South Africa (2011); in these cases, values from the nearest available age were used. Across all four panels, employment is proxied by the employment-to-population ratio, derived from census microdata covering 78 countries and sourced from IPUMS International.

Figure A2: Female employment-to-population ratio (%) by education and country income group

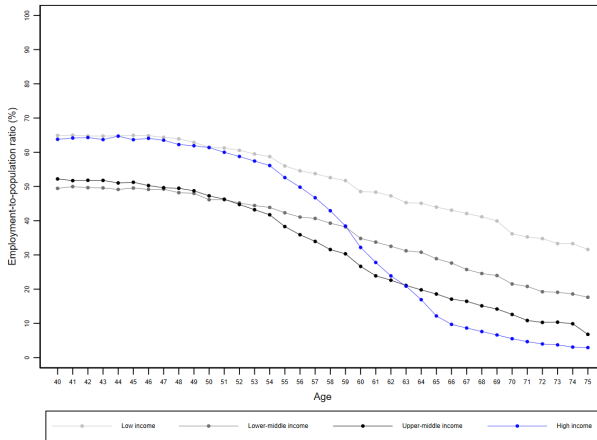
Panel A: Female employment age profiles by country income group (University graduates)



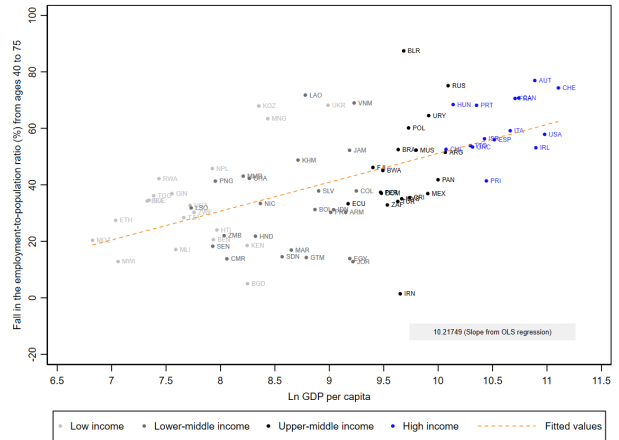
Panel B: Female employment decline (ages 40–75) vs. Ln GDP per capita (University graduates)



Panel C: Female employment age profiles by country income group (Non-university graduates)



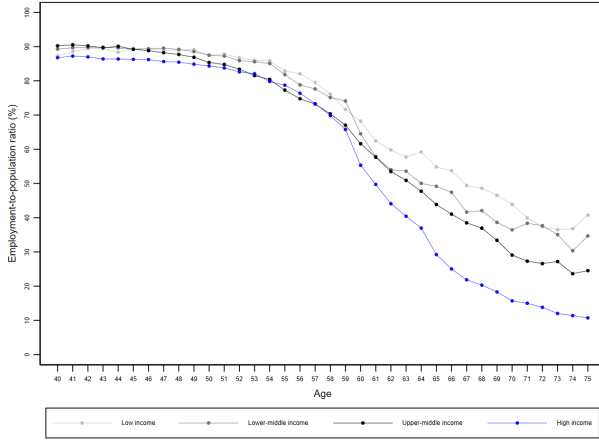
Panel D: Female employment decline (ages 40–75) vs. Ln GDP per capita (Non-university graduates)



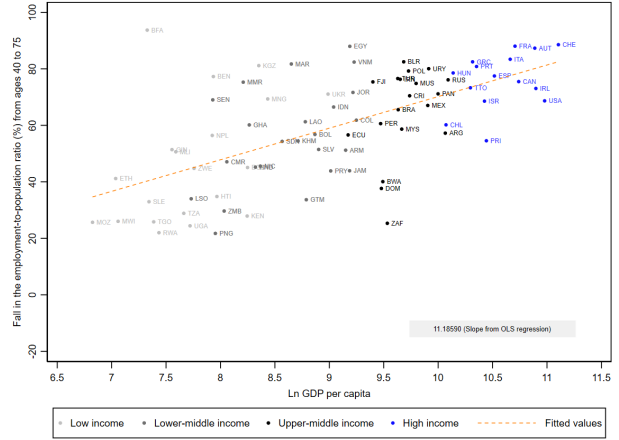
Notes: Panels B and D plot the relationship between the natural logarithm of GDP per capita and the total decline in employment between ages 40 and 75. In the scatterplots, employment data at age 75 were unavailable for three countries—Jordan (2004), Russia (2010), and South Africa (2011); in these cases, values from the nearest available age were used. Across all four panels, employment is proxied by the employment-to-population ratio, derived from census microdata covering 78 countries and sourced from IPUMS International.

Figure A3: Male employment-to-population ratio (%) by education and country income group

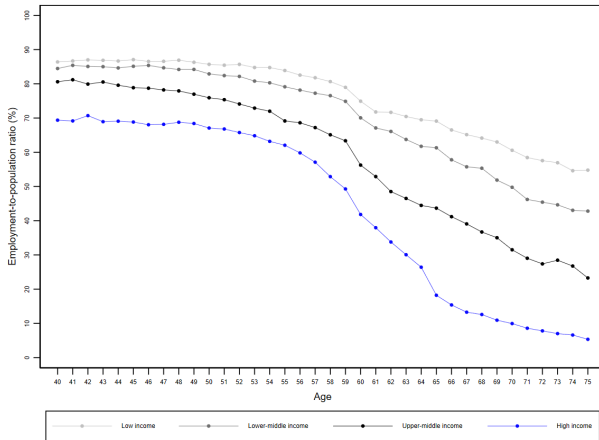
Panel A: Male employment age profiles by country income group (Secondary graduates)



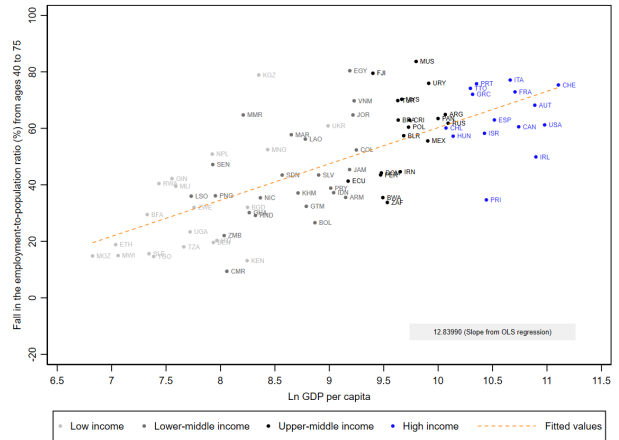
Panel B: Male employment decline (ages 40–75) vs. Ln GDP per capita (Secondary graduates)



Panel C: Male employment age profiles by country income group (Non-secondary graduates)



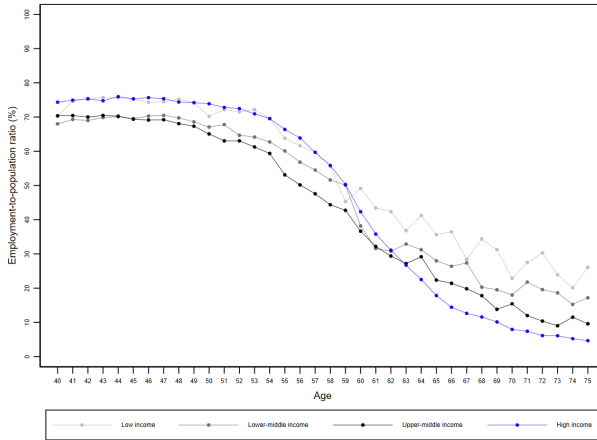
Panel D: Male employment decline (ages 40–75) vs. Ln GDP per capita (Non-secondary graduates)



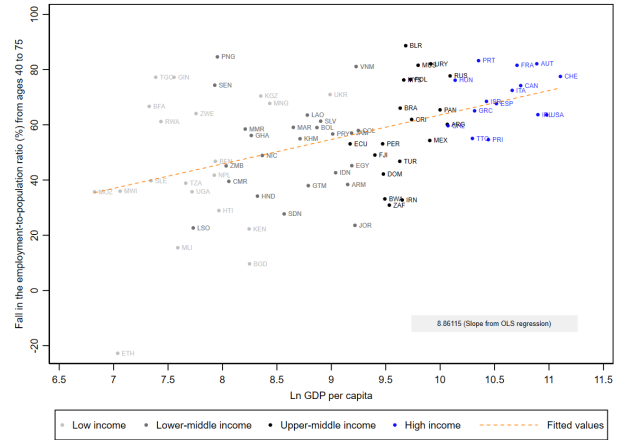
Notes: Panels B and D plot the relationship between the natural logarithm of GDP per capita and the total decline in employment between ages 40 and 75. In the scatterplots, employment data at age 75 were unavailable for three countries—Jordan (2004), Russia (2010), and South Africa (2011); in these cases, values from the nearest available age were used. Across all four panels, employment is proxied by the employment-to-population ratio, derived from census microdata covering 78 countries and sourced from IPUMS International.

Figure A4: Female employment-to-population ratio (%) by education and country income group

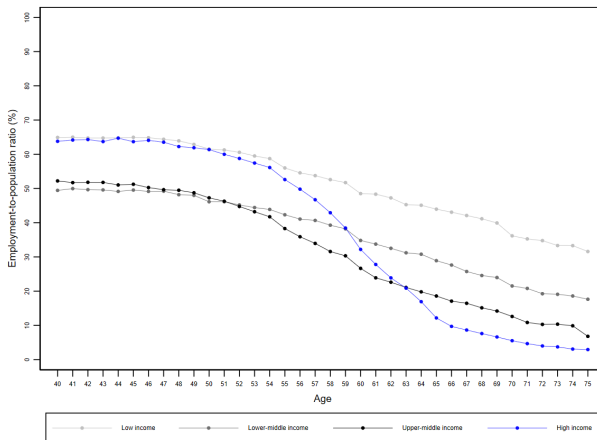
Panel A: Female employment age profiles by country income group (Secondary graduates)



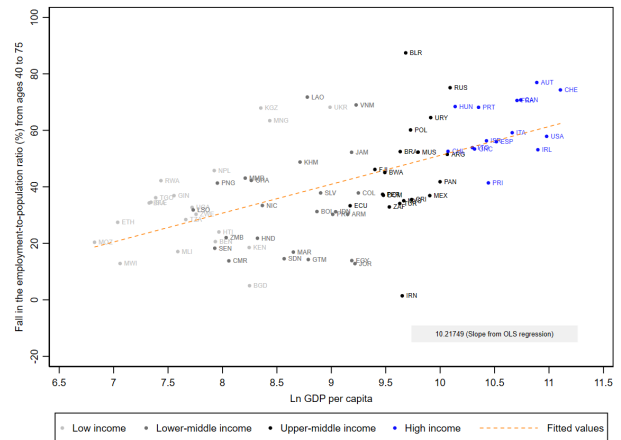
Panel B: Female employment decline (ages 40–75) vs. Ln GDP per capita (Secondary graduates)



Panel C: Female employment age profiles by country income group (Non-secondary graduates)



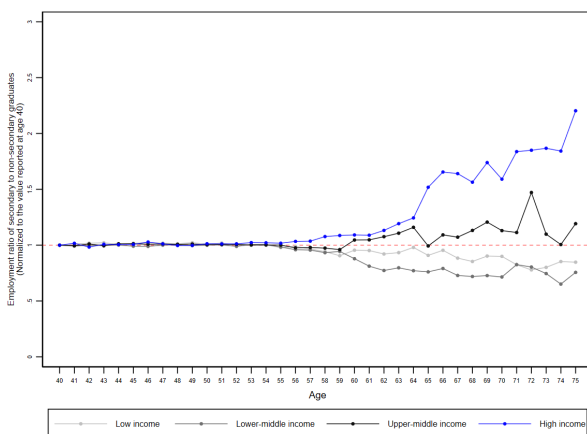
Panel D: Female employment decline (ages 40–75) vs. Ln GDP per capita (Non-secondary graduates)



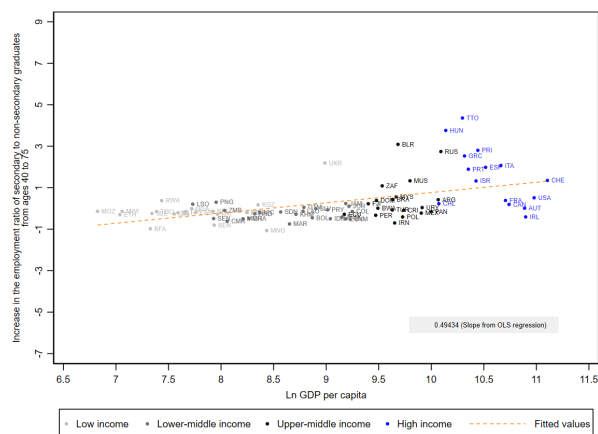
Notes: Panels B and D plot the relationship between the natural logarithm of GDP per capita and the total decline in employment between ages 40 and 75. In the scatterplots, employment data at age 75 were unavailable for three countries—Jordan (2004), Russia (2010), and South Africa (2011); in these cases, values from the nearest available age were used. Across all four panels, employment is proxied by the employment-to-population ratio, derived from census microdata covering 78 countries and sourced from IPUMS International.

Figure A5: Employment ratio of secondary to non-secondary graduates by country income group, and sex

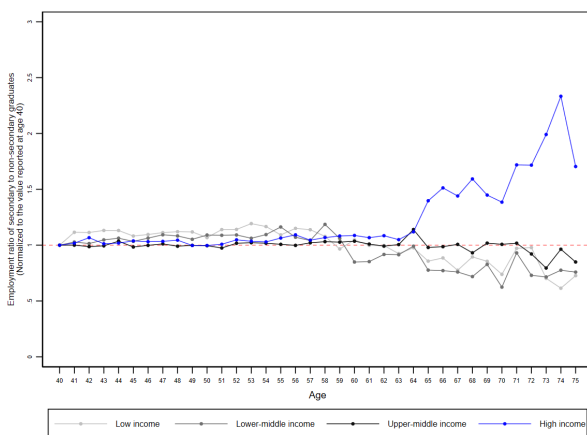
Panel A: Employment ratio of secondary to non-secondary graduates by country income group (Men)



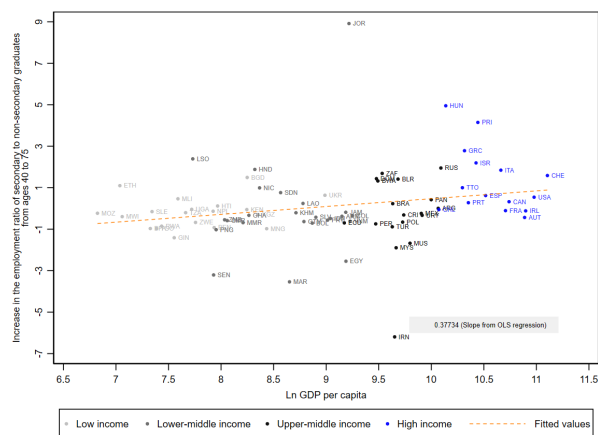
Panel B: Increase in the employment ratio of secondary to non-secondary graduates (ages 40–75) vs. Ln GDP per capita (Men)



Panel C: Employment ratio of secondary to non-secondary graduates by country income group (Women)



Panel D: Increase in the employment ratio of secondary to non-secondary graduates (ages 40–75) vs. Ln GDP per capita (Women)



Notes: Panels B and D plot the relationship between the natural logarithm of GDP per capita and the total increase in the employment ratio of secondary to non-secondary graduates between ages 40 and 75. Employment data at age 75 were unavailable for three countries—Jordan (2004), Russia (2010), and South Africa (2011); in these cases, values from the nearest available age were used. Across all four panels, employment is proxied by the employment-to-population ratio, derived from census microdata covering 78 countries and sourced from IPUMS International. In Panels A and C, the y-axis variable is normalized to 1 at age 40 by dividing each series by its value at that age.

B. Tables

Table A1: Descriptive statistics on late-life labor supply and old-age pension system features by country income group

	High -Income	Upper -Middle -Income	Lower -Middle -Income	Low -Income	World (Full sample)		
					Min	Max	Mean
Aging							
Share of population 65 and over (Men)	13.5	6.4	4.0	3.2	1.5	18.1	6.2
Share of population 65 and over (Women)	17.3	9.0	5.1	4.3	2.1	23.1	8.2
Life expectancy at age 60 (Men)	21.5	17.7	16.1	14.8	11.0	23.1	17.2
Life expectancy at age 60 (Women)	25.4	21.4	18.5	16.6	12.5	27.4	20.1
Labor supply							
Employment-to-population ratio (%) (Men, age 40)	82.3	84.9	85.0	86.9	63.0	97.4	85.0
Employment-to-population ratio (%) (Women, age 40)	68.5	55.8	50.8	65.0	8.5	90.6	59.0
Employment-to-population ratio (%) (Men, age 65)	24.5	44.4	59.4	68.8	8.1	88.6	51.5
Employment-to-population ratio (%) (Women, age 65)	13.6	19.4	28.9	43.8	0.8	78.1	27.6
Employment-to-population ratio (%) (Men, age 75)	7.6	23.3	41.5	54.1	1.4	75.6	34.0
Employment-to-population ratio (%) (Women, age 75)	3.2	7.0	17.5	31.4	0.4	59.5	16.0
Old-age pension system design							
Statutory retirement age (Men)	64.6	61.2	59.9	59.5	55.0	70.0	61.0
Statutory retirement age (Women)	63.1	59.1	58.5	58.3	50.0	70.0	59.5
Early retirement age (Men)	60.2	57.5	51.6	54.8	45.0	63.0	56.1
Early retirement age (Women)	59.3	54.1	51.6	53.7	45.0	62.0	54.8
Earliest retirement age (Men)	62.2	58.7	57.5	57.0	45.0	70.0	58.6
Earliest retirement age (Women)	60.7	56.2	56.3	55.9	45.0	70.0	57.0
Old-age pension system performance							
Active contributors to a pension scheme (% of the labor force)	88.9	52.5	20.6	15.1	0.8	100.0	40.1
Effective coverage (% of relevant population)	89.7	60.9	24.7	22.9	0.7	100.0	45.5
Number of countries	15	19	24	20	78		

Note: Employment-to-population ratios are calculated using census microdata from IPUMS International. Population aging indicators are obtained from the United Nations Population Division. Statutory and early retirement ages are drawn from the U.S. Social Security Administration's Social Security Programs Throughout the World (SSPTW) series, supplemented with data from the International Social Security Association (ISSA). Measures of effective pension coverage and active contributors are taken from the ILO's Sustainable Development Goals labor market indicators (ILOSDG). Country income groups follow the World Bank's four-tier classification. All variables are aligned to the same reference year as the employment data.

Table A2: Employment-to-population ratio (%) by sex and education

Age	Educational attainment									
	All education levels		Non-university graduates		University graduates		Non-secondary graduates		Secondary graduates	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
40	59.0	85.0	56.8	84.6	80.0	91.6	50.9	81.1	70.4	88.5
41	59.3	85.4	57.0	84.9	81.8	92.2	50.8	81.6	72.0	89.1
42	59.2	85.4	56.9	84.9	82.2	92.6	51.0	81.6	72.1	89.3
43	58.9	85.0	56.7	84.5	83.1	92.2	51.0	81.3	72.4	89.0
44	58.8	84.8	56.6	84.3	82.9	92.4	50.5	80.9	72.7	88.8
45	58.7	84.7	56.6	84.1	82.5	92.4	51.0	81.0	72.1	88.7
46	58.4	84.5	56.3	83.9	82.9	92.4	50.8	80.7	72.1	88.6
47	58.1	84.2	56.0	83.7	82.2	91.8	50.5	80.4	72.1	88.3
48	57.3	83.8	55.2	83.3	81.7	91.2	50.1	80.4	71.6	88.1
49	56.6	83.3	54.7	82.8	81.6	91.3	49.6	79.9	70.8	87.6
50	55.1	82.1	53.3	81.6	80.6	90.7	48.5	78.9	68.7	86.4
51	54.7	81.9	52.7	81.3	79.7	90.6	47.9	78.5	68.7	86.1
52	53.6	81.1	51.6	80.6	79.0	89.2	46.9	78.0	67.5	84.9
53	52.4	80.0	50.5	79.4	77.2	88.1	46.1	76.8	66.8	84.0
54	51.4	79.3	49.5	78.7	76.4	88.1	45.5	76.1	65.0	83.1
55	48.5	77.6	46.8	77.0	71.9	85.7	42.8	74.6	60.6	80.4
56	46.7	76.0	45.0	75.4	68.2	83.7	41.4	73.4	57.8	78.2
57	45.1	74.5	43.6	73.8	64.0	82.5	40.5	72.1	55.1	76.2
58	43.0	72.7	41.5	72.0	65.3	78.4	38.8	70.3	51.7	73.2
59	41.1	70.3	39.8	69.7	56.6	75.1	37.3	68.2	47.1	70.2
60	36.8	64.4	35.8	63.6	48.7	69.9	34.0	62.5	41.4	63.0
61	34.8	60.4	33.9	59.8	43.5	64.2	32.4	59.2	35.6	57.4
62	33.0	58.0	32.2	57.4	40.2	57.9	30.9	57.0	33.5	53.5
63	31.0	55.8	30.4	55.1	37.2	58.3	29.4	54.8	31.3	51.5
64	29.7	53.6	29.1	53.0	38.1	54.3	28.2	52.7	31.6	49.3
65	27.6	51.5	27.1	51.1	33.5	49.5	26.4	50.8	26.7	45.5
66	26.0	48.3	25.7	47.9	29.0	48.0	25.2	47.9	25.5	43.2
67	24.7	46.3	24.5	46.0	25.9	44.3	24.1	46.0	23.0	39.1
68	23.6	44.8	23.4	44.6	22.8	42.2	23.0	44.9	21.7	38.3
69	22.6	42.9	22.5	42.7	24.3	39.2	22.3	42.9	19.4	35.5
70	20.2	40.4	20.1	40.3	17.5	36.5	19.9	40.5	16.7	32.6
71	19.2	37.9	19.1	37.8	19.1	31.3	19.0	38.0	18.2	31.6
72	18.3	37.0	18.2	37.0	19.6	31.9	18.2	37.0	17.6	30.4
73	17.8	36.4	17.8	36.3	14.7	31.9	17.8	36.8	15.4	29.1
74	17.4	34.7	17.5	34.8	11.9	27.7	17.4	35.3	13.7	26.8
75	16.0	34.0	16.0	34.0	15.2	27.9	15.9	34.1	15.3	29.2

Note: This table presents descriptive statistics of the employment-to-population ratio (%) worldwide during the study period (2000-2019), based on data from 78 countries extracted from IPUMS International. The following countries are included in the analysis: Argentina (2010), Armenia (2011), Austria (2011), Bangladesh (2011), Belarus (2009), Benin (2013), Bolivia (2012), Botswana (2011), Brazil (2010), Burkina Faso (2006), Cambodia (2019), Cameroon (2005), Canada (2011), Chile (2017), Colombia (2005), Costa Rica (2011), Dominican Republic (2010), Ecuador (2010), Egypt (2006), El Salvador (2007), Ethiopia (2007), Fiji (2014), France (2011), Ghana (2010), Greece (2011), Guatemala (2002), Guinea (2014), Haiti (2003), Honduras (2001), Hungary (2011), Indonesia (2010), Iran (2011), Ireland (2011), Israel (2008), Italy (2011), Jamaica (2001), Jordan (2004), Kenya (2009), Kyrgyzstan (2009), Laos (2015), Lesotho (2006), Malawi (2008), Malaysia (2000), Mali (2009), Mauritius (2011), Mexico (2015), Mongolia (2000), Morocco (2004), Mozambique (2007), Myanmar (2014), Nepal (2011), Nicaragua (2005), Panama (2010), Papua New Guinea (2000), Paraguay (2002), Peru (2017), Poland (2002), Portugal (2011), Puerto Rico (2015), Russia (2010), Rwanda (2012), Senegal (2013), Sierra Leone (2015), South Africa (2011), Spain (2011), Sudan (2008), Switzerland (2011), Tanzania (2012), Togo (2010), Trinidad and Tobago (2011), Turkey (2000), Uganda (2014), Ukraine (2001), United States of America (2015), Uruguay (2011), Vietnam (2019), Zambia (2010), and Zimbabwe (2012).

Table A3: Employment-to-population ratio (%) in low-income countries by sex and education

Age	Educational attainment									
	All education levels		Non-university graduates		University graduates		Non-secondary graduates		Secondary graduates	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
40	64.96	86.88	64.91	87.02	74.97	89.49	63.98	86.39	70.27	87.27
41	65.32	87.30	65.00	87.37	79.47	91.57	63.79	86.68	74.67	88.53
42	65.03	87.60	64.74	87.65	81.16	91.66	63.41	87.00	75.41	89.41
43	65.01	87.37	64.74	87.52	83.33	91.50	63.54	86.87	75.70	89.53
44	65.10	87.24	64.78	87.36	83.67	91.30	63.50	86.66	75.64	88.31
45	65.19	87.57	64.96	87.61	81.62	92.01	63.97	87.07	75.16	89.48
46	65.10	87.26	64.84	87.26	82.62	92.38	63.57	86.54	74.25	89.28
47	64.67	87.17	64.38	87.25	79.87	91.31	63.37	86.58	74.51	88.94
48	64.17	87.22	63.92	87.30	80.05	90.80	62.97	86.90	75.17	89.00
49	63.13	86.73	62.87	86.76	83.90	91.94	62.06	86.30	74.17	89.09
50	61.78	85.89	61.50	85.94	79.84	89.92	60.83	85.70	70.20	87.48
51	61.67	85.83	61.26	85.89	79.90	91.25	60.35	85.44	72.15	87.86
52	60.91	85.73	60.57	85.88	80.24	88.60	59.45	85.69	71.51	86.72
53	59.95	84.83	59.50	84.91	77.95	88.82	58.22	84.77	72.17	85.99
54	59.29	84.73	58.73	84.73	79.01	89.06	58.07	84.75	69.60	85.84
55	56.42	83.91	56.00	83.91	71.46	87.52	55.50	83.89	63.81	82.86
56	55.01	82.49	54.58	82.50	71.74	86.41	54.06	82.54	61.59	82.09
57	53.91	81.63	53.76	81.66	62.89	84.18	53.20	81.77	59.69	79.52
58	52.81	80.61	52.59	80.61	68.24	78.48	52.22	80.65	55.64	76.12
59	51.88	78.27	51.72	78.71	51.76	71.92	51.28	78.96	45.29	71.69
60	48.56	74.95	48.50	74.85	52.83	73.49	48.23	74.92	49.14	68.21
61	48.38	71.36	48.34	71.55	40.96	67.28	47.97	71.78	43.45	62.46
62	47.22	70.99	47.26	71.17	46.11	60.91	47.08	71.66	42.36	59.81
63	45.27	69.91	45.28	69.98	36.72	62.77	45.13	70.45	36.81	57.74
64	45.04	68.96	45.10	69.02	45.33	61.95	45.12	69.50	41.24	59.22
65	43.82	68.77	43.96	68.97	38.93	53.72	44.00	69.10	35.65	54.82
66	42.95	65.86	43.08	66.03	40.88	53.70	43.29	66.52	36.44	53.74
67	41.65	64.36	42.11	64.73	30.04	50.82	42.21	65.16	28.40	49.38
68	40.97	63.20	41.16	63.50	27.16	50.01	41.21	64.14	34.36	48.63
69	39.79	61.98	39.93	62.42	37.86	50.05	40.08	63.01	31.27	46.58
70	35.99	60.08	36.17	60.33	18.56	44.75	36.19	60.58	22.89	43.89
71	35.09	57.31	35.27	57.85	18.07	35.98	35.32	58.45	27.48	39.93
72	34.54	56.49	34.77	56.97	24.23	37.76	34.78	57.56	30.30	37.34
73	33.12	55.74	33.33	56.07	15.66	36.64	33.41	56.95	23.91	36.49
74	33.02	53.77	33.30	54.25	10.37	32.48	33.37	54.61	20.10	36.81
75	31.39	54.13	31.58	54.49	16.16	35.15	31.59	54.78	26.09	40.75

Note: This table presents descriptive statistics of the employment-to-population ratio (%) in low-income countries during the study period (2000-2019), based on data from 20 countries extracted from IPUMS International. The following countries are included in the analysis: Bangladesh (2011), Benin (2013), Burkina Faso (2006), Ethiopia (2007), Guinea (2014), Haiti (2003), Kenya (2009), Kyrgyzstan (2009), Malawi (2008), Mali (2009), Mongolia (2000), Mozambique (2007), Nepal (2011), Rwanda (2012), Sierra Leone (2015), Tanzania (2012), Togo (2010), Uganda (2014), Ukraine (2001), and Zimbabwe (2012).

Table A4: Employment-to-population ratio (%) in lower-middle-income countries by sex and education

Age	Educational attainment									
	All education levels		Non-university graduates		University graduates		Non-secondary graduates		Secondary graduates	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
40	50.76	85.05	49.45	85.26	80.29	92.41	47.35	84.48	68.00	89.26
41	51.54	85.68	49.97	85.78	80.75	92.47	46.68	85.40	69.30	89.67
42	51.06	85.59	49.66	85.74	81.13	93.44	47.66	85.08	68.99	89.79
43	51.01	85.59	49.58	85.75	81.93	92.32	47.15	85.01	69.87	89.83
44	50.67	85.14	49.14	85.33	80.75	92.94	46.83	84.64	70.08	89.61
45	50.67	85.30	49.55	85.50	82.23	93.10	47.73	85.12	69.55	89.18
46	50.47	85.45	49.14	85.53	82.11	92.68	47.06	85.38	70.29	89.37
47	50.51	85.16	49.22	85.22	81.76	92.10	46.97	84.68	70.48	89.56
48	49.49	84.41	48.19	84.55	81.63	91.52	46.43	84.20	69.75	89.18
49	49.32	84.05	48.01	84.21	79.96	92.28	46.23	84.21	68.60	88.54
50	46.97	82.67	46.12	82.82	80.57	92.24	44.81	82.89	67.08	87.47
51	47.38	82.73	46.14	82.70	79.26	91.89	44.44	82.41	67.80	87.25
52	46.20	82.19	45.18	82.24	77.62	91.53	44.02	82.17	64.67	85.90
53	45.44	81.01	44.43	81.00	75.74	88.68	43.28	80.80	64.16	85.59
54	44.79	80.69	43.87	80.67	75.04	89.98	43.04	80.30	62.73	85.06
55	42.96	78.97	42.32	79.18	73.42	87.05	41.37	79.13	60.10	81.82
56	41.76	77.57	41.07	77.73	66.52	84.95	40.82	78.16	56.82	78.80
57	41.33	76.48	40.67	76.56	64.64	83.89	40.61	77.25	54.52	77.63
58	39.80	75.55	39.28	75.77	67.03	79.64	39.21	76.54	51.61	75.11
59	38.66	73.91	38.21	74.12	60.16	77.76	37.91	74.88	50.10	74.11
60	34.94	68.57	34.81	69.19	45.73	69.96	35.37	70.05	38.20	64.53
61	33.91	64.52	33.75	64.99	46.88	63.09	34.28	67.10	31.59	57.85
62	32.66	63.51	32.52	64.19	37.95	55.67	32.70	66.09	30.79	54.03
63	31.22	61.58	31.21	62.01	41.96	58.72	32.07	63.75	32.89	53.61
64	30.81	59.69	30.79	60.23	38.48	51.49	31.18	61.75	31.23	50.03
65	28.94	59.37	28.91	59.91	36.42	51.93	29.26	61.31	28.01	49.17
66	27.50	55.72	27.63	56.13	28.22	51.65	28.23	57.80	26.39	47.43
67	25.61	53.97	25.75	54.45	28.42	46.33	26.29	55.75	27.36	41.64
68	24.53	53.04	24.57	53.54	25.33	44.86	25.11	55.34	20.29	42.07
69	23.87	50.13	23.98	50.64	24.25	38.84	24.65	51.88	19.54	38.64
70	21.29	47.91	21.51	48.32	17.22	39.71	21.88	49.76	17.99	36.46
71	20.71	44.82	20.81	45.34	28.77	35.70	21.29	46.21	21.76	38.37
72	19.12	43.98	19.24	44.52	27.04	37.26	19.75	45.42	19.57	37.68
73	18.95	42.96	19.09	43.29	18.77	38.03	19.42	44.64	18.63	35.05
74	18.47	41.32	18.59	41.71	13.10	30.38	19.04	43.05	15.26	30.36
75	17.53	41.53	17.63	42.01	19.34	31.63	17.97	42.80	17.19	34.67

Note: This table presents descriptive statistics of the employment-to-population ratio (%) in lower-income countries during the study period (2000-2019), based on data from 24 countries extracted from IPUMS International. The following countries are included in the analysis: Armenia (2011), Bolivia (2012), Cambodia (2019), Cameroon (2005), Colombia (2005), Egypt (2006), El Salvador (2007), Ghana (2010), Guatemala (2002), Honduras (2001), Indonesia (2010), Jamaica (2001), Jordan (2004), Laos (2015), Lesotho (2006), Morocco (2004), Myanmar (2014), Nicaragua (2005), Papua New Guinea (2000), Paraguay (2002), Senegal (2013), Sudan (2008), Vietnam (2019), and Zambia (2010).

Table A5: Employment-to-population ratio (%) in upper-middle-income countries by sex and education

Age	Educational attainment									
	All education levels		Non-university graduates		University graduates		Non-secondary graduates		Secondary graduates	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
40	55.80	84.94	52.21	84.58	83.31	93.36	43.89	80.61	70.36	90.23
41	55.39	85.31	51.72	84.80	83.83	93.30	44.33	81.19	70.43	90.52
42	55.49	85.08	51.81	84.46	82.79	93.62	44.53	79.92	70.00	90.21
43	55.21	84.48	51.77	83.89	83.69	93.42	44.56	80.53	70.46	89.66
44	54.48	84.39	51.03	83.80	83.29	93.48	42.38	79.59	70.25	90.09
45	54.43	83.46	51.24	82.81	81.90	92.79	44.07	78.86	69.37	89.22
46	53.52	83.20	50.27	82.54	82.30	92.62	43.47	78.73	69.13	88.83
47	52.90	82.74	49.65	82.04	82.93	92.14	42.57	78.22	69.21	88.21
48	52.55	81.99	49.48	81.38	81.16	91.59	42.77	77.92	68.08	87.71
49	51.63	81.33	48.74	80.72	79.59	90.44	41.87	76.97	67.33	86.88
50	50.23	79.92	47.27	79.30	78.43	89.34	40.67	75.93	65.07	85.36
51	49.20	79.26	46.29	78.67	76.21	88.89	40.17	75.37	63.04	84.79
52	47.67	78.00	44.75	77.36	75.95	86.93	38.59	74.11	63.03	83.39
53	45.94	76.61	43.20	75.90	73.89	85.87	37.36	72.90	61.26	81.53
54	44.59	75.68	41.73	75.09	72.38	84.77	36.43	71.99	59.37	80.40
55	41.09	72.87	38.29	72.13	66.44	81.49	32.96	69.16	53.12	77.28
56	38.38	71.43	35.90	70.81	60.89	78.99	31.43	68.62	50.17	74.77
57	36.33	69.98	33.95	69.25	58.77	78.25	29.91	67.21	47.58	73.21
58	33.80	67.57	31.57	66.94	56.25	75.01	27.99	65.11	44.35	70.35
59	32.18	65.57	30.33	64.84	52.37	73.65	27.55	63.35	42.75	67.04
60	28.24	58.87	26.66	57.95	46.28	67.67	24.15	56.24	36.64	61.61
61	25.29	55.48	23.90	54.39	41.39	64.82	21.85	52.90	32.16	57.68
62	23.88	51.26	22.62	50.21	37.66	59.14	20.81	48.52	29.39	53.49
63	22.26	48.75	21.08	47.72	35.15	57.95	19.59	46.51	27.17	50.92
64	20.89	46.31	19.79	45.34	36.48	54.79	18.20	44.47	29.17	47.74
65	19.38	44.40	18.59	43.89	30.19	51.11	17.63	43.67	22.35	43.86
66	17.60	41.84	17.09	41.30	24.09	48.82	16.11	41.19	21.42	41.04
67	17.02	39.87	16.47	39.15	24.72	45.56	15.70	39.07	19.83	38.49
68	15.61	36.89	15.13	36.63	21.26	41.39	14.63	36.71	17.82	36.95
69	14.54	35.73	14.19	35.19	17.49	39.57	13.76	35.03	13.83	33.40
70	13.01	31.78	12.62	31.38	22.32	35.50	12.27	31.51	15.42	29.08
71	11.09	29.12	10.85	28.71	14.29	29.19	10.64	29.03	11.99	27.31
72	10.51	28.18	10.29	27.81	13.69	29.21	10.13	27.39	10.37	26.59
73	10.43	28.22	10.35	28.08	11.81	30.85	10.40	28.46	9.02	27.20
74	10.00	26.17	9.89	26.14	16.42	27.79	9.69	26.75	11.51	23.63
75	7.02	23.26	6.80	23.12	16.64	25.50	6.77	23.28	9.59	24.54

Note: This table presents descriptive statistics of the employment-to-population ratio (%) in upper-middle income countries during the study period (2000-2019), based on data from 19 countries extracted from IPUMS International. The following countries are included in the analysis: Argentina (2010), Belarus (2009), Botswana (2011), Brazil (2010), Costa Rica (2011), Dominican Republic (2010), Ecuador (2010), Fiji (2014), Iran (2011), Malaysia (2000), Mauritius (2011), Mexico (2015), Panama (2010), Peru (2017), Poland (2002), Russia (2010), South Africa (2011), Türkiye (2010), and Uruguay (2011).

Table A6: Employment-to-population ratio (%) in high-income countries by sex and education

Age	Educational attainment									
	All education levels		Non-university graduates		University graduates		Non-secondary graduates		Secondary graduates	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
40	68.47	82.34	63.79	80.22	81.81	90.90	47.81	69.38	74.34	86.77
41	68.80	82.51	64.16	80.33	83.98	91.40	48.32	69.16	74.92	87.24
42	69.08	82.56	64.30	80.48	84.71	91.33	48.23	70.71	75.30	86.99
43	68.17	81.70	63.72	79.42	84.04	91.46	48.49	68.94	74.76	86.38
44	69.14	81.65	64.71	79.46	84.82	91.66	49.06	69.08	75.96	86.38
45	68.14	81.31	63.68	79.06	84.67	91.31	47.95	68.84	75.34	86.26
46	68.35	81.04	64.07	78.78	85.19	91.79	48.94	68.05	75.67	86.21
47	67.88	80.58	63.52	78.44	85.27	91.29	48.90	68.16	75.36	85.63
48	66.44	80.61	62.25	78.59	84.79	90.84	47.84	68.77	74.38	85.45
49	66.08	79.79	61.91	77.71	83.93	90.10	48.16	68.41	74.21	84.87
50	65.47	79.04	61.37	76.66	84.58	91.13	47.93	67.08	73.89	84.33
51	64.06	78.48	59.99	76.20	84.45	89.58	46.77	66.80	72.81	83.76
52	62.98	77.22	58.77	74.88	83.66	89.14	45.47	65.77	72.47	82.63
53	61.72	76.50	57.44	74.08	82.65	88.84	45.33	64.83	70.94	82.09
54	60.14	74.40	56.13	71.95	80.37	87.80	44.03	63.19	69.53	79.81
55	56.42	73.13	52.61	70.52	76.98	86.26	40.72	62.06	66.38	78.74
56	53.81	70.63	49.81	68.06	75.27	84.19	38.25	59.82	63.89	76.38
57	50.26	67.70	46.72	64.59	71.20	83.18	36.80	57.11	59.69	73.36
58	46.63	63.90	42.92	60.65	69.84	80.48	33.72	52.88	55.85	69.84
59	41.72	59.96	38.45	56.73	62.72	77.02	30.12	49.29	50.30	65.79
60	34.91	50.45	32.20	47.07	51.21	67.72	25.16	41.83	42.33	55.34
61	30.05	45.62	27.80	42.48	44.37	61.13	22.02	37.96	35.81	49.73
62	25.90	40.34	23.88	37.47	39.29	55.96	19.00	33.78	31.11	44.09
63	22.47	36.74	20.88	33.69	32.87	51.98	16.57	30.07	26.72	40.42
64	18.41	32.76	16.94	30.00	29.93	48.05	13.30	26.41	22.52	36.97
65	13.64	24.50	12.18	22.05	25.55	37.86	8.94	18.22	17.84	29.23
66	10.89	20.80	9.71	18.51	20.25	33.82	6.90	15.40	14.43	25.03
67	9.68	17.78	8.64	15.51	17.79	30.98	6.34	13.27	12.63	21.88
68	8.48	16.38	7.62	14.53	14.86	28.38	5.49	12.60	11.58	20.32
69	7.47	14.73	6.62	12.95	14.50	25.08	4.94	10.94	10.14	18.31
70	6.14	12.63	5.53	11.23	10.62	21.41	4.35	9.95	7.95	15.70
71	5.19	11.43	4.68	10.15	10.66	20.39	3.55	8.59	7.41	15.01
72	4.44	10.40	3.99	9.32	8.50	18.91	3.04	7.81	6.15	13.82
73	4.13	9.28	3.72	8.22	10.00	17.09	2.73	7.03	6.11	12.03
74	3.41	8.45	3.08	7.46	6.82	16.99	2.24	6.60	5.23	11.39
75	3.23	7.55	2.94	6.57	5.96	15.11	2.22	5.35	4.67	10.73

Note: This table presents descriptive statistics of the employment-to-population ratio (%) in high-income countries during the study period (2000-2019), based on data from 15 countries extracted from IPUMS International. The following countries are included in the analysis: Austria (2011), Canada (2011), Chile (2017), France (2011), Greece (2011), Hungary (2011), Ireland (2011), Israel (2008), Italy (2011), Portugal (2011), Puerto Rico (2015), Spain (2011), Switzerland (2011), Trinidad and Tobago (2011), and United States of America (2015).

Table A7: The impact of effective old-age pension coverage on late-life employment after the gender-specific earliest retirement age

Variables	(1)	(2)	(3)
	Outcome 1: Employment-to-population ratio		
	All	Women	Men
(Earliest retirement age -9) * coverage	3.520** (1.379)	1.588 (1.669)	1.867 (1.668)
(Earliest retirement age -8) * coverage	3.680** (1.584)	0.852 (1.916)	2.536 (1.816)
(Earliest retirement age -7) * coverage	3.800** (1.748)	1.234 (2.133)	2.137 (2.018)
(Earliest retirement age -6) * coverage	3.229 (1.983)	0.552 (2.373)	1.508 (2.317)
(Earliest retirement age -5) * coverage	2.553 (2.250)	-0.342 (2.613)	1.005 (2.746)
(Earliest retirement age -4) * coverage	1.750 (2.619)	-1.623 (3.069)	0.441 (3.120)
(Earliest retirement age -3) * coverage	1.027 (2.883)	-2.480 (3.442)	-0.122 (3.288)
(Earliest retirement age -2) * coverage	0.191 (3.283)	-3.356 (3.823)	-1.180 (3.734)
(Earliest retirement age -1) * coverage	-2.746 (3.699)	-7.421* (4.407)	-2.988 (4.116)
(Earliest retirement age) * coverage	-8.328* (4.490)	-12.862** (4.957)	-8.802* (5.161)
(Earliest retirement age +1) * coverage	-11.553** (5.078)	-16.264*** (5.505)	-12.038** (5.916)
(Earliest retirement age +2) * coverage	-14.834** (5.711)	-20.280*** (6.131)	-14.643** (6.538)
(Earliest retirement age +3) * coverage	-16.343*** (5.782)	-22.411*** (6.218)	-15.832** (6.592)
(Earliest retirement age +4) * coverage	-17.515*** (6.005)	-23.260*** (6.432)	-17.481** (6.979)
(Earliest retirement age +5) * coverage	-18.536*** (6.173)	-24.459*** (6.530)	-18.532** (7.182)
(Earliest retirement age +6) * coverage	-19.218*** (6.254)	-25.407*** (6.624)	-19.104** (7.339)
(Earliest retirement age +7) * coverage	-20.061*** (6.351)	-26.406*** (6.732)	-20.112*** (7.430)
(Earliest retirement age +8) * coverage	-20.230*** (6.482)	-26.911*** (6.707)	-20.259** (7.847)
(Earliest retirement age +9) * coverage	-20.074*** (6.691)	-27.473*** (7.039)	-19.783** (7.956)
(Earliest retirement age +10) * coverage	-20.518*** (6.638)	-28.836*** (7.119)	-23.031*** (7.942)
Constant	59.080*** (1.452)	59.103*** (0.821)	85.061*** (0.648)
Observations	5,586	2,793	2,793
R-squared	0.870	0.934	0.939
FE by Country	Yes	Yes	Yes
Mean of dependent variable	53.49	41.07	65.92
Standard deviation of dependent variable	27.78	24.74	24.95

Notes: Robust standard errors are clustered at the country level and reported in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A8: The impact of effective old-age pension coverage on late-life employment after the gender-specific earliest retirement age

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Outcome 2: Employment ratio of university to non-university graduates			Outcome 3: Employment ratio of secondary to non-secondary graduates		
	All	Women	Men	All	Women	Men
(Earliest retirement age -9) * coverage	-0.054 (0.166)	-0.100 (0.367)	0.052 (0.064)	0.031 (0.092)	0.122 (0.150)	0.072 (0.044)
(Earliest retirement age -8) * coverage	-0.171 (0.227)	-0.339 (0.477)	0.065 (0.072)	-0.009 (0.108)	0.038 (0.170)	0.096* (0.049)
(Earliest retirement age -7) * coverage	-0.205 (0.304)	-0.397 (0.633)	0.061 (0.083)	0.021 (0.132)	0.161 (0.224)	0.052 (0.058)
(Earliest retirement age -6) * coverage	-0.193 (0.307)	-0.363 (0.623)	0.081 (0.089)	-0.031 (0.132)	0.084 (0.210)	0.042 (0.071)
(Earliest retirement age -5) * coverage	-0.224 (0.335)	-0.422 (0.661)	0.085 (0.111)	0.015 (0.142)	0.132 (0.227)	0.113 (0.076)
(Earliest retirement age -4) * coverage	-0.090 (0.306)	-0.124 (0.600)	0.112 (0.119)	0.121 (0.153)	0.364 (0.264)	0.117 (0.086)
(Earliest retirement age -3) * coverage	-0.181 (0.327)	-0.376 (0.612)	0.179 (0.132)	0.148 (0.183)	0.381 (0.313)	0.148* (0.087)
(Earliest retirement age -2) * coverage	-0.100 (0.370)	-0.096 (0.688)	0.103 (0.144)	0.214 (0.188)	0.562* (0.328)	0.130 (0.099)
(Earliest retirement age -1) * coverage	-0.003 (0.396)	0.028 (0.745)	0.185 (0.160)	0.215 (0.176)	0.591* (0.306)	0.110 (0.107)
(Earliest retirement age) * coverage	0.054 (0.420)	-0.071 (0.760)	0.411** (0.202)	0.378* (0.221)	0.715** (0.358)	0.307** (0.152)
(Earliest retirement age +1) * coverage	0.275 (0.391)	0.310 (0.656)	0.494** (0.247)	0.486** (0.240)	0.908** (0.370)	0.346* (0.184)
(Earliest retirement age +2) * coverage	0.387 (0.431)	0.448 (0.694)	0.556* (0.292)	0.592** (0.260)	0.928** (0.384)	0.537** (0.234)
(Earliest retirement age +3) * coverage	0.420 (0.415)	0.481 (0.631)	0.648** (0.313)	0.702*** (0.264)	1.088*** (0.393)	0.614** (0.243)
(Earliest retirement age +4) * coverage	0.653 (0.486)	0.648 (0.813)	0.951*** (0.324)	0.753** (0.307)	1.111** (0.454)	0.686** (0.264)
(Earliest retirement age +5) * coverage	0.475 (0.538)	0.477 (0.873)	0.776** (0.355)	0.861** (0.387)	1.338** (0.548)	0.661** (0.297)
(Earliest retirement age +6) * coverage	0.700 (0.475)	0.875 (0.688)	0.842** (0.390)	0.863** (0.368)	1.057** (0.451)	0.924** (0.381)
(Earliest retirement age +7) * coverage	0.552 (0.554)	0.344 (0.840)	1.061*** (0.395)	1.048*** (0.377)	1.579*** (0.517)	0.802** (0.333)
(Earliest retirement age +8) * coverage	0.460 (0.659)	0.395 (1.021)	0.853** (0.422)	0.985*** (0.372)	1.509*** (0.536)	0.752** (0.296)
(Earliest retirement age +9) * coverage	0.747 (0.535)	0.759 (0.790)	1.020** (0.456)	0.968*** (0.349)	1.304*** (0.473)	0.924*** (0.347)
(Earliest retirement age +10) * coverage	0.977 (0.678)	0.697 (1.073)	1.548*** (0.534)	1.046** (0.411)	1.216** (0.497)	1.220*** (0.408)
Constant	1.742*** (0.124)	1.759*** (0.188)	1.091*** (0.037)	1.689*** (0.085)	1.687*** (0.101)	1.108*** (0.030)
Observations	5,585	2,792	2,793	5,584	2,791	2,793
R-squared	0.115	0.178	0.575	0.338	0.514	0.595
FE by Country	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent variable	1.63	2.04	1.22	1.46	1.78	1.15
Standard deviation of dependent variable	4.13	5.76	0.74	1.48	1.96	0.61

Notes: Robust standard errors are clustered at the country level and reported in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Table A9: The impact of effective old-age pension coverage on late-life employment after the gender-specific statutory retirement age

Variables	(1)	(2)	(3)
	Outcome 1:		
	Employment-to-population ratio		
	All	Women	Men
(Statutory retirement age -4) * coverage	-4.158* (2.260)	-7.309** (2.769)	-3.039 (2.493)
(Statutory retirement age -3) * coverage	-6.677** (2.893)	-9.047*** (3.266)	-6.196* (3.129)
(Statutory retirement age -2) * coverage	-8.189** (3.435)	-11.242*** (3.672)	-7.281* (3.779)
(Statutory retirement age -1) * coverage	-10.246*** (3.844)	-13.621*** (4.030)	-9.227** (4.341)
(Statutory retirement age) * coverage	-17.789*** (4.285)	-21.275*** (4.369)	-16.927*** (4.955)
(Statutory retirement age +1) * coverage	-19.610*** (4.896)	-23.673*** (4.918)	-18.651*** (5.844)
(Statutory retirement age +2) * coverage	-21.188*** (5.231)	-25.361*** (5.211)	-20.212*** (6.254)
(Statutory retirement age +3) * coverage	-21.422*** (5.234)	-26.288*** (5.255)	-19.941*** (6.273)
(Statutory retirement age +4) * coverage	-22.439*** (5.445)	-27.088*** (5.447)	-21.252*** (6.611)
(Statutory retirement age +5) * coverage	-21.167*** (5.996)	-27.158*** (6.136)	-21.861*** (7.304)
Constant	59.092*** (1.458)	59.061*** (0.850)	85.059*** (0.666)
Observations	5,586	2,793	2,793
R-squared	0.869	0.933	0.939
FE by Country	Yes	Yes	Yes
Mean of dependent variable	53.49	41.07	65.92
Standard deviation of dependent variable	27.78	24.74	24.95

Notes: Robust standard errors are clustered at the country level and reported in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.