

Appendix A. Descriptive statistics and labor income t-test

Table A.1
Household-level descriptive statistics from training data

	<i>Mean and standard deviation</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
Household size	3.909 (1.962)	3.807 (1.925)	3.713 (1.891)	3.721 (1.855)	3.665 (1.841)	3.605 (1.836)
Hours worked per week	71.771 (51.969)	71.518 (53.044)	71.687 (53.140)	72.603 (52.784)	76.634 (54.275)	76.728 (54.980)
Labor income per month	8403.6 (17451.6)	7661.9 (11335.4)	7992.6 (13393.9)	8901.9 (21599.2)	9371.0 (52960.6)	10191.3 (17567.8)
Households with per capita labor income lower than the mwl	0.329 (0.470)	0.370 (0.483)	0.400 (0.490)	0.392 (0.488)	0.349 (0.477)	0.348 (0.476)
Observations	60,155	61,840	57,273	58,121	70,307	74,642

Note: Standard deviations are shown in parentheses.

Source: Author’s calculations using data from the MCS-ENIGH from 2008 to 2018, and without utilizing expansion factors.

Table A.2
Individual-level descriptive statistics from training data

	<i>Mean and standard deviation</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
Rural localities	0.256 (0.436)	0.254 (0.435)	0.267 (0.443)	0.255 (0.436)	0.376 (0.484)	0.395 (0.489)
Women	0.514 (0.500)	0.512 (0.500)	0.511 (0.500)	0.511 (0.500)	0.511 (0.500)	0.511 (0.500)

Table A.2
(Continued)

	<i>Mean and standard deviation</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
Age	29.248 (20.613)	29.828 (20.780)	30.378 (21.037)	30.470 (20.954)	30.688 (21.129)	31.527 (21.390)
Economically Inactive Population	0.258 (0.437)	0.264 (0.441)	0.255 (0.436)	0.253 (0.435)	0.232 (0.422)	0.238 (0.426)
Employed EAP	0.402 (0.490)	0.402 (0.490)	0.421 (0.494)	0.425 (0.494)	0.455 (0.498)	0.463 (0.499)
Unemployed EAP	0.021 (0.144)	0.027 (0.163)	0.024 (0.153)	0.022 (0.146)	0.013 (0.115)	0.013 (0.115)
EAP under 15	0.319 (0.466)	0.307 (0.461)	0.300 (0.458)	0.300 (0.458)	0.300 (0.458)	0.286 (0.452)
Not in school	0.690 (0.462)	0.695 (0.460)	0.699 (0.459)	0.695 (0.461)	0.698 (0.459)	0.709 (0.454)
Incomplete elementary school	0.399 (0.490)	0.385 (0.487)	0.373 (0.484)	0.356 (0.479)	0.353 (0.478)	0.338 (0.473)
Completed elementary school	0.203 (0.402)	0.194 (0.395)	0.191 (0.393)	0.189 (0.391)	0.189 (0.392)	0.182 (0.386)
Completed junior high school	0.397 (0.489)	0.421 (0.494)	0.436 (0.496)	0.455 (0.498)	0.458 (0.498)	0.480 (0.500)
Educational lag	0.216 (0.411)	0.208 (0.406)	0.201 (0.401)	0.187 (0.390)	0.188 (0.391)	0.185 (0.388)
IMSS affiliation	0.310 (0.462)	0.277 (0.447)	0.256 (0.436)	0.276 (0.447)	0.284 (0.451)	0.312 (0.463)
ISSSTE affiliation	0.075 (0.263)	0.075 (0.264)	0.066 (0.247)	0.061 (0.239)	0.056 (0.229)	0.057 (0.231)
No health insurance	0.348 (0.476)	0.271 (0.444)	0.194 (0.396)	0.170 (0.376)	0.140 (0.347)	0.140 (0.347)

Table A.2
(Continued)

	<i>Mean and standard deviation</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
Poverty	0.425	0.467	0.471	0.458	0.411	0.400
	(0.494)	(0.499)	(0.499)	(0.498)	(0.492)	(0.490)
Observations	235,072	235,423	212,674	216,209	257,647	269,055

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the MCS-ENIGH from 2008 to 2018, without utilizing expansion factors.

Table A.3
Household-level descriptive statistics from 2008-2009 prediction data

	<i>Mean and standard deviation</i>							
	<i>2008</i>				<i>2009</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Household size	3.802	3.799	3.787	3.788	3.773	3.764	3.752	3.756
	(1.869)	(1.868)	(1.863)	(1.866)	(1.854)	(1.851)	(1.861)	(1.871)
Hours worked per week	62.86	66.22	65.18	65.35	63.03	60.71	62.83	63.44
	(49.54)	(49.65)	(50.24)	(49.55)	(48.98)	(48.63)	(49.79)	(49.76)
Labor income per month	7510.2	7506.0	7274.1	6852.6	6771.8	6688.3	6537.4	6431.4
	(9807.8)	(9137.2)	(8762.5)	(8120.5)	(8095.0)	(7984.6)	(8204.3)	(7329.1)
Households with per capita labor income lower than the mwl	0.290	0.286	0.315	0.336	0.340	0.356	0.373	0.371
	(0.454)	(0.452)	(0.464)	(0.472)	(0.474)	(0.479)	(0.484)	(0.483)
Observations	97,250	96,782	94,859	93,214	93,894	93,697	92,924	93,085

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2008 through the last quarter of 2009, without utilizing expansion factors.

Table A.4
Household-level descriptive statistics from 2010-2011 prediction data

	<i>Mean and standard deviation</i>							
	<i>2010</i>				<i>2011</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Household size	3.764	3.762	3.756	3.732	3.718	3.704	3.701	3.691
	(1.869)	(1.881)	(1.876)	(1.850)	(1.852)	(1.846)	(1.839)	(1.845)
Hours worked per week	62.53	63.20	62.88	62.73	62.29	61.98	62.18	63.53
	(49.10)	(49.41)	(50.01)	(49.20)	(49.08)	(49.08)	(49.30)	(49.74)

Table A.4
(Continued)

<i>Mean and standard deviation</i>									
	<i>2010</i>				<i>2011</i>				
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	
Labor income per month	7042.3 (8396.5)	7156.3 (8236.4)	7068.6 (8105.7)	6782.0 (7867.2)	6846.5 (7706.0)	6925.5 (7882.7)	6822.1 (7864.4)	6794.4 (8020.2)	
Households with per capita labor income lower than the mwl	0.347 (0.476)	0.342 (0.474)	0.343 (0.475)	0.369 (0.482)	0.360 (0.480)	0.358 (0.479)	0.362 (0.481)	0.378 (0.485)	
Observations	94,266	94,496	93,545	92,348	92,879	92,741	91,452	90,972	

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2010 through the last quarter of 2011, without utilizing expansion factors.

Table A.5
Household-level descriptive statistics from 2012-2013 prediction data

<i>Mean and standard deviation</i>								
	<i>2012</i>				<i>2013</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Household size	3.695 (1.840)	3.681 (1.834)	3.673 (1.830)	3.655 (1.818)	3.663 (1.813)	3.653 (1.809)	3.658 (1.808)	3.678 (1.812)
Hours worked per week	62.94 (49.17)	62.64 (49.11)	63.54 (49.84)	63.13 (49.22)	61.56 (48.71)	62.30 (48.65)	62.42 (49.13)	64.51 (49.38)
Labor income per month	7386.4 (8408.8)	7512.8 (8462.0)	7427.8 (9882.7)	7283.6 (8919.5)	7329.1 (9632.5)	7312.6 (8704.1)	7279.1 (8317.1)	7304.1 (8734.1)

Table A.5
(Continued)

	<i>Mean and standard deviation</i>							
	<i>2012</i>				<i>2013</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Households with per capita labor income lower than the mwl	0.350 (0.477)	0.345 (0.475)	0.368 (0.482)	0.381 (0.486)	0.374 (0.484)	0.385 (0.487)	0.389 (0.487)	0.386 (0.487)
Observations	92,397	92,577	91,372	90,066	90,301	90,041	89,681	90,684

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2012 through the last quarter of 2013, without utilizing expansion factors.

Table A.6
Household-level descriptive statistics from 2014-2015 prediction data

	<i>Mean and standard deviation</i>							
	<i>2014</i>				<i>2015</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Household size	3.671 (1.796)	3.649 (1.789)	3.638 (1.783)	3.634 (1.783)	3.619 (1.780)	3.613 (1.776)	3.601 (1.764)	3.597 (1.770)
Hours worked per week	61.84 (48.50)	61.20 (47.57)	62.02 (48.34)	63.39 (48.30)	62.25 (48.07)	62.09 (48.47)	62.51 (48.72)	62.92 (48.54)
Labor income per month	7722.0 (8403.0)	7619.4 (8234.8)	7543.2 (8305.8)	7483.5 (8028.8)	7637.8 (8104.1)	7730.4 (8275.2)	7727.8 (8553.8)	7698.3 (8353.5)
Households with per capita labor income lower than the mwl	0.376 (0.484)	0.375 (0.484)	0.385 (0.487)	0.402 (0.490)	0.389 (0.488)	0.386 (0.487)	0.388 (0.487)	0.386 (0.487)
Observations	91,865	92,335	92,182	91,937	92,658	92,829	91,798	91,148

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2014 through the last quarter of 2015, without utilizing expansion factors.

Table A.7
Household-level descriptive statistics from 2016-2017 prediction data

	<i>Mean and standard deviation</i>							
	<i>2016</i>				<i>2017</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Household size	3.577 (1.763)	3.566 (1.756)	3.540 (1.751)	3.540 (1.760)	3.526 (1.755)	3.515 (1.762)	3.509 (1.758)	3.506 (1.753)
Hours worked per week	60.90 (47.98)	63.05 (48.01)	62.59 (48.77)	63.01 (48.44)	62.26 (48.21)	60.81 (47.79)	61.58 (48.31)	62.23 (48.34)
Labor income per month	8158.8 (8548.1)	8234.1 (8787.1)	8210.9 (8795.6)	8151.2 (8677.6)	8175.0 (8660.4)	8102.5 (8718.4)	7970.9 (8508.4)	7941.9 (8478.4)
Households with per capita labor income lower than the mwl	0.375 (0.484)	0.367 (0.482)	0.365 (0.481)	0.370 (0.483)	0.375 (0.484)	0.381 (0.486)	0.406 (0.491)	0.404 (0.491)
Observations	91,200	91,398	90,236	89,884	90,361	91,492	88,661	89,084

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2016 through the last quarter of 2017, without utilizing expansion factors.

Table A.8
Household-level descriptive statistics from 2018-2019 prediction data

	<i>Mean and standard deviation</i>							
	<i>2018</i>				<i>2019</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Household size	3.496 (1.747)	3.486 (1.755)	3.468 (1.750)	3.474 (1.758)	3.474 (1.757)	3.477 (1.755)	3.466 (1.756)	3.454 (1.749)
Hours worked per week	61.26 (48.16)	61.71 (48.22)	62.24 (48.83)	62.62 (48.93)	61.35 (48.70)	61.96 (48.95)	62.73 (49.52)	63.30 (49.17)

Table A.8
(Continued)

	<i>Mean and standard deviation</i>							
	<i>2018</i>				<i>2019</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Labor income per month	9057.9 (9658.9)	9231.2 (9682.3)	9103.8 (9707.2)	8993.6 (9568.1)	9331.0 (9749.7)	9428.4 (9800.0)	9498.4 (10041.1)	9453.5 (9872.6)
Households with per capita labor income lower than the mwl	0.361 (0.480)	0.352 (0.478)	0.366 (0.482)	0.373 (0.484)	0.364 (0.481)	0.361 (0.480)	0.366 (0.482)	0.363 (0.481)
Observations	89,258	89,658	89,099	88,722	93,797	94,648	95,026	94,526

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2018 through the last quarter of 2019, without utilizing expansion factors.

Table A.9
Individual-level descriptive statistics from 2008-2009 prediction data

	<i>Mean and standard deviation</i>							
	<i>2008</i>				<i>2009</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Rural localities	0.181 (0.385)	0.183 (0.387)	0.183 (0.387)	0.187 (0.390)	0.187 (0.390)	0.188 (0.391)	0.190 (0.393)	0.190 (0.392)
Women	0.519 (0.500)	0.518 (0.500)	0.519 (0.500)	0.518 (0.500)	0.517 (0.500)	0.517 (0.500)	0.518 (0.500)	0.517 (0.500)
Age	29.224 (20.487)	29.184 (20.460)	29.290 (20.520)	29.317 (20.547)	29.453 (20.542)	29.513 (20.554)	29.605 (20.635)	29.651 (20.641)
Economically Inactive Population	0.263 (0.440)	0.259 (0.438)	0.261 (0.439)	0.266 (0.442)	0.271 (0.444)	0.269 (0.444)	0.264 (0.441)	0.266 (0.442)
Employed EAP	0.405 (0.491)	0.410 (0.492)	0.406 (0.491)	0.401 (0.490)	0.397 (0.489)	0.398 (0.490)	0.400 (0.490)	0.404 (0.491)

Table A.9
(Continued)

	<i>Mean and standard deviation</i>							
	<i>2008</i>				<i>2009</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Unemployed EAP	0.016 (0.126)	0.015 (0.122)	0.018 (0.132)	0.018 (0.133)	0.022 (0.145)	0.022 (0.148)	0.027 (0.162)	0.023 (0.150)
EAP under 15	0.316 (0.465)	0.316 (0.465)	0.315 (0.465)	0.315 (0.464)	0.311 (0.463)	0.310 (0.463)	0.309 (0.462)	0.307 (0.461)
Not in school	0.666 (0.472)	0.666 (0.472)	0.670 (0.470)	0.669 (0.471)	0.670 (0.470)	0.670 (0.470)	0.672 (0.469)	0.672 (0.469)
Incomplete elementary school	0.389 (0.487)	0.389 (0.488)	0.386 (0.487)	0.386 (0.487)	0.383 (0.486)	0.381 (0.486)	0.378 (0.485)	0.377 (0.485)
Completed elementary school	0.200 (0.400)	0.199 (0.399)	0.200 (0.400)	0.200 (0.400)	0.201 (0.400)	0.199 (0.400)	0.200 (0.400)	0.198 (0.398)
Completed junior high school	0.411 (0.492)	0.412 (0.492)	0.414 (0.493)	0.413 (0.492)	0.417 (0.493)	0.420 (0.494)	0.422 (0.494)	0.426 (0.494)
Educational lag	0.178 (0.383)	0.178 (0.382)	0.177 (0.382)	0.177 (0.382)	0.178 (0.383)	0.175 (0.380)	0.174 (0.379)	0.173 (0.379)
IMSS affiliation	0.344 (0.475)	0.341 (0.474)	0.344 (0.475)	0.340 (0.474)	0.327 (0.469)	0.324 (0.468)	0.320 (0.467)	0.321 (0.467)
ISSSTE affiliation	0.080 (0.272)	0.079 (0.269)	0.078 (0.268)	0.078 (0.268)	0.079 (0.270)	0.079 (0.269)	0.078 (0.268)	0.077 (0.267)
No health insurance	0.246 (0.431)	0.252 (0.434)	0.248 (0.432)	0.245 (0.430)	0.245 (0.430)	0.249 (0.432)	0.253 (0.434)	0.257 (0.437)
Observations	369,784	367,629	359,250	353,113	354,297	352,634	348,694	349,649

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2008 through the last quarter of 2009, without utilizing expansion factors.

Table A.10
Individual-level descriptive statistics from 2010-2011 prediction data

	<i>Mean and standard deviation</i>							
	<i>2010</i>				<i>2011</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Rural localities	0.191 (0.393)	0.192 (0.394)	0.191 (0.393)	0.194 (0.395)	0.194 (0.395)	0.193 (0.394)	0.193 (0.394)	0.198 (0.398)
Women	0.517 (0.500)	0.516 (0.500)	0.516 (0.500)	0.516 (0.500)	0.516 (0.500)	0.515 (0.500)	0.516 (0.500)	0.517 (0.500)
Age	29.673 (20.628)	29.728 (20.640)	29.773 (20.683)	29.860 (20.724)	29.922 (20.740)	29.969 (20.758)	30.028 (20.797)	30.097 (20.812)
Economically Inactive Population	0.272 (0.445)	0.266 (0.442)	0.268 (0.443)	0.277 (0.447)	0.278 (0.448)	0.273 (0.446)	0.272 (0.445)	0.268 (0.443)
Employed EAP	0.398 (0.490)	0.406 (0.491)	0.403 (0.491)	0.397 (0.489)	0.397 (0.489)	0.403 (0.490)	0.403 (0.490)	0.411 (0.492)
Unemployed EAP	0.023 (0.150)	0.023 (0.150)	0.024 (0.154)	0.023 (0.150)	0.023 (0.149)	0.023 (0.150)	0.025 (0.156)	0.022 (0.147)
EAP under 15	0.306 (0.461)	0.305 (0.461)	0.305 (0.460)	0.303 (0.460)	0.302 (0.459)	0.301 (0.459)	0.301 (0.458)	0.300 (0.458)
Not in school	0.673 (0.469)	0.674 (0.469)	0.675 (0.468)	0.676 (0.468)	0.676 (0.468)	0.677 (0.468)	0.677 (0.468)	0.676 (0.468)
Incomplete elementary school	0.375 (0.484)	0.375 (0.484)	0.371 (0.483)	0.369 (0.483)	0.369 (0.483)	0.368 (0.482)	0.364 (0.481)	0.363 (0.481)
Completed elementary school	0.196 (0.397)	0.194 (0.396)	0.194 (0.395)	0.194 (0.396)	0.194 (0.395)	0.193 (0.395)	0.193 (0.395)	0.193 (0.395)
Completed junior high school	0.429 (0.495)	0.431 (0.495)	0.435 (0.496)	0.436 (0.496)	0.437 (0.496)	0.438 (0.496)	0.443 (0.497)	0.444 (0.497)
Educational lag	0.174 (0.379)	0.174 (0.379)	0.171 (0.376)	0.170 (0.376)	0.172 (0.377)	0.171 (0.376)	0.167 (0.373)	0.166 (0.372)

Table A.10
(Continued)

	<i>Mean and standard deviation</i>							
	<i>2010</i>				<i>2011</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
IMSS affiliation	0.318 (0.466)	0.319 (0.466)	0.322 (0.467)	0.329 (0.470)	0.320 (0.466)	0.322 (0.467)	0.320 (0.467)	0.321 (0.467)
ISSSTE affiliation	0.077 (0.267)	0.077 (0.266)	0.076 (0.265)	0.075 (0.264)	0.075 (0.263)	0.074 (0.262)	0.074 (0.262)	0.073 (0.260)
No health insurance	0.252 (0.434)	0.258 (0.438)	0.255 (0.436)	0.246 (0.431)	0.249 (0.433)	0.254 (0.435)	0.255 (0.436)	0.263 (0.440)
Observations	354,833	355,449	351,313	344,659	345,337	343,474	338,431	335,765

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2010 through the last quarter of 2011, without utilizing expansion factors.

Table A.11
Individual-level descriptive statistics from 2012-2013 prediction data

	<i>Mean and standard deviation</i>							
	<i>2012</i>				<i>2013</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Rural localities	0.195 (0.396)	0.194 (0.395)	0.194 (0.396)	0.198 (0.398)	0.192 (0.394)	0.188 (0.390)	0.181 (0.385)	0.176 (0.381)
Women	0.516 (0.500)	0.516 (0.500)	0.516 (0.500)	0.517 (0.500)	0.516 (0.500)	0.516 (0.500)	0.516 (0.500)	0.516 (0.500)
Age	30.209 (20.826)	30.274 (20.841)	30.400 (20.878)	30.563 (20.971)	30.504 (20.926)	30.383 (20.868)	30.363 (20.888)	30.240 (20.792)
Economically Inactive Population	0.275 (0.446)	0.268 (0.443)	0.266 (0.442)	0.275 (0.447)	0.279 (0.448)	0.270 (0.444)	0.269 (0.444)	0.266 (0.442)

Table A.11
(Continued)

	<i>Mean and standard deviation</i>							
	<i>2012</i>				<i>2013</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Employed EAP	0.406 (0.491)	0.414 (0.493)	0.415 (0.493)	0.409 (0.492)	0.405 (0.491)	0.411 (0.492)	0.408 (0.491)	0.413 (0.492)
Unemployed EAP	0.022 (0.146)	0.022 (0.145)	0.024 (0.153)	0.022 (0.147)	0.022 (0.146)	0.023 (0.149)	0.024 (0.154)	0.022 (0.146)
EAP under 15	0.297 (0.457)	0.296 (0.457)	0.295 (0.456)	0.294 (0.455)	0.295 (0.456)	0.296 (0.457)	0.298 (0.457)	0.299 (0.458)
Not in school	0.676 (0.468)	0.677 (0.467)	0.679 (0.467)	0.679 (0.467)	0.678 (0.467)	0.677 (0.468)	0.677 (0.467)	0.676 (0.468)
Incomplete elementary school	0.361 (0.480)	0.360 (0.480)	0.356 (0.479)	0.355 (0.479)	0.355 (0.479)	0.355 (0.479)	0.351 (0.477)	0.350 (0.477)
Completed elementary school	0.191 (0.393)	0.190 (0.393)	0.190 (0.393)	0.191 (0.393)	0.189 (0.391)	0.187 (0.390)	0.188 (0.391)	0.187 (0.390)
Completed junior high school	0.448 (0.497)	0.450 (0.497)	0.453 (0.498)	0.454 (0.498)	0.456 (0.498)	0.458 (0.498)	0.461 (0.498)	0.463 (0.499)
Educational lag	0.166 (0.372)	0.164 (0.371)	0.163 (0.369)	0.162 (0.368)	0.162 (0.369)	0.159 (0.366)	0.155 (0.362)	0.154 (0.361)
IMSS affiliation	0.319 (0.466)	0.322 (0.467)	0.325 (0.468)	0.330 (0.470)	0.327 (0.469)	0.334 (0.472)	0.337 (0.473)	0.343 (0.475)
ISSSTE affiliation	0.073 (0.261)	0.073 (0.261)	0.071 (0.257)	0.073 (0.259)	0.071 (0.256)	0.069 (0.254)	0.068 (0.253)	0.067 (0.250)
No health insurance	0.257 (0.437)	0.263 (0.440)	0.264 (0.441)	0.254 (0.435)	0.253 (0.435)	0.257 (0.437)	0.255 (0.436)	0.257 (0.437)
Observations	341,394	340,803	335,605	329,204	330,745	328,944	328,059	333,492

Note: Standard deviations are shown in parentheses. Source: Author's calculations using data from the ENOE from the first quarter of 2012 through the last quarter of 2013, without utilizing expansion factors.

Table A.12
Individual-level descriptive statistics from 2014-2015 prediction data

	<i>Mean and standard deviation</i>							
	<i>2014</i>				<i>2015</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Rural localities	0.169 (0.375)	0.170 (0.376)	0.172 (0.377)	0.171 (0.377)	0.171 (0.377)	0.171 (0.377)	0.172 (0.377)	0.172 (0.378)
Women	0.516 (0.500)	0.516 (0.500)	0.516 (0.500)	0.518 (0.500)	0.517 (0.500)	0.517 (0.500)	0.516 (0.500)	0.516 (0.500)
Age	30.208 (20.767)	30.342 (20.824)	30.471 (20.891)	30.541 (20.893)	30.643 (20.914)	30.668 (20.912)	30.724 (20.945)	30.748 (20.981)
Economically Inactive Population	0.273 (0.446)	0.273 (0.445)	0.272 (0.445)	0.273 (0.446)	0.277 (0.447)	0.273 (0.446)	0.274 (0.446)	0.271 (0.445)
Employed EAP	0.405 (0.491)	0.406 (0.491)	0.406 (0.491)	0.409 (0.492)	0.409 (0.492)	0.412 (0.492)	0.411 (0.492)	0.416 (0.493)
Unemployed EAP	0.022 (0.148)	0.022 (0.148)	0.024 (0.154)	0.021 (0.142)	0.020 (0.139)	0.020 (0.140)	0.022 (0.146)	0.019 (0.136)
EAP under 15	0.299 (0.458)	0.299 (0.458)	0.298 (0.457)	0.297 (0.457)	0.295 (0.456)	0.295 (0.456)	0.294 (0.455)	0.294 (0.456)
Not in school	0.674 (0.469)	0.674 (0.469)	0.677 (0.468)	0.675 (0.468)	0.676 (0.468)	0.676 (0.468)	0.678 (0.467)	0.677 (0.468)
Incomplete elementary school	0.349 (0.477)	0.348 (0.476)	0.344 (0.475)	0.342 (0.474)	0.340 (0.474)	0.338 (0.473)	0.334 (0.472)	0.335 (0.472)
Completed elementary school	0.186 (0.389)	0.187 (0.390)	0.189 (0.392)	0.189 (0.391)	0.189 (0.391)	0.187 (0.390)	0.187 (0.390)	0.186 (0.389)
Completed junior high school	0.464 (0.499)	0.465 (0.499)	0.467 (0.499)	0.469 (0.499)	0.471 (0.499)	0.474 (0.499)	0.479 (0.500)	0.479 (0.500)
Educational lag	0.153 (0.360)	0.152 (0.359)	0.151 (0.358)	0.150 (0.357)	0.151 (0.358)	0.149 (0.356)	0.147 (0.354)	0.147 (0.354)

Table A.12
(Continued)

	<i>Mean and standard deviation</i>							
	<i>2014</i>				<i>2015</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
IMSS affiliation	0.349 (0.477)	0.350 (0.477)	0.350 (0.477)	0.349 (0.477)	0.350 (0.477)	0.353 (0.478)	0.351 (0.477)	0.350 (0.477)
ISSSTE affiliation	0.068 (0.251)	0.066 (0.249)	0.065 (0.247)	0.066 (0.249)	0.066 (0.248)	0.065 (0.247)	0.065 (0.246)	0.063 (0.243)
No health insurance	0.247 (0.431)	0.247 (0.431)	0.247 (0.431)	0.249 (0.432)	0.248 (0.432)	0.250 (0.433)	0.250 (0.433)	0.256 (0.436)
Observations	337,258	336,915	335,376	334,130	335,374	335,362	330,572	327,820

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2014 through the last quarter of 2015, without utilizing expansion factors

Table A.13
Individual-level descriptive statistics from 2016-2017 prediction data

	<i>Mean and standard deviation</i>							
	<i>2016</i>				<i>2017</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Rural localities	0.172 (0.378)	0.173 (0.378)	0.173 (0.378)	0.176 (0.381)	0.175 (0.380)	0.171 (0.376)	0.173 (0.378)	0.173 (0.378)
Women	0.516 (0.500)	0.517 (0.500)	0.518 (0.500)	0.517 (0.500)	0.518 (0.500)	0.517 (0.500)	0.517 (0.500)	0.516 (0.500)
Age	30.904 (21.010)	30.958 (21.012)	31.144 (21.097)	31.217 (21.105)	31.322 (21.143)	31.473 (21.238)	31.519 (21.273)	31.608 (21.288)
Economically Inactive Population	0.278 (0.448)	0.275 (0.447)	0.274 (0.446)	0.278 (0.448)	0.282 (0.450)	0.282 (0.450)	0.283 (0.450)	0.283 (0.451)

Table A.13
(Continued)

<i>Mean and standard deviation</i>								
	<i>2016</i>				<i>2017</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Employed EAP	0.412 (0.492)	0.416 (0.493)	0.419 (0.493)	0.419 (0.493)	0.416 (0.493)	0.417 (0.493)	0.415 (0.493)	0.418 (0.493)
Unemployed EAP	0.018 (0.134)	0.018 (0.134)	0.019 (0.136)	0.017 (0.128)	0.016 (0.127)	0.017 (0.129)	0.018 (0.131)	0.016 (0.126)
EAP under 15	0.292 (0.454)	0.291 (0.454)	0.288 (0.453)	0.287 (0.452)	0.286 (0.452)	0.284 (0.451)	0.284 (0.451)	0.283 (0.450)
Not in school	0.678 (0.467)	0.678 (0.467)	0.683 (0.465)	0.683 (0.465)	0.682 (0.466)	0.684 (0.465)	0.685 (0.465)	0.687 (0.464)
Incomplete elementary school	0.334 (0.472)	0.333 (0.471)	0.328 (0.469)	0.327 (0.469)	0.325 (0.468)	0.323 (0.468)	0.320 (0.467)	0.319 (0.466)
Completed elementary school	0.185 (0.389)	0.184 (0.387)	0.184 (0.388)	0.183 (0.387)	0.182 (0.386)	0.181 (0.385)	0.182 (0.385)	0.180 (0.384)
Completed junior high school	0.481 (0.500)	0.484 (0.500)	0.488 (0.500)	0.490 (0.500)	0.492 (0.500)	0.496 (0.500)	0.498 (0.500)	0.501 (0.500)
Educational lag	0.149 (0.356)	0.147 (0.354)	0.145 (0.352)	0.144 (0.351)	0.145 (0.352)	0.142 (0.349)	0.140 (0.347)	0.139 (0.346)
IMSS affiliation	0.347 (0.476)	0.351 (0.477)	0.350 (0.477)	0.354 (0.478)	0.350 (0.477)	0.354 (0.478)	0.353 (0.478)	0.353 (0.478)
ISSSTE affiliation	0.063 (0.243)	0.063 (0.242)	0.062 (0.241)	0.062 (0.240)	0.061 (0.240)	0.060 (0.237)	0.059 (0.236)	0.059 (0.235)
No health insurance	0.252 (0.434)	0.254 (0.435)	0.256 (0.436)	0.254 (0.435)	0.253 (0.435)	0.253 (0.435)	0.253 (0.435)	0.255 (0.436)
Observations	326,265	325,948	319,394	318,179	318,578	321,559	311,112	312,352

Note: Standard deviations are shown in parentheses. Source: Author's calculations using data from the ENOE from the first quarter of 2016 through the last quarter of 2017, and without utilizing expansion factors

Table A.14
Individual-level descriptive statistics from 2018-2019 prediction data

	<i>Mean and standard deviation</i>							
	<i>2018</i>				<i>2019</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Rural localities	0.173 (0.379)	0.172 (0.377)	0.172 (0.378)	0.172 (0.377)	0.165 (0.371)	0.162 (0.369)	0.160 (0.366)	0.160 (0.367)
Women	0.517 (0.500)	0.516 (0.500)	0.518 (0.500)	0.518 (0.500)	0.517 (0.500)	0.517 (0.500)	0.518 (0.500)	0.517 (0.500)
Age	31.751 (21.298)	31.812 (21.275)	32.015 (21.361)	32.084 (21.394)	32.280 (21.448)	32.386 (21.481)	32.559 (21.515)	32.672 (21.529)
Economically Inactive Population	0.287 (0.452)	0.283 (0.450)	0.283 (0.450)	0.284 (0.451)	0.286 (0.452)	0.283 (0.450)	0.282 (0.450)	0.283 (0.451)
Employed EAP	0.418 (0.493)	0.424 (0.494)	0.423 (0.494)	0.425 (0.494)	0.425 (0.494)	0.429 (0.495)	0.431 (0.495)	0.434 (0.496)
Unemployed EAP	0.016 (0.124)	0.016 (0.125)	0.018 (0.132)	0.016 (0.126)	0.017 (0.127)	0.017 (0.130)	0.019 (0.135)	0.016 (0.127)
EAP under 15	0.280 (0.449)	0.278 (0.448)	0.276 (0.447)	0.275 (0.447)	0.272 (0.445)	0.271 (0.444)	0.268 (0.443)	0.266 (0.442)
Not in school	0.686 (0.464)	0.687 (0.464)	0.690 (0.463)	0.690 (0.463)	0.691 (0.462)	0.692 (0.462)	0.694 (0.461)	0.694 (0.461)
Incomplete elementary school	0.315 (0.465)	0.313 (0.464)	0.308 (0.462)	0.306 (0.461)	0.304 (0.460)	0.302 (0.459)	0.297 (0.457)	0.296 (0.456)
Completed elementary school	0.179 (0.383)	0.178 (0.382)	0.177 (0.382)	0.177 (0.381)	0.175 (0.380)	0.174 (0.379)	0.173 (0.379)	0.172 (0.378)
Completed junior high school	0.506 (0.500)	0.510 (0.500)	0.515 (0.500)	0.517 (0.500)	0.521 (0.500)	0.524 (0.499)	0.529 (0.499)	0.532 (0.499)
Educational lag	0.139 (0.346)	0.138 (0.344)	0.135 (0.342)	0.133 (0.340)	0.134 (0.341)	0.133 (0.339)	0.131 (0.337)	0.130 (0.336)

Table A.14
(Continued)

<i>Mean and standard deviation</i>								
	<i>2018</i>				<i>2019</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
IMSS affiliation	0.355 (0.479)	0.359 (0.480)	0.357 (0.479)	0.359 (0.480)	0.364 (0.481)	0.371 (0.483)	0.372 (0.483)	0.372 (0.483)
ISSSTE affiliation	0.058 (0.234)	0.057 (0.233)	0.059 (0.236)	0.057 (0.232)	0.058 (0.233)	0.057 (0.231)	0.057 (0.231)	0.060 (0.237)
No health insurance	0.253 (0.435)	0.256 (0.436)	0.256 (0.436)	0.257 (0.437)	0.254 (0.435)	0.255 (0.436)	0.256 (0.437)	0.256 (0.437)
Observations	312,062	312,528	308,987	308,201	325,839	329,052	329,382	326,490

Note: Standard deviations are shown in parentheses.

Source: Author's calculations using data from the ENOE from the first quarter of 2018 through the last quarter of 2019, without utilizing expansion factors.

Table A.15
Two-sample t-test for the labor income variable of both training and prediction data

<i>Two-sample t-test with unequal variances</i>						
<i>Samples</i>	<i>MCS-ENIGH mean income</i>	<i>ENOE mean income</i>	<i>Difference in means</i>	<i>t</i>	<i>p-value</i>	
2008 MCS-ENIGH and ENOE from 2008 Q1 to 2009 QIV	8403.553	6952.764	1450.790	20.200	<0.001	
2010 MCS-ENIGH and ENOE from 2010 Q1 to 2011 QIV	7661.908	6931.188	730.720	15.707	<0.001	
2012 MCS-ENIGH and ENOE from 2012 Q1 to 2013 QIV	7992.633	7355.194	637.439	11.197	<0.001	
2014 MCS-ENIGH and ENOE from 2014 Q1 to 2015 QIV	8901.894	7645.290	1256.603	13.945	<0.001	
2016 MCS-ENIGH and ENOE from 2016 Q1 to 2017 QIV	9370.964	8118.965	1251.999	6.260	<0.001	
2018 MCS-ENIGH and ENOE from 2018 Q1 to 2019 QIV	10191.330	9267.304	924.024	14.150	<0.001	

Source: Author's calculations using the MCS-ENIGH and the ENOE from 2008 to 2019, without utilizing expansion factors and following the methodology of Welch (1947) for each time window.

Appendix B. Logit AME and LASSO logistic coefficients

Table B.1
Logistic regression average marginal effects

	<i>Dependent variable: Probability of being poor</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
Nuevo León	-0.029*** (0.006)	-0.019*** (0.006)	0.010 (0.006)	0.004 (0.006)	0.020*** (0.005)	0.024*** (0.005)
Baja California Sur	-0.009 (0.006)	0.001 (0.006)	0.010 (0.006)	0.048*** (0.006)	0.028*** (0.006)	0.042*** (0.006)
Coahuila	-0.011** (0.005)	-0.013** (0.006)	-0.015** (0.006)	0.012** (0.006)	0.026*** (0.005)	0.022*** (0.005)
Oaxaca	0.019*** (0.005)	0.075*** (0.005)	0.061*** (0.006)	0.075*** (0.006)	0.128*** (0.005)	0.126*** (0.005)
Guerrero	0.037*** (0.005)	0.037*** (0.006)	0.068*** (0.006)	0.050*** (0.006)	0.096*** (0.006)	0.108*** (0.006)
Chiapas	0.050*** (0.005)	0.077*** (0.005)	0.082*** (0.006)	0.094*** (0.006)	0.144*** (0.006)	0.120*** (0.006)
Rural localities	-0.159*** (0.001)	-0.144*** (0.001)	-0.142*** (0.002)	-0.147*** (0.002)	-0.156*** (0.001)	-0.154*** (0.001)
Women	-0.006*** (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.005*** (0.001)	-0.003** (0.001)	-0.006*** (0.001)
Age	-0.001*** (5x10 ⁻⁵)	-0.001*** (5x10 ⁻⁵)	-0.001*** (5x10 ⁻⁵)	-0.001*** (5x10 ⁻⁵)	-0.001*** (5x10 ⁻⁵)	-0.001*** (5x10 ⁻⁵)
Household size	0.085*** (0.0005)	0.085*** (0.0005)	0.083*** (0.001)	0.083*** (0.001)	0.088*** (0.001)	0.093*** (0.001)
Employed EAP	0.020*** (0.002)	0.028*** (0.002)	0.029*** (0.002)	0.026*** (0.002)	0.027*** (0.002)	0.030*** (0.002)
Unemployed EAP	0.023*** (0.004)	0.038*** (0.004)	0.039*** (0.005)	0.047*** (0.005)	0.041*** (0.005)	0.041*** (0.005)

Table B.1
(Continued)

	<i>Dependent variable: Probability of being poor</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
EAP under 15	-0.028*** (0.003)	-0.031*** (0.003)	-0.032*** (0.004)	-0.029*** (0.004)	-0.025*** (0.003)	-0.030*** (0.003)
Hours worked per week	0.0004*** (2x10 ⁻⁵)	0.0004*** (2x10 ⁻⁵)	0.0003*** (2x10 ⁻⁵)	0.0005*** (2x10 ⁻⁵)	0.001*** (2x10 ⁻⁵)	0.001*** (2x10 ⁻⁵)
Labor income per month	-7x10 ⁻⁵ *** (3x10 ⁻⁷)	-7x10 ⁻⁵ *** (3x10 ⁻⁷)	-6x10 ⁻⁵ *** (4x10 ⁻⁷)	-6x10 ⁻⁵ *** (3x10 ⁻⁷)	-5x10 ⁻⁵ *** (2x10 ⁻⁷)	-5x10 ⁻⁵ *** (3x10 ⁻⁷)
Households with per capita labor income lower than the mwl	-0.045*** (0.002)	-0.038*** (0.002)	-0.022*** (0.002)	-0.021*** (0.002)	-0.023*** (0.002)	-0.025*** (0.002)
Not in school	0.020*** (0.002)	0.012*** (0.002)	0.014*** (0.002)	0.013*** (0.002)	0.012*** (0.002)	0.010*** (0.002)
Completed elementary school	-0.044*** (0.002)	-0.023*** (0.002)	-0.028*** (0.002)	-0.021*** (0.002)	-0.019*** (0.002)	-0.020*** (0.002)
Completed junior high school	-0.074*** (0.003)	-0.045*** (0.003)	-0.048*** (0.003)	-0.033*** (0.003)	-0.030*** (0.003)	-0.028*** (0.003)
Educational lag	0.043*** (0.002)	0.071*** (0.002)	0.072*** (0.003)	0.087*** (0.003)	0.085*** (0.002)	0.083*** (0.002)
IMSS affiliation	-0.145*** (0.002)	-0.175*** (0.002)	-0.180*** (0.002)	-0.186*** (0.002)	-0.168*** (0.002)	-0.170*** (0.002)
ISSSTE affiliation	-0.198*** (0.003)	-0.235*** (0.004)	-0.261*** (0.004)	-0.256*** (0.004)	-0.248*** (0.004)	-0.244*** (0.003)
No health insurance	0.015*** (0.002)	0.012*** (0.002)	0.013*** (0.002)	0.018*** (0.002)	0.018*** (0.002)	0.004** (0.002)

Note: *p<0.1; **p<0.05; ***p<0.01. Standard errors are shown in parentheses. Source: Author's calculations using the MCS-ENIGH from 2008 to 2018. The first three states are below the 10th percentile on the 2018 national poverty scale, while the last three are above the 90th percentile; the remaining states coefficients are not shown. The reference levels of categorical variables are Aguascalientes, economically inactive population, and incomplete elementary school.

Table B.2
Alternative LASSO logistic specification

	<i>Dependent variable: Probability of being poor</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
Nuevo León	-0.247	-0.318	-0.050	-0.069	0.004	0.025
Baja California Sur	-0.062	-0.140	-0.053	0.326	0.088	0.195
Coahuila	-0.069	-0.260	-0.277		0.068	0.017
Oaxaca	0.130	0.484	0.318	0.577	1.016	0.986
Guerrero	0.313	0.115	0.379	0.343	0.715	0.813
Chiapas	0.455	0.523	0.520	0.765	1.168	0.928
Rural localities	-1.574	-1.358	-1.265	-1.437	-1.479	-1.539
Women	-0.037			-0.049	-0.026	-0.051
Age	-0.011	-0.010	-0.010	-0.013	-0.013	-0.013
Household size	0.804	0.781	0.724	0.773	0.799	0.879
Employed EAP	0.218	0.280	0.279	0.249	0.256	0.292
Unemployed EAP	0.190	0.335	0.326	0.453	0.385	0.387
EAP under 15	-0.099	-0.118	-0.111	-0.253	-0.216	-0.273
Hours worked per week	0.003	0.003	0.002	0.004	0.005	0.005
Labor income per month	-0.001	-0.001	-0.001	-0.001	-0.001	-0.0005
Households with per capita labor income lower than the mwl	-0.183	-0.168	-0.167	-0.129	-0.176	-0.214
Not in school	0.178	0.105	0.111	0.116	0.105	0.096
Completed elementary school	-0.332	-0.123	-0.156	-0.185	-0.167	-0.173
Completed junior high school	-0.575	-0.283	-0.289	-0.292	-0.259	-0.247
Educational lag	0.496	0.760	0.739	0.835	0.792	0.790
IMSS affiliation	-1.360	-1.553	-1.538	-1.592	-1.475	-1.518
ISSSTE affiliation	-1.975	-2.208	-2.357	-2.417	-2.480	-2.525
No health insurance	0.158	0.113	0.110	0.171	0.159	0.033
Constant	0.491	0.443	0.487	0.406	0.124	0.172

Table B.2
(Continued)

	<i>Dependent variable: Probability of being poor</i>					
	<i>2008</i>	<i>2010</i>	<i>2012</i>	<i>2014</i>	<i>2016</i>	<i>2018</i>
Interaction terms	No	No	No	No	No	No
Non-zero coefficients (total=49)	41	42	42	47	49	49
Penalty λ	0.001	0.001	0.001	0.0001	0.0001	0.0001
Error rate	0.128	0.133	0.140	0.144	0.147	0.146

Note: LASSO logistic models are estimated via penalized maximum likelihood. Empty spaces represent shrunk-to-zero coefficients. Independent variables are displayed in table 3. 10-fold CV error rates are computed according to the maximum probability criterion. The first three states are below the 10th percentile on the 2018 national poverty scale, while the last three are above the 90th percentile. The remaining states' coefficients are not displayed.

Source: Author's estimates using the MCS-ENIGH from 2008 to 2018, and the glmnet package (version 4.1-1) in R.

Appendix C. Quarterly poverty predictions

Table C.1
CONVAL poverty rates and ex-ante/ex-post machine learning multidimensional poverty estimates

	2008				2009			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Labor Poverty	33.17	32.87	35.75	37.36	37.26	38.73	39.52	38.92
Logit	42.81	42.58	43.39	45.06	44.80	44.94	45.47	45.45
	-	-	-	-	-	-	-	-
LASSO Logistic	45.67	45.41	46.09	47.79	47.54	47.30	47.99	48.14
	-	-	-	-	-	-	-	-
Random Forest	44.56	43.99	45.08	46.56	46.56	46.71	47.34	47.75
	-	-	-	-	-	-	-	-
Support Vector Machine	46.03	45.88	46.97	48.58	48.53	49.00	49.87	49.94
	-	-	-	-	-	-	-	-
Multidimensional Poverty				44.36				
	2010				2011			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Labor Poverty	38.83	38.27	38.01	40.03	38.37	38.22	38.92	39.29
Logit	46.57	46.18	46.38	46.61	46.01	45.43	45.97	45.67
	(45.36)	(45.21)	(45.39)	(45.52)	(44.73)	-	-	-
LASSO Logistic	48.19	47.66	47.94	48.03	47.41	46.72	47.40	47.30
	(47.93)	(47.74)	(47.86)	(48.02)	(47.26)	-	-	-
Random Forest	46.67	46.42	46.26	46.65	46.12	45.67	46.34	46.61
	(47.62)	(47.79)	(47.45)	(47.69)	(47.30)	-	-	-
Support Vector Machine	48.74	48.57	48.36	48.82	48.47	47.88	48.48	48.57
	(50.30)	(49.84)	(49.74)	(50.16)	(49.88)	-	-	-
Multidimensional Poverty				46.11				

Table C.1
(Continued)

	<i>2012</i>				<i>2013</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Labor Poverty	39.78	38.91	40.45	41.06	40.4	40.98	41.58	41.14
Logit	46.29	45.25	45.87	45.82	45.39	45.69	46.48	45.83
	(45.58)	(44.53)	(45.09)	(44.95)	(44.33)	-	-	-
LASSO Logistic	48.37	47.19	47.62	47.31	47.25	47.54	48.23	47.41
	(47.03)	(45.97)	(46.67)	(46.44)	(46.05)	-	-	-
Random Forest	46.30	45.72	45.81	46.04	45.57	46.47	46.57	46.40
	(46.52)	(45.87)	(46.26)	(46.14)	(45.81)	-	-	-
Support Vector Machine	48.16	47.46	47.96	48.05	47.90	48.31	48.79	48.33
	(48.58)	(47.76)	(48.45)	(48.52)	(48.51)	-	-	-
Multidimensional Poverty				45.48				
	<i>2014</i>				<i>2015</i>			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Labor Poverty	42.03	41.65	42.75	42.88	41.27	41.38	41.07	42.00
Logit	46.00	45.97	46.61	46.85	45.67	45.38	45.20	44.88
	(45.86)	(45.86)	(46.48)	(46.73)	(45.49)	-	-	-
LASSO Logistic	47.56	47.46	48.20	48.34	47.11	46.65	46.58	46.09
	(47.16)	(47.22)	(47.96)	(48.17)	(46.97)	-	-	-
Random Forest	45.49	45.63	46.50	46.80	45.61	45.09	45.03	44.78
	(46.32)	(46.55)	(46.94)	(47.50)	(46.30)	-	-	-
Support Vector Machine	46.59	46.78	47.41	48.02	46.74	46.23	46.33	45.94
	(48.29)	(48.58)	(49.07)	(49.52)	(48.27)	-	-	-
Multidimensional Poverty				46.17				

Table C.1
(Continued)

	2016				2017			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Labor Poverty	41.71	40.97	39.98	39.97	38.94	40.09	41.8	41.04
Logit	44.92	44.17	43.70	43.50	42.94	43.34	43.26	43.78
	(44.25)	(43.54)	(43.10)	(42.81)	(42.24)	(42.71)	-	-
LASSO Logistic	45.81	45.37	44.88	44.46	44.00	44.33	44.17	44.67
	(45.54)	(45.00)	(44.49)	(44.20)	(43.81)	(44.09)	-	-
Random Forest	44.25	43.74	43.31	43.03	43.05	43.14	43.25	43.85
	(44.32)	(43.57)	(43.27)	(43.39)	(42.93)	(43.35)	-	-
Support Vector Machine	43.88	43.39	42.87	42.62	42.61	43.09	43.66	43.91
	(45.63)	(44.95)	(44.61)	(44.44)	(44.40)	(44.79)	-	-
Multidimensional Poverty				43.56				
	2018				2019			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Labor Poverty	39.13	38.47	39.29	39.80	38.71	38.06	38.54	37.35
Logit	42.59	42.05	42.34	42.69	40.83	40.47	40.71	39.92
	(42.02)	(41.42)	(41.75)	(42.05)	(40.21)	-	-	-
LASSO Logistic	44.87	44.21	44.55	44.84	42.85	42.48	42.43	41.90
	(42.88)	(42.23)	(42.55)	(42.54)	(40.83)	-	-	-
Random Forest	42.21	41.40	41.90	42.53	40.64	40.25	40.65	40.30
	(42.16)	(41.47)	(41.67)	(42.13)	(40.45)	-	-	-
Support Vector Machine	44.16	43.44	43.80	43.79	42.54	42.01	42.24	41.70
	(42.45)	(41.90)	(42.23)	(42.42)	(41.20)	-	-	-
Multidimensional Poverty				41.91				

Note: For ML algorithms, entries without parentheses correspond to ex-post estimates, while ex-ante estimates appear in parentheses. Support vector machine refers to the cell approach described in Steinwart and Thomann (2017). Source: Author's calculations using the MCS-ENIGH and the ENOE from 2008 to 2019.

Appendix D. Performance metrics

In the classification framework, the overall accuracy metric summarizes the fraction of correctly predicted statuses regardless of which class is better predicted or the proximity of classified test observations to the expected labels. It is thus advisable to use metrics that assess different aspects of the classification process, in order to test the robustness and out-of-sample performance of the ML algorithms. Among the most common metrics are those based on the confusion matrix, which is constructed from the predicted classes by the algorithm and the actual classes of the test observations, as shown in the following table:

Table D.1
Confusion matrix

		<i>Predicted status</i>	
		<i>Poor</i>	<i>Non-poor</i>
<i>Actual status</i>	<i>Poor</i>	TP	FN
	<i>Non-poor</i>	FP	TN

where TP refers to true positive, FN to false negative, FP to false positive, and TN to true negative. The metrics accuracy, recall, specificity, precision, negative predictive value (NPV), F1 score, and kappa (κ) are defined as follows:

$$Accuracy = \frac{TP + TN}{TP + FN + FP + TN}$$

$$Recall = \frac{TP}{TP + FN}$$

$$Specificity = \frac{TN}{TN + FP}$$

$$Precision = \frac{TP}{TP + FP}$$

$$NPV = \frac{TN}{TN + FN}$$

$$F1score = 2 \frac{Precision \times Recall}{Precision + Recall}$$

$$\kappa = \frac{Accuracy - E[Accuracy]}{1 - E[Accuracy]}$$

where

$$E[Accuracy] =$$

$$P(\text{predictedstatus} = \text{non - poor}) \times P(\text{actualstatus} = \text{non - poor}) \\ + P(\text{predictedstatus} = \text{poor}) \times P(\text{actualstatus} = \text{poor})$$

Intuitively, accuracy refers to the percentage of correct predictions of all possible classes, and is equal to one minus the error rate of the model. Recall refers to the proportion of correctly classified test observations within the relevant true class (actual status=poor), while specificity refers to the same proportion but within the non-relevant true class (actual status=non-poor). Precision refers to the proportion of correctly predicted statuses within the relevant predicted class (predicted status=poor), while negative predictive value refers to the same proportion for the non-relevant predicted class (predicted status=non-poor). The harmonic mean of precision and recall gives the F1 score, which better captures the algorithm's performance for the relevant class (poor) than its input metrics separately. Kappa refers to the bias of accuracy with respect to the expected accuracy of a random classifier that exactly matches the confusion matrix, as a proportion of the same difference but with perfect accuracy. It should be noted that all metrics are optimal when they are equal to one and, with the exception of kappa, they are all between zero and one.