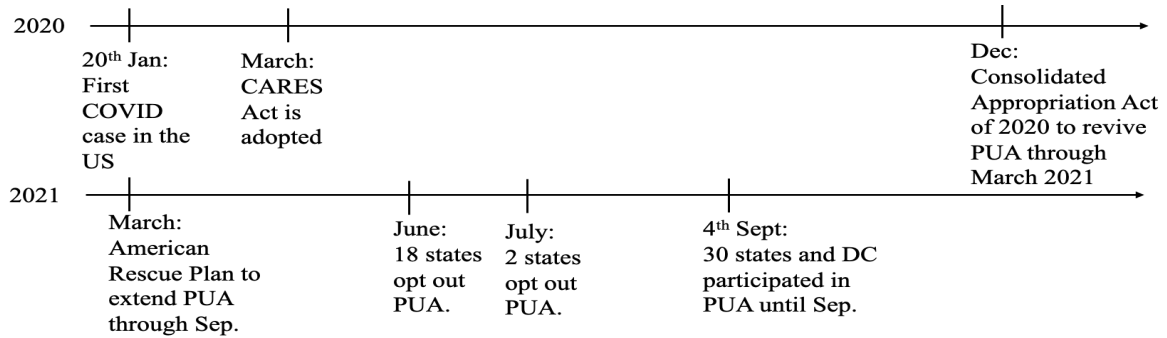


[Appendix A]

**Figure A1.** Timeline of PUA program (Source: edited by the author based on Congressional Research Service 2021)



**Table A1.** HPS Data Survey Phases

Week	Phase 3 – Phase 3.2 (2021.02 ~ 2021.08)
w24	2/3 - 2/15
w25	2/17 - 3/1
w26	3/3 - 3/15
w27	3/17 - 3/29
w28	4/14 - 4/26
w29	4/28 - 5/10
w30	5/12 - 5/24
w31	5/26 - 6/7
w32	6/9 - 6/21 [Early-treated groups]
w33	6/23 - 7/5 [Late-treated groups]
w34	7/21 - 8/2
w35	8/4 - 8/16
w36	8/18 - 8/30

(Source: United States Census Bureau, <https://www.census.gov/programs-surveys/household-pulse-survey/datasets.html#phase3.1>)

**Table A2. Descriptive Table by Treated and Controlled States**

	Treated States		Control States	
	Obs.	Mean	Obs.	Mean
<i>Dependent Variables</i>				
Difficulty of Paying Expense	279,084	1.752 (0.992)	520,643	1.688 (0.962)
Confidence in Paying Rent or Mortgage	157,482	3.567 (0.818)	313,275	3.616 (0.779)
Depression	247,367	1.657 (0.93)	463,634	1.654 (0.911)
<i>Control Variables</i>				
ln(Confirmed Cases)	296,619	13.068 (1.097)	551,356	13.258 (1.187)
COVID Stringency Index	296,619	26.518 (9.813)	551,356	38.839 (15.025)
Male (%)	91,568	39.6 (0.489)	177,993	41.01 (0.492)
Female (%)	139,719	60.4 (0.489)	256,032	58.99 (0.492)
White (%)	248,379	83.7 (0.369)	445,433	80.8 (0.394)
Black (%)	27,669	9.33 (0.29)	41,654	7.55 (0.264)
Asian (%)	8,748	2.95 (0.169)	38,180	6.92 (0.254)
Any other race or biracial (%)	11,823	3.99 (0.465)	26,089	4.73 (0.212)
Labor Market Insiders (%)	196,383	83.03 (0.375)	374,540	84.68 (0.36)
Labor Market Outsiders (%)	40,128	16.97 (0.375)	67,768	15.32 (0.36)

Notes: Each cell contains the mean with the standard deviation in parentheses.

**Table A3.** Tabulation of the Variable of ‘Confidence in Paying Rent or Mortgage’ and Summary statistics of those who responded to ‘payment is/will be deferred.’

**Panel A:** Tabulation of Confidence in Paying Rent or Mortgage

Confidence in Paying Rent or Mortgage	Freq.	Percent
1) No confidence	19,014	4.10
2) Slight confidence	32,119	6.92
3) Moderate confidence	62,426	13.45
4) High confidence	345,218	74.36
5) Payment is/will be deferred	5,489	1.18
Total	464,266	100.00

**Panel B:** The percentage of homeowners of those who responded to ‘(5) payment is/will be deferred’

Variable	Obs.	Mean (Std. Dev)
Percentage of own home	5,489	0.753 (0.43)

**Panel C.** DID Estimates of the Early Withdrawal on Confidence in Paying Rent or Mortgage (Coding the Response of ‘(5) payment is/will be deferred’ as ‘(1) no confidence’)

DVs	(1) Overall Sample	(2) Overall Sample	(3) Subgroup Analysis of Labor Market Outsiders	(4) Subgroup Analysis of Labor Market Outsiders	(5) Subgroup Analysis of Labor Market Insiders	(6) Subgroup Analysis of Labor Market Insiders
Early Withdrawal States	-0.0152** (0.0057)	-0.0122* (0.0066)	-0.0442** (0.0184)	-0.0396* (0.0228)	-0.0101 (0.0062)	-0.00766 (0.0069)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	464,266	464,266	78,208	78,208	386,058	386,058

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors are clustered at the state level. Standard errors in parentheses. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed test)

**[Appendix B: Robustness check]**

**Table B1.** DID Estimates of the Effects of Early Withdrawal on Financial and Mental Difficulties: Treatment as Proportion<sup>1</sup>

**Panel A: Full Sample**

DVs	(1)	(2)	(3)	(4)	(5)	(6)
	Difficulty of paying expenses		Confidence in paying rent or mortgage		Depression	
Early Withdrawal States	0.0315*** (0.0074)	0.0282*** (0.0089)	-0.0157** (0.0061)	-0.0133* (0.0077)	0.0335*** (0.0065)	0.0288*** (0.0074)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	677,526	677,526	458,777	458,777	677,044	677,044

**Panel B: Subgroup Analysis of Labor Market Outsiders**

DVs	(1)	(2)	(3)	(4)	(5)	(6)
	Difficulty of paying expenses		Confidence in paying rent or mortgage		Depression	
Early Withdrawal States	0.0566*** (0.0197)	0.0597** (0.0237)	-0.0457** (0.0178)	-0.0434* (0.0235)	0.0421*** (0.0142)	0.0453*** (0.0168)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	107,671	107,671	76,852	76,852	107,550	107,550

**Panel C: Subgroup Analysis of Labor Market Insiders**

DVs	(1)	(2)	(3)	(4)	(5)	(6)
	Difficulty of paying expenses		Confidence in paying rent or mortgage		Depression	
Early Withdrawal States	0.0269*** (0.0065)	0.0228*** (0.0076)	-0.0105* (0.0053)	-0.00825 (0.0067)	0.0314*** (0.0062)	0.0255*** (0.0071)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes

<sup>1</sup> The treatment proportion is calculated based on the date of the termination of the UI benefit and the survey week. For example, Iowa terminated the policy on June 12, so the Expired variable as of Week 32 (6/9 - 6/21) should be 0.75 (1-3/12=0.75), which means that in the survey week, the policy expired in 75% of the period.

Observations	569,855	569,855	381,925	381,925	569,494	569,494
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Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)

**Table B2.** Robustness check: DID<sub>M</sub> Estimates of the Effects of Early Withdrawal on Financial and Mental Difficulties

DVs	(1)	(2)	(3)	(4)	(5)	(6)
	Difficulty of paying expenses		Confidence in paying rent or mortgage		Depression	
Early Withdrawal States	0.0315*** (0.0114)	0.0313*** (0.0117)	-0.0079 (0.0111)	-0.0054 (0.0106)	0.0171 (0.0087)	0.0144 (0.0098)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	677,526	677,526	458,777	458,777	677,044	677,044

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors in parentheses are clustered at the state level. The estimate of DID<sub>M</sub> is average treatment effect. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)

**Table B3.** Robustness check: Ordered Logit Model Estimates of the Effects of Early Withdrawal on Financial and Mental Difficulties

DVs	(1)	(2)	(3)	(4)	(5)	(6)
	Difficulty of paying expenses		Confidence in paying rent or mortgage		Depression	
Early Withdrawal States	0.0658*** (0.0129)	0.0599*** (0.0149)	-0.0399** (0.0153)	-0.0369** (0.0188)	0.0659*** (0.0144)	0.0546*** (0.0152)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	677,526	677,526	458,777	458,777	677,044	677,044

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)

**Table B4.** Robustness checks: DID Estimates of Early Withdrawal on Financial and Mental Difficulties  
**Table B4-1.** Dropping respondents who are covered by Medicare.

**Panel A.** Overall Sample

DVs	(1) Difficulty of paying expenses	(2) Difficulty of paying expenses	(3) Confidence in paying rent or mortgage	(4) Confidence in paying rent or mortgage	(5) Depression	(6) Depression
Early Withdrawal States	0.0306*** (0.007)	0.0277*** (0.0087)	-0.0168** (0.0075)	-0.0133 (0.0091)	0.0319*** (0.0072)	0.0261*** (0.0083)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	486,695	486,695	364,755	364,755	486,189	486,189

**Panel B.** Subgroup Analysis of Labor Market Outsiders

DVs	(1) Difficulty of paying expenses	(2) Difficulty of paying expenses	(3) Confidence in paying rent or mortgage	(4) Confidence in paying rent or mortgage	(5) Depression	(6) Depression
Early Withdrawal States	0.0613*** (0.0182)	0.0640*** (0.0205)	-0.0419** (0.0182)	-0.0375 (0.0234)	0.0404*** (0.0148)	0.0417** (0.0165)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	107,671	107,671	76,852	76,852	107,550	107,550

**Panel C.** Subgroup Analysis of Labor Market Insiders

DVs	(1) Difficulty of paying expenses	(2) Difficulty of paying expenses	(3) Confidence in paying rent or mortgage	(4) Confidence in paying rent or mortgage	(5) Depression	(6) Depression
Early Withdrawal States	0.0235*** (0.0065)	0.0185*** (0.008)	-0.0121** (0.0068)	-0.0087 (0.0083)	0.0298*** (0.0073)	0.022** (0.0084)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	379,024	379,024	287,903	287,903	378,639	378,639

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)



**Panel D. Triple Difference**

DV	(1) Difficulty of paying expenses	(2) Difficulty of paying expenses	(3) Confidence in paying rent or mortgage	(4) Confidence in paying rent or mortgage	(5) Depression	(6) Depression
Labor market outsiders in early withdrawal states	0.0372** (0.0185)	0.0397** (0.0167)	-0.0284 (0.0197)	-0.0277 (0.0188)	0.0105 (0.0142)	0.0135 (0.0141)
State and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Time and Work Status FE	Yes	Yes	Yes	Yes	Yes	Yes
State and Work Status FE	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	No	Yes	No	Yes
Observations	486,695	486,695	364,755	364,755	486,189	486,189

Notes: Demographic controls include gender, race, educational level, and income. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$  (two-tailed p-values)

**Table B4-2.** Keeping respondents under 65  
**Panel A.** Overall Sample

DVs	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5)	(6) Depression
Early Withdrawal States	0.0326*** (0.0074)	0.029*** (0.0092)	-0.017** (0.0072)	-0.0144 (0.0087)	0.0329*** (0.0071)	0.0283*** (0.0079)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	482,384	482,384	366,183	366,183	481,962	481,962

**Panel B.** Subgroup Analysis of Labor Market Outsiders

DVs	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5)	(6) Depression
Early Withdrawal States	0.0602*** (0.0178)	0.0602*** (0.0205)	-0.0444** (0.0191)	-0.0407 (0.0247)	0.035** (0.0138)	0.0369** (0.0158)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	100,745	100,745	73,396	73,396	100,643	100,643

**Panel C.** Subgroup Analysis of Labor Market Insiders

DVs	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5)	(6) Depression
Early Withdrawal States	0.0261*** (0.0072)	0.021** (0.0086)	-0.0112 (0.0067)	-0.009 (0.008)	0.0324*** (0.0081)	0.0259*** (0.0089)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	381,639	381,639	292,787	292,787	381,319	381,319

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)

**Panel D. Triple Difference**

DV	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5) Depression	(6)
Labor market outsiders in early withdrawal states	-0.0286 (0.0189)	0.0235 (0.0162)	-0.0436** (0.0195)	-0.0815*** (0.0196)	-0.0308* (0.0155)	-0.00126 (0.0145)
State and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Time and Work Status FE	Yes	Yes	Yes	Yes	Yes	Yes
State and Work Status FE	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	No	Yes	No	Yes
Observations	482,384	482,384	366,183	366,183	481,962	481,962

Notes: Demographic controls include gender, race, educational level, and income. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$  (two-tailed p-values)

**Table B5-1.** Validity Check: Cross-tabulation of ESI and sector of employment

	Sector of Employment					Total
	Gov't	Private	Non-profit	Self-employed	Family business	
ESI	65,334 18.77%	194,915 56.01%	50,904 14.63%	31,823 9.14%	5,045 1.45%	348,021 100.00
Non-ESI	3,627 6.73%	27,077 50.22%	3,939 7.31%	16,830 31.22%	2,439 4.52%	53,912 100.00
Total	68,961	221,992	54,843	48,653	7,484	401,933

Notes: The first row has frequencies, and the second row has row percentages.

**Table B5-2.** Cross-tabulation of ESI and Medicare recipients

Covered by ESI	Covered by Medicare				Total
	Question seen but not selected	Missing/Not report	Yes	No	
Question seen but not selected	11,028	0	16,152	870	28,050
Missing/Not report	0	141,106	0	0	141,106
Yes	38,417	0	81,237	341,136	460,790
No	4,254	0	110,133	103,642	218,029
Total	53,699	141,106	207,522	445,648	847,975

**Table B6.** Robustness checks with Announcement as Treatment  
**Table B6-1.** Announcement Dates of Early Withdrawal States

Announcement dates of early withdrawal states (26 states)	
W29 (4/28 - 5/10):	6 states
5/4:	Montana
5/6:	South Carolina
5/7:	Arkansas
5/10:	Alabama, Mississippi, North Dakota
W30 (5/12 - 5/24):	18 states
5/11:	Idaho, Iowa, Missouri, Tennessee, Wyoming
5/12:	South Dakota, Utah, West Virginia
5/13:	Arizona, Ohio
5/14:	Georgia, Alaska
5/17:	Texas, Oklahoma, Indiana
5/18:	New Hampshire
5/24:	Nebraska, Florida
W31(5/26 - 6/7):	1 state
6/2:	Maryland
W32 (6/9 - 6/21):	1 state
6/16:	Louisiana

**Table B6-2.** HPS Data Survey Phases

Week	Phase 3 – Phase 3.2 (2021. 02 ~ 2021.08)
w24	2/3 -2/15
w25	2/17 - 3/1
w26	3/3 - 3/15
w27	3/17 - 3/29
w28	4/14 - 4/26
w29	4/28 - 5/10
w30	5/12 - 5/24
w31	5/26 - 6/7
w32	6/9 - 6/21 [Early-treated groups]
w33	6/23 - 7/5 [Late-treated groups]
w34	7/21 - 8/2
w35	8/4-8/16
w36	8/18 - 8/30

(Source: United States Census Bureau,  
<https://www.census.gov/programs-surveys/household-pulse-survey/datasets.html#phase3.1>)

**Table B6-3.** DID Estimates of Early Withdrawal on Financial and Mental Difficulties – Treatment on Announcement Dates

**Panel A.** Overall Sample

DVs	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5) Depression	(6)
Early Withdrawal States	0.0124** (0.0059)	0.0091 (0.0061)	-0.0051 (0.0058)	-0.0046 (0.0061)	0.0249*** (0.0046)	0.0233*** (0.0047)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	750,377	750,377	506,564	506,564	749,844	749,844

**Panel B.** Subgroup Analysis of Labor Market Outsiders

DVs	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5) Depression	(6)
Early Withdrawal States	0.0193 (0.0135)	0.0159 (0.0138)	-0.0187 (0.0158)	-0.0168 (0.0157)	0.0257** (0.0104)	0.0234* (0.0129)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	120,834	120,834	86,082	86,082	120,712	120,712

**Panel C.** Subgroup Analysis of Labor Market Insiders

DVs	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5) Depression	(6)
Early Withdrawal States	0.0101* (0.0053)	0.0061 (0.0057)	-0.00155 (0.0047)	-0.00062 (0.0052)	0.0236*** (0.0048)	0.0219*** (0.0047)
Week FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes	No	Yes
Observations	629,543	629,543	420,482	420,482	629,132	629,132

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)

**Panel D. Triple Difference - Treatment on Announcement Dates**

DV	(1) Difficulty of paying expenses	(2)	(3) Confidence in paying rent or mortgage	(4)	(5) Depression	(6)
Labor market outsiders in early withdrawal states	0.539*** (0.0187)	0.412*** (0.0134)	-0.351*** (0.0207)	-0.299*** (0.0167)	0.374*** (0.0095)	0.319*** (0.0084)
State and Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Time and Work Status FE	Yes	Yes	Yes	Yes	Yes	Yes
State and Work Status FE	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	No	Yes	No	Yes
Observations	750,377	750,377	506,564	506,564	749,844	749,844

Notes: Demographic controls include gender, race, educational level, and income. Standard errors in parentheses are clustered at the state level. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$  (two-tailed p-values)

[Appendix C: Placebo tests]

**Table C1. DID Estimates of the Effects of Early Withdrawal on the Number of Labor Market Outsiders**

	(1)	(2)
DV	# of Labor Market Outsiders	
Early Withdrawal States	-0.0016 (0.0025)	0.0008 (0.0025)
Week FE	Yes	Yes
State FE	Yes	Yes
COVID-related Controls	No	Yes
Observations	678,819	678,819

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors are clustered at the state level. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)

**Table C2. DID Analysis on Placebo Estimates**

DVs	(1) Expected household job loss	(2) Expected household job loss	(3) Housing owned	(4) Housing owned
Early Withdrawal States	0.00472 (0.0041)	0.00214 (0.0043)	-0.000885 (0.0022)	-0.00184 (0.0026)
Week FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
COVID-related Controls	No	Yes	No	Yes
Observations	524,296	524,296	678,819	678,819

Notes: COVID-related controls include state-level stringency index and COVID-confirmed cases from OxCGRT. Standard errors are clustered at the state level. Standard errors in parentheses. The number of observations varies across columns as the numbers of respondents to each dependent variable vary. \*\*\* p<0.01, \*\* p<0.05, \* p<0.10 (two-tailed p-values)