Online Appendix for

The Unintended Consequences of Employer Credit Check Bans for Labor Markets

By Kristle R. Cortés, Andrew Glover and Murat Tasci

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The first part of this online appendix shows the triple-difference of the effect of employer credit check bans on vacancies from the level specification of our baseline regression.

The second part of this online appendix includes additional tables presenting results for robustness exercises in our accompanying paper. Table A1 presents summary statistics for the vacancy data, this time detailing the moments in our full sample when we use an inverse hyperbolic sine function transformation for the data to help handle the 'zero vacancy' problem for some county-occupation-quarter observations. Table A2, similarly depicts the summary statistics for vacancies in our adjacent-border-county sample, comparing both the log specification and the inverse hyperbolic sine specification. Table A3 presents another set of summary statistics, this time for the variable we use to proxy exposure to the ban in our signaling interpretation; that is the fraction of subprime borrowers in a county measured by the Equifax risk score. Tables A4-A8 present regression results analogous to Tables 3-7 in the main text, using the inverse-hyperbolic sine specification for vacancies as the dependent variable. Finally, Table A9 presents results from four placebo tests described in Section 7 of the paper.

Finally, we have compiled the text of each employer credit check ban law and some articles for context, these are available at

http://andyecon.weebly.com/uploads/5/1/3/8/5138005/cgt_online_appendix.pdf.

Part 1

Our baseline model is in levels with fixed effects chosen to be as granular as possible such that the change in vacancies in affected versus exempt occupations in ban states relative to non-ban states identifies the effect β. Since the verbal description is somewhat convoluted, it is useful to work through the differences mathematically. Equation (4) from the body is our baseline model:

$$(4) \quad V_{i,o,t} = \alpha_{i,o} + \mu_{o,t} + \gamma_{i,t} + \beta\, Ban_{i,t} * Affected_{i,o} + \varepsilon_{i,o,t}\,.$$

First take a county i_1 in a state that passes a ban in quarter t. Let occupation o_1 be affected by the ban and occupation o_2 be exempt. Then the difference between vacancies is

$$V_{i_1,o_1,t} - V_{i_1,o_2,t} = \beta + \alpha_{i_1,o_1} - \alpha_{i_1,o_2} + \mu_{o_1,t} - \mu_{o_2,t} + \varepsilon_{i_1,o_1,t} - \varepsilon_{i_1,o_2,t}\,,$$

which has eliminated the county-time fixed effect. Now let county i_2 be a county that does not have a ban at period t and construct the difference

$$V_{i_1,o_1,t} - V_{i_1,o_2,t} - (V_{i_2,o_1,t} - V_{i_2,o_2,t}) = \beta + \alpha_{i_1,o_1} - \alpha_{i_1,o_2} - (\alpha_{i_2,o_1} - \alpha_{i_2,o_2}) + \varepsilon_{i_1,o_1,t} - \varepsilon_{i_1,o_2,t} - (\varepsilon_{i_2,o_1,t} - \varepsilon_{i_2,o_2,t})\,,$$

which has eliminated the occupation-time fixed effects. The final difference is from t-1 to t

$$V_{i_1,o_1,t} - V_{i_1,o_2,t} - (V_{i_2,o_1,t} - V_{i_2,o_2,t}) - [V_{i_1,o_1,t-1} - V_{i_1,o_2,t-1} - (V_{i_2,o_1,t-1} - V_{i_2,o_2,t-1})\,] = \beta$$

$$+\varepsilon_{i_1,o_1,t} - \varepsilon_{i_1,o_2,t} - (\varepsilon_{i_2,o_1,t} - \varepsilon_{i_2,o_2,t}) - [\varepsilon_{i_1,o_1,t-1} - \varepsilon_{i_1,o_2,t-1} - (\varepsilon_{i_2,o_1,t-1} - \varepsilon_{i_2,o_2,t-1})],$$

which has eliminated the county-occupation fixed effects. Taking the expectation over all counties, occupations, and periods gives just the coefficient β after imposing that the residuals are mean zero.

Part 2

TABLE A1: DISTRIBUTION OF VACANCIES - THE ROLE OF ZERO VACANCIES

a) Log Specification

	Exempt Occupations				Affected Occupations			
	Obs.	Mean		Std. Dev.	Obs.	Mean		Std. Dev.
		Levels	Logs			Levels	Logs	
2005	14,306	54.70	1.39	1.87	124,719	60.29	1.76	1.89
2006	20,211	62.48	1.39	1.93	171,931	64.98	1.75	1.94
2007	20,553	69.06	1.44	1.97	173,153	73.31	1.82	1.99
2008	20,903	60.08	1.47	1.95	175,414	67.90	1.84	1.98
2009	20,331	39.12	1.36	1.86	176,518	50.13	1.73	1.91
2010	20,979	47.52	1.42	1.88	183,186	59.64	1.82	1.94
2011	21,849	51.91	1.46	1.89	190,763	67.73	1.94	1.97
2012	23,209	58.61	1.50	1.92	198,676	77.18	2.09	1.97
2013	24,452	59.30	1.53	1.91	202,288	83.06	2.16	1.98
2014	24,263	62.30	1.64	1.91	206,358	86.40	2.23	1.98
2015	25,106	63.75	1.63	1.92	207,426	92.32	2.29	2.00
2016	24,612	62.08	1.65	1.91	206,886	87.90	2.26	1.98
All Years	260,774	57.89	1.49	1.91	2,217,318	73.64	1.96	1.97

b) Inverse Hyperbolic Sine Specification

	Exempt Occupations				Affected Occupations			
	Obs.	Mean		Std. Dev.	Obs.	Mean		Std. Dev.
		Levels	Logs			Levels	Logs	
2005	28,290	27.65	1.12	1.66	188,094	39.96	1.12	1.66
2006	37,720	27.65	1.20	1.71	250,792	44.53	1.20	1.71
2007	37,720	37.61	1.25	1.76	250,792	50.60	1.25	1.76
2008	37,720	33.28	1.28	1.77	250,792	47.47	1.28	1.77
2009	37,720	21.07	1.19	1.66	250,792	35.26	1.19	1.66
2010	37,708	26.42	1.26	1.71	250,712	43.54	1.26	1.71
2011	37,684	30.06	1.33	1.74	250,552	51.50	1.33	1.74
2012	37,684	36.05	1.44	1.80	250,552	61.12	1.44	1.80
2013	37,684	38.43	1.53	1.82	250,552	66.97	1.53	1.82
2014	37,681	40.06	1.58	1.85	250,532	71.07	1.58	1.85
2015	37,672	42.43	1.63	1.86	250,472	76.33	1.63	1.86
2016	37,672	40.49	1.61	1.85	250,472	72.48	1.61	1.85
All Years	442,955	34.05	1.37	1.78	2,945,106	55.38	1.37	1.78

Note: In panel a), "Affected Occupations" and "Exempt Occupations" display cross-sectional means and standard deviations of vacancies for each year in our log specification. Panel b) presents the same moments for the sample in the inverse hyperbolic sine specification.

TABLE A2: DISTRIBUTION OF VACANCIES IN ADJACENT COUNTY SAMPLE – COUNTY LEVEL

a) Log (Vacancies)

	Exempt Occupations			Affected Occupations		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
2005	11,527	1.39	1.87	100,710	1.76	1.86
2006	16,338	1.39	1.93	138,209	1.74	1.92
2007	16,514	1.45	1.98	138,357	1.81	1.97
2008	16,730	1.49	1.96	140,060	1.83	1.97
2009	16,180	1.40	1.87	140,391	1.72	1.90
2010	16,989	1.46	1.87	146,246	1.83	1.93
2011	17,670	1.50	1.88	151,744	1.94	1.96
2012	18,837	1.52	1.92	157,719	2.08	1.95
2013	19,789	1.53	1.90	161,034	2.14	1.97
2014	19,552	1.63	1.90	164,459	2.20	1.96
2015	20,325	1.62	1.91	165,108	2.28	1.98
2016	19,902	1.65	1.90	164,888	2.25	1.96
All Years	210,353	1.51	1.91	1,768,925	1.98	1.96

b) Inverse Hyperbolic Sine Transformation of Vacancies

	Exempt Occupations			Affected Occupations		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
2005	22,590	1.13	1.66	149,772	1.72	1.87
2006	30,120	1.21	1.72	199,696	1.76	1.90
2007	30,120	1.26	1.77	199,696	1.81	1.95
2008	30,120	1.29	1.78	199,696	1.85	1.96
2009	30,120	1.21	1.68	199,696	1.78	1.88
2010	30,120	1.30	1.73	199,696	1.93	1.93
2011	30,120	1.36	1.75	199,696	2.08	1.98
2012	30,120	1.47	1.80	199,696	2.26	2.01
2013	30,120	1.55	1.81	199,696	2.36	2.03
2014	30,120	1.59	1.84	199,696	2.45	2.03
2015	30,120	1.65	1.85	199,696	2.52	2.06
2016	30,120	1.63	1.85	199,696	2.49	2.04
All Years	353,910	1.39	1.78	2,346,428	2.09	1.99

Notes: Table displays summary statistics for vacancies in the adjacent-county sample. Panel a) presents the cross-sectional means and standard deviations of log-vacancies for each year in this sample whereas panel b) shows that same moments for inverse hyperbolic sine transformation of the vacancy data.

TABLE A3: DISTRIBUTION OF SUBPRIME BORROWERS – COUNTY LEVEL

		Fraction Subprime					
Year	Obs.	Mean	25th pct	Median	75th pct	95th pct	Std. dev.
2005	12,560	0.29	0.20	0.27	0.36	0.5	0.12
2006	12,560	0.29	0.20	0.27	0.36	0.5	0.12
2007	12,559	0.28	0.20	0.27	0.36	0.49	0.12
2008	12,556	0.28	0.20	0.27	0.35	0.48	0.11
2009	12,556	0.28	0.20	0.27	0.35	0.47	0.11
2010	12,548	0.26	0.20	0.26	0.34	0.46	0.11
2011	12,548	0.27	0.19	0.25	0.33	0.46	0.11
2012	12,548	0.26	0.19	0.25	0.33	0.46	0.11
2013	12,546	0.26	0.18	0.24	0.32	0.45	0.11
2014	12,544	0.25	0.17	0.24	0.32	0.44	0.11
2015	12,544	0.24	0.17	0.23	0.31	0.44	0.11
2016	12,544	0.24	0.17	0.23	0.31	0.43	0.11
All years	150,613	0.27	0.19	0.26	0.34	0.47	0.11

TABLE A4: BASELINE REGRESSIONS EXEMPTION STATUS - The role of zero Vacancies

	Dependent Variable: Inverse Hyperbolic Sine Transformation of Vacancies			
	(1)	(2)	(3)	(4)
	Full Sample	Adjacent County Sample		
Credit check ban * Affected	-0.052*	-0.078**	-0.077**	-0.077**
	(0.029)	(0.036)	(0.035)	(0.034)
Credit check ban			-0.030	-0.030
			(0.031)	(0.030)
Unemployment rate				-0.007
				(0.006)
Fixed Effects				
County x Time	Yes	Yes	No	No
Pair x Time x Occupation	No	Yes	Yes	Yes
Occupation x Time	Yes	Yes	Yes	Yes
County x Occupation	Yes	Yes	Yes	Yes
Number of clusters	(50, 23)	(212,1103)	(212,1103)	(212,1103)
Observations	3,388,061	2,700,338	2,700,338	2,693,484
R-squared	0.943	0.972	0.964	0.964

Standard errors clustered are clustered two-way.
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports OLS regressions for the inverse-hyperbolic sine transformation of the dependent variable vacancies for each occupation *o,*in county *c (or* county pair *p)* at time *t* (quarterly). Column (1) displays the results from our full sample whereas (2) - (4) display the results for the adjacent-county sub-sample. Standard errors are clustered by state and occupation in column (1) and by borders and state-by-occupation tuples in the adjacent-county sample.

TABLE A5: DYNAMIC EFFECTS OF CREDIT CHECK BANS ON LABOR DEMAND
THE ROLE OF ZERO VACANCIES

	Dependent Variable: Inverse Hyperbolic Sine Transformation of Vacancies			
	(1) Exemption Status	(2) Subprime Fraction	(3) Less Skilled	(4) Routine
Interaction with credit check ban, *t-4*	-0.002	-0.002	0.061	-0.017
	(0.022)	(0.103)	(0.073)	(0.041)
Interaction with credit check ban, *t-3*	0.001	0.008	0.046	-0.009
	(0.024)	(0.112)	(0.062)	(0.035)
Interaction with credit check ban, *t-2*	-0.017	-0.088	-0.009	-0.047
	(0.021)	(0.109)	(0.047)	(0.035)
Interaction with credit check ban, *t-1*	-0.038	-0.172	0.013	-0.048
	(0.030)	(0.134)	(0.061)	(0.038)
Interaction with credit check ban, *t*	-0.012	-0.036	-0.011	-0.038
	(0.029)	(0.129)	(0.064)	(0.037)
Interaction with credit check ban, *t+1*	-0.043	-0.205*	-0.093	-0.084*
	(0.026)	(0.104)	(0.066)	(0.046)
Interaction with credit check ban, *t+2*	-0.073**	-0.321**	-0.128	-0.128***
	(0.031)	(0.129)	(0.070)	(0.044)
Interaction with credit check ban, *t+3*	-0.100***	-0.426**	-0.072	-0.108**
	(0.035)	(0.157)	(0.071)	(0.045)
Interaction with credit check ban, *t+4*	-0.052	-0.204	-0.095	-0.094*
	(0.033)	(0.130)	(0.089)	(0.046)
Interaction with credit check ban, *t>4*	-0.054	-0.244	-0.185*	-0.133**
	(0.035)	(0.148)	(0.092)	(0.051)
Fixed Effects				
County x Time FE	Yes	Yes	Yes	Yes
County x Occupation FE	Yes	Yes	No	Yes
Occupation x Time FE	Yes	Yes	No	Yes
County x Education FE	No	No	Yes	No
Education x Time FE	No	No	Yes	No
State x Time FE	No	No	No	No
State x Industry FE	No	No	No	No
Industry x Time FE	No	No	Yes	No
Number of clusters	(50,23)	(50,23)	(50,8)	(50,23)
Observations	3,388,061	3,388,061	1,180,264	3,388,061
R-squared	0.943	0.943	0.944	0.943

Standard Errors clustered at the state level
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports OLS regressions for two dependent variables; inverse hyperbolic sine transformation for vacancies in each county i, at date (quarter) t, for occupation o, in columns (1) through (4). Column (1) reports the result for the dynamic version of our baseline specification. Analogously, columns (2) – (4) display the dynamic versions of equation (7), (8), and (10), respectively. Note that the log transformation of J2J rates do not produce any missing observations as actual zeros do not exist in the data. We have two-way clustered standard errors for each regression reported in the table. First set of clusters always refer to the number of states and the second group indicates the appropriate number of occupations, education groups, or industries.

TABLE A6: HETEROGENEITY ANALYSIS - INSPECTING THE MECHANISM
THE ROLE OF ZERO VACANCIES

	Dependent Variable: Inverse Hyperbolic Sine Transformation of Vacancies		
	(1) Subprime	(2) Less Skilled	(3) Routine
Credit check ban * Affected * Fraction subprime	-0.231*		
	(0.119)		
Credit check ban *Less than College		-0.163*	
		(0.075)	
Credit check ban * Affected*Routine			-0.117**
			(0.042)
Credit check ban * Affected			
Fixed Effects			
County x Time FE	Yes	Yes	Yes
County x Occupation FE	Yes	No	Yes
Occupation x Time FE	Yes	No	Yes
County x Education FE	No	Yes	No
Education x Time FE	No	Yes	No
State x Time FE	No	No	No
State x Industry FE	No	No	No
Industry x Time FE	No	Yes	No
Number of Clusters	(50, 23)	(50,8)	(50,23)
Observations	3,386,980	1,180,264	3,388,061
R-squared	0.922	0.943	0.922

Standard errrors are clustered two-way.
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports OLS regressions for two dependent variables; inverse hyperbolic sine transformation for vacancies in each county i, at date (quarter) t, for occupation o, in columns (1) through (3). Column (1) reports the result for the baseline specification exploring the role of heterogeneity by county-level subprime rates expressed in equation (7) in the text. Analogously, columns (2) – (3) display the estimates of the regression coefficients from specifications (8) and (10), respectively. Note that the log transformation of J2J rates do not produce any missing observations as actual zeros do not exist in the data. We have two-way clustered standard errors for each regression reported in the table. First set of clusters always refer to the number of states and the second group indicates the appropriate number of occupations, education groups, or industries.

TABLE A7: ALTERNATIVE MEASURES OF COUNTY EXPOSURE TO BAN
The role of zero Vacancies

	Dependent Variable: Inverse Hyperbolic Sine Transformation of Vacancies		
	(1)	(2)	(3)
Credit check ban * Affected * Fraction subprime	-0.024*		
	(0.012)		
Credit check ban * Affected * Std. Dev. of Risk Scores		-0.006*	
		(0.003)	
Credit check ban * Affected * 90/10 Ratio of Risk Scores			-0.007*
			(0.004)
Fixed Effects			
County x Time	Yes	Yes	Yes
Occupation x Time	Yes	Yes	Yes
County x Occupation	Yes	Yes	Yes
Number of Clusters	(50, 23)	(50,8)	(50,23)
Observations	3,386,980	3,382,886	3,386,474
R-squared	0.943	0.943	0.943

Standard errors clustered two-way.
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table reports OLS regressions for our specification in equation 7 for the inverse hyperbolic sine transformation of the vacancy data, replacing the fraction of subprime residents with different moments of the county-level distribution of risk scores. Each regression coefficient is normalized by the cross-sectional standard deviation of that variable to maintain comparability. Column (1) corresponds to the baseline measure, which is the fraction of residents with a subprime credit score. The second column uses the county-level standard deviation of risk scores as the relevant metric and the third uses the 90/10 ratio of risk scores. Standard errors are clustered in two-way, by state and occupation.

TABLE A8: OCCUPATIONAL TASK COMPOSITION AND EXPOSURE TO THE BAN - The role of zero Vacancies

	Dependent Variable: Inverse Hyperbolic Sine Transformation of Vacancies			
	(1)	(2)	(3)	(4)
Credit check ban * Affected * Non-Routine	-0.017	-0.017		
	(0.030)	(0.030)		
Credit check ban * Routine Manual		-0.129**		
		(0.047)		
Credit check ban * Routine Cognitive		-0.127**		
		(0.049)		
Credit check ban * Routine	-0.129**			
	(0.048)			
Credit check ban * Affected * Non-Routine*Fraction subprime			-0.078	-0.078
			(0.130)	(0.130)
Credit check ban * Routine * Fraction subprime			-0.579***	
			(0.195)	
Credit check ban * Routine Manual * Fraction subprime				-0.582***
				(0.191)
Credit check ban * Routine Cognitive * Fraction subprime				-0.574**
				(0.204)
Fixed Effects				
County x Time	Yes	Yes	Yes	Yes
Occupation x Time	Yes	Yes	Yes	Yes
County x Occupation	Yes	Yes	Yes	Yes
Number of Clusters	(50, 23)	(50, 23)	(50, 23)	(50, 23)
Observations	3,388,061	3,388,061	3,386,980	3,386,980
R-squared	0.943	0.943	0.943	0.943

Standard errors clustered at the state level

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

Notes: This table reports OLS regressions vacancies in each county i, at date (quarter) t, for occupation o, on various different interactions of the exposure to the ban by occupational and county level heterogeneity and the inverse hyperbolic sine transformation of the vacancy data. We have two-way clustered standard errors for each regression reported in the table. First set of clusters always refer to the number of states and the second group indicates the appropriate number of occupations, education groups, or industries. For a detailed description of the mapping between two-digit SOC codes and the routine task content of an occupation, please see section 5.D in the text.

TABLE A9: ROBUSTNESS for CREDIT CHEK BAN EFFECTS - PLACEBO TESTS

	Log(Earnings)	Emp. Share for New Firms	Log(Avg. Deposits)	Log(Total Deposits)
	(1)	(2)	(3)	(4)
Credit check ban * Affected	-0.008	-0.183*		
	(0.012)	(0.074)		
Credit check ban			0.006	0.002
			(0.017)	(0.021)
Fixed Effects				
County x Time	Yes	Yes	No	No
County x industry	Yes	Yes	No	No
Industry x Time	Yes	Yes	No	No
County	No	No	Yes	Yes
Time	No	No	Yes	Yes
Number of Clusters	(50,19)	(50,19)	50	50
Observations	1,811,481	1,811,481	38,422	38,422
R-squared	0.945	0.374	0.932	0.993

Standard errors clustered two-way in (1) and (2), by state and industry.
*** p<0.01, ** p<0.05, * p<0.1

Notes: Columns (1)-(2) use county by industry data and a similar triple-diff specification we use in our baseline for vacancies. Columns (3) - (4) present difference-in-difference estimates of the effect of employer credit check bans on bank deposits, which are at the county level with annual observations. Earnings and employment shares for new firms are measured quarterly from the QWI. Deposits are measured annually from the FDIC.