Table A.1: Effects of Covid-19 Infections on Small Businesses (%)
(Random 20% sample)

Notes: This table reports estimates of local infections on business outcomes using a random 20% of the all businesses sample. Panel A reports the effect of each new cases per 1,000 residents and panel B reports the effect of cumulative cases in a county. Columns 1 through 4 report estimates using outcomes normalized 2019 weekly average, and the estimated coefficients can be interpreted as change as percent of 2019 weekly average. Columns 5 through 8 report estimates using seasonally-adjusted outcomes, and the coefficients can be interpreted as change as percent of 2019 9-week centered average. All regressions include firm and household pair fixed effects. Columns 2 and 6 include time effects, columns 3 and 7 include time × NAICS 2-digit industry effects, and columns 4 and 8 include time × size bin effects to flexibly control for time-varying trends in industry and firm size. Size bins are as defined in Table 1. Coefficients are multiplied by 100 and represented in a percent unit. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	Increase as percent of 2019 weekly average				Increase as percent of 2019 9-week centered average			
Outcomes	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Impact of New Cases per 1,000 Residents							
Revenue	-2.29 ***	-.577 ***	-.572 ***	-.512 ***	-3.89 ***	-.522 ***	-.546 ***	-.460 ***
	(.03)	(.0324)	(.0324)	(.0324)	(.0506)	(.0546)	(.0549)	(.0548)
Expense	-2.28 ***	-.906 ***	-.896 ***	-.871 ***	-3.56 ***	-.793 ***	-.797 ***	-.760 ***
	(.0237)	(.0256)	(.0257)	(.0257)	(.0379)	(.0409)	(.0411)	(.041)
Profit Margin	-.469 ***	.143 ***	.154 ***	.197 ***	-.542 ***	.058	.087	.146 **
	(.0367)	(.0397)	(.0399)	(.0398)	(.0526)	(.057)	(.0573)	(.0572)
	B. Impact of Cumulative Cases per 1,000 Residents							
Exit	.016 ***	-.005 ***	-.005 ***	-.004 ***	.016 ***	-.005 ***	-.005 ***	-.004 ***
	(.0002)	(.00021)	(.00022)	(.00022)	(.0002)	(.00021)	(.00022)	(.00022)
Number of Obs	6,558,951	6,558,951	6,558,951	6,558,951	6,029,488	6,029,488	6,029,488	6,029,488
Firm FE	X	X	X	X	X	X	X	X
Time FE		X				X		
Time x Industry FE			X				X	
Time x Size Bin FE				X				X

Table A.2: Effects of Covid-19 Infections on Small Businesses and Owners (%)

Notes: This table reports estimates of local infections on business outcomes and consumption of the owners. Panel A reports the effect of each new cases per 1,000 residents and panel B reports the effect of cumulative cases. Columns 1 through 4 report estimates using outcomes normalized 2019 weekly average, and the estimated coefficients can be interpreted as change as percent of 2019 weekly average. Columns 5 through 8 report estimates using seasonally-adjusted outcomes, and the coefficients can be interpreted as change as percent of 2019 9-week centered average. All regressions include firm and household pair fixed effects. Columns 2 and 6 include time effects, columns 3 and 7 include time $\times$ NAICS 2-digit industry effects, and columns 4 and 8 include time $\times$ size bin effects to flexibly control for time-varying factors related to industry and firm size. Size bins are as defined in Table 1. Coefficients are multiplied by 100 and represented in a percent unit. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	Increase as percent of 2019 weekly average				Increase as percent of 2019 9-week centered average			
Outcomes	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Impact of New Cases per 1,000 Residents							
Revenue	-2.23 ***	-.492 ***	-.449 ***	-.427 ***	-4.01 ***	-.595 ***	-.557 ***	-.521 ***
	(.0283)	(.0306)	(.0308)	(.0306)	(.0499)	(.0539)	(.0542)	(.054)
Expense	-2.29 ***	-.855 ***	-.820 ***	-.823 ***	-3.69 ***	-.837 ***	-.808 ***	-.808 ***
	(.0225)	(.0243)	(.0244)	(.0243)	(.0375)	(.0405)	(.0407)	(.0405)
Profit	-.444 ***	.229 ***	.252 ***	.270 ***	-.375 ***	.215 ***	.254 ***	.283 ***
	(.036)	(.039)	(.0393)	(.0391)	(.05)	(.0542)	(.05451)	(.0542)
Consumption	-2.12 ***	-.563 ***	-.530 ***	-.557 ***	-3.66 ***	-.853 ***	-.809 ***	-.837 ***
	(.02229)	(.02405)	(.02421)	(.02409)	(.03719)	(.04017)	(.04043)	(.04022)
	B. Impact of Cumulative Cases per 1,000 Residents							
Exit	.016 ***	-.005 ***	-.005 ***	-.005 ***	.016 ***	-.005 ***	-.005 ***	-.005 ***
	(.00019)	(.00021)	(.00021)	(.00021)	(.00019)	(.00021)	(.00021)	(.00021)
Number of Obs	6,929,132	6,929,132	6,929,132	6,929,132	6,258,498	6,258,498	6,258,498	6,258,498
Firm-Household FE	X	X	X	X	X	X	X	X
Time FE		X				X		
Time x Industry FE			X				X	
Time x Size Bin FE				X				X

Table A.3: Effects of Shelter in Place (SIP) on Small Businesses and Owners (%)

Notes: This table reports estimates of shelter in place on business outcomes and consumption of the owners. Panel A reports the effect of SIP and panel B reports the effect of cumulative number of weeks that SIP has been in effect. Columns 1 through 4 report estimates using outcomes normalized 2019 weekly average, and the estimated coefficients can be interpreted as change as percent of 2019 weekly average. Columns 5 through 8 report estimates using seasonally-adjusted outcomes, and the coefficients can be interpreted as change as percent of 2019 9-week centered average. All regressions include firm and household pair fixed effects. Columns 2 and 6 include time effects, columns 3 and 7 include time $\times$ NAICS 2-digit industry effects, and columns 4 and 8 include time $\times$ size bin effects to flexibly control for time-varying factors related to industry and firm size. Size bins are as defined in Table 1. Coefficients are multiplied by 100 and represented in a percent unit. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	Increase as percent of 2019 weekly average				Increase as percent of 2019 9-week centered average			
Outcomes	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Shelter in Place Indicator							
Revenue	-16.77 ***	-2.829 ***	-2.688 ***	-2.793 ***	-32.81 ***	-3.045 ***	-3.062 ***	-3.006 ***
	(.105)	(.212)	(.213)	(.212)	(.185)	(.374)	(.375)	(.374)
Expense	-14.93 ***	-3.526 ***	-3.272 ***	-3.508 ***	-28.01 ***	-4.124 ***	-4.051 ***	-4.079 ***
	(.084)	(.169)	(.169)	(.169)	(.14)	(.283)	(.283)	(.283)
Profit	-5.51 ***	.910 ***	.776 ***	.929 ***	-4.552 ***	1.117 ***	1.016 ***	1.146 ***
	(.134)	(.271)	(.272)	(.271)	(.186)	(.377)	(.378)	(.377)
Consumption	-15.98 ***	-3.314 ***	-3.154 ***	-3.294 ***	-27.96 ***	-4.578 ***	-4.430 ***	-4.546 ***
	(.083)	(.167)	(.168)	(.167)	(.138)	(.279)	(.28)	(.279)
	B. Cumulative Number of Weeks that Shelter in Place has been in Effect							
Exit	.176 ***	-.027 ***	-.029 ***	-.026 ***	.176 ***	-.027 ***	-.029 ***	-.026 ***
	(.001)	(.003)	(.003)	(.003)	(.001)	(.003)	(.003)	(.003)
Number of Obs	7,260,196	7,260,196	7,260,196	7,260,196	6,554,549	6,554,549	6,554,549	6,554,549
Firm-Household FE	X	X	X	X	X	X	X	X
Time FE		X				X		
Time x Industry FE			X				X	
Time x Size Bin FE				X				X

Table A.4: Principal Component Analysis of State-level NPIs

Notes: This table reports results from the principal component analysis using state-level NPI data obtained from Keystone Strategy. Panel A reports the standard deviation, proportion of variance, and cumulative proportion of each component. Panel B reports factor loadings. Gathering restriction indicators are transformed such that less restrictive measures are automatically considered to be in effect if more restrictive measures are in place. For example, if a state has gathering limit of 10 people, then less restrictive gathering restrictions (limit of 25, 100, or 500 people) are assumed to be in effect. We use the first component (PC 1) as the primary measure of NPI strictness.

	PC 1 (1)	PC 2 (2)	PC 3 (3)	PC 4 (4)	PC 5 (5)	PC 6 (6)	PC 7 (7)	PC 8 (8)	PC 9 (9)	PC 10 (10)
	A. Importance of Components									
Standard Deviation	2.761	0.863	0.675	0.597	0.548	0.467	0.381	0.325	0.178	0.130
Proportion of Variance	0.763	0.074	0.046	0.036	0.030	0.022	0.015	0.011	0.003	0.002
Cumulative Proportion	0.763	0.837	0.883	0.918	0.948	0.970	0.985	0.995	0.998	1.000
	B. Factor Loadings (Rotated and Scaled)									
	Shelter in place	Non-essential svcs closure	School closure	Public venue	Religious gathering	Social distancing	Gathering 10	Gathering 25	Gathering 100	Gathering 500
Shelter in place	0.286	0.394	-0.432	-0.303	-0.681	0.133	-0.032	0.014	-0.007	0.024
Non-essential svcs closure	0.303	0.404	-0.291	0.173	0.386	-0.500	-0.419	-0.234	-0.028	-0.003
School closure	0.329	-0.146	-0.112	0.104	0.225	0.584	-0.516	0.434	0.003	-0.020
Public venue closure	0.321	0.241	-0.259	0.106	0.401	0.210	0.732	0.126	0.063	0.032
Religious gathering cancellation	0.254	0.551	0.779	0.058	-0.068	0.129	-0.026	0.010	-0.008	-0.004
Social distancing	0.297	-0.238	0.008	0.797	-0.412	-0.183	0.100	0.084	-0.001	-0.006
Gathering restriction: 10	0.338	-0.208	0.121	-0.327	-0.004	-0.378	0.067	0.343	0.266	-0.621
Gathering restriction: 25	0.340	-0.245	0.137	-0.290	0.012	-0.309	0.034	0.248	-0.063	0.748
Gathering restriction: 100	0.345	-0.254	0.063	-0.142	0.029	0.093	0.071	-0.356	-0.777	-0.219
Gathering restriction: 500	0.339	-0.273	0.066	-0.080	0.006	0.223	-0.030	-0.654	0.563	0.072

Table A.5: The Effect of Infections on NPIs

Notes: This table shows OLS estimates of the effect of county-level infections on NPIs to test whether contemporaenous or past cases can predict whether a state adopts policies. The regressions are run at the county-time level. Panel A reports estimates on shelter in place and panel B reports estimates on NPI tightness. Columns 1 and 2 estimates the effect of cumulative and new cases per 1,000 residents. Columns 3 estimates the joint effect, column 4 includes time effects, and column 5 reports estimates including past cases. Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	A. Shelter in Place				
	(1)	(2)	(3)	(4)	(5)
Cumulative Cases	.020 ***		.011 ***	.003 ***	-.010 ***
	(.001)		(.001)	(.001)	(.002)
New Cases		.075 ***	.052 ***	.00	.056 ***
		(.003)	(.003)	(.002)	(.004)
New Cases (t-1)					.038 ***
					(.004)
New Cases (t-2)					.027 ***
					(.004)
New Cases (t-3)					.020 ***
					(.005)
New Cases (t-4)					.014 ***
					(.005)
Adj. R-squared	0.02	0.02	0.03	0.63	0.02
	B. NPI Strictness				
Cumulative Cases	.185 ***		.135 ***	.012 ***	.057 ***
	(.004)		(.005)	(.002)	(.013)
New Cases		.568 ***	.297 ***	.013 *	.256 ***
		(.017)	(.02)	(.007)	(.022)
New Cases (t-1)					.155 ***
					(.023)
New Cases (t-2)					.087 ***
					(.024)
New Cases (t-3)					.028
					(.025)
New Cases (t-4)					-.014
					(.027)
Adj. R-squared	0.05	0.03	0.05	0.88	0.04
Number of Obs	32,692	31,206	31,206	31,206	25,262
Time Effects				X	

Table A.6: Effects of Non-Pharmaceutical Intervention (NPI) Strictness (%)

Notes: This table reports estimates of NPI strictness on business outcomes and consumption of the owners. NPI strictness is measured as the first principal component of state-level NPIs. The first component explains 76% of variance and weighs positively on all restrictions. The underlying eigenvalues and eigenvectors are reported in Appendix Table A.4. Columns 1 through 4 report estimates using outcomes normalized 2019 weekly average, and the estimated coefficients can be interpreted as change as percent of 2019 weekly average. Columns 5 through 8 report estimates using seasonally-adjusted outcomes, and the coefficients can be interpreted as change as percent of 2019 9-week centered average. The reported estimates represent effects per standard deviation increase in strictness. All regressions include firm and household pair fixed effects. Columns 2 and 6 include time effects, columns 3 and 7 include time × NAICS 2-digit industry effects, and columns 4 and 8 include time × size bin effects to flexibly control for time-varying factors related to industry and firm size. Size bins are as defined in Table 1. Coefficients are multiplied by 100 and represented in a percent unit. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	Increase as percent of 2019 weekly average				Increase as percent of 2019 9-week centered average			
Outcomes	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	NPI Strictness							
Revenue	-8.79 ***	-2.31 ***	-.590 ***	-.562 ***	-17.78 ***	-3.08 ***	-.806 ***	-.747 ***
	(.0495)	(.207)	(.0559)	(.0494)	(.0873)	(.364)	(.099)	(.087)
Expense	-7.50 ***	-2.72 ***	-.687 ***	-.657 ***	-14.39 ***	-3.63 ***	-.955 ***	-.887 ***
	(.0395)	(.1646)	(.0445)	(.0394)	(.0659)	(.275)	(.074)	(.066)
Profit	-3.30 ***	.791 ***	.210 ***	.189 ***	-2.84 ***	.892 **	.245 **	.214 **
	(.0632)	(.264)	(.072)	(.063)	(.0878)	(.367)	(.099)	(.088)
Consumption	-8.15 ***	-2.35 ***	-.607 ***	-.567 ***	-14.40 ***	-3.450 ***	-.908 ***	-.828 ***
	(.039)	(.1628)	(.0441)	(.0389)	(.0651)	(.272)	(.074)	(.065)
Exit	.542 ***	.0002	.0003	-.0006	.542 ***	.00	.00	-.001
	(.00216)	(.009)	(.00244)	(.00216)	(.00216)	(.009)	(.00244)	(.00216)
Number of Obs	7,258,042	7,258,042	7,258,042	7,258,042	6,552,425	6,552,425	6,552,425	6,552,425
Std Dev. (Strictness)	2.84							
Firm-Household FE	X	X	X	X	X	X	X	X
Time FE		X				X		
Time x Industry FE			X				X	
Time x Size Bin FE				X				X

Table A.7: Naive OLS of Owner's Consumption on Business Outcomes

Notes: This table reports estimates obtained from a naive regression of owner's consumption on business outcomes. Columns 1 and 2 use outcomes are in dollars (level) and Columns 3 and 4 use seasonally-adjusted outcomes that are normalized by 2019 9-week centered average. All regressions include firm and household pair fixed effects. Columns 2 and 4 additionally include time $\times$ county fixed effects. Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	MPC				Elasticity			
Outcomes	(1)		(2)		(3)		(4)	
Revenue	.007	***	.005	***	.022	***	.016	***
	(.0001)		(.0001)		(.0003)		(.0003)	
Expense	.010	***	.007	***	.030	***	.021	***
	(.0001)		(.0001)		(.0004)		(.0004)	
Profit	.00	***	.00	***	.003	***	.002	***
	(.0001)		(.0001)		(.0003)		(.0003)	
Number of Obs	7,531,326		7,531,326		6,482,239		6,482,239	
Firm-Household FE	X		X		X		X	
Time x County FE			X				X	

Table A.8: Transmission of Business Shocks to Owner's Consumption (Elasticity)

Notes: This table reports elasticities of owner households' consumption with respect to changes in business revenues, expenses, and profit margins using equations (10). The first four columns use outcomes normalized by 2019 weekly average and the last four columns use seasonally-adjusted outcomes that are normalized by 2019 9-week centered average. Columns 1, 2, 5 and 6 use variation by industry due to SIP or SIP and infections as the excluded instruments. Columns 3, 4, 7, and 8 use variation by industry due to NPI strictness or NPI strictness and infections as the excluded instruments. NPI strictness is as defined in Table 4. All regressions include firm and household pair fixed effects. Panel A reports estimates including county × time fixed effects and panel B reports estimates controlling for state × time effects. Firms that operate in sub-industries with less than 30 firms are dropped from the estimation. Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	Increase as percent of 2019 weekly average				Increase as percent of 2019 9-week centered average			
	Variation by industry due to				Variation by industry due to			
Endogenous Variable	SIP (1)	SIP & Infections (2)	NPI Strictness (3)	NPI Strictness & Infections (4)	SIP (5)	SIP & Infections (6)	NPI Strictness (7)	NPI Strictness & Infections (8)
				A. County x time fixed effects				
Revenue	.149 ***	.119 ***	.156 ***	.127 ***	.163 ***	.099 ***	.173 ***	.108 ***
	(.007)	(.007)	(.006)	(.006)	(.009)	(.009)	(.009)	(.008)
Expense	.195 ***	.148 ***	.197 ***	.153 ***	.205 ***	.127 ***	.208 ***	.130 ***
	(.008)	(.008)	(.008)	(.008)	(.011)	(.011)	(.01)	(.01)
Profit	.237 ***	.190 ***	.256 ***	.205 ***	.170 ***	.124 ***	.188 ***	.140 ***
	(.012)	(.011)	(.012)	(.01)	(.016)	(.014)	(.014)	(.013)
				B. State x time fixed effects				
Revenue	.120 ***	.111 ***	.132 ***	.121 ***	.080 ***	.062 ***	.089 ***	.070 ***
	(.007)	(.007)	(.006)	(.006)	(.01)	(.009)	(.009)	(.009)
Expense	.154 ***	.141 ***	.164 ***	.149 ***	.093 ***	.086 ***	.096 ***	.086 ***
	(.009)	(.008)	(.008)	(.008)	(.012)	(.012)	(.011)	(.011)
Profit	.210 ***	.175 ***	.230 ***	.190 ***	.170 ***	.116 ***	.189 ***	.134 ***
	(.012)	(.011)	(.012)	(.01)	(.016)	(.014)	(.014)	(.013)
Number of Obs	7,248,362	6,918,891	7,248,362	6,918,891	6,482,239	6,190,218	6,482,239	6,190,218
Firm-Household FE	X	X	X	X	X	X	X	X

Table A.9: Transmission of Business Shocks to Owner's Consumption by Subgroup (Elasticity)

Notes: This table reports elasticities of owner households' consumption with respect to changes in business revenues, expenses, and profit margin using equations (10) by business type. Odd numbered columns in each panel use variation by SIP or NPI strictness and even numbered columns in each panel uses that due to SIP and infections or NPI strictness and infections as the excluded instruments. NPI strictness is as defined in Table 4. Outcomes are normalized by 2019 9-week centered average, and all regressions include firm and household pair fixed effects and time × county fixed effects. Panels A and B reports estimates using subsamples of nonemployer and employer firms. Panels C and D reports estimates using subsamples of low and high liquidity firms. Panels E and F report estimates using subsamples of small and large firms. Liquidity is computed as the ratio of 2019 average monthly cash balances to expenses multiplied by 30 and can be interpreted as a firm's average cash buffer days, or the number of days of operating expenses that a business could pay out of its cash balances were its revenues to stop. "Low (high) liquidity" sample includes firms with lower (higher) than the first (third) quartile of cash buffer days within its sub-industry (NAICS 4-digit). "Small" ("Large") firms includes those with lower (higher) than median annual sales in 2019 within its sub-industry. Firms that operate in sub-industries with less than 30 firms are dropped from the estimation. Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

	Variation by industry due to				Variation by industry due to			
Endogenous Variable	SIP (1)	SIP & Infections (2)	NPI Strictness (3)	NPI Strictness & Infections (4)	SIP (5)	SIP & Infections (6)	NPI Strictness (7)	NPI Strictness & Infections (8)
	A. Nonemployer				B. Employer			
Revenue	.156 ***	.091 ***	.168 ***	.099 ***	.161 ***	.122 ***	.156 ***	.122 ***
	(.01)	(.01)	(.01)	(.009)	(.02)	(.018)	(.018)	(.017)
Expense	.190 ***	.125 ***	.193 ***	.125 ***	.213 ***	.121 ***	.197 ***	.111 ***
	(.012)	(.012)	(.011)	(.011)	(.025)	(.025)	(.023)	(.023)
Profit	.172 ***	.107 ***	.192 ***	.125 ***	-.008	.045	-.014	.054
	(.016)	(.014)	(.015)	(.013)	(.042)	(.035)	(.039)	(.034)
Number of Obs	5,423,637	5,179,493	5,423,637	5,179,493	1,040,142	993,101	1,040,142	993,101
	C. Low Liquidity				D. High Liquidity			
Revenue	.176 ***	.110 ***	.169 ***	.107 ***	.138 ***	.071 ***	.152 ***	.085 ***
	(.019)	(.018)	(.018)	(.017)	(.016)	(.015)	(.015)	(.014)
Expense	.206 ***	.150 ***	.180 ***	.126 ***	.131 ***	.050 ***	.130 ***	.056 ***
	(.023)	(.021)	(.021)	(.02)	(.019)	(.018)	(.017)	(.017)
Profit	.242 ***	.096 ***	.274 ***	.124 ***	.074 ***	.052 ***	.080 ***	.056 ***
	(.046)	(.036)	(.041)	(.034)	(.013)	(.012)	(.012)	(.011)
Number of Obs	1,608,813	1,536,047	1,608,813	1,536,047	1,569,870	1,499,274	1,569,870	1,499,274
	E. Small				F. Big			
Revenue	.104 ***	.063 ***	.120 ***	.074 ***	.192 ***	.123 ***	.201 ***	.131 ***
	(.013)	(.012)	(.012)	(.011)	(.012)	(.012)	(.012)	(.011)
Expense	.113 ***	.055 ***	.123 ***	.064 ***	.240 ***	.158 ***	.243 ***	.160 ***
	(.016)	(.015)	(.015)	(.014)	(.015)	(.015)	(.014)	(.014)
Profit	.118 ***	.080 ***	.156 ***	.114 ***	.190 ***	.129 ***	.195 ***	.136 ***
	(.02)	(.018)	(.018)	(.016)	(.02)	(.018)	(.019)	(.017)
Number of Obs	2,807,419	2,681,118	2,807,419	2,681,118	3,656,360	3,491,476	3,656,360	3,491,476
Firm-Household FE	X	X	X	X	X	X	X	X
Time x County FE	X	X	X	X	X	X	X	X

Figure A.1: Average business outcomes of a random subset of all businesses (levels)

Notes: This figure shows average weekly dollar levels of business revenues, expenses, profits, and household consumption from the week starting December 30th, 2019 to the week starting May 25th, 2020 for a random subset (20%) of businesses in the all businesses sample. Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020. Blue horizontal lines denote the average of respective outcomes between January 13, 2020 to February 9, 2020 (i.e., two months before the week of national emergency). This figure illustrates that the business owners sample that we use for our main analysis have similar declining patterns as the broader sample of businesses in the all businesses sample.

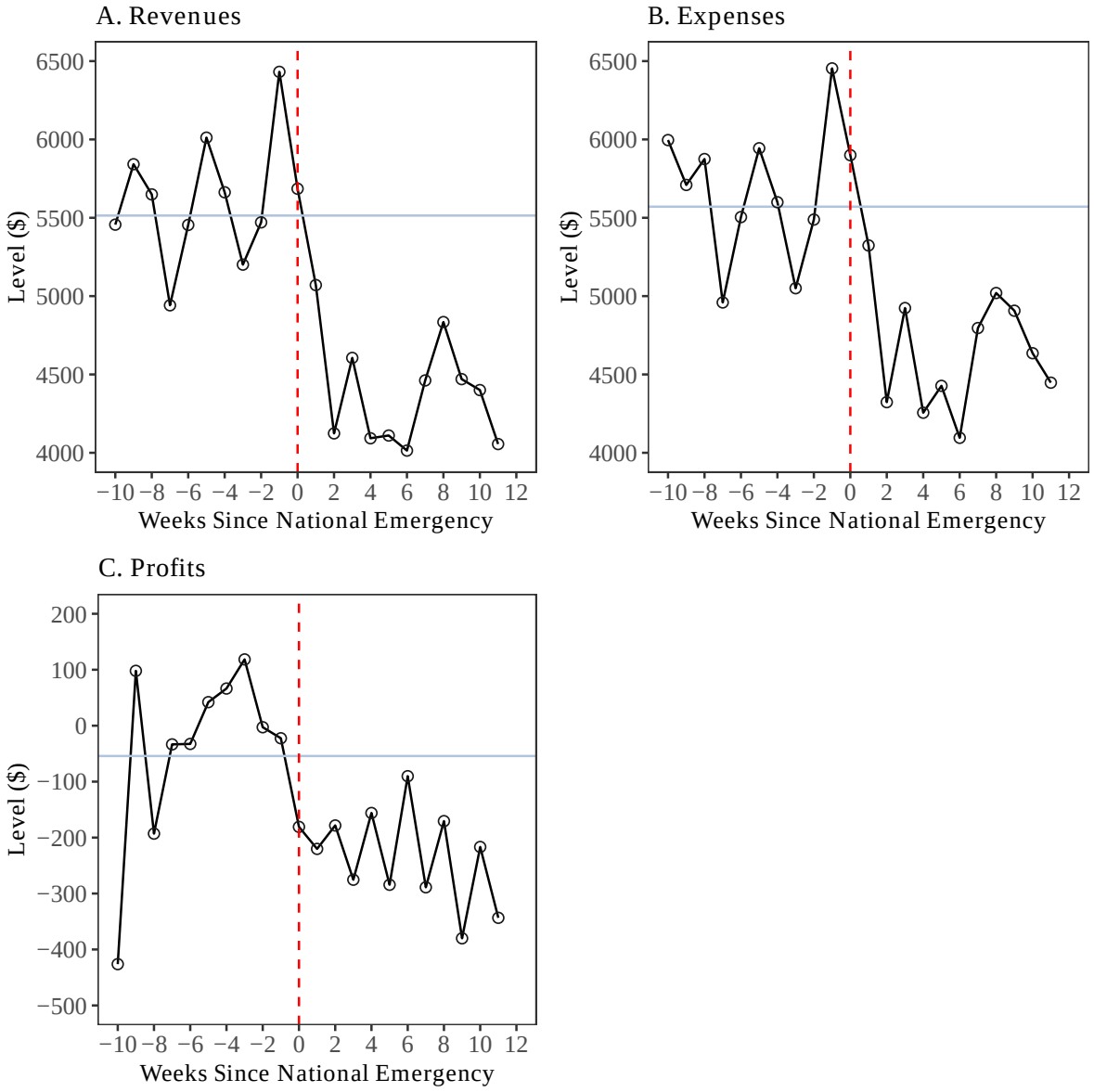

Figure A.2: Average changes in business outcomes of a random subset of all businesses

Notes: This figure shows average weekly changes in business revenues, expenses, profits, and household consumption from the week starting December 30th, 2019 to the week starting May 25th, 2020 for a random subset (20%) of businesses in the all businesses sample. Outcomes are normalized by the centered 9-week average from a year ago, and the change is defined as a percent change from its own average between January 13, 2020 and February 9, 2020 (i.e., two months before the week of national emergency). Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020.

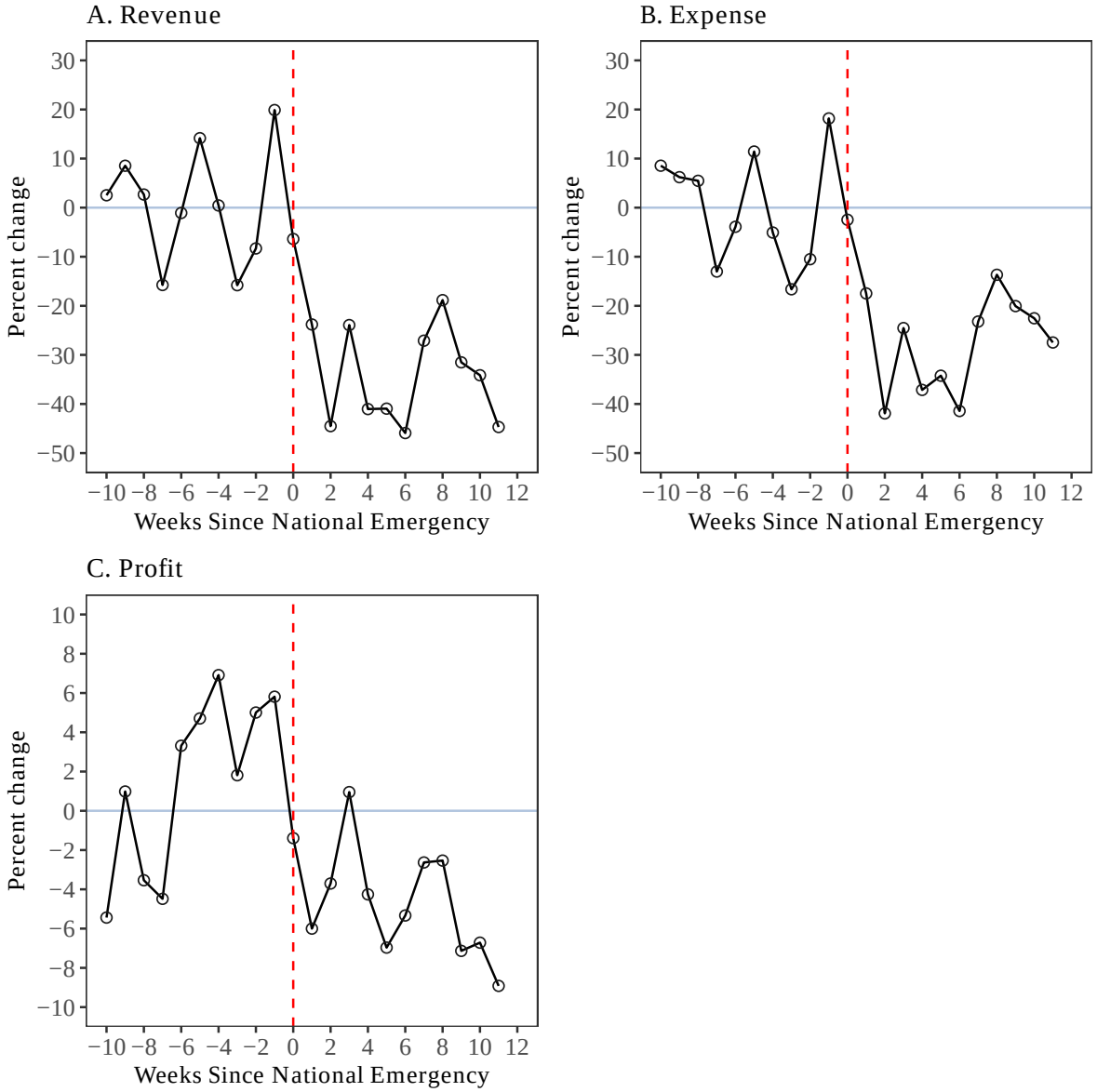

Figure A.3: Average changes in business expenses in 2020 by subgroup

Notes: This figure shows average weekly changes in business expenses from the week starting December 30th, 2019 to the week starting May 25th, 2020 by business type. Outcomes are normalized by the centered 9-week average from a year ago, and the change is defined as a percent change from its own average between January 13, 2020 and February 9, 2020 (i.e., two months before the week of national emergency). Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020. Panel A plots weekly changes for essential and non-essential businesses; Panel B for smaller and bigger small businesses; Panel C by employer and non-employer firms; and panel D by low vs. high liquidity firms. Essential industry categorization is based on the advisory list provided by the Department of Homeland Security (HLS). "Small" ("Large") firms includes businesses with lower (higher) than median annual sales in 2019 within its NAICS 4-digit industry. A firm is considered to be an employer firm if a business had payroll expenses for at least 6 months in 2019. Low (high) liquidity sample includes firms with lower (higher) than the first (third) quartile of cash buffer days within its sub-industry. Cash buffer days represent the number of days of operating expenses that a business could pay out of its cash balances were its revenues to stop.

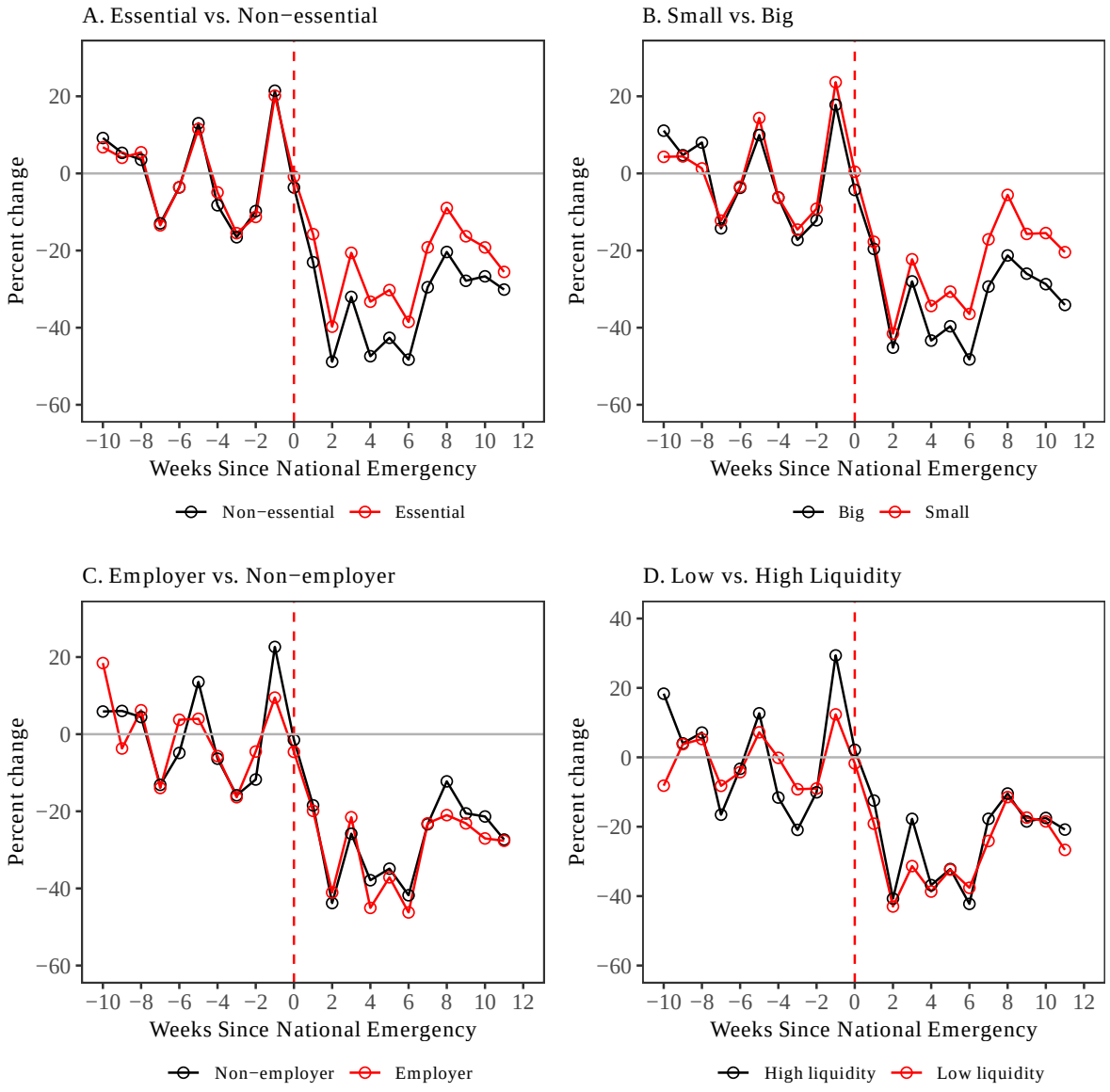

Figure A.4: Average changes in owner's consumption in 2020 by subgroup

Notes: This figure shows average weekly changes in business owner's consumption from the week starting December 30th, 2019 to the week starting May 25th, 2020 by business type. Outcomes are normalized by the centered 9-week average from a year ago, and the change is defined as a percent change from its own average between January 13, 2020 and February 9, 2020 (i.e., two months before the week of national emergency). Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020. Panel A plots weekly changes for essential and non-essential businesses; Panel B for smaller and bigger small businesses; Panel C by employer and non-employer firms; and panel D by low vs. high liquidity firms. Essential industry categorization is based on the advisory list provided by the Department of Homeland Security (HLS). "Small" ("Large") firms includes businesses with lower (higher) than median annual sales in 2019 within its NAICS 4-digit industry. A firm is considered to be an employer firm if a business had payroll expenses for at least 6 months in 2019. Low (high) liquidity sample includes firms with lower (higher) than the first (third) quartile of cash buffer days within its sub-industry. Cash buffer days represent the number of days of operating expenses that a business could pay out of its cash balances were its revenues to stop.

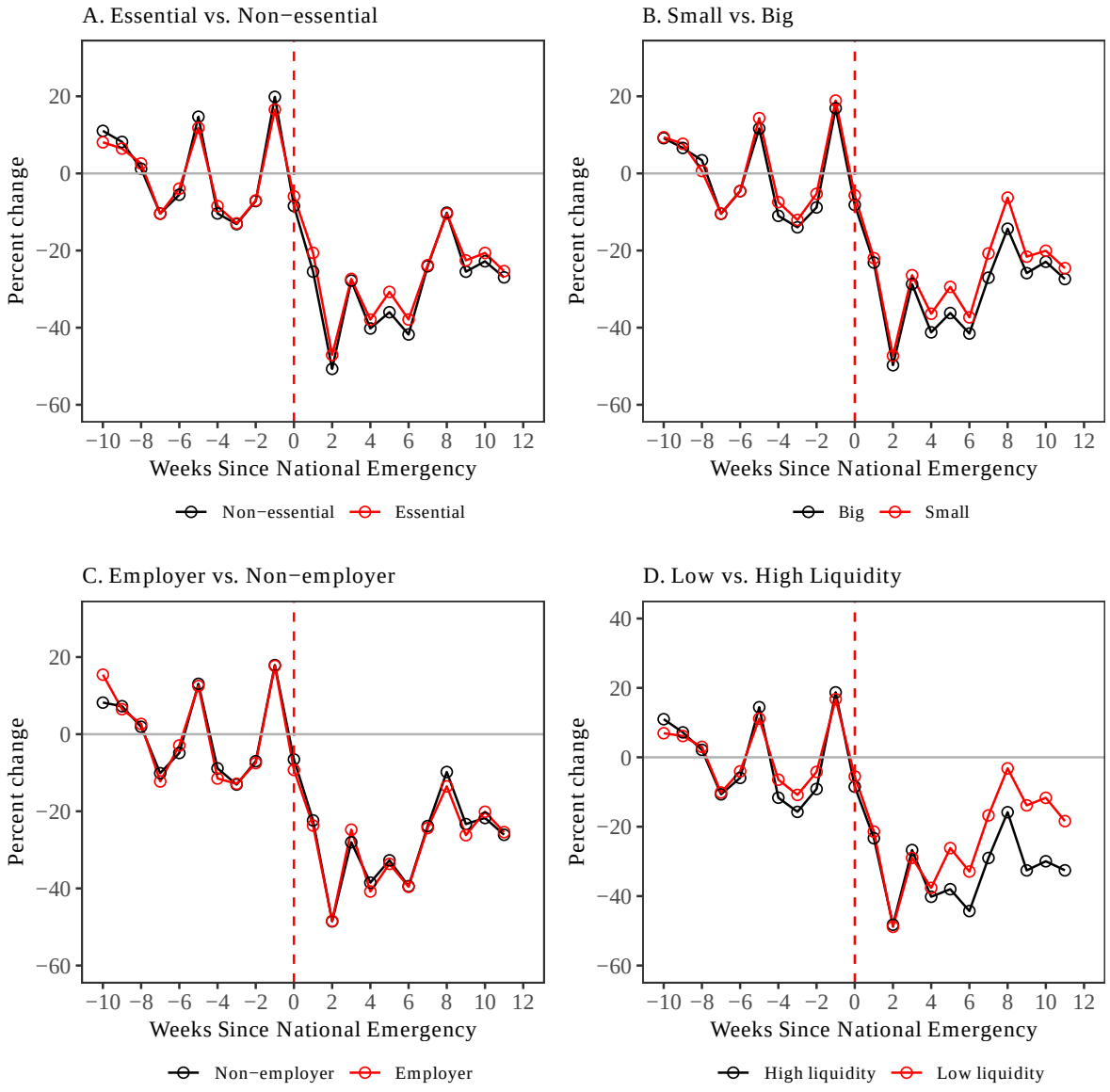

Figure A.5: Top ten industries with the highest exit rates

Notes: This figure shows top ten NAICS 5-digit industries with the highest incidence of business closures from the week starting December 30th, 2019 to the week starting May 25th, 2020 for the business owners sample. Exit rates for respective industries are reported at the end of each bar. For example, 3.12% of all firms that exited operated in full-service restaurants sector. Industries that are deemed essential according to the advisory list of the Department of Homeland Security (HLS) are shown in red. Non-essential industries are shown in dark gray. Although full-service restaurants are categorized as "essential" and not technically closed, we categorize them in the "non-essential" group because they are affected by stay-at-home restrictions.

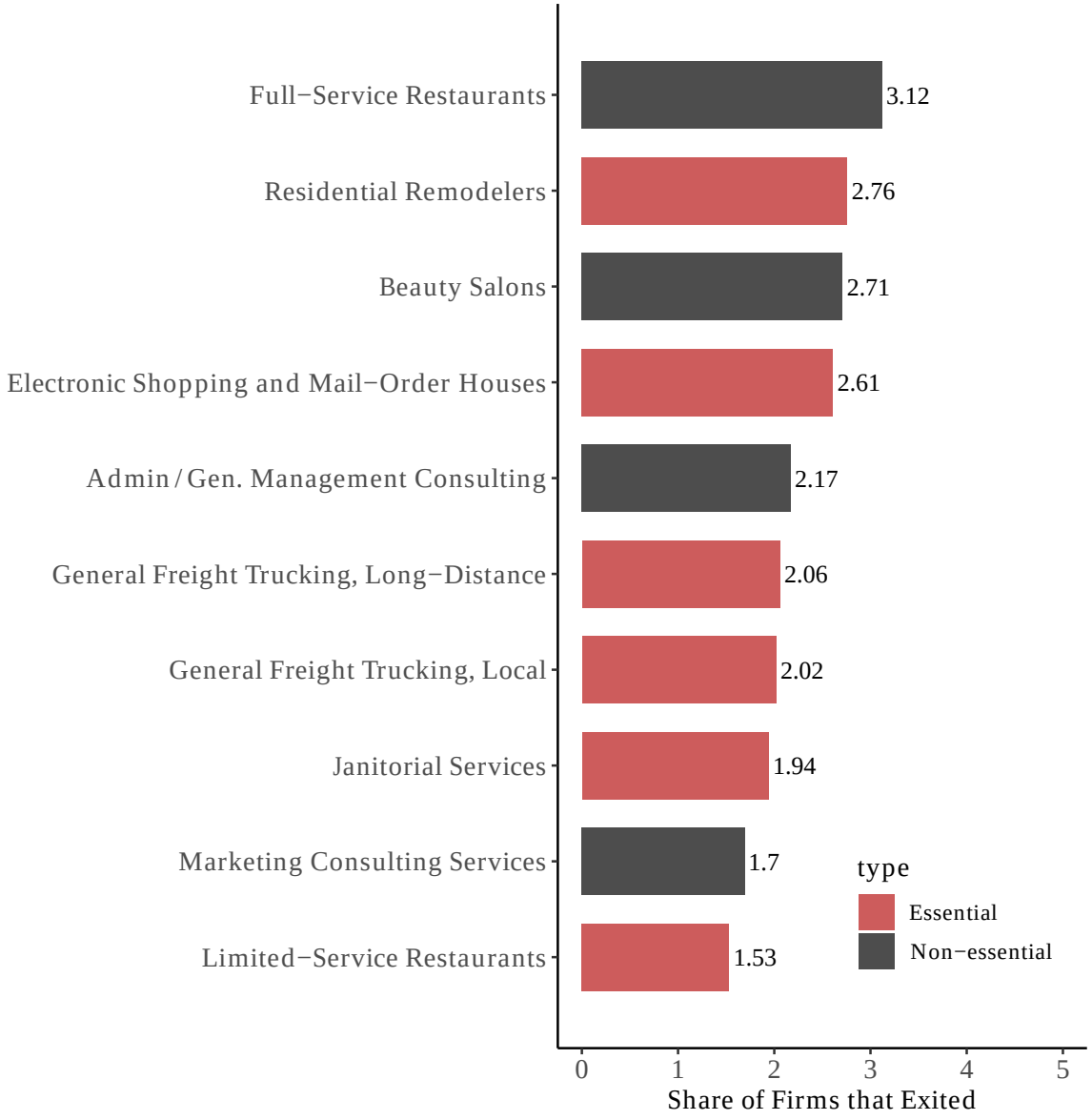

Figure A.6: Share of states that introduced or ended NPIs

Notes: This figure plots the share of states that introduced (red), ended (blue), or continued to have respective NPIs in effect by the end of May (green). The annotated number at the top left corner of each panel denotes the share of states that ever implemented a given policy. "Nonessential", "Public venue", "Religious gathering", and "School" refer to closures or restrictions on the said activities. The numbers in parenthesis for "Gathering limit" restrictions refer to gathering limits (e.g., limit of 10 people). Source: State-level NPI data are obtained from Keystone Strategy.

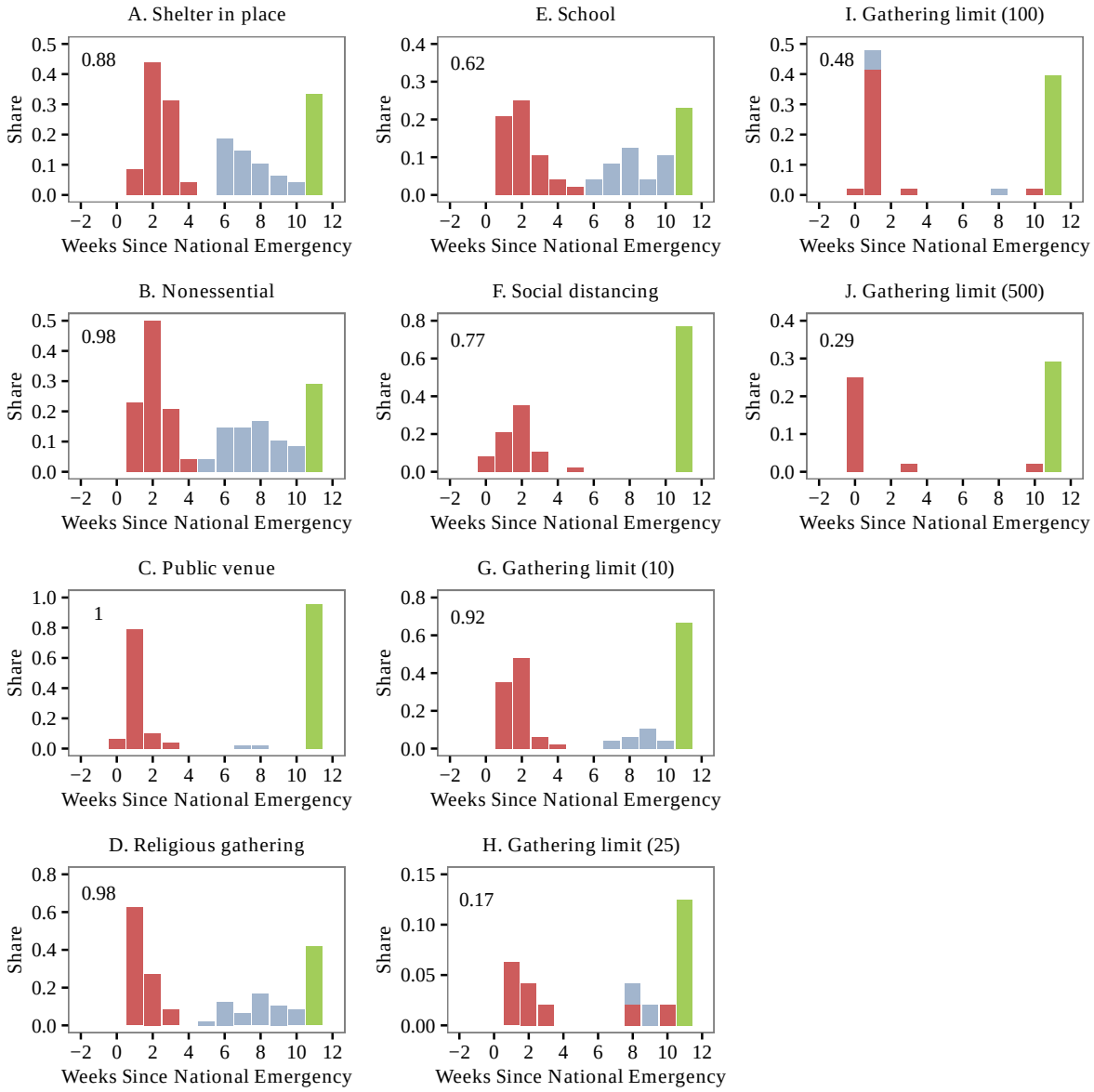

Figure A.7: Estimated time effects on business outcomes and household consumption

Notes: This figure plots estimated time effects on business revenues, expenses, profits, and consumption using outcomes normalized by 2019 centered 9-week average. The estimates are obtained from Equation 7. Whiskers show 95% confidence intervals. Gray dashed lines are linearly fitted regression lines. Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020.

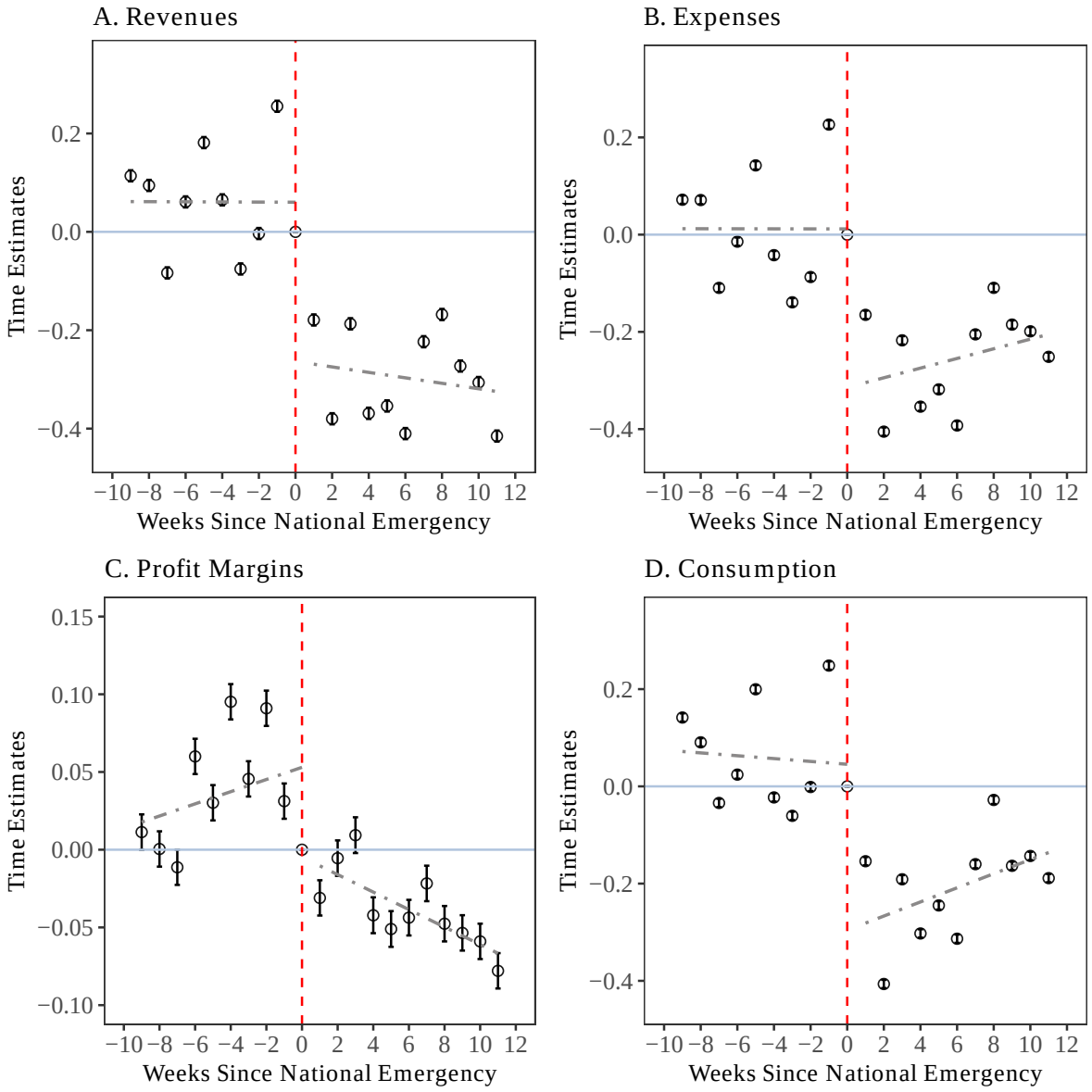

Figure A.8: Correlation between State-level Non-Pharmaceutical Interventions (NPIs)

Notes: This figure shows pair-wise correlation between state-level NPI policies. Highly correlated ($\rho > 0.5$) policies are marked in red bubbles.

Figure A.9: Average changes in business revenues and owners' consumption by industry performance for the lowest and the middle three deciles

Notes: This figure shows average weekly changes in business revenues (blue) and owners' consumption (red) for businesses in the middle and bottom three deciles of industry performance. Outcomes are normalized by the centered 9-week average from a year ago, and the change is defined as a percent change from its own average between January 13, 2020 and February 9, 2020 (i.e., two months before the week of national emergency). Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020. Line types capture different industry rankings in terms of their average drop in revenues since the onset of the national emergency. Each decile contains roughly 20 industries. For this analysis, we restrict the sample to industries with at least 100 businesses.

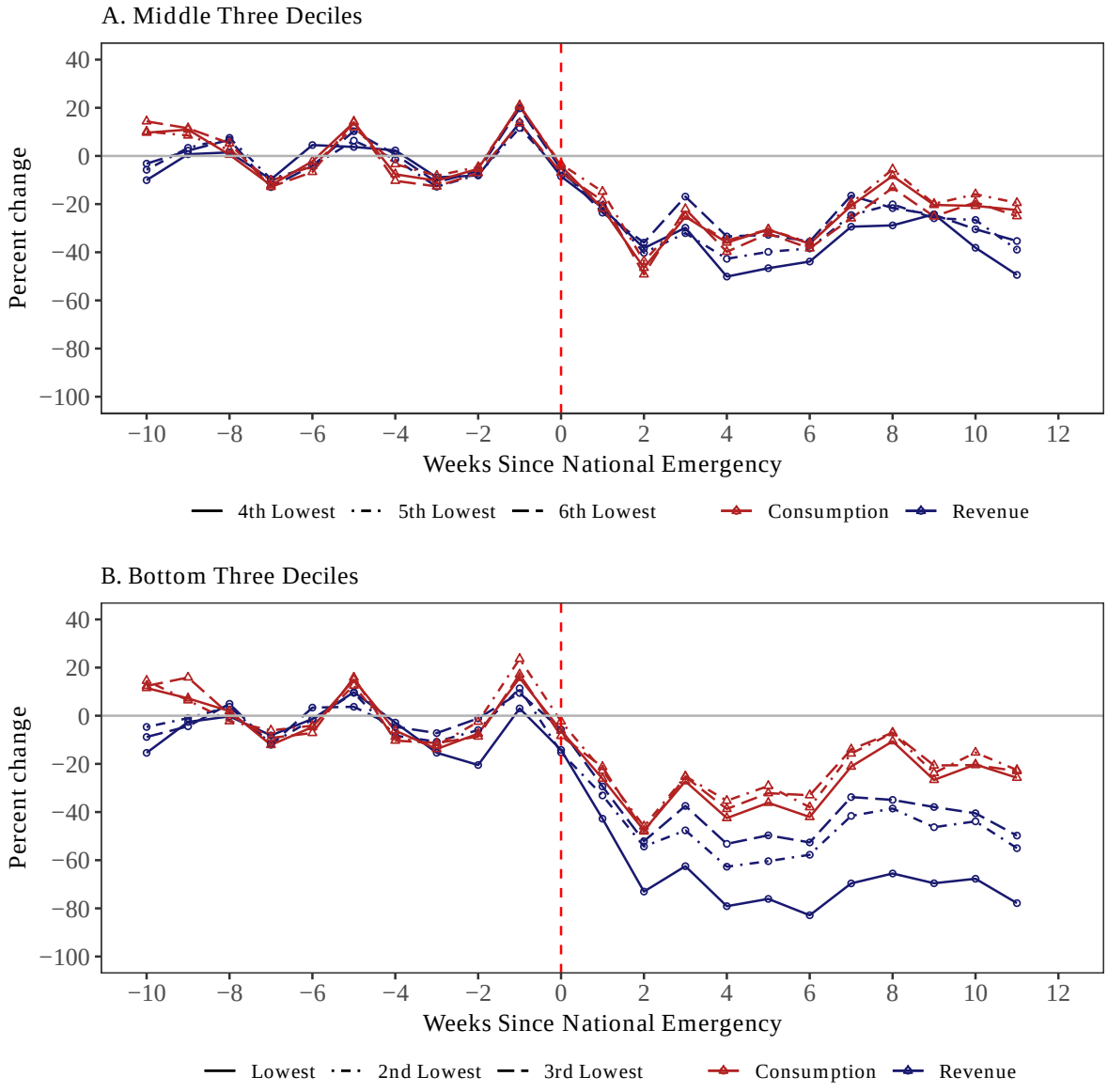

Figure A.10: Average changes in business revenue by top and bottom performing sectors

Notes: This figure shows average weekly changes in business revenues for businesses in the top five and the bottom five performing industries. Industry performance is defined as the average drop in revenues by NAICS 4-digit industries since the onset of the national emergency. Panel A plots revenue series for businesses in the five least affected (i.e., best performing) industries, and Panel B plots those for businesses in the five most affected (i.e., worst performing) industries. Industries shown in this figure correspond to the underlying sectors in the least and the most affected industries shown in Figure 11. For this analysis, we restrict the sample to industries with at least 100 businesses. Outcomes are normalized by the centered 9-week average from a year ago, and the change is defined as a percent change from its own average between January 13, 2020 and February 9, 2020 (i.e., two months before the week of national emergency). Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020.

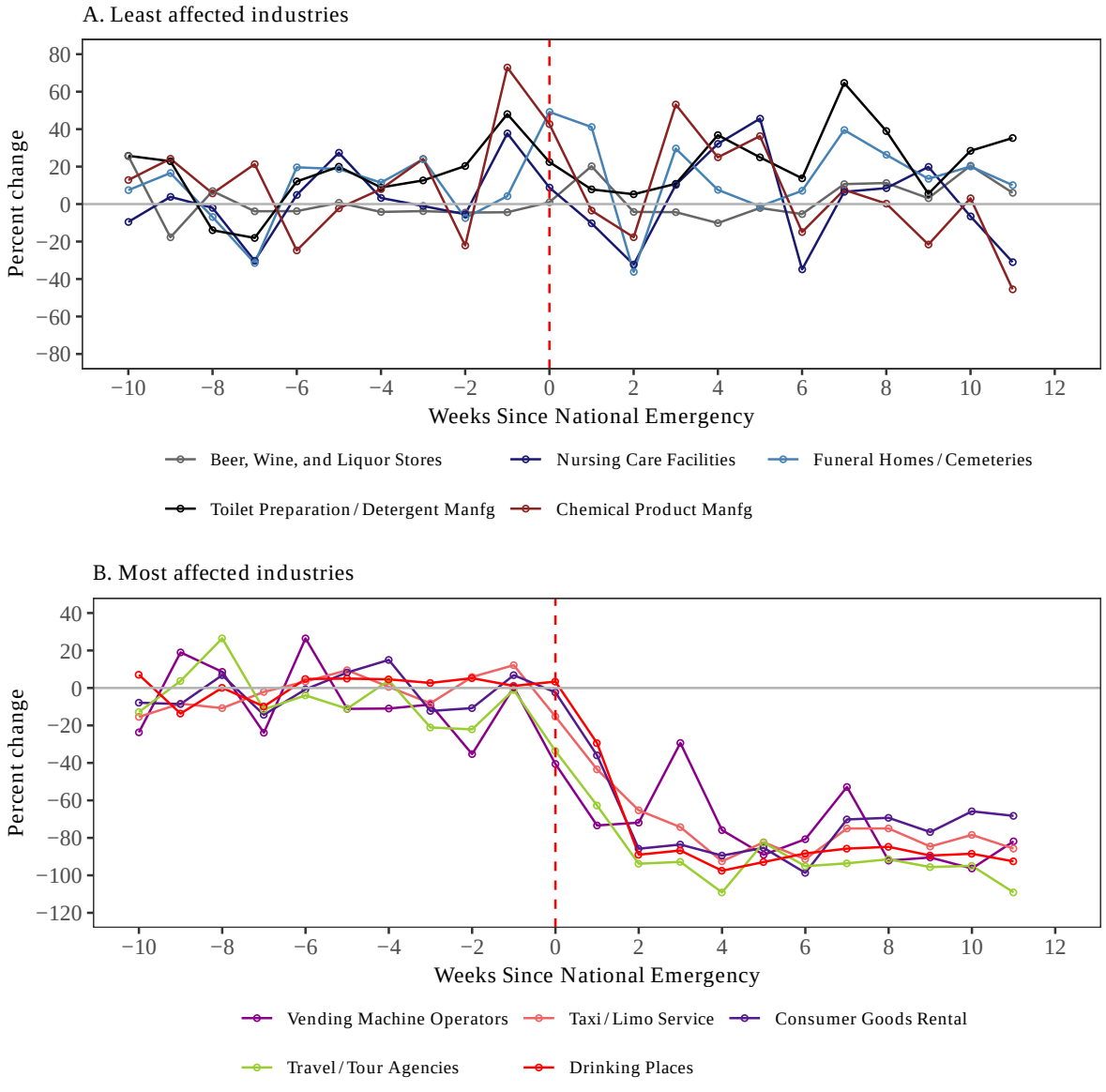

Figure A.11: Average changes in household consumption by top and bottom performing sectors

Notes: This figure shows average weekly changes in business owner's consumption for businesses in the top five and the bottom five performing industries. Industry performance is defined as the average drop in revenues by NAICS 4-digit industries since the onset of the national emergency. Panel A plots revenue series for businesses in the five least affected (i.e., best performing) industries, and Panel B plots those for businesses in the five most affected (i.e., worst performing) industries. Industries shown in this figure correspond to the underlying sectors in the least and the most affected industries shown in Figure 11. For this analysis, we restrict the sample to industries with at least 100 businesses. Outcomes are normalized by the centered 9-week average from a year ago, and the change is defined as a percent change from its own average between January 13, 2020 and February 9, 2020 (i.e., two months before the week of national emergency). Dotted vertical lines denote the week of national emergency, which was declared the week starting March 9th, 2020.

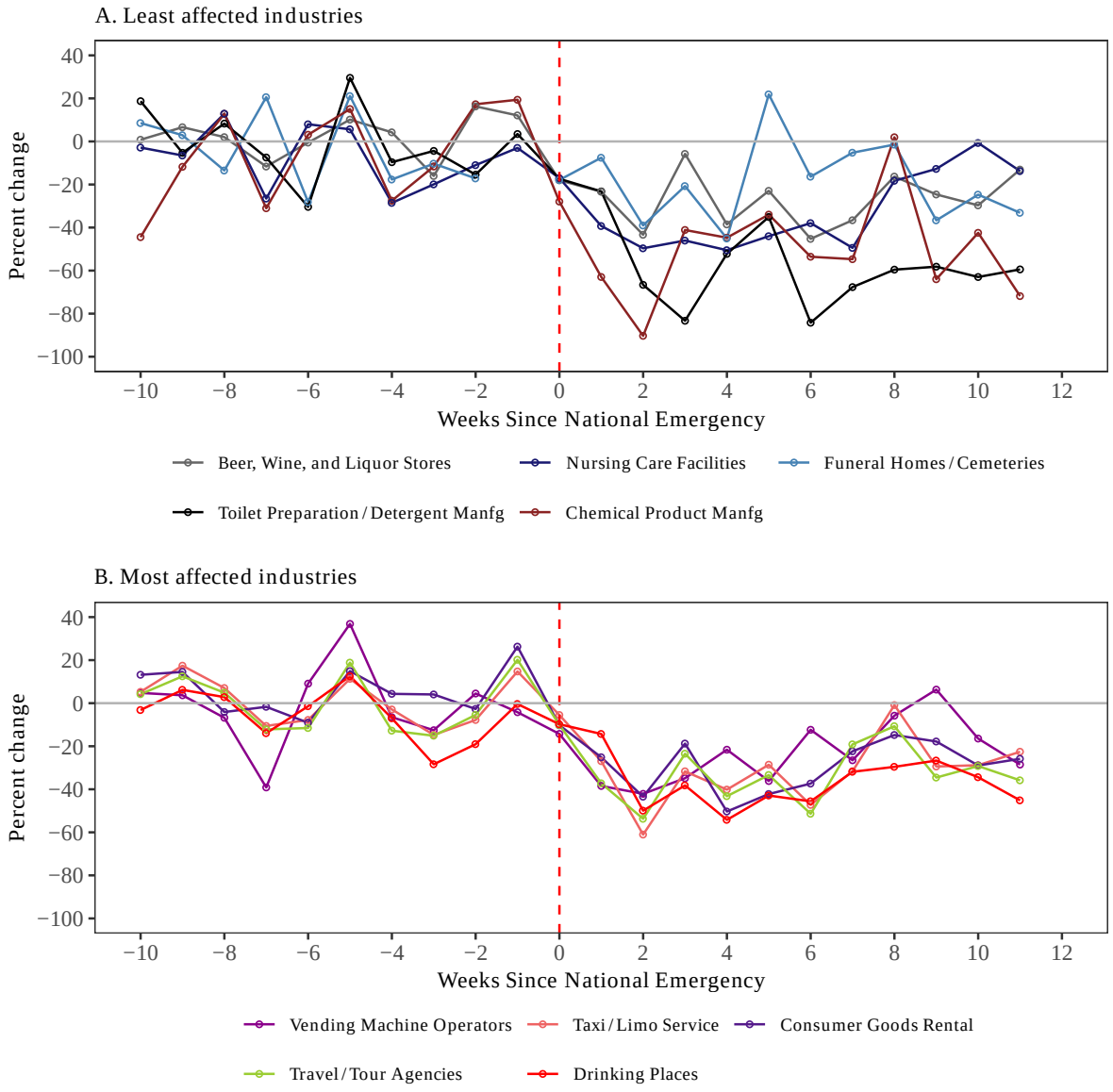

Figure A.12: Industry Distribution of 2019 Average Cash Buffer Days and Firm Size

Notes: This figure shows the histogram of average cash buffer days and annual revenue in 2019. Panel A plots the histogram of average cash buffer days by liquidity bin and panel B plots that of annual revenue by firm size bin. Each bar represents the number of industries with average cash buffer days corresponding to the x-axis within each cash buffer day bin. P25 (p75) of panel A represents the within-industry ceiling (floor) cutoff for defining the "low (high) liquidity" subgroup. Similarly, p50 of panel B represents the within-industry cutoff for defining "small" vs. "large" firms. For example, panel A highlights that even within the lowest liquidity quartile bin, there is a wide dispersion in the distribution of cash buffer days, indicating liquidity heterogeneity across industries.