Child Care Over the Business Cycle

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September 21, 2022

Child care market subject to macroeconomy

- Most providers rely on parent fees
- Reduced revenue during downturns may lead to lay offs or closures
- Labor market for child care workers also affected by macroeconomy, affecting:
  - Turnover
  - Teacher experience
  - Teacher education

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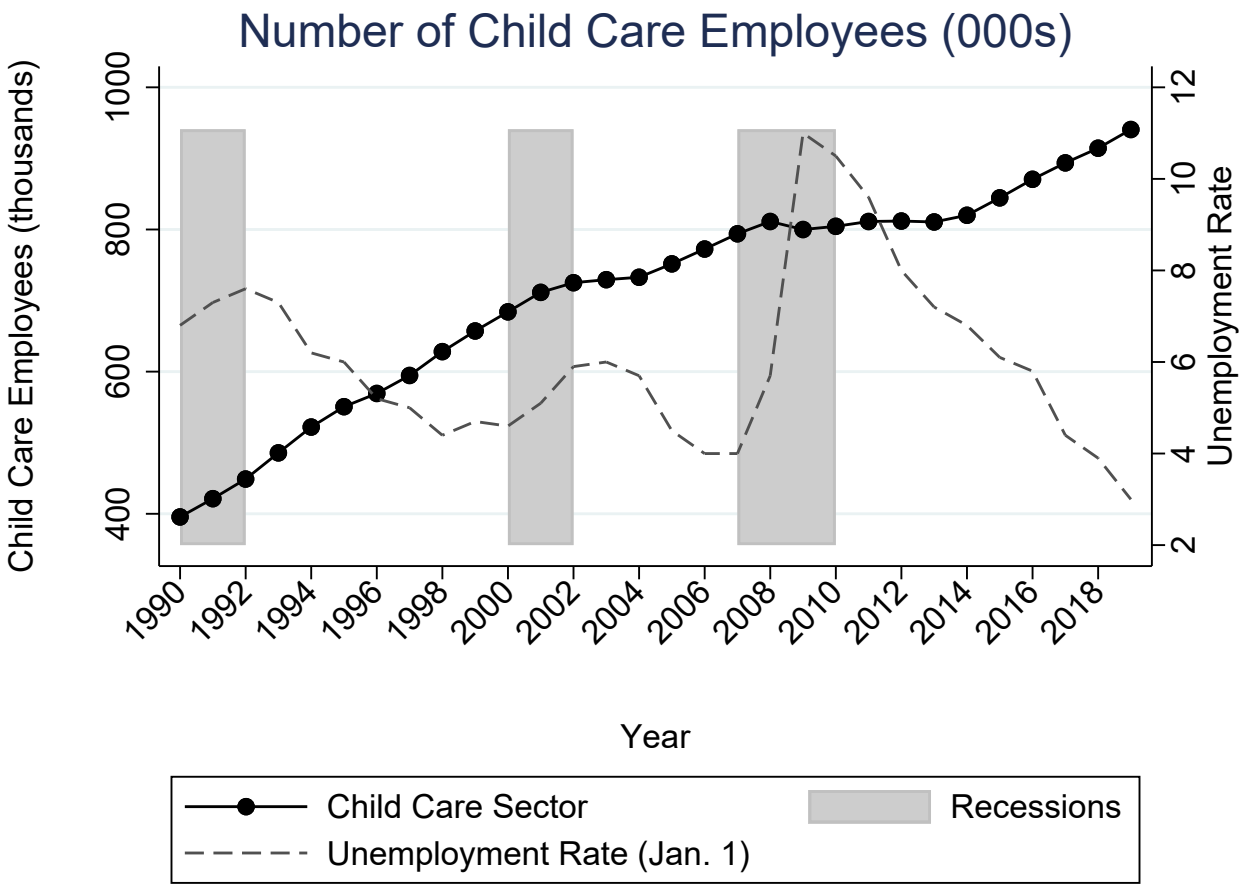
- Most providers rely on parent fees
- Reduced revenue during downturns may lead to lay offs or closures
- Labor market for child care workers also affected by macroeconomy, affecting:
  - Turnover
  - Teacher experience
  - Teacher education
- Changes in availability, stability, and quality of care have implications for child development and parental labor force participation
- Understanding effect of downturns on child care market especially relevant given the recent recession

Chlid Care Employment Over Time (QCEW)



- Employees are a proxy for available slots for children
- Employment slows when unemployment high

Q: How does child care market respond to business cycle?

- What impact does the macroeconomy have on...
  - **Child care availability?** (proxied by employment, establishments)
  - **Child care stability?** (proxied by establishments, turnover)
  - **Caregiver composition?** (age, education, English proficiency)
  - **Consumer satisfaction?** (as measured by Yelp reviews)
- How quickly does the child care market recover relative to the rest of the economy?
- How do effects compare to other similar industries?

Approach

- Bring together several data sets, each with 20-30 years of data, including multiple recessions
- Exploit state-year variation in unemployment rates to estimate effect of macroeconomy on child care market

Results preview

- **Highly exposed to business cycle**: Child care employment declines 2-3% and establishments 1% for a 1pp increase in unemployment rate
  - Employment sensitivity in top quintile of all 4-digit industries
- Response **asymmetric**: General employment decrease of 1% assoc. with ≈1% decrease in child care employment, but for a 1% *increase*, child care increases only ≈0.75%
- **Quality Countercyclical**: Higher unemployment rates associated with modest increases in caregiver education and experience, lower turnover, higher Yelp reviews

Child Care Market, briefly

- Consider four sectors in market: center-based, school-based, home-based, and private household
  - Coverage of each will vary across data sets

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- **Center-based**: child care in non-residential buildings; highly regulated; usually has classrooms split by age
- **School-based**: primarily preschool and after-school programs
- **Home-based**: child care run out of an individual's home; less regulated than center-based
- **Private household**: caregiver comes to children's home; primarily nannies and au pairs

Data Sources

1. Quarterly Census of Employment and Wages (QCEW): 1990-2019
2. Quarterly Workforce Indicators (QWI): availability varies by state
3. American Communities Survey (ACS): 2001-2019
4. Yelp reviews: 2005-2017

Data Sources

1. Quarterly Census of Employment and Wages (QCEW): 1990-2019
   - Industry-level annual avg employment and establishments at state-year level, derived from UI system records
   - Focus on Child Day Care Services (Industry code 624410)
   - Primarily captures center-based workers
   - Preferred data set where possible: longest time horizon, administrative data
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   - Quarterly data on employment stocks and flows: employment, turnover, hires, separations
   - Allows for **heterogeneity** by education
   - Also derived from UI records
   - 80% of states available by 2000, all except one by 2005
3. American Communities Survey (ACS): 2001-2019
4. Yelp reviews: 2005-2017

Data Sources

1. Quarterly Census of Employment and Wages (QCEW): 1990-2019
2. Quarterly Workforce Indicators (QWI): availability varies by state
3. American Communities Survey (ACS): 2001-2019
    - Can identify whether women work in any of the four child care sectors: center-based, school-based, home-based, or private household
    - Also includes demographic variables, allowing for heterogeneity analysis (age, education, English proficiency)
4. Yelp reviews: 2005-2017

Data Sources

1. Quarterly Census of Employment and Wages (QCEW): 1990-2019
2. Quarterly Workforce Indicators (QWI): availability varies by state
3. American Communities Survey (ACS): 2001-2019
4. Yelp reviews: 2005-2017
    - Business and reviewer information scraped from "Child Care and Day Care" businesses from 2005-2017 (Herbst et al. 2020)
    - Includes the 40 largest cities in the United States

Unemployment Rate Regressions

$$Y_{st} = \alpha + \beta UR_{st} + \tau_t + \gamma_s + \epsilon_{st}$$

where:

Y_{st} is the outcome of interest

UR_{st} is the unemployment rate in state s at time t

τ_t are time fixed effects

γ_s are state fixed effects

Standard errors clustered at the state level.

Unemployment Rate Regressions

$$Y_{ist} = \alpha + \beta UR_{st} + X_i + \tau_t + \gamma_s + \epsilon_{ist}$$

where:

Y_{st} is the outcome of interest

UR_{st} is the unemployment rate in state s at time t

X_i is a vector of individual characteristics
quadratic in age, race, ethnicity, married, children, education

τ_t are time fixed effects

γ_s are state fixed effects

Standard errors clustered at the state level.

Unemployment Rate Regressions

$$Y_{ist} = \alpha + \beta UR_{st} + X_i + \tau_t + \gamma_s + \epsilon_{st}$$

- β identifies the change in Y associated with a 1pp change in the state unemployment rate, controlling for state and year/quarter (and, if relevant, individual demographic characteristics)
  - In particular, the year/quarter fixed effects mean we're controlling for *national* macroeconomic conditions
  - β specifically identifies the effect of changes in the *local* unemployment rate

Changes in Employment (QCEW)

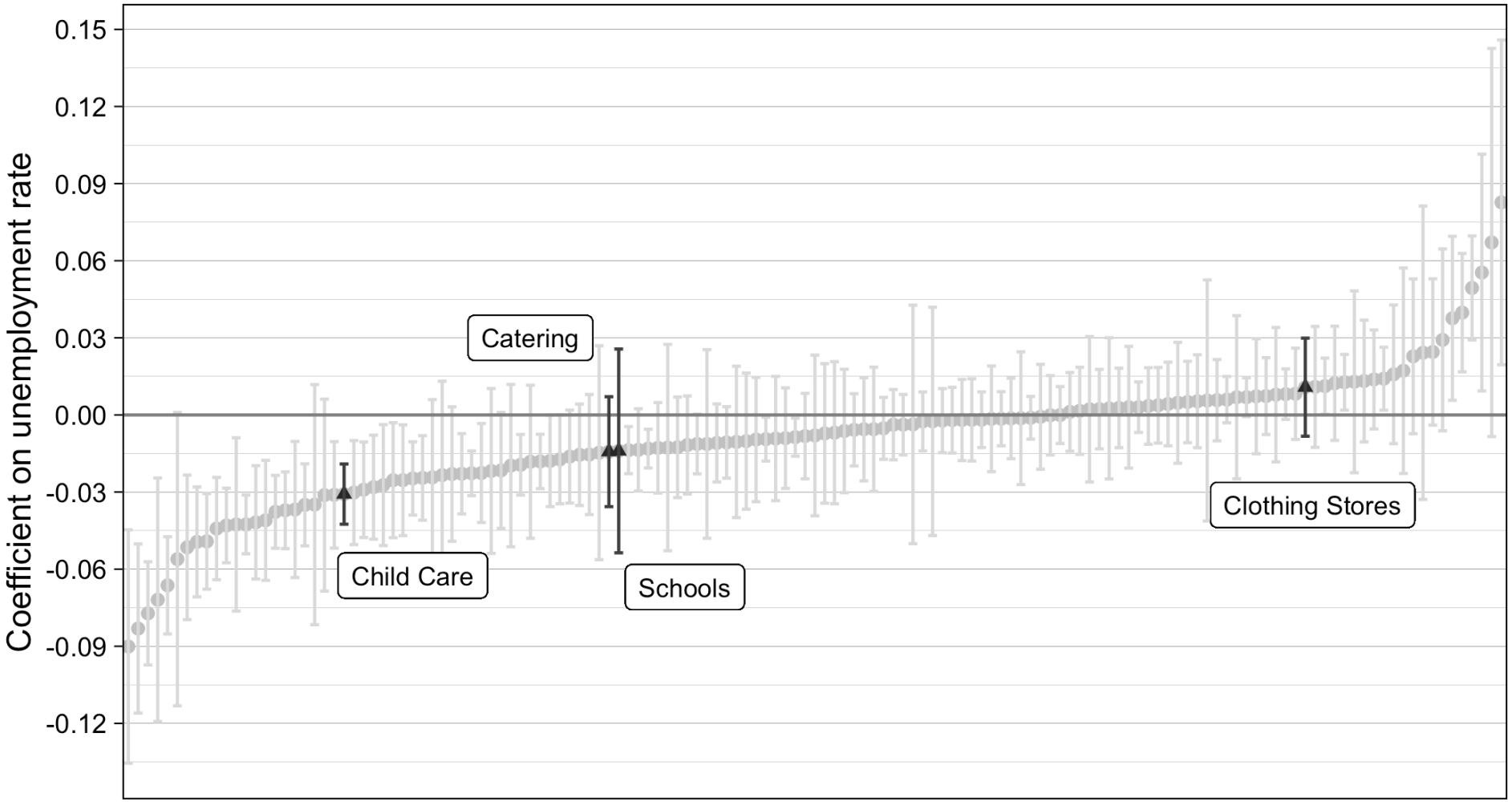
Dependent Variable: Log(Employment$_{st}$)

	(1) Child Care	(2) Household	(3) Schools	(4) Clothing	(5) Restaurants	(6) Manufacturing	(7) All
Unemployment Rate	-0.0308***	-0.0363	-0.0140	0.0108	0.0032	-0.0144	-0.0120**
	(0.0071)	(0.0220)	(0.0241)	(0.0116)	(0.0143)	(0.0094)	(0.0045)
Dep. Var. Mean	9.071	7.882	11.13	9.271	11.58	11.94	14.26
Mean Level	14,124	5,599	138,430	19,447	179,143	286,394	2,521,512

- Proxy for availability of care
- Regressions include state and year fixed effects

Log Changes in Employment (QCEW)

Employment Response to 1pp ↑ Unemployment Rate, All 4-digit Industries



Employment by sector (ACS)

	(1) Any Employment	(2) Any Child Care	(3) Center-based	(4) Household	(5) Home-based	(6) School-based
Unemployment Rate	-0.00463***	-0.00016	-0.00023***	0.00002	0.00005	-0.00001
	[-0.62%]	[-0.81%]	[-2.09%]	[1.11%]	[1.20%]	[-0.23%]
	(0.00034)	(0.00010)	(0.00006)	(0.00002)	(0.00005)	(0.00002)
Dep. Var. Mean	0.748	0.0204	0.0112	0.00220	0.00424	0.00271
N	15,466,008	15,466,008	15,466,008	15,466,008	15,466,008	15,466,008

- Dependent variable: indicator that equals one if the woman works in specified sector and zero otherwise
- Data restricted to women age 18-64
- Point estimate as a percent of the mean in brackets

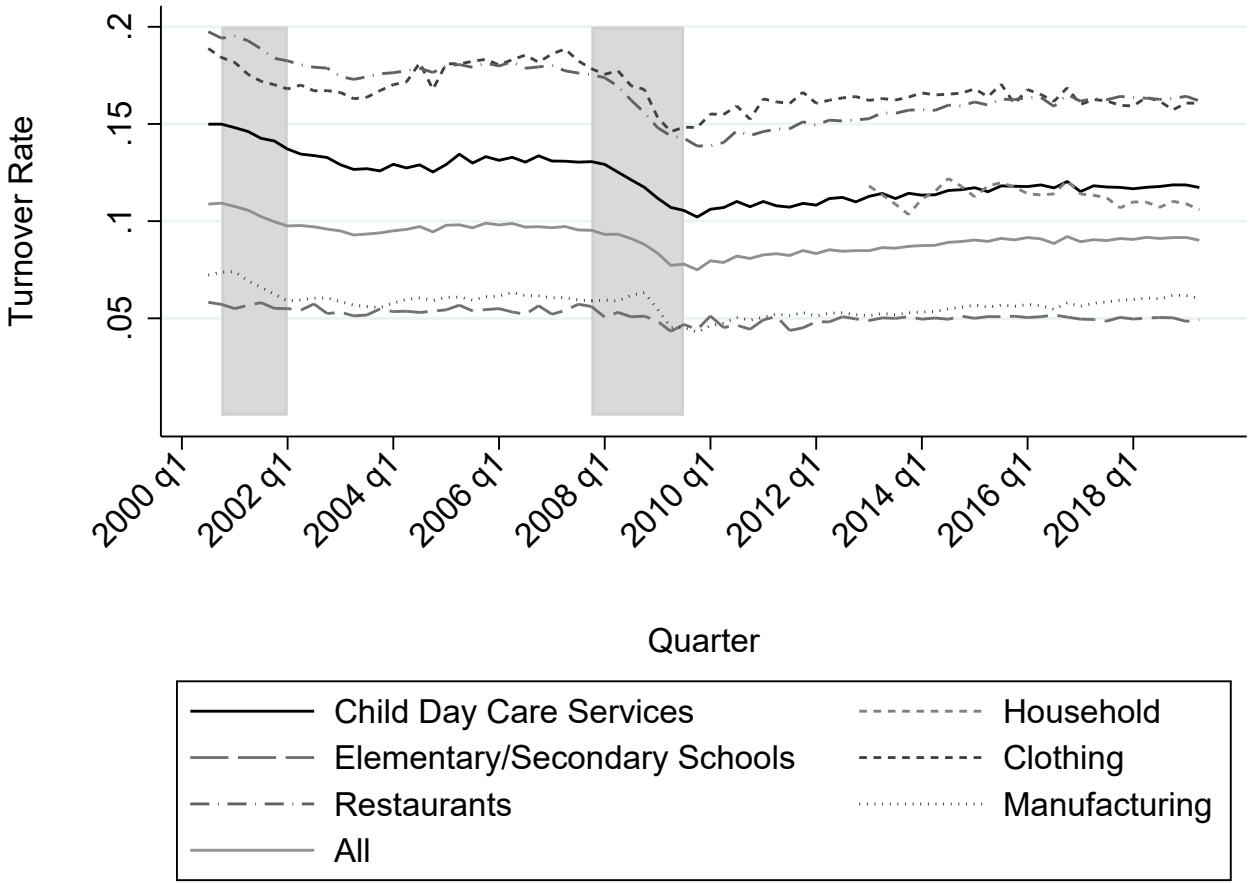
Changes in Establishments (QCEW)

Dependent Variable: Log(Establishments$_{st}$)

	(1) Child Care	(2) Household	(3) Schools	(4) Clothing	(5) Restaurants	(6) Manufacturing	(7) All
Unemployment Rate	-0.0112*	-0.0183	-0.0287	0.0100	0.0152	0.0006	0.0024
	(0.0065)	(0.0262)	(0.0398)	(0.0101)	(0.0154)	(0.0077)	(0.0057)
Dep. Var. Mean	6.688	7.685	6.498	6.893	8.731	8.354	11.55
Mean Level	1,237	4,814	1,293	1,619	10,251	7,307	164,603
N	1,475	306	1,438	1,479	1,458	1,475	1,479

- Proxy for availability and stability of care
- Regressions include state and year fixed effects

Turnover: Child Care v. Similar Industries (QWI)



- Seasonally adjusted, includes states in QWI as of 2000Q1
- In regression, estimate 2,000 fewer child care workers/quarter leaving per 1pp increase in unemployment rate

Fraction with Some College Education Countercyclical

Dependent Variable: Fraction of Workers with Some College or More

	(1) Child Care	(2) Household	(3) Schools	(4) Clothing	(5) Restaurants	(6) Manufacturing	(7) All
Unemployment Rate	0.00169***	-0.00194	-0.000238	0.000939	0.000908*	0.00252***	0.00243***
	(0.000554)	(0.00137)	(0.000538)	(0.000842)	(0.000521)	(0.000594)	(0.000469)
Dep. Var. Mean	0.590	0.513	0.726	0.543	0.457	0.523	0.603
N	4,537	1,402	4,530	4,537	4,537	4,537	4,485

- Only includes employees ages 25 and older
- Regressions include state and year fixed effects
- We find similar results using ACS data: child care workers with more education and experience are less exposed to the business cycle

Consumer satisfaction countercyclical (Yelp)

	Gave Highest Rating			
	(1)	(2)	(3)	(4)
Unemployment Rate	0.0106**	0.0152***	0.0202***	0.0167***
	(0.0041)	(0.0050)	(0.0060)	(0.0063)
UR*Low Income			-0.0050*	
			(0.0030)	
UR*High Non-White				-0.0014
				(0.0032)
Dep. Var. Mean	0.76	0.76	0.76	0.76
County FE	Yes	No	No	No
Firm FE	No	Yes	Yes	Yes
N	48,637	48,637	48,630	48,630

Employment Betas: Exposure of child care market to macroeconomic shifts

$$\Delta Log(CCEmp_{st}) = \alpha + \beta * \Delta Log(Emp_{st}) + \tau_t + \gamma_s + \epsilon_{st}$$

where:

$CCEmp_{st}$ is child care employment in state s at time t

Emp_{st} is employment in all industries except child care in state s at time t

τ_t are time fixed effects

γ_s are state fixed effects

Standard errors clustered at the state level.

Interpret β as a 1% change in overall employment is associated with a β% change in child care employment

Employment Betas: Exposure of child care market to macroeconomic shifts

$$\Delta Log(CCEmp_{st}) = \alpha + \beta_1 * \Delta Log(Emp_{st}) * \mathbb{1}_{\Delta Emp_{st} \geq 0} + \beta_2 * \Delta Log(Emp_{st}) * \mathbb{1}_{\Delta Emp_{st} < 0} + \tau_t + \gamma_s + \epsilon_{st}$$

- A 1% *increase* in overall employment is associated with a $\beta_1\%$ change in child care employment
- A 1% *decrease* in overall employment is associated with a $-\beta_2\%$ change in child care employment

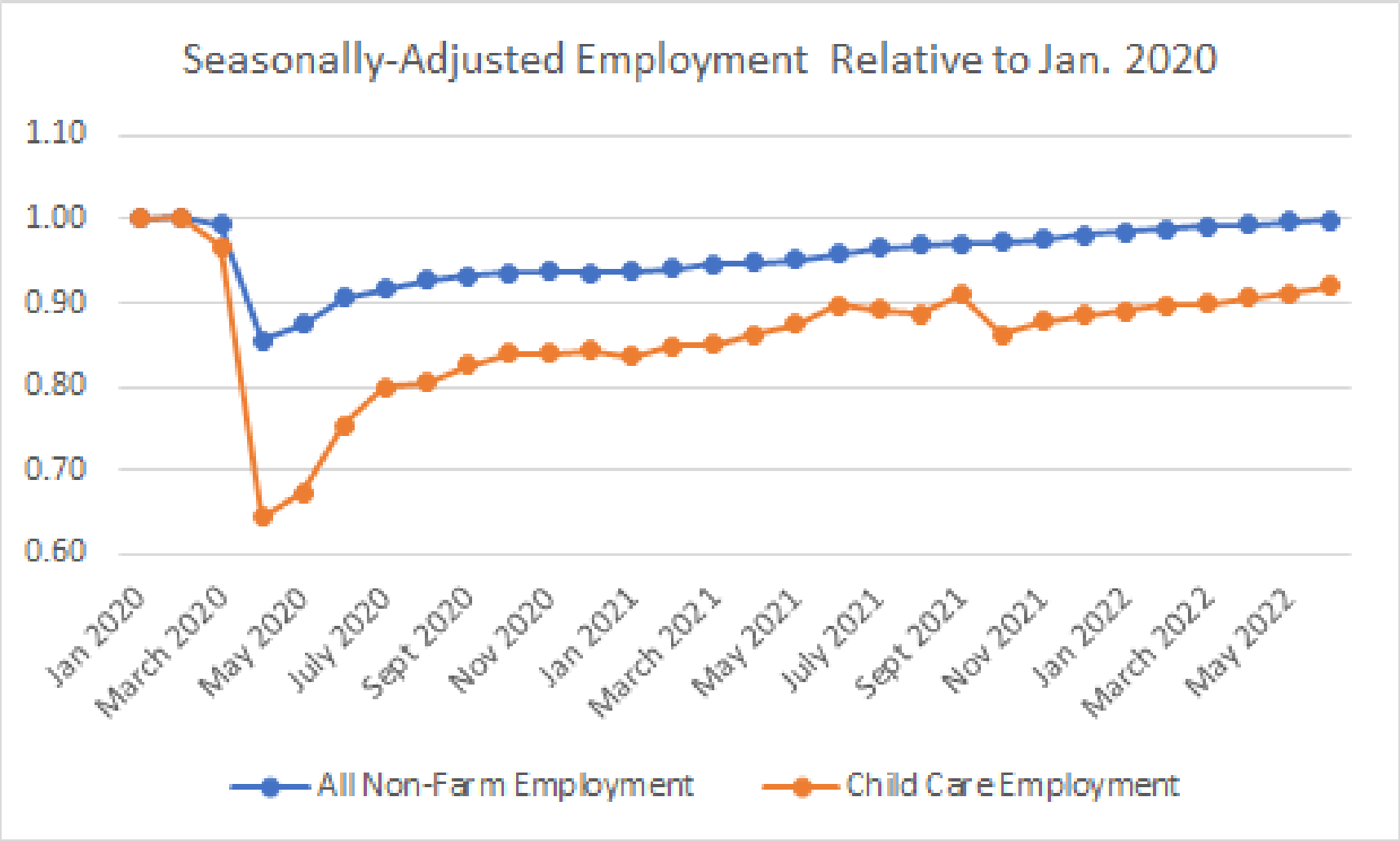
Child care employment response stronger in downturns

Dependent Variable: $\Delta Log(Emp)$ in Industry:	(1) Child Care	(2) Household	(3) Schools	(4) Clothing	(5) Restaurants	(6) Manufacturing
Panel A: Employment Betas						
$\Delta Log(Emp)$	0.829***	-0.754	0.387***	0.617***	0.638***	0.686***
	(0.0880)	(0.461)	(0.103)	(0.0993)	(0.0632)	(0.121)
Panel B: Employment Betas Split by whether Total Employment is Increasing or Decreasing						
$\Delta Log(Emp) * [\Delta Log(Emp) > 0]$	0.709***	-0.634	0.343**	0.588***	0.598***	0.612***
	(0.103)	(1.098)	(0.168)	(0.162)	(0.110)	(0.178)
$\Delta Log(Emp) * [\Delta Log(Emp) < 0]$	1.021***	-0.914	0.456***	0.663***	0.701***	0.823***
	(0.194)	(0.668)	(0.139)	(0.221)	(0.0934)	(0.170)
One-sided p-val	0.10	0.43	0.32	0.41	0.27	0.22
Dep. Var. Mean	0.0308	-0.00546	0.0145	-0.00134	0.0199	-0.00856
Mean Level	13,886	5,558	135,521	19,428	177,148	287,802
N	1,475	306	1,449	1,479	1,458	1,477

Asymmetry of Response Robust

	(1)	(2)	(3)	(4)
Panel A: Employment Betas				
$\Delta Log(Emp)$	0.829***	0.877***	0.460***	0.898***
	(0.0880)	(0.0770)	(0.0701)	(0.0758)
Panel B: Employment Betas Split by whether Total Employment is Increasing or Decreasing				
$\Delta Log(Emp) * [\Delta Log(Emp) > 0]$	0.709***	0.707***	0.334***	0.664***
	(0.103)	(0.0851)	(0.0415)	(0.110)
$\Delta Log(Emp) * [\Delta Log(Emp) < 0]$	1.021***	1.112***	0.659***	1.195***
	(0.194)	(0.151)	(0.176)	(0.168)
One-sided p-val	0.10	0.01	0.05	0.01
Level of Data	State-level	County-level	County-level	County-level
Level of RHS Variable	State-level	State-level	County-level	County-level
Instrumented with State?	N/A	N/A	No	Yes
Dep. Var. Mean	0.0308	0.0298	0.0298	0.0298
Mean Level	13886	292	292	292
N	1,475	42,598	42,598	42,598

Child Care Industry Response to 2020 Recession



Source: Current Employment Statistics, BLS

Conclusion

- **Highly exposed to business cycle**: Child care employment declines 2-3% and establishments 1% for a 1pp increase in unemployment rate
- Response **asymmetric**: Child care industry recovers from recessions more slowly than other industries
- **Quality Countercyclical**: Higher unemployment rates associated with modest increases in caregiver education and experience, lower turnover, higher Yelp reviews

Thank you!

Contact us with any questions or comments!

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