

The impact of accessing childcare centers on Chilean mothers' probability of employment

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Motivation

The question of interest: to identify and unbiasedly estimate the impact of childcare center availability on FLFP.

- Random data is not available and **unobserved heterogeneity** among mothers makes it difficult to isolate the impact of daycare center availability on mothers' decisions.

A standard answer in the literature is to use **instrumental variables** to estimate the effect.

- However, there is no strong instrument available capable of satisfying both the inclusion and the exclusion restriction.

What is done in this paper?

Unobserved heterogeneity is controlled using a panel of data on mothers who have raised at least two children since 1995.

Access to childcare centers determines an increase in mothers' probability of employment.

- The result is driven by partnered mothers. For this group, the effect of accessing childcare is significant and positive.
- When education is considered, the result is due to the response of mothers that have achieved some secondary studies or have graduated from high school.

Finally, it is shown that there is high persistence in mothers' decisions: working six months before delivery is strongly associated with working thereafter.

Scope of the analysis

More than 85% of urban women between the ages of 41-65 are mothers; 23% have a child, while 62% have more than two children. Thus, almost all of them at some point of their lives may have needed a daycare center.

Table 1 : Mothers

Percentage	
Non_mother	13,4%
Mother of 1	23,1%
Mother of 2	32,1%
Mother of 3	17,8%
Mother of 4	7,7%
Mother of 5	5,9%

National survey 2011 (EVM), urban zones

Access (potential) and use

Table 2 : Access (potential) to childcare centers

12 months old	
1995 to 1999	58,6%
2000 to 2004	65,2%
2005 to 2010	71,3%
National survey Voz de Mujer 2009 and 2011 (EVM and SEVM), urban zones	

Table 3 : Use of childcare centers

12 months old	
1995 to 1999	10,9%
2000 to 2004	12,8%
2005 to 2010	23,7%
National survey Voz de Mujer 2009 and 2011 (EVM and SEVM), urban zones	

Chile Crece Contigo

Table 4 : Chile Crece Contigo

Quantiles	Children younger than 2 years old	Employment rate	Unemployment rate	FLFP
I	91,101	21.3%	31.8%	31.3%
II	111,757	32.3%	10.5%	36.1%
III	87,292	41.7%	4.7%	43.7%
IV	65,422	49.5%	6.3%	52.8%
V	68,341	74.3%	1.3%	75.3%
All	423,913	43.8%	7.4%	47.3%
Source: CASEN 2011.				

The percentage of those saying that they use childcare centers to look for a job has increased (EVM and SEVM).

Literature review

Women that do not participate in the labor market often cite the need to do housework and the lack of childcare as barriers to employment.

- Lefebvre and Merrigan (2008) reviewed evidence from developed countries and concluded that an important part of the differences across studies yields on econometric problems that determine biased estimates.
- In developing countries, Berlinsky et al (2008) found that attendance of the youngest child increases the probability of full-time employment of mothers. Medrano and Martínez (2009) and Encina and Martínez (2009) found that the increase in childcare centers has no effect on FLFP. Medrano and Bravo (2010) found mixed evidence.

Data and description of the variables

Table 5 : Variables

Variables used in the regression (for the 12th months stage)	
econ_growth_1	economic growth during the previous year of baby's birth
econ_growth	economic growth during the year of baby's birth
sixmonth_before	1 if mother worked 6 months before delivery
teenmother	1 if mother was a teenager when baby born
otherinc12	1 if there was other person working in the household when baby was 12 months old
birthspace	years between mother's deliveries
childcare_center12	1 if there was a childcare center close to mother's home or work when baby was 12 months old
FLFP12	1 if mother worked when baby was 12 months old

Data and description of the variables

Table 6 : Variables

	N	Mean	Std
econ_growth_1	2121	0,041	0,018
econ_growth	2121	0,035	0,022
sixmonth_before	2121	0,756	1,674
teenmother	2121	0,155	0,363
otherinc12	1946	0,921	0,269
birthspace	-	-	-
childcare_center12	1955	0,625	0,484
FLFP12	1955	0,369	0,483

Data and description of the variables

Table 7 : Variables

	N/n	Mean	Std
econ_growth_1	1291/559	0,047	0,026
econ_growth	1291/559	0,043	0,027
sixmonth_before	1291/559	0,800	1,873
teenmother	1291/559	0,128	0,334
otherinc12	1186/555	0,936	0,245
birthspace	1291/559	4,522	2,717
childcare_center12	1191/556	0,644	0,479
FLFP12	1191/556	0,353	0,478

Econometric approach

For the sake of comparison, the first equation of interest is:

$$Y_i = \beta CC_i + X_i' \delta + \mu_i \quad (1)$$

Though not likely in this case, such pooled OLS analysis requires that:

$$E(\mu_i | X_i, CC_i) = 0 \quad (2)$$

- This is used for the entire sample of mothers and for the subsample of those that have more than two kids.

Econometric approach

The impact of childcare availability on employment is explored, while controlling for FE and for variables that represent time-varying characteristics that may also affect a woman's decision of work.

The main equation is:

$$Y_{i,k} = \beta CC_{i,k} + X_{i,k}' \delta + \alpha_i' + \varepsilon_{i,k} \quad (3)$$

Consistency in this model requires that:

$$E(\varepsilon_i | X_{ik}, CC_{i,k} \alpha_i') = 0 \quad (4)$$

The error has a child-invariant component correlated with the regressors and a child-varying component uncorrelated with them.

- This is estimated for the panel of those mothers that have more than two kids.

Econometric approach

Being the main equation:

$$Y_{i,k} = \beta CC_{i,k} + X_{i,k}' \delta + \alpha_i' + \varepsilon_{i,k} \quad (5)$$

If the child-varying component of the error is correlated with the regressors, then a instrument (Z), if it exists, can be used. Such instrument must be correlated with the regressors and must satisfy:

$$E(\varepsilon_i | Z_{ik}, CC_{i,k}, \alpha_i') = 0 \quad (6)$$

In the last set of regressions, the child-invariant component of the error is controlled and the instrumental variables method is applied to the transformed model.

Results

Table 8 : Linear probability model: OLS estimates and FE estimates

Dependent Variable: Mother worked - Linear Probability Model						
Independent Variable	Whole sample		Sub-sample (mothers with 2 or more kids)			
	N	Coefficient pool	N	Coefficient pool	N/n	Coefficient FE panel
Childcare center (4 months old)	2061	0,045	1247	0,101***	1247/556	0,130
Childcare center (6 months old)	2010	0,062**	1217	0,121***	1217/555	0,166*
Childcare center (12 months old)	1946	0,082***	1186	0,117***	1186/555	0,164*
Childcare center (24 months old)	1810	0,054	1106	0,059	1106/552	0,119
Six months before (4 months old)	2061	0,039***	1247	0,042***	1247/556	0,206***
Six months before (6 months old)	2010	0,043***	1217	0,054***	1217/555	0,166***
Six months before (12 months old)	1946	0,057***	1186	0,058***	1186/555	0,122***
Six months before (24 months old)	1810	0,049***	1106	0,048***	1106/552	0,104***

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

Results: childcare center availability

Dependent variable takes value 1 whenever mother worked when her baby was 4, 6, 12 or 24 months old.

- The coefficient of “a childcare center was available close to mother’s home or work” is statistically significant at the 10 percent level. It suggests a positive effect of 17 percentage points.
- Pooled analyses, both with the whole sample and the subsample of mothers with two or more children, show more significant, but smaller, results.

However, given the unobserved heterogeneity problem, at least for mothers of two or more children, the most reliable results are those from the FE study.

Results: persistence

Dependent variable takes value 1 whenever mother worked when her baby was 4, 6, 12 or 24 months old.

- The coefficient of “worked six months before delivery” is statistically significant at the 1 percent level.
- It indicates a positive effect that goes from 4 percentage points (OLS for the whole data) to 12 percentage points (FE panel data).

However, given the unobserved heterogeneity problem, at least for mothers of two or more children, the most reliable results are those from the FE study.

Results

Table 9 : Linear probability model: FE estimates

Dependent Variable: Mother worked - Linear Probability Model						
Independent Variable	Sub-sample (mothers with 2 or more kids)		Partnered mothers		Non partnered mothers	
	N/n	Coefficient FE panel	N/n	Coefficient FE panel	N/n	Coefficient FE panel
Childcare center (4 months old)	1247/556	0.130	1161/533	0.153	86/58	-1.311***
Childcare center (6 months old)	1217/555	0.166*	1133/533	0.205**	84/58	-1.362***
Childcare center (12 months old)	1186/555	0.164*	1110/534	0.176*	76/51	-0.375
Childcare center (24 months old)	1106/552	0.119	1031/528	0.116***	75/51	-1.342***
Six months before (4 months old)	1247/556	0.206***	1161/533	0.198***	86/58	0.25*
Six months before (6 months old)	1217/555	0.166***	1133/533	0.1602**	84/58	0.299***
Six months before (12 months old)	1186/555	0.122***	1110/534	0.106**	76/51	0.43***
Six months before (24 months old)	1106/552	0.104***	1031/528	0.089*	75/51	0.203**

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

Results: childcare center availability

Accessing childcare centers determines an increase in mothers' probability of employment of approximately 17 percentage points.

- The result is driven by partnered mothers. No positive effects are detected for non-partnered mothers.

A high proportion of mothers in the second group work (with or without access to formal childcare). FLFP is 20 percentage points higher among head of household women.

Results

Table 10 : Linear probability model: FE estimates

Independent Variable	Dependent Variable: Mother worked - Linear Probability Model					
	Sub-sample (mothers with 2 or more kids)		Secondary education		Tertiary education	
	N/n	Coefficient FE panel	N/n	Coefficient FE panel	N/n	Coefficient FE panel
Childcare center (4 months old)	1247/556	0,130	752/335	0,149	254/113	0,329
Childcare center (6 months old)	1217/555	0,166*	731/335	0,241**	250/113	0,274
Childcare center (12 months old)	1186/555	0,164*	710/335	0,304***	246/113	0,083
Childcare center (24 months old)	1106/552	0,119	657/333	0,186	229/113	0,133
Six months before (4 months old)	1247/556	0,206***	752/335	0,203**	254/113	0,234*
Six months before (6 months old)	1217/555	0,166***	731/335	0,138**	250/113	0,328**
Six months before (12 months old)	1186/555	0,122***	710/335	0,104*	246/113	0,171
Six months before (24 months old)	1106/552	0,104***	657/333	0,078*	229/113	0,189

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

Results: childcare center availability

Accessing childcare centers determines an increase in mothers' probability of employment close to 17 percentage points.

- The result is due to the response of mothers that have achieved some secondary studies or have graduated from high school.

Such result is consistent with the “Chile Crece Contigo” program's target, since it was to provide free childcare to the most vulnerable women.

Results

Table 11 : Linear probability model: FE-IV estimates

Independent Variable	Dependent Variable: Mother worked - Linear Probability Model					
	Sub-sample (mothers with 2 or more kids)		Partnered mothers		Secondary education	
	N/n	Coefficient FE panel	N/n	Coefficient FE panel	N/n	Coefficient FE panel
Childcare center (6 months old)	1217/555	0,115**	1110/534	0,117**	731/335	0,187***
Childcare center (12 months old)	1186/555	0,160***	1110/534	0,164***	710/335	0,259***
Childcare center (24 months old)	1105/552	0,119**	1036/530	0,103*	657/333	0,137***

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

Results are robust. There are a positive and significant effects of accessing childcare centers on mothers' probability of employment.

Conclusions

Increasing women employment is a major Chilean public policy goal. The impact of childcare center availability on mothers' employment is under continuous evaluation.

- Accessing childcare centers determines an important increase in mothers' probability of employment. This result is robust to different specifications.
 - The result is driven by partnered mothers.
 - The result is due to the response of mothers that have achieved some secondary studies or have graduated from high school.
- Working before delivery increases probability of employment in 15 percentage points (average) according to FE analyses. Such high persistence was hidden by non panel data regressions.