Child care and Women’s Labour Supply in Australia

based upon work by
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with
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Background

1. Australia is a low-unemployment country with important labour shortages in some areas

2. There is little free child care provided before age of 5 (kindergarten)

3. Rapid growth of for-profit child care provision in last decade

4. The well-publicized collapse of largest private child-care provider; ABC Learning (2008/2009)

5. Child care are parenting issues are large on the agenda for both government and opposition

6. Paucity of work on child care in Australia
Australia’s childcare for pre-school-aged children

- From Wave 10 of HILDA, 54.2% of households with children under age 15 use some form of child care besides parental care.

- If we look at households with children aged 0-4, this goes to 66.8%.

If we look at care of not-yet-in-school children

1. Center-based care 51%
   
   (a) Childcare centers (Long Day Care) and pre-school
   
   (b) Relatively skilled staff provide education activities
   
   (c) Run by private companies (15% in 1991; 70% in 2010), local councils, community organizations
2. Home-based care 20%
   (a) Registered carers come to the child’s home (In-Home Care) or take care of the child at their home (Family Day Care)
   (b) Coordination offices recruit, train, and monitor carers, and provide information for families
3. Informal care 52% (21% use only informal)
   (a) Grandparents, relatives, friends (often not paid)
   (b) Unregulated caregivers (often paid)
Key aspects of the policy framework

1. Price subsidy: Child Care Benefit
   Higher rates for low-income families
   No payment above $147,594 (two kids)
   Family making $130,000 would get $40 per week per child.
   Family making $80,000 would get $147.56 per week per child

2. Tax rebate: Child Care Rebate
   Families can claim 50% of out-of-pocket costs up to $7,500 per year per child.
   The nature of the rebate has changed recently.

3. Child care is fairly expensive
   Typical LDC in Canberra charges $400 - $500 per week for a 50 hour week.
4. Nation-wide quality assessment system
   • Accredited = subsidized
   • A majority of providers participate in the quality assessment system

5. Support to providers in areas with limited supply

6. Government owns and operates centres in some areas (3%)

7. Licensing by state/territory governments
   [Changed as of 1 January 2012.]
The policy environment

• Growing concern about limited accessibility of childcare as a barrier for
  – Maternal labor force participation
    * Aging populations/labour shortages
    * Welfare-to-work schemes
  – Early childhood education/experience

Leads policy sometimes pushing in opposite directions.
The National Quality Framework (NQF)

- Raising standards for early childhood education and care and harmonising them across states and territories
- Publishing a quality rating system which families can use to assess their childhood care options
- Introducing streamlined regulatory arrangements
NQF: higher staff-to-child ratios

- 1:4 staff-to-child ratio for 0-24 month-olds effective from 1 January 2012
- 1:5 staff-to-child ratio for 25-35 month-olds effective from 1 January 2016
- 1:11 staff-to-child ratio for children older than 35 months effective from 1 January 2016
NQF: increased staff qualifications

For family day care and long day care, by 1 January 2014:

- A degree qualified early childhood teacher will need to be in attendance all of the time when LDC and preschool services are being provided to 25 children or more, and some of the time when services are being provided to less than 25 children.

- For LDCs, half of all staff will need to have (or be actively working towards) a diploma-level ECEC qualification or above, and the remaining staff will be required to have (or actively working towards) a Certificate III level qualification.

- All FDC coordinators will need to have a diploma-level qualification or above.

- All FDC carers will be required to have (or be actively working towards) a Certificate III level qualification, or equivalent.
The Australian Literature I

1. Early descriptive papers

2. Papers directly based on Connelly (1992)
   Rammohan and Whelan (2005)
   Rammohan and Whelan (2007)

3. Models based on bi-variate tobit estimates of formal and informal child care usage
   Kalb and Lee (2008) (uses HILDA)
The Australian Literature II

1. Generally find no labour supply response to child care price
2. Plagued by data availability problems
3. Serious endogeneity problems
Three research questions

1. Does a lack of affordable, quality child care really prevent women from working?
   Breunig, Gong, Mercante, Weiss and Yamauchi (2011)

2. Is it really true that women’s labour supply is non-responsive to child care price?
   Breunig, Gong and King (2012), Gong and Breunig (2011a), Gong and Breunig (2013)

3. How is the new National Quality Framework going to affect women’s labour supply?
   Breunig, Gong and Trott (2012)
Paper 1: Effect of child care supply on women’s labour supply

- The government has detailed data (child care census) on the exact number of places, tariffs, and quality measures for child care centres throughout Australia.

- Despite its strong public pronouncements about ‘research-based’ policy and a professed desire to get good answers to questions about child care, it refuses to release this data.

- So, we are forced to find some other way of addressing the question.
So what data do we use?

- **HILDA**
  2001 - 2007 (seven waves of data pooled)

- We use subjective questions about availability, quality, and cost of child care.
  Asked of all individuals with children aged 14 and younger who indicate that they used or thought about using child care in the last 12 months.

- We use aggregate responses at the local level (statistical division) of other individuals.
Child care questions

Responses scaled from “No difficulty” (0) to “Severe difficulty” (10)

- Difficulty in finding quality child care (2.72)
- Difficulty in finding right person to care for my child
- Difficulty in finding care that my children are happy with (2.38)
- Difficulty in finding care for hours needed (3.08)
- Difficulty juggling multiple child care arrangements
- Difficulty finding a place in the child care centre of choice
- Difficulty finding child care in the right location (2.45)
- Difficulty with the costs of child care (3.93)
Child care questions

- Responses are highly correlated with one another
- Responses clustered at 0, 5, and 10.
Leave-one out versions of the child care questions

We construct leave-one-out versions of the questions for labour force survey regions.

Problems with direct use of subjective questions in the model

- Box-standard endogeneity problem
- Reflection problem in aggregate built from individual responses.

We also construct aggregate measures: “any quality difficult”, “any availability difficulty”, “any difficulty”
What models do we estimate?

- Probit models of the probability of working;
- Probit model of the probability of working full-time conditional on working;
- Structural, linear labour supply model (Heckman (1974)). Joint estimation of labour supply and wage equation.

We add child care difficulty questions one-by-one and as a group into these models.
What do we find?

1. Reports of local problems with child care are highly correlated (and strongly statistically significant) with women’s labour supply and the probability of working (and of working full-time).

2. Result confirms the ‘cheap talk’ in newspapers and amongst politicians and is somewhat inconsistent with the idea that the market is characterized by free entry.

3. Difficult to quantify in terms of relationship to actual number of child care places.

4. It’s not clear whether the problems are persistent or not. The blockages could be short-term.
Papers 2 & 3: Joint estimation of child care demand and women’s labour supply

Motivation

- Four previous Australian studies find no effect of child care price.
- What drives this result?
- We think prior results are primarily driven by methodological issue in the construction of the child care price
  - differentiating between mother’s work hours and child care hours
  - estimating separate prices for different age groups
  - Using a quality-adjusted average local price
Two approaches

1. Use estimation approach of previous literature combined with a better measure of child care price

2. Discrete, structural model with two methodological innovations
   Improves on international literature
The difficulties with modeling child care

1. Cost of working
2. Input into production of child quality
3. Need to model complexities of tax and transfer system
4. Presence of alternative child care arrangements, essentially informal ones
5. Heterogeneous quality
6. Modeling expenditure on multiple children in households
7. Determining the correct price
Getting the right price

Previous studies plagued by two data problems which we solve

1. Negative correlation between hours worked and child care price. (Endogeneity)
2. Treatment of child care as a homogeneous good. (Measurement error)

Our approach:

- Use data on hours in child care
- Use data on child care at individual child level to calculate three separate prices
- Use local average (median) price as the ‘cost of working’ component
Endogeneity

Approach of Connelly (1992) is to calculate

\[
p_{\text{child care}} = \frac{\text{Total cost of child care}}{\text{Total hours worked by mother} \times \# \text{ of children}}
\]  

(1)

- Conflates hours in child care with hours of work
- Constructed price varies with hours worked even if real price doesn’t
- Constructed variable is put on the right-hand side of a labour supply regression, and is thus, by construction, correlated with the variable it is intended to explain.
Our modeling approach

- Structural labour supply model and child care demand equation. Unobservables in labour supply and child care demand are allowed to be correlated. Estimation by maximum likelihood. Joint estimation of two tobit equations.
- Very detailed model of the tax and transfer system at each possible hours work / hours of child care point.
- Include prices for three different types of child care:
  0-2 year olds (not yet in school)
  3-5 year olds (not yet in school)
  5-14 year olds (in school)
- We calculate prices from child-level data using cost of child care and hours of child care for purposes of working
  Use local area average median prices as explanatory variable
Our modeling approach (continued)

- Local prices (partially) control for quality variations across geographic regions.

- We include state-level quality controls. (Percentages of qualified and experienced staff in child care centres.)

- We include variables which attempt to control for availability of informal care as an alternative to formal, centre-based care. Presence of other female adults in household, migration status, presence of older siblings.

- We use waves 5 - 7 (2005 - 2007) of HILDA. No child-level data in previous waves. Fairly consistent policy environment over this period.
What do we find?

- We find a significant and negative effect of child care price on women’s labour supply. (-0.29)

- We explain findings of previous papers in Australia on the basis of these two data problems. We use Connelly (1992) approach (approach of Rammohan and Whelan (2005) and Rammohan and Whelan (2007)) for our data and find an insignificant price elasticity of labour force participation (-0.009).

If we use state-level averages (akin to Doiron and Kalb (2002), Doiron and Kalb (2005), Kalb and Lee (2008)) we also find insignificant price elasticities.
Extensions

In Gong and Breunig (2011a) and Gong and Breunig (2011b) we extend this work to a discrete structural labour supply model.

• More realistic
  Hours of work and hours of child care must be chosen from a small set of discrete points which match the choices actually available to families.

• Specify and estimate utility function
  Combined with use of net prices, this allows derivation of a net price elasticity and provides a model which can be used to evaluate alternative policies.
Extensions: continued

Gong and Breunig (2011a) and Gong and Breunig (2011b) also introduce two methodological improvements to previous work in this area.

- Child care may be used to free up time for the mother to pursue other activities besides paid work.
  
  Previous structural papers have required mothers work hours to be greater than or equal to child care hours. We relax this. Child care may be used strictly for educational goals, unrelated to labour supply.

- Child care is explicitly included in parental utility as a proxy for child development.
Findings

- Smaller point estimates for elasticities, but still statistically significant.
  Evidence that failing to account for informal care leads to an over-estimate of elasticities.

- Poorer households, lower educated households more responsive to changes in the child care price.

- We evaluate the two main policy instruments, CCB and CCTR
  *CCTR moves more people into the labour force than CCB.
  *CCB redistributes to lower income households more effectively and brings more lower-income women into the labour force.
Table 1. Elasticities (average over whole sample)

<table>
<thead>
<tr>
<th>With respect to:</th>
<th>Labour supply</th>
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<tbody>
<tr>
<td></td>
<td>Hours</td>
</tr>
<tr>
<td>Gross child care price</td>
<td>-0.135 (0.04)</td>
</tr>
<tr>
<td>Net child care price</td>
<td>-0.099 (0.03)</td>
</tr>
<tr>
<td>Wage</td>
<td>0.475 (0.11)</td>
</tr>
<tr>
<td>Income</td>
<td>-0.126 (0.05)</td>
</tr>
</tbody>
</table>

Standard errors in parentheses

All estimates are significant at 5% level or smaller

Table taken from Gong and Breunig (2012)
### Table 1. Elasticities (average over whole sample)

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</thead>
<tbody>
<tr>
<td></td>
<td>Hours</td>
<td>Use of formal care</td>
<td></td>
</tr>
<tr>
<td>Gross child care price</td>
<td>-0.287(0.05)</td>
<td>-0.169(0.03)</td>
<td></td>
</tr>
<tr>
<td>Net child care price</td>
<td>-0.217(0.05)</td>
<td>-0.129(0.02)</td>
<td></td>
</tr>
<tr>
<td>Wage</td>
<td>0.329(0.07)</td>
<td>0.213(0.04)</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>-0.128(0.05)</td>
<td>-0.100(0.04)</td>
<td></td>
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</tbody>
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Standard errors in parentheses

All estimates are significant at 5% level or smaller

Table taken from Gong and Breunig (2012)
Ex-ante evaluation of the the NQF

- NQF was introduced in 2012
- Official government policy was based upon a zero response of women’s labour supply to changes in the child care price
- We can use our model to predict impacts of the NQF on women’s labour supply (with some important caveats)
- Gong and Breunig (2013) undertake ex-post evaluation of introduction of the CCTR using long panel data. A similar approach could be used to evaluate the NQF in a few years.
Evaluating the NQF

Table 1: ‘Total impact’\(^{(a)}\) of National Quality Framework (NQF)

Table reports average weekly changes per household

<table>
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<th>Scenario 2</th>
<th>Scenario 3</th>
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<tbody>
<tr>
<td>Price increase per child per day</td>
<td>$13.00</td>
</tr>
<tr>
<td>Married women’s labour supply effects</td>
<td></td>
</tr>
<tr>
<td>Change in hours worked</td>
<td>$-0.294$ (0.074)</td>
</tr>
<tr>
<td>Change (%) in participation</td>
<td>$-0.573%$ (0.132)</td>
</tr>
</tbody>
</table>
## Evaluating the NQF

<table>
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<td>$13.00</td>
<td>$25.00</td>
</tr>
<tr>
<td><strong>Child care demand effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in hours of formal care</td>
<td>$-0.410$</td>
<td>$-0.816$</td>
</tr>
<tr>
<td></td>
<td>$(0.111)$</td>
<td>$(0.206)$</td>
</tr>
<tr>
<td>Change (%) in participation in formal care</td>
<td>$-0.760%$</td>
<td>$-1.600%$</td>
</tr>
<tr>
<td></td>
<td>$(0.139)$</td>
<td>$(0.275)$</td>
</tr>
<tr>
<td>Change in gross costs ($) of formal child care</td>
<td>$14.212$</td>
<td>$25.322$</td>
</tr>
<tr>
<td></td>
<td>$(2.624)$</td>
<td>$(5.013)$</td>
</tr>
<tr>
<td>Change in net costs ($) of formal child care</td>
<td>$7.252$</td>
<td>$14.142$</td>
</tr>
<tr>
<td></td>
<td>$(2.588)$</td>
<td>$(4.854)$</td>
</tr>
<tr>
<td>Change in hours of informal care</td>
<td>$0.113$</td>
<td>$0.224$</td>
</tr>
<tr>
<td></td>
<td>$(0.132)$</td>
<td>$(0.252)$</td>
</tr>
</tbody>
</table>
## Evaluating the NQF

<table>
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<tr>
<th>Income and program effects</th>
<th>12</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in disposable income ($) (less child care costs)</td>
<td>$-5.290$</td>
<td>$-10.422$</td>
</tr>
<tr>
<td></td>
<td>(1.329)</td>
<td>(2.566)</td>
</tr>
<tr>
<td>Change in disposable income ($) (including child care costs)</td>
<td>$-12.542$</td>
<td>$-24.564$</td>
</tr>
<tr>
<td></td>
<td>(1.614)</td>
<td>(3.029)</td>
</tr>
<tr>
<td>Change in child care subsidy ($) received</td>
<td>$6.960$</td>
<td>$11.180$</td>
</tr>
<tr>
<td></td>
<td>(0.920)</td>
<td>(1.620)</td>
</tr>
<tr>
<td>Change in government expenditure ($) (net of child care subsidies)</td>
<td>$10.821$</td>
<td>$18.801$</td>
</tr>
<tr>
<td></td>
<td>(1.494)</td>
<td>(2.797)</td>
</tr>
</tbody>
</table>
Conclusions: summary

1. Does a lack of affordable, quality child care really prevent women from working?
   Yes, at least in the short-run.

2. Is it really true that women’s labour supply is non-responsive to child care price?
   No. If one is careful about using the data correctly, there is definitely an effect of child care price on labour supply.

3. Is the NQF going to have large effects on women’s labour supply and household well-being?
   No. The effects are fairly modest, particularly given the expected benefits.
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