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The Demand for Child Care Services in Canada

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RÉSUMÉ - ABSTRACT

This paper examines the determinants of the demand for child care services in Canada. Using survey data collected for 1981 by Statistics Canada and Probit analysis we find that the likelihood of using child care services increases with variables such as the education of the mother and the age of the child and decreases with the number of children in the family.

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Ce texte examine les facteurs qui expliquent la demande de services de garde d'enfants au Canada. Utilisant des données d'enquête recueillies en 1981 par Statistique Canada et la méthode probit, nous concluons que la probabilité d'utiliser les services de garde d'enfants augmente avec des variables telles la scolarité de la mère et l'âge de l'enfant et diminue avec le nombre d'enfants dans la famille.

Introduction

Since the second World War, increases in the labor force participation of women have made the demand for child care an important issue in industrial countries. Unfortunately, this demand has not been examined for Canada due to the lack of data.[1] This study of the demand for child care services was made possible by data collected in a survey undertaken in early 1981 by Statistics Canada.

This analysis focuses on the determinants of the demand for child care services. This demand, however, is usually the result of a mother's decision to participate in activities outside the home, particularly the decision to participate in the labor force. Hence, when discussing the determinants of the demand for child care, one is also examining, in part, the decision to participate in the labor force. The choice of a mode of child care will also be examined with care in a day care center and care in a home being distinguished.

This paper is divided as follows. In Section I, the analytical framework is established and the major factors that influence the demand for child care services are discussed. In Section II, the data and the variables used in the estimations of the model are specified. In section III, the empirical results are presented and discussed.

I.   The Analytical Framework

Demand for day care is a derived demand in that it manifests itself when family care providers, usually mothers, choose to participate in activities outside the home, and thus become users (demanders) of child care services.

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1   A study which used a similar multivariate analysis as ours was performed for the United States by Robins, P.K. and Speigelman, R.G., "An Econometric Model of the Demand for Child Care", _Economic Inquiry_, January 1978, Volume 15, no 1, pp. 83-94.

There exists various activities outside the home that may explain a mother's decision to use child care services, but the principal activity is joining the work force. Women with children of preschool age are, therefore, faced with two decisions:

1- they must decide whether or not to participate (full or part time) in the labor force which in turn leads to the creation of a demand for child care services (a substitute for time with the child); and

2- they must then choose the appropriate and convenient mode(s) of child care.

From an economic perspective (theory of consumer choice), a rational decision is made when an individual, who possessing sufficient information (costs, substitutes, etc.), examines the gross benefits and costs of an activity and undertakes it, if and only if, it is the best possible choice given its net positive benefits and those of other activities.

In our case, a woman deciding to join the labor force must consider such benefits (both monetary and non-monetary) as personal satisfaction, the acquisition or maintenance of human capital and the labor income (net of taxes) thus gained. The costs include the transportation and child care costs as well as the opportunity costs defined as being the benefits that would have been earned if the individual would have chosen the next best activity, which, in the case of a woman joining the labor force, may include a mix of domestic production, child rearing activities, volunteer work and leisure.

In this paper we will use various characteristics of its mother and of its family to explain why a child is cared for by its parents or by child care services. Each of these characteristics influences the benefits, and/or the costs of using child care services and of entering the work force. We thus use an approach similar to that of Robins and

Speigelman (1978) where individual (earnings) and household (care, number of children, etc.) characteristics are used to explain the demand for day care.

Number of children	:	The greater the number of children, particularly of preschool age, a mother must care for, the greater the time needed and the greater the cost of alternative care. Hence, the less likely the mother will tend to work, and as a result, the less likely she will use child care services.
Age of children	:	The needs of children for motherly time differ with age, the younger the child the less probable it will be that the mother will reallocate her time to activities outside the home; this in turn results in her not requiring child care services.
Age of mother	:	This variable could capture changes through time in mother's tastes and attitudes towards the use of child care services. If such changes took place, one would expect that younger women would be less reluctant to use child care services than older women.
Education of the mother:		An educated woman is more likely to participate in the labor force than a woman with little education since the costs of not participating (lost income, depreciation of human capital) are greater. Therefore, better

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educated mothers are more likely to use child care services than those who are less educated.

Employment status : The more intense the participation in the labor force of a mother, the more likely she is to use child care services so as to be able to fulfill her commitment.

Education of spouse : This variable can have two opposing effects on the probability of using child care services. Firstly, if the spouse is highly educated, we can expect him to have high earnings making the supplementary earnings of his wife unnecessary. On the other hand, if we view this variable as an indicator of attitudes and tastes, it is possible that highly educated spouses would tend to favor the participation of their wives in the labor force more than less educated men. Due to these opposing effects, the expected effect of this variable is ambiguous.

Province of Residence : Since child care services are a provincial responsibility, availability is expected to vary from province to province. Hence, we include a set of dichotomous variables to account for this.

Let us now turn to the data and specific variables used.

II.   The Data and the Variables

The data used were collected by Statistics Canada as a supplement to the Labor Force Survey in February 1981. The survey of child care arrangements was designed to generate data on the types of non-parental child care used, the quantity of services used, the reasons for choosing the arrangements utilized, the satisfaction with the arrangements and other socio-economic factors pertaining to both the parents and the child. The Labor Force Survey used a representative stratified sample of almost all Canadians.[2]

The survey was administered using one questionnaire per child permitting the generation of two data files; one relating to the children themselves called the child file and the second relating to the parents of the children called the family file. In order to obtain the number of siblings which was found in the family file but not in the child file, it was necessary for the authors to merge both files into one: an "augmented" child file.[3]

The dependent variable used in our analysis is "care". This variable takes on the value of 1 if during the reference week, the child was cared for by someone other than their parents, 0 otherwise.

As discussed in the analytical framework, the independent variables include the age and number of children, the age and education of the

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[2]   Excluded are residents of the Yukon, the Northwest Territories and the Indian Reservations, members of the armed forces and inmates of institutions. In total they represent less than 5% of Canada's population.

[3]   For further information as to the procedure used, see Payette and Vaillancourt (1984).

mother, her labor force activity, the education of her spouse and her province of residence.[4]

Given the dichotomous nature of our dependent variable, we must use the probit method to estimate our multivariable equation.

Before carrying out our probit analysis, let us look at the use of child care services for various characteristics in Table 1. We find that, everything else not equal, children are more likely to be users of child care services as their age increases and less likely as their number of siblings increase. Also the use of child care services appears to first increase then decrease with age, to always increase with an increase in the education of the mother and to usually increase with the education of the spouse. Finally, there are important variations between provinces in the use of child care services.

Also found in Table 1 are results on the use of day care centers. These results indicate the percentage of children using child care services that use day care centers,[5] defined as a government licensed center serving at least five children, for part or all of the day. Children not cared for in a day care center are cared for in a home, either theirs or another, either by a relative or non-relative. One notes that the use of day care centers increases about tenfold with the age of the child, reflecting perhaps the need of children for socialization activities as they grow older. It does not vary as much with the number of children or the age of the mother, but does increase with the education of both

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4   The relationship between each independent variable and the codebook is found in Payette and Vaillancourt (1984) with the exception of the province variable. That variable is divided into 10 categories, namely Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. The category omitted is Quebec.

5   We chose to separate our data into day care centers and other modes of day care for two reasons. First the various types of home care are fairly homogeneous by opposition to day care and second, day care centers are usually the focus of government policies.

Table 1

Participation rates associated with the use
of child care services of children
aged 0 to 4 years old by category,
Canada, 1981.

Variable/Category	% of Children	
	Using child care services	Day Care Center
Age of child	(1)	(2)
Less than 1 year	36,9	6,2
1 year old	38,8	7,2
2 years old	45,6	17,0
3 years old	49,2	44,2
4 years old	62,1	56,4
Number of children Under 14 years of age		
1 child	52,8	20,2
2 children	47,7	32,4
3 children and over	34,9	37,8
Age of mother		
15 to 24 years	37,1	15,1
25 to 34 years	48,9	30,4
35 to 44 years	50,1	43,8
45 to 54 years	15,9	26,3
Education of mother		
None or elementary	29,8	21,2
Secondary	42,5	28,4
Post-secondary without degree	57,1	31,8
Post-secondary with degree	57,9	32,2
University	62,4	30,7
Education of spouse		
None or elementary	31,7	22,3
Secondary	44,1	27,2
Post-secondary without degree	52,5	26,5
Post-secondary with degree	47,9	32,1
University	59,0	33,0

Table 1 (continued)

Variable/Category	% of Children	
	Using child care services	Day Care Center
Employment status of mother	(1)	(2)
Full time	79,0	19,8
Part time	64,7	26,1
Not-employed	43,1	28.3
Inactive	27,3	43,7
Province		
Newfoundland	29,1	19,8
Prince Edward Island	29,5	31,0
Nova Scotia	38,3	28,6
New Brunswick	35,4	23,2
Quebec	45,9	20,2
Ontario	50,3	31,6
Manitoba	47,8	39,8
Saskatchewan	40,1	24,3
Alberta	42,0	40,1
British Columbia	51,7	35,9
Household Income		
Less than $9,000	-	34,7
$ 9,000 - $14,999	-	26,8
$15,000 - $19,999	-	23,4
$20,000 - $24,999	-	30,6
$25,000 - $34,999	-	28,9
$35,000 and over	-	30,1

Source: Calculation by the authors, using data from the 1981 Statistics Canada Child Care Survey.

parents and is higher for inactive mothers and those members of low income (less than 9 000 $) households. This reflects the fact that subsidized day care is usually available only to users of day care centers and not to users of all child care services.

III.   The Results

Let us now examine our results keeping in mind that the transformed probit coefficients (probability differential) are reported as different from zero when the original coefficients are significantly different from zero using a one-tailed or a two-tailed t-test (see footnote (a), Table 2), at a 95% level.

The use of day care (Table 2) is explained as follows:
- as expected, the older the child, the more likely it is that child care services are used;

- as expected, an increase in the number of children under 14 years of age decreases the likelihood that child care services are used. Robins and Speigelman (1978) found that an increase in the number of 6-12 years old had the same impact;

- the age of the mother has no net effect on the likelihood of using child care services. Thus changes in attitudes by age groups, if they occured, are not strong enough to allow age to have a significant impact on the choice of using or not child care services;

- as expected, the more educated the mother the more likely it is that she uses child care services;

- the effect of an increase in the education of the spouse is not as evident but in general it appears to increase the likelihood of a child using day care services;

Table 2

The likelihood of using child care services, children aged 0 to 4 years old, Canada, 1981

Variable/Category	Probability Impact (a)	Probit Coefficients	t-ratios
Age of child (less than 1 omitted)			
1 year old	0	0,026	0,37
2 years old	0,089	0,227	3,35
3 years old	0,151	0,383	5,51
4 years old	0,269	0,688	10,01
Number of children under 14 years of age	-0,0713	-0,189	- 5,88
Age of mother (15 to 24 years omitted)			
25 - 34 years	0	-0,035	- 0,62
35 - 44 years	0	-0,235	- 0,27
45 - 54 years	0	-0,509	- 1,77
Education of mother (none or elementary omitted)			
secondary	0.083	0.216	2.67
post secondary without degree	0.176	0.444	3.94
post secondary with degree	0.177	0.449	4.57
university	0.164	0.415	3.59
Education of spouse (none or elementary omitted)			
secondary	0	0.050	0.82
post secondary without degree	0.131	0.332	3.41
post secondary with degree	0	0.080	0.95
university	0.124	0.315	3.57

Table 2 (continued)

Variable/Category	Probability Impact (a)	Probit Coefficients	t-ratios
Employment status of mother (employed full time omitted)			
part time	-0,167	-0,457	- 6,33
not-employed	-0,299	-0,959	- 9,47
inactive	-0,482	-1,304	-23,44
Province of residence (Quebec omitted)			
Newfoundland	-0,177	-0,495	- 4,97
Prince Edward Island	0	-0,278	- 1,88
Nova Scotia	0	-0,137	- 1,40
New Brunswick	-0,081	-0,215	- 2,41
Ontario	0	0,068	0,92
Manitoba	0	0,035	0,36
Saskatchewan	0	-0,073	- 0,85
Alberta	0	-0,099	- 1,21
British Columbia	0,106	0,269	3,19
pseudo R^2		0,239	
Number of observations		4211	

(a) Only significant coefficients at the 95% level are reported as different from zero. A one-tailed t-test was used for the variables "age of the child", "number of children under 14 years of age" and "education of the mother". In the case of the remaining variables where the expected result was uncertain, a two-tailed t-test was used.

Source: Calculations by the authors using data from the Statistics Canada, 1981 Child Care Survey.

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- as expected, mothers working part time, unemployed mothers and
  inactive mothers are less and less likely to use child care
  services than those working full time.

Residents of Newfoundland and New Brunswick are less likely to
use child care services than those of Quebec while residents of British
Columbia are more likely to do so and residents of other provinces act in
a similar fashion to those of Quebec. This may reflect in part the grea-
ter availability of day care services in urban centers.

Thus, in general, the expected effects put forward in our analy-
tical framework are supported by the data.

Let us now examine the factors that affect the choice of a mode
of child care. Using the results of Table 3 one finds that:

- an increase in the age of the child leads to an increase in
  the likelihood of using day care centers rather than home
  care. One possible explanation could be that parents with
  children 3 or 4 years old view the socialization of their
  children as an important factor;

- an increase in the number of children has no significant ef-
  fect on the decision to use day care centers. This is some-
  what surprising since one expects the per child cost of care
  to decrease with the number of children in a home care setting
  while it remains the same in a day care center;

- mothers aged 25 to 44 are more likely to use day care centers
  than others. This may reflect differences in tastes;

- in general, better educated mothers are more likely to use
  day care centers. This may reflect their desire for a more
  structured learning environment for their child;

Table 3

**The likelihood
of using day care centers, by cared for children
aged 0 to 4 years old, Canada, 1981**

Variable/Category	Probability Impact	Probit Coefficients	t-ratios
Age of child (less than 1 omitted)			
1 year old	0	0,035	0,18
2 years old	0,228	0,708	4,16
3 years old	0,455	1,333	8,12
4 years old	0,586	1,786	11,22
Number of children under 14 years of age	0	-0,047	- 0,73
Age of mother (15 to 24 years omitted)			
25 - 34 years	0,070	0,262	2,08
35 - 44 years	0,152	0,474	2,76
45 - 54 years	0	1,095	1,28
Education of mothers (none or elementary omitted)			
secondary	0,141	0,513	2,43
post-secondary without degree	0,264	0,773	3,12
post-secondary with degree	0	0,359	1,58
university	0,225	0,681	2,74
Education of spouse (none or elementary omitted)			
secondary	0	0,100	0,76
post-secondary without degree	0	-0,007	- 0,04
post-decondary with degree	0	0,119	0,71
university	0	0,199	1,16

Table 3 (continued)

Variable/Category	Probability Impact	Probit Coefficients	t-ratios
Employment status of mother (employed full time omitted)			
part time	0	0,006	0,05
not-employed	0	0,201	0,90
inactive	0,173	0,582	5,80
Province (Quebec omitted)			
Newfoundland	0	0,015	0,07
Prince Edward Island	0	0,226	0,72
Nova Scotia	0	-0,008	- 0,04
New Brunswick	0	0,219	1,19
Ontario	0,116	0,383	2,79
Manitoba	0,206	0,618	3,44
Saskatchewan	0	0,108	0,61
Alberta	0,137	0,434	2,71
British Columbia	0	0,222	1,44
Household Income (a) (less than $9,000 omitted)			
$ 9,000 - $14,999	0	-0,346	- 1,86
$15,000 - $19,999	-0,091	-0,364	- 1,97
$20,000 - $24,999	-0,103	-0,414	- 2,24
$35,000 - $34,999	0	-0,365	- 1,95
$35,000 and over	0	-0,189	- 0,93

pseudo R^2	0,256
Number of observations	1435

(a) Only significant coefficients at the 95% level are reported as different from zero.

(b) This variable is included in this part of our analysis since the decision to use day care centers depends, in part, on the financial resources of the mother which, due to the lack of information pertaining to the mother's revenue, is approximated by the household income.

Source: Calculations by the authors using data from the Statistics Canada, 1981, Child Care Survey.

- the education of the spouse has no significant effect on the decision to use day care centers;

- women who are inactive are more likely to use day care centers than all other women. This may be due to the fact that subsidized day care for low income families is offered only through day care centers as a result of government policies;

- residents of Ontario, Manitoba and Alberta are more likely to use day care centers than residents of Quebec. This may reflect either the availability of day care (Manitoba) or the lack of home care by family members (grandparents) due to the greater past geographical mobility of parents now residing in a province (Alberta, Ontario);

- low income and high income households use day care more than middle income households. This may reflect the availability of subsidies (low incomes) or the desire for "certified" quality care (high incomes) users.

Conclusion

Our results indicate that the decision to use or not use child care services can be modelled using economic theory. One finds that the greater the expected rewards either for the mother (education, work, clothes) or the child (age) the greater the likelihood of using child care services while the higher the cost (number of children), the lower that likelihood becomes.

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