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IMPACT OF QUEBEC'S UNIVERSAL LOW FEE CHILDCARE PROGRAM ON FEMALE LABOUR FORCE PARTICIPATION, DOMESTIC INCOME, AND GOVERNMENT BUDGETS

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ABSTRACT

Based on earlier studies, we estimate that in 2008 universal access to low-fee childcare in Quebec induced nearly 70,000 more mothers to hold jobs than if no such program had existed – an increase of 3.8% in women employment. By our calculation, Quebec's domestic income (GDP) was higher by about 1.7% (\$5 billion) as a result. We run a simulation of the impact of the childcare program on government own-source revenues and family transfers. We find that the tax-transfer return the federal and Quebec governments get from the program significantly exceeds its cost.

BACKGROUND

In the Canadian federation, the Province of Quebec stands out on account of its more extensive family policy. Its income support to families is more extensive, its parental leave plan is more generous, and its universal low-fee childcare program is unique in Canada. This study focuses on the last of these. We aim to estimate the program's impact on female labour force participation, domestic income and government budgets.

The childcare program was launched by the Quebec government in September 1997. Back then, it cost parents \$5 per day, and initially it targeted the 4 year olds. Simultaneously, full-time kindergarten was extended to all 5 year olds. In September 1998, low-fee daycare was offered to all 5-to-12 children before and after school in kindergarten and elementary school. The program was then progressively extended to younger children. It was finally opened to all preschool-age (0-to-4) children in September 2000. In January 2004, the daily fee was raised to \$7. In March 2011, the program was serving 215,000 preschool-age children, that is, nearly half of all Quebec children in this age group. Of these, 38% attended early childhood daycare centres (*Centre de la Petite Enfance* or CPE), 43% home daycare facilities, and 19% other subsidized daycare services (Ministère de la Famille et des Aînés, 2011). In fiscal year 2011-2012, the provincial government expected to spend \$2,215 million (0.7% of Quebec's GDP) to subsidize low-fee childcare (Québec Treasury Board, 2011, p. 115).

Below, in Section 1, we draw a broad comparative picture of recent trends in daycare services and female labour force participation in Quebec, Ontario and Canada as a whole. Section 2 focuses on four recent studies that found that subsidized daycare has led to a significant increase in the number of Quebec working mothers in the short and

long term¹. Our assessment of their results leads us to conclude that in the reference year 2008 the availability of low-fee childcare had a significant positive effect on the number of Quebec mothers at work. In Section 3, we push the analysis further and estimate by how much the higher mother employment rate increased Quebec's domestic income (GDP) in 2008. Finally, in Section 4, we estimate the impact of the higher mother employment rate and higher domestic income on federal and provincial government revenues and family transfers. We conclude that in 2008 the low-fee childcare program improved the budget balances of all levels of government. It was therefore a "profitable" financial operation for all of them.

¹ A large body of empirical literature has shown the labour supply of mothers to be very sensitive to variations in the cost of daycare. A useful review can be found in Baker, Gruber, and Milligan (2008). The OECD (2011) has estimated the net cost of daycare in several member countries. It has confirmed that this factor matters a lot for the labour supply decision.

1. RECENT TRENDS IN DAYCARE AND FEMALE LABOUR FORCE PARTICIPATION IN QUEBEC AND CANADA

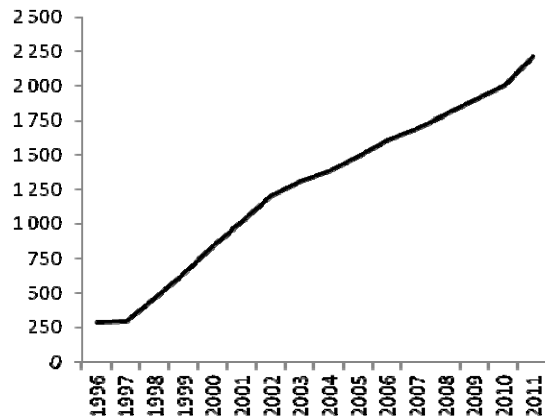
We begin by describing the evolution of daycare services and female labour force participation in Quebec and other Canadian provinces over the past 15 years.

Quebec's low-fee childcare program expanded rapidly after its inception. The number of subsidized spaces (CPE, home daycare and other subsidized services) took off immediately following official implementation of the program in September 1997. Growth was very fast from 1998 to 2005, averaging 16,000 new spaces per year. It slowed down subsequently. In March 2011, 215,000 subsidized spaces were available. In non-subsidized (but regulated) daycare facilities, the number of spaces understandably crumbled at the end of the 1990s. However, it has bounced back since, first slowly until 2008 and then more rapidly since 2009. As a percentage of the total number of available spaces, non-subsidized spaces have jumped from 2% in 2008 to 8% in 2011. This recent increase in non-subsidized daycare stems from the rise of unmet excess demand for subsidized spaces, and also from the increase in the refundable provincial tax credit for daycare expenses in 2009.

The following two figures track the evolution of the cost of daycare subsidies for the Quebec government.

Figure 1 shows that the annual cost of government subsidies increased sharply from \$300 million in 1997-1998, the year the program was launched, to \$2.2 billion in 2011-2012.

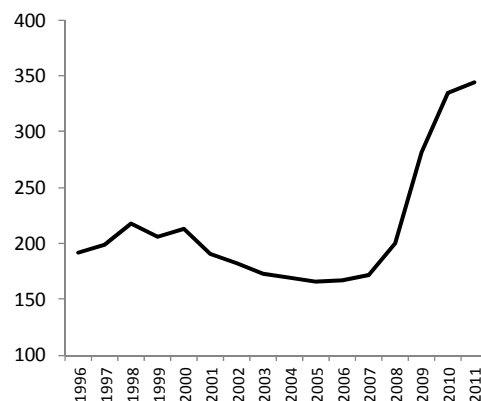
Figure 1: Gross cost of subsidies to daycare services, 1996-2011 (millions of \$)



Source: Québec Treasury Board (various years).

Figure 2 indicates that the cost of Quebec's refundable tax credit for daycare expenses declined significantly up until 2005. This resulted from the fact that the daily fee paid by users for subsidized spaces did not qualify for this tax credit. Since 2005, the cost of the tax credit for the government has increased again because (as mentioned above) the number of occupied *non*-subsidized spaces has been on the rise and the tax credit itself was made more generous beginning in 2009.

Figure 2: Cost of Quebec's refundable tax credit for daycare expenses, 1996-2010 (millions of \$)

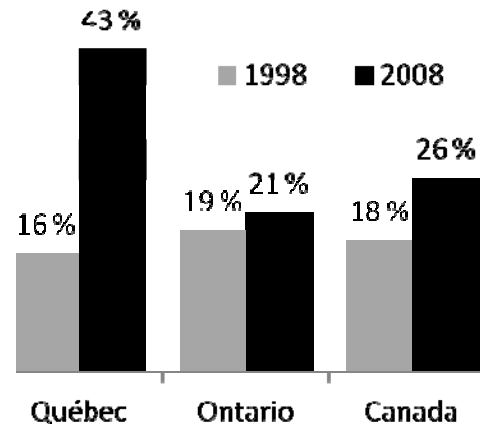


Source: Finances Québec (2011).

While attendance in regulated daycare grew spectacularly in Quebec, it changed very little in other parts of Canada.

This is shown by Figure 3, which compares attendance rates of 0-to-5 children in regulated daycare (subsidized or not) in Canadian provinces in 1998 and in 2008 (CRRU, 2000; Beach et al., 2009). The Quebec rate went from 16% to 43%². In Ontario and elsewhere, it kept hovering around 20%. The Quebec increase lifted the national average from 18% in 1998 to 26% in 2008. To sum up, over this period the attendance rate increased by 27 percentage points in Quebec, 2 points in Ontario, and 8 points in the country as a whole.

Figure 3: Percentage of children aged 0 to 5 in regulated daycare places, 1998 and 2008



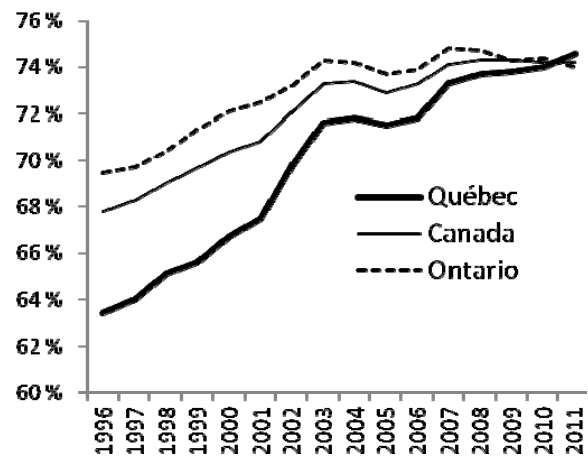
Sources: CRRU (2000), Beach et al. (2009), Statistics Canada, CANSIM Table 051-001.

The rapid development of the number of low-fee daycare spaces in Quebec was accompanied by an equally large increase in the number of Quebec women in the labour force.

² As a percentage of children of preschool age in Quebec (birth to 4 years), the attendance rate in regulated daycare increased to 51% in 2008 from 18% in 1998.

Figure 4 shows that the labour force participation rate of women aged 15–64 in Quebec increased from 63% in 1996 to 75% in 2011. Though the participation rate of women in this age group increased in other provinces as well, the pace in Quebec was faster than the national average. The 6-point participation rate gap that existed between women in Quebec and those in other parts of Canada in 1996 had closed completely by 2011.

Figure 4: Labour force participation rate of women aged 15 to 64, Quebec, Ontario and Canada, 1989-2011



Source: Statistics Canada, CANSIM Table 282-0002.

Table 1 compares the increases in labour force participation rates of women aged 15 to 64 that took place between 1996 to 2008 in Quebec, Ontario, and Canada as a whole. In Quebec, mothers experienced more pronounced increases in labour force participation than women without children. This was not the case in Ontario or in Canada as a whole.

Table 1: Labour force participation rate of women aged 15 to 64 by age of youngest child at home, Quebec, Ontario and Canada, 1996 and 2008 (percentages)

<u>Québec</u>			
	1996	2008	Variation
Less than de 6 years old	63,1	74,3	11,2
6 to 15 years old	73,4	86,9	13,5
Without children	60,9	70,8	9,9
<u>Ontario</u>			
	1996	2008	Variation
Less than de 6 years old	66,9	71,1	4,2
6 to 15 years old	78,8	83,7	4,9
Without children	67,8	73,5	5,7
<u>Canada</u>			
	1996	2008	Variation
Less than de 6 years old	65,3	70,9	5,6
6 to 15 years old	77,2	84,1	6,9
Without children	66,0	72,9	7,0

Source: Statistics Canada (2009).

Table 2 further indicates that the increase in labour force participation from 1996 to 2008 in Quebec was very pronounced among single mothers with preschool-age children. It was nearly 22 percentage points. Over this period, the number of single-parent families on Quebec welfare rolls (headed by mothers in the vast majority of cases) declined from 99,000 to 45,000. Moreover, the relative poverty rate of single-mother families went down from 36% to 22%, and their median real after-tax income shot up by 81%³.

³ Sources: Ministère de l'Emploi et de la Solidarité sociale, for the number of families on welfare; Québec Statistics Institute, for the percentage of families whose income is less than half the median provincial household income; Statistics Canada, CANSIM Table 202-0605, for the median real after-tax income.

Table 2: Labour force participation rate of women aged 15 to 64 by family type and age of youngest child at home, Quebec, 1996 and 2008 (percentages)

<u>Dual-parent family</u>			
	1996	2008	Variation
Less than de 6 years old	65,6	75,3	9,7
6 to 15 years old	73,4	87,2	13,8
<u>Single-parent family</u>			
	1996	2008	Variation
Less than de 6 years old	46,2	67,8	21,6
6 to 15 years old	73,5	86,3	12,8

Source: Statistics Canada (2009).

Given that it is the behaviour of mothers that is most likely to be influenced by the low-fee daycare services made available in Quebec, and that (as shown in Table 1) the labour force participation rate of mothers increased more rapidly in Quebec than in Ontario or Canada as a whole from 1996 to 2008, it is interesting ask how many fewer Quebec mothers would have been employed in 2008 if their employment rate had moved in parallel with that of Ontario mothers between 1996 and 2008 instead of rising faster as it did. Needless to say, such a calculation is exploratory. It cannot ensure that the quantitative effect of low-fee childcare on female employment is appropriately identified, as there is no way of knowing by how much the employment rate of Quebec mothers would have changed absent these services. However, it can provide a useful indication of the order of magnitude of the impact that might be expected.

Table 3 presents the calculation in question. The upshot is that the number of Quebec mothers actually employed in 2008 exceeded by about 61,000 the number that would have been observed if their employment rate had moved in parallel with that of Ontario mothers from 1996 to 2008.

Table 3: Calculation of the number of Quebec mothers that would have been employed in 2008 if their employment rate had moved in parallel with that of Ontario mothers since 1996 instead of following the path actually recorded

	<u>Number of mothers</u>
Number of Quebec mothers who would have been employed in 2008 if their employment rate had remained the same as in 1996	459,940
<u>Plus:</u> Increase in the number of Quebec mothers employed that would have been observed from 1996 to 2008 if their employment rate had moved in parallel with that of Ontario mothers	54,884
<u>Equals:</u> Number of Quebec mothers who would have been employed in 2008 if their employment rate had moved in parallel with that of Ontario mothers	514,824
<u>Minus:</u> Number of Quebec mothers actually employed in 2008	575,579
<u>Equals:</u> Number of <u>fewer</u> Quebec mothers employed if their employment rate had moved in parallel with that of Ontario mothers instead of following the path actually recorded	60,755

Sources: Statistics Canada (2009); authors' calculations.

The fact that over the past 15 years Quebec has diverged from the national average both in terms of mothers' labour force participation and of children's attendance in regulated daycare does not constitute in and of itself proof that the latter has been the cause of the former. Factors other than implementation of the low-fee childcare program were present at the same time and could have drawn more (or fewer) women and mothers to the Quebec labour force. Only a finer statistical analysis can get at the true role that the program played in the matter. In the next section, we review the relevant statistical analyses that are available in the recent literature.

2. IMPACT OF QUEBEC'S LOW FEE CHILDCARE PROGRAM ON THE EMPLOYMENT RATE OF MOTHERS

To date in the research literature, there have been four attempts at statistically estimating the impact of the low-fee childcare program on the employment rate of Quebec mothers. They have commonly applied the “difference in differences” method to microdata from two Canadian longitudinal surveys. Basically, these studies have sought to estimate by how much the difference between the employment rate of Quebec mothers and those from other parts of Canada has changed between the period prior to and the one following the introduction of the Quebec program.

Two of these studies – Lefebvre and Merrigan (2008) and Lefebvre, Merrigan, and Verstraete (2009) – have relied on the annual data from the Survey of Labour and Income Dynamics (SLID) for the periods 1993 to 2002 and 1996 to 2004, respectively. The other two – Baker, Gruber, and Milligan (2008) and Lefebvre, Merrigan, and Roy-Desrosiers (2011) – have used the biennial data from the National Longitudinal Survey of Children and Youth (NLSCY). The earlier study has exploited the data from the five NLSCY cycles 1994-1995 to 2002-2003. The later one has extended the sample to include the more recent 2004-2005 and 2006-2007 NLSCY cycles⁴. In addition to estimating the impact of the low-fee childcare program on the employment rate of mothers, these four studies have examined other outcomes as well, such as the effects of the program on the attendance rate of children in daycare and on a number of indicators of child development and well-being. In order to isolate the effects of the childcare program, a host of factors capable of influencing these various outcomes simultaneously have been taken into account, including mother's age, origin and educational attainment, family type, child's sex and birth order, size of place of residence, income other than mother's earned income, language spoken at home, and province of residence.

⁴ In 2012, Lefebvre, Merrigan and Roy-Desrosiers have posted a new version of their 2011 paper that includes data from the 2008-2009 NLSCY cycle. The results they get for the employment behaviour of mothers with this expanded data set are only marginally different from those of the 2011 version.

The four studies have exploited various samples. They differ with respect to the children's age group, the mothers' family types (i.e., all types or just two-parent families), and the sample period. These differences are indicated in Table 4.

A first characteristic of the studies is that the three of them that have focused on mothers of preschool-age children (Lefebvre and Merrigan, 2008; Baker, Gruber, and Milligan, 2008; Lefebvre, Merrigan, and Roy-Desrosiers 2011) give entirely consistent results for the period around 2002. Their estimates of program impact on the employment rate of mothers for this period have low sample variance and are of similar orders of magnitude. This is the case whether the data is from the SLID or the NLSCY and whether the sample includes all mothers or only mothers from two-parent families. The estimated increases in the employment rate lie in the 7.7-to-8.8 percentage point interval of the total population of mothers, with a standard deviation of 2 to 3 points.

Table 4: Estimated increases in the employment rate of Quebec mothers resulting from the low-fee childcare program according to four studies (percentage points of the total population of mothers)

	Lefebvre and Merrigan 2008	Baker, Gruber, and Milligan 2008	Lefebvre, Merrigan, and Roy-Desrosiers 2011		Lefebvre, Merrigan, and Verstraete 2009
Data source	SLID	NLSCY	NLSCY		SLID
Children's age group	1 to 5 years	Birth to 4 years	Birth to 5 years		6 to 11 years
Mothers' family type	All	Only from dual-parent families	All		All
Period of estimate	2002	2000-2003	2002-2003	2006-2007	2004
Estimated impact on employment rate for this period (standard error)	8.1 (3.4)	7.7 (1.8)	8.8 (2.0)	12.0 (2.0)	7.0 (2.3)

Note: The studies are based on data from two surveys conducted by Statistics Canada: the Survey of Labour and Income Dynamics (SLID) and the National Longitudinal Survey of Children and Youth (NLSCY). The employment rate of mothers is the percentage of the total population of mothers that had some employment in the survey reference year. The estimated impact reported on the next-to-last line should be interpreted as follows: if a group's initial employment rate was, say, 50% of the group's total population and if it increased by 7 percentage points (as in the right-most column), this means that the rate went from 50% to 57%. In the case of Lefebvre, Merrigan, and Roy-Desrosiers (2011), the effects reported for 2002-2003 and 2006-2007 are simple averages of the individual effects estimated separately for each of the six years of age (0 to 5).

Sources: Lefebvre and Merrigan (2008), Table 5; Baker, Gruber, and Milligan (2008), Table 2; Lefebvre, Merrigan, and Roy-Desrosiers (2011), Table 6; Lefebvre, Merrigan, and Verstraete (2009), Tables 3 and 4.

A second characteristic is that the impact on the employment rate of mothers estimated by the most recent study, that of Lefebvre, Merrigan, and Roy-Desrosiers (2011), is larger for 2006-2007 (12.0 points) than for 2002-2003 (8.8 points). This 35% increase in the program's impact over time is consistent with the increase in the number of low-fee childcare spaces between these two years. The number of spaces grew by 35%, from 146,000 in 2002 to 197,000 in 2006⁵.

A third characteristic of the results has been identified by Lefebvre, Merrigan, and Roy-Desrosiers (2011), but is not reported in Table 4 above. These authors have estimated that the

⁵ Lefebvre, Merrigan, and Roy-Desrosiers (2011) also estimate for 2006-2007 an increased impact on employment for mothers of 5 year olds who were entering kindergarten and a decreased impact for mothers of children aged 0 to 11 months. In the latter case, the decrease might have come about in response to the 2006 introduction of the Quebec Parental Insurance Plan, which offers more generous parental leaves than those available in other provinces through the federally-administered plan.

childcare program had a large impact on the employment rate of mothers with a university degree as early as 2000, but that for mothers with a lower educational attainment the timing of the impact was different. It was initially small, but it gained strength over time until it managed to reach the same level as for the higher-educated mothers (after 2004)⁶. In 2006-2007, the impact seemed to be evenly distributed across levels of education.

A fourth characteristic of the results is the evidence they provide that the use of low-fee daycare when the child is of preschool age raises the mother's employment rate not only during this early period of the child's life but also later, once he or she has entered school. In other words, the program's impact on female participation in the labour force would have a dynamic extension and would persist over the long term. The evidence for this persistence effect was uncovered by Lefebvre, Merrigan, and Verstraete (2009), who examined the behaviour of mothers of children aged 6 to 11 having used low-fee daycare when their children were of preschool age⁷. As reported in Table 4 above, these authors have estimated that in 2004 the employment rate of mothers of elementary school children was 7.0 percentage points higher if they had used low-fee daycare when their children were of preschool age. They also found that this increase in the employment rate was mostly due to mothers with less than a university degree. This result is consistent with the view that, even without a low-fee childcare program, a mother with a higher degree is very likely to return to work once her young children have entered school.

All told, how many more Quebec mothers has the program brought into employment⁸? Taking 2008 as our reference year, we base our answer to this question on the two most recent studies by Lefebvre, Merrigan, and Roy-Desrosiers (2011) and Lefebvre, Merrigan, and Verstraete (2009), whose results are reported in the last two columns of Table 4 above. In 2008, there were about 347,200 mothers of children aged 0 to 5 and 400,100 mothers whose youngest child

⁶ The 2009 Survey on childcare use, needs and preferences of families conducted by the Québec Statistics Institute (QSI 2011b) provides further evidence. Table 6.1 of the survey reports that low-income families participate in the low-fee childcare program to almost the same extent (66%) as medium- and high-income families (75%).

⁷ See their Table 4.

⁸ Lefebvre, Merrigan and Roy-Desrosiers (2012) have estimated the impact of the program on the employment rate of fathers. They find that the impact is generally insignificant except perhaps in the case of fathers of 3 year olds. In what follows, we neglect the fathers' response to the program.

was 6 to 14 years old in Quebec⁹. Multiplying these numbers by the respective increases of 12.0% and 7.0% in employment of these two groups of mothers (Table 4), we obtain an estimate of 69,700 more mothers at work in that year. This number is the sum of 41,700 more mothers of children aged 0 to 5 (the “static” effect) and 28,000 more mothers of children aged 6 to 14 who had previously been users of low-fee daycare (the “dynamic” effect)¹⁰.

Our bottom-line estimate is therefore that in 2008 the Quebec low-fee childcare program allowed 69,700 more mothers to hold jobs than would have been the case without it¹¹. Given that there were 1,852,400 women and 2,028,000 men in employment in Quebec in that year, these 69,700 more mothers raised total women employment by 3.79% and total Quebec employment by 1.78%. These orders of magnitude are quite significant. They are not too different from the exploratory results presented in Table 3.

To date, only mothers aged 50 or under may have had access to subsidized daycare and increased their presence in the labour market as a result. It can be conjectured that, as new cohorts of mothers access the program, the persistence or “dynamic” effect, and hence the total effect, of the program will grow larger over time than it was in 2008. Although plausible, this conjecture will have to wait for hard evidence to become available before a definitive conclusion can be reached.

⁹ Sources: Statistics Canada (2009) and the 2006 Census of Canada.

¹⁰ This follows from $12.0\% \times 347,200 = 41,664$ and $7.0\% \times 400,100 = 28,007$, which gives $41,664 + 28,007 = 69,671$. Note that we apply here to mothers of children 6 to 14 years old the figure of 7.0% that Lefebvre, Merrigan, and Verstraete (2009) have estimated for mothers whose youngest child is 6 to 11 years old. This is unlikely to generate a sizeable estimation error.

¹¹ Based on the standard errors reported in Table 4, we obtain an estimate of 11,500 mothers for the standard deviation around the estimated level of 69,700 mothers. This is calculated as follows: $((347,200)^2 \times (0.02)^2 + (400,100)^2 \times (0.023)^2)^{1/2} = 11,528$.

3. IMPACT OF QUEBEC'S LOW FEE CHILDCARE PROGRAM ON DOMESTIC INCOME (GDP)

Estimating the impact of the childcare program on women's employment is only the first step that must be taken in order to measure its macroeconomic and budgetary impact correctly. In this section, we proceed to estimate the macroeconomic impact, that is, the effect on Quebec's total domestic income (GDP). In the following section, we evaluate the budgetary impact, that is, the effect on revenues and expenditures of the federal and provincial governments.

What are the consequences for the economy of several tens of thousands of women entering the Quebec labour force? More people looking for work exercises downward pressure on wages, which induces firms to employ more women. In a growing economy with inflation, wages do not diminish in absolute terms, but they do increase at a somewhat slower pace on the whole than would be the case without such a pressure from additional workers-to-be. The slower rate of wage growth increases business profitability and gives firms the needed incentive to invest in new productive equipment (e.g., machinery and equipment, buildings and engineering construction) that will make the new hires as productive as existing workers. This ensures that there will be growth not only in the total wage bill, but also in property income (e.g., business profits, investment income, etc.). All components of domestic income eventually benefit from the arrival of new workers. At the same time, precisely because the new equipment installed makes everyone more productive, wages and business profits finally return to the more "normal" levels dictated by the cost of capital established by local and global competition¹².

Given this kind of upward pressure on the labour force and the consequences just described, a fundamental theorem of the theory of economic growth due Robert Solow (1956) stipulates that domestic income (GDP) essentially reacts in proportion to the increase in the number of persons employed, provided that the new hires work as many hours and are just as productive as existing workers. This means that if employment grows, say, by 2%, GDP will end up increasing

¹² A widespread fallacy is to consider that the number of available jobs in the economy is fixed and that more women can get jobs only if they displace workers from existing jobs. The assumption that the number of available jobs is independent of the number of people who want to work is incorrect and has been shown to be so by thousands of empirical studies in time and space.

2% as well. Solow himself (1957) presented empirical evidence for his theorem. It has since been confirmed time and again in the contemporary literature on developed economies¹³.

What of the number of hours worked and productivity¹⁴ of mothers that are induced to join the ranks of the labour force by the low-fee childcare program? The studies by Lefebvre and Merrigan (2008)¹⁵, Baker, Gruber, and Milligan (2008)¹⁶ and Lefebvre, Merrigan, and Verstraete (2009)¹⁷ have estimated the impact of the childcare program on both the number of weeks and the number of annual hours of work. Their estimates suggest that mothers who enter the labour force essentially hold full-time jobs and work as many hours in the year as workers who are already in the labour force on average.

The picture is a bit different for productivity and wages, which are closely related to education and experience¹⁸. The results in Lefebvre, Merrigan, and Roy-Desrosiers (2011) imply that the childcare program's impact on the employment rate of mothers of children aged 0 to 5 is as large for those with less than a university degree as for those with such a degree. However, in the case of mothers whose youngest child is over the age of 6, Lefebvre, Merrigan, and Verstraete (2009) have found that the impact on employment is concentrated among those with a lower level of education. As we have reported earlier, they get no significant effect in the case of university graduates. Given that the average wage of employees without a university degree was 89% of the average wage of the general population of workers in Quebec in 2008¹⁹, we take it that the ratio between the corresponding productivity levels of these two groups was 89% as well.

All these results on the number of hours of work and the productivity of mothers of children aged 0 to 5 and over 6 that were employed in 2008 due to the childcare program entail that their average productivity was 95.6% of the average productivity of other employed Quebec

¹³ Olivier Blanchard (2000) presents a simple proof of the Solow theorem as well as modern evidence based on macroeconomic behaviour of several advanced countries.

¹⁴ Productivity is defined here as value produced *per person employed*.

¹⁵ See Table 5 of this study.

¹⁶ See Table 2 of this study.

¹⁷ See Tables 3 and 4 of this study.

¹⁸ The seminal work on the connection between wages, education and experience is that of Mincer (1974). Lemieux (2006) presents a contemporary review of the work.

¹⁹ Source: Statistics Canada (2009).

workers²⁰. With the 69,700 more mothers at work representing an increase of total employment of 1.78%, the program must have in turn raised domestic income (GDP) in 2008 by 95.6% of 1.78%, i.e., by 1.7%. This leads to an estimate of \$5.1 billion for the increase in Quebec's GDP due to the low-fee childcare program²¹.

²⁰ This follows from: $(12.0\% \times 347,200 \times 100\% + 7.0\% \times 400,100 \times 89\%) / 69,700 = 95.6\%$.

²¹ The official GDP figure for 2008 is \$304,479 million, from which we get $0.0170 \times 304,479 / 1.017 = \$5,089$ million.

4. IMPACT OF QUEBEC'S LOW FEE CHILDCARE PROGRAM ON GOVERNMENT BUDGETS

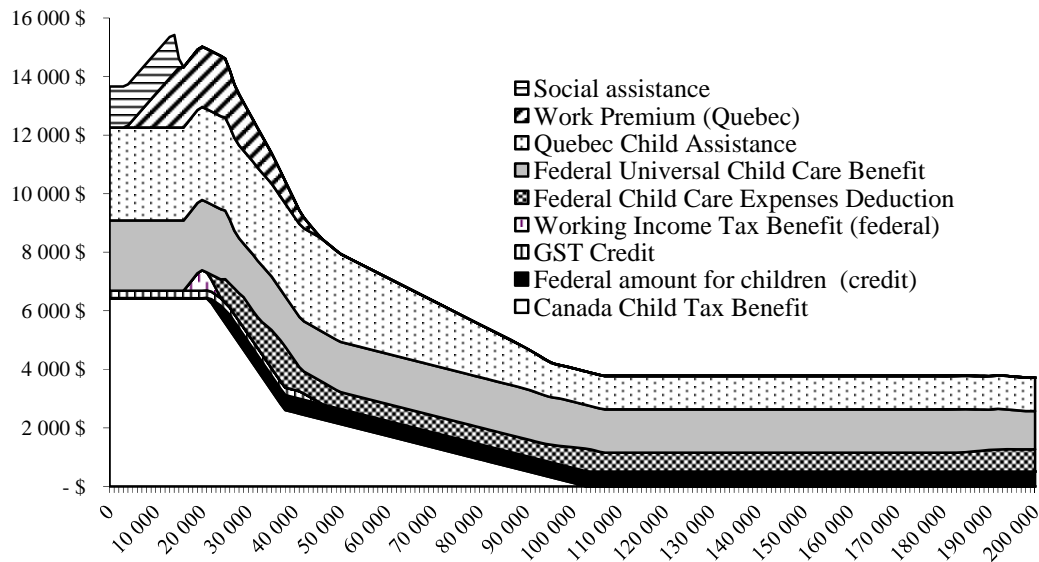
The impact of the childcare program on global economic activity obviously has implications for public finances. There are two main budgetary effects: increases in tax revenues and decreases in family transfers.

The standard assumption concerning tax revenues is that they are roughly unit-elastic, meaning that tax revenues increase more or less in proportion with GDP (see, for example, Dungan and Murphy, 2011; Advisory Committee on the Economy and Public Finances, 2010; Finances Québec, 2009, p. C.17). Under this hypothesis, the 1.7% increase in GDP arising from the increase in women employment we have just estimated must have led to a more or less equal increase of 1.7% in the own-source revenues of the government sector. The implied boost to tax revenues in 2008 is \$2.2 billion²². We are going to check the validity of this exploratory result through a more detailed analysis of the impact on government revenues.

Transfers, credits and other benefits broadly decrease when family income increases. Figure 5 illustrates this by referring to the situation of a family with two working parents and two small children. Collectively, the set of income support measures for Quebec families are a decreasing function of family income. The measures are less and less generous as family income increases. The straight implication is that higher women labour force participation translates into revenue savings for the government sector.

²² Since $\$128.2 \text{ billion} \times 0.017/1.017 = \2.2 billion , where \$128.2 billion is the amount of tax revenues collected by all levels of government in 2008 (Statistics Canada, CANSIM Table 384-0004).

Figure 5: Income support measures for families with two working parents and two children under 6, Quebec, 2008



Source: Authors' calculations.

Using a tax calculator, Baker, Gruber, and Milligan (2008) have estimated how much of the cost of the Quebec's subsidy to low-fee childcare is covered by the favourable impact of the increase in mothers' earned income on government budgets. They have found that in 2002 the two levels of government together managed to recoup 38% of the gross cost of the subsidy through an increase in personal income taxes and contributions to social insurance and a decrease in child tax measures. Lefebvre, Merrigan, and Roy-Desrosiers (2011) have later used the same tax calculator to estimate the increase in individual income taxes and the decrease in tax credits and transfers generated by the increase in mothers' earned income. They report that these favourable changes in taxes and transfers allowed the two levels of government together to recuperate an amount they estimate to be between a floor of 11% and a ceiling of 79% of the gross cost of the subsidy in 2004, depending on whether they assume the newly employed mothers to earn very low or very high wages. Going away from these extremes and assuming, more realistically, that these mothers earned median-level wages puts the government sector recuperation rate at roughly 35%. This is close to the earlier estimate reported by Baker, Gruber, and Milligan (2008).

The preliminary analysis of the budgetary impact of low-fee childcare offered by these authors is a good starting point but it does not cover all of the tax and transfer changes generated by the

Quebec program. Three additional elements need be taken into account. First, we have seen that the rise in the employment rate of mothers who take advantage of the program persists over the long term after the child has entered school (Lefebvre, Merrigan, and Verstraete 2009). This persistence effect too has tax-transfer implications. Second, the introduction of the childcare program has generated much more than an increase in the economy's total wage bill. As we pointed out in the previous section, it has also caused total GDP to expand and the government sector to extract – in addition to individual income taxes – indirect taxes, corporate taxes, and dividends from public enterprises. Third, a distinction must be made between the *gross* cost of the program, which is the total amount of the childcare subsidies, and its *net* cost, which subtracts from the gross cost the Quebec government savings arising from the lower use of its refundable tax credit for daycare expenses.

In the rest of this section, we explain how we have expanded the first-hand analyses of the program's budgetary impact carried out by Baker, Gruber, and Milligan (2008) and by Lefebvre, Merrigan, and Roy-Desrosiers (2011) along the lines just mentioned. We continue to use 2008 as our reference year.

We have proceeded in three steps. First, we have sought to reproduce as faithfully as possible the distribution of Quebec women into four family types according to whether they are single-parent or two-parent and whether the youngest child is less than 6 years of age or between 6 and 14. In each of these family types, women have been further distributed across five levels of annual earned income. In all, this has given us 20 categories (4 family types x 5 income levels).

For the purpose of distributing the women across the 20 categories, we have used the Survey of Labour and Income Dynamics (SLID). The SLID is an annual longitudinal survey on personal and household income that Statistics Canada has conducted since 1993, based on samples drawn from the Labour Force Survey. It provides detailed information on a vast array of characteristics and activities, such as composition of household, age and sex of members, kinship ties, educational attainment, employment experience, and various sources of income (Statistics Canada, 2010a).

It has seemed reasonable to us to assume that the childcare program had no effect on the employment of mothers whose (after-the-fact) earned income was less than \$10,000 or greater than \$60,000 in 2008. This has left women whose earned income was between \$10,000 and

\$60,000 to be affected by the program. We have also assumed that the program had no effect on women from dual-parent families whose contribution to family income exceeded 75%.

The results of this operation based on the SLID are presented in Table 5. Each column of the table indicates how women are distributed by earned income (from \$10,000 to \$60,000) within one of the four family types. Depending on family type, between 70% and 80% of women earned less than \$40,000 in 2008.

Table 5: Distribution of women by family type and earned income, Quebec, 2008

	Dual-parent family		Single-parent family	
	Less than 6 y.o.	Between 6 and 14 y.o.	Less than 6 y.o.	Between 6 and 14 y.o.
\$10,000 to \$20,000	33 %	33 %	30 %	22 %
\$20,000 to \$30,000	27 %	21 %	30 %	30 %
\$30,000 to \$40,000	19 %	18 %	21 %	21 %
\$40,000 to \$50,000	12 %	19 %	13 %	18 %
\$50,000 to \$60,000	9 %	9 %	6 %	10 %
	100 %	100 %	100 %	100 %

Sources: Statistics Canada (2010b), authors' calculations.

The second step of our procedure has consisted of calculating by how much individual income taxes would have decreased and various transfers (GST and PST credits, Canada child tax benefit, provincial child support, and work premium) and social assistance benefits (mostly in the case of single-parent families) would have increased if the women newly hired following the introduction of low-fee daycare had not worked at all in 2008. This calculation provides an estimate of the program's direct budgetary impact.

This calculation depends on two elements. The first is the total number of women that the program has attracted into employment. Here, we make the same distinction as earlier in Section 2 between the program's "static" effect on the number of working mothers of children aged 0 to 5 (41,700 additional mothers in 2008), and its "dynamic" or persistence effect on the number of working mothers of children aged 6 to 14 who have been previous users of the program (28,000 additional mothers). For the sake of clarity, we will present our results on budgetary impact separately for the static effect and for the total effect (static and dynamic) of

the program. The second required element in the calculation is the distribution of new working mothers across family types and earned income cells in 2008. We have assumed that the distribution of mothers across cells reproduces the pattern that has been reported in Table 5 from SLID data.

Once the direct impact on individual income taxes and on various transfers and social assistance benefits has been calculated based on these elements, we have proceeded to implement a third step. Full calculation of the global budgetary impact of the increase in economic activity generated by the childcare program requires estimating its effects on federal and Quebec own-source revenues other than income taxes and government transfers. These include employer and employee contributions to employment insurance, parental insurance, the Quebec Pension Plan, workman's compensation, indirect taxes (e.g., consumption taxes, property taxes, gasoline taxes, capital taxes, employer contributions to the Quebec Health Services Fund), and other revenues such as corporate income taxes and remitted profits from government enterprises. We have generally assumed that these revenues increased in proportion to GDP, that is, by 1.1% for the static effect alone and by 1.7% for the total effect²³.

The results of our calculations based on the three steps just described are summarized in Table 6. The estimated budgetary impact is presented in three dimensions: according to whether we take into account only the static effect or include also the dynamic effect; according to whether we measure the direct budgetary impact only or the global impact; and according to whether we look at the impact on the federal budget or the Quebec budget.

²³ The relevant data are from Statistics Canada's *Provincial Economic Accounts* for 2008 (CANSIM Tables 384-0006 and 384-0007). The equation used is the following: if T is the amount of revenue and g is the percent increase in GDP (1.1% or 1.7%, as the case may be), then the resulting increase in T is calculated as $g \times T / (1 + g)$.

Table 6: Estimated impact of Quebec's low-fee childcare program on federal and provincial finances, 2008 (millions of \$)

	Static effect			Total effect (static and dynamic)		
	Federal	Quebec	Total	Federal	Quebec	Total
Increase in individual income taxes	142	213	355	231	349	580
Decrease in fiscal benefits	58	44	102	100	63	162
Decrease in social assistance benefits	-	47	47	-	116	116
Direct budgetary impact	200	304	503	330	528	859
Increase in social contributions	34	199	234	55	318	373
Increase in indirect taxes	96	366	463	154	585	739
Increase in other own-source revenues	107	169	275	171	269	440
Global budgetary impact	437	1 038	1,475	710	1,701	2,411

Note: The nomenclature followed is based on Statistics Canada's provincial economic accounts. In addition to various consumption taxes, indirect taxes include property taxes, corporate taxes other than on income (e.g., capital tax), and payroll taxes other than social contributions (e.g., contributions to the Quebec Health Services Fund). Other own-source revenues are made of corporate income taxes, government investment income, and other transfers paid by individuals. Quebec government revenues include local government revenues.

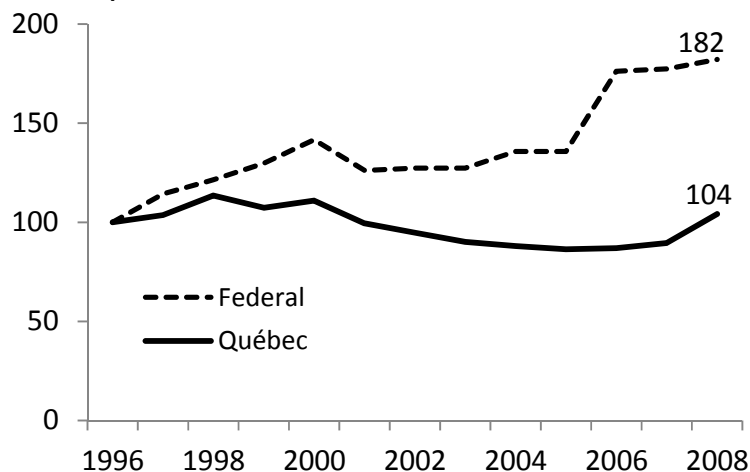
Sources: Statistics Canada (2010b), QSI (2011a), authors' calculations.

Considering the static effect alone, we calculate that the program allowed the two levels of government to recuperate \$503 million directly and \$1,475 million globally. When the dynamic effect is added, we obtain a direct budgetary impact of \$859 million and a global impact of \$2,411, again for the two administrations jointly. About 29% of the latter amount went to the federal government and 71% to the Quebec government. We also note that this global budgetary impact of \$2,411 million exceeds by about \$240 million the rough estimate obtained earlier under the assumption that the elasticity of own-source revenues relative to GDP was equal to 1 (see note 21). This extra amount may be explained by the fact that we now take into account not only the increase in own-source revenues, but also the decrease in government transfers.

The estimated global budgetary impact of \$2,411 million compares against a *gross* cost of daycare subsidies of \$1,796 million reported by Quebec government accounts in 2008. However, it is important to note that, as parents of children in subsidized daycare are not eligible for Quebec's refundable tax credit for daycare expenses, the use of this tax credit has diminished considerably since 1997. This has allowed the government to realize non-negligible savings. We estimate that these savings amounted to \$150 million in 2008. Figure 6 explains how we arrive at this estimate. The figure draws two curves, both originating at index level 100 in

the year prior to the program's introduction (i.e., 1996). The bottom curve tracks the evolution of Quebec's refundable tax credit for daycare expenses. Its trajectory is rather flat and winds up at 104 in 2008. The top curve shows how the cost of the federal government's tax deduction for daycare expenses in all of Canada evolved over time. It is on a rising trend, reaching index level 182 in 2008.

Figure 6: Cost of federal and provincial tax relief for daycare expenses, 1996-2008 (1996 = 100)



Sources: Finances Québec (2011), Finance Canada (2010)

We assume that in the absence of the low-fee childcare program the cost of Quebec's refundable tax credit for daycare expenses would have mimicked that of the federal tax deduction for daycare expenses, that is, it would have increased by 82% between 1996 and 2008. With such growth, the cost of the Quebec tax credit would have been \$350 million in 2008 instead of \$200 million as was actually recorded. Hence our inference that in 2008 the Quebec tax credit was \$150 million smaller than in the absence of the childcare program. We recognize that the program may also have had an impact on the use of the federal deduction for daycare expenses by Quebec taxpayers. However, there are two opposite effects at work here: on the one hand, the number of Quebec parents using the federal deduction was much higher, but, on the other, the expenses deducted by each parent were much lower. We have neglected these effects, as they are likely to have only a small impact on net.

We conclude that in 2008 the *net* cost of childcare subsidies for the Quebec government amounted to \$1,646 million, that is, \$150 million less than their *gross* cost of \$1,796 million. The estimates that we report in Table 6 indicate that the static effect of the childcare program alone

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allowed the two levels of government to get back 31% of this net cost directly and 90% globally. Adding the dynamic effect, we find that the program's total tax-transfer return was 52% of the net cost directly and 147% globally.

CONCLUSION

In September 1997, the Quebec government launched a universal low-fee childcare program that initially targeted the 4 year olds and was gradually expanded to cover all preschool-age children (birth to 4 years) by September 2000. Over the past 15 years, there has been a spectacular jump in the proportion of Quebec children in this age group who attend regulated daycare. The percentage has shot up to 53% in 2011 from 18% in 1998. This trend has been unique to Quebec among Canadian provinces. Elsewhere in the country, the attendance rate in regulated daycare has not changed much. From 1998 to 2008, it hovered around 20% for children aged 0 to 5.

The labour force participation of Quebec women has also followed a different trend. In 1996, the labour force participation rate of mothers²⁴ was 4 percentage points lower in Quebec than in other parts of Canada. In the last 15 years it has increased more rapidly than elsewhere and is now higher than the national average²⁵. The increase in women employment in Quebec has been particularly marked among mothers of children under the age of 15 and among heads of single-parent families.

Based on our review of existing studies, we have calculated that the low-fee childcare program was responsible for about 70,000 additional Quebec mothers being at work in 2008. We have then estimated that this influx of women in Quebec's labour force led to a \$5.1 billion increase in provincial domestic income (GDP) in that year.

More employed women and increased domestic income have had a significant positive impact on government fiscal balances, generating more income and other taxes and lower transfers. We have estimated that the tax-transfer return to the federal and provincial administrations from the childcare program ranged from \$500 million to \$2.4 billion in 2008, depending on

²⁴ That is, women age 15-64 with children under the age of 16.

²⁵ Women labour force participation has also increased briskly in the three Maritime Provinces over the 1996-2011 period.

whether the particular impact considered was direct or global, and whether only the program's static effect was considered or its dynamic effect was taken into account as well.

Finally, we have compared the \$2.4 billion overall budgetary return against the program's cost in 2008. We have taken into account that the lower use of the Quebec refundable tax credit for daycare expenses was subtracting some \$150 million from the out-of-pocket cost of the childcare program for the Quebec government. Our resulting estimate has been that the net cost of the program was just over \$1.6 billion in 2008. One implication is that the direct budgetary impact arising from the program's static effect and benefitting the two governments covered of 31% of its net cost. Adding the dynamic effect and extending estimation to the global budgetary impact, we have found that the program did much better than just pay for itself. Quebec's net expenditure of \$1.6 billion generated a favourable budgetary impact of \$2.4 billion for the federal and Quebec administrations taken together. The breakdown was \$1.7 billion for Quebec and \$0.7 billion for Ottawa. One way to sum it up is that in 2008 each \$100 of daycare subsidy paid out by the Quebec government generated a return of \$104 for itself and a windfall of \$43 for the federal government.

Quebec's low-fee childcare program has been financially "profitable" for the two levels of government. This in itself is interesting and reassuring. However, this is neither a necessary nor a sufficient condition for it to qualify as a "good" program. There is no doubt that the program makes it easier for parents to better balance work and family. But it needs to be recognized that its rapid growth has given rise to various problems. Above all, the demand for subsidized spaces still considerably exceeds the supply. Moreover, the development of new facilities, place assignment rules, the flexibility of operating hours, the quality of educational services (particularly for children from low-income backgrounds), short- and long-term effects on child development, the rate of investment in staff training, and the universal nature of the program are regular topics of debate. Nevertheless, the program is extremely popular with young families, so that it is definitely there to stay. Consequently, these problems must be viewed as challenges to growth that must be met rather than as threats to the program's survival.

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