# A Note on the Microsimulation Modelling Results of the "Working Model": An Alternative Policy for Alleviating the Cost of Care Developed by the Taskforce on Care Costs

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# 1. Introduction

The aim of this note is to analyse the effects of a number of changes to subsidies provided to households who have to purchase childcare services so that the secondary earner or single parent can participate in the labour market, in training, in education or in looking for work activities. The note distinguishes between effects on (i) labour force participation of fathers and mothers, and on (ii) government expenditures.

The Taskforce on Care Costs (TOCC) has a broader interest in the cost of caring extending beyond the cost for childcare, and they were interested in having the effects of elder and disability care costs analysed as well as the effects of childcare costs. However, due to data limitations and the fact that a model applying to these other types of care has not been built yet, only the effects related to childcare are analysed in this note.

This note is concerned with the following:

1. Identify whether the proposed working model of providing a 50% reimbursement of out-of-pocket childcare costs up to a maximum of $20,000 per year per family (or the alternative of a 100% reimbursement) will have a positive impact on current workforce participation levels for workers with caring responsibilities;
2. If this is indeed so:
    a. Determine the expected size of the effect; and
    b. Analyse how this is likely to be distributed across various segments of Australian families with caring responsibilities; and
3. Conduct a cost/benefit analysis to assess the upfront costs of the working model for Government (that is, without taking into account any labour supply responses), and the comparative benefits of the expected increase in workforce participation for workers with caring responsibilities (and therefore contributions to the economy in terms of income tax and reduced income support).

Section 2 of the note briefly describes the current situation and the "working model" of the TOCC and the aspects of this policy that are analysed here. Section 3 describes the

approach used, the assumptions that have been made and the limitations of the model. Section 4 gives the results for the two versions of the working model.

## 2. The current situation and the working model

In the before and after reform situation the social security and income tax system are the same (as current on 1 July 2006). In addition, the Childcare Benefit remains unchanged as well. The only difference is that the current 30% Child Care Tax Rebate for formal childcare costs is replaced with a reimbursement of 50% and 100% respectively of the out-of-pocket formal and informal childcare costs up to a maximum amount of either $20,000 per year per family or the earned income of the secondary earner, whichever is the lower of the two. Both the Child Care Tax Rebate and the two alternatives proposed by the TOCC are available to couples where both partners are either in work, studying, or looking for work. If the secondary partner or the single person does not have a positive income then the maximum amount that is rebatable is set to $20,000.

One of the disadvantages of the current system is that it is paid out through the tax system with a delay of 1 to 2 years (that is childcare costs made in 2004-2005 can be claimed for the 2005-2006 tax year after July 2006). The proposed alternative would be paid out directly (fortnightly) through alternative channels. The proposed alternative also allows for more choice by households, with regard to the type of childcare they would like to use, by allowing informal care costs (such as those for a nanny, which for larger families could be more economical) to be reimbursed as well as formal childcare costs. In addition, the rebate paid in the current system is a tax refund. It can only be paid if the parents have a sufficiently large tax liability in the relevant tax year.

## 3. The approach

We use a microsimulation model to calculate the effect of changing the current childcare subsidies to those proposed by the TOCC.[1] The microsimulation is based on a sample of

[1] The expected effects presented in this note are based on estimated models and on simulations. The effects are not actually observed. Assumptions underlying the model and limitations of the model are outlined in this section, and in Appendices B and C. Although there is uncertainty surrounding the predicted effects, the analyses provide us with useful information about the relative size and direction of the effects for different groups in the population and of the effects of alternative policies.

representative Australian households in the 2002/2003 Survey of Income and Housing Costs (SIHC), which can be weighted to obtain population amounts. This is the latest survey available that has been incorporated in the microsimulation model. Detailed information is available on each household and on the individuals in the households. This allows us to replicate the social security payments received and income tax paid for each individual and household. The information is updated to 2006 values using the Consumer Price Index and the Average Weekly Earnings Indices for men and women (ABS: 2006a, 2006b). [2]

The SIHC contains no information on childcare use and cost, so these are imputed for each household based on a model estimated using the second wave of Households, Income and Labour Dynamics in Australia data (HILDA), using household and individual characteristics that are observed in the HILDA and the SIHC data. Details on this methodology can be found in Doiron and Kalb (2005a, or in the more extended version: 2005b). In that study, the authors estimated costs of and demands for childcare conditional on labour supply and on household characteristics based on the 1996 Australian Bureau of Statistics' (ABS) Child Care Survey (CCS) data. These estimates were used to impute revised net incomes (the original net incomes minus the imputed childcare costs) for the households in another data set, the 1996 SIHC. Labour supply parameters were then estimated taking into account the imputed childcare costs. This model was recently updated by using the 2002 wave of the HILDA and the 2002/2003 SIHC. The updated model is used for the analysis in this note.

Formal childcare fees are constructed for 2002 using information from the Census of Child Care Services (FaCS, 2003). See Appendix C for a table with the fees by state and age of the child. These fees are inflated by the CPI in the simulations in this note. In addition, we have increased childcare fees by an additional amount of 42.4% over the period from 2002 to mid 2006, based on four years with an additional yearly 12.4% increase in childcare prices as reported for the two years from 2004 to 2006 in Taskforce on Care Costs (2006). This would result in a 59.6% price increase over the four years. Over the same time period

[2] The description of microsimulation modelling presented here is very brief. Detailed discussion of the type of microsimulation model used in this analysis can be found in Creedy and Kalb (2005b, 2006).

of four years, the increase in CPI was 12.1%, so the increase in childcare fees in addition to the CPI was 42.4% (1.596/1.121=1.424).

In order to simulate the current situation and the situation under the alternative proposed policy, a few assumptions and simplifications are needed. A crucial assumption is that no one who would like to enter the labour market or increase their hours worked is restricted by a lack of labour demand. In the current situation of low unemployment, this is a reasonable assumption to make, although there still may be a mismatch of skills between the additional workers and the available vacancies.

Another assumption in the microsimulation modelling is that everyone who is eligible for any of the government-provided payments will take up these payments.

One limitation of the model is that it cannot predict labour supply changes for individuals who are currently self-employed. This is due to the lack of information on hours worked by the self-employed in the data that we use and the lack of a labour supply model applying to the self-employed. In section 4.2 (Tables 9 and 10), we present the proportion of individuals who are self-employed in the sole parents and the couples with children groups.

The current Child Care Tax Rebate (CCTR) is calculated based on current childcare costs, current income and current labour force status, because information for preceding years is not available in the data. In addition, the model is a point-in-time model and cannot account for the effect of delaying the payment (that is rebating childcare costs of 2004-2005 at the end of the financial year 2005-2006). That is, the results are calculated without taking into account the CCTR time delay, because our model cannot take the time delay into account. As far as the model is concerned, households receive the CCTR payment as soon as they make the childcare costs. This delay is likely to be particularly important for low-income households, where the additional childcare payments may be crucial in the labour force decision and the two-year wait for the subsidy cannot be bridged (that is, without the additional payments, employment may not be viable for the primary carer). This inability to allow for time delays causes us to overestimate the CCTR effect on labour force participation, and as a consequence of overestimating the CCTR effect, the TOCC will be underestimated because we are comparing the alternative policy to something that is more favourable than the current situation is in reality. The present value of the CCTR is lower

than the amount we calculate because it will be paid in the future rather than immediately. The effect of the TOCC alternatives is likely to be underestimated due to leaving out the difference in waiting time between the current policy and the alternative policies. For this reason, we carry out an alternative simulation, ignoring the CCTR completely, to provide an upper boundary of the effect we are interested in.

Finally, any changes in childcare pricing by childcare providers or behavioural changes in households' demands for childcare (beyond the obvious increase in childcare use when labour supply increases) resulting from the proposed changes in childcare subsidies are not included in this modelling. For example, we assume that the additional subsidy will not lead to increased childcare prices and that parents are not going to choose more expensive forms of childcare due to the increased subsidy. Neither do we allow for an increase in childcare prices as a result of the potential increase in the demand for childcare due to higher subsidies.

# 4. The Results

### 4.1 Results for fixed labour supply

The first set of results, presented in Table 1, relates to the simulated total expenditure on childcare related subsidies in the current situation and under the alternative policies. Comparing the current system (1 July 2006) that includes the 30% Child Care Tax Rebate with the current system where the Child Care Tax Rebate is replaced with the 50% TOCC reimbursement, the expected increase in total government expenditure, assuming that everyone works at the same hours level for the latter is $0.762 billion. When the Child Care Tax Rebate is replaced with the 100% TOCC reimbursement, the expected increase is $1.992 billion. These amounts are likely to be somewhat higher if childcare use, and therefore also childcare costs, are indeed underestimated in our model as seems to be the case, given the predicted amount of Child Care Benefit Payments. The relative size of the effects will however remain similar. That is, increasing the 50% reimbursement to a 100% reimbursement will be relatively costly.

When labour supply is fixed, government expenditure on social security payments and family payments, and government revenue from income taxation and the medicare levy will

not change.[3] This section, therefore, does not present government expenditure and revenue details. This will be left for the next section (Table 8), where we present total childcare subsidies, and government revenue and expenditure broken down by type of revenue and expenditure.

**Table 1: Total Annual Government Expenditures on Childcare Subsidies Before and After the Introduction of the TOCC Reimbursement (in $ millions)**

| | Current | TOCC 50% | TOCC 100% |
|---|---|---|---|
| Child Care Benefit Payments | 772 | 772 | 772 |
| Child Care July 2006 Tax Rebate | 458 | 0 | 0 |
| Child Care TOCC reimbursement | 0 | 1220 | 2450 |
| Total | 1230 | 1992 | 3222 |

Tables 2 and 3 present the average amount of the different childcare subsidies for families where the childcare costs are positive. For example, in Table 2 we can see that sole parents in the income range between 0 and 200 dollars per week, who have positive childcare costs, receive on average $27.87 per week in CCB. This increases with income at first, due to the larger amount of formal childcare used by higher income families, and then decreases due to the increased household income. For sole parent families, as the proposed 50% reimbursement is larger than the current 30% rebate, the average weekly payment (Table 3) increases from the current system.

**Table 2: Average Weekly Child Care Benefit Amounts for Sole Parent Families with Dependent Children who Incur Childcare Costs (in $)**

| | Current | TOCC 50% | TOCC 100% |
|---|---|---|---|
| Gross weekly income $0 - $200 | 27.87 | 27.87 | 27.87 |
| Gross weekly income $200 - $800 | 32.13 | 32.13 | 32.13 |
| Gross weekly income $800 - $1200 | 27.66 | 27.66 | 27.66 |
| Gross weekly income > $1200 | 7.79 | 7.79 | 7.79 |

**Table 3: Average Weekly Child Care Tax Rebate Amounts and TOCC Reimbursement Amounts for Sole Parent Families with Dependent Children who Incur Childcare Costs (in $)**

| | Current (CCTR) | TOCC 50% | TOCC 100% |
|---|---|---|---|
| Gross weekly income $0 - $200 | 2.11 | 5.95 | 11.91 |
| Gross weekly income $200 - $800 | 13.59 | 34.56 | 69.12 |
| Gross weekly income $800 - $1200 | 16.89 | 41.49 | 82.99 |
| Gross weekly income > $1200 | 12.03 | 40.68 | 81.35 |

[3] Labour supply is fixed to the level observed in the 2002/2003 data.

The net result in terms of changes in the total subsidies as a percentage of childcare costs is that a larger proportion of childcare costs is now subsidised. Table 4 shows that for families with gross weekly incomes of $0-$200, under the 50% TOCC reimbursement, the increase in subsidies increases from 33.9% before the reform to 40.6% after the reform. The increase in subsidies for those on higher incomes is considerably more. For families with gross weekly incomes between $200 and $800, the subsidy increases from 39.1% to 63.0% of costs. The increase in subsidies is largest for those with more than $1200 in gross weekly income who experience an increase in the percentage of childcare costs subsidised from 17.6% to 53.4%. The subsidies are partly related to income, and in addition people on higher incomes tend to spend more on childcare, whereas people on lower incomes are more likely to use informal childcare at no cost or low cost. As a result, the increase in subsidies is on average higher for the higher income groups. Finally, the alternative childcare subsidies are targeted at improving the financial incentives for primary carers who are in the labour force. Sole parents in the lowest income group are the least likely to be in the labour force. Therefore, they are less likely to be eligible for the new TOCC subsidies and, as a result, will not experience a reduction in the proportion of childcare cost paid by themselves.

**Table 4: Average Weekly Child Care Total Subsidies as a Percentage of Childcare Costs for Single Families with Dependent Children who incur child care costs (in %)**

| | Current (CCTR + CCB) | TOCC 50% (TOCC + CCB) | TOCC 100% (TOCC + CCB) |
|---|---|---|---|
| Gross weekly income $0 - $200 | 33.9 | 40.6 | 49.6 |
| Gross weekly income $200 - $800 | 39.1 | 63.0 | 99.1 |
| Gross weekly income $800 - $1200 | 35.3 | 60.7 | 99.9 |
| Gross weekly income > $1200 | 17.6 | 53.4 | 99.9 |

Under the 100% TOCC reimbursement, sole parents with $0-$200 of gross weekly earnings receive a 15.7 percentage point increase in subsidies, families with more than $200 in gross weekly earnings gain between 60 and 82 percentage points in subsidies. For sole parents on higher incomes nearly 100% of cost is reimbursed, since all sole parents in these income groups are in the labour force. This implies that these childcare costs are nearly completely borne by the government. As we will see in Table 7 this is not the case for couple families,

since not all primary carers are in the labour force when household income increases (although the proportion of labour force participants is probably increasing with household income). Therefore, the proportion of childcare costs reimbursed is clearly less than 100% for couple families in all income categories.

Tables 5 to 7 present similar information for couple families as is presented in Tables 2 to 4 for sole parents. For couple families, there is an issue with the difference in treatment of individuals on a low income versus those without income. Under the proposed 50% reimbursement, if the secondary person does not have positive income, the maximum amount that is rebatable is set to $20,000. However, if the secondary person has a small amount of income (e.g. $1000 a year), the 50% TOCC reimbursement is based on the lesser amount of the actual care costs and the total labour-related income of the lower income spouse. Under the current rebate system, eligibility for the Child Care Tax Rebate can be fully or partly transferred to the primary earner. As a result, although in principle the proposed 50% reimbursement is more generous than the current 30% rebate, the TOCC proposal can in effect penalise families when the secondary earner is on a low income. Some couples with low secondary earnings may end up with a smaller proportion of their childcare costs subsidised after the reform.

**Table 5: Average Weekly Child Care Benefit Amounts for Couple Families with Dependent Children who Incur Child Care Costs (in $)**

| | Current | TOCC 50% | TOCC 100% |
|---|---|---|---|
| Gross weekly income $0 - $200 | 28.69 | 28.69 | 28.69 |
| Gross weekly income $200 - $800 | 27.71 | 27.71 | 27.71 |
| Gross weekly income $800 - $1200 | 24.38 | 24.38 | 24.38 |
| Gross weekly income > $1200 | 13.36 | 13.36 | 13.36 |

**Table 6: Average Weekly Child Care Tax Rebate Amounts and TOCC Reimbursement Amounts for Couple Families with Dependent Children who Incur Child Care Costs (in $)**

| | Current (CCTR) | TOCC 50% | TOCC 100% |
|---|---|---|---|
| Gross weekly income $0 - $200 | 1.14 | 5.87 | 11.73 |
| Gross weekly income $200 - $800 | 4.07 | 10.91 | 21.83 |
| Gross weekly income $800 - $1200 | 7.34 | 20.19 | 40.39 |
| Gross weekly income > $1200 | 16.84 | 45.39 | 90.80 |

**Table 7: Average Weekly Child Care Total Subsidies as Percentage of Child Care Costs for Couple Families with Dependent Children who incur child care costs (in $)**

| | Current (CCTR + CCB) | TOCC 50% (TOCC + CCB) | TOCC 100% (TOCC + CCB) |
|---|---|---|---|
| Gross weekly income $0 - $200 | 34.9 | 40.2 | 46.8 |
| Gross weekly income $200 - $800 | 31.9 | 39.7 | 51.9 |
| Gross weekly income $800 - $1200 | 30.0 | 42.9 | 62.7 |
| Gross weekly income > $1200 | 23.6 | 46.3 | 82.0 |

Due to the clause that the reimbursements are the lesser amount of actual care costs or the total income of the lower income spouse combined with the fact that many secondary earners earn relatively small amounts, and the fact that couple families are more likely to use childcare even if the primary carer is not in paid employment, the overall effect is to increase the percentage of subsidy by a lesser amount for couple families than for sole parent families. However, similar to the sole parents, the highest income group still enjoys the largest gain in terms of the additional proportion of childcare costs subsidised, due to this group being more likely to have a secondary earner than the lower income groups, and are therefore more likely to receive the TOCC reimbursements.

### 4.2 Results allowing for labour supply responses

This section discusses the behavioural responses. For each simulation of the effect of changing the current system to the proposed alternative, two runs are required from the simulation model. This is due to the fact that the data used in the simulation is not collected in 2006 but in 2002/2003. Because we use observed labour supply as the starting point in our simulations and the data is from 2002/2003, our starting point also needs to be 2002/2003. We therefore need to simulate the effect on labour supply when going from the tax and transfer system as it was in 2002/2003 to the current tax and transfer system (July 2006) and to the alternative system as proposed by the TOCC. We can then take the difference between the alternative TOCC system and the current tax and transfer system by taking the difference from the two sets of results obtained from the two simulation runs.

Table 8 presents the results on Government Revenue and Expenditure under the different systems for sole parents and couples with dependent children separately. The first three rows in each part of the table present the predicted revenue, consisting of the amount of

income tax and the medicare levy. The table shows that both revenue components increase for sole parent and couple families.

**Table 8: Government Revenue and Expenditure under the Different Policies by Demographic Group (in $millions per year)**

| | Current System | 50% TOCC | 100% TOCC |
|---|---|---|---|
| **sole parents** | | | |
| *Government Revenue* | | | |
| Income Tax | 2594.2 | 2644.4 | 2702.6 |
| Medicare | 137.3 | 139.9 | 142.2 |
| Total Revenue | 2731.5 | 2784.3 | 2844.8 |
| *Government Expenditure* | | | |
| Tax Rebates | 424.8 | 421.9 | 423.8 |
| Family Tax Benefit, part A and B | 4874.6 | 4869.8 | 4865.2 |
| Allowances | 4035.2 | 3949.6 | 3840.9 |
| Pensions | 364.0 | 363.8 | 362.9 |
| Pharmaceutical Allowance | 60.3 | 59.9 | 59.6 |
| Rent Allowance | 626.4 | 625.0 | 623.5 |
| Total Expenditure | 10385.3 | 10290.0 | 10175.9 |
| Net Expenditure | 7653.8 | 7505.7 | 7331.1 |
| childcare subsidies | 281.4 | 436.2 | 821.4 |
| **Couples with dependent children** | | | |
| *Government Revenue* | | | |
| Income Tax | 36875.6 | 36992.3 | 37146.6 |
| Medicare | 3001.1 | 3015.3 | 3035.0 |
| Total Revenue | 39876.7 | 40007.6 | 40181.7 |
| *Government Expenditure* | | | |
| Tax Rebates | 743.2 | 745.4 | 749.7 |
| Family Tax Benefit, part A and B | 11615.1 | 11533.9 | 11423.7 |
| Allowances | 3630.7 | 3599.5 | 3564.6 |
| Pensions | 1233.7 | 1233.7 | 1233.3 |
| Pharmaceutical Allowance | 10.1 | 10.0 | 10.0 |
| Rent Allowance | 634.5 | 632.1 | 628.4 |
| Total Expenditure | 17867.3 | 17754.6 | 17609.7 |
| Net Expenditure | -22009.4 | -22253.0 | -22572.0 |
| childcare subsidies | 708.8 | 1272.8 | 2361.3 |

The following seven rows in both parts of Table 8 present information on government expenditure components. All expenditures, except the rebates, decrease with the introduction of the TOCC reimbursement policies.[4] Allowances (such as NewStart

[4] An increase in income can have two alternative (and opposite) effects on the amount of tax rebate received. First, the increase in paid income taxes could mean there is a larger amount of tax to be offset by the tax rebates. This would cause tax rebates to increase. Second, the increase in income could mean that individuals now fall into the withdrawal range of the rebate, which would cause a decrease in tax rebates. The first effect dominates in most cases. That is, tax rebates mostly increase slightly due to the increase in income tax paid by

Allowance or Parenting Allowance) and family payments decrease to the largest extent. Only few households with children would receive any pension payments, and people on pensions (such as Disability Support Pension or the Age Pension) are usually not expected to respond to financial incentives. The following row represents the net government expenditure taking the difference between total expenditure and total revenue. The fact that it is negative for couple families with children indicates that the government receives more income tax and medicare levy payments from these households than it spends on income support and family payments for these households. That is, net revenue is positive for this group. Finally, the predicted amounts of childcare subsidies are presented separately in the bottom row and are an additional separate expenditure to the government.[5]

Compared to the increase in childcare subsidies due to implementing the 50% and 100% TOCC reimbursement (of 0.719 billion and 2.193 billion dollars per year respectively), the increase in net government revenue (or the decrease in net government expenditure) is about 54 and 40% of the additional cost in subsidies respectively.[6] For sole parents, the cost of the 50% TOCC reimbursement seems to be close to completely returned in increased tax revenue and decreased income support. An increase in labour supply of sole parents is more likely to result in both increased tax revenue and decreased income support than an increase in labour supply of partnered mothers. The partners' incomes of the latter group may be sufficient to make partnered mothers ineligible for income support even when they are not in paid employment.

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the households. The exception is for the 50% TOCC in the sole parents group. In this group, the second effect dominates.

[5] The total childcare subsidies presented in Table 8 are somewhat different from those presented in Table 1. This is mostly due to the predicted changes in labour supply. In addition, there is a small difference due to the calculation of all payments at the discrete labour supply points, which means all observed hours are rounded to the closest multiple of 5 hours (for all individuals except partnered men) or 10 hours (for partnered men).

[6] These two percentages are derived by adding childcare subsidies for sole parents and couples with children and by adding the net expenditures for sole parents and couples with children. We then take the difference between the alternative policy and the current policy and compute the proportion of the change in the childcare subsidies which is compensated by the increased revenue for the government. To give a practical example of the calculation, we compute the 50% TOCC percentage in the following way. First we add $281.4 million and $708.8 million to obtain total childcare subsidies in the current situation. We do the same for the 50% TOCC ($436.2 + 1272.8 million). Then we compute the total net expenditure in the current situation ($7653.8 – 22009.4 million) and the 50% TOCC situation ($7505.7 – 22253 million). We then take the difference in subsidies in the current situation and the 50% TOCC situation and the difference in net expenditure in the current situation and the 50% TOCC situation. In this case the difference in net expenditure is negative which indicates there is an increase in net revenue. We take the ratio of this increase in net revenue and the increase in childcare subsidy which is 0.54 or 54%.

The labour supply responses for single parents are reported in Tables 9 and 10 while the labour supply responses for couples are reported in Tables 11 to 13. Comparing labour supply effects across the demographic groups, a larger effect is observed for sole parents than for partnered mothers (compare Tables 9 and 10 with Tables 11 and 12). The larger effect could be partly due to a larger proportion of sole parents using informal care (and paying for this informal care, even if it is a small amount), especially when they are on a low income, and partly it could be due to the lower wages (and lower household incomes) of sole parents on average, which means the childcare subsidy is more relevant to this group's labour supply. As a result, they are more likely to benefit to a larger extent from the proposed changes.

**Table 9 Summary of Labour Supply Responses for Single Parent Families with Dependent Children (in % of population)**

| | Current System | 50% TOCC | 100% TOCC | Current System without CCTR |
|---|---|---|---|---|
| Labour force participants | 52.18 | 53.99 | 57.03 | 50.78 |
| self employed | 4.91 | 4.91 | 4.91 | 4.91 |
| wage and salary workers | 47.27 | 49.08 | 52.12 | 45.87 |
| average hours change in hours per week | | 0.57 | 1.46 | -0.40 |

**Table 10 Distribution of Sole Parents with Dependent Children over the Levels of Labour Supply (in % of population, 0 includes those who are self employed)**

| **Hours per week** | **0** | **5** | **10** | **15** | **20** | **25** | **30** | **35** | **40** | **45** | **50** | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Current System* | *52.7* | *2.1* | *3.5* | *3.0* | *4.5* | *3.0* | *4.2* | *5.6* | *11.8* | *3.1* | *6.5* | *100.0* |
| Gross weekly income $0 - 200 | 90.8 | 3.1 | 3.2 | 0.7 | 0.4 | 0.4 | 0.2 | 0.2 | 0.2 | 0.5 | 0.2 | 100.0 |
| Gross wkly income $200 - 800 | 13.1 | 1.3 | 6.3 | 8.8 | 13.6 | 9.3 | 10.8 | 9.6 | 16.3 | 3.7 | 7.2 | 100.0 |
| Gross wkly income $800 - 1200 | 7.3 | 0.3 | 0.1 | 0.0 | 2.2 | 0.2 | 6.8 | 13.2 | 37.9 | 7.9 | 24.0 | 100.0 |
| Gross wkly income > $1200 | 9.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 1.7 | 16.9 | 37.9 | 12.0 | 21.9 | 100.0 |
| *50% TOCC* | *50.9* | *2.0* | *3.6* | *3.1* | *4.7* | *3.2* | *4.5* | *5.8* | *12.2* | *3.2* | *6.6* | *100.0* |
| Gross weekly income $0 - 200 | 89.4 | 3.1 | 3.4 | 0.9 | 0.6 | 0.6 | 0.4 | 0.4 | 0.3 | 0.6 | 0.3 | 100.0 |
| Gross wkly income $200 - 800 | 9.7 | 1.2 | 6.2 | 8.9 | 14.1 | 9.7 | 11.6 | 9.9 | 17.3 | 4.0 | 7.5 | 100.0 |
| Gross wkly income $800 - 1200 | 6.9 | 0.3 | 0.0 | 0.0 | 2.1 | 0.2 | 6.7 | 13.3 | 38.1 | 8.0 | 24.3 | 100.0 |
| Gross wkly income > $1200 | 9.2 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 1.7 | 16.9 | 37.9 | 12.1 | 21.9 | 100.0 |
| *100% TOCC* | *47.9* | *2.0* | *3.7* | *3.5* | *5.2* | *3.8* | *5.0* | *6.2* | *12.5* | *3.5* | *6.8* | *100.0* |
| Gross weekly income $0 - 200 | 83.9 | 3.1 | 3.8 | 1.8 | 1.6 | 1.6 | 1.2 | 0.9 | 0.8 | 0.8 | 0.5 | 100.0 |
| Gross wkly income $200 - 800 | 9.1 | 1.2 | 5.8 | 8.7 | 13.8 | 9.9 | 11.8 | 10.1 | 17.6 | 4.2 | 7.8 | 100.0 |
| Gross wkly income $800 - 1200 | 6.9 | 0.3 | 0.0 | 0.0 | 2.1 | 0.2 | 6.7 | 13.3 | 38.1 | 8.1 | 24.4 | 100.0 |
| Gross wkly income > $1200 | 9.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 1.7 | 16.9 | 38.0 | 12.1 | 21.8 | 100.0 |

**Table 11 Summary of Labour Supply Responses for Couple Families with Dependent Children (in % of population)**

| | Current System | | 50% TOCC | | 100% TOCC | | Current System without CCTR | |
|---|---|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women | Men | Women |
| Labour force participants | 89.17 | 61.12 | 89.27 | 61.74 | 89.40 | 62.63 | 89.11 | 60.67 |
| self employed | 14.64 | 8.14 | 14.64 | 8.14 | 14.64 | 8.14 | 14.64 | 8.14 |
| wage and salary workers | 74.53 | 52.98 | 74.63 | 53.6 | 74.76 | 54.49 | 74.47 | 52.53 |
| average hours change in hours per week | | | 0.04 | 0.20 | 0.08 | 0.51 | -0.02 | -0.15 |

**Table 12 Distribution of Partnered Mothers with Dependent Children over the Levels of Labour Supply (in % of population, 0 includes those who are self employed)**

| Hours per week | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Current System* | *47.0* | *2.8* | *4.0* | *4.9* | *7.0* | *5.7* | *5.8* | *4.9* | *10.7* | *2.6* | *4.6* | *100.0* |
| Gross weekly income $0 - 200 | 93.0 | 2.8 | 2.9 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.0 | 100.0 |
| Gross wkly income $200 - 800 | 74.0 | 2.6 | 2.9 | 3.1 | 3.8 | 2.3 | 3.9 | 1.2 | 4.4 | 0.6 | 1.2 | 100.0 |
| Gross wkly income $800 - 1200 | 56.7 | 3.9 | 6.0 | 4.8 | 7.5 | 3.2 | 4.7 | 3.3 | 6.6 | 0.9 | 2.5 | 100.0 |
| Gross wkly income > $1200 | 28.5 | 2.5 | 3.8 | 6.3 | 8.9 | 8.3 | 7.6 | 7.3 | 15.5 | 4.2 | 7.1 | 100.0 |
| *50% TOCC* | *46.4* | *2.8* | *4.0* | *5.0* | *7.1* | *5.7* | *5.9* | *5.0* | *10.8* | *2.7* | *4.7* | *100.0* |
| Gross weekly income $0 - 200 | 92.7 | 2.8 | 2.9 | 0.3 | 0.3 | 0.2 | 0.3 | 0.2 | 0.1 | 0.1 | 0.0 | 100.0 |
| Gross wkly income $200 - 800 | 73.7 | 2.6 | 2.9 | 3.2 | 3.9 | 2.3 | 4.0 | 1.2 | 4.4 | 0.6 | 1.2 | 100.0 |
| Gross wkly income $800 - 1200 | 56.2 | 3.9 | 6.0 | 4.9 | 7.7 | 3.2 | 4.8 | 3.3 | 6.6 | 0.9 | 2.5 | 100.0 |
| Gross wkly income > $1200 | 27.7 | 2.5 | 3.8 | 6.3 | 8.9 | 8.4 | 7.7 | 7.4 | 15.8 | 4.3 | 7.2 | 100.0 |
| *100% TOCC* | *45.5* | *2.8* | *4.0* | *5.0* | *7.2* | *5.9* | *6.0* | *5.1* | *11.0* | *2.8* | *4.7* | *100.0* |
| Gross weekly income $0 - 200 | 92.1 | 2.7 | 2.9 | 0.3 | 0.4 | 0.3 | 0.4 | 0.3 | 0.2 | 0.2 | 0.1 | 100.0 |
| Gross wkly income $200 - 800 | 72.8 | 2.6 | 3.0 | 3.3 | 4.0 | 2.5 | 4.1 | 1.4 | 4.5 | 0.7 | 1.3 | 100.0 |
| Gross wkly income $800 - 1200 | 55.2 | 3.9 | 6.1 | 5.0 | 7.9 | 3.4 | 5.0 | 3.5 | 6.7 | 1.0 | 2.5 | 100.0 |
| Gross wkly income > $1200 | 26.9 | 2.4 | 3.8 | 6.3 | 9.0 | 8.6 | 7.8 | 7.5 | 16.1 | 4.4 | 7.3 | 100.0 |

**Table 13 Distribution of Partnered Fathers with Dependent Children over the Levels of Labour Supply (in % of population, 0 includes those who are self employed)**

| Hours per week | 0 | 10 | 20 | 30 | 40 | 50 | Total |
|---|---|---|---|---|---|---|---|
| *Current System* | *25.5* | *1.3* | *1.8* | *4.6* | *38.6* | *28.2* | *100.0* |
| Gross weekly income $0 - $200 | 94.6 | 1.8 | 0.9 | 0.5 | 1.1 | 1.1 | 100.0 |
| Gross weekly income $200 - $800 | 41.7 | 3.4 | 4.9 | 7.3 | 33.9 | 8.8 | 100.0 |
| Gross weekly income $800 - $1200 | 22.2 | 2.0 | 1.6 | 4.0 | 46.6 | 23.6 | 100.0 |
| Gross weekly income > $1200 | 10.7 | 0.4 | 1.2 | 4.7 | 43.4 | 39.7 | 100.0 |
| *50% TOCC* | *25.4* | *1.3* | *1.8* | *4.6* | *38.7* | *28.2* | *100.0* |
| Gross weekly income $0 - $200 | 94.3 | 1.8 | 0.9 | 0.6 | 1.3 | 1.2 | 100.0 |
| Gross weekly income $200 - $800 | 41.7 | 3.4 | 4.8 | 7.4 | 33.8 | 8.9 | 100.0 |
| Gross weekly income $800 - $1200 | 22.2 | 2.0 | 1.6 | 4.1 | 46.6 | 23.6 | 100.0 |
| Gross weekly income > $1200 | 10.6 | 0.4 | 1.2 | 4.7 | 43.6 | 39.6 | 100.0 |
| *100% TOCC* | *25.2* | *1.3* | *1.8* | *4.7* | *38.8* | *28.1* | *100.0* |
| Gross weekly income $0 - $200 | 93.6 | 1.8 | 0.9 | 0.7 | 1.6 | 1.4 | 100.0 |
| Gross weekly income $200 - $800 | 41.6 | 3.4 | 4.8 | 7.4 | 33.7 | 9.1 | 100.0 |
| Gross weekly income $800 - $1200 | 22.1 | 2.0 | 1.6 | 4.2 | 46.5 | 23.7 | 100.0 |
| Gross weekly income > $1200 | 10.5 | 0.4 | 1.2 | 4.7 | 43.8 | 39.5 | 100.0 |

A very small effect is observed for partnered men (see Tables 11 and 13). This result is as expected and is consistent with results found by other researchers. Married men usually work full time and are not affected much by changes in financial incentives. The effect observed for partnered women is somewhat larger than for partnered men but lower than for sole parents. We suspect that the relatively small effect is due to the reimbursement being paid to a relatively large number of individuals who already are in the labour market.

To summarise the effects for the 50% TOCC reimbursement, the expected percentage increase in labour force participation is 3.5% for sole parents, 0.1% for partnered men and 1.0% for married women. For all groups combined, the expected percentage increase in labour force participation is 0.9% (which translates into just over 43,000 new entrants into the labour force) and average hours of work per week increase by 0.17 hours. For the 100% TOCC reimbursement, the expected percentage increase in labour force participation is 9.3% for sole parents, 0.3% for partnered men and 2.5% for married women. For all groups combined, the percentage increase in labour force participation is 2.3% (which translates into just under 110,000 new entrants into the labour force) and average hours of work per week increases by 0.44 hours.

For sole parents and partnered men, the largest labour supply effects are found for those at lower gross household incomes. The effect is largely to decrease the proportion of non-participants, increasing the proportion of partnered men at 40 and 50 hours of paid work per week and the proportion of sole parents across all hours of labour supply between 10 and 50 hours per week. The effects on partnered women are found to be more equally distributed across the range of household incomes, although they appear to be somewhat more prevalent amongst those on higher household incomes.

As mentioned in Section 3, we cannot assess the effect of the child care tax rebate being paid at the time that the cost is made rather than after 1 to 2 years, as is the case with the current child care tax rebate. In an alternative simulation, we exclude the child care tax rebate when predicting current labour supply in July 2006. This would lead to a lower predicted labour supply in the starting point (see last columns of Tables 9 and 11). On average for sole parents, labour supply would be 0.4 hours lower and labour force

participation would be 1.4 percentage points lower. For married women, labour supply would be 0.15 hours lower and labour force participation would be 0.45 percentage points lower and for married men the difference would be quite small but in the same direction as for the other two groups. Compared to these lower labour supply levels, the labour supply under the alternative policies proposed by the TOCC would look more favourable, particularly for sole parents. The 'true' expected labour supply effect of introducing the TOCC reimbursements is likely to lie in between the values presented in the tables of this section and the larger effect implied by the lower expected labour supply in the starting point if the child care tax rebate were not taken into account.

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# Appendix A Childcare Fees

An additional external source of data was used to obtain average hourly childcare fees by age of the child and State of residency. Average fees were calculated from the Child Care Census 2002 (Department of Family and Community Services), weighting the hourly fees of different types of childcare by the number of children of a particular age using that type of childcare. The hourly fees are calculated by dividing the weekly fees of Private Long Day Care and Community Long Day Care by 50 hours, Family Day Care by 35 hours, and OSHC services by the average time of a session. Table A.1 presents the average fees for four age groups by State. The 12.4% additional yearly increases in childcare fees are used to construct hourly fees for later years.

**Table A.1: Hourly fees by state/territory and age of child in 2002 (in $)**

| | Age of child | | | | OSHC fee |
|---|---|---|---|---|---|
| ***States/Territories*** | ***5+*** | ***3-4*** | ***2*** | ***0-1*** | |
| New South Wales | 3.57 | 4.00 | 4.22 | 4.56 | 3.31 |
| Victoria | 3.35 | 3.84 | 3.85 | 3.89 | 3.13 |
| Queensland | 3.12 | 3.56 | 3.63 | 3.70 | 2.72 |
| South Australia | 3.43 | 3.96 | 3.91 | 3.97 | 3.02 |
| Western Australia | 3.78 | 3.71 | 3.77 | 3.88 | 3.57 |
| Tasmania | 4.12 | 4.28 | 4.25 | 4.28 | 3.77 |
| Northern Territory | 4.59 | 3.67 | 3.68 | 3.76 | 4.63 |
| Australian Capital Territory | 4.22 | 4.30 | 4.38 | 4.39 | 4.08 |
| **Total** | **3.43** | **3.86** | **3.94** | **4.07** | **3.14** |

# Appendix B The Imputation of Childcare Costs

The predicted demand for formal childcare and cost of informal childcare are used to impute childcare costs for households in the SIHC sample at different levels of hours of work. The modelling of the budget constraint for each household (in this case allowing for childcare costs) and more generally the labour supply form part of the Melbourne Institute Tax and Transfer Simulator (MITTS), a microsimulation model for Australia. First, for each hours level, a gross income level (together with all transfers and taxes) is computed within the MITTS model. Then, for each household with children of 12 years or younger in the SIHC a predicted cost of childcare is imputed based on the characteristics of the household (State, urban, number and age of children, couples versus lone parents, hours of labour supply, qualifications of childcare workers, childcare fees, and calculated gross income). This childcare cost is generated for each possible hours level allowed in the labour supply model.

Net costs are calculated from the predicted gross costs of childcare and the predicted levels of childcare benefits. These are calculated within MITTS based on the characteristics of the households and the predicted formal childcare costs (which are computed from predicted formal childcare demand multiplied by the average childcare fees for that particular household). Any childcare subsidies are deducted from formal costs (and informal costs in the "working model"), before adding the formal and informal costs together.[7] The result is a predicted net childcare cost for each household based on predicted formal demands, average fees per household, total predicted informal care costs and calculated subsidies.

Appendix C describes in more technical terms the labour supply model used. In summary, households are assumed to maximise a utility function of household consumption (assumed to equal net incomes) and leisure hours of the adults, subject to a time constraint for each adult and a household budget constraint. This budget constraint includes all main tax and transfer programs in place at the time of the survey. Household composition, non-labour

[7] It is assumed that all people paying for formal childcare are eligible for the childcare benefit for the hours they use (up to a maximum of 50 hours per child for those who work, study or are looking for work and 24 hours per child for the others).

incomes (other than government benefits) and wages are treated as exogenous. Labour supply choices are discrete and include the option of not working.

Individuals in our model have the choice between 11 labour supply points if they are single and 66 points if they are a couple family. Singles and married women can choose 0, 5, 10, 15,…, 50 hours and married men can choose 0, 10, 20, …, 50 hours. Married men and married women choose jointly from any combination of the 6×11 points. More labour supply means less leisure time. Each of the available labour supply points is associated with a net household income level and with an amount of leisure (including home production time) for each adult individual in the household. Net income and leisure time determine the household utility level which the household is assumed to maximise over the available labour supply choices. Parameters on net income and leisure time in the household utility function determine how much the household values each adults' leisure time and how much it values income. These parameters depend on individual and household characteristics such as for example, age of the individual, education and age of the youngest child. To give an example, the presence of a young child usually decreases the preference for labour supply of women. These parameters have been estimated previously and are used to predict labour supply responses in the microsimulation model.

Importantly, as we are interested in analysing the effect of varying childcare costs on hours worked, the household budget constraint also incorporates childcare costs. Rather than associating each household with one specific predicted childcare cost amount, recognising the uncertainty in predicted childcare costs, we use a simulation technique that involves repeated draws from the distribution of childcare costs to improve the efficiency of the model. This consists of including a draw of the error term when predicting childcare costs and demand using the model. This method provides a more efficient prediction of the childcare costs since it incorporates the variation in unobservables affecting costs based on the estimated variance of these unobservables. A further advantage is that the calculation of the Child Care Benefits is more accurate in this approach, given that the subsidy payable for the average childcare cost is not the same as the average Child Care Benefits. The labour supply model used here is based on 10 values drawn from the distribution of the unobservables in the model of hours of formal care and costs of informal care. In other words, 10 draws are taken for each household and the likelihood function is averaged over

these draws before being maximised. The optimal hours level of work can be predicted for each draw and an average is taken over the draws. Technically, this involves averaging the hours of work estimates rather than the childcare costs estimates.

# Appendix C The Labour Supply Model

The labour supply model is described in detail in Kalb (2002). Here, we provide an overview only. Given the aim of simulating policy changes with regard to taxes and transfers, priority is given to incorporating all possible details of the taxation and social security system. The approach follows most of the literature in adopting a neoclassical framework: utility is maximised conditional on the total amount of time available to each adult and a household budget constraint. It is expected that utility increases with an increase in leisure and home production time (referred to as leisure for convenience) and income (consumption of all other goods). Households maximise utility by choosing leisure (and hence labour supply) for each adult.[8] The labour supply values for each parent are the endogenous variables in the model. Wage rates, non-labour income (other than taxes and transfers), household composition and other household attributes are exogenous. Specifically, the exogenous factors include the number and ages of children, the age and education level of each parent, and components of income other than labour earnings, transfers and taxes. The rules of the taxation and social security systems are used to relate the net income of the household with its choices of labour supply. Separate models are specified for sole parents and couple families.

Turning to the choice of functional form, the labour supply function is modelled as a discrete choice. Restricting the number of possible working hours to a limited set of discrete values is done in many other studies (for example, Van Soest, 1995; Keane and Moffitt, 1998; Duncan et al., 1999). The advantage of using a discrete choice framework is that it allows more complex modelling of the budget constraint. Assuming there are two adults in the household, the labour supply is derived from the following:

$$\max U(x, l_1, l_2) \tag{1}$$

subject to a time constraint for each adult:

$$l_1 + h_1 = T \quad \text{and} \quad l_2 + h_2 = T \tag{2}$$

$$(h_1, h_2) \in \mathcal{A} \times \mathcal{B}$$

[8] It is assumed that all non-employed are voluntarily not working and that participants are at their preferred labour supply points.

and subject to a budget constraint:

$$x = w_1h_1 + w_2h_2 + y_1 + y_2 + B(c, w_1h_1 + w_2h_2 + y_1 + y_2) - \tau(B, w_1h_1 + y_1, w_2h_2 + y_2, c) \quad (3)$$

where U( ) is the utility function of a two-adult household; $l_1$ and $l_2$ indicate the leisure hours (including home production) per week of the husband and wife (married or de facto) respectively; $h_1$ and $h_2$ are the hours of work of husband and wife; $\mathcal{A}$ and $\mathcal{B}$ are the sets of discrete points from which values can be chosen for $h_1$ and $h_2$; T is the total time available for each person in the household; x indicates net income per week, which is assumed equal to household consumption; $w_1$ and $w_2$ are the gross wage rates of husband and wife respectively; $y_1$ and $y_2$ are the non-labour incomes of husband and wife; c is a set of household attributes; B(.) is the amount of benefit a household is eligible for given their household characteristics c and household income; and $\tau$ is the tax function that indicates the amount of tax to be paid.

In the discrete choice case the budget constraint is defined on a discrete set of points $h_1 \in \mathcal{A} = \{0, h_{11}, h_{12}, ..., h_{1m}\}$ and $h_2 \in \mathcal{B} = \{0, h_{21}, h_{22}, ..., h_{2k}\}$ on the interval [0,T], instead of being defined on a continuous set of working hours [0,T].[9] Using these sets, net income x is calculated for all (m+1)×(k+1) combinations of $h_1$ and $h_2$. For this limited set of hours, one can then calculate the level of utility generated by each possible combination of hours. The choice of labour supply is simultaneously determined for both adult members of the household. Depending on the choice of utility function, different interactions between household income and the labour supply of adults can be modelled. For one-adult households, the model is simplified by excluding everything related to the second adult.

To deal with unobserved market wages for people who are not working, we estimate their potential wage using a wage equation estimated on workers.[10] A two-stage selection model is used to correct for possible selection bias. Separate wage equations are estimated for married men, married women, single men, single women and lone parents (see Kalb and

[9] 0, $h_{11}$, $h_{12}$, etc represent the discrete values that labour supply can take. Here we have chosen 0, 5, 10, 15,…, 50 hours of labour supply for married women and singles. Given the low number of married men working low part-time hours, they are assumed to choose from 0, 10, 20, 30, 40 or 50 hours.

[10] This follows the approach used by Van Soest (1995) and many others in the area.

Scutella, 2002).

Based on the assumption of utility maximisation for each household and assuming households behave independently, the likelihood function can be written as:

$$\prod_i \Pr(U(x((h_{1i}, h_{2i})_r), (h_{1i}, h_{2i})_r, \varepsilon_r) \geq U(x((h_{1i}, h_{2i})_s), (h_{1i}, h_{2i})_s, \varepsilon_s) \textit{ for all } s) \quad (4)$$

where r stands for the combination $h_1$ and $h_2$ that is preferred; s stands for all possible combinations that can be made, given the discrete choice sets for hours worked; and $\varepsilon_r$ and $\varepsilon_s$ represent error terms. Adding an error term to the utility function prevents contributions to the likelihood of any data point from becoming zero, by allowing for optimisation errors. Choosing an extreme value specification for the error term in (4) results in a multinomial logit model.

Following Keane and Moffitt (1998), a quadratic specification is used for the utility function. This utility function is simple but quite flexible in that it allows for the leisure of each person and income to be substitutes or complements. Parameters representing fixed costs of working are included in the utility when positive labour choices are made. The fixed cost of working parameter, $\gamma$, is included in the income variable x to indicate the cost of working versus non-participation (following Callan and Van Soest, 1996). As a result of the inclusion in x, this cost of working parameter is measured in dollars per week.[11] The utility is specified as follows:

$$\begin{aligned} U(x,h_1,h_2) = {} & \beta_x(x-\gamma_1-\gamma_2)+\beta_1 h_1+\beta_2 h_2+\alpha_{xx}(x-\gamma_1-\gamma_2)^2+\alpha_{11}(h_1)^2+\alpha_{22}(h_2)^2+ \\ & \alpha_{x1}(x-\gamma_1-\gamma_2)h_1+\alpha_{x2}(x-\gamma_1-\gamma_2)h_2+\alpha_{12}h_1h_2 \end{aligned} \quad (5)$$

where $\alpha$.. and $\beta$. are preference parameters and $\gamma_1$ and $\gamma_2$ are the fixed cost of working parameters to be estimated (where the indices 1 and 2 denote the husband and wife respectively). The fixed cost is zero when the relevant person is not working. For single adult households, all terms related to $h_2$ drop out of the utility function and $\gamma_2$ is set to zero.

We include observed heterogeneity by allowing $\beta_1$, $\beta_2$, $\beta_x$, $\gamma_1$ and $\gamma_2$ to depend on the personal and household characteristics listed above. Unobserved heterogeneity is added to

[11] Fixed costs of working are implicit costs that we do not observe, but we can estimate their value through observing whether or not individuals participate in the labour force. Fixed costs of working may include for example financial costs such as travel costs but also non-financial costs such as the difficulty of finding part-time work for example.

$\beta_1$, $\beta_2$, $\beta_x$, and $\gamma_2$, in the form of a normally distributed error term with zero mean and unknown variance. Finally, the model is estimated using simulated maximum likelihood. In estimation, the unobserved heterogeneity parameters were found to be insignificant and were dropped. More detail on the model and implied average wage elasticities can be found in Kalb (2002) and Creedy and Kalb (2005a) respectively.